S+S REGELTECHNIK



SENSOR TECHNOLOGY & FIELD DEVICES

Catalogue | 2023

Climate Action Starts Right with Room Climate

The ongoing pandemic and the Russian 'Special Operation' in Ukraine have distracted our attention from some other global challenges. It belongs to the irony of events that the lack of Russian crude oil and natural gas supplies has moved climate protection and a more sustainable use of our planet's resources back into focus.

For S+S, climate action has always been a mission that starts right with room climate. This is why we have thoroughly expanded and innovated the family of our **RYM**ASKON® operating devices for room automation.

Our new devices do not only help users optimise the comfort level of indoor climate. Their flexible control functions also enable measurable energy savings, in turn contributing to the reduction of CO2 emissions and costs.

Besides, take advantage of our multi-functional and durable **AER**ASGARD® ambient sensors for controlling the CO2, VOC, particulate matter and CO loads in rooms – for a sustainably healthier living and working environment.

Tino Schulze
General Manager
S+S Regeltechnik GmbH®

Heiko Linke
General Manager
S+S Regeltechnik GmbH®



Sustainability Across All Levels

S+S Regeltechnik GmbH is determined to keep designing its manufacturing processes and its products in line with the targets of the United Nations' for sustainable development and with the Greenhouse Gas Protocol.
In doing so, our priorities are clearly defined:

1 Environmentally friendly production

Our new gigafactory is specially focussed on low-energy, low-emission processes and on waste prevention. Upcoming and current activities:

- Audit and certification of our environmental management according to DIN 14001
- Consistent further minimisation of our Scope 1 and Scope 2 emissions as well as of our share in the Scope 3 emissions of our customers [1]

2 Durable and energy efficient sensor technology

We manufacture advanced products for sustainable building and plants.
This means:

- Sensor and control devices for controlled energy management enabling lower energy consumption and reduced pollutant emissions
- Smart software for optimising and automating energy saving solutions
- Durable and low-maintenance product quality for enhanced sustainability by means of reduced resource consumption
- Energy efficient ambient sensor devices for a healthy and productive room climate
- Multifunctional sensor technology for reduced equipment variety and less installation work



[1] According to the Greenhouse Gas Protocol, Scope 1 refers to direct emissions from in-house production processes, Scope 2 to indirect emissions from purchased energy, and Scope 3 to all other indirect emissions from upstream and downstream sources, such as material supplies, packaging and transportation.

S+S Product Groups

ETHER CAT P MEASURING TRANSDUCER

Temperature sensors		
ATM 2 - EtherCATP	Outside temperature sensor	031
TM 65 - EtherCATP	Duct / immersion / screw-in temperature sensor	033
MWTM - EtherCATP	Mean-value temperature sensor	039
HFTM - EtherCATP	Sleeve sensor with cable	041
ALTM 2 - EtherCATP	Surface-contact temperature sensor with cable	043
Humidity sensors		
AFTF - EtherCATP	On-wall humidity/temperature sensor	047
KFTF - EtherCATP	Duct humidity/temperature sensor	051
Pressure sensors		
PREMASGARD® **612x - EtherCATP**	Pressure measuring transducer (Differential pressure, volume flow)	055
Special accessories		
see chapter Accessories		659

EtherCAT® P

Fast standard industrial bus with communication and power on one cable



BUS-CAPABLE MEASURING TRANSDUCER

Room control units			
RYMASKON® **200**	Room control units		099
RYMASKON® **400**	Room control units		097
RYMASKON® **500**	Room controller (Thermostat)	NEW	095
RYMASKON® **600**	Room controller (Controller)	NEW	091
RYMASKON® **700**	Room control units (Interface)	NEW	087
RYMASKON® **1000**	Room control units (Interface)	NEW	077
RYMASKON® **1000**	Room controller (Controller)	NEW	083
RFTF - Modbus-xx	Room control units		101
RTM1 - Modbus	Room control units		103
RFTM - CO2 - Modbus - P	Room control units		159
FSFTM - Modbus - xx	Room control units, In-wall		125/161
Temperature sensors			
RTM1 - Modbus	Room temperature sensor		103
RPTM1 - Modbus - T3	Room pendulum temperature sensor		119
RPTM 2 - Modbus - T3	Room pendulum temperature sensor		121
HFTM - Modbus - T3	Sleeve sensor with cable		113
ALTM1 - Modbus - T3	Surface-contact temperature sensor		115
ALTM 2 - Modbus - T3	Surface-contact temperature sensor with cable		117
ATM 2 - Modbus - T3	Outside temperature sensor		105
TM 65 - Modbus - T3	Duct / immersion / screw-in sensor		107
MWTM - Modbus - T3	Mean-value temperature sensor		111
Humidity sensors			
FSFTM - Modbus	In-wall humidity temperature sensor		125
RFTF - Modbus	Room humidity temperature sensor		123
RPFTF - Modbus - T3	Room pendulum humidity temperature sensor		131
VFTF - Modbus - T3	Showcase humidity temperature sensor		133
AFTF - Modbus - T3	On-wall humidity temperature sensor		127
KFTF - Modbus - T3	Duct humidity temperature sensor		129
TW - Modbus - T3	Dew point control switch		137
Pressure sensors			
PREMASGARD® **232x - Modbus - T3**	Pressure measuring transducer (differential pressure)		141
PREMASGARD® **714x - Modbus**	Pressure measuring transducer (differential pressure, volume flow)		145
PREMASGARD® **724x - Modbus**	Pressure measuring transducer (differential pressure, volume flow) **with dual pressure sensor**	NEW	151
PREMASGARD® **814x - Modbus**	Duct sensor for humidity, temperature with pressure measuring transducer (differential pressure, volume flow)		155

BUS-CAPABLE MEASURING TRANSDUCER

CO2, VOC and fine dust sensor			
FSFTM-CO2-Modbus	In-wall sensor for humidity, temperature, air quality (VOC), CO2		161
RFTM-LQ-PS-CO2-Modbus	Room sensor for humidity, temperature, air quality (VOC), CO2, and fine dust (PM)		159
AFTM-LQ-CO2-Modbus	On-wall sensor for humidity, temperature, air quality (VOC), CO2		165
KFTM-LQ-CO2-Modbus	Duct sensor for humidity, temperature, air quality (VOC), CO2		169
Airflow monitors			
KLGF-Modbus	Duct airflow monitor	NEW	173
KLGFVT-Modbus	Duct sensor for airflow, volume flow and temperature	NEW	173
Special accessories			
LA-Modbus	Line termination device		175
KA2-Modbus	Communication adapter		177
see chapter Accessories			659

POWER IO BUILDING AUTOMATION

powerIO® Main components		
Box	Decentralised automation box	067
Line	Hybrid cable	067
Start Unit	Switch	067
Starter Set	with basic components	066
powerIO® Expansion components		
Bluetooth Dongle	Communication with powerIO® App	069
Rio1	Expansion box non-communicative sensors / actuators	068
Rio 4DI / 8DI	Digital input modules	068
Hub	Distributor	068
Booster	Power output amplification	068
HK Distributor	Thermal drives	068
Y Distributor Box	RS485 nodes	068
BSK Modules	Fire damper	069
powerIO® Expansion cards		
C100_ETH	Ethernet	070
C100_RS485	RS485	070
C100_RS232	RS232	070
powerIO® Special accessories		
see product page		070 / 071

RADIO SENSOR RADIO TRANSMITTER

KYMASGARD® 9000 EnOcean radio transmitter		
RFTM-FSE	Room temperature radio sensor	635
RFTM-LQ-FSE	Room radio sensor for humidity, temperature and air quality	635
RFTM-BW-FSE	Room radio sensor for humidity, temperature and motion	635
EnOcean radio transmitter		
RTF2-FSE	Room temperature radio sensor	636
RFTF2-FSE	Room humidity temperature radio sensor	636
RTF2-FSE-P	Room temperature radio sensor	637
RFTF2-FSE-P	Room humidity temperature radio sensor	637
RTF2-FSE-PT	Room temperature radio sensor	638
RFTF2-FSE-PT	Room humidity temperature radio sensor	638
RTF2-FSE-PD	Room temperature radio sensor	639
RFTF2-FSE-PD	Room humidity temperature radio sensor	639
RTF2-FSE-PDT	Room temperature radio sensor	640
EnOcean outside radio sensor		
AFTF-HK-FSE	Outside radio sensor for humidity, temperature and light intensity	641

power IO

The system for decentralised building automation



TEMPERATURE SENSORS PASSIVE

Room sensors		
DTF	In-ceiling temperature sensor	199
RTF	Room temperature sensor, on-wall	182
FSTF	Room temperature sensor, in-wall	192
RPTF 1	Room pendulum temperature sensor	256
RPTF 2	Room pendulum temperature sensor	257
RSTF	Room radiation temperature sensor	259
RTF-xx	Room control units, on-wall	186
FSTF-xx	Room control units, in-wall	194
Cable sensors, surface-contact sensors, outdoor sensors		
HTF	Sleeve temperature sensor with cable	246
OFTF	Surface temperature sensor	251
ALTF 1	Surface-contact temperature sensor	252
ALTF 2 / 02	Surface-contact temperature sensor	255/254
ATF 1 / 01	Outside temperature sensor	201/200
ATF 2	Outside temperature sensor	203
Duct, immersion, screw-in sensors		
TF 43 / 65	Duct / immersion / screw-in sensor	208/206
TF 54	Duct / immersion / screw-in sensor	220
MWTF / SD	Mean-value temperature sensor	215
ETF 6	Screw-in sensor with neck tube	228
ETF 7	Screw-in sensor, fast-acting	217
RGTF 2	Smoke gas screw-in sensor	241
RGTF 1	Smoke gas duct sensor	235
HTF	Sleeve sensor with cable	246
Radiation temperature sensors		
ASTF	On-wall radiation temperature sensor	258
RSTF	Room radiation temperature sensor	259

TEMPERATURE SENSOR ACTIVE MEASURING TRANSDUCER

Room sensors		
RTM 1	Room temperature measuring transducer	263
FSTM	Room temperature sensor, in-wall	265
RPTM 1	Room pendulum temperature measuring transducer	323
RPTM 2	Room pendulum temperature measuring transducer	325
Cable sensors, surface-contact sensors, outdoor sensors		
HFTM	Sleeve sensor with measuring transducer	307
HFTM-VA	Sleeve sensor with measuring transducer (Stainless steel housing Tyr 2E)	311
ALTM 1	Surface-contact temperature measuring transducer	313
ALTM 2	Surface-contact temperature measuring transducer	317
ALTM 2-VA	Surface-contact temperature measuring transducer (Stainless steel housing Tyr 2E)	321
ATM 2	Outside temperature measuring transducer	269
ATM 2-VA	Outside temperature measuring transducer (Stainless steel housing Tyr 2E)	273
Duct, immersion, screw-in sensors		
TM 43 / 65	Duct / immersion / screw-in temperature measuring transducer	277
TM 54	Duct / immersion / screw-in temperature measuring transducer	287
MWTM / SD	Mean-value temperature measuring transducer	283
RGTM 1	Smoke gas temperature measuring transducer	295
RGTM 2	Smoke gas temperature measuring transducer	301

TEMPERATURE CONTROLLERS / THERMOSTATS

Room temperature controllers		
RTR-B	Room temperature controller	329
RTR-S	Room temperature controller, fan coil controller	331
TET	Top hat rail measuring transducer	365
Built-in controllers, duct controllers		
ETR	Built-in temperature controller	341
KTR	Duct temperature controller	347
TR 040/060	Temperature controller	334
TR 22	Temperature controller	335
TR 04040	Temperature controller, two-step	336
TR xx-F	Temperature controller with remote sensor	337
Thermostats		
ALTR xx	Surface-contact thermostats	350/351
FST	Frost protection thermostat, mechanical	355
FST-K	Duct frost protection thermostat, mechanical	359
FS-20	2-phase frost protection thermostat, two-step, switching	363

HUMIDITY SENSORS HUMIDITY CONTROLLERS / HYGROSTATS

Room sensors		
RFF/RFTF	Room humidity sensor, on-wall	373
FSFM/FSFTM	Room humidity sensor, in-wall	375
RPFF-SD	Room pendulum humidity sensor	433
RPFF/RPFTF	Room pendulum humidity sensor	437
RPFF/RPFTF-25	Room pendulum humidity sensor, pluggable	441
VFF/VFTF	Showcase humidity sensor	445
DFF/DFTF	In-ceiling humidity sensor	379
On-wall sensors, outdoor sensors		
AFF/AFTF-SD	On-wall humidity sensor	383
AFF/AFTF	On-wall humidity sensor	388
AFF/AFTF-20	On-wall humidity sensor	391
AFF/AFTF-25	On-wall humidity sensor, pluggable	389
AFTF-20-VA	On-wall humidity sensor (Stainless steel housing Tyr 2E)	396
AFTF-35	On-wall humidity sensor for high humidity NEW	401
AAVTF	On-wall humidity sensor	405
Duct sensors		
KFF/KFTF-SD	Duct humidity sensor	410
KFF/KFTF	Duct humidity sensor	411
KFF/KFTF-20	Duct humidity sensor	413
KFTF-20-VA	Duct humidity sensor (Stainless steel housing Tyr 2E)	419
KFTF-35	Duct humidity sensor for high humidity NEW	423
KAVTF	Duct humidity sensor	427
ESFTF	Screw-in humidity sensor for pressure systems NEW	431
Hygrostats		
RH-2	Room hygrostat, one-step	447
KH-10	Duct hygrostat, one-step	459
KH-40	Duct hygrostat, one-step	461
AH-40	On-wall hygrostat, one-step	453
RHT	Room hygrothermostat	446
RHT-30	Room hygrothermostat, two-step	451
KHT-30	Duct hygrothermostat, two-step	465
AHT-30	On-wall hygrothermostat, two-step	457
Control switches		
KW/KW-SD	Condensation control switch	469/468
TW	Dew point control switch	473
LS	Leakage sensor	475

PRESSURE SENSORS PRESSURE CONTROLLERS / SWITCHES

for gaseous media			
PREMASGARD® **111x / 112x / SD**	Pressure measuring transducer [mbar/Pa], Differential pressure sensor		490/491
PREMASGARD® **211x / 212x / SD**	Pressure measuring transducer [mbar/Pa], Differential pressure sensor		485/484
PREMASGARD® **711x**	Pressure measuring transducer [mbar/Pa], Differential pressure sensor		497
PREMASGARD® **711x-VA**	Pressure measuring transducer [mbar/Pa], Differential pressure sensor (Stainless steel housing Tyr 2E)		503
PREMASGARD® **722x**	Pressure measuring transducer [mbar/Pa], Differential pressure sensor **with dual pressure sensor**	NEW	509
PREMASREG® **711x**	Pressure measuring transducer [mbar/Pa], Differential pressure switch		515
PREMASREG® **711x-VA**	Pressure measuring transducer [mbar/Pa], Differential pressure switch (Stainless steel housing Tyr 2E)		521
ALD	Measuring transducer [mbar], Atmospheric pressure		535
DS 1 / DS2	Differential pressure switch [mbar/Pa]		539
for volume flow			
PREMASREG® **716x**	Pressure measuring transducer [mbar/Pa], Volume flow / differential pressure switch		527
PREMASREG® **716x-VA**	Pressure measuring transducer [mbar/Pa], Volume flow / differential pressure switch (Stainless steel housing Tyr 2E)		533
for liquid media			
SHD / SHD-SD	Pressure measuring transducer [bar]	NEW	541
SHD-692	Pressure measuring transducer [bar]	NEW	543

LIGHT INTENSITY SENSORS MOTION DETECTORS / PRESENCE DETECTORS

Light intensity sensors			
AHKF	Outdoor light intensity sensor		553
RHKF	Room light intensity sensor		552
FSHKM	Room light intensity sensor, in-wall	NEW	551
DHKF	In-ceiling light intensity sensor		555
Motion detectors			
ABWF	Outdoor motion detector		559
RBWF	Room motion detector		558
FSBWF-W	Room motion detector, in-wall	NEW	557
DBWF/DBWF-C	In-ceiling motion detector		561
Motion and light intensity sensors			
ABWF/LF	Outdoor motion detector / light intensity sensor		565
RBWF/LF	Room motion detector / light intensity sensor		563
DBWF/LF/FTF	In-ceiling sensor for temperature, humidity, motion and light intensity		567

IMMERSION SLEEVES ACCESSORIES / SPARE PARTS

Immersion sleeves		
TH 08	Immersion sleeves for temperature sensors	644
TH	Immersion sleeves for temperature sensors	646
THR	Immersion sleeves for temperature controllers	648
THE	Immersion sleeves for sleeve sensors	650
Mounting accessories		
MF-xx	Mounting flanges	652/653
KRD-04	Capillary tube leadthrough, plastic	652
MK-xx	Mounting clamps	653
ESSH	Welding protection sleeve	654
Others	see chapter Accessories	652

AIR QUALITY SENSORS

* **W** with changeover contact

Gas mixture sensor (VOC)			
RLQ-SD	Room air quality sensor		577
RLQ-W	Room air quality sensor		* 577
FSLQ	Room air quality sensor, in-wall	NEW	597
KLQ-SD	Duct air quality sensor		611
KLQ-W	Duct air quality sensor		* 611
Carbon dioxide sensor (CO2)			
FSCO2	Room CO2 sensor, in-wall		595
FSTM-CO2	Room temperature / CO2 sensor, in-wall		595
RCO2-AS xx	**CO2 traffic light with signal tone**, table-top unit with plug-in power supply unit, wall unit with/without power supply unit		581
RCO2-SD	Room CO2 sensor		585
RCO2-W	Room CO2 sensor		* 585
RCO2-W-A	Room CO2 sensor with LED display		* 585
RTM-CO2-SD	Room temperature / CO2 sensor		589
RFTM-CO2-W	Room humidity / temperature / CO2 sensor		* 589
ACO2-SD	On-wall CO2 sensor		599
ACO2-W	On-wall CO2 sensor		* 599
ATM-CO2-SD	On-wall temperature / CO2 sensor		605
AFTM-CO2-W	On-wall humidity / temperature / CO2 sensor		* 605
KCO2-SD	Duct CO2 sensor		615
KCO2-W	Duct CO2 sensor		* 615
KTM-CO2-SD	Duct temperature / CO2 sensor		621
KFTM-CO2-W	Duct humidity / temperature / CO2 sensor		* 621
Fine dust sensor (PM)			
RPS-SD	Room fine dust sensor		593
RFTM-PS-W	Room humidity / temperature / fine dust sensor		593
APS-SD	On-wall fine dust sensor		607
Multifunctional air quality sensor (VOC/CO2/PM)			
RLQ-CO2-W	Room air quality CO2 sensor		* 589
RFTM-LQ-CO2-W	Room humidity / temperature / air quality / CO2 sensor		* 589
RFTM-PS-CO2-W	Room humidity / temperature / fine dust / CO2 sensor		* 593
ALQ-CO2-W	On-wall air quality / CO2 sensor		* 605
AFTM-LQ-CO2-W	On-wall humidity / temperature / air quality / CO2 sensor		* 605
KLQ-CO2-W	Duct air quality / CO2 sensor		* 621
KFTM-LQ-CO2-W	Duct humidity / temperature / air quality / CO2 sensor		* 621

AIRFLOW MONITORS FLOW SENSORS / CONTROLLERS

Airflow monitors			
KLSW / KLGF	Duct airflow monitor, electronic	NEW	625
KLGFVT	Duct sensor, electronic, for air flow, volume flow and temperature	NEW	625
WFS	Wind vane switch, mechanical		627
SW	Flow monitor, mechanical		629

S+S Products A-Z

TYPE		PAGE
A		
AAVTF	Outdoor humidity sensor	405
ABWF	Outdoor motion detector	559
ABWF/LF	Outdoor motion detector and light sensor	565
ACO2-Modbus	On-wall CO2 sensor	165
ACO2-SD	On-wall CO2 sensor	599
ACO2-W	On-wall CO2 sensor	599
AFF	On-wall humidity sensor	388
AFF-20	On-wall humidity sensor	391
AFF-25	On-wall humidity sensor, pluggable	389
AFF-SD	On-wall humidity sensor	383
AFTF	On-wall humidity / temperature sensor	388
AFTF-20	On-wall humidity / temperature sensor	391
AFTF-20-VA	On-wall humidity / temperature sensor in stainless steel housing	396
AFTF-25	On-wall humidity / temperature sensor, pluggable	389
AFTF-35	On-wall humidity / temperature sensor for high humidity NEW	401
AFTF-HK-FSE	Outdoor radio sensor for humidity, temperature and light intensity	641
AFTF-EtherCATP	On-wall humidity / temperature sensor	047
AFTF-Modbus-T3	On-wall humidity / temperature sensor	127
AFTF-SD	On-wall humidity / temperature sensor	383
AFTM-CO2-Modbus	On-wall humidity / temperature / CO2 sensor	165
AFTM-CO2-W	On-wall humidity / temperature / CO2 sensor	605
AFTM-LQ-CO2-Modbus	On-wall humidity / temperature / air quality / CO2 sensor	165
AFTM-LQ-CO2-W	On-wall humidity / temperature / air quality / CO2 sensor	605
AHKF	Outdoor light intensity sensor	553
AH-40	On-wall hygrostat, one-step	453
AHT-30	On-wall hygrothermostat, two-step	457
ALD	Measuring transducer for atmospheric pressure	535
ALQ-CO2-Modbus	On-wall air quality / CO2 sensor	165
ALQ-CO2-W	On-wall air quality / CO2 sensor	605
ALTF1	Surface-contact temperature sensor	252
ALTF02	Surface-contact temperature sensor	254
ALTF2	Surface-contact temperature sensor	255
ALTM1	Surface-contact temperature measuring transducer	313
ALTM1-Modbus-T3	Surface-contact temperature measuring transducer	115
ALTM2	Surface-contact temperature measuring transducer	317
ALTM2-EtherCATP	Surface-contact temperature measuring transducer	043
ALTM2-Modbus-T3	Surface-contact temperature measuring transducer	117
ALTM2-VA	Surface-contact temperature measuring transducer in stainless steel housing	321
ALTR060	Surface-contact thermostats	350
ALTR090	Surface-contact thermostats	350
ALTR1	Surface-contact thermostats	351
ALTR3	Surface-contact thermostats	351
ALTR5	Surface-contact thermostats	351
ALTR7	Surface-contact thermostats	351
APS-SD	On-wall fine dust sensor	607
ASTF	On-wall radiation temperature sensor	258
ATF01	On-wall temperature sensor	200
ATF1	On-wall temperature sensor	201
ATF2	On-wall temperature sensor	203
ATM2	On-wall temperature measuring transducer	269
ATM2-EtherCATP	On-wall temperature measuring transducer	031
ATM2-Modbus-T3	On-wall temperature measuring transducer	105
ATM2-VA	On-wall temperature measuring transducer in stainless steel housing	273
ATM-CO2-SD	On-wall temperature / CO2 sensor	605
D		
DBWF	In-ceiling motion detector	561
DBWF-C	In-ceiling motion detector	561
DBWF/LF/FTF	In-ceiling motion detector / light / temperature / humidity sensor	567
DFF	In-ceiling humidity sensor	379
DFTF	In-ceiling humidity sensor	379
DHKF	In-ceiling light intensity sensor	555
DTF	In-ceiling temperature sensor	199
DS1	Differential pressure switch	539
DS2	Differential pressure switch	539
E		
ESFTF	Screw-in humidity sensor for pressure systems NEW	431
ETF6	Screw-in sensor	228
ETF7	Screw-in sensor	217
ETR	Built-in temperature controller	341
F		
FS-20	2-phase frost protection thermostat	363
FSBWF-W	In-wall motion detector NEW	557
FSCO2	In-wall CO2 sensor	595
FSFM	In-wall humidity sensor	375
FSFTM	In-wall humidity / temperature sensor	375
FSFTM-CO2-Modbus	In-wall humidity / temperature / CO2 sensor	161
FSFTM-Modbus	In-wall humidity / temperature sensor	125
FSHKM	In-wall light intensity sensor NEW	551
FSLQ	In-wall air quality sensor NEW	597
FST	Frost protection thermostat, mechanical	355
FST-K	Duct frost protection thermostat, mechanical	359
FSTF	In-wall temperature sensor	192
FSTF-xx	Room control units, in-wall	194
FSTM	In-wall temperature sensor	265
FSTM-CO2	In-wall temperature / CO2 sensor	595
H		
HFTM	Sleeve sensor with measuring transducer	307
HFTM-EtherCATP	Sleeve sensor with measuring transducer	041
HFTM-Modbus-T3	Sleeve sensor with measuring transducer	113
HFTM-VA	Sleeve sensor with measuring transducer in stainless steel housing	311
HTF-50	Sleeve temperature sensor	246
HTF-200	Sleeve temperature sensor, duct / immersion / screw-in sensor with cable	248
K		
KA2-Modbus	Communication adapter	177
KAVTF	Duct humidity sensor	427

TYPE		PAGE
KCO2-Modbus	Duct CO2 sensor	169
KCO2-SD	Duct CO2 sensor	615
KCO2-W	Duct CO2 sensor	615
KFF	Duct humidity sensor	411
KFF-20	Duct humidity sensor	413
KFF-SD	Duct humidity sensor	410
KFTF	Duct humidity / temperature sensor	411
KFTF-20	Duct humidity / temperature sensor	413
KFTF-20-VA	Duct humidity / temperature sensor in stainless steel housing	419
KFTF-35	Duct humidity / temperature sensor for high humidity NEW	423
KFTF-EtherCATP	Duct humidity / temperature sensor	051
KFTF-Modbus-T3	Duct humidity / temperature sensor	129
KFTF-SD	Duct humidity / temperature sensor	410
KFTM-CO2-Modbus	Duct humidity / temperature / CO2 sensor	169
KFTM-CO2-W	Duct humidity / temperature / CO2 sensor	621
KFTM-LQ-CO2-Modbus	Duct humidity / temperature / air quality / CO2 sensor	169
KFTM-LQ-CO2-W	Duct humidity / temperature / air quality / CO2 sensor	621
KH-10	Duct hygrostat, one-step	459
KH-40	Duct hygrostat, one-step	461
KHT-30	Duct hygrothermostat, two-step	465
KLGF	Duct airflow monitor NEW	625
KLGF-Modbus	Duct airflow monitor NEW	625
KLGFVT	Duct monitor for airflow, volume flow and temperature NEW	625
KLGFVT-Modbus	Duct monitor for airflow, volume flow and temperature NEW	173
KLSW	Duct airflow monitor NEW	625
KLQ-CO2-Modbus	Duct air quality / CO2 sensor	169
KLQ-CO2-W	Duct air quality / CO2 sensor	621
KLQ-SD	Duct air quality sensor	611
KLQ-W	Duct air quality sensor	611
KTM-CO2-SD	Duct temperature / CO2 sensor	621
KTR	Duct temperature controller	347
KW	Condensation control switch	469
KW-SD	Condensation control switch	468
L		
LA-Modbus	Line termination device	175
LS	Leakage sensor	475
M		
MWTF	Mean-value temperature sensor	215
MWTF-SD	Mean-value temperature sensor	215
MWTM	Mean-value temperature measuring transducer	283
MWTM-SD	Mean-value temperature measuring transducer	283
MWTM-EtherCATP	Mean-value temperature sensor	039
MWTM-Modbus-T3	Mean-value temperature sensor	111
O		
OFTF	Surface temperature sensor	251
P		
powerIO®	Installation system for building automation	066
PREMASGARD® **111x**	Pressure measuring transducer, compact design	491
PREMASGARD® **112x**	Pressure measuring transducer, compact design	491
PREMASGARD® **112x-SD**	Pressure measuring transducer, compact design	490

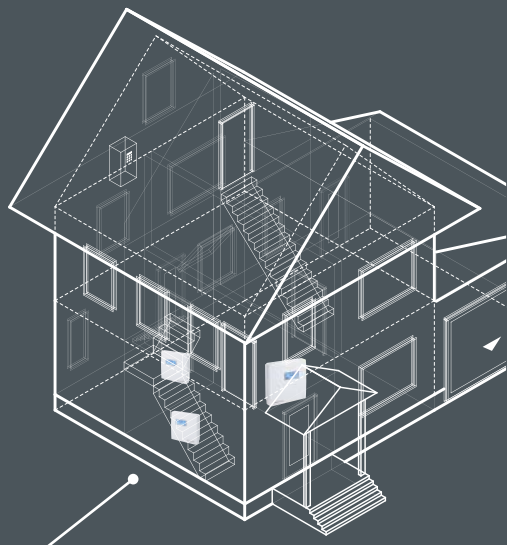
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PREMASGARD® **211x**	Pressure measuring transducer, compact design	485
PREMASGARD® **212x**	Pressure measuring transducer, compact design	485
PREMASGARD® **212x-SD**	Pressure measuring transducer, compact design	484
PREMASGARD® **232x-Modbus-T3**	Pressure measuring transducer	141
PREMASGARD® **612x-EtherCATP**	Pressure measuring transducer (differential pressure, volume flow)	055
PREMASGARD® **711x**	Pressure measuring transducer	497
PREMASGARD® **711x-VA**	Pressure measuring transducer in stainless steel housing	503
PREMASGARD® **714x-Modbus**	Pressure measuring transducer (differential pressure, volume flow)	145
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TYPE			PAGE
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S+S Goes Digital

USE OUR ONLINE RESOURCES
FOR PLANNING AND SOURCING

BIM READY



Building Information Modeling (BIM) is the key to efficient planning, approval, maintenance and further development of operation-critical building systems. Our products are BIM ready and can be directly integrated in your BIM process. With detailed data for all devices and in standardised formats to create a precise digital image in your BIM system.

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- Fewer input errors
- Easy changes
- Speedy approvals, installation and commissioning
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NEW

RYMASKON® 1000 / 2000 / 3000

The perfect solution for intelligent individual room control

For the extended product family of modern individual room control units **RYM**ASKON® **1000 / 2000 / 3000**, we have developed our new Iduna housing series. in a timeless look with high-quality surfaces in white and black.

The graphic **design** with international symbols and multiple languages offers the perfect solution for all visible areas in the building. Intuitive operation is via touch keys or touch screen.

High-contrast **colour displays** with strong LED backlighting allow effortless reading up to a viewing angle of 85°. even under unfavourable conditions, such as strong solar irradiation.

It also **saves power** with features such as automatic brightness adjustment, stand-by mode or wake-up function using hand gestures.

The room climate can be monitored in up to 5 zones via the integrated **sensor technology**. The ability to detect open windows and a programmable reset function round out the features, which include the control of temperature, fan, sun protection and lighting. In this way, buildings can be operated in an **energy-optimised** and **environmentally-friendly** manner.



INTEGRATED SENSOR TECHNOLOGY



INTUITIVE CONTROL

Interface and controller variants are available with a wide range of technical options. Optionally with communication interface (Modbus, BACnet, KNX) or with active outputs (0-10 V).

Further **information** on the new **RYM**ASKON unit series can be found on the following pages.

Technical details from page 072

RYMASKON® **3000**
5,0" TFT touch display (Iduna 5 housing)

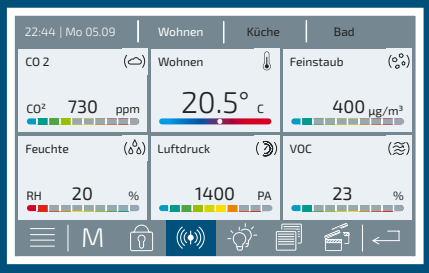
RYMASKON® **2000**
4,3" TFT touch display (Iduna 4 housing)

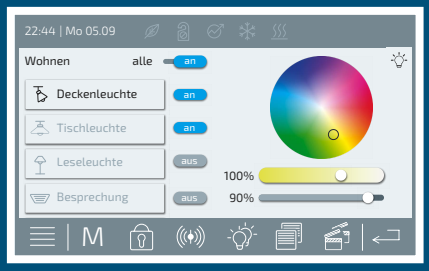
RYMASKON® **1000**
2,0" TFT display or LEDs, touch keys
(Iduna 1/2/3 housing)

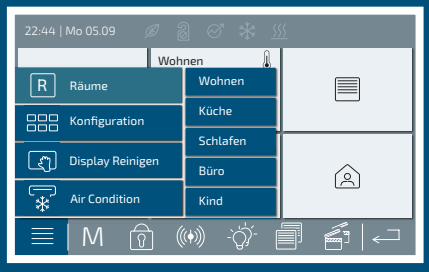


S+S ADDED VALUE

- Timeless design in the elegant Iduna housing (white or black colour)
- Intuitive operation with modern graphics via touch keys or touch screen
- Integrated environment sensor technology enables energy-efficient room ventilation and a comfortable climate
- Power-saving and environmentally friendly thanks to features, such as automatic brightness adjustment and reset, stand-by, wake-up, time control, etc.
- Extensive room lighting control with dimming function and advanced colour settings
- Many standard languages for menu control (DE, EN, FR, ES, IT, RU, others available upon request)
- Quick and easy installation (push-in terminals) and mounting (on in-wall flush box or on-wall)
- Wide range of configuration options







NEW

RYMASKON® 1000
Compact and flexible

RYMASKON® **1000** series of room control units are designed to control **temperature, fans, sun protection** and **lighting** in offices, homes and hotels.

Two compact housing sizes with colour TFT display (2.0") or LED display are available. Operation is intuitive via capacitive **touch keys** in combination with international symbols and a wide choice of languages.

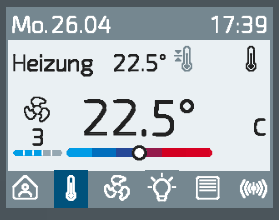
In addition to temperature and fan **control**, there are two pairs of keys available for sun protection and room lighting.

The integrated **sensors** (temperature, humidity, CO2, VOC) support room control with **limit value** monitoring.

The units can be seamlessly integrated into an existing building management system (BMS). Optionally with communication interface (Modbus, BACnet, KNX) or with active outputs (0-10 V).

The **RYM**ASKON® **1000 Controller** can also be operated as a stand-alone solution thanks to the integrated control functions (PI, PWM, 2-point or 3-point control). The controller can be used with all common heating/cooling systems in room climate technology, e.g. for controlling heating convectors, fan coils, cooling ceilings or floor heating.







RYMASKON® **1000 Interface**
RYMASKON® **1000 Controller**

Housing variants (Iduna 1/2/3)
with 2,0" display or LED display, touch keys
(adjusting wheels available upon request)



HIGHLIGHTS 1000

- 2,0" TFT display (320 x 240 x 3 RGB pixels) with LED backlighting, high contrast, 85° viewing angle
- 10 capacitive keys (freely configurable) alternatively with adjusting wheels (available upon request)
- 2 housing sizes available (92 x 82 mm and 110 x 88 mm)
- Integrated sensor technology (temperature, humidity, CO2, VOC) with limit value monitoring
- Control of temperature, fan, sun protection (max. 2 circuits) and lighting with dimming function
- Bus capable communication (Modbus, BACnet, KNX) or active outputs (0-10 V)
- Controller unit type for heating convectors and fan coils, with continuous output (0-10 V) or with 2-point or 3-point regulation (relay) for 2-pipe and 4-pipe systems
- Other configuration options

More details from page 072

NEW

RYMASKON® 2000/3000

Versatile and smart

RYMASKON® **2000/3000** series of room control units are designed to control **temperature, fans, sun protection** and **lighting** in up to 5 climate zones (rooms); specially designed for offices, practices, restaurants, hotels and smart homes.

Choice of two housing formats with large TFT colour displays (4.3" or 5.0"). Intuitive operation on a **touch screen** with international symbols and a wide choice of languages.

Besides the control of **temperature** and **fan**, they also provide 4 or 20 circuits each for **sun protection** and **lighting** (with dimming function).

The integrated **sensors** (temperature, humidity, CO2, VOC) support room control with **limit value** monitoring.

The units can be seamlessly integrated into an existing building management system (BMS). Optionally with communication interface (Modbus, BACnet, KNX) or with active outputs (0-10 V).

The **RYM**ASKON® **2000 Controller** can also be operated as a stand-alone solution thanks to the integrated control functions (PI, PWM, 2-point or 3-point control). The controller can be used with all common heating/cooling systems in room climate technology, e.g. for controlling heating convectors, fan coils, cooling ceilings or floor heating.



RYMASKON® **2000 Interface**
RYMASKON® **2000 Controller**
with 4.3" display, Iduna 4 housing

RYMASKON® **3000 Interface**
with 5.0" display, Iduna 5 housing









Further information upon request

HIGHLIGHTS 2000

- 4.3" TFT display (800 x 480 x 3 RGB pixels) with LED backlighting, high contrast, 85° viewing angle
- High-performance Quad Core CPU with 1.5 GHz, 512 MB RAM and 4 GB memory
- Iduna 4 housing (approx. 129 x 88 mm)
- Integrated sensor technology (temperature, humidity, CO2, VOC) with limit value monitoring
- Control of temperature and ventilation
- Control of 4 circuits each for sun protection and lighting
- Freely configurable function icons (e.g. lighting or sun protection)
- 8 scenes with start and end time (e.g. meeting, cinema, holiday, etc.)
- 'Please do not disturb' (e.g. in hotels, offices, practices)
- Bus capable communication (Modbus, BACnet, KNX) or active outputs (0-10 V)
- Controller unit type for heating convectors and fan coils, with continuous output (0-10 V) or with 2-point or 3-point regulation (relay) for 2-pipe and 4-pipe systems
- Other configuration options

UPGRADE 3000

- 5.0" TFT display (800 x 480 x 3 RGB pixels)
- Iduna 5 housing (approx. 143 x 98 mm)
- Control of 20 circuits each for sun protection and lighting
- Additional multi-room control (up to 5 rooms)

Automated Sensor Technology

S+S TEMPERATURE, HUMIDITY AND PRESSURE TRANSDUCERS FOR OPERATION ON THE ETHERCAT P INDUSTRIAL BUS

We have extended our bus-capable portfolio to include a range of sensor devices for consistent industrial automation solutions from field to control level using EtherCAT P.
The 'P' stands for routing both real-time communication and power through one and the same cable. Standardised M8 connectors enable commissioning without the need for opening the device.

Our EtherCAT P capable products are perfectly tailored to cabinet-free automation in industrial process, plant and facility engineering.

They are ideal for use in central energy management as well as for interconnected temperature, humidity and pressure control in poorly accessible areas.

Moreover, they offer superior added-value characteristics for configuration, data processing and display. All devices can also communicate using wireless Bluetooth technology.

Details on pp. 026





© Beckhoff Automation GmbH & Co. KG

EtherCAT®

S+S REGELTECHNIK

THERMASGARD®
ALTM2-EtherCATP
Surface-contact temperature transducer

HYGRASGARD®
AFTF-EtherCATP
On-wall temperature and humidity transducer

HYGRASGARD®
KFTF-EtherCATP
Duct temperature and humidity transducer

PREMASGARD®
612x-EtherCATP
Differential pressure transducer

NEW



Bar graph display for indication of working, limiting or fault ranges. Colour change and colour gradients of the 7 LEDs can be configured.

S+S ADDED VALUE

- **Wireless communication option**
  Bluetooth-capable devices
- **Writable LCD display**
  large back-lit three-line display, individually programmable
- **Configurable LED display**
  individually configurable bar graph with 7 colour LEDs (e.g. as traffic light indicator)
- **Additional configuration possibilities**
  preset of process data objects (PDOs) to the controller using the ESI function module for measured value queries, filtering, sampling time, etc.
- **Extended sensor data**
  e.g. retrievable history (min/max/mean) and service interval determination depending on stress and sensor type

ADVANTAGES AT A GLANCE

- **Single-cable solution with free choice of topology**
  communication and power on one single cable, for combination with line, star and tree structures
- **Implicit EtherCAT bus configuration and diagnosis**
  straightforward integration at PLC level using the EtherCAT Slave Information (ESI) configuration file of the device, and communication fault counter for quick localization of connection problems
- **Fast standard industrial bus (Industry 4.0)**
  intelligent machine-to-machine communication
- **Standardised M8 connector**
  minimal wiring thanks to safe and quick plug-screw connections

32 Devices in One

ACTIVE PRESSURE TRANSMITTER
WITH DOUBLE SENSOR AND
AUTOMATIC OUTPUT SWITCHING

Our new calibratable **PREM**ASGARD® **722x double-sensor** pressure transmitter is a real multi-functional talent and therefore ideal for use in clean room, medical and filtration engineering, ventilation and air conditioning ducts, spray booths and commercial kitchens, level measurement and frequency converter control.

With 2x 8 switchable measuring ranges (max. ±500 Pa or ±7000 Pa) as well as automatic output detection and switching to the required 0...10 V or 4...20 mA standard signal, it masters the tasks of up to 32 individual pressure sensors.

In this way, even highly demanding filtration and ventilation systems can be monitored with just one single pressure transmitter.

Details on pp. 504







Tyr2 housing,
with/without display
and cable gland
or M12 connector

WITH **DOUBLE**
PRESSURE SENSOR

PREMASGARD®
722x (active)

The actual pressure is alternately displayed (approx. 6 s interval), the measuring channel indicated at lower left



Pressure (channel 1)



Pressure (channel 2)





Automatic Detection and Switching
to 0...10 V or 4...20 mA standard signal

NEW

The newly developed Automatic Output Switching process is a protected S+S patent.
(Nr. DE 10 2015 015 941 B4)

AOS-PATENTED
AUTOMATIC OUTPUT SWITCHING

The Automation Specialist

BUS-CAPABLE DEVICE WITH DOUBLE SENSOR FOR PRESSURE, DIFFERENTIAL PRESSURE, VOLUME FLOW AND TEMPERATURE

The new maintenance-free **PREM**ASGARD® **724x-Modbus double-pressure sensor** unit can be used in many different application areas. The focus is on precise measuring and monitoring of positive, negative and differential pressures in two measuring channels using one single device (max. pressure ranges ±500 Pa and ±7000 Pa).

There is a version available for optional connection of an Pt1000 external sensor, if additional temperature reading is required (max. measuring range –50 ... +150 °C).

The highlights of the Modbus device also include its galvanically isolated RS485 interface as well as the possibility of setting bus parameters and bus address when the unit is de-energised.

Details on pp. 146

The display value depends on the set unit system (switchable via Modbus)



NEW





The 'T' version features an analogue input for connecting a Pt1000 external temperature sensor.

S+S REGELTECHNIK

SI IMP

WITH **DOUBLE** PRESSURE SENSOR

PREMASGARD® 724x-Modbus

As with all of our network-able devices, the display is individually configurable by bus.



System of Units

Standard display can be switched by bus from **SI units** [Pa, m3/h, °C] to **imperial units** [iWC, CFM, °F] via Modbus.



Pressure (channel 1)



Pressure (channel 2)



Volume flow



Temperature (type **'T'**)

Everything from a Single Source

S+S stands for a fully integral value chain.

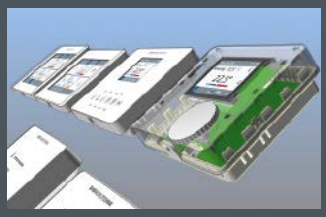
All products are designed, developed, manufactured and programmed in-house. Our new gigafactory in Nuremberg also includes a test centre with climate chambers, measuring benches and calibration facilities for all measurands.

- approx. 85 employees
- 4000 m² of production space, incl. test centre, warehousing and shipping area
- 2000 m² of office space for development, marketing, sales and administration
- 24 hours shipping service
- Made-to-order manufacturing



MADE
IN
GERMANY

S+S REGELTECHNIK



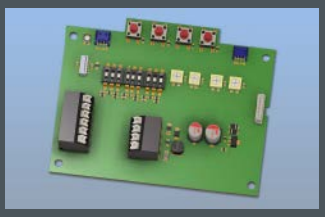
Design



Construction



Toolmaking



Hard- & Software



Test Equipment



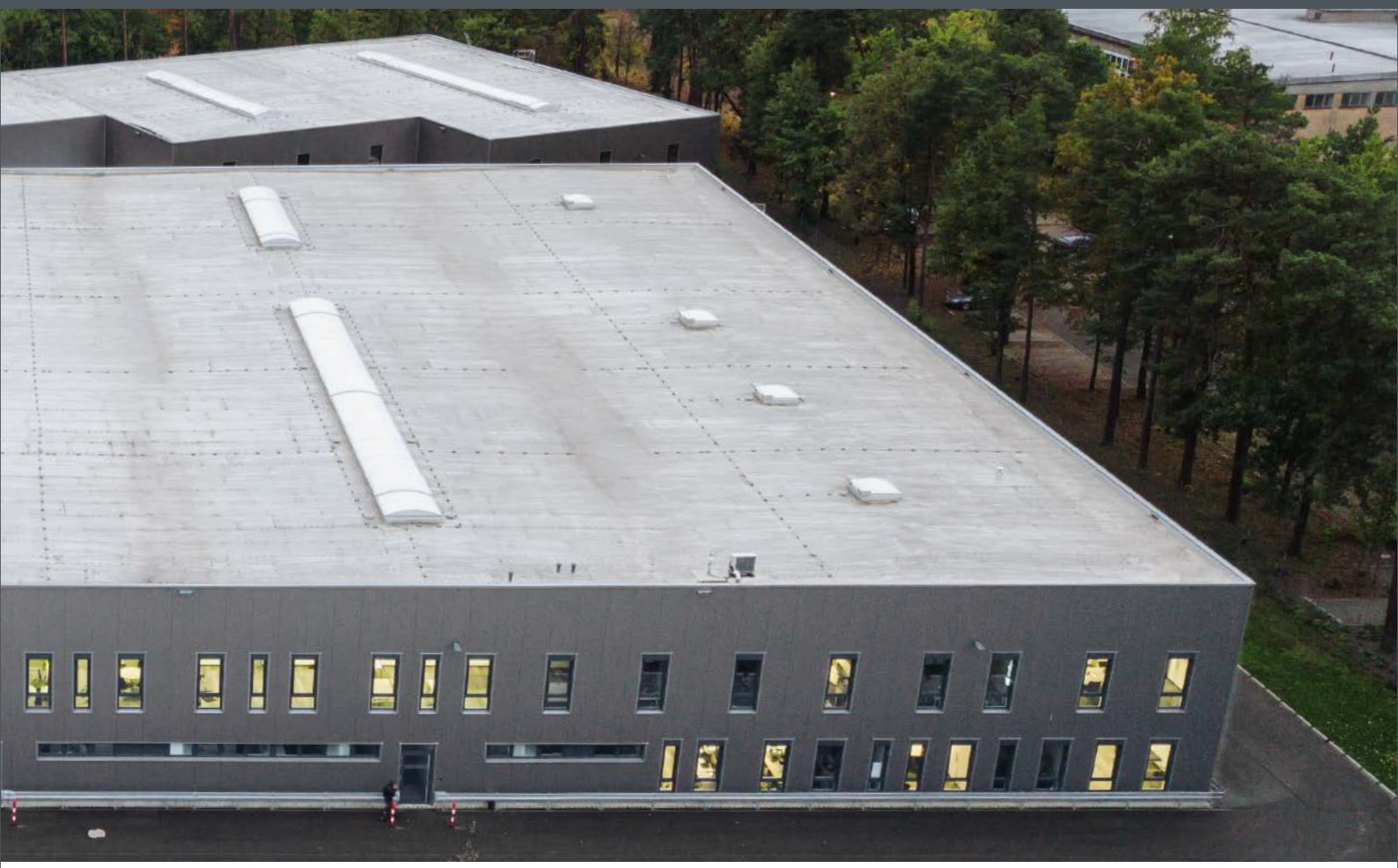
Production



Testing



Shipping



S+S Catalogue Items 2023



S+S REGELTECHNIK



ETHERCAT P

Bus-capable sensors
for industrial automation

026 – 055



MODBUS & BACnet

Single-room controllers with touch screen,
bus-capable sensors
with programmable control

056 – 177



THERMASGARD® & **THERM**ASREG®

Temperature sensors /
temperature transducers,
temperature controllers and thermostats

178 – 365



HYGRASGARD® & **HYGR**ASREG®

Humidity sensors /
humidity transducers,
humidity controllers and hygrostats

366 – 475



PREMASGARD® & **PREM**ASREG®

Pressure sensors /
pressure transducers,
pressure regulators and switches

476 – 543



PHOTASGARD® & **KIN**ASGARD®

Light intensity sensors,
motion detectors and presence detectors

544 – 567



AERASGARD®
RHEASGARD® & **RHE**ASREG®

Air quality , CO2 and fine dust sensors,
flow monitors and controllers

568 – 629



KYMASGARD®

Radio sensors, radio transmitters
and radio signal receivers
with EnOcean technology

630 – 641



Immersion sleeves & Accessories

Basic Programme,
appendix, useful information

642 –676

EtherCAT P

The industrial single-cable solution for communication and power

Industrial automation requires quick and cohesive solutions for real-time communication from control level to field level.

You can also fulfil these increased demands in the sensor technology area with our bus capable measuring transducers for connecting to EtherCAT P.

Application Areas

- Industrial process and plant automation
- Central energy management in the manufacturing industry and in process engineering
- Networked measuring and control of temperature, humidity and pressure parameters in poorly accessible or distant areas



S+S REGELTECHNIK





THERMASGARD®, **HYGR**ASGARD®, **PREM**ASGARD® – ETHERCATP CAPABLE MEASURING TRANSDUCERS

Temperature sensors

ATM 2 - EtherCATP	Outside temperature sensor	**031**
TM 65 - EtherCATP	Duct / immersion / screw-in temperature sensor	**033**
MWTM - EtherCATP	Mean-value temperature sensor	**039**
HFTM - EtherCATP	Sleeve sensor with cable	**041**
ALTM 2 - EtherCATP	Surface-contact temperature sensor	**043**

Moisture and temperature sensors

AFTF - EtherCATP	On-wall humidity and temperature sensor	**047**
KFTF - EtherCATP	Duct humidity and temperature sensor	**051**

Pressure sensors

PREMASGARD® **612x - EtherCATP**	Pressure sensor for differential pressure and volume flow	**055**

Accessories

Special accessories for EtherCATP	**659**
For others see chapter Accessories	**644**





EtherCAT P

THERMASGARD®, **HYGR**ASGARD®, **PREM**ASGARD® – for industrial automation

Ultra-fast industrial bus

Our new EtherCAT P sensors are perfectly tailored for automation without switch cabinets in industrial process, system and facility engineering.
For central energy management and for networked temperature, humidity and pressure control in areas that are difficult to access.

Optimum Precision

All devices are developed, manufactured and tested in accordance with the latest criteria. Take advantage of our experience, our development, manufacturing and product know-how and order these products directly from the manufacturer.

Technical Highlights

- EtherCAT capable
- Can be cascaded in all topologies
- Dual power supply
- Minimal amount of wiring due to M8 connectors
- Fewer fault sources

S+S added value

- Large, three-line display, individually programmable
- Configurable bar graph for displaying the measured value
- Additional configuration facilities, e.g. measurand, filtering, sample time
- Extended sensor data, e.g. retrievable history, maintenance interval determination

Certified Quality

Our development and production in Nuremberg/Germany is certified by TÜV Thüringen according to DIN EN ISO 9001:2015.

GOST certified

EAC certified

Approved Safety

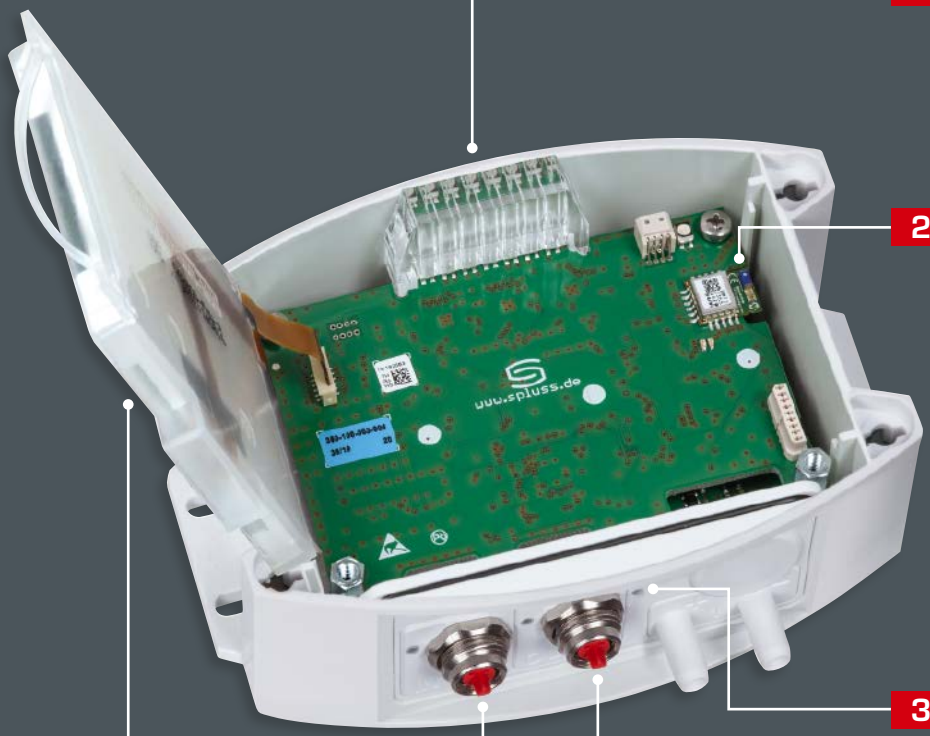
RoHS conforming materials

ESD compliant manufacturing

CE compliance tested by external laboratories

MADE
IN
GERMANY

S+S REGELTECHNIK



1

Bargraph

Fibre optics with 7 LEDs, colours, colour change or colour gradient freely configurable, e.g. as traffic light display

2

Bluetooth

Module for wireless communication

3

Status LEDs

For displaying the three EtherCAT operating statuses IN, OUT and RUN

4

M8 connectors

Low wiring effort due to EtherCATP coded built-in connectors

5

Illuminated display

Large, three-line display with background lighting, individually programmable



S+S TECHNOLOGY FOR
SMART BUILDINGS

THERMASGARD® ATM 2 - EtherCAT P

On-wall / outdoor- / wet room temperature measuring transducers, Bluetooth-enabled, with EtherCATP port

S+S REGELTECHNIK

Networkable outdoor temperature measuring transducer **THERM**ASGARD® **ATM 2 - EtherCAT P** with M8 plug-in connector (EtherCATP-encoded), Bluetooth-enabled, in an impact-resistant plastic housing with quick-locking screws, optionally with / without display and bar graph.

The on-wall sensor is used to detect the temperature in gaseous media. It is used outdoors or in wet rooms, in cold storage buildings and greenhouses, in the industrial sector and in agriculture. Installation on outside walls is preferably performed on the north side or in a protected place. In case of direct solar irradiation, the weather and sun protection hood **WS 03** (accessory) is to be used. The sensor is factory-calibrated.

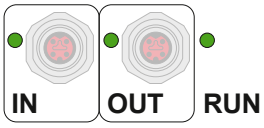
EtherCATP-enabled measuring transducer for industrial requirements with maximum reliability: includes easy PLC integration using the device's ESI configuration file, diagnostics (such as communication failure counter), advanced settings options, access to historical data (min / max) and establishing the sensor's service interval. Optionally with large illuminated display (3-line, customised programming in the 7-segment and dot-matrix range) and bar graph (7-digit, LEDs freely configurable) for graphical display, e.g., as a traffic light indicator.

ATM 2 - EtherCAT P





EtherCAT P
Cable connection and LED status display



TECHNICAL DATA	
Power supply:	24VDC via EtherCATP (U_S)
Power consumption:	< 3W
Bus protocol:	**EtherCAT**
Radio technology:	**Bluetooth** (LE)
Sensor:	Pt1000, DIN EN 60751, class B (**Perfect Sensor Protection**)
Measuring range:	–50...+150°C
Deviation in temperature:	Typically ± 0.2K at +25°C
Medium:	Clean air and non-aggressive, non-combustible gases
Protective tube:	Stainless steel, **V4A** (1.4571), Ø = 6mm (see dimensional drawing)
Housing:	Plastic, UV-resistant, polyamide material, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Dimensions:	126 x 90 x 50mm (Tyr 2)
Cable connection:	**M8 plug-in connector**, EtherCATP-encoded
Ambient temperature:	Measuring transducer –30...+70°C
Permitted humidity:	< 95% RH, non-precipitating air
Protection class:	III (according to EN 60730)
Protection type:	**IP 54** (according to EN 60529) when built-in
Standards:	CE conformity, according to EMC Directive 2014 / 30 / EU, according to RED 2014 / 53 / EU
Equipment:	**Display with illumination,** 3-line, customised programming, cutout approx. W 51 x H 29mm, to display the actual temperature or a customised display value. **Bar graph**, 7-digit, LEDs freely configurable, to graphically display the reading.
ACCESSORIES	See table

EtherCAT P	LED status display
1. LED	**"IN"**
off	no connection to upstream EtherCAT module
illuminated	LINK: connection to upstream EtherCAT module
blinking	ACT: communication with upstream EtherCAT module
2. LED	**"OUT"**
off	no connection to downstream EtherCAT module
illuminated	LINK: connection to downstream EtherCAT module
blinking	ACT: communication with downstream EtherCAT module
3. LED	**"RUN"**
off	EtherCAT module is in "Init" state
quickly blinking	EtherCAT module is in "Pre-Operational" state
slowly blinking	EtherCAT module is in "Safe-Operational" state
illuminated	EtherCAT module is in "Operational" state
The status LEDs are next to the cable connection.	

Display screen Reading — **xx-ECATP Tyr 2**



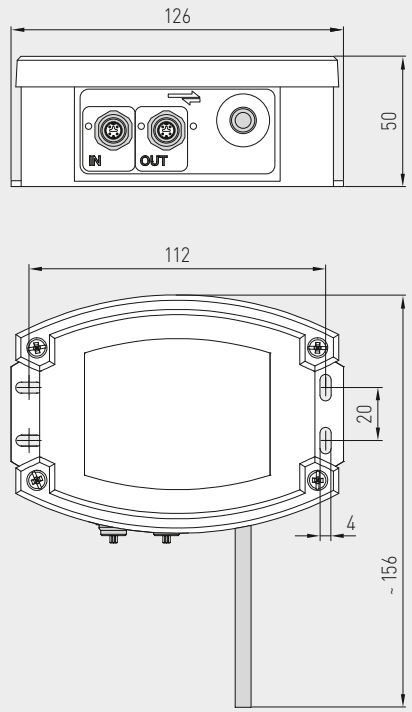
Temperature

Programmable display screen — **xx-ECATP Tyr 2**



Dimensional drawing

ATM2-EtherCAT P





M8-plug-in connector
EtherCATP-encoded

ATM2-EtherCAT P
with display and bar graph





WS-03
Weather and sun protection hood, (optional)





High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

THERMASGARD® ATM2-EtherCAT P	On-wall temperature sensor, with EtherCATP port					
Type / WG02	**Measuring Range** Temperature	**Sensor**	**Output**	**Bar graph Display**	**Item No.**	**Price**
ATM2-ECATP xx						
ATM2-ECATP	–50...+150 °C	Pt1000	EtherCAT P		2001-6201-9100-001	**345,85 €**
ATM2-ECATP **LCD**	–50...+150 °C	Pt1000	EtherCAT P	□■	2001-6202-9100-001	**392,10 €**
Note:	Cable connection with **M8 plug-in connector** (EtherCATP-encoded)					

ACCESSORIES			
WS-03	**Weather and sun protection hood,** 200 x 180 x 150 mm, stainless steel **V2A** (1.4301)	7100-0040-6000-000	**44,74 €**
	For further information, see last chapter Accessories!		

THERMASGARD® TM65-EtherCAT P

Immersion / screw-in / duct temperature measuring transducer, Bluetooth-enabled, with EtherCATP port

S+S REGELTECHNIK

Networkable temperature measuring transducer with sensor tube **THERM**ASGARD® **TM65-EtherCAT P** with M8 plug-in connector (EtherCATP-encoded), Bluetooth-enabled, in an impact-resistant plastic housing with quick-locking screws, optionally with / without display and bar graph.

The duct sensor is used to detect the temperature in liquid or gaseous media. Use the stainless steel immersion sleeves for aggressive media. It is used in heating engineering, ventilation and air conditioning ducts, pipes, storage systems, compact district heating stations, warm and cold water systems, oil and lubrication cycle systems, machine and systems engineering and the entire industry sector. The sensor is factory-calibrated.

EtherCATP-enabled measuring transducer for industrial requirements with maximum reliability: includes easy PLC integration using the device's ESI configuration file, diagnostics (such as communication failure counter), advanced settings options, access to historical data (min / max) and establishing the sensor's service interval. Optionally with large illuminated display (3-line, customised programming in the 7-segment and dot-matrix range) and bar graph (7-digit, LEDs freely configurable) for graphical display, e.g., as a traffic light indicator.

TM65-EtherCAT P

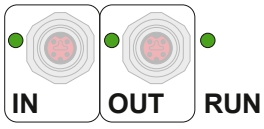


TECHNICAL DATA

Power supply:	24VDC via EtherCATP (U_S)
Power consumption:	< 3W
Bus protocol:	**EtherCAT**
Radio technology:	**Bluetooth** (LE)
Sensor:	Pt1000, DIN EN 60751, class B (**Perfect Sensor Protection**)
Measuring range:	–50...+150°C
Deviation in temperature:	Typically ±0.2K at +25°C
Medium:	Clean air and non-aggressive, non-combustible gases; liquids depending on selected immersion sleeve (accessory)
Protective tube:	Stainless steel, **V4A** (1.4571), Ø = 6mm, installation length (IL) = 50–400mm (see table)
Housing:	Plastic, UV-resistant, polyamide material, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Dimensions:	126 x 90 x 50mm (Tyr 2)
Cable connection:	**M8 plug-in connector**, EtherCATP-encoded
Ambient temperature:	Measuring transducer –30...+70°C
Permitted humidity:	< 95% RH, non-precipitating air
Protection class:	III (according to EN 60730)
Protection type:	**IP 54** (according to EN 60529) when built-in
Standards:	CE conformity, according to EMC Directive 2014 / 30 / EU, according to RED 2014 / 53 / EU
Equipment:	**Display with illumination,** 3-line, customised programming, cutout approx. W51 x H29mm, to display the actual temperature or a customised display value. **Bar graph**, 7-digit, LEDs freely configurable, to graphically display the reading.
ACCESSORIES	See table



EtherCAT P
Cable connection and LED status display



EtherCAT P	LED status display
1. LED	**"IN"**
off	no connection to upstream EtherCAT module
illuminated	LINK: connection to upstream EtherCAT module
blinking	ACT: communication with upstream EtherCAT module
2. LED	**"OUT"**
off	no connection to downstream EtherCAT module
illuminated	LINK: connection to downstream EtherCAT module
blinking	ACT: communication with downstream EtherCAT module
3. LED	**"RUN"**
off	EtherCAT module is in "Init" state
quickly blinking	EtherCAT module is in "Pre-Operational" state
slowly blinking	EtherCAT module is in "Safe-Operational" state
illuminated	EtherCAT module is in "Operational" state
The status LEDs are next to the cable connection.	

Display screen Reading — **xx-ECATP Tyr 2**



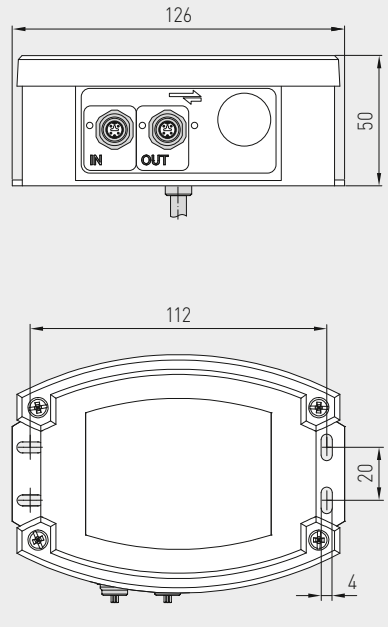
Temperature

Programmable display screen — **xx-ECATP Tyr 2**



Immersion / screw-in / duct temperature measuring transducer, Bluetooth-enabled, with EtherCATP port

Dimensional drawing **TM65-EtherCAT P**





M8-plug-in connector
EtherCATP-encoded



TM65-EtherCAT P
with display and bar graph





High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

THERMASGARD® TM65-EtherCAT P	Temperature measuring transducer (basic unit), with EtherCATP port					
Type / WG02	**Measuring Range** Temperature	**Output**	**Inserted Length**	**Bar graph Display**	**Item No.**	**Price**
TM65-ECATP xx			**(EL)**			
TM65-ECATP 50mm	–50…+150 °C	EtherCAT P	**50 mm**		2001-4201-9100-011	**341,95 €**
TM65-ECATP 50mm **LCD**				□ ■	2001-4202-9100-011	**388,22 €**
TM65-ECATP 100mm	–50…+150 °C	EtherCAT P	**100 mm**		2001-4201-9100-021	**342,38 €**
TM65-ECATP 100mm **LCD**				□ ■	2001-4202-9100-021	**388,65 €**
TM65-ECATP 150mm	–50…+150 °C	EtherCAT P	**150 mm**		2001-4201-9100-031	**342,84 €**
TM65-ECATP 150mm **LCD**				□ ■	2001-4202-9100-031	**389,09 €**
TM65-ECATP 200mm	–50…+150 °C	EtherCAT P	**200 mm**		2001-4201-9100-041	**343,27 €**
TM65-ECATP 200mm **LCD**				□ ■	2001-4202-9100-041	**389,52 €**
TM65-ECATP 250mm	–50…+150 °C	EtherCAT P	**250 mm**		2001-4201-9100-051	**343,69 €**
TM65-ECATP 250mm **LCD**				□ ■	2001-4202-9100-051	**389,94 €**
TM65-ECATP 300mm	–50…+150 °C	EtherCAT P	**300 mm**		2001-4201-9100-061	**344,13 €**
TM65-ECATP 300mm **LCD**				□ ■	2001-4202-9100-061	**390,38 €**
TM65-ECATP 400mm	–50…+150 °C	EtherCAT P	**400 mm**		2001-4201-9100-081	**344,56 €**
TM65-ECATP 400mm **LCD**				□ ■	2001-4202-9100-081	**390,81 €**
Note:	Cable connection with **M8 plug-in connector** (EtherCATP-encoded)					

Immersion / screw-in / duct temperature measuring transducer, Bluetooth-enabled, with EtherCATP port

S+S REGELTECHNIK

One basic device in four variants ...



TM65-ECATP + TH-ms/xx

Immersion / screw-in temperature sensor with immersion sleeve, brass, nickel-plated



TM65-ECATP + TH-VA/xx

Immersion / screw-in temperature sensor with immersion sleeve, stainless steel, V4A



TM65-ECATP + TH-VA/xx/90

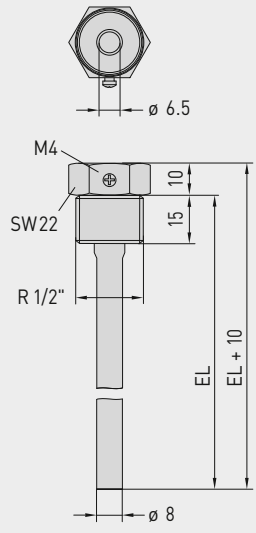
Immersion / screw-in temperature sensor with immersion sleeve with neck tube, stainless steel, V4A



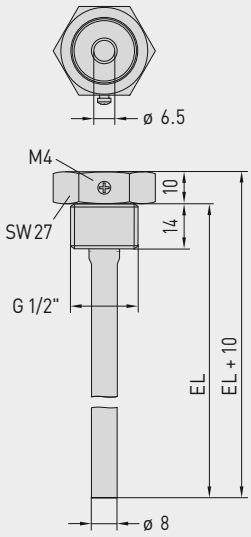
TM65-ECATP + MF-06-K

Duct temperature sensor with mounting flange, plastic

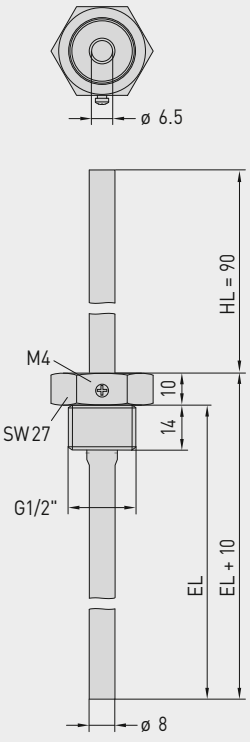
Dimensional drawing
TH-ms/xx



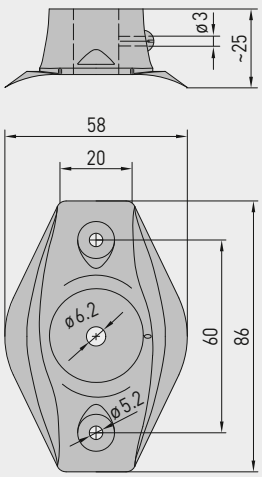
Dimensional drawing
TH-VA/xx



Dimensional drawing
TH-VA/xx/90



Dimensional drawing
MF-06-K



... through combination with accessories:



TH-ms/xx

Immersion sleeve, brass, nickel-plated, thread-sealing, conical, according to DIN 10226



TH-VA/xx

Immersion sleeve, stainless steel, V4A, flat-sealing, cylindrical, according to DIN 228



TH-VA/xx/90

Immersion sleeve with neck tube, stainless steel, V4A, flat-sealing, cylindrical, according to DIN 228



MF-06-K

Mounting flange, plastic

THERMASGARD® **TH**	Immersion sleeve Ø 8 mm (Accessories)				
Type / WG01	**p_{max} (static)**	**T_{max}**	**Inserted Length (EL)**	**Item No.**	**Price**
TH-ms/xx	**Brass nickel-plated**			without neck tube	
TH-MS 50MM	10 bar	+150 °C	**50 mm**	7100-0011-0010-001	**9,31 €**
TH-MS 100MM	10 bar	+150 °C	**100 mm**	7100-0011-0020-001	**10,61 €**
TH-MS 150MM	10 bar	+150 °C	**150 mm**	7100-0011-0030-001	**11,20 €**
TH-MS 200MM	10 bar	+150 °C	**200 mm**	7100-0011-0040-001	**11,56 €**
TH-MS 250MM	10 bar	+150 °C	**250 mm**	7100-0011-0050-001	**13,39 €**
TH-MS 300MM	10 bar	+150 °C	**300 mm**	7100-0011-0060-001	**13,76 €**
TH-MS 350MM	10 bar	+150 °C	**350 mm**	7100-0011-0070-001	**13,87 €**
TH-MS 400MM	10 bar	+150 °C	**400 mm**	7100-0011-0080-001	**14,00 €**
TH-VA/xx	**Stainless steel V4A** (1.4571)			without neck tube	
TH-VA 50MM	40 bar	+600 °C	**50 mm**	7100-0012-0010-001	**20,28 €**
TH-VA 100MM	40 bar	+600 °C	**100 mm**	7100-0012-0020-001	**22,41 €**
TH-VA 150MM	40 bar	+600 °C	**150 mm**	7100-0012-0030-001	**24,08 €**
TH-VA 200MM	40 bar	+600 °C	**200 mm**	7100-0012-0040-001	**25,38 €**
TH-VA 250MM	40 bar	+600 °C	**250 mm**	7100-0012-0050-001	**31,55 €**
TH-VA 300MM	40 bar	+600 °C	**300 mm**	7100-0012-0060-001	**32,97 €**
TH-VA 350MM	40 bar	+600 °C	**350 mm**	7100-0012-0070-001	**33,19 €**
TH-VA 400MM	40 bar	+600 °C	**400 mm**	7100-0012-0080-001	**33,78 €**
TH-VA/xx/90	**Stainless steel V4A** (1.4571)			**with neck tube** (90 mm)	
TH-VA 50/90MM	40 bar	+600 °C	**50 mm**	7100-0012-2010-001	**29,04 €**
TH-VA 100/90MM	40 bar	+600 °C	**100 mm**	7100-0012-2020-001	**30,35 €**
TH-VA 150/90MM	40 bar	+600 °C	**150 mm**	7100-0012-2030-001	**31,84 €**
TH-VA 200/90MM	40 bar	+600 °C	**200 mm**	7100-0012-2040-001	**33,19 €**
TH-VA 250/90MM	40 bar	+600 °C	**250 mm**	7100-0012-2050-001	**34,79 €**
TH-VA 300/90MM	40 bar	+600 °C	**300 mm**	7100-0012-2060-001	**37,71 €**
Note:	inner diameter of socket 6.5 mm For further information see last chapter!				

Mounting flange (Accessories)			
Type / WG01		**Item No.**	**Price**
MF xx			
MF-06-K	**Mounting flange,** plastic, 56.8 x 84.3 mm, Ø 6.2 mm tube gland, T_{max} +100°C	7100-0030-1000-000	**6,12 €**
Note:	For information see last chapter!		

THERMASGARD® MWTM-EtherCAT P

**Mean value temperature measuring transducer,
incl. mounting flange, Bluetooth-enabled,
with EtherCATP port**

S+S REGELTECHNIK

Networkable mean value temperature measuring transducer **THERM**ASGARD® **MWTM-EtherCAT P** with M8 plug-in connector (EtherCATP-encoded), Bluetooth-enabled, in an impact-resistant plastic housing with quick-locking screws, optionally with/without display and bar graph, with bendable sensor rod (0.4...20m, fully active) in a robust plastic-coated protective copper tube, incl. mounting flange.

The rod sensor is used to detect the mean temperature (mean value) in gaseous media. It is used in ventilation and air conditioning ducts over the entire cross-section or on a defined length (laid along a meandering route, it uniformly detects the surrounding temperature). For proper mounting of the rod, mounting clamps **MK-05-M** (accessory) are available. The sensor is factory-calibrated.

EtherCATP-enabled measuring transducer for industrial requirements with maximum reliability: includes easy PLC integration using the device's ESI configuration file, diagnostics (such as communication failure counter), advanced settings options, access to historical data (min / max) and establishing the sensor's service interval. Optionally with large illuminated display (3-line, customised programming in the 7-segment and dot-matrix range) and bar graph (7-digit, LEDs freely configurable) for graphical display, e.g., as a traffic light indicator.



MWTM-EtherCAT P
Rod length
0,4 m

TECHNICAL DATA

Power supply:	24 V DC via EtherCATP (U_S)
Power consumption:	< 3 W
Bus protocol:	**EtherCAT**
Radio technology:	**Bluetooth** (LE)
Sensor:	Pt1000, DIN EN 60751, class B
Measuring range:	–50...+150 °C **T_{min} –50 °C, T_{max} +80 °C**
Deviation in temperature:	Typically ±0.2 K at +25 °C
Medium:	Clean air and non-aggressive, non-combustible gases
Sensors:	active across the entire length (averaging)
Rod material:	**protective tube made from copper, plastic-coated,** with anti-kink spring and sleeve, stainless steel V4A (1.4571)
Rod dimensions:	Ø = 5.0 mm, nominal length (NL) = 0.4 m / 3 m / 6 m (nominal length optionally up to max. 20 m)
Rod laying:	Bending radius: **> 35 mm** Vibration load: **≤ 0.5 g** Tensile load: **< 480 N**
Housing:	Plastic, UV-resistant, polyamide material, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Dimensions:	126 x 90 x 50mm (Tyr 2)
Cable connection:	**M8 plug-in connector**, EtherCATP-encoded
Process connection:	Using plastic mounting flange (included in the delivery scope) and mounting clamps **MK-05-M** (optional accessory)
Ambient temperature:	Measuring transducer –30...+70 °C
Permitted humidity:	< 95% RH, non-precipitating air
Protection class:	III (according to EN 60730)
Protection type:	**IP 54** (according to EN 60529) when built-in
Standards:	CE conformity, according to EMC Directive 2014/30/EU, according to RED 2014/53/EU
Equipment:	**Display with illumination,** 3-line, customised programming, cutout approx. W51 x H29mm, to display the actual temperature or a customised display value. **Bar graph**, 7-digit, LEDs freely configurable, to graphically display the reading.
ACCESSORIES	See table



EtherCAT P
Cable connection and
LED status display

Display screen **xx-ECATP**
Reading **Tyr 2**



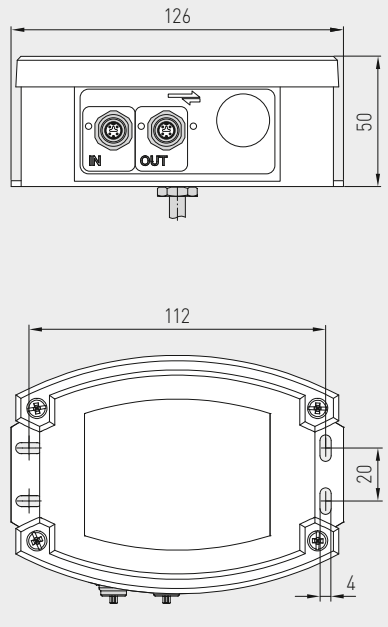
Temperature

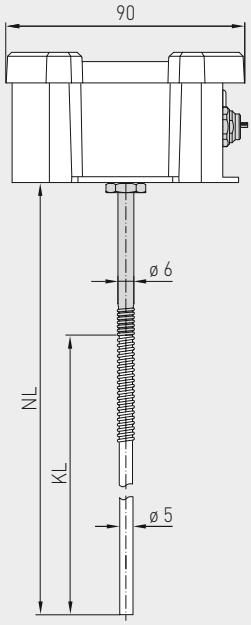
Programmable **xx-ECATP**
display screen **Tyr 2**



Mean value temperature measuring transducer, incl. mounting flange, Bluetooth-enabled, with EtherCATP port

Dimensional drawing **MWTM-EtherCAT P**







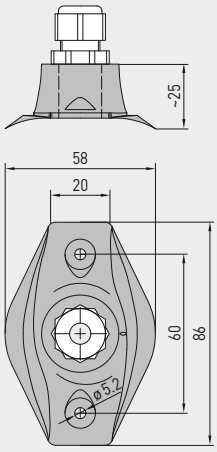
M8-plug-in connector
EtherCATP-encoded

MWTM-EtherCAT P
Rod length
3 m / 6 m

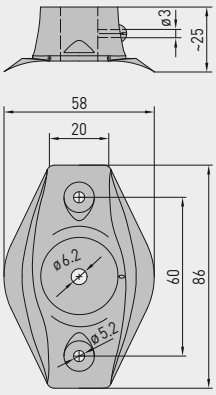




Dimensional drawing **KRD-04**



Dimensional drawing **MF-06-K**



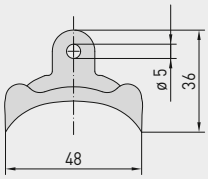
MF-06-K
Mounting flange, plastic
(included in the scope of delivery)



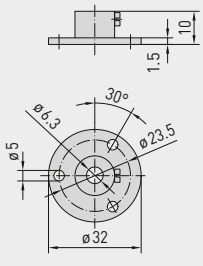
KRD-04
Capillary tube gland bracket, plastic
(optional)



Dimensional drawing **MK-05-M**



Dimensional drawing **MF-06-M**



MF-06-M
Mounting flange, metal
(optional)

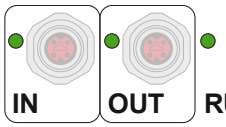


MK-05-M
Galvanised steel mounting clamps
(optional)



**Mean value temperature measuring transducer,
incl. mounting flange, Bluetooth-enabled,
with EtherCATP port**

S+S REGELTECHNIK



EtherCAT P	LED status display
1. LED	**"IN"**
off	no connection to upstream EtherCAT module
illuminated	LINK: connection to upstream EtherCAT module
blinking	ACT: communication with upstream EtherCAT module
2. LED	**"OUT"**
off	no connection to downstream EtherCAT module
illuminated	LINK: connection to downstream EtherCAT module
blinking	ACT: communication with downstream EtherCAT module
3. LED	**"RUN"**
off	EtherCAT module is in "Init" state
quickly blinking	EtherCAT module is in "Pre-Operational" state
slowly blinking	EtherCAT module is in "Safe-Operational" state
illuminated	EtherCAT module is in "Operational" state
The status LEDs are next to the cable connection.	

MWTM-EtherCAT P
with display and bar graph





Mean value temperature measuring transducer, incl. mounting flange, Bluetooth-enabled, with EtherCATP port

MWTM-EtherCAT P
Rod length
3 m / 6 m



MWTM-EtherCAT P
Rod length
0,4 m



THERMASGARD® **MWTM-EtherCAT P**	Mean value temperature measuring transducer with EtherCATP port					
Type / WG02	**Measuring Range** Temperature	**Output**	**Rod length**	**Bar graph Display**	**Item No.**	**Price**
MWTM-ECATP xx						
MWTM-ECATP 0,4m	–50…+150 °C	EtherCAT P	**0,4 m**		2001-4211-9100-001	**384,75 €**
MWTM-ECATP 0,4m **LCD**				□ ■	2001-4212-9100-001	**431,01 €**
MWTM-ECATP 3,0m	–50…+150 °C	EtherCAT P	**3,0 m**		2001-4211-9100-011	**419,34 €**
MWTM-ECATP 3,0m **LCD**				□ ■	2001-4212-9100-011	**465,60 €**
MWTM-ECATP 6,0m	–50…+150 °C	EtherCAT P	**6,0 m**		2001-4211-9100-021	**462,57 €**
MWTM-ECATP 6,0m **LCD**				□ ■	2001-4212-9100-021	**508,83 €**
Note:	Cable connection with **M8 plug-in connector** (EtherCATP-encoded)					

ACCESSORIES			
MF-06-K	**Mounting flange,** plastic (included in the scope of delivery)	7100-0030-1000-000	**6,12 €**
MF-06-M	**Mounting flange,** metal, galvanised steel, Ø = 35 mm	7100-0030-5000-100	**9,56 €**
KRD-04	**Capillary tube gland bracket,** plastic	7100-0030-7000-000	**8,91 €**
MK-05-M	Galvanised steel **mounting clamps** (6 pieces)	7100-0034-0000-000	**9,88 €**
	For further information, see last chapter Accessories!		

THERMASGARD® HFTM-EtherCAT P

**Sleeve sensor with temperature measuring transducer,
Bluetooth-enabled,
with EtherCATP port**

S+S REGELTECHNIK

Networkable sleeve temperature measuring transducer **THERM**ASGARD® **HFTM-EtherCAT P** with M8 plug-in connector (EtherCATP-encoded), Bluetooth-enabled, in an impact-resistant plastic housing with quick-locking screws, optionally with/without display and bar graph, cable sensor with stainless steel sleeve.

The sleeve sensor is used to detect the temperature in liquid and gaseous media. It is used as a duct sensor or, if installed in an immersion sleeve **THE** (accessory), as an immersion and screw-in sensor in liquids. The sensor is factory-calibrated.

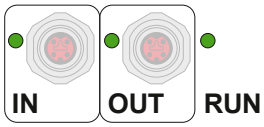
EtherCATP-enabled measuring transducer for industrial requirements with maximum reliability: includes easy PLC integration using the device's ESI configuration file, diagnostics (such as communication failure counter), advanced settings options, access to historical data (min / max) and establishing the sensor's service interval. Optionally with large illuminated display (3-line, customised programming in the 7-segment and dot-matrix range) and bar graph (7-digit, LEDs freely configurable) for graphical display, e.g., as a traffic light indicator.

HFTM-EtherCAT P





EtherCAT P
Cable connection and
LED status display



TECHNICAL DATA	
Power supply:	24 V DC via EtherCATP (U_S)
Power consumption:	< 3 W
Bus protocol:	**EtherCAT**
Radio technology:	**Bluetooth** (LE)
Sensor:	Pt1000, DIN EN 60751, class B (**Perfect Sensor Protection** at IP68)
Measuring range:	–50...+150 °C; T_{max} **up to +150 °C**
Deviation in temperature:	typically ± 0.2 K at +25 °C
Medium:	clean air and non-aggressive, non-combustible gases; liquids depending on selected immersion sleeve (accessory)
Sensor protection:	sensor sleeve made from stainless steel V4A (1.4571), Ø = 6 mm, nominal length (NL) = 50 mm (optional 30...400 mm)
Sensor cable:	Silicone, SiHF, 2 x 0,25 mm²; cable length (KL) = 1.5m (other lengths and jacket materials, e.g. PTFE or glass fibre with steel mesh, available on request)
Housing:	Plastic, UV-resistant, polyamide material, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Dimensions:	126 x 90 x 50mm (Tyr 2)
Cable connection:	**M8 plug-in connector**, EtherCATP-encoded
Ambient temperature:	measuring transducer –30...+70 °C
Permitted humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type housing:	**IP 54** (according to EN 60 529)
Protection type sensor:	**IP 65** (according to EN 60 529) **sleeve** humidity-tight (standard) **IP 68** (according to EN 60 529) **sleeve** water-tight (optional) **IP 54** (according to EN 60 529) with **glass fibre** cable (optional)
Standards:	CE conformity, according to EMC Directive 2014 / 30 / EU, according to RED 2014 / 53 / EU
Equipment:	**Display with illumination,** 3-line, customised programming, cutout approx. 51 x 29 mm, to display the actual temperature or a customised display value. **Bar graph**, 7-digit, LEDs freely configurable, to graphically display the reading.
ACCESSORIES	see table

EtherCAT P	LED status display
1. LED	**"IN"**
off	no connection to upstream EtherCAT module
illuminated	LINK: connection to upstream EtherCAT module
blinking	ACT: communication with upstream EtherCAT module
2. LED	**"OUT"**
off	no connection to downstream EtherCAT module
illuminated	LINK: connection to downstream EtherCAT module
blinking	ACT: communication with downstream EtherCAT module
3. LED	**"RUN"**
off	EtherCAT module is in "Init" state
quickly blinking	EtherCAT module is in "Pre-Operational" state
slowly blinking	EtherCAT module is in "Safe-Operational" state
illuminated	EtherCAT module is in "Operational" state

The status LEDs are next to the cable connection.

Display screen
Reading

xx-ECATP
Tyr 2



Temperature

Programmable
display screen

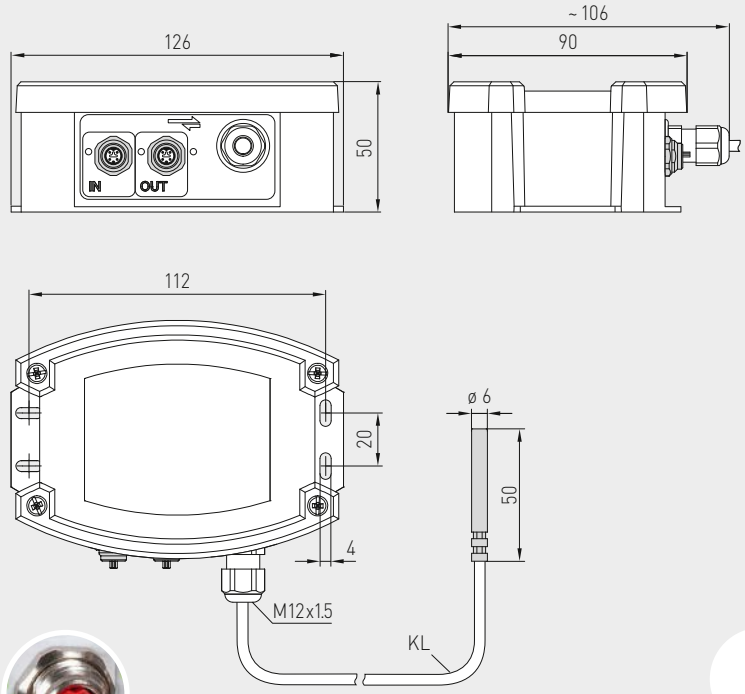
xx-ECATP
Tyr 2



Sleeve sensor with temperature measuring transducer, Bluetooth-enabled, with EtherCATP port

Dimensional drawing

HFTM-EtherCAT P





M8-plug-in connector
EtherCATP-encoded

HFTM-EtherCAT P
with display and bar graph

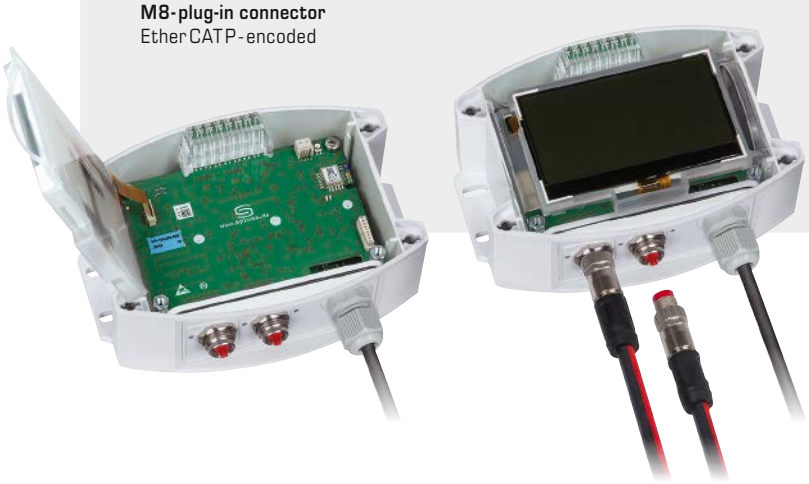




IP65 (standard)
humidity-tight

IP68 (optional)
watertight
Perfect Sensor Protection

IP54 (optional)
with **glass fibre** cable



High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

THERMASGARD® HFTM-EtherCAT P	Sleeve sensors with temperature measuring transducer with EtherCATP port					
Type / WG02	**Measuring Range** Temperature	**Sensor**	**Output**	**Bar graph Display**	**Item No.**	**Price**
HFTM-ECATP xx						
HFTM-ECATP	–50…+150 °C	Pt1000	EtherCAT P		2001-2161-9100-001	**354,50 €**
HFTM-ECATP **LCD**	–50…+150 °C	Pt1000	EtherCAT P	□ ■	2001-2162-9100-001	**400,75 €**
Note:	Cable connection with **M8 plug-in connector** (EtherCATP-encoded)					
Extra charge:	Protection type **IP68** (sensor sleeve watertight compound-filled)					**3,40 €**
	per running metre of connecting lead (**silicone / PTFE / glass fibre**)				on request	
	other protection sleeve lengths (optional 30…400 mm)				on request	

ACCESSORIES

THE-xx	**Immersion sleeve**, stainless steel **V4A** (1.4571) or nickel-plated brass, Ø = 9 mm For further information, see last chapter Accessories!
	For further information, see last chapter Accessories!

THERMASGARD® ALTM2-EtherCAT P

Surface-contact temperature measuring transducer / pipe surface-contact sensor, with detached sensor, incl. strap, Bluetooth-enabled, with EtherCATP port

S+S REGELTECHNIK

Networkable surface-contact temperature measuring transducer (detached version) **THERM**ASGARD® **ALTM2-EtherCAT P** with M8 plug-in connector (EtherCATP-encoded), Bluetooth-enabled, in an impact-resistant plastic housing with quick-locking screws, optionally with / without display and bar graph, cable sensor with pipe feeder, incl. strap.

The pipe surface-contact sensor is used to detect the temperature on lines, pipes (e.g., cold and warm water) or on heating sections for heating control. The sensor is factory-calibrated.

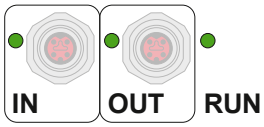
EtherCATP-enabled measuring transducer for industrial requirements with maximum reliability: includes easy PLC integration using the device's ESI configuration file, diagnostics (such as communication failure counter), advanced settings options, access to historical data (min / max) and establishing the sensor's service interval. Optionally with large illuminated display (3-line, customised programming in the 7-segment and dot-matrix range) and bar graph (7-digit, LEDs freely configurable) for graphical display, e.g., as a traffic light indicator.

ALTM2-EtherCAT P





EtherCAT P
Cable connection and LED status display



TECHNICAL DATA	
Power supply:	24 V DC via EtherCATP (U_S)
Power consumption:	< 3 W
Bus protocol:	**EtherCAT**
Radio technology:	**Bluetooth** (LE)
Sensor:	Pt1000, DIN EN 60751, class B (**Perfect Sensor Protection** at IP68)
Measuring range:	–50...+150 °C
Deviation in temperature:	typically ± 0.2 K at +25 °C
Medium:	clean air and non-aggressive, non-combustible gases
Sensor protection:	pipe feeder made of stainless steel **V4A** (1.4571), Ø = 6 mm, L = 50 mm
Sensor cable:	silicone, SiHF, 2 x 0.25 mm²; cable length (KL) = 1.5m (other lengths and jacket materials, e.g. PTFE or glass fibre with steel mesh, available on request)
Housing:	Plastic, UV-resistant, polyamide material, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Dimensions:	126 x 90 x 50mm (Tyr 2)
Cable connection:	**M8 plug-in connector**, EtherCATP-encoded
Process connection:	endless strap with metal tightener (included in delivery scope), Ø = 13 - 92 mm (¼ - 3"), L = 300 mm
Ambient temperature:	Measuring transducer –30...+70 °C
Permitted humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type housing:	**IP 54** (according to EN 60 529)
Protection type sensor:	**IP 65** (according to EN 60 529) **sleeve** humidity-tight (standard) **IP 68** (according to EN 60 529) **sleeve** water-tight (optional)
Standards:	CE conformity, according to EMC Directive 2014 / 30 / EU, according to RED 2014 / 53 / EU
Equipment:	**Display with illumination,** 3-line, customised programming, cutout approx. W51 x H29mm, to display the actual temperature or a customised display value. **Bar graph**, 7-digit, LEDs freely configurable, to graphically display the reading.
ACCESSORIES	see table

EtherCAT P	LED status display
1. LED	**"IN"**
off	no connection to upstream EtherCAT module
illuminated	LINK: connection to upstream EtherCAT module
blinking	ACT: communication with upstream EtherCAT module
2. LED	**"OUT"**
off	no connection to downstream EtherCAT module
illuminated	LINK: connection to downstream EtherCAT module
blinking	ACT: communication with downstream EtherCAT module
3. LED	**"RUN"**
off	EtherCAT module is in "Init" state
quickly blinking	EtherCAT module is in "Pre-Operational" state
slowly blinking	EtherCAT module is in "Safe-Operational" state
illuminated	EtherCAT module is in "Operational" state

The status LEDs are next to the cable connection.

Display screen Reading — **xx-ECATP Tyr 2**



Temperature

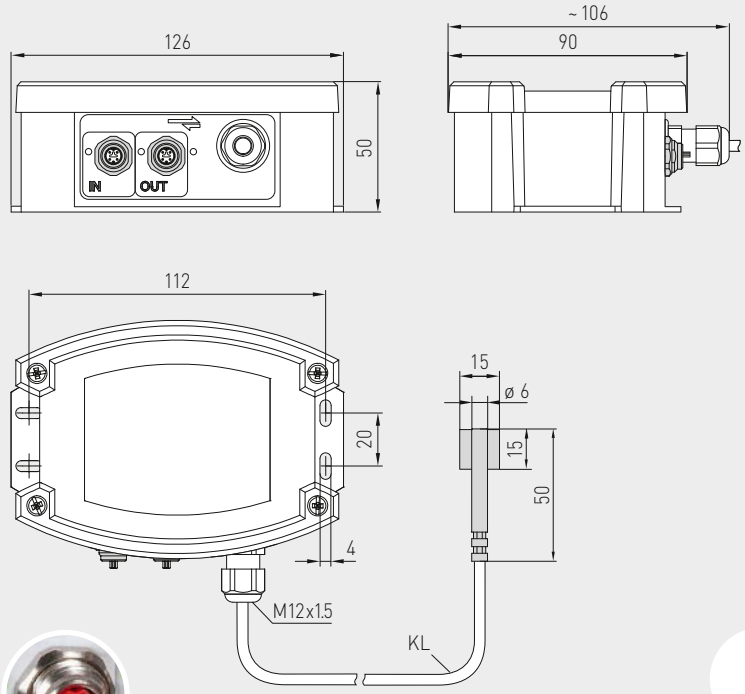
Programmable display screen — **xx-ECATP Tyr 2**



Surface-contact temperature measuring transducer / pipe surface-contact sensor, with detached sensor, incl. strap, Bluetooth-enabled, with EtherCATP port

Dimensional drawing

ALTM2-EtherCAT P



ALTM2-EtherCAT P
with display and bar graph





M8-plug-in connector
EtherCATP-encoded



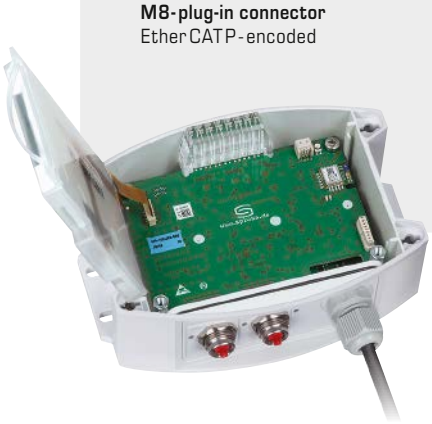
IP65 (standard)
humidity-tight



IP68 (optional)
watertight
Perfect Sensor Protection



IP54 (optional)
with **glass fibre** cable





High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

THERMASGARD® ALTM2-EtherCAT P	Surface-contact temperature measuring transducer with detached sensor, with EtherCATP port					
Type / WG02	**Measuring Range** Temperature	**Sensor**	**Output**	**Bar graph Display**	**Item No.**	**Price**
ALTM2-ECATP xx						
ALTM2-ECATP	–50…+150 °C	Pt1000	EtherCAT P		2001-2171-9100-001	**357,68 €**
ALTM2-ECATP **LCD**	–50…+150 °C	Pt1000	EtherCAT P	□ ■	2001-2172-9100-001	**403,95 €**
Note:	Cable connection with **M8 plug-in connector** (EtherCATP-encoded)					
Extra charge:	Protection type **IP68** (sensor sleeve watertight compound-filled) per running metre of connecting lead (**silicone / PTFE / glass fibre**)				**on request**	**3,40 €**

ACCESSORIES			
WLP-1	**Heat-conductive paste**, silicone-free	7100-0060-1000-000	**3,38 €**
	For further information, see last chapter Accessories!		

HYGRASGARD® AFTF-EtherCAT P

On-wall humidity and temperature sensor (± 2.0%), for mixture ratio, relative/absolute humidity, dew point, enthalpy and temperature, Bluetooth-enabled, with EtherCATP port

S+S REGELTECHNIK

Networkable on-wall humidity and temperature sensor **HYGR**ASGARD® **AFTF-EtherCAT P** with M8 plug-in connector (EtherCATP-encoded), Bluetooth-enabled, in an impact-resistant plastic housing with quick-locking screws, optionally with / without display and bar graph, with plastic sinter filter (replaceable).

The sensor is used to detect various parameters in humidity measurement. It measures the **relative humidity** (0...100% RH) and the **temperature** (–35...+80°C) of the ambient air. These measurands are used internally to calculate further output values: **absolute humidity** (0...80g/m³), **mixture ratio** (0...80g/kg), **dew point temperature** (–20...+80°C) and **enthalpy** (0...85kJ/kg) while ignoring atmospheric air pressure. A long-term stable, digital sensor guarantees exact measurement results. The sensor is factory-calibrated.

EtherCATP-enabled measuring transducer for industrial requirements with maximum reliability: includes easy PLC integration using the device's ESI configuration file, diagnostics (such as communication failure counter), advanced settings options, access to historical data (min / max) and establishing the sensor's service interval. Optionally with large illuminated display (3-line, customised programming in the 7-segment and dot-matrix range) and bar graph (7-digit, LEDs freely configurable) for graphical display, e.g., as a traffic light indicator.

AFTF-EtherCAT P





EtherCAT P
Cable connection and LED status display

TECHNICAL DATA

Power supply:	24VDC via EtherCATP (U_S)
Power consumption:	< 3W
Bus protocol:	**EtherCAT**
Radio technology:	**Bluetooth** (LE)
Data points:	Temperature [°C], relative humidity [% RH], dew point [°C], absolute humidity [g/m³], mixture ratio [g/kg], enthalpy [kJ/kg]
Sensor:	**Digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
Measuring range:	0...100% RH (humidity) –35...+80°C (temperature)
Deviation in humidity:	Typically **± 2.0%** (20...80% RH) at +25°C, otherwise ± 3.0%
Deviation in temperature:	Typically ± 0.4K at +25°C
Long-term stability:	± 1% per year
Medium:	Clean air and non-aggressive, non-combustible gases
Sensor protection:	Plastic sinter filter, Ø 14mm, l = 35 mm, replaceable (optionally **metal** sinter filter, Ø 16mm, l = 32mm)
Protective tube:	Stainless steel **V2A** (1.4301), Ø 16mm (see dimensional drawing)
Housing:	Plastic, UV-resistant, polyamide material, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Dimensions:	126 x 90 x 50mm (Tyr 2)
Cable connection:	**M8 plug-in connector**, EtherCATP-encoded
Process connection:	Using screw-in device on housing
Ambient temperature:	–30...+70 °C
Permitted humidity:	< 95% RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 54** (according to EN 60 529)
Standards:	CE conformity, according to EMC Directive 2014 / 30 / EU, according to RED 2014 / 53 / EU
Equipment:	**Display with illumination,** 3-line, customised programming, cutout approx. W 51 x H 29mm, to display actual humidity, actual temperature and/or an alternative characteristic value or a customised display value. **Bar graph**, 7-digit, LEDs freely configurable, to graphically display the reading.
ACCESSORIES	See table

Display screen Reading — **xx-ECATP Tyr 2**



Humidity



Temperature

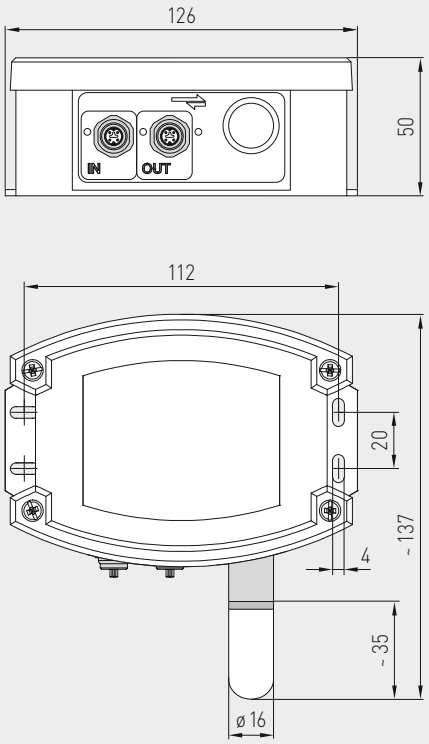
Programmable display screen — **xx-ECATP Tyr 2**



HYGRASGARD® AFTF-EtherCAT P

On-wall humidity and temperature sensor (± 2.0%), for mixture ratio, relative/absolute humidity, dew point, enthalpy and temperature, Bluetooth-enabled, with EtherCATP port

Dimensional drawing **AFTF-EtherCAT P**





M8-plug-in connector
EtherCATP-encoded



SF-K
Plastic sinter filter (standard)



SF-M
Metal sinter filter (optional)

AFTF-EtherCAT P
with display and bar graph

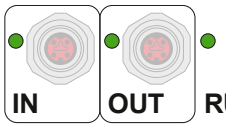




HYGRASGARD® AFTF-EtherCAT P

On-wall humidity and temperature sensor (± 2.0%), for mixture ratio, relative/absolute humidity, dew point, enthalpy and temperature, Bluetooth-enabled, with EtherCATP port

S+S REGELTECHNIK



EtherCAT P	LED status display
1. LED	**"IN"**
off	no connection to upstream EtherCAT module
illuminated	LINK: connection to upstream EtherCAT module
blinking	ACT: communication with upstream EtherCAT module
2. LED	**"OUT"**
off	no connection to downstream EtherCAT module
illuminated	LINK: connection to downstream EtherCAT module
blinking	ACT: communication with downstream EtherCAT module
3. LED	**"RUN"**
off	EtherCAT module is in "Init" state
quickly blinking	EtherCAT module is in "Pre-Operational" state
slowly blinking	EtherCAT module is in "Safe-Operational" state
illuminated	EtherCAT module is in "Operational" state
The status LEDs are next to the cable connection.	

WS-03
Weather and sun protection hood (optional)



Display screen Reading **xx-ECATP Tyr 2**



Humidity



Temperature

Display screen alternative output variables **xx-ECATP Tyr 2**



Absolute humidity



Mixture ratio



Dew point



Enthalpy

Programmable display screen **xx-ECATP Tyr 2**



Use the EtherCAT interface to program the **LCD display**.
With only one output value selected, the display is static;
with several values selected, the display is cyclical with one after the other.

In the **first line** the value is displayed and in the **second line** the corresponding unit.
The **third line** is empty by default if there are no customised inputs.

The entire display in the 7-segment range
as well as in the dot-matrix range can be **customised**.

On-wall humidity and temperature sensor (± 2.0%), for mixture ratio, relative/absolute humidity, dew point, enthalpy and temperature, Bluetooth-enabled, with EtherCATP port

AFTF-EtherCAT P
with display and bar graph







HYGRASGARD® **AFTF-EtherCAT P**	On-wall humidity and temperature sensor (± 2.0%), with EtherCATP port						
Type / WG02	**Measuring Range / Readout** Humidity (switchable)		Temperature	**Output**	**Bar graph Display**	**Item No.**	**Price**
AFTF-ECATP xx							
AFTF-ECATP	0 ...100 % RH 0 ... 80 g / kg 0 ... 80 g / m³ 0 ... 85 kJ / kg –20...+80 °C	(default) (MV) (a.F.) (ENT.) (TP)	–35...+80 °C	EtherCAT P		2003-6261-9100-001	**367,46 €**
AFTF-ECATP **LCD**	0 ...100 % RH 0 ... 80 g / kg 0 ... 80 g / m³ 0 ... 85 kJ / kg –20...+80 °C	(default) (MV) (a.F.) (ENT.) (TP)	–35...+80 °C	EtherCAT P	□ ■	2003-6262-9100-001	**413,72 €**
Note:	Cable connection with **M8 plug-in connector** (EtherCATP-encoded)						

ACCESSORIES			
WS-03	**Sun and ball-impact protection hood,** 184 x 180 x 80 mm, stainless steel **V2A** (1.4301)	7100-0040-6000-000	**44,74 €**
SF-K	**Plastic sinter filter**, Ø 16 mm, L = 35 mm, exchangeable	7000-0050-2310-000	**12,86 €**
SF-M	**Metal sinter filter**, Ø 16 mm, L = 32 mm, exchangeable, stainless steel **V4A** (1.4404)	7000-0050-2200-100	**42,33 €**
	For further information, see last chapter Accessories!		

HYGRASGARD® KFTF-EtherCAT P

Duct humidity and temperature sensor (± 2.0%), for mixture ratio, relative/absolute humidity, dew point, enthalpy and temperature, Bluetooth-enabled, with EtherCATP port

S+S REGELTECHNIK

Networkable duct humidity and temperature sensor **HYGR**ASGARD® **KFTF-EtherCAT P** with M8 plug-in connector (EtherCATP-encoded), Bluetooth-enabled, in an impact-resistant plastic housing with quick-locking screws, optionally with/without display and bar graph, with plastic sinter filter (replaceable), incl. mounting flange.

The sensor is used to detect various parameters in humidity measurement. It measures the **relative humidity** (0...100% RH) and the **temperature** (–35...+80°C) of the ambient air. These measurands are used internally to calculate further output values: **absolute humidity** (0...80g/m³), **mixture ratio** (0...80g/kg), **dew point temperature** (–20...+80°C) and **enthalpy** (0...85kJ/kg) while ignoring atmospheric air pressure. A long-term stable, digital sensor guarantees exact measurement results. The sensor is factory-calibrated.

EtherCATP-enabled measuring transducer for industrial requirements with maximum reliability: includes easy PLC integration using the device's ESI configuration file, diagnostics (such as communication failure counter), advanced settings options, access to historical data (min / max) and establishing the sensor's service interval. Optionally with large illuminated display (3-line, customised programming in the 7-segment and dot-matrix range) and bar graph (7-digit, LEDs freely configurable) for graphical display, e.g., as a traffic light indicator.

KFTF-EtherCAT P



TECHNICAL DATA

Power supply:	24 V DC via EtherCATP (U_S)
Power consumption:	< 3 W
Bus protocol:	**EtherCAT**
Radio technology:	**Bluetooth** (LE)
Data points:	temperature [°C], relative humidity [% RH], dew point [°C], absolute humidity [g/m³], mixture ratio [g/kg], enthalpy [kJ/kg]
Sensor:	**Digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
Measuring range:	0...100 % RH (humidity) –35...+80 °C (temperature)
Deviation in humidity:	typically **± 2.0** % (20...80 % RH) at +25 °C, otherwise ± 3.0 %
Deviation in temperature:	typically ± 0.4 K at +25 °C
Long-term stability:	± 1 % per year
Medium:	clean air and non-aggressive, non-combustible gases
Sensor protection:	plastic sinter filter, Ø 14mm, l = 35 mm, replaceable (optionally **metal** sinter filter, Ø 16mm, l = 32mm)
Protective tube:	**PLEUROFORM**™, material polyamide (PA6), with torsion protection, Ø 20 mm, NL = 235 mm (optionally 100 mm), v_{max} = 30 m/s (air) (option on request in stainless steel **V2A** (1.4301), Ø 16mm)
Housing:	plastic, UV-resistant, polyamide material, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Dimensions:	126 x 90 x 50mm (Tyr 2)
Cable connection:	**M8 connector**, EtherCATP-encoded
Process connection:	by plastic mounting flange (included in the delivery scope)
Ambient temperature:	–30...+70 °C
Permitted humidity:	< 95 % r. H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 54** (according to EN 60 529)
Standards:	CE conformity, according to EMC Directive 2014 / 30 / EU, according to RED 2014 / 53 / EU
Equipment:	**Display with illumination,** 3-line, customised programming, cutout approx. W 51 x H 29mm, to display actual humidity, actual temperature and/or an alternative characteristic value or a customised display value. **Bar graph**, 7-digit, LEDs freely configurable, to graphically display the reading.
ACCESSORIES	see table



EtherCAT P
Cable connection and LED status display

Display screen Reading — **xx-ECATP Tyr 2**



Humidity



Temperature

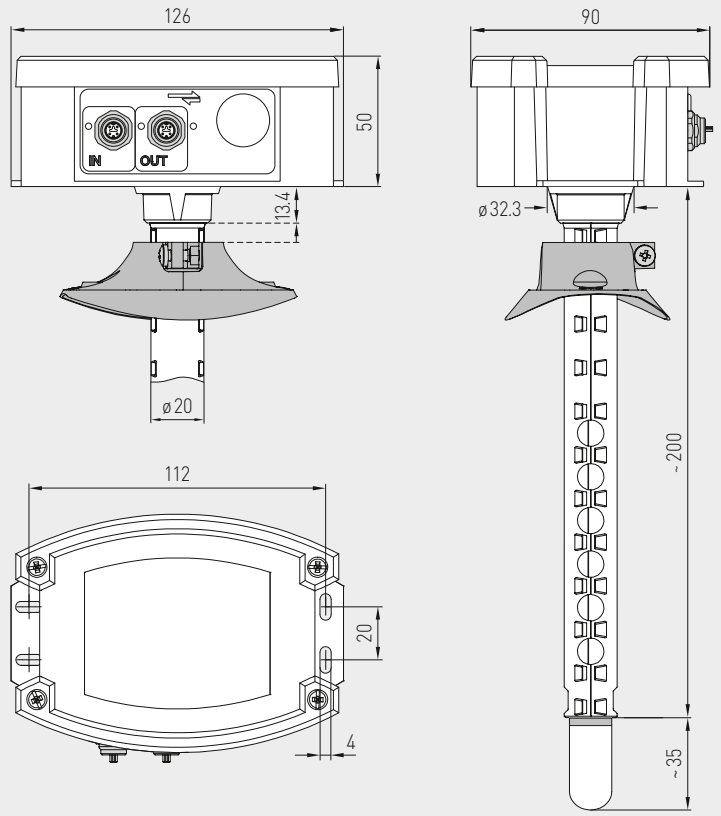
Programmable display screen — **xx-ECATP Tyr 2**



Duct humidity and temperature sensor (± 2.0%), for mixture ratio, relative/absolute humidity, dew point, enthalpy and temperature, Bluetooth-enabled, with EtherCAT P port

Dimensional drawing
[mm]

KFTF-EtherCAT P



KFTF-EtherCAT P
with display and bar graph





M8-plug-in connector
EtherCAT-encoded

SF-K
Plastic sinter filter
(standard)



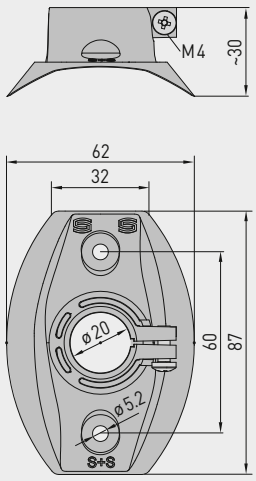
SF-M
Metal sinter filter
(optional)

Protective tube made from stainless steel
(optional on request)



Dimensional drawing
[mm]

MFT-20-K



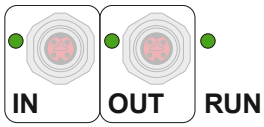
MFT-20-K
Mounting flange,
plastic
(included in the scope
of delivery)



HYGRASGARD® KFTF-EtherCAT P

Duct humidity and temperature sensor (± 2.0%), for mixture ratio, relative/absolute humidity, dew point, enthalpy and temperature, Bluetooth-enabled, with EtherCATP port

S+S REGELTECHNIK



EtherCAT P	LED status display
1. LED	**"IN"**
off	no connection to upstream EtherCAT module
illuminated	LINK: connection to upstream EtherCAT module
blinking	ACT: communication with upstream EtherCAT module
2. LED	**"OUT"**
off	no connection to downstream EtherCAT module
illuminated	LINK: connection to downstream EtherCAT module
blinking	ACT: communication with downstream EtherCAT module
3. LED	**"RUN"**
off	EtherCAT module is in "Init" state
quickly blinking	EtherCAT module is in "Pre-Operational" state
slowly blinking	EtherCAT module is in "Safe-Operational" state
illuminated	EtherCAT module is in "Operational" state
The status LEDs are next to the cable connection.	

Display screen Reading — **xx-ECATP Typ 2**



Humidity



Temperature

Display screen alternative output variables — **xx-ECATP Typ 2**



Absolute humidity



Mixture ratio



Dew point



Enthalpy

Programmable display screen — **xx-ECATP Typ 2**



Use the EtherCAT interface to program the **LCD display**.
With only one output value selected, the display is static;
with several values selected, the display is cyclical with one after the other.

In the **first line** the value is displayed and in the **second line** the corresponding unit. The **third line** is empty by default if there are no customised inputs.

The entire display in the 7-segment range as well as in the dot-matrix range can be **customised**.

Duct humidity and temperature sensor (± 2.0%), for mixture ratio, relative/absolute humidity, dew point, enthalpy and temperature, Bluetooth-enabled, with EtherCATP port

KFTF-EtherCAT P
with display and bar graph



HYGRASGARD® **KFTF-EtherCAT P**	Duct humidity and temperature sensor (± 2.0%), with EtherCATP port						
Type / WG02	**Measuring Range / Readout** Humidity (switchable)		Temperature	**Output**	**Bar graph Display**	**Item No.**	**Price**
KFTF-ECATP xx							
KFTF-ECATP	0 ...100 % RH 0 ... 80 g / kg 0 ... 80 g / m³ 0 ... 85 kJ / kg –20...+80 °C	(default) (MV) (a.F.) (ENT.) (TP)	–35...+80 °C	EtherCAT P		2003-4221-9100-001	**389,09 €**
KFTF-ECATP **LCD**	0 ...100 % RH 0 ... 80 g / kg 0 ... 80 g / m³ 0 ... 85 kJ / kg –20...+80 °C	(default) (MV) (a.F.) (ENT.) (TP)	–35...+80 °C	EtherCAT P	□ ■	2003-4222-9100-001	**435,34 €**
Optional:	shortened protective tube **PLEUROFORM**™, NL = 100 mm					on request	
Note:	Cable connection with **M8 plug-in connector** (EtherCATP-encoded)						

ACCESSORIES			
MFT-20-K	**Mounting flange**, plastic (included in the scope of delivery)	7000-0031-0000-000	**9,56 €**
SF-K	**Plastic sinter filter**, Ø 16 mm, L = 35 mm, exchangeable	7000-0050-2310-000	**12,86 €**
SF-M	**Metal sinter filter**, Ø 16 mm, L = 32 mm, exchangeable, stainless steel **V4A** (1.4404)	7000-0050-2200-100	**42,33 €**
	For further information, see last chapter Accessories!		

PREMASGARD® 612x-EtherCAT P

Pressure measuring transducer for differential pressure and volume flow, incl. connection kit, Bluetooth-enabled, with EtherCATP port

S+S REGELTECHNIK

Networkable pressure measuring transducer **PREM**ASGARD® **612x-EtherCAT P** (series) with M8 plug-in connector (EtherCATP-encoded), Bluetooth-enabled, in an impact-resistant plastic housing with quick-locking screws, optionally with / without display and bar graph, nozzles for pressure hose (Ø 6 mm), incl. connection kit **ASD-06** (2m connecting hose, two pressure port nipples, screws).

The on-wall sensor is used to measure positive, negative or differential pressure in clean air and gaseous media as well to calculate volume flows using the K-factor with function selection. The piezoresistive measuring element is temperature-compensated and guarantees a high degree of reliability and accuracy. The sensor is factory-calibrated.

It is used in the clean room, medical and filter technology, ventilation and air conditioning ducts, spray booths, large-scale catering facilities, for filter monitoring and level measurement or for triggering frequency converters. In case of direct solar irradiation, we recommend using our weather and sun protection hood **WS 03** (accessory).

EtherCATP-enabled measuring transducer for industrial requirements with maximum reliability: includes easy PLC integration using the device's ESI configuration file, diagnostics (such as communication failure counter), advanced settings options, access to historical data (min / max) and establishing the sensor's service interval. Optionally with large illuminated display (3-line, customised programming in the 7-segment and dot-matrix range) and bar graph (7-digit, LEDs freely configurable) for graphical display, e.g., as a traffic light indicator.

PREMASGARD® **612x-ECATP**





EtherCAT P
Cable connection and LED status display

TECHNICAL DATA

Power supply:	24VDC via EtherCATP (U_S)
Power consumption:	< 3W
Bus protocol:	**EtherCAT**
Radio technology:	**Bluetooth** (LE)
Type of pressure:	Differential pressure (Pa), volume flow [m^3/h]
Pressure port:	With nozzles for pressure hose Ø 6mm
Measuring range, pressure:	**–500... +500 Pa** or **–7000...+7000 Pa** depending on the device type, see table
Pressure accuracy:	**Type 6128** (500 Pa): typically ± 3 Pa at +25°C **type 6127** (7000 Pa): typically ± 35 Pa at +25°C compared to the calibrated reference device
Positive / negative pressure:	max. ± 50 kPa
Medium:	Clean air and non-aggressive, non-combustible gases
Parts in contact with media:	Brass, Ni, Duroplast, Si, epoxy, RTV, BSG, UV silicone gel
Media temperature:	–20...+50°C (temperature-compensated 0...+50°C)
Hysteresis:	0.3% of final value
Linearity:	< ± 1% of final value
Temp. drift values:	± 0.1% / °C
Long-term stability:	± 1% per year
Housing:	Plastic, UV-resistant, polyamide material, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), enclosure cover for display is transparent!
Dimensions:	126 x 90 x 50mm (Tyr 2)
Cable connection:	**M8 plug-in connector**, EtherCATP-encoded
Permitted humidity:	< 95% RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 54** (according to EN 60 529) when built-in
Standards:	CE conformity, according to EMC Directive 2014 / 30 / EU, according to RED 2014 / 53 / EU
Equipment:	**Display with illumination,** 3-line, customised programming, cutout approx. W51 x H29mm, to display the actual pressure or a customised display value. **Bar graph**, 7-digit, LEDs freely configurable, to graphically display the reading.
ACCESSORIES	See table

Display screen Reading — **xx-ECATP Tyr 2**



Differential pressure



Volume flow rate

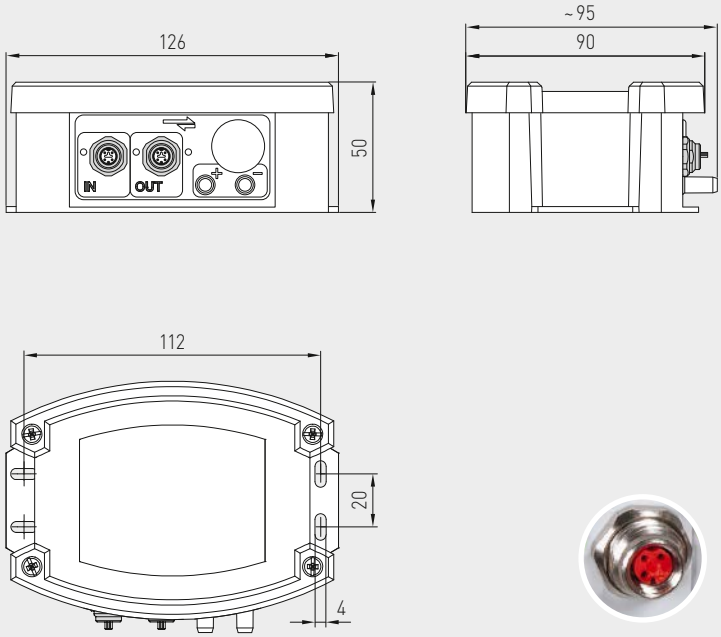
Programmable display screen — **xx-ECATP Tyr 2**



Pressure measuring transducer for differential pressure and volume flow, incl. connection kit, Bluetooth-enabled, with EtherCATP port

Dimensional drawing

PREMASGARD® 612x-ECATP



M8-plug-in connector
EtherCATP-encoded

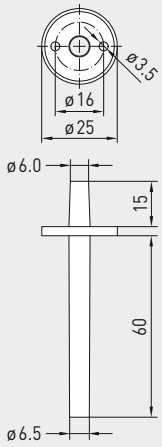
PREMASGARD® 612x-ECATP
with display and bar graph





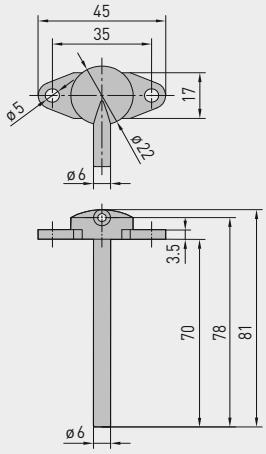
Dimensional drawing

ASD-06
Connection set



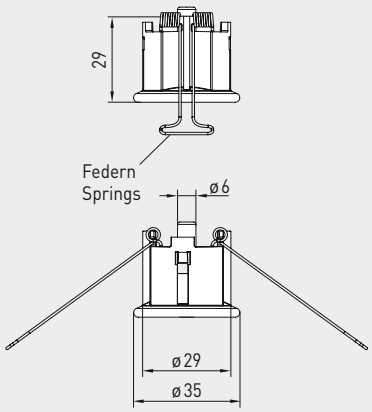
Dimensional drawing

ASD-07
Connection nipple



Dimensional drawing

DAL-01
Pressure outlet



ASD-06
Connection set



ASD-07
Connection nipple



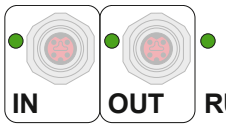
DAL-01
Pressure outlet



PREMASGARD® 612x-EtherCAT P

Pressure measuring transducer for differential pressure and volume flow, incl. connection kit, Bluetooth-enabled, with EtherCATP port

S+S REGELTECHNIK

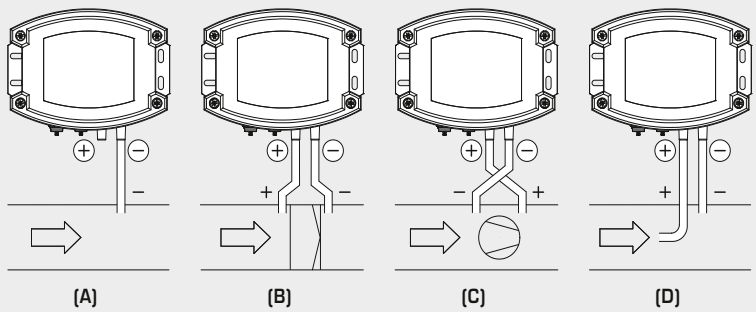


EtherCAT P	LED status display
1. LED	**"IN"**
off	no connection to upstream EtherCAT module
illuminated	LINK: connection to upstream EtherCAT module
blinking	ACT: communication with upstream EtherCAT module
2. LED	**"OUT"**
off	no connection to downstream EtherCAT module
illuminated	LINK: connection to downstream EtherCAT module
blinking	ACT: communication with downstream EtherCAT module
3. LED	**"RUN"**
off	EtherCAT module is in "Init" state
quickly blinking	EtherCAT module is in "Pre-Operational" state
slowly blinking	EtherCAT module is in "Safe-Operational" state
illuminated	EtherCAT module is in "Operational" state
The status LEDs are next to the cable connection.	

WS-03
Weather and sun protection hood, (optional)



Mounting diagram **PREMASGARD® 612x-ECATP**



TYPES OF MONITORING:
The pressure connections are on the housing with
P1 (+) for higher pressure and
P2 (–) for lower pressure.

(A) Below-atmospheric pressure
P1 (+) is not connected, but open to the atmosphere
P2 (–) connected to inside of duct

(B) Filter
P1 (+) connected upstream of filter
P2 (–) connected downstream of filter

(C) Ventilator
P1 (+) connected downstream of ventilator
P2 (–) connected upstream of ventilator

(D) Volume flow
P1 (+) dynamic pressure, connected in flow direction
P2 (–) static pressure, connected free of dynamic pressure components

Conversion table for pressure values:

Unit =	bar	mbar	Pa	kPa	mWS
1 Pa	0,00001 bar	0,01 mbar	1 Pa	0,001 kPa	0,000101971 mWS
1 kPa	0,01 bar	10 mbar	1000 Pa	1 kPa	0,101971 mWS
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10,1971 mWS
1 mbar	0,001 bar	1 mbar	100 Pa	0,1 kPa	0,0101971 mWS
1 mWS	0,0980665 bar	98,0665 mbar	9806,65 Pa	9,80665 kPa	1 mWS

Pressure measuring transducer for differential pressure and volume flow, incl. connection kit, Bluetooth-enabled, with EtherCATP port

PREMASGARD® **612x-ECATP**
with display and bar graph



PREMASGARD® **612x-EtherCAT P**	Pressure measuring transducer for differential pressure and volume flow, with EtherCATP port				
Type / WG02	**Measuring Range / Readout** Pressure	**Output**	**Bar graph Display**	**Item No.**	**Price**
Type 6128	**– 500...+ 500 Pa**				
PREMASGARD 6128-ECATP	–500...+ 500 Pa	EtherCAT P		2004-6271-9100-011	**363,14 €**
PREMASGARD 6128-ECATP **LCD**	–500...+ 500 Pa	EtherCAT P	□ ■	2004-6272-9100-011	**409,40 €**
Type 6127	**– 7000...+ 7000 Pa**				
PREMASGARD 6127-ECATP	–7000...+ 7000 Pa	EtherCAT P		2004-6271-9100-001	**363,14 €**
PREMASGARD 6127-ECATP **LCD**	–7000...+ 7000 Pa	EtherCAT P	□ ■	2004-6272-9100-001	**409,40 €**
Note:	Cable connection with **M8 plug-in connector** (EtherCATP-encoded)				

ACCESSORIES			
ASD-06	**Connection set (included in the scope of delivery),** consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose (soft, UV-resistant) and 4 screws	7100-0060-3000-000	**7,64 €**
ASD-07	**2 connection nipples** (at 90° angle) made of ABS	7100-0060-7000-000	**7,64 €**
DAL-01	**Pressure outlet** for ceiling or in-wall installation (e.g. in clean rooms)	7300-0060-3000-001	**35,77 €**
WS-03	**Weather and sun protection hood,** 200 x 180 x 150 mm, stainless steel **V2A** (1.4301)	7100-0040-6000-000	**44,74 €**
	For further information, see last chapter Accessories!		

Modbus

Save Energy with Interconnectivity

Against the background of rapidly increasing energy costs, the centralised measurement, monitoring, and control of power consumption in buildings is also becoming increasingly important.

The interconnection of our bus capable measuring transducers for temperature, humidity, pressure as well as VOC, CO2, particulate matter and air flow leads to comprehensive energy efficiency and thus saves money.

Application Areas

- Building automation in industry and commerce
- Central energy management in public and private facilities, such as hospitals, administrative centres, schools and museums
- Detection and control of temperature, humidity, pressure, air quality and flow in areas which are difficult to access or remote





THERMASGARD®, **HYGR**ASGARD®, **PREM**ASGARD®, **AER**ASGARD® – MODBUS CAPABLE MEASUREMENT TRANSDUCERS

Room control units, Room sensors
Room controller with touch screen / touch keys

RYMASKON® **200**	Room control units, on-wall		099
RYMASKON® **400**	Room controller, on-wall		097
RYMASKON® **500**	Room controller, on-wall	NEW	095
RYMASKON® **600**	Room controller, on-wall	NEW	091
RYMASKON® **700**	Room control units, on-wall	NEW	087
RYMASKON® **1000**	Room control units, on-wall	NEW	077
RYMASKON® **1000C**	Room controller, on-wall	NEW	083
RFTF-Modbus-xx	Room control units, on-wall		101
RTM 1-Modbus	Room sensor, on-wall		103
RFTM-CO2-Modbus-P	Room control units, on-wall		159
FSFTM-Modbus **FSFTM-Modbus-P**	Room sensor / Room control units, in-wall		125
FSFTM-CO2-Modbus **FSFTM-CO2-Modbus-P**	Room sensor / Room control units, in-wall		161

Temperature sensors

RTM 1-Modbus	Room temperature sensor	103
RPTM 1-Modbus-T3	Pendulum room temperature sensor	119
RPTM 2-Modbus-T3	Pendulum room temperature sensor	121
HFTM-Modbus-T3	Sleeve sensor with cable	113
ALTM 1-Modbus-T3	Surface-contact temperature sensor	115
ALTM 2-Modbus-T3	Surface-contact temperature sensor with cable	117
ATM 2-Modbus-T3	Outside temperature sensor	105
TM 65-Modbus-T3	Duct / immersion / screw-in sensor	107
MWTM-Modbus-T3	Mean value temperature sensor	111

Special accessories

powerIO®-System	Installation system	067
MODKON® **LA-Modbus**	Line termination device	175
MODKON® **KA2-Modbus**	Communication adapter	177
see chapter Accessories		644

Humidity sensors

FSFTM-Modbus	In-wall humidity and temperature sensor	125
RFTF-Modbus	Room humidity and temperature sensor	123
RPFTF-Modbus-T3	Pendulum room humidity and temperature sensor	131
VFTF-Modbus-T3	Showcase humidity and temperature sensor	133
AFTF-Modbus-T3	On-wall humidity and temperature sensor	127
KFTF-Modbus-T3	Duct humidity and temperature sensor	129
TW-Modbus-T3	Dew point sensor	137

Pressure sensors

PREMASGARD® **232x-Modbus-T3**	Pressure measuring transducer	141
PREMASGARD® **714x-Modbus**	Pressure / volume flow measuring transducer	145
PREMASGARD® **724x-Modbus**	Pressure / volume flow measuring transducer (2 channels) NEW	151
PREMASGARD® **814x-Modbus**	Duct humidity and temperature sensor with pressure measuring transducer	155

Air quality sensors
VOC / CO2 / fine dust sensors (PM)

FSFTM-CO2-Modbus	In-wall sensor	161
RFTM-LQ-PS-CO2-Modbus	Room sensor	159
AFTM-LQ-CO2-Modbus	On-wall sensor	165
KFTM-LQ-CO2-Modbus	Duct sensor	169

Multifunctional sensors for humidity and temperature and air quality (VOC), fine dust (PM) and CO2 content

Flow sensors

KLGF-Modbus	Duct air flow sensor	NEW	173
KLGFVT-Modbus	Duct sensor for air flow, volume flow and temperature	NEW	173

Modbus

Modbus capable measuring transducers for multi-functional requirements

Broad Spectrum

Our Modbus-capable temperature, pressure, and humidity sensors are designed to be multifunctional.
This reduces the diversity of types and expands their possible applications.
Thanks to microprocessor technology, almost any measuring range can be represented, including custom specifications.

Optimum Precision

All devices are developed, manufactured and tested in accordance with the latest criteria. Each sensor is precisely readjustable using offset potentiometers.
Take advantage of our experience, our development, manufacturing and product know-how and order these products directly from the manufacturer.

Technical Highlights

- Galvanic isolation of the RS485 Modbus interface
- Integrated selectable bus termination resistance
- Display with backlighting and freely configurable
- Offset adjustment with potentiometer
- Temperature resolution: 16 bit AD converter, 0.1 K resolution
- Measuring range: –50 to +150 °C
- Accuracy: typically ± 0.2K at+25 °C
- Power supply: 15...36V DC; 24V AC ±20%
- All devices programmable and addressable even when not energized

Certified Quality

Our development and production in Nuremberg/Germany is certified by TÜV Thüringen according to DIN EN ISO 9001:2015.

GOST certified

EAC certified

Approved Safety

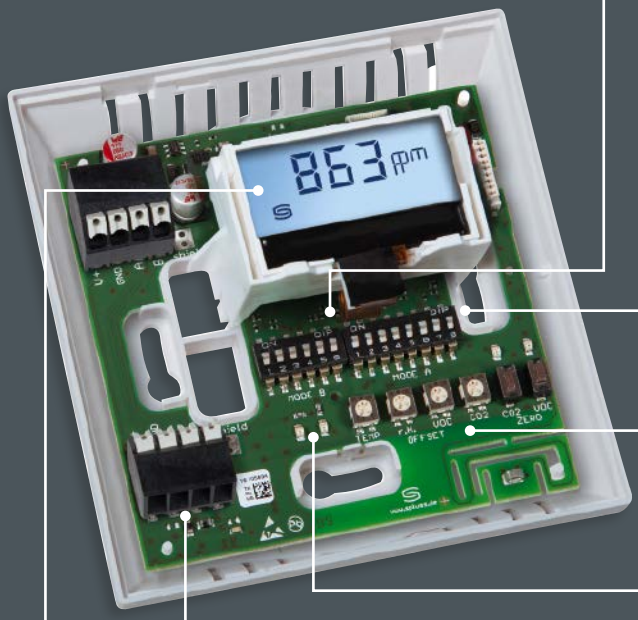
RoHS conforming materials

ESD compliant manufacturing

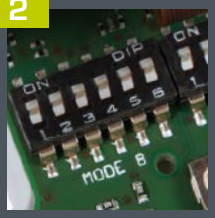
CE compliance tested by external laboratories

MADE
IN
GERMANY

S+S REGELTECHNIK



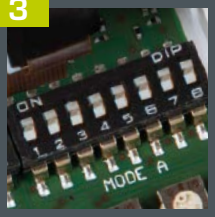
2



DIP Switches für Busparameter

Easy configuration of bus parameters: baud rate, parity, parity check and bus termination

3



DIP Switches for Bus Address

Up to 247 addresses possible, address can be configured even when the device is not energized

4



Offset Potentiometer

For fine adjustment (zero point offset) and readjustment upon recalibration

5



LED for Telegram Indication

(Green for Receive, Red for Error) Permits fast bus communication diagnosis

6



Bus Terminals

Push-in terminals (2x) for I/O

1

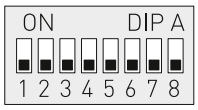


Illuminated Display

With backlighting as well as freely configurable 7/14 segment and 40-point matrix for display of individual measured values

S+S TECHNOLOGY FOR
SMART BUILDINGS

Bus address (DIP A) in binary format



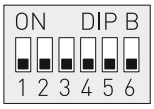
DIP switch [A] for setting the bus address:

Bus address (binary coded, value selectable from 1 to 247)							
DIP 1	**DIP 2**	**DIP 3**	**DIP 4**	**DIP 5**	**DIP 6**	**DIP 7**	**DIP 8**
128	**64**	**32**	**16**	**8**	**4**	**2**	**1**
ON	**ON**	OFF	OFF	OFF	OFF	OFF	**ON**

Example shows
128 + 64 + 1 = 193
as Modbus address.

DIP switch

1		51		101		151		201	
2		52		102		152		202	
3		53		103		153		203	
4		54		104		154		204	
5		55		105		155		205	
6		56		106		156		206	
7		57		107		157		207	
8		58		108		158		208	
9		59		109		159		209	
10		60		110		160		210	
11		61		111		161		211	
12		62		112		162		212	
13		63		113		163		213	
14		64		114		164		214	
15		65		115		165		215	
16		66		116		166		216	
17		67		117		167		217	
18		68		118		168		218	
19		69		119		169		219	
20		70		120		170		220	
21		71		121		171		221	
22		72		122		172		222	
23		73		123		173		223	
24		74		124		174		224	
25		75		125		175		225	
26		76		126		176		226	
27		77		127		177		227	
28		78		128		178		228	
29		79		129		179		229	
30		80		130		180		230	
31		81		131		181		231	
32		82		132		182		232	
33		83		133		183		233	
34		84		134		184		234	
35		85		135		185		235	
36		86		136		186		236	
37		87		137		187		237	
38		88		138		188		238	
39		89		139		189		239	
40		90		140		190		240	
41		91		141		191		241	
42		92		142		192		242	
43		93		143		193		243	
44		94		144		194		244	
45		95		145		195		245	
46		96		146		196		246	
47		97		147		197		247	
48		98		148		198			
49		99		149		199			
50		100		150		200			



DIP switch [B] for setting bus parameters:

Baud rate (selectable)	DIP 1	DIP 2
9600 baud	**ON**	OFF
19200 baud	**ON**	**ON**
38400 baud	OFF	**ON**
Reserved	OFF	OFF

Parity (selectable)	DIP 3
EVEN (numbered)	**ON**
ODD (numbered)	OFF

Parity check (on/off)	DIP 4
Active (1 stop bit)	**ON**
Inactive (no parity) (2 stop bits)	OFF

8N1 mode (on/off)	DIP 5
Active	**ON**
Inactive (default)	OFF

Bus termination (on/off)	DIP 6
Active	**ON**
Inactive	OFF

BUS ADDRESS

The device address in the range of **1 to 247** is set at DIP switch [A].
For switch positions 1 to 8 see the table on the back!

Address 0 is reserved for broadcast messages. Addresses greater than 247 must not be assigned and are ignored by the device.
The DIP switches are binary-coded with the following values:

DIP 1 = **128** ..... DIP 1 = **ON**
DIP 2 = **64** ..... DIP 2 = **ON**
DIP 3 = 32 ..... DIP 3 = OFF
DIP 4 = 16 ..... DIP 4 = OFF
DIP 5 = 8 ..... DIP 5 = OFF
DIP 6 = 4 ..... DIP 6 = OFF
DIP 7 = 2 ..... DIP 7 = OFF
DIP 8 = **1** ..... DIP 8 = **ON**

The switch positions shown here result in the Modbus address **128 + 64 + 1 = 193**

BUS PARAMETERS

The baud rate (speed of transmission) is set at DIP switches 1 and 2 of DIP switch block [B].
Selectable are **9600 baud, 19200 baud**, or **38400 baud** – see table!

Parity is set at DIP switch 3 of DIP switch block [B].
Selectable are **EVEN** or **ODD** – see table!

Parity check is activated via DIP switch 4 of DIP switch block [B].
Selectable are **active (1 stop bit)**, or **inactive (2 stop bits)**, i.e. no parity check – see table!

The **8N1 mode** is activated via DIP switch 5 of DIP switch block [B].
The functionality of DIP switch 3 (parity) and DIP switch 4 (parity check) of DIP switch block [B] is therefore deactivated.
Selectable are 8N1 **active** or **inactive (default)** – see table!.

Bus termination is activated via DIP switch 6 of DIP switch block [B].
Selectable are **active** (bus termination resistance of 120 Ohm), or **inactive** (no bus termination) – see table!

When bus parameters and bus address are changed at devices with **display**,
the respective settings are shown on the display for approx. 30 seconds.

COMMUNICATION INDICATOR

Communication is indicated via two LEDs.
Error-free received telegrams are signalized by the green LED lighting up, regardless of the device address.
Faulty telegrams or triggered Modbus exception telegrams are depicted by the red LED lighting up.

DIAGNOSTICS

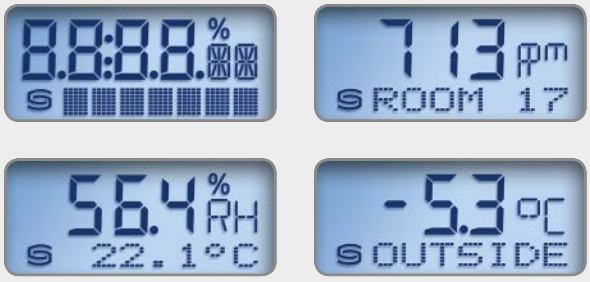
An error diagnostic function is integrated.

Modbus

Display individually programmable via Modbus interface

S+S REGELTECHNIK

Display (Baldur)
Symbols and display examples



Alternative parameters
Display programmable via index



Display (Tyr 2)
Symbols and display examples



Individually programmable display area for two or three-line displays

Our displays can be controlled via the Modbus interface.
This means that messages such as those from the PLC can also be displayed.

All characters in the display can be individually described both in the 7-segment area, and in the dot matrix area.

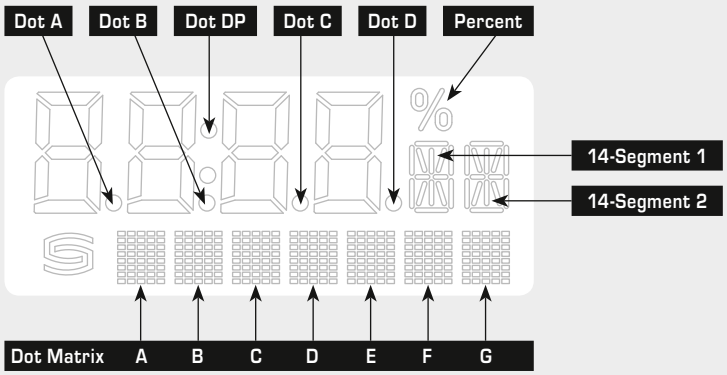
Depending on the device type, it is also possible to display alternative parameters such as absolute humidity, dew point, mixture ratio or enthalpy instead of the standard display.

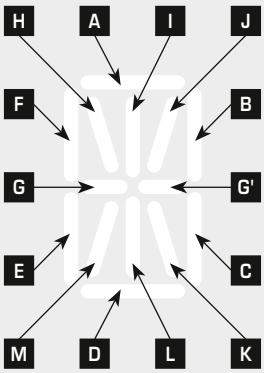
Display (Tyr 3)
Symbols and display examples



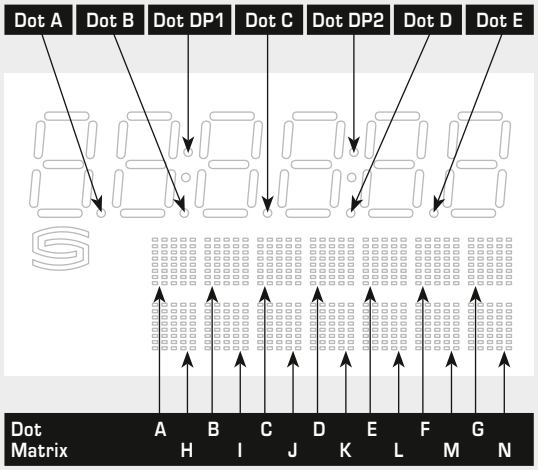
Composition of segment patterns

Display (Baldur)
two-line, cut-out approx. 36 x 15 mm

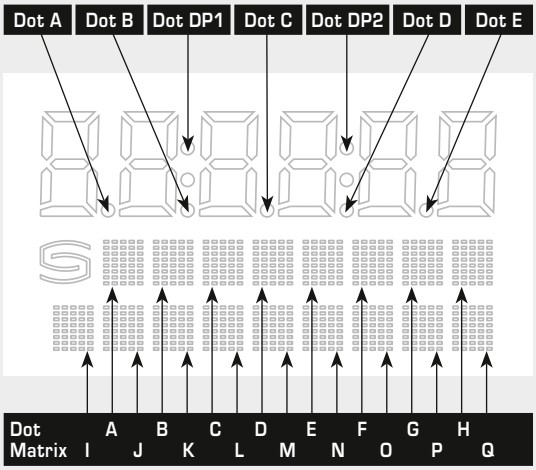




Display (Tyr 2)
three-line, cut-out approx. 70 x 40 mm



Display (Tyr 3)
three-line, cut-out approx. 51 x 29 mm



Representable characters in the dot matrix display area for two- and three-line displays

ASCII characters or control characters are displayed as spaces.

ASCII	Sign
32	Blank
33	!
34	“
35	#
36	$
37	%
38	&
40	(
41	)
42	*
43	+
44	,
45	-
46	.
47	/

ASCII	Sign
48	0
49	1
50	2
51	3
52	4
53	5
54	6
55	7
56	8
57	9
58	:
59	;
60	<
61	=
62	>

ASCII	Sign
63	?
64	@
65	A
66	B
67	C
68	D
69	E
70	F
71	G
72	H
73	I
74	J
75	K
76	L
77	M

ASCII	Sign
78	N
79	O
80	P
81	Q
82	R
83	S
84	T
85	U
86	V
87	W
88	X
89	Y
90	Z
91	[
93	]

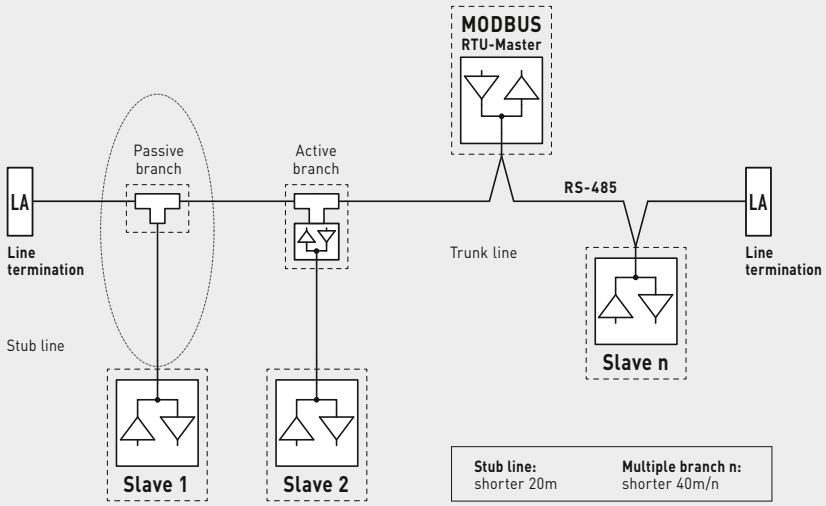
ASCII	Sign
94	^
95	_
96	\
97	a
98	b
99	c
100	d
101	e
102	f
103	g
104	h
105	i
106	j
107	k
108	l

ASCII	Sign
109	m
110	n
111	o
112	p
113	q
114	r
115	s
116	t
117	u
118	v
119	w
120	x
121	y
122	z
123	{

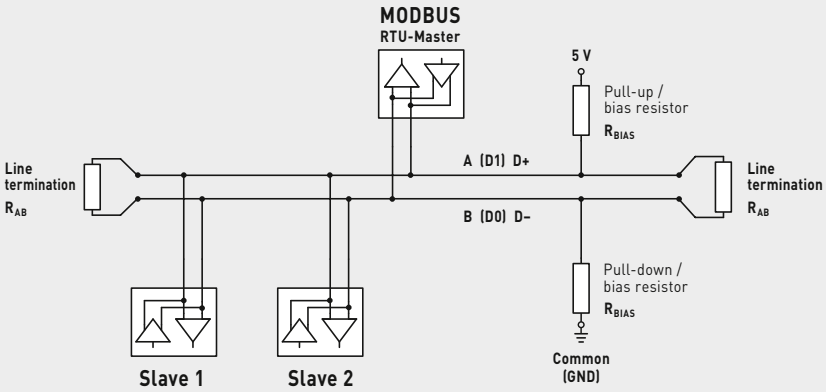
ASCII	Sign
124	|
125	}
129	ü
132	ä
142	Ä
148	ö
153	Ö
154	Ü
223	°

General layout of bus structure and bus topology with terminating and bias resistors

General layout of bus structure



Bus topology with terminating and bias resistors

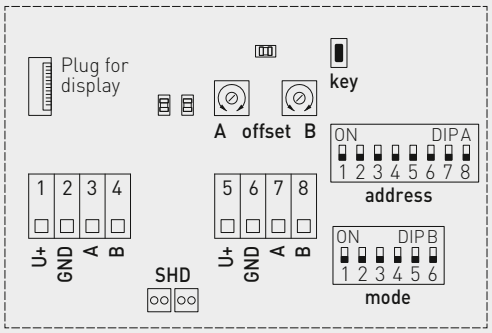


Terminating resistor may only be installed at the ends of the bus line.
In networks with repeaters not more than two line terminations are allowed.
Line termination at the device can be activated via DIP switch 6.
The bias resistors for bus level definition in the resting state are usually activated at the Modbus master / repeater.

The maximum number of subscribers per Modbus segment is 32 devices.
When the number of subscribers is greater, the bus must be subdivided into several segments separated by repeaters. The subscriber address can be set from 1 to 247.

For the bus line, a twisted-pair cable data line / power supply line and copper mesh wire shield must be used. Therefore, the line capacitance should be less than 100 pF/m (e.g. Profibus cable).

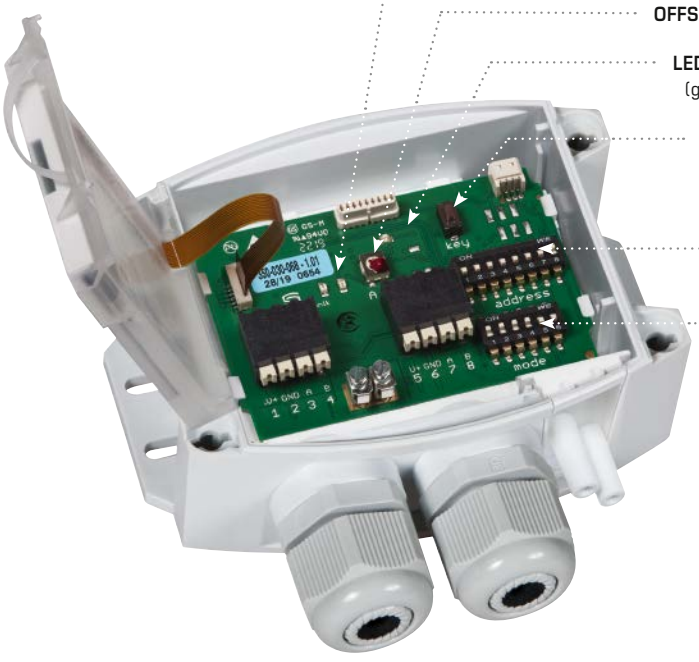
Circuit board basic design — **Modbus Tyr3**



DIP A: Bus address
DIP B: Bus parameters (Baud rate, parity...)
Telegram indicator Reception (LED green) Error (LED red)
LED (internal status)
Offset correction
Button „**key**" (auto zero)
Shielding

TECHNICAL DATA

Power supply:	24 V AC (± 20 %) and 15...36 V DC
Power consumption:	< 2 W / 24 V DC < 3,5 VA / 24 V AC
Electrical connection:	see schematic diagram 0.2 - 1.5 mm², via push-in terminals
Bus parameters:	**can be configured and addressed** via DIP switches **in the absence of current delivery** (under currentless conditions)
Bus interface:	RS 485, **galvanically isolated,** Bus termination activatable via DIP switches. Up to 32 devices possible in one segment. In case of a greater number of devices, RS485 transceivers must be used.
Bus protocol:	Modbus (RTU mode), address range 0...**247** selectable
Baud rate:	9600, 19200, 38400 Baud
Status indicator:	LED green = Telegram valid LED red = Telegram error
Display:	The Modbus interface allows the display to be **individually** configured both in the 7-segment area and in the dot-matrix area.



2 separate **plug terminals** (push-in terminals)

OFFSET correction

LED for telegram indication
(green for reception , red for error)

Push-button for manual zero point calibration

DIP switches block A
for bus address

DIP switches block B
for bus parameters



Foldable **display** (optional),
Individually programmable display

2 separate **cable glands**
with seal and strain relief

Building automation is used to control heating, ventilation and air conditioning equipment. The powerIO®-System provides more efficient control, better monitoring and more reliable operational management than previous conventional systems.
And does this independently of control system providers.

The installation system has outstanding compatibility with all sensors and actuators from leading manufacturers, and can be enhanced with all of the popular protocols.
The system mainly consists of three parts:

powerIO®-Line

A hybrid cable which transmits data via Ethernet (TCP/IP, 100 Mbit/s) and also power (230 V). This makes it possible to transmit data and provide sensors and actuators with power over long distances with a single cable.

powerIO®-Box

The powerIO®-Line connects the powerIO®-Boxes. Several communicative sensors and actuators can be connected over short distances with standardised industrial M12 plug-in connections with the boxes.

Control in accordance with IEC 61131-3
You can optionally create a CODESYS® controller from any powerIO®-Box and use HLK libraries from **www.hvac-automation.com**

powerIO®-App

The app turns your Smartphone into a measuring device. This gives you control over the communicative sensor system. You can start up and test devices independently of the manufacturer. Manual intervention and various service functions can be carried out using the Bluetooth connection or via WLAN.

Download the powerIO®-App
www.powerio.com/app

OVERVIEW OF THE ADVANTAGES:

Easy connection of the systems thanks to standardised M12 plug-in connectors.
The error quota is reduced. A practical aid in times of skill shortages!

Fewer problems with interfaces. Coordination problems (cable installations, among other things) between electrical systems and measuring and control equipment are a thing of the past.

More reliability during operational management due to preventive messages.
Optimum for predictive maintenance.

More information content can be transmitted. Ideal for communicative devices and intelligent sensors.
Makes better system optimisation and monitoring possible.

Powerful, also for large systems.
And long distances can also be achieved due to the 230 V powerIO®-Line.

COST-EFFECTIVE
Reduction of cabling and cabinets by up to 70 %

FLEXIBLE
Open system for easy and fast expansion

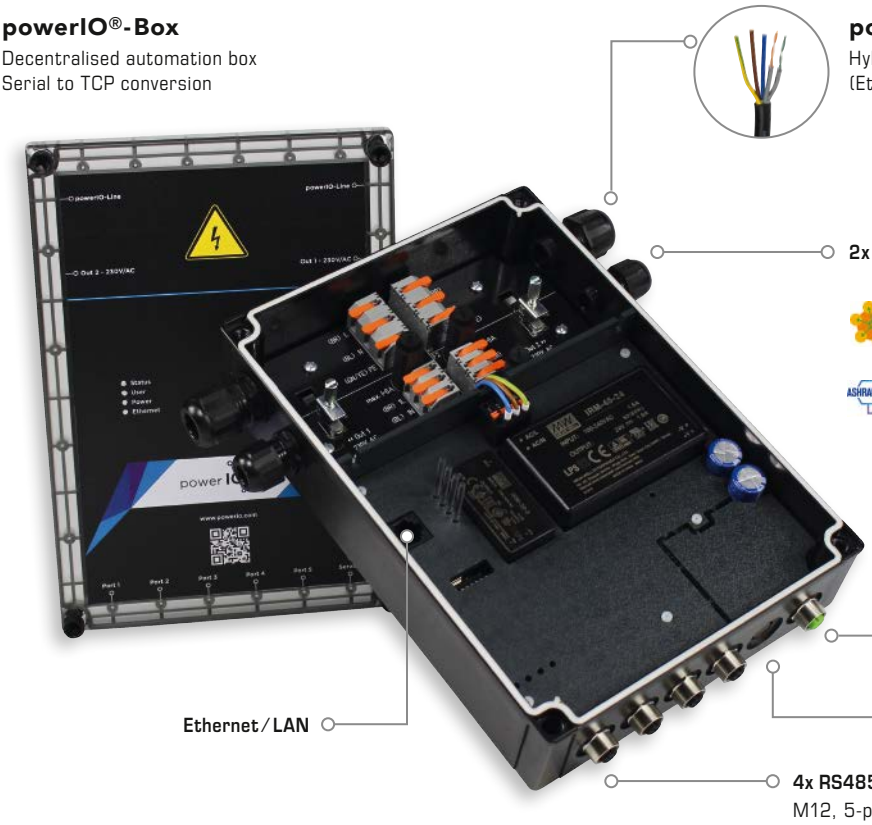
DEPENDABLE
Better control, higher safety, fewer connection faults, more data

powerIO® System

Type / WG02I	Description	(Parts No.)	Item No.	Price
Starter set				
	**powerIO®-Starter Set** 1 x (T1.B100) powerIO®-Box 1 x (T1.S110) powerIO®-Start Unit 1 x (T1.L100) powerIO®-Line, 20 m 1 x (T1.Z109) Installation cable, 5 m 1 x (T1.Z104) M12 connecting cable, 2 m 1 x (T1.Z105) M12 connecting cable, 5 m 1 x (T1.Z106) M12 connecting cable, 10 m 1 x (T1.Z107) M12 connecting cable, 2 m 1 x (T1.Z114) M12 flange connector, front-of-wall mounting 1 x (T1.Y200) powerIO®-Y distributor 1 x (T1.D100) powerIO®-Bluetooth Dongle	(T1.Z121)	3PIO-1502-0000-000	**1.735,02 €**

Note: Only one starter set is available per customer. Product is not discountable.

powerIO®-Box
Decentralised automation box
Serial to TCP conversion



powerIO®-Line
Hybrid cable for transmitting data
(Ethernet TCP/IP, 100 Mbit/s) and power (230V)

Modbus · DALI · M-Bus · BACnet · KNX · enocean

powerIO® System

Type / WG02I	Description	(Parts No.)	Item No.	Price
Main components				
	**powerIO®-Box** **Decentralised automation box** 230V voltage supply, Ethernet communication, Gateway functionn 2 x 230 V outputs up to 6 A 4 x M12 coupling, A-coded for RS485 connections incl. 24 V / 2 A DC voltage supply (ports 1 to 6) 1 x optional plug-in location (port 5) 1 x M12 service interface for commissioning with Smartphone app incl. shield terminal, Ethernet, fine fuse (4 A). Dimensions 180 x 255 x 64 mm (W x H x D) (plus cable lead-in and M12 ports) Can be extended with a **CODESYS®** runtime licence and HVAC libraries.	(T1.B100)	3PIO-1101-0000-000	**1.735,02 €**
	**powerIO®-Line** **Hybrid cable for connecting the powerIO®-Boxes** Sold by the metre, minimum ordering quantity 10 m Data: 2 x (2 x 0,34 mm²), shielded Power: 3 x **4.00 mm²**	(T1.L100)	3PIO-1201-0000-000	**16,21 €** / m
	Power: 3 x **2.50 mm²**	(T1.L200)	3PIO-1203-0000-000	**15,76 €** / m
	**powerIO®-Start Unit** **Switch, allows connection of up to 3x powerIO®-Lines and 2x RJ45 Ethernet cables** (e.g. for control, touch panel or network) Top-hat rail installation for switch cabinet or sub-distributor 4TE housing / dimensionsn 72 x 90 x 65 mm (B x H x T)	(T1.S110)	3PIO-1102-0000-000	**300,74 €**

See next page for more information and accessories.

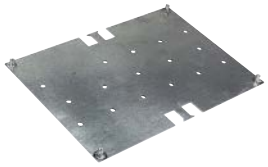
powerIO® System

Type / WG02I	Description	(Parts No.)	Item No.	Price
Expansion components				
	**powerIO®-Rio1** **Expansion box for non-communicative sensors / actuators** 6 x Digital input 1 x Analogue input 0–10 V 1 x Analogue input, passive (PT1000) 3 x Digital outputs pot.-free (Imax 16 A) 4 x Digital outputs 24 V / 0.5 A 1 x Analogue outputs 0–10 V Each output with manual override (switch/potentiometer). Addressable using rotary switch. Connected via Modbus RTU. Dimensions 160 x 140 x 83 mm (W x H x D)	(T1.R100)	3PIO-1104-0100-000	**461,52 €**
	**powerIO®-Rio 4DI** **Digital input modules for the activation of messages (24 V)** **4 x** Digital input with counting function 24 V AC/DC power supply Connection via Modbus RTU Housing protection class **IP67** Dimensions 160 x 140 x 81 mm (W x H x D)	(T1.R100-4DI)	3PIO-1104-0300-000	**141,12 €**
	powerIO®-Rio 8DI **8 x** Digital input with counting function (any other design as above)	(T1.R100-8DI)	3PIO-1104-0400-000	**150,37 €**
	**powerIO®-Hub** **Distributor for hybrid cable powerIO®-Line** Input terminals for power and Ethernet CAT6 hybrid cable with shield terminals, output terminals for 2x power and Ethernet CAT 6, hybrid cable with shield terminals HUB functionality for Ethernet CAT6 distribution via connection to "Ethernet" additional card at powerIO®-Box. Dimensions 160 x 140 x 83 mm (W x H x D)	(T1.H100)	3PIO-1106-0000-000	**196,63 €**
	**powerIO®-Booster** **Power output amplification on 24 V end** Input U = 230 V AC Output U = 24 V DC / I = 2 A 2x M12 connectors each with 24V DC outlet and Modbus RTU Dimensions 160 x 140 x 81 mm (W x H x D)	(T1.R350)	3PIO-1105-0000-000	**230,18 €**
	**powerIO®-HK Distributor** **for controlling thermal drives** (such as underfloor heating circuit distributor or concrete core heating distributor) 12x Digital output 24 V 2x Digital input 2x Analogue input (0-10 V, PT1000, Ohm) 230 V AC power supply Connection via Modbus RTU, DIN rail or wall-mounting (optionally with magnetic feet) Dimensions 326.5 x 90 x 52 mm (W x H x D)	(T1.R310)	3PIO-1110-0000-000	**403,68 €**
	**powerIO®-Y Distributor Box** **Distributor box for connection of 2 RS485 nodes per port (1-4) to the powerIO® box** Bridged bus and voltage, Connection terminals with lever (5x 3-pin / up to 4.00 mm²), Connection is established (see below for type) via cable gland and/or M12 socket Dimensions 85 x 85 x 51 mm (W x H x D)			
	2x cable gland	(T1.Y100)	3PIO-1107-0100-000	**28,92 €**
	1x cable gland **1x M12 socket**, 5-pin, A-coded	(T1.Y200)	3PIO-1107-0200-000	**45,11 €**
	2x M12 socket, 5-pin, A-coded	(T1.Y300)	3PIO-1107-0300-000	**61,30 €**

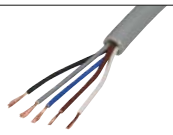
powerIO® System

Type / WG02I	Description	(Parts No.)	Item No.	Price
Service Tool				
	**powerIO®-Bluetooth Dongle** **Communication with powerIO®-App** For plugging into service port of the powerIO®-Box. For commissioning/servicing the sensors/actuators.	(T1.D100)	3PIO-1103-0000-000	**229,03 €**
BSK modules				
	**powerIO®-BSK ECO** **Fire damper module for 1 fire damper (24 V or 230 V), without galvanic isolation (ECO)** 2 x digital input 1 x digital output relay 230 V / 5 A 24 V AC/DC power supply Connection via Modbus RTU BSK connection via AMP socket Housing protection class **IP 54** Dimensions 110 x 110 x 66 mm (W x H x D)	(T1.BSK1-AMP-24-ECO)	3PIO-1108-0100-000	**117,98 €**
	BSK connection via terminal blocks Housing protection class **IP 67** (any other design as above)	(T1.BSK1-24-ECO)	3PIO-1108-0200-000	**117,98 €**
	**powerIO®-BSK 24** **Fire damper module for 2 fire dampers (24 V or 230 V), with galvanic isolation** 4 x Digital input 2 x Digital output relay 230 V / 16 A 24 V AC/DC power supply Connection via Modbus RTU BSK connection via AMP socket Housing protection class **IP 54** Dimensions 160 x 140 x 81 mm (W x H x D)	(T1.BSK2-AMP-24)	3PIO-1108-0300-000	**166,56 €**
	BSK connection via terminal blocks Housing protection class **IP 67** (any other design as above)	(T1.BSK2-24)	3PIO-1108-0400-000	**166,56 €**
	**powerIO®-BSK 230** **Fire damper module for 2 fire dampers (230 V), with galvanic isolation** 4 x Digital input 2 x Digital output relay 230 V / 16 A 230 V AC power supply Connection via Modbus RTU BSK connection via AMP socket Housing protection class **IP 54** Dimensions 160 x 140 x 81 mm (W x H x D)	(T1.BSK2-AMP-230)	3PIO-1108-0500-000	**175,81 €**
	BSK connection via terminal blocks Housing protection class **IP 67** (any other design as above)	(T1.BSK2-230)	3PIO-1108-0600-000	**175,81 €**

powerIO® System

Type / WG02I	Description	(Parts No.)	Item No.	Price
Expansion cards powerIO®-Box T1				
	**Expansion card "Ethernet"** M12, 4-pin D-coded Allows connection of an M12 Ethernet cable (T1.Z102). Incorporation of other IP subscribers with up to 100 Mbit/s.	(T1.C100-ETH)	3PIO-1301-0000-000	**229,03 €**
	**Expansion card "RS485"** M12, 5-pin A-coded Extends port 5 with an RS485 COM port. With 24 V on M12 pins as output voltage.	(T1.C100-RS485-24)	3PIO-1302-0000-000	**229,03 €**
	Expansion card "RS232" M12, 5-pin A-coded Extends port 5 with an RS232 COM port. With 24 V on M12 pins as output voltage.	(T1.C100-RS232-24)	3PIO-1303-0000-000	**300,74 €**
Installation board powerIO®-Box T1				
	**Installation board** Simple preinstallation for electrical installation, 4 threaded bolts for screwing on the powerIO®-Box (series T1) at a later date. Aluminium installation board with cut-out for installation to pipes using lashing straps.	(T1.Z119)	3PIO-1403-0000-000	**60,14 €**
	Installation board with magnets Simple preinstallation for electrical installation, 4 threaded bolts for screwing on the powerIO®-Box (series T1) at a later date. Aluminium installation board with pre-installed magnets for attaching to air ducts, for example.	(T1.Z125)	3PIO-1404-0000-000	**84,44 €**

powerIO® Accessories

Type / WG02	Description	(Parts No.)	Item No.	Price
Connecting cable				
	**M12 connecting cable** PVC cable, shielded, 5-pin, A-coded, M12 connector <–> open end	(ALG)	**ALG M12-A5M PVC xx**	
		2 m	2000-9141-0100-011	**31,31 €**
		5 m	2000-9141-0100-021	**39,60 €**
		10 m	2000-9141-0100-031	**52,90 €**
	**M12 connecting cable** PVC cable, shielded, 5-pin, A-coded, M12 connector <–> M12 socket	(VLG)	**VLG M12-A5 PVC xx**	
		2 m	2000-9111-0000-031	**59,02 €**
		5 m	2000-9111-0000-041	**66,86 €**
		10 m	2000-9111-0000-051	**80,29 €**
	**M12 Ethernet cable** M12 connector, 4-pin, D-coded <–> RJ45 connector Ethernet cable for direct connection to the powerIO®-"Ethernet" expansion card	(T1.Z102)	3PIO-1601-0000-000	**83,29 €**
	**M12 installation cable** PVC cable, shielded, 5-pin (5 x 0.25 mm²), open ended, same colour code as M12 cable Sold by the metre, minimum ordering quantity 10 m	(T1.Z109)	3PIO-1202-0000-000	**2,43 € / m**

powerIO® Accessories

Type / WG02	Description	(Parts No.)	Item No.	Price
Connection accessories				
	**M12-Y-distributor** M12, 5-pin, A-coded, 1x connector –> 2x sockets For connecting two M12 connectors to one M12 socket. Bus and voltage are available at both connections. Can be plugged directly into the powerIO®-Box for connecting two sensors / actuators. Length 300 mm	(T1.Z122)	3PIO-1602-0000-000	**65,93 €**
	**M12-Y-adapter** M12, 5-pin, A-coded. 1x socket / 1x connector –> 1x connector	(T1.Z110)	3PIO-1603-0000-000	**46,26 €**
	**M12 coupling** M12, 5-pin, A-coded, 1x socket unassembled	(T1.Z111)	3PIO-1604-0000-000	**16,66 €**
	**M12 connector** M12, 5-pin, A-coded, 1x connector unassembled	(T1.Z112)	3PIO-1605-0000-000	**15,36 €**
	**M12 flange coupling VWM** M12, 5-pin, A-coded. 1x socket for front-of-wall mounting	(T1.Z113)	3PIO-1607-0000-000	**17,35 €**
	**M12 flange connector VWM** M12, 5-pin, A-coded, 1x connector for front-of-wall mounting	(T1.Z114)	3PIO-1608-0000-000	**18,51 €**
	**M12 flange coupling HWM** M12, 5-pin, A-coded. 1x socket for rear-wall mounting	(T1.Z115)	3PIO-1609-0000-000	**17,35 €**
	**M12 flange connector HWM** M12, 5-pin, A-coded, 1x connector for rear-wall mounting	(T1.Z116)	3PIO-1610-0000-000	**17,35 €**
	**M12 protection cap** Protection cap for unused M12 sockets	(T1.Z117)	3PIO-1606-0000-000	**3,47 €**
	**Ethernet connector** Connector for the powerIO®-Line to the powerIO®-Box or powerIO®-Start Unit (included in scope of delivery of the powerIO®-Box)	(T1.Z101)	3PIO-1402-0000-000	**10,41 €**
	**Shield terminal** for connecting the shield of the powerIO®-Line to the powerIO®-Box (included in scope of delivery of the powerIO®-Box)	(T1.Z100)	3PIO-1401-0000-000	**8,10 €**

NEW

S+S REGELTECHNIK

Interface for control of temperature, fan, light and sun protection
Room control panel with colour TFT display,
with Modbus connection or with active outputs

The room control units of the **RYM**ASKON® **1000** / **2000** / **3000** series are designed for control (up to 5 climate zones) in residential, hotel and office rooms and individually regulate the heating, cooling and fan levels of the internal rooms. The controller variants can be operated as stand-alone units thanks to the integrated control functions PI, PWM or 2-/3-point control. The product family is characterised by its elegant design, intuitive operation and the many possible combinations of the individual components.

The **RYM**ASKON® **1000** room control units (interface) are used for controlling temperature, fans, sun protection (Venetian blinds, shutters) or light. The room control units make the setpoints available to the BMS either via Modbus or analogue outputs (0-10 V). Visual indication takes place on a 2" TFT **display** (colour **LEDs** as an option), operation is via capacitive **touch keys** (adjusting wheels optional on request).

In addition to the integrated temperature and humidity sensor, **sensors** for CO2 and VOC are available as an option. An input for a passive temperature sensor (NTC10K) and an input for a potential-free contact are additionally available. This allows a window contact or a condensation control switch to be connected, for example.
This provides all options for air-conditioning of the rooms according to individual requirements.

All unit types are optionally available in the contemporary **housing** Iduna 1 (92 x 82 mm) and Iduna 3 (110 x 88 mm) in white or black colour. Wall-mounting is performed on standard in-wall flush boxes (optional on-wall).

TECHNICAL DATA

Unit type:	Room control units (interface)
Functions:	Temperature, fan, sun protection and light (see type table)
System of units:	SI (default) or imperial (can be changed via Modbus)
Data points:	Temperature [°C] [°F], relative humidity [% RH], air quality (VOC) [%] [pbb], carbon dioxide (CO2) [ppm], setpoint (temperature, fan, presence)
Power consumption:	typically < 3 W at 24 V DC; typically < 4.5 VA at 24 V AC
Voltage supply:	24 V AC/DC (± 10 %)
Communication:	**Modbus RTU** Slave, address range 1...247, RS 485 interface, max. 63 units, 9600 / 19200 / 38400 / 57500 Baud, 8N1, even / odd parity, 1 / 2 stop bits
Display:	**TFT display**, 2" (41 x 30 mm), 320 x 240 x 3 pixels (RGB), LED backlighting, viewing angle ± 85° (can be parametrised via the menu on the display or via the bus) or **LEDs** for displaying the setpoint temperature and fan stages (can only be parametrised via the bus)
Operating elements:	**Capacitive keys** (up to 10 keys, depending on type) for setting the target temperature, fan stages, presence message, sensor values, and for operating sun protection and light (with adjusting wheels on request)
Inputs:	1 NTC10K (configurable as a digital input) 1 digital input for potential-free switches
Outputs:	**Modbus** or (available upon request) 5 analogue outputs (0-10 V) for target temperature, fan stages, presence message, sensor values, digital output
Electrical connection:	0.2 - 1.5 mm², using push-in terminals
Housing:	Plastic, ABS material, colour white or black
Housing dimensions:	92 x 82 x 28 mm (Iduna 1) + 22 mm (in-wall flush box) 110 x 88 x 22 mm (Iduna 3) + 22 mm (in-wall flush box)
Mounting:	Wall-mounting on in-wall flush box, Ø 55 mm, (on-wall installation available upon request)
Ambient temperature:	0...+50 °C (operation); –30...+70 °C (storage)
Permitted humidity:	0...90 % RH (non-precipitating air)
Protection type:	IP 30 (according to EN 60529)
Standards:	CE conformity, 2014/30/EU EMC Directive (EN 60730-1/2, EN 61000-6-1/3), 2001/95/EG Product safety (EN 60730-1)

Continued on next page!

Interface for control of temperature, fan, light and sun protection
Room control panel with colour TFT display,
with Modbus connection or with active outputs

TECHNICAL DATA	(continuation)
TEMPERATURE	(basic equipment)
Sensor:	digital temperature sensor, low hysteresis, high long-term stability
Measuring range:	0...+50 °C / +32...+122 °F
Accuracy:	typically ± 0.5 K at +25 °C
HUMIDITY	(basic equipment)
Sensor:	digital humidity sensor, low hysteresis, high long-term stability
Measuring range:	0...100 % RH
Accuracy:	typically ± 2.0 % (20...80 % RH) at +25 °C, otherwise ± 3.0 %
CARBON DIOXIDE (CO2)	(optional)
Sensor:	digital photoacoustic NDIR-CO2 sensor (non-dispersive infra-red technology), with automatic calibration and high long-term stability
Measuring range:	0...2000 ppm
Accuracy:	typically ±50 ppm, ±3 % of the measured value at +25 °C
AIR QUALITY (VOC)	(optional)
Sensor:	digital metal oxide (MOX) based VOC sensor
Measuring range:	0...100 % (corresponds to 0...30 000 ppb ethanol equiv.)
Accuracy:	< ± 15 %
Service life:	> 10 years (if used as intended, depending on type and duration of VOC exposure)

Standard design
with display and touch keys
e.g. **type 1201-LB**

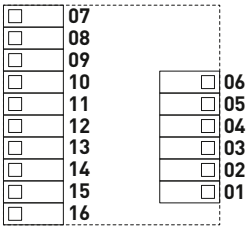


Optional design
with LEDs and touch keys
(on request)
e.g. **type 1201-LB-LED**



Connection diagram
Pin 01-16

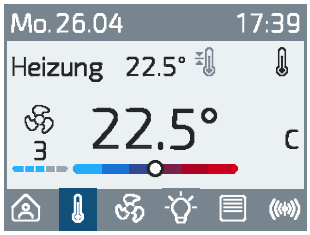
RYMASKON 1000
Interface Modbus

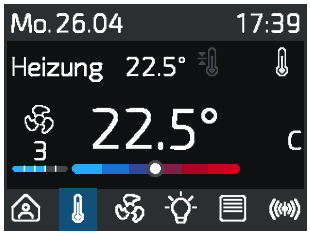


01 free
02 free
03 **DI2** (potential-free)
04 GND
05 **NTC10K** (**DI1**, potential-free)
06 GND (NTC10K)

07 24V AC/DC
08 GND
09 Shielding
10 Modbus A
11 Modbus B
12 Modbus B
13 Modbus A
14 Shielding
15 GND
16 24V AC/DC

Display symbols





Modbus

NEW

S+S REGELTECHNIK

Interface for control of temperature, fan, light and sun protection
Room control panel with colour TFT display,
with Modbus connection or with active outputs

Basic models
(see type table)
Iduna 1

Type 1101



Type 1102



Type 1201

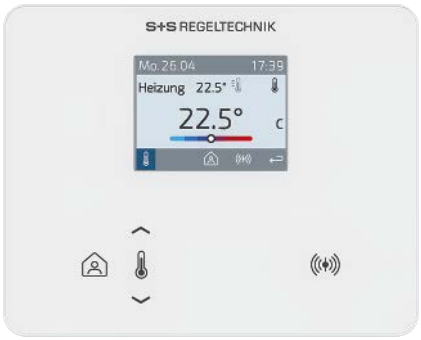


Type 1202



Basic models
(see type table)
Iduna 3

Type 1301



Type 1302



Type 1401



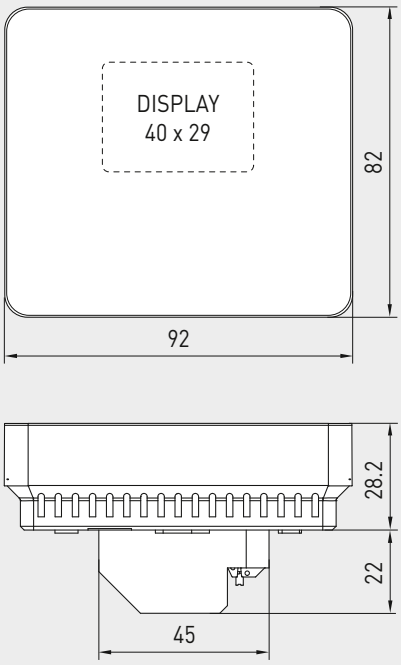
Type 1402



Interface for control of temperature, fan, light and sun protection
Room control panel with colour TFT display,
with Modbus connection or with active outputs

Dimensional drawing
Iduna 1
[mm]

RYMASKON® **11xx**
RYMASKON® **12xx**



Optional designs
with 2 keys – sun protection
Type 1201-BB

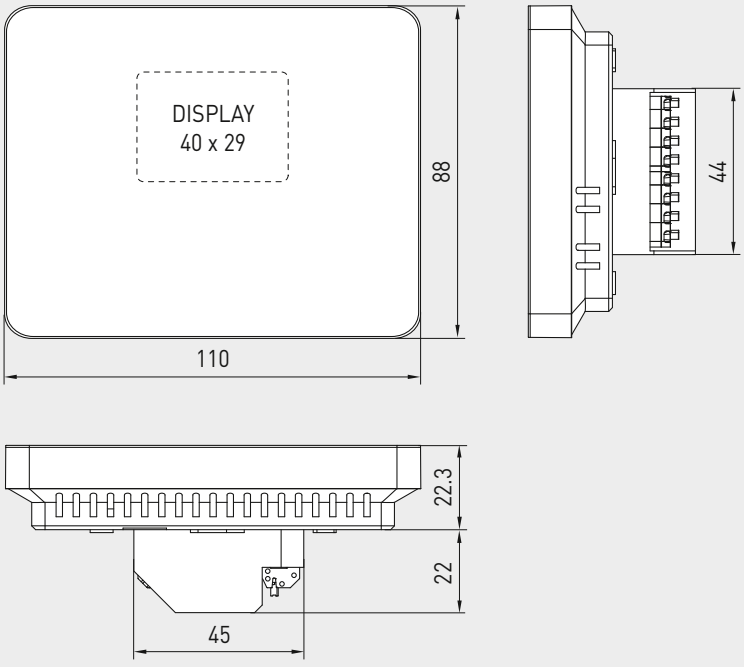


Type 1201-LED-BB



Dimensional drawing
Iduna 3
[mm]

RYMASKON® **13xx**
RYMASKON® **14xx**



Type 1401-BB



Type 1401-LED-BB



Modbus

NEW

S+S REGELTECHNIK

Interface for control of temperature, fan, light and sun protection
Room control panel with colour TFT display,
with Modbus connection or with active outputs

RYMASKON® 1000 Interface (series)
Number key for type versions

R Y M 1 - x 0 x x - x x 1 0 - 0 x x

Pos. 1-4 **Type name**

RYMASKON 1000	RYM1

Pos. 5 Housing | **setpoint adjustment**

Iduna 1 | Temperature	1
Iduna 1 | Temperature + fan	2
Iduna 3 | Temperature	3
Iduna 3 | Temperature + fan	4

Pos. 6 **Unit type**

Interface	0

Pos. 7 **Housing colour**

White	1
Black	2

Pos. 8 **Visual indication**

TFT display (2.0")	1
LEDs	2

Pos. 9 **Communication / output**

Modbus	M
active (0-10 V)	U

Pos. 10 **Sensors**

T [°C/°F]		1
T [°C/°F], **RH** [%]	*1	2
T [°C/°F], **CO2** [ppm]	*1	3
T [°C/°F], **VOC** [%]	*1	4
T [°C/°F], **CO2** [ppm], **VOC** [%]	*1	5
T [°C/°F], **RH** [%], **CO2** [ppm]	*1	6
T [°C/°F], **RH** [%], **VOC** [ppm]	*1	7
T [°C/°F], **RH** [%], **CO2** [ppm], **VOC** [%]	*2	8

Pos. 11 **Voltage supply**

24 V AC/DC	1

Pos. 14-15 **Touch key extension** *3

Basic model (cf. **Pos. 5**) including room occupancy	00
+ **B** (1 sun protection)	01
+ **BB** (2 sun protection)	02
+ **L** (1 light)	03
+ **LL** (2 light)	04
+ **LB** (1 light, 1 sun protection)	05

*1 With active units (0-10 V)
2 or 3 sensors available upon request

*2 4 sensors only with bus units

*3 Sun protection adjustment (**B**) and light (**L**) only via bus

Sensors
T Temperature [°C/°F]
RH Relative humidity [%]
CO2 Carbon dioxide [ppm]
VOC Air quality [%]

S+S REGELTECHNIK

NEW

Interface for control of temperature, fan, light and sun protection
Room control panel with colour TFT display,
with Modbus connection or with active outputs

KEY FEATURES

Basic models (see type table)

- 24 V AC/DC voltage supply
- **Modbus** connection
  (active outputs available upon request)
- 2.0" TFT **display** (320 x 240 x 3 RGB pixels),
  with LED backlighting, high contrast, 85° viewing angle,
  (LED display available upon request)
- Capacitive **touch keys**
  (optional extension to max. 10 keys,
  adjusting wheels available upon request)
- optional **housing** Iduna 1 (92 x 82 mm) and
  Iduna 3 (110 x 88 mm), white and black colours,
  for wall-mounting on in-wall flush boxes (on-wall available as an option),
  quick and easy installation via push-in terminals
- Integrated temperature and humidity sensor (basic equipment)
  (CO2 and VOC sensors available as an option)
- **Regulation** of heating, cooling, fan
  via Modbus
- **Control** of temperature, fan
  (sun protection and light with dimming function available as an option)
- Power-saving and environmentally friendly thanks to **features**
  such as automatic brightness adjustment, stand-by, wake-up, etc.

Type 1101



Type 1402



RYMASKON® **1000**	**Interface** (basic model) Room control units for temperature adjustment						
Type / WG02	**Communi-cation**	**Measuring element**	**Control system**	**Colour / Housing**	**Display**	**Item no.**	**Price**
RYMASKON® **110x**				**Iduna 1**			
RYM 1101-RH-MOD	Modbus	**T** | **RH**	**T** | – | **R**	white	■	RYM1-1011-M210-000	**199,50 €**
RYM 1102-RH-MOD	Modbus	**T** | **RH**	**T** | – | **R**	black	■	RYM1-1021-M210-000	**199,50 €**
RYMASKON® **130x**				**Iduna 3**			
RYM 1301-RH-MOD	Modbus	**T** | **RH**	**T** | – | **R**	white	■	RYM1-3011-M210-000	**199,50 €**
RYM 1302-RH-MOD	Modbus	**T** | **RH**	**T** | – | **R**	black	■	RYM1-3021-M210-000	**199,50 €**

RYMASKON® **1000**	**Interface** (basic models) Room control units for temperature and fan adjustment						
Type / WG02	**Communi-cation**	**Measuring element**	**Control system**	**Colour / Housing**	**Display**	**Item no.**	**Price**
RYMASKON® **120x**				**Iduna 1**			
RYM 1201-RH-MOD	Modbus	**T** | **RH**	**T** | **F** | **R**	white	■	RYM1-2011-M210-000	**199,50 €**
RYM 1202-RH-MOD	Modbus	**T** | **RH**	**T** | **F** | **R**	black	■	RYM1-2021-M210-000	**199,50 €**
RYMASKON® **140x**				**Iduna 3**			
RYM 1401-RH-MOD	Modbus	**T** | **RH**	**T** | **F** | **R**	white	■	RYM1-4011-M210-000	**199,50 €**
RYM 1402-RH-MOD	Modbus	**T** | **RH**	**T** | **F** | **R**	black	■	RYM1-4021-M210-000	**199,50 €**
Measuring element / control system:	**T** = Temperature sensor (basic equipment) **RH** = Humidity sensor		**T** = Temperature **F** = Fan **R** = Room occupancy				

OPTIONS			
Measuring elements:	**CO2** = CO2 sensor	Extra charge	**120,00 €**
	VOC = VOC sensor	Extra charge	**117,00 €**
Control:	**B** / **L** Keys for sun protection and/or light (cf. **Pos. 14-15**)	on request	
Communication:	without Modbus	on request	
Optional:	**More type versions available upon request!** For configuration options, see number key (left)		

NEW

S+S REGELTECHNIK

Controller for control of temperature, fan, light and sun protection
Room controller with colour TFT display,
with Modbus connection or with active outputs

The room control units of the **RYM**ASKON® **1000** / **2000** / **3000** series are designed for control (up to 5 climate zones) in residential, hotel and office rooms and individually regulate the heating, cooling and fan levels of the internal rooms. The controller variants can be operated as stand-alone units thanks to the integrated control functions PI, PWM or 2-/3-point control. The product family is characterised by its elegant design, intuitive operation and the many possible combinations of the individual components.

The room control units **RYM**ASKON® **1000 C** (controller) are used to control and regulate heating convectors and fan coils. Depending on the type variant, the units are available with analogue outputs (0-10 V) and with 2-point control or 3-point control, for controlling heating valves, cooling valves, 6-way valves, staged fans or EC fans.
The change-over function can be used to operate 2-pipe and 4-pipe systems. The Modbus communication interface enables the climate parameters on the controller to be changed and monitored via the BMS at any time. In addition, the sun protection (Venetian blinds, shutters) and light functions can be controlled via the bus. Visual indication takes place on a 2" TFT **display**, operation is via capacitive **touch keys**.

In addition to the integrated temperature and humidity sensor, **sensors** for CO2 and VOC are available as an option. An input for a passive temperature sensor (NTC10K) and an input for a potential-free contact are additionally available. This allows a window contact or a condensation control switch to be connected, for example.
This provides all options for air-conditioning of the rooms according to individual requirements.

All unit types are available in the contemporary **housing** Iduna 3 (110 x 88 mm) in white or black colour.
Wall-mounting is performed on standard in-wall flush boxes.

TECHNICAL DATA

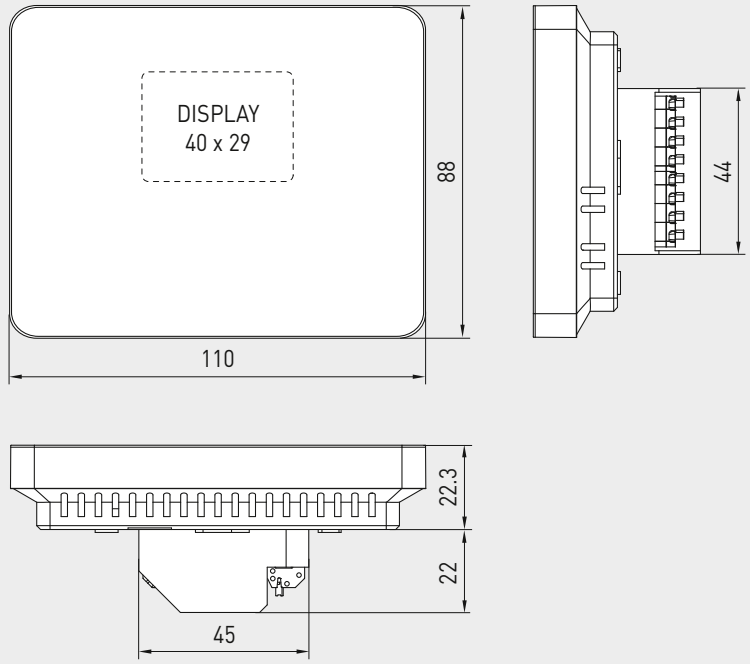
Unit type:	Room controller for heating convectors or fan coils
Functions:	Temperature, fan, sun protection and light (see type table)
System of units:	SI (default) or imperial (can be changed via Modbus)
Data points:	Temperature [°C] [°F], relative humidity [% RH], air quality (VOC) [%] [pbb], carbon dioxide (CO2) [ppm], setpoint (temperature, fan, presence)
Power consumption:	typically < 3 W at 24 V DC; typically < 4.5 VA at 24 V AC
Voltage supply:	24 V AC/DC (± 10 %)
Communication:	**Modbus RTU** Slave, address range 1...247, RS 485 interface, max. 63 units, 9600 / 19200 / 38400 / 57500 Baud, 8N1, even / odd parity, 1 / 2 stop bits
Display:	**TFT display**, 2" (41 x 30 mm), 320 x 240 x 3 pixels (RGB), LED backlighting, viewing angle ± 85° (can be parametrised via the menu on the display or via the bus)
Operating elements:	**Capacitive keys** (up to 10 keys, depending on type) for setting the target temperature, fan stages, presence message, sensor values, and for operating sun protection and light (with adjusting wheels on request)
Inputs:	1 Input **NTC10K** (can be configured as a digital input **DI 1**, potential-free) 1 Digital input **DI 2** for potential-free switches or for potential-loaded switch (230 V AC relay variant)
Outputs:	Analogue outputs **AO** (0-10 V DC, max. 5 mA) and/or relay outputs **RO** (230 V AC, max. 500 mA, cos φ = 1.0) for heating/cooling, 6-way-valves, fan, number depends on controller type (see connection diagrams)
Electrical connection:	0.2 - 1.5 mm², using push-in terminals
Housing:	Plastic, ABS material, colour white or black
Housing dimensions:	110 x 88 x 22 mm (Iduna 3) + 22 mm (in-wall flush box)
Mounting:	Wall-mounting on in-wall flush box, Ø 55 mm, (on-wall installation available upon request)
Ambient temperature:	0...+50 °C (operation); –30...+70 °C (storage)
Permitted humidity:	0...90 % RH (non-precipitating air)
Protection type:	IP 30 (according to EN 60 529)
Standards:	CE conformity, 2014/30/EU EMC Directive (EN 60730-1/2, EN 61000-6-1/3), 2001/95/EG Product safety (EN 60730-1), 2014/35/EU Low-Voltage Directive (EN 60730-1/2)

Continued on next page!

Controller for control of temperature, fan, light and sun protection
Room controller with colour TFT display,
with Modbus connection or with active outputs

Dimensional drawing
Iduna 3
[mm]

RYMASKON® **13xx**
RYMASKON® **14xx**



Standard design with
display and touch keys
e.g. **type 14x1-LB**



e.g. **type 14x1-BB**



TECHNICAL DATA	(continuation)
TEMPERATURE	(basic equipment)
Sensor:	digital temperature sensor, low hysteresis, high long-term stability
Measuring range:	0...+50 °C / +32...+122 °F
Accuracy:	typically ± 0.5 K at +25 °C
HUMIDITY	(basic equipment)
Sensor:	digital humidity sensor, low hysteresis, high long-term stability
Measuring range:	0...100 % RH
Accuracy:	typically ± 2.0 % (20...80 % RH) at +25 °C, otherwise ± 3.0 %
CARBON DIOXIDE (CO2)	(optional)
Sensor:	digital photoacoustic NDIR-CO2 sensor (non-dispersive infra-red technology), with automatic calibration and high long-term stability
Measuring range:	0...2000 ppm
Accuracy:	typically ±50 ppm, ±3 % of the measured value at +25 °C
AIR QUALITY (VOC)	(optional)
Sensor:	digital metal oxide (MOX) based VOC sensor
Measuring range:	0...100 % (corresponds to 0...30 000 ppb ethanol equiv.)
Accuracy:	< ± 15 %
Service life:	> 10 years (if used as intended, depending on type and duration of VOC exposure)

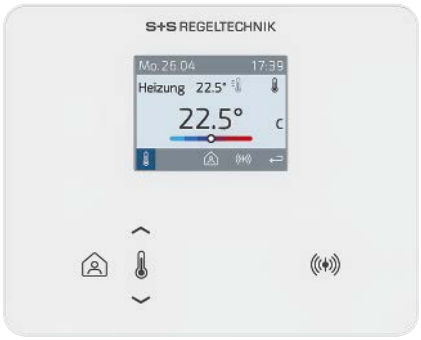
Controller for control of temperature, fan, light and sun protection
Room controller with colour TFT display,
with Modbus connection or with active outputs

NEW

S+S REGELTECHNIK

Basic models
(see type table)
Iduna 3

Type 1311 / 1321



Type 1312 / 1322



Type 1431 / 1441 / 1451



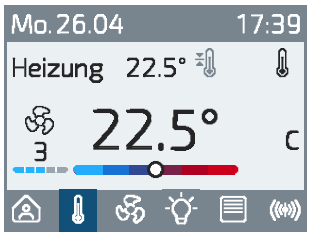
Type 1432 / 1442 / 1452

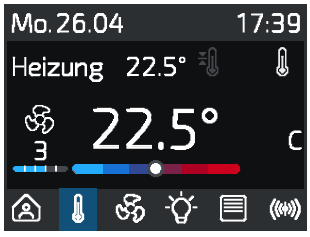


KEY FEATURES

Basic models
(see type table)

- 24 V AC/DC voltage supply
- **Modbus** connection
  (active outputs available upon request)
- 2.0" TFT **display** (320 x 240 x 3 RGB pixels),
  with LED backlighting, high contrast, 85° viewing angle
  (LED display available upon request)
- Capacitive **touch keys**
  (optional extension to max. 10 keys)
- **Housing** Iduna 3 (110 x 88 mm), white and black colours,
  for wall-mounting on in-wall flush boxes (on-wall available as an option),
  quick and easy installation via push-in terminals
- Integrated temperature and humidity sensor (basic equipment)
  (CO2 and VOC sensors available as an option)
- **Control** of heating, cooling, 6-way valve, fan
- **Control** of temperature, fan
  (sun protection and light with dimming function available as an option)
- Power-saving and environmentally friendly thanks to **features**
  such as automatic brightness adjustment, stand-by, wake-up, etc.





Display symbols

Controller for control of temperature, fan, light and sun protection
Room controller with colour TFT display,
with Modbus connection or with active outputs

Type 132x C

3 AO (h, c, 6W)

01	24V AC/DC Supply
02	GND
03	Modbus A
04	Modbus B
05	**NTC10K** (**DI1**, Potential-free)
06	GND (NTC10K)
07	**AO1** (0-10V) 6-way-valves
08	**AO2** (0-10V) cooling
09	**AO3** (0-10V) heating
10	GND
11	GND
12	GND
13	free
14	free
15	**DI2** (Potential-free)
16	GND

Type 131x C

2 RO (h, c) + 1 AO (6W)

01	24V AC/DC Supply
02	GND
03	Modbus A
04	Modbus B
05	**NTC10K** (**DI1**, Potential-free)
06	GND (NTC10K)
07	**DI2** (230V AC, L-Input)
08	230V AC (N, Relay)
09	230V AC (L, Relay)
10	**RO1** Relay cooling
11	**RO2** Relay heating
12	free
13	GND
14	**AO1** (0-10V) 6-way-valves

Type 143x C

3 AO (h, c, 6W, f)

01	24V AC/DC Supply
02	GND
03	Modbus A
04	Modbus B
05	**NTC10K** (**DI1**, Potential-free)
06	GND (NTC10K)
07	**AO1** (0-10V) **Fan**
08	**AO2** (0-10V) cooling, 6-way-valves
09	**AO3** (0-10V) heating, 6-way-valves
10	GND
11	GND
12	GND
13	free
14	free
15	**DI2** (Potential-free)
16	GND

Type 144x C

5 RO (h, c, f)

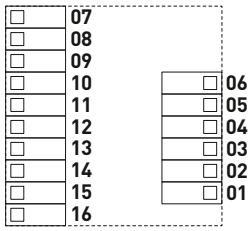
01	24V AC/DC Supply
02	GND
03	Modbus A
04	Modbus B
05	**NTC10K** (**DI1**, Potential-free)
06	GND (NTC10K)
07	**DI2** (230V AC, L-Input)
08	230V AC (N, Relay)
09	230V AC (L, Relay)
10	**RO1** Relay cooling
11	**RO2** Relay heating
12	**RO3** Relay **Fan stages 1**
13	**RO4** Relay **Fan stages 2**
14	**RO5** Relay **Fan stages 3**

Type 145x C

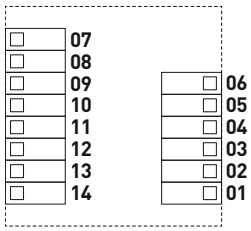
2 RO (h, c) + 1 AO (f)

01	24V AC/DC Supply
02	GND
03	Modbus A
04	Modbus B
05	**NTC10K** (**DI1**, Potential-free)
06	GND (NTC10K)
07	**DI2** (230V AC, L-Input)
08	230V AC (N, Relay)
09	230V AC (L, Relay)
10	**RO1** Relay cooling
11	**RO2** Relay heating
12	free
13	GND
14	**AO1** (0-10V) **Fan**

Connection diagram **Pin 01-16**



Connection diagram **Pin 01-14**



NEW

S+S REGELTECHNIK

Controller for control of temperature, fan, light and sun protection
Room controller with colour TFT display,
with Modbus connection or with active outputs

RYMASKON® 1000 C Controller (series)
Number key for type versions

R	Y	M	1	-	x	x	x	1	-	x	x	1	0	-	0	x	x

Pos. 1-4 **Type name**

RYMASKON 1000 C	RYM1

Pos. 5-6 **Controller type**

Setpoint adjustment | outputs

	Temperature	
[1]	2 **RO** (h, c) + 1 **AO** (6W)	31
[2]	3 **AO** (h, c, 6W)	32
	Temperature + fan	
[3]	2 **AO** (h, c, 6W) + 1 **AO** (f)	43
[4]	2 **RO** (h, c) + 3 **RO** (f)	44
[5]	2 **RO** (h, c) + 1 **AO** (f)	45

Pos. 7 **Housing colour**

White	1
Black	2

Pos. 8 **Visual indication**

TFT display (2.0")	1

Pos. 9 **Communication**

Modbus	M
without	0

Pos. 10 **Sensors** *1

T [°C/°F]	1
T [°C/°F], **RH** [%]	2
T [°C/°F], **CO2** [ppm]	3
T [°C/°F], **VOC** [%]	4
T [°C/°F], **CO2** [ppm], **VOC** [%]	5
T [°C/°F], **RH** [%], **CO2** [ppm]	6
T [°C/°F], **RH** [%], **VOC** [ppm]	7
T [°C/°F], **RH** [%], **CO2** [ppm], **VOC** [%]	8

Pos. 11 **Voltage supply**

24 V AC/DC	1

Pos. 14-15 **Touch key extension** *2

Basic model (cf. **Pos. 5**) including room occupancy	00
+ **B** (1 sun protection)	01
+ **BB** (2 sun protection)	02
+ **L** (1 light)	03
+ **LL** (2 light)	04
+ **LB** (1 light, 1 sun protection)	05

*1 With units without bus (cf. **Pos. 9**) no output, display only

*2 Adjustment of sun protection (**B**) and light (**L**) only via bus

Outputs

AO	Analogue (0-10 V DC)
RO	Relay (230 V AC)
(h)	Heating
(c)	Cooling
(f)	Fan
(6 W)	6-way valve

Sensors

T	Temperature [°C/°F]
RH	Relative humidity [%]
CO2	Carbon dioxide [ppm]
VOC	Air quality [%]

Controller for control of temperature, fan, light and sun protection
Room controller with colour TFT display,
with Modbus connection or with active outputs

Type 1311 / 1321



Type 1431 / 1441 / 1451



RYMASKON® 1000 C	**Controller** (basic model) for heating convectors (**HC**) for temperature adjustment						
Type / WG02 Control outputs	**Communi-cation**	**Measuring element**	**Control system**	**Colour / Housing**	**Display**	**Item no.**	**Price**
[1] 2 RO (heating, cooling, 230 V AC, max. 500 mA) + 1 AO (6-way valve, 0-10 V DC, max. 5 mA)							
RYMASKON® 131x C				**Iduna 3**			
RYM 1311C-RH-MOD	Modbus	**T** I **RH**	**T** I – I **R**	white	■	RYM1-3111-M210-000	**213,50 €**
RYM 1312C-RH-MOD	Modbus	**T** I **RH**	**T** I – I **R**	black	■	RYM1-3121-M210-000	**213,50 €**
[2] 3 AO (heating, cooling, 6-way valve, 0-10 V DC, max. 5 mA)							
RYMASKON® 132x C				**Iduna 3**			
RYM 1321C-RH-MOD	Modbus	**T** I **RH**	**T** I – I **R**	white	■	RYM1-3211-M210-000	**213,50 €**
RYM 1322C-RH-MOD	Modbus	**T** I **RH**	**T** I – I **R**	black	■	RYM1-3221-M210-000	**213,50 €**

RYMASKON® 1000 C	**Controller** (basic models) for **FAN COILS** for temperature and fan adjustment						
Type / WG02 Control outputs	**Communi-cation**	**Measuring element**	**Control system**	**Colour / Housing**	**Display**	**Item no.**	**Price**
[3] 3 AO (heating, cooling, 6-way valve, EC fan, 0-10 V DC, max. 5 mA)							
RYMASKON® 143x C				**Iduna 3**			
RYM 1431C-RH-MOD	Modbus	**T** I **RH**	**T** I **F** I **R**	white	■	RYM1-4311-M210-000	**213,50 €**
RYM 1432C-RH-MOD	Modbus	**T** I **RH**	**T** I **F** I **R**	black	■	RYM1-4321-M210-000	**213,50 €**
[4] 5 RO (heating, cooling, 3-stage fan, 230 V AC, max. 500 mA)							
RYMASKON® 144x C				**Iduna 3**			
RYM 1441C-RH-MOD	Modbus	**T** I **RH**	**T** I **F** I **R**	white	■	RYM1-4411-M210-000	**213,50 €**
RYM 1442C-RH-MOD	Modbus	**T** I **RH**	**T** I **F** I **R**	black	■	RYM1-4421-M210-000	**213,50 €**
[5] 2 RO (heating, cooling, 230 V AC, max. 500 mA) + 1 AO (EC fan, 0-10 V DC, max. 5 mA)							
RYMASKON® 145x C				**Iduna 3**			
RYM 1451C-RH-MOD	Modbus	**T** I **RH**	**T** I **F** I **R**	white	■	RYM1-4511-M210-000	**213,50 €**
RYM 1452C-RH-MOD	Modbus	**T** I **RH**	**T** I **F** I **R**	black	■	RYM1-4521-M210-000	**213,50 €**
Measuring element / control system:	**T** = Temperature sensor (basic equipment) **RH** = Humidity sensor		**T** = Temperature **F** = Fan **R** = Room occupancy				

OPTIONS			
Measuring elements:	**CO2** = CO2 sensor	Extra charge	**120,00 €**
	VOC = VOC sensor	Extra charge	**117,00 €**
Control:	**B / L** Keys for sun protection and/or light (cf. **Pos. 14-15**)	on request	
Communication:	without Modbus	on request	
Optional:	**More type versions available upon request!** For configuration options, see number key (left)		

RYMASKON® 700 Interface

**Interface for controlling temperature,
fan, light, air conditioning (1 zone) and sun protection (2 zones),
room control unit with colour touch display,
with Modbus or BACnet connection**

S+S REGELTECHNIK

The **RYM**ASKON® **500** / **600** / **700** series of room control units are designed for controlling the climatic zone in residential, hotel and office rooms and individually regulate the heating/cooling steps of the internal rooms. A colour touch display with modern icons is used for the visual display and operation at the location. The product range is characterised by the variety of combination options of the individual components.

The **RYM**ASKON® **700 Interface** series controls via the bus **heating or cooling valves, fan speed** and the **sun protection** (blinds, shutters) in two zones. Through the appropriate symbols, it is possible to control the light and air conditioning instead of the sun protection. In addition to the integrated temperature sensor, two external temperature sensors (NTC10K) can also be connected. Measuring elements for relative humidity and CO2 are also available. The devices are used in room climate technology, including convector fans, cooling ceilings and heating/cooling systems. Wall mounting is performed on standard in-wall flush boxes. The devices are optionally available with a Modbus or BACnet communication interface and in various type versions (see number key).

The basic model **RYM**ASKON® **710 Interface** with colour touch display (3.5"), in a white housing, possesses an integrated temperature and humidity sensor (CO2 sensor optional), 2 resistance inputs (NTC10K) for external sensors, 1 digital input, 1 relay output (7 A / 0.5 A with CO2) and optionally with Modbus or BACnet connection. The room control units are used for controlling temperature, fans and sun protection (2 zones) via the bus.

TECHNICAL DATA	(Basic model)
Device type:	room control unit
Functions:	temperature, fan, light, air conditioning (1 zone), and sun protection (2 zones)
Communication:	**Modbus RTU Slave** address range can be configured between 1...247 **or** **BACnet MS/TP** device ID 65100 (default) and MAC address can be configured between 1...127 RS 485 interface, max. 63 devices, 9600 / 19200 / 38400 / 57500 / 76800 Baud, none / even / odd parity, 1 / 2 stop bits
Voltage supply:	24 V AC/DC (± 15%)
Power consumption:	max. 1.92 W
Inputs:	2 resistance inputs (NTC10K) for external temperature sensors 1 digital input (potential-free), impedance <1 kOhm
Outputs:	1 relay output (2-point regulation) without CO2: 7 A (resistive load); 1.3 A (inductive load) with CO2: 0.5 A (resistive/inductive load)
Operating mode:	Comfort, ECO, OFF, Boost
Control element:	**3.5" touch display** with backlighting, cut-out approx. 50 x 75 mm, resolution 320 x 480 pixels, 255,000 colours
TEMPERATURE	
Sensor:	integrated temperature sensor
Measuring range:	–40...+125 °C
Accuracy:	typically ±0.5 °C at +25 °C
HUMIDITY	
Sensor:	integrated humidity sensor
Measuring range:	0...100 % RH
Accuracy:	typically ±2 % RH (20...80 % RH) at +25 °C
CARBON DIOXIDE (CO2)	
Sensor:	optical NDIR sensor (non-dispersive infrared technology), with automatic calibration
Measuring range:	0...5000 ppm
Accuracy:	typically ±50 ppm ±3 % of the measured value at +25 °C
Electrical connection:	0.14 - 1.5 mm², via screw terminals≠
Housing:	plastic, polycarbonate material, self-extinguishing, white colour (optionally black or chrome), weight approx. 220 g
Housing dimensions:	approx. 88 x 112 x 14.5 mm (on-wall) approx. 88 x 112 x 20.5 mm (on-wall with CO2 sensor) approx. 52 x 53 x 28.5 mm (in-wall)
Mounting:	wall-mounting on in-wall flush box, Ø 55 mm
Ambient temperature:	0...+50 °C (operation); –30...+70 °C (storage)
Permitted humidity:	0...95 % RH, (non-precipitating air)
Protection type:	**IP 20** (according to EN 60 529)
Standards:	CE conformity, according to EMC directive 2004/108/EU, Low-Voltage directive 2006/95/EU, according to EN 61000-6-1/3, EN 60730-1, EN 6100-4-2/4/5/11
ACCESSORIES	see table

RYMASKON® **700**
Sensors



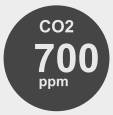
Room temperature
[°C / °F]



External temperature
[°C / °F]



Relative humidity
[%RH]



CO2 content
[ppm]
optional

RYMASKON® **700**
Functions



Fan
(blower speeds,
Automatic/Manual)



Sun protection
(max. 2 zones)



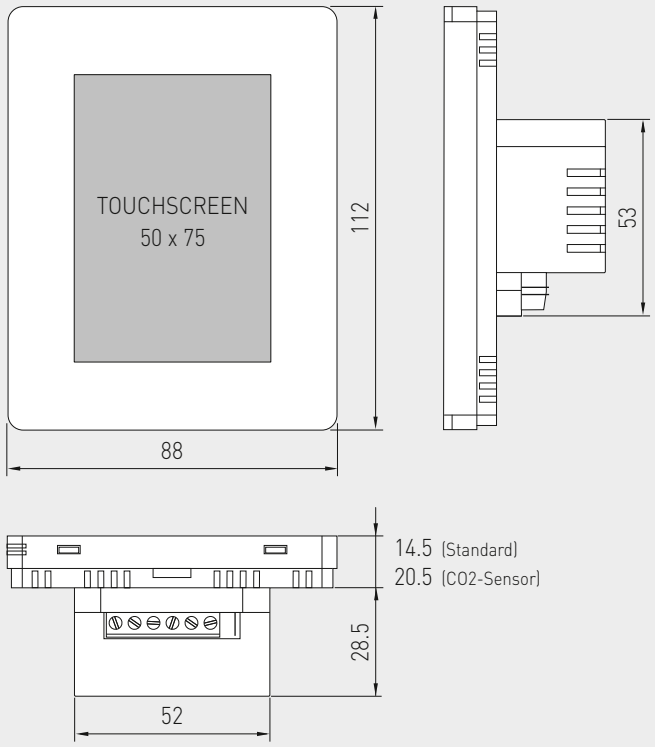
Light
(1 zone)



Air Conditioning
(1 zone)

Interface for controlling temperature, fan, light, air conditioning (1 zone) and sun protection (2 zones), room control unit with colour touch display, with Modbus or BACnet connection

Dimensional drawing — **RYMASKON® 700**



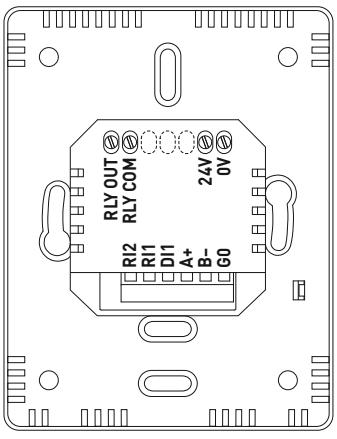
RYMASKON® 700
On-wall 14.5 mm



RYMASKON® 700
with CO2 sensor
On-wall 20.5 mm



Connecting diagram
Basic model — **RYMASKON® 710**



RYMASKON 710

RLY OUT	30V DC Rated Relay Output
COM	Relay Common Terminal
24V	24V AC/DC Supply
0V	0V Supply
	Inputs NTC10K Temperature Sensor
RI1	Input 1 (External Sensor)
RI2	Input 2 (External Sensor)
DI1	Digital Input (Potential-free)
	Modbus / BACnet MS/TP
A+	RS485 A+
B-	RS485 B-
G0	GND

RYMASKON® 700 Interface

**Interface for controlling temperature,
fan, light, air conditioning (1 zone) and sun protection (2 zones),
room control unit with colour touch display,
with Modbus or BACnet connection**

S+S REGELTECHNIK

RYMASKON® 700 Interface (series)
Number key for type versions

RYM7-10Ix-xx0x-000

Pos. 1–4 **Type name**
RYMASKON 700 — RYM7

Pos. 5 **Channel configuration**
Type 710 — **2RI**, **1DI**, **1RO** 7 A / 0.5 A with CO2 — 1

Pos. 7 **Device type**
Interface — I

Pos. 8 **Communication**
Modbus — M
BACnet — B

Pos. 9 **Voltage supply**
12 V DC — 1
24 V AC/DC — 2

Pos. 10 **Additional measuring elements**
without * — 0
RH (rel. humidity) — 1
CO2 (carbon dioxide) — 2
RH + **CO2** — 3

Pos. 11 **Extra options**
without — 0

Pos. 12 **Housing colour**
black — 1
white — 2
chrome — 3

Pos. 5
RI Resistance input (NTC10K) for external temperature sensors
DI Digital input (potential-free)
RO Relay output (7 A), (2-point regulation)

Pos. 10 * The **temperature sensor** forms part of the basic equipment and is included in the option "without" additional measuring elements.

Type 710 **Basic model** (see table on the right) available from stock –
Freely configurable type versions available upon request!

RYMASKON® (basic model) Comparison table		Type 510 Thermostat	Type 610 Controller	Type 710 Interface
Outputs	Relay output for heating / cooling	**1**	–	Bus
	Analogue output (0–10 V) Heating / cooling 6-way valves, fans	–	**3**	Bus
Function	Sun protection (max. 2 zones)	●	● ●	● ●
	Light / room lighting (1 zone)	–	●	●
	Air Conditioning (1 zone)	●	–	●
Sensors	Temperature (°C)	●	●	●
	Humidity (% RH)	●	●	●
	CO2 (ppm)	–	○	○
Inputs	Digital input	**1**	**1**	**1**
	Analogue input (0–10 V)	–	**2**	–
	Resistance input (NTC10K)	**2**	–	**2**
				○ = optional

Interface for controlling temperature, fan, light, air conditioning (1 zone) and sun protection (2 zones), room control unit with colour touch display, with Modbus or BACnet connection

KEY FEATURES

Basic model type 710

- 24 V AC/DC voltage supply
- 3.5 inch touch display with backlighting
- Modbus or BACnet
- Wall mounting on standard in-wall flush boxes
- Integrated temperature sensor (basic equipment)
- Integrated humidity sensor
- Integrated CO2 sensor (optional)
- Regulation of heating, cooling, fans via the bus
- Operation of temperature, fan, light, air conditioning (1 zone) and sun protection (2 zones) via touch display
- 2 resistance inputs (NTC10K) for external temperature sensors
- 1 relay output (7A / 0.5A with CO2) as 2-point regulator (potential-free) controllable via bus
- 1 digital input (potential-free)
- Operating modes Comfort (Normal), OFF, Party (Boost), ECO, Frost Protection

RYMASKON® 700
Home Screen



RYMASKON® 710	Interface (basic model), room control unit with touch display						
Type / WG02	**Communi-cation**	**Measuring element**	**Control system**	**Colour Display**		**Item No.**	**Price**
RYMASKON® 710-Modbus							
Rymaskon 712-MOD-RH	Modbus	**T** | **RH**	**T** | **V** | **2S** | **L** | **K**	white	■	RYM7-10IM-2102-000	**355,99 €**
Rymaskon 712-MOD-RH-CO2	Modbus	**T** | **RH** | **CO2**	**T** | **V** | **2S** | **L** | **K**	white	■	RYM7-10IM-2302-000	**537,42 €**
RYMASKON® 710-BACnet							
Rymaskon 712-BAC-RH	BACnet	**T** | **RH**	**T** | **V** | **2S** | **L** | **K**	white	■	RYM7-10IB-2102-000	**355,99 €**
Rymaskon 712-BAC-RH-CO2	BACnet	**T** | **RH** | **CO2**	**T** | **V** | **2S** | **L** | **K**	white	■	RYM7-10IB-2302-000	**537,42 €**
Measuring element / control system:	**T** = Temperature sensor (basic equipment) **RH** = Humidity sensor **CO2** = Carbon dioxide sensor		**T** = Temperature **V** = Fan **S** = Sun protection (2 zones) **L** = Light **K** = Air Conditioning (AC)				
Channel configuration:	**2RI** 2 Resistance inputs (NTC10K) for external temperature sensors **1DI** 1 digital input (potential-free) **1RO** 1 Relay output (7 A), (2-point regulation)						
Optional:	**More type versions available upon request!** For configuration options, see number key (left).						
ACCESSORIES							
RYMASKON® USB Configuration Tool							
RYMASKON USB_CT	For quick transfer of the device configuration from the PC to all devices in the building					1901-51Z3-0002-000	**153,60 €**

RYMASKON® 600 Controller

Controller for controlling and regulating temperature, fan, light (1 zone) and blind (2 zones), room control unit with colour touch display, with Modbus or BACnet connection

S+S REGELTECHNIK

The **RYM**ASKON® **500** / **600** / **700** series of room control units are designed for controlling the climatic zone in residential, hotel and office rooms and individually regulate the heating/cooling steps of the internal rooms. A colour touch display with modern icons is used for the visual display and operation at the location. The product range is characterised by the variety of combination options of the individual components.

The **RYM**ASKON® **600 Controller** series regulates through analogue outputs (0...10 V) up to two **heating or cooling valves** (6-way valves can also be controlled) and the **fan** (EC fan).
The **sun protection** (blinds, shutters) can be controlled in two zones via the bus.
Through the appropriate symbols, it is possible to control the **light** instead of the sun protection.
In addition to the integrated temperature sensor, two external temperature sensors (NTC10K) or two analogue sensors (0...10 V) can also be connected. Measuring elements for relative humidity and CO2 are also available. The devices are used in room climate technology, including convector fans, cooling ceilings and heating / cooling systems. Wall mounting is performed on standard in-wall flush boxes.
The devices are optionally available with a Modbus or BACnet communication interface and in various type versions (see number key).

The basic model **RYM**ASKON® **610 Controller** with colour touch display (3.5"), in a white housing, possesses an integrated temperature and humidity sensor (CO2 sensor optional), 2 analogue inputs for external sensors (0...10 V), 1 digital input, 3 analogue outputs (0...10 V), and optionally with Modbus or BACnet connection. The room control units are used for controlling temperature, fan, light (1 zone) and sun protection (2 zones) directly via the analogue outputs or via the bus.

TECHNICAL DATA	(Basic model)
Device type:	room control unit with controller
Functions:	temperature, fan, light (1 zone), and sun protection (2 zones)
Communication:	**Modbus RTU Slave** address range can be configured between 1...247 **or** **BACnet MS/TP** device ID 65100 (default) and MAC address can be configured between 1...127 RS 485 interface, max. 63 devices, 9600 / 19200 / 38400 / 57500 / 76800 Baud, none / even / odd parity, 1 / 2 stop bits
Power supply:	24 V AC/DC (± 15 %)
Power consumption:	max. 1.92 W
Inputs:	2 analogue inputs 0–10 V 1 digital input (potential-free), Impedance <1 kOhm
Outputs:	3 analogue outputs 0–10 V (heating, cooling, fan) input impedance > 100 kOhm
Operating mode:	Comfort, ECO, OFF, Boost, Frost Protection
Control element:	**3.5" touch display** with backlighting, cut-out approx. 50 x 75 mm, resolution 320 x 480 pixels, 255,000 colours
TEMPERATURE	
Sensor:	integrated temperature sensor
Measuring range:	–40...+125 °C
Accuracy:	typically ±0.5 °C at +25 °C
HUMIDITY	
Sensor:	integrated humidity sensor
Measuring range:	0...100 % RH
Accuracy:	typically ±2 % RH (20...80 % RH) at +25 °C
CARBON DIOXIDE (CO2)	
Sensor:	optical NDIR sensor (non-dispersive infrared technology), with automatic calibration
Measuring range:	0...5000 ppm
Accuracy:	typically ±50 ppm ±3 % of the measured value at +25 °C
Electrical connection:	0.14–1.5 mm², via screw terminals
Housing:	plastic, polycarbonate material, self-extinguishing, white colour (optionally black or chrome), weight approx. 220 g
Housing dimensions:	approx. 88 x 112 x 14.5 mm (on-wall) approx. 88 x 112 x 20.5 mm (on-wall with CO2 sensor) approx. 52 x 53 x 28.5 mm (in-wall)
Mounting:	wall mounting on in-wall flush box, Ø 55 mm
Ambient temperature:	0...+50 °C (operation); –30...+70 °C (storage)
Permitted humidity:	0...95 % RH, (non-precipitating air)
Protection type:	**IP 20** (according to EN 60 529)
Standards:	CE conformity, according to EMC directive 2004/108/EU, Low-Voltage directive 2006/95/EU, according to EN 61000-6-1/3, EN 60730-1, EN 6100-4-2/4/5/11
ACCESSORIES	see table

RYMASKON® **600**
Sensors



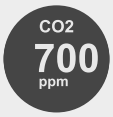
Room temperature
[°C / °F]



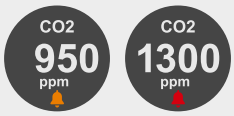
External temperature
[°C / °F]



Relative humidity
[%RH]



CO2 content
[ppm]
optional



Alarm levels 1/2
(incl. bell icon)
configurable

RYMASKON® **600**
Functions



Fan
(blower speeds,
Automatic/Manual)



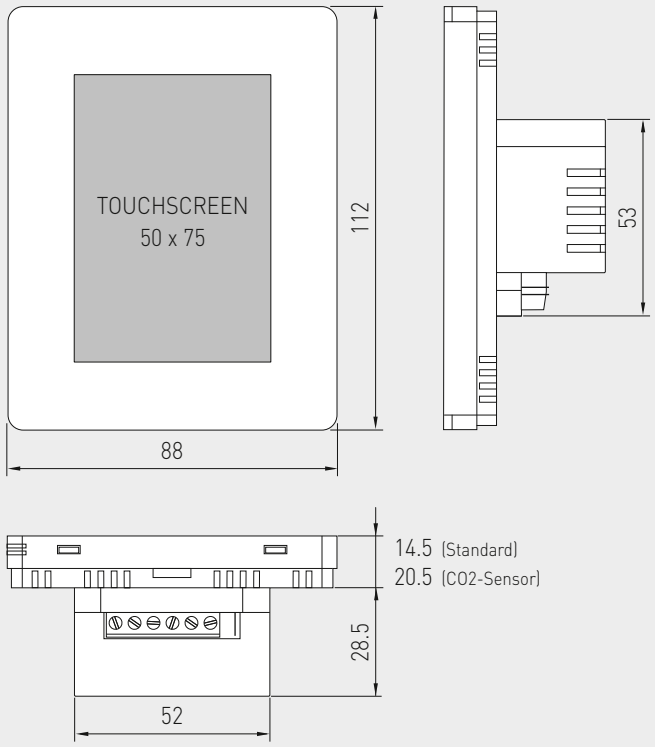
Sun protection
(max. 2 zones)



Light
(1 zone)

Controller for controlling and regulating temperature, fan, light (1 zone) and blind (2 zones), room control unit with colour touch display, with Modbus or BACnet connection

Dimensional drawing — **RYMASKON® 600**



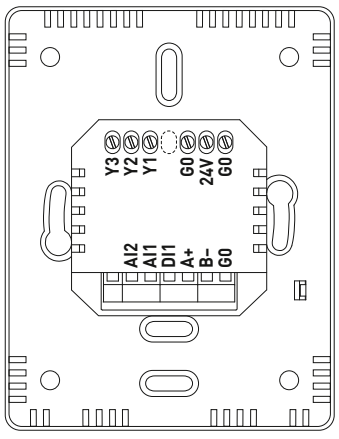
RYMASKON® 600
On-wall 14.5 mm



RYMASKON® 600
with CO2 sensor
On-wall 20.5 mm



Connecting diagram
Basic model — **RYMASKON® 610**



	RYMASKON 610
	0..10V DC Analogue Outputs
Y1	AO1 – default fan speed
Y2	AO2 – default heating stage 1
Y3	AO3 – default cooling stage 1
24V	24V AC/DC Supply
G0	GND
	0-10V Analogue Inputs
AI1	Analogue Input 1 (RI optional)
AI2	Analogue Input 2 (RI optional)
DI1	Digital Input (potential-free)
	Modbus / BACnet MS/TP
A+	RS485 A+
B–	RS485 B–

RYMASKON® 600 Controller

Controller for controlling and regulating temperature, fan, light (1 zone) and blind (2 zones), room control unit with colour touch display, with Modbus or BACnet connection

S+S REGELTECHNIK

RYMASKON® 600 Controller (series)
Number key for type versions

RYM6-x0Cx-2xxx-000

Pos. 1–4 **Type name**
- RYMASKON 600 — RYM6

Pos. 5 **Channel configuration**
- Type 610 — **2RI**, **1DI**, **3AO** (h,c,f) — 1
- Type 620 — **1RI**, **1DI**, **2AO** (h,c), **3RO** (f) 0.5 A — 2
- Type 630 — **1RI**, **1DI**, **2AO** (h,c), **3RO** (f) 7A — 3
- Type 640 — **2RI**, **1DI**, **1AO** (f), **2DO** (h, c, PMW) — 4
- Type 650 — **2RI**, **1DI**, **1AO** (EC-f), **4RO** (h,c,f) 0.5 A — 5
- Type 660 — **2RI**, **1DI**, **2DO** (h, c, PMW), **3RO** (f) 7 A — 6

Pos. 7 **Device type**
- Controller — C

Pos. 8 **Communication**
- Modbus — M
- BACnet — B

Pos. 9 **Voltage supply**
- 24 V AC/DC — 2

Pos. 10 **Additional measuring elements**
- without * — 0
- **RH** (rel. humidity) — 1
- **CO2** (carbon dioxide) — 2
- **RH** + **CO2** — 3

Pos. 11 **Extra options**
- without — 0
- **AI** instead of **RI** — 1

Pos. 12 **Housing colour**
- black — 1
- white — 2
- chrome — 3

Pos. 5
- **RI** Resistance input (NTC10K)
- **RO** Relay output (0.5 A / 7 A)
- **AI** Analogue input (0...10 V DC) instead of **RI**
- **AO** Analogue output (0...10 V DC)
- **DI** Digital input (potential-free)
- **DO** Digital output (potential-free)

- (h) Heating
- (c) Cooling
- (f) Fan
- (EC-f) EC fan
- (PMW) Pulse Width Modulation

Pos. 10 * The **temperature sensor** forms part of the basic equipment and is included in the option "without" additional measuring elements.

Type 610 **Basic model** (see table on the right) available from stock – Freely configurable type versions available upon request!

RYMASKON® (basic model) Comparison table		Type 510 Thermostat	Type 610 Controller	Type 710 Interface
Outputs	Relay output for heating/cooling	**1**	–	Bus
	Analogue output (0–10 V) Heating/cooling 6-way valves, fans	–	**3**	Bus
Function	Sun protection (max. 2 zones)	●	● ●	● ●
	Light / room lighting (1 zone)	–	●	●
	Air Conditioning (1 zone)	●	–	●
Sensors	Temperature (°C)	●	●	●
	Humidity (% RH)	●	●	●
	CO2 (ppm)	–	○	○
Inputs	Digital input	**1**	**1**	**1**
	Analogue input (0–10 V)	–	**2**	–
	Resistance input (NTC10K)	**2**	–	**2**
				○ = optional

Controller for controlling and regulating temperature, fan, light (1 zone) and blind (2 zones), room control unit with colour touch display, with Modbus or BACnet connection

KEY FEATURES
Basic model type 610

- 24 V AC/DC voltage supply
- 3.5 inch touch display with background lighting
- Modbus or BACnet
- Wall mounting on standard in-wall flush boxes
- Integrated temperature sensor (basic equipment)
- Integrated humidity sensor
- Integrated CO2 sensor (optional)
- Regulation of heating, cooling, fan directly through analogue outputs (0...10 V)
- Operation of temperature, fan, light (1 zone) and sun protection (2 zones) via touch display
- 3 analogue outputs (0...10 V) for controlling heating/cooling valves and EC motor
- 2 analogue inputs (0...10 V) for external sensors
- 1 digital input (potential-free)
- Operating modes Comfort (Normal), OFF, Party (Boost), ECO, Frost Protection

RYMASKON® 600
Home Screen



RYMASKON® 610	Controller (basic model), room control unit with touch display						
Type / WG02	**Communi-cation**	**Measuring element**	**Control system**	**Colour**	**Display**	**Item No.**	**Price**
RYMASKON® 610-Modbus							
Rymaskon 612-MOD-RH-AI	Modbus	**T** I **RH**	**T** I **V** I **2S** I **L**	white	■	RYM6-10CM-2112-000	**415,52 €**
Rymaskon 612-MOD-RH-CO2-AI	Modbus	**T** I **RH** I **CO2**	**T** I **V** I **2S** I **L**	white	■	RYM6-10CM-2312-000	**598,33 €**
RYMASKON® 610-BACnet							
Rymaskon 612-BAC-RH-AI	BACnet	**T** I **RH**	**T** I **V** I **2S** I **L**	white	■	RYM6-10CB-2112-000	**415,52 €**
Rymaskon 612-BAC-RH-CO2-AI	BACnet	**T** I **RH** I **CO2**	**T** I **V** I **2S** I **L**	white	■	RYM6-10CB-2312-000	**598,33 €**
Measuring element / control system:	**T** = Temperature sensor (basic equipment) **RH** = Humidity sensor **CO2** = Carbon dioxide sensor		**T** = Temperature **V** = Fan **S** = Sun protection (2 zones) **L** = Light				
Channel configuration:	**2AI** 2 analogue inputs (0–10 V DC) instead of **2RI** **1DI** 1 digital input (potential-free) **3AO** 3 analogue outputs (0–10 V DC) for heating, cooling, fan						
Optional:	**More type versions available upon request!** For configuration options, see number key (left).						
ACCESSORIES							
RYMASKON® USB Configuration Tool							
RYMASKON USB CT	For quick transfer of the device configuration from the PC to all devices in the building					1901-51Z3-0002-000	**153,60 €**

RYMASKON® 500 Thermostat

Thermostat for controlling and regulating temperature, light, air conditioning and the sun protection (1 zone), room control unit with colour touch display, with Modbus or BACnet connection

S+S REGELTECHNIK

The **RYM**ASKON® **500** / **600** / **700** series of room control units are designed for controlling the climatic zone in residential, hotel and office rooms and individually regulate the heating/cooling steps of the internal rooms. A colour touch display with modern icons is used for the visual display and operation at the location. The product range is characterised by the variety of combination options of the individual components.

The **RYM**ASKON® **500 Thermostat** series regulates a **heating or cooling valve** directly through a relay. The **sun protection** (blinds, shutters) can be controlled in one zone via the bus. Through the appropriate symbols, it is possible to control the light and air conditioning instead of the sun protection. In addition to the integrated temperature sensor, two external temperature sensors (NTC10K) can also be connected. A measuring element for relative humidity is also available. The devices are used in room climate technology and heating/cooling systems, such as cooling ceilings and floor heating. Wall mounting is performed on standard in-wall flush boxes. The devices are optionally available with a Modbus or BACnet communication interface (optionally without communication) and in various type versions (see number key).

The basic model **RYM**ASKON® **510 Thermostat** with colour touch display (3.5"), in a white housing, possesses an integrated temperature and humidity sensor, 2 resistance inputs (for external NTC10K temperature sensors), 1 digital input, 1 relay output (7A) and optionally with a Modbus or BACnet connection. The room control units are used for controlling heating/cooling directly through the relay (2-point regulation) light, air conditioning and the sun protection (1 zone) via the bus.

TECHNICAL DATA	(Basic model)
Device type:	room control unit with 2-point regulation
Functions:	temperature, light, air conditioning and sun protection (1 zone)
Communication:	**Modbus RTU Slave** address range can be configured between 1...247 **or** **BACnet MS/TP** device ID 65100 (default) and MAC address can be configured between 1...127 RS 485 interface, max. 63 devices, 9600 / 19200 / 38400 / 57500 / 76800 Baud, none / even / odd parity, 1 / 2 stop bits
Power supply:	24 V AC/DC (± 15 %)
Power consumption:	max. 1.92 W
Inputs:	2 resistance inputs (NTC10K) for external temperature sensors 1 digital input (potential-free), impedance <1 kOhm
Outputs:	1 relay output (2-point regulation) 7 A (resistive load); 1.3 A (inductive load)
Operating mode:	Comfort, ECO, OFF, Boost, Holiday, Frost Protection
Control element:	**3.5" touch display** with background lighting, cut-out approx. 50 x 75 mm, resolution 320 x 480 pixels, 255,000 colours
TEMPERATURE	
Sensor:	integrated temperature sensor
Measuring range:	–40...+125 °C
Accuracy:	typically ±0.5 °C at +25 °C
HUMIDITY	
Sensor:	integrated humidity sensor
Measuring range:	0...100 % RH
Accuracy:	typically ±2 % RH (20...80 % RH) at +25°C
Electrical connection:	0.14 - 1.5 mm², via screw terminals
Housing:	plastic, polycarbonate material, self-extinguishing, white colour (optionally black or chrome), weight approx. 220 g
Housing dimensions:	approx. 88 x 112 x 14.5 mm (on-wall) approx. 52 x 53 x 28.5 mm (in-wall)
Mounting:	wall mounting on in-wall flush box, Ø 55 mm
Ambient temperature:	0...+50 °C (operation); –30...+70 °C (storage)
Permitted humidity:	0...95 % RH, (non-precipitating air)
Protection type:	**IP 20** (according to EN 60 529)
Standards:	CE conformity, according to EMC directive 2004/108/EU, Low-Voltage directive 2006/95/EU, according to EN 61000-6-1/3, EN 60730-1, EN 6100-4-2/4/5/11
ACCESSORIES	see table

RYMASKON® **500**
Sensors



Room temperature
[°C]



External temperature
[°C]



Relative humidity
[%RH]

RYMASKON® **500**
Functions



Sun protection
(1 zone)



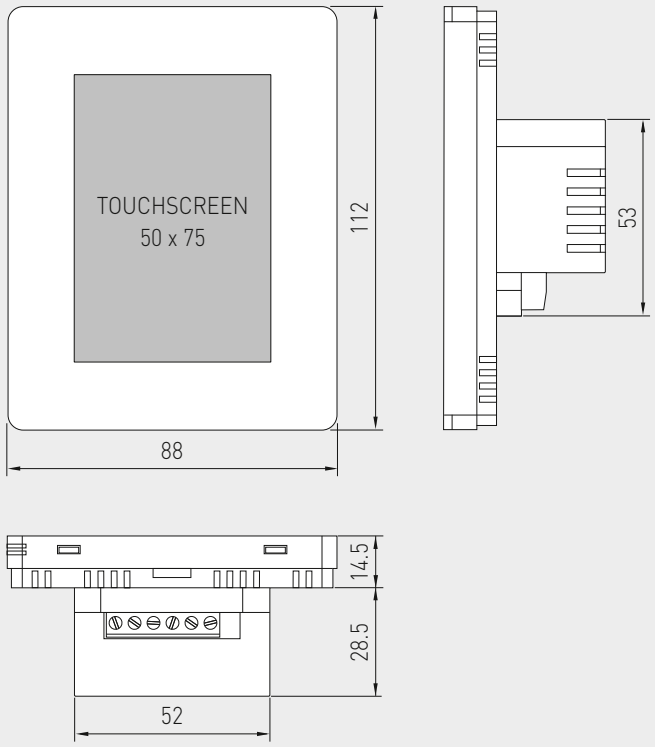
Light
(1 zone)



Air Conditioning
(1 zone)

Thermostat for controlling and regulating temperature, light, air conditioning and the sun protection (1 zone), room control unit with colour touch display, with Modbus or BACnet connection

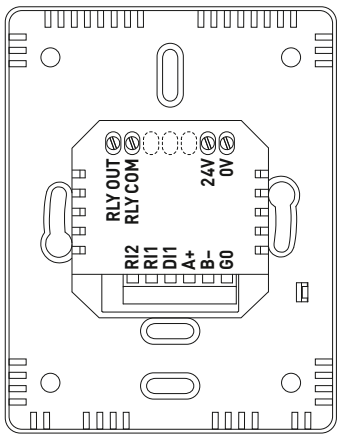
Dimensional drawing — **RYM**ASKON® **500**



RYMASKON® **500**
On-wall 14.5 mm



Connecting diagram
Basic model — **RYM**ASKON® **510**



RYMASKON 510

RLY OUT	30V DC 7A(res) / 1.3(ind) Rated Relay Output
COM	Relay Common Terminal
24V	24V AC/DC Supply
0V	0V Supply
	Inputs NTC10K Temperature Sensor
RI1	Input 1 (External Sensor)
RI2	Input 2 (External Sensor)
DI1	Digital Input (Potential-free)
	Modbus / BACnet MS/TP
A+	RS485 A+
B–	RS485 B–
G0	GND (internally linked with 0V Supply)

Thermostat for controlling and regulating temperature, light, air conditioning and the sun protection (1 zone), room control unit with colour touch display, with Modbus or BACnet connection

S+S REGELTECHNIK

RYMASKON® 500 Thermostat (series)
Number key for type versions

R Y M 5 - 1 0 T x - x x 0 x - 0 0 0

Pos. 1–4 **Type name**
RYMASKON 500 — RYM5

Pos. 5 **Channel configuration**
Type 510 **2RI**, **1DI**, **1RO** 7A — 1

Pos. 7 **Device type**
Thermostat — T

Pos. 8 **Communication**
without — A
Modbus — M
BACnet — B

Pos. 9 **Voltage supply**
12 V DC — 1
24 V AC/DC — 2
90–250 V AC — M

Pos. 10 **Additional measuring elements**
without * — 0
RH (rel. humidity) — 1

Pos. 11 **Extra options**
without — 0

Pos. 12 **Housing colour**
black — 1
white — 2
chrome — 3

Pos. 5
RI Resistance input (NTC10K) for external temperature sensors
DI Digital input (potential-free)
RO Relay output (7 A), (2-point regulation)

Pos. 10 * The **temperature sensor** forms part of the basic equipment and is included in the option "without" additional measuring elements.

Type 510 **Basic model** (see table on the right) available from stock – Freely configurable type versions available upon request!

RYMASKON® (basic model) Comparison table		Type 510 Thermostat	Type 610 Controller	Type 710 Interface
Outputs	Relay output for heating/cooling	**1**	–	Bus
	Analogue output (0–10 V) Heating/cooling 6-way valves, fans	–	**3**	Bus
Function	Sun protection (max. 2 zones)	●	● ●	● ●
	Light / room lighting (1 zone)	–	●	●
	Air Conditioning (1 zone)	●	–	●
Sensors	Temperature (°C)	●	●	●
	Humidity (% RH)	●	●	●
	CO2 (ppm)	–	○	○
Inputs	Digital input	**1**	**1**	**1**
	Analogue input (0–10 V)	–	**2**	–
	Resistance input (NTC10K)	**2**	–	**2**
				○ = optional

Thermostat for controlling and regulating temperature, light, air conditioning and the sun protection (1 zone), room control unit with colour touch display, with Modbus or BACnet connection

KEY FEATURES
Basic model type 510

- 24 V AC/DC voltage supply
- 3.5 inch touch display with background lighting
- Modbus or BACnet
- Wall mounting on standard in-wall flush boxes
- Integrated temperature sensor (basic equipment)
- Integrated humidity sensor
- Regulation of heating or cooling via relay (2-point regulator)
- Operation of temperature, light, air conditioning and sun protection (1 zone) via touch display
- 2 resistance inputs (NTC10K) for external temperature sensors
- 1 digital input (potential-free)
- 1 relay output (7 A), (2-point regulation)
- Operating modes Comfort (Normal), OFF, Boost, ECO, Holiday, Frost Protection

RYMASKON® 500
Home Screen



RYMASKON® 510	Thermostat (basic model), room control unit with touch display						
Type / WG02	**Communi-cation**	**Measuring element**	**Control system**	**Colour**	**Display**	**Item No.**	**Price**
RYMASKON® 510-Modbus							
Rymaskon 512-MOD-RH	Modbus	**T** I **RH**	**T** I **S** I **L** I **K**	white	■	RYM5-10TM-2102-000	**290,35 €**
RYMASKON® 510-BACnet							
Rymaskon 512-BAC-RH	BACnet	**T** I **RH**	**T** I **S** I **L** I **K**	white	■	RYM5-10TB-2102-000	**290,35 €**
Measuring element / control system:	**T** = Temperature sensor (basic equipment) **RH** = Humidity sensor		**T** = Temperature heating / cooling **S** = Sun protection **L** = Light **K** = Air Conditioning (AC)				
Channel configuration:	**2RI** 2 resistance inputs (NTC10K) for external temperature sensors **1DI** 1 digital input (potential-free) **1RO** 1 Relay output (7 A), (2-point regulation)						
Optional:	**More type versions available upon request!** For configuration options, see number key (left).						
ACCESSORIES							
RYMASKON® USB Configuration Tool							
RYMASKON USB_CT	For quick transfer of the device configuration from the PC to all devices in the building					1901-51Z3-0002-000	**153,60 €**

RYMASKON® 400 - Modbus

Room control unit for room automation, configurable, with multifunctional display and Modbus connection

S+S REGELTECHNIK

RYMASKON® stands for a series of multifunctional room control units.
The individually configurable **RYM**ASKON® **400 - Modbus** enables automated monitoring and control of the indoor climate and illumination in a Modbus network. It has two digital inputs and two digital/analogue outputs. Room climate control and regulation can be accessed from a central point on a higher-level Modbus master and on-site operation can be selectively or completely disabled. Thanks to its internal outputs, the inputs and settings on the device do not necessarily have to be processed by the master. This means that it is also possible to have decentralised individual room control at any time. An internal sensor detects the room temperature.

Six freely assignable function buttons on the front panel of the unit can be used for on-site operation and configuration. An integrated rotary encoder with a central input button enables manual adjustment of settings and parameter assignment on location. Desired functions (such as "Light ON") and display values can be activated by triggering an approximation sensor when entering the room.

The dimmable multifunctional display is designed specifically for room operation and uses intuitive symbols for a clear view of all available spatial data. Besides the time, weekday and climate parameters (temperature, humidity, dew point, CO_2 content), it can also display additional features, such as heating/cooling and fan modes, window open, lighting, alarm, key lock or room occupancy.

RYMASKON® **412 - Modbus**
RYMASKON® **422 - Modbus**

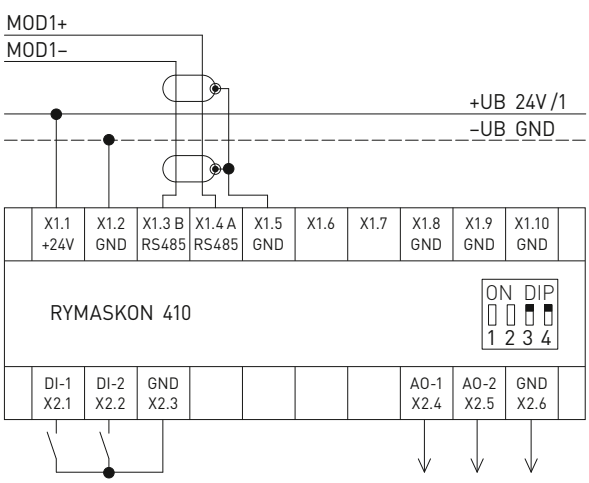


TECHNICAL DATA

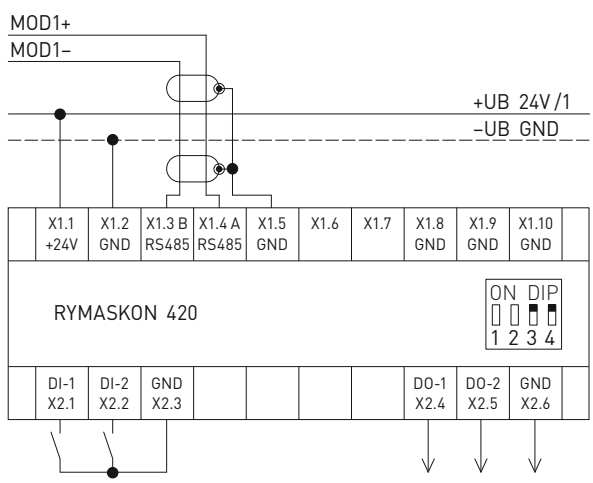
Power supply:	24 V DC (± 10 %)
Power consumption:	1.08 W at 100 % backlighting 0.94 W at 15 % backlighting 0.89 W without backlighting (without load at the actuator outputs)
Inputs:	2 digital inputs without additional 0 V output signal *
Outputs:	Type 410 : 2 analogue outputs (0-10 V DC) rated current max. 4 mA Type 420 : 2 digital outputs or PWM rated current 400 mA (short circuit max. 1.2 A)
Interface:	RS485 Modbus RTU Slave (57600, 38400, 19200, 9600 Baud), bus termination can be set via DIP switch
Sensor:	NTC 10 kΩ, 0...+70 °C, precision ±0.4 K
Operating elements:	multifunctional display, 6 touch buttons, 1 rotary encoder, 1 approximation sensor (IR)
Electrical connection:	0.14 - 1.5 mm², via plug-in screw terminals
Housing:	plastic, glass front panel, black or white colour
Dimensions:	88 x 173 x 30 mm (incl. connection terminals)
Mounting:	using a plastic mounting plate (see dimensional drawing), wall mounting or on in-wall flush double switch box
Ambient temperature:	+5...+40 °C (operation); –10...+50 °C (storage)
Permitted humidity:	0...85 % RH (without dew formation)
Protection type:	**IP 20** (according to EN 60 529)
Standards:	CE-conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU

*** digital inputs (DI1 / DI2)**
In order to connect potential-free contacts, a GND signal (e.g. terminal X2.3) should be routed to the desired input via the contact.

Schematic diagram * **RYM**ASKON® **410 - Modbus**

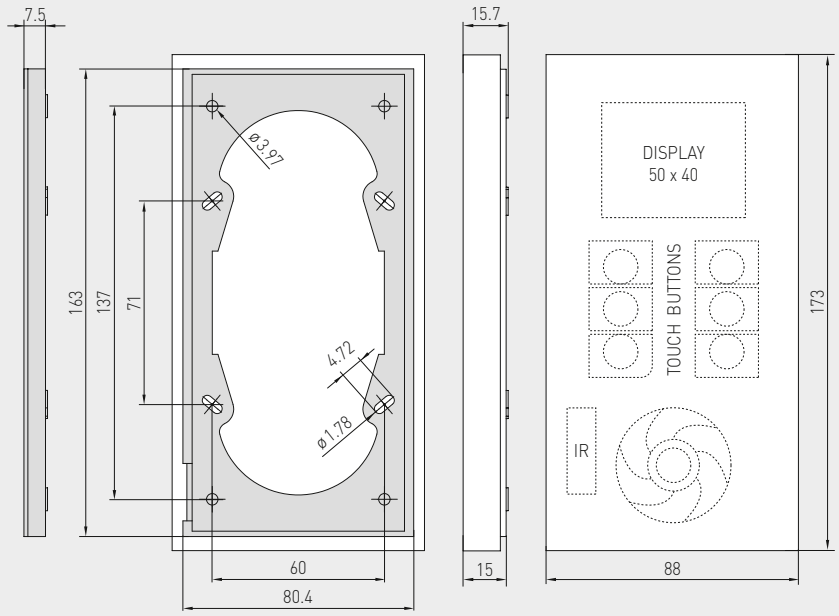


Schematic diagram * **RYM**ASKON® **420 - Modbus**



Room control unit for room automation, configurable, with multifunctional display and Modbus connection

Dimensional drawing — **RYM**ASKON® **400 - Modbus**



RYMASKON® **411 - Modbus**
RYMASKON® **421 - Modbus**



Display symbols — **RYM**ASKON® **400 - Modbus**

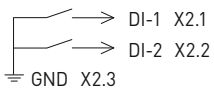


DIP Switch — **RYM**ASKON® **400 - Modbus**		
RS 485 bus termination	**DIP 3**	**DIP 4**
activated (default)	**ON**	**ON**
deactivated	OFF	OFF

Note:
Always configure the bus termination of the RS 485 interface (DIP 3 and DIP 4) **in pairs!**

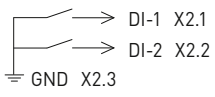
Connecting diagram — **RYM**ASKON® **410 - Modbus**

	X2	
Input 1	1	DI-1 (digital) 0 V
Input 2	2	DI-2 (digital) 0 V
	3	GND
Output 1	4	AO-1 (analogue) 0-10 V DC
Output 2	5	AO-2 (analogue) 0-10 V DC
	6	GND
	X1	
	1	+UB 24 V DC
	2	–UB GND
	3	RS485 – B (Modbus RTU)
	4	RS485 – A (Modbus RTU)
	5	GND
	6	
	7	
	8	GND
	9	GND
	10	GND



Connecting diagram — **RYM**ASKON® **420 - Modbus**

	X2	
Input 1	1	DI-1 (digital) 0 V
Input 2	2	DI-2 (digital) 0 V
	3	GND
Output 1	4	DO-1 (digital / PWM)
Output 2	5	DO-2 (digital / PWM)
	6	GND
	X1	
	1	+UB 24 V DC
	2	–UB GND
	3	RS485 – B (Modbus RTU)
	4	RS485 – A (Modbus RTU)
	5	GND
	6	
	7	
	8	GND
	9	GND
	10	GND



RYMASKON® **400 - Modbus** Room control unit for room automation

Type / WG02	Communication	Output	Colour	Display	Item No.	Price
RYMASKON® **410 - Modbus**						
RYMASKON 411	RS485	2x (analog) 0-10V	black	■	1901-5121-2101-000	**539,46 €**
RYMASKON 412	RS485	2x (analog) 0-10V	white	■	1901-5121-2102-000	**539,46 €**
RYMASKON® **420 - Modbus**						
RYMASKON 421	RS485	2x (digital / PWM)	black	■	1901-5121-2201-000	**539,46 €**
RYMASKON 422	RS485	2x (digital / PWM)	white	■	1901-5121-2202-000	**539,46 €**
	PWM = pulse-width modulation					

ACCESSORIES			
KA2 - Modbus	**Communication adapter** (USB/RS485) for system connection	1906-1200-0000-100	**213,99 €**
LA - Modbus	**Line termination device** (with terminating resistor) as an active bus termination	1906-1300-0000-100	**79,81 €**

RYMASKON® 200 - Modbus

Room control unit for room automation, configurable, with multifunctional display and Modbus connection

S+S REGELTECHNIK

RYMASKON® stands for a series of multifunctional room control units.
The individually configurable **RYM**ASKON® **200 - Modbus** enables automated monitoring and control of the indoor climate and illumination in a Modbus network. It provides three digital inputs and a universal input, which allows connection of up to four external push buttons or switches. It can be configured remotely from a higher-level Modbus master and integrated into a cross-building room climate monitoring and data acquisition system. Internal sensors record room temperature, relative humidity and dew point.

Up to eight capacitive function buttons on the front panel of the compact unit can be used for on-site operation and configuration. A buzzer sounds to acknowledge button use and can also be used as an acoustic fault or alarm warning.

The dimmable multifunctional display is designed specifically for room operation and uses intuitive symbols for a clear view of all available spatial data. Besides the time, date and climate parameters (temperature, humidity, dew point, CO_2 content), it can also display additional features, such as fan mode or room occupancy. The back light colour can be adapted to the room design.

RYMASKON® **200 - Modbus**
Type 232



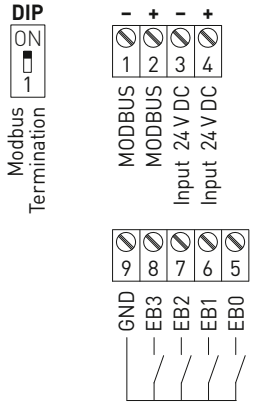
TECHNICAL DATA	
Power supply:	24 V DC (± 10 %)
Power consumption:	max. 0.8 W
Inputs:	3 digital inputs (for standard push buttons or switches) 1 universal input (can be configured for connecting NTC10K temperature sensors or as additional digital input for the connection of standard push buttons or switches)
Bus interface:	RS485 Modbus RTU slave (57600, 38400, 19200, 9600 Baud), bus termination can be set via DIP switch, configurable speed 1200-115200 bit/s (typically 57600 bit/s), adjustable transfer mode (typically "8E1", 1 start bit, 8 data bits, even parity, 1 stop bit)
Equipment:	1 NFC (Near Field Communication) 1 infra-red receiver (NEC protocol) 1 buzzer
Operating elements:	1 backlit multifunctional display (individually programmable RGB colour selection) 4 / 6 / 8 touch buttons, type-dependent
TEMPERATURE	
Sensor:	CMOS temperature sensor
Measuring Range:	–40...+125 °C, resolution: 0.1 °C
Accuracy:	typically ±0.5 °C (at +5...+60 °C)
HUMIDITY	
Sensor:	capacitative humidity sensor
Measuring Range:	0...100 % RH, resolution: 0.1 % RH
Accuracy:	typically ±2 % RH (at +25 °C, 20...80 % RH) typically ±3 % RH (at +25 °C, 0...20 % RH or 80...100 % RH)
Electrical connection:	0.2 - 1.5 mm², via plug-in screw terminals
Housing:	plastic, black or white colour
Dimensions:	approx. 94.5 x 110 x 19.5 mm
Mounting:	using a plastic mounting plate (see dimensional drawing), on in-wall flush box, Ø 55 mm
Ambient temperature:	0...+50 °C (operation)
Permitted humidity:	0...90 % RH (without dew formation)
Protection type:	**IP 30** (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 50491, EMC directive 2014 / 30 / EU
CONTROL	
Type 210:	Temperature up/down, Room occupancy, Menu
Type 220:	Temperature up/down, Fan speed up/down, Room occupancy, Menu
Type 230:	Temperature up/down, Fan speed up/down, Light on/off, Room occupancy, Menu
Type 240:	Temperature up/down, Sun protection up/down, Light on/off, Room occupancy, Menu
Type 250:	Temperature up/down, Fan speed up/down, Sun protection up/down, Room occupancy, Menu
Type 260:	Temperature up/down, Fan speed up/down, Sun protection up/down, Light, Menu
ACCESSORIES	see table

Display symbols — **RYM**ASKON® **200 - Modbus**



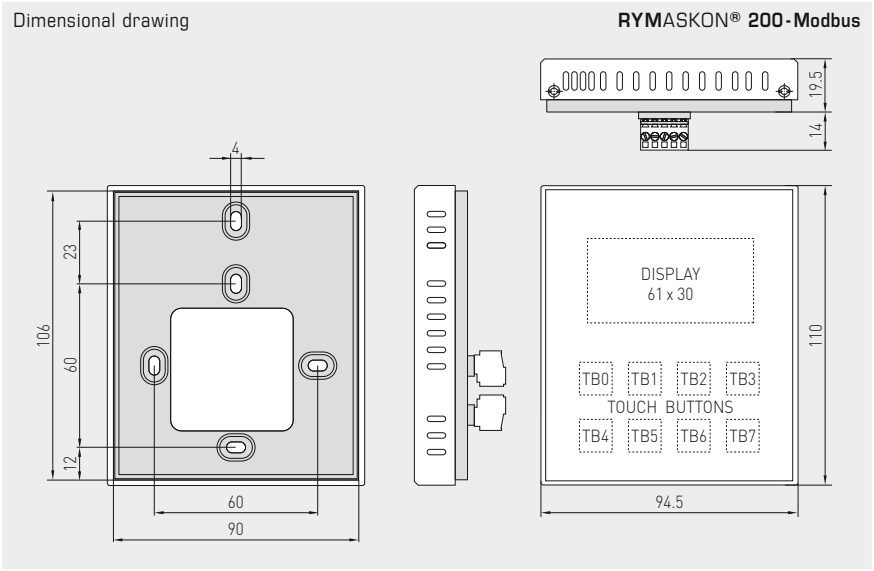
DIP Switch — **RYM**ASKON® **200-Modbus**	
RS485 bus termination	**DIP 1**
activated (default)	**ON**
deactivated	OFF

Connecting diagram — **RYM**ASKON® **200 - Modbus**



Room control unit for room automation, configurable, with multifunctional display and Modbus connection

Dimensional drawing — **RYM**ASKON® **200 - Modbus**



RYMASKON® **200 - Modbus**
Type 231



Type 211



Type 221



Type 241



Type 251



Type 261



Type 212



Type 222



Type 242



Type 252



Type 262



RYMASKON® **200 - Modbus** Room control unit for room automation

Type / WG02	Communication	Buttons	Control	Colour	Display	Item No.	Price
RYMASKON® **210 - Modbus**							
RYMASKON 211	RS485, NFC, NEC	4	**T** | – | – | – | **R** | **M**	black	■	1901-5111-3011-001	**335,88 €**
RYMASKON 212	RS485, NFC, NEC	4	**T** | – | – | – | **R** | **M**	white	■	1901-5111-3012-001	**347,73 €**
RYMASKON® **220 - Modbus**							
RYMASKON 221	RS485, NFC, NEC	6	**T** | **V** | – | – | **R** | **M**	black	■	1901-5111-3011-002	**335,88 €**
RYMASKON 222	RS485, NFC, NEC	6	**T** | **V** | – | – | **R** | **M**	white	■	1901-5111-3012-002	**347,73 €**
RYMASKON® **230 - Modbus**							
RYMASKON 231	RS485, NFC, NEC	8	**T** | **V** | – | **L** | **R** | **M**	black	■	1901-5111-3011-003	**335,88 €**
RYMASKON 232	RS485, NFC, NEC	8	**T** | **V** | – | **L** | **R** | **M**	white	■	1901-5111-3012-003	**347,73 €**
RYMASKON® **240 - Modbus**							
RYMASKON 241	RS485, NFC, NEC	8	**T** | – | **S** | **L** | **R** | **M**	black	■	1901-5111-3011-004	**335,88 €**
RYMASKON 242	RS485, NFC, NEC	8	**T** | – | **S** | **L** | **R** | **M**	white	■	1901-5111-3012-004	**347,73 €**
RYMASKON® **250 - Modbus**							
RYMASKON 251	RS485, NFC, NEC	8	**T** | **V** | **S** | – | **R** | **M**	black	■	1901-5111-3011-005	**335,88 €**
RYMASKON 252	RS485, NFC, NEC	8	**T** | **V** | **S** | – | **R** | **M**	white	■	1901-5111-3012-005	**347,73 €**
RYMASKON® **260 - Modbus**							
RYMASKON 261	RS485, NFC, NEC	8	**T** | **V** | **S** | **L** | – | **M**	black	■	1901-5111-3011-006	**335,88 €**
RYMASKON 262	RS485, NFC, NEC	8	**T** | **V** | **S** | **L** | – | **M**	white	■	1901-5111-3012-006	**347,73 €**

Control: **T** = Temperature, **V** = Ventilation, **R** = Room occupancy, **S** = Sun protection, **L** = Light, **M** = Menu

ACCESSORIES			
KA2 - Modbus	**Communication adapter** (USB/RS485) for system connection	1906-1200-0000-100	**213,99 €**
LA - Modbus	**Line termination device** (with terminating resistor) as an active bus termination	1906-1300-0000-100	**79,81 €**

HYGRASGARD® RFTF-Modbus-xx

Roomoperating humidity and temperature sensor (± 2.0 %), on-wall, for temperature, relative / absolute humidity, dew point, mixture ratio, enthalpy, calibratable, with Modbus connection

S+S REGELTECHNIK

The calibratable room sensor **HYGR**ASGARD® **RFTF-Modbus** with Modbus connection, in an elegant plastic housing (Baldur 2) with snap-on lid, base with 4-hole attachment, optionally with/without display, measures air humidity (0...100 % RH) and temperature (0...+50 °C). International system of units **SI** (default) can be changed to **imperial** (via Modbus). These measured values are used to internally calculate the following parameters that can be retrieved via Modbus: relative humidity, absolute humidity, mixture ratio, dew point temperature, enthalpy (ignoring atmospheric air pressure) and temperature. Available as a room control unit in various type versions with **control elements** such as setpoint potentiometer (%), rotary switch (5-step), presence button or five-colour **LEDs** (colours and modes configurable) for displaying the operating states.

A long-term stable, **digital humidity and temperature sensor** guarantees exact measurement results. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible. **Modbus sensor** with galvanically separated RS485 Modbus interface, selectable bus termination resistance, DIP switches for setting the bus parameters and bus address in a currentless state, internal LEDs for telegram status display and two-line display (illuminated, in the 7-segment and dot-matrix range, individually programmable).

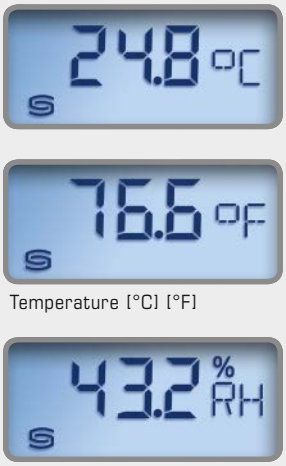
RFTF-Modbus-PTD5 5L
with potentiometer, push-buttons, rotary switches and LED display



TECHNICAL DATA

Power supply:	24 V AC (± 20 %) and 15...36 V DC
Power consumption:	< 1.0 W / 24 V DC; < 2.2 VA / 24 V AC
Sensor:	**Digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
System of units:	**SI** (default) or **Imperial** (switchable via Modbus)
Data points:	Temperature [°C] [°F], relative humidity [% RH], absolute humidity [g/m³] [gr/ft³], dew point [°C] [°F], mixture ratio [g/kg] [gr/lb], enthalpy [kJ/kg] [Btu/lb], setpoint potentiometer, rotary switch and presence button
Measuring range:	0...100 % RH (humidity) 0...+ 50 °C (temperature)
Deviation, humidity:	typically **± 2.0** % (20...80 % RH) at +25 °C, otherwise ± 3.0 %
Deviation, temperature:	typically ± 0.2 K at +25 °C
Zero point offset:	± 10 % RH (humidity) ± 10 °C (temperature) adjustable using potentiometer
Ambient temperature:	storage –35...+85 °C; operation 0...+50 °C
Medium:	clean air and **non-aggressive**, non-combustible gases
Bus protocol:	Modbus (RTU mode), address range 0...**247** selectable
Baud rate:	9600, 19200, 38400 Baud
Signal filtering:	4 s / 32 s
Electrical connection:	0.2 - 1.5 mm², via terminal screws
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010)
Dimensions:	98 x 98 x 33 mm (Baldur 2)
Installation:	wall mounting or on in-wall flush box, Ø 55 mm, base with 4 holes, for attachment to vertically or horizontally installed in-wall flush boxes for rear cable entry, with predetermined breaking point for cable entry from top / bottom in case of plain on-wall installation
Long-term stability:	± 1 % per year
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 30** (according to EN 60 529)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU, according to EN 61 326
Features:	**Display with illumination,** two-line, programmable, cutout approx. 36 x 15 mm (W x H), to display actual humidity and temperature or a selectable parameter or an individually programmable display value **LEDs** (colour-programmable)
ACCESSORIES	see table

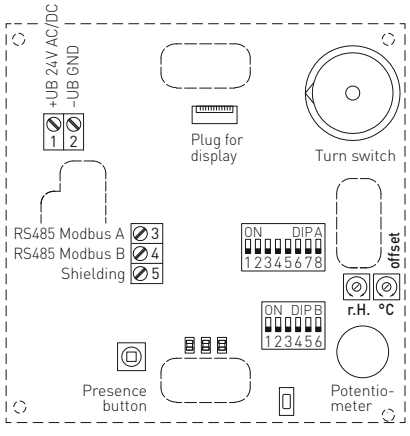
Display **Standard** — **RFTF-Modbus Display**



Temperature [°C] [°F]

Humidity [% RH]

Schematic diagram **RFTF-Modbus**

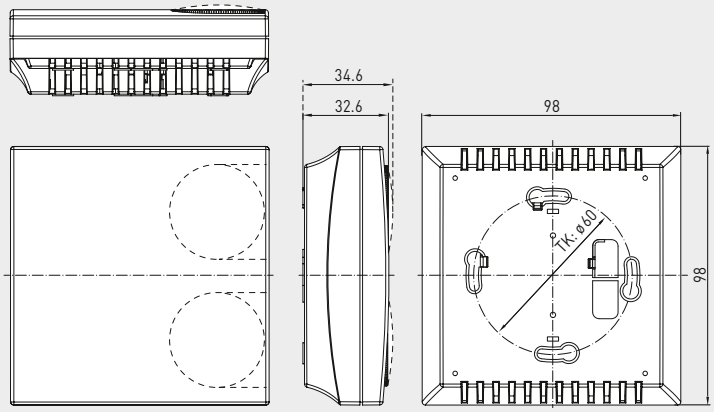


DIP A: Bus address
DIP B: Bus parameters (Baud rate, parity ...)
Telegram indicator
Reception (LED green)
Error (LED red)
LED (internal status)

Roomoperating humidity and temperature sensor (± 2.0 %), on-wall, for temperature, relative / absolute humidity, dew point, mixture ratio, enthalpy, calibratable, with Modbus connection

Dimensional drawing
[mm]

Housing **Baldur 2**



SI IMP

RFTF-Modbus-P T 5L
with display, potentiometer, push-buttons and LED display



Display
alternative output variables

RFTF-Modbus
Display



The display value depends on the set unit system.
By default, the display alternates between the **actual temperature** and the **actual humidity** (relative humidity).

The Modbus interface allows the display to be **individually** configured both in the 7-segment area and in the dot-matrix area.

The **Modbus configuration** can be used to program an alternative output variable instead of the standard display.
In this case, the first line displays the value and index while the second line displays the corresponding unit.
The index identifies the display type:

Index 1 = temperature
Index 2 = setpoint potentiometer
Index 3 = dew point
Index 4 = relative humidity
Index 5 = absolute humidity
Index 6 = mixture ratio
Index 7 = enthalpy

HYGRASGARD® RFTF-Modbus — Roomoperating humidity and temperature sensor

Type / WG01	Measuring Range / Readout Humidity (switchable)	Temperature	Output	Display	Item No.	Price
RFTF-Modbus-xx						
RFTF-Modbus **P**	0...100 % RH (default) 0...80 g / kg (MR) 0...80 g / m³ (A.H.) 0...85 kJ / kg (ENT.) –20...+80 °C (DP)	0...+50 °C	Modbus		1201-42B6-6001-005	**200,50 €**
RFTF-Modbus **P LCD**	(5 x as above)	(1 x as above)	Modbus	■	1201-42B6-7001-005	**238,69 €**
RFTF-Modbus **P 5L**	(5 x as above)	(1 x as above)	Modbus		1201-42B6-6119-005	**258,54 €**
RFTF-Modbus **P 5L LCD**	(5 x as above)	(1 x as above)	Modbus	■	1201-42B6-7119-005	**296,73 €**
RFTF-Modbus **P D5**	(5 x as above)	(1 x as above)	Modbus		1201-42B6-6012-841	**230,74 €**
RFTF-Modbus **P D5 5L**	(5 x as above)	(1 x as above)	Modbus		1201-42B6-6120-841	**291,20 €**
RFTF-Modbus **P T D5 5L**	(5 x as above)	(1 x as above)	Modbus		1201-42B6-6121-841	**305,72 €**
RFTF-Modbus **P T**	(5 x as above)	(1 x as above)	Modbus		1201-42B6-6047-005	**212,59 €**
RFTF-Modbus **P T LCD**	(5 x as above)	(1 x as above)	Modbus	■	1201-42B6-7047-005	**250,78 €**
RFTF-Modbus **P T 5L**	(5 x as above)	(1 x as above)	Modbus		1201-42B6-6051-005	**273,05 €**
RFTF-Modbus **P T 5L LCD**	(5 x as above)	(1 x as above)	Modbus	■	1201-42B6-7051-005	**311,24 €**
Equipment:	**P** = Potentiometer (setpoint setter) **T** = Presence push-buttons		**D5** = Rotary switch, 5-step **5L** = LED display, multi-colour (5x)			

ACCESSORIES

KA2-Modbus	**Communication adapter** (USB/RS485)	1906-1200-0000-100	**213,99 €**

THERMASGARD® RTM1 - Modbus

**Room operating temperature sensor, on-wall,
for temperature, dew point,
calibratable, with Modbus connection**

S+S REGELTECHNIK

The calibratable room temperature measuring transducer **THERM**ASGARD® **RTM1 - Modbus** with Modbus connection, in an elegant housing (Baldur 1) with snap-on lid, base with 4-hole attachment, optionally with/without display, for detecting room temperature (0...+50 °C). International system of units **SI** (default) can be changed to **imperial** (via Modbus). The following parameters can be retrieved via Modbus: Temperature, dew point temperature. Available as a room control unit in various type versions with setpoint potentiometer (%).

A long-term stable, **digital temperature sensor** guarantees exact measurement results. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible. **Modbus sensor** with galvanically separated RS485 Modbus interface, selectable bus termination resistance, DIP switches for setting the bus parameters and bus address in a currentless state, internal LEDs for telegram status display and two-line display (illuminated, in the 7-segment and dot-matrix range, individually programmable).

RTM1 - Modbus
Standard



TECHNICAL DATA

Voltage supply:	24 V AC (± 20 %) and 15...36 V DC
Power consumption:	< 1.0 W / 24 V DC; < 2.2 VA / 24 V AC
Sensor:	**digital temperature sensor,** low hysteresis, high long-term stability
System of units:	**SI** (default) or **imperial** (can be changed via Modbus)
Data points:	temperature [°C] [°F], dew point [°C] [°F], setpoint potentiometer
Measuring range:	0...+ 50 °C
Temperature deviation:	typically ± 0.2 K at +25 °C
Zero point offset:	± 10 °C adjustable by potentiometer
Ambient temperature:	storage –35...+85 °C; operation 0...+50 °C
Medium:	clean air and **non-aggressive**, non-combustible gases
Bus protocol:	Modbus (RTU mode), address range 0...**247** selectable
Baud rate:	9600, 19200, 38400 Baud
Signal filtering:	4 s / 32 s
Electrical connection:	0.2 - 1.5 mm², via terminal screws
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010)
Dimensions:	85 x 85 x 27 mm (Baldur 1)
Installation:	wall mounting or on in-wall flush box, Ø 55 mm, base with 4 holes, for attachment to vertically or horizontally installed in-wall flush boxes for rear cable entry, with predetermined breaking point for cable entry from top / bottom in case of plain on-wall installation
Long-term stability:	± 1 % per year
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 30** (according to EN 60 529)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU, according to EN 61 326
Features:	**Display with illumination,** two-line, programmable, cutout approx. 36 x 15 mm (W x H), to display actual temperature or a selectable parameter or an individually programmable display value
ACCESSORIES	see table

Display **RTM1 - Modbus**
Standard



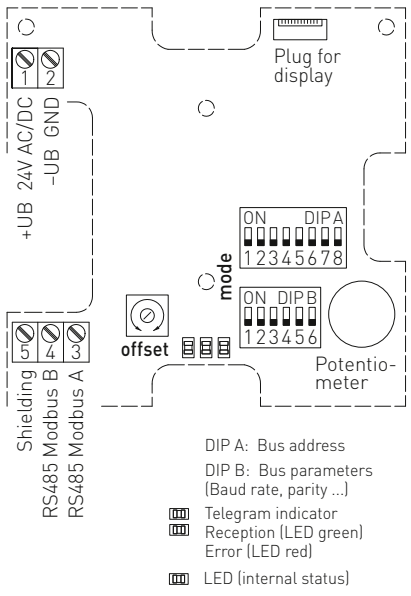


Temperature [°C] [°F]



Programmable display screen

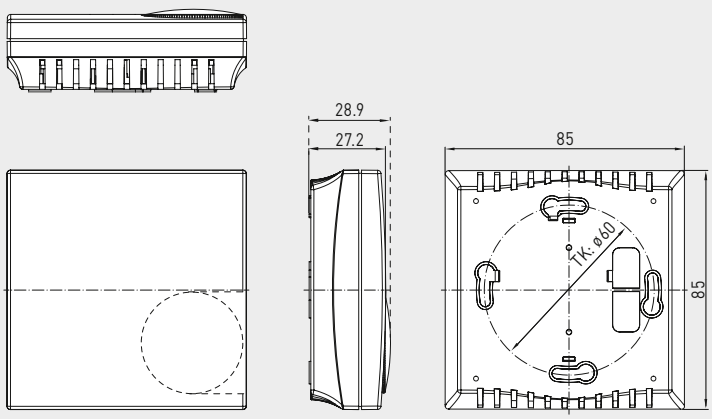
Schematic diagram **RTM1 - Modbus**



Room operating temperature sensor , on-wall, for temperature, dew point, calibratable, with Modbus connection

Dimensional drawing [mm]

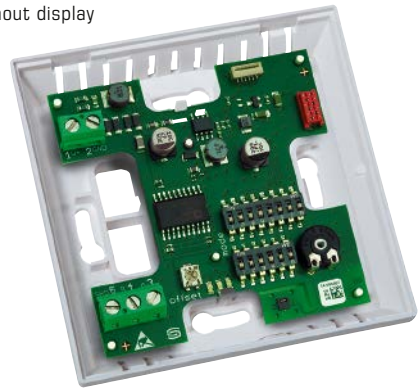
Housing **Baldur 1**



RTM1-Modbus
with display



RTM1-Modbus
without display



RTM1-Modbus
with display



RTM1-Modbus-P
with display and potentiometer



RTM1-Modbus-P
with potentiometer



THERMASGARD® RTM 1-Modbus Room operating temperature sensor

Type / WG01	Measuring Range	Output	Equipment	Display	Item No.	Price
RTM 1-Modbus					**IP 30**	
RTM1-Modbus	0...+50 °C	Modbus	–		1101-42A6-0000-000	**115,22 €**
RTM1-Modbus **LCD**	0...+50 °C	Modbus	–	■	1101-42A6-2000-000	**170,60 €**
RTM 1-P-Modbus					**IP 30**	
RTM1-Modbus P	0...+50 °C	Modbus	potentiometer		1101-42A6-0001-005	**151,49 €**
RTM1-Modbus P **LCD**	0...+50 °C	Modbus	potentiometer	■	1101-42A6-2001-005	**272,82 €**
Note:	System of units **SI** (default) or **imperial** (can be changed via Modbus).					
ACCESSORIES						
KA2-Modbus	**Communication adapter** (USB/RS485) for system connection				1906-1200-0000-100	**213,99 €**
LA-Modbus	**Line termination device** (with terminating resistor) as an active bus termination				1906-1300-0000-100	**79,81 €**

THERMASGARD® ATM 2 - Modbus - T3

Outside temperature / wet room temperature measuring transducers, calibratable, with Modbus connection

S+S REGELTECHNIK

Calibratable outside temperature measurement transducer **THERM**ASGARD® **ATM 2 - Modbus - T3**, with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, optionally with / without display, measures temperature (–50...+150 °C). International system of units **SI** (default) can be changed to **imperial** (via Modbus).

The on-wall sensor is used to detect the temperature in gaseous media. It is used outside or in wet rooms, in cold storage buildings and greenhouses, in the industrial sector and in agriculture. Installation on outside walls is preferably performed on the north side or in a protected place. In case of direct solar irradiation, we recommend using our sun and ball-impact protection hood **WS01** or **WS04** (accessories).

Innovative Modbus sensor with galvanically separated RS485 Modbus interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in current-free state, internal LEDs for telegram status display, two separate push-in terminals and large three-line display (illuminated, with customised programming in the 7-segment range and dot-matrix range). Uses **internal diagnostics** to detect sensor breakage or sensor short circuit as errors. The error messages can be retrieved via Modbus and are shown on the display. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

ATM 2 - Modbus - T3



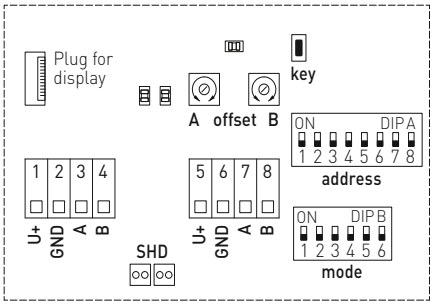
Device variant with **M12 connector** (optional on request)



TECHNICAL DATA

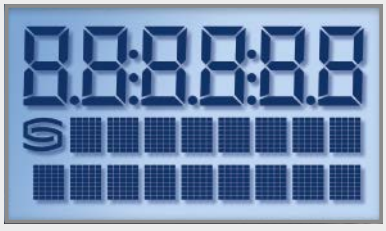
Voltage supply:	24 V AC (± 20 %); 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
System of units:	**SI** (default) or **Imperial** (switchable via Modbus)
Data points:	Temperature [°C] [°F]
Sensor:	Pt1000, DIN EN 60751, class B
Measuring range:	–50...+150 °C
Deviation, temperature:	typically ± 0.2 K at +25 °C
Zero point offset:	± 10 °C
Ambient temperature:	Measuring transducer –30...+70 °C
Medium:	clean air and non-aggressive, non-combustible gases
Bus protocol:	Modbus (RTU mode), address range 0...**247** selectable
Baud rate:	9600, 19200, 38400 Baud
Signal filtering:	0.3 s / 1 s / 10 s
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45,8 mm (Tyr 3 with display)
Cable connection:	**cable gland**, plastic (2x M 20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) **or M12 connector** according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.2 - 1.5 mm², using push-in terminals
Process connection:	by screws
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU
Features:	**Display with illumination**, three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual temperature, error message or an individually programmable display value
Internal diagnostics:	**Error 1** at sensor breakage **Error 2** at sensor short circuit

Schematic diagram **Modbus Tyr 3**



DIP A: Bus address
DIP B: Bus parameters (Baud rate, parity...)
Telegram indicator Reception (LED green) Error (LED red)
LED (internal status)
Offset correction
Button „**key**" (auto zero)
Shielding

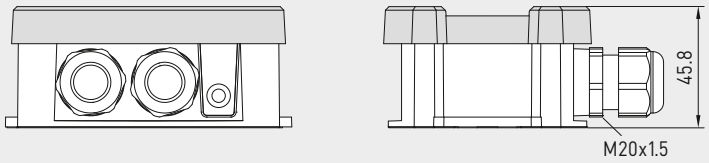
Programmable display screen **Modbus Tyr 3**



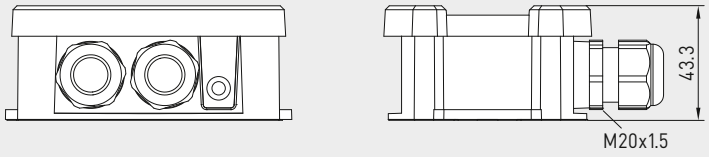
Dimensional drawing
[mm]

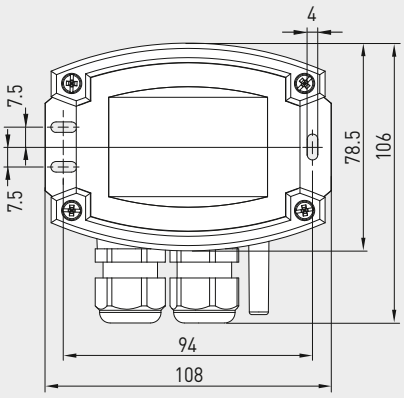
ATM 2 - Modbus - T3

with display



without display





ATM 2 - Modbus - T3
with display







THERMASGARD® ATM 2 - Modbus - T3 Outside temperature / wet room temperature measuring transducers

Type / WG01		Sensor	Output	Display	Item No.	Price
ATM 2 - Modbus - T3						
ATM2-Modbus-T3		Pt1000	Modbus		1101-12C6-0000-000	**167,39 €**
ATM2-Modbus-T3	**LCD**	Pt1000	Modbus	■	1101-12C6-4000-000	**221,60 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101				on request	
Note:	System of units **SI** (default) or **imperial** (can be changed via Modbus).					
ACCESSORIES						
KA2 - Modbus	**Communication adapter** (with USB and RS485 interface) for system connection (incl. quick-start software)				1906-1200-0000-100	**213,99 €**
LA - Modbus	**Line termination device** (with terminating resistor) as an active bus termination of RS485 networks				1906-1300-0000-100	**79,81 €**
WS-01	**Sun and ball-impact protection hood,** 184 x 180 x 80 mm, stainless steel **V2A** (1.4301)				7100-0040-2000-000	**31,77 €**
WS-04	**Weather and sun protection hood,** 130 x 180 x 135 mm, stainless steel **V2A** (1.4301)				7100-0040-7000-000	**37,49 €**
	For further information, see last chapter Accessories!					

THERMASGARD® TM 65 - Modbus - T3

Immersion / screw-in / duct temperature measuring transducer, calibratable, with Modbus connection

S+S REGELTECHNIK

Patented quality product (Immersion sensor patent no. DE 10 2012 017 500.0)

Calibratable temperature measuring transducer with sensor tube **THERM**ASGARD® **TM 65 - Modbus - T3**, with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, stainless steel-protective tube (50 - 400 mm), optionally with / without display, measures temperature (–50...+150 °C). International system of units **SI** (default) can be changed to **imperial** (via Modbus).

The duct sensor is used to detect the temperature in liquid or gaseous media. Use the stainless steel immersion sleeves for aggressive media. It is used in heating engineering, ventilation and air conditioning ducts, pipes, storage systems, compact district heating stations, warm and cold water systems, oil and lubrication cycle systems, machine and systems engineering and the entire industry sector.

Innovative Modbus sensor with galvanically separated RS485 Modbus interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in current-free state, internal LEDs for telegram status display, two separate push-in terminals and large three-line display (illuminated, with customised programming in the 7-segment range and dot-matrix range). Uses **internal diagnostics** to detect sensor breakage or sensor short circuit as errors. The error messages can be retrieved via Modbus and are shown on the display. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TM 65 - Modbus - T3



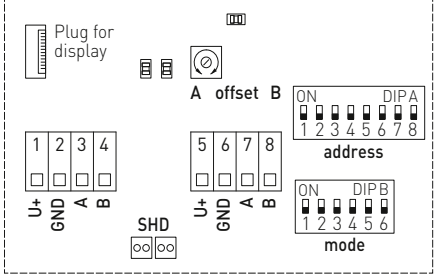
Device version with **M12 connector** (optional on request)



TECHNICAL DATA

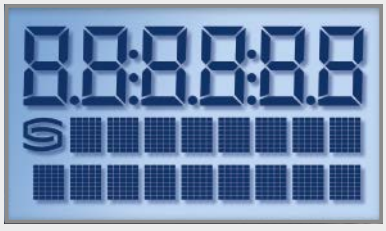
Voltage supply:	24 V AC (± 20 %); 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
System of units:	**SI** (default) or **Imperial** (switchable via Modbus)
Data points:	Temperature [°C] [°F]
Sensor:	Pt1000, DIN EN 60751, class B (**Perfect Sensor Protection**)
Measuring range:	–50...+150 °C
Deviation, temperature:	typically ± 0.2 K at +25 °C
Zero point offset:	± 10 °C
Ambient temperature:	Measuring transducer –30...+70 °C
Medium:	depending on selected immersion sleeve
Bus protocol:	Modbus (RTU mode), address range 0...**247** selectable
Baud rate:	9600, 19200, 38400 Baud
Signal filtering:	0.3 s / 1 s / 10 s
Protective tube:	stainless steel, **V4A** (1.4571), Ø = 6 mm, inserted length (EL) = 50 - 400 mm (see table)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45,8 mm (Tyr 3 with display)
Cable connection:	**cable gland**, plastic (2x M 20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) **or M12 connector** according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.2 - 1.5 mm², using push-in terminals
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU
Features:	**Display with illumination**, three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual temperature, error message or an individually programmable display value
Internal diagnostics:	**Error 1** at sensor breakage **Error 2** at sensor short circuit

Schematic diagram **Modbus Tyr 3**



DIP A: Bus address
DIP B: Bus parameters (Baud rate, parity...)
Telegram indicator Reception (LED green) Error (LED red)
LED (internal status)
Offset correction
Shielding

Programmable display screen **Modbus Tyr 3**

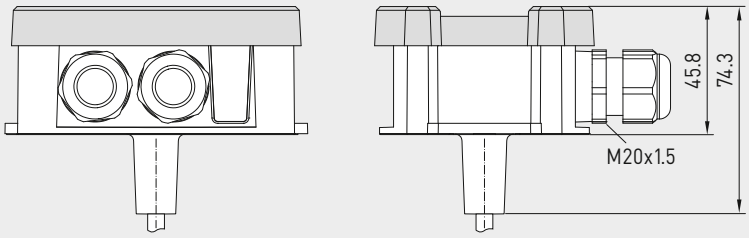


Immersion / screw-in / duct temperature measuring transducer, calibratable, with Modbus connection

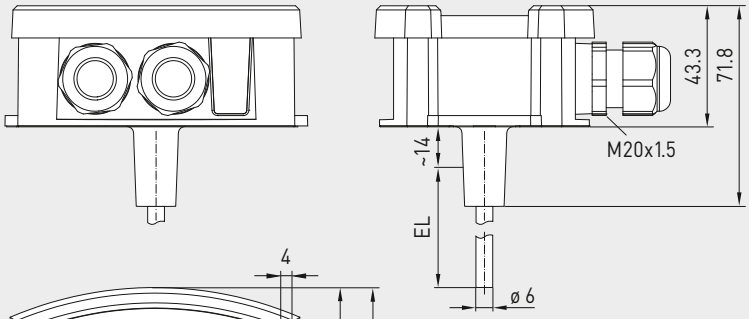
Dimensional drawing [mm]

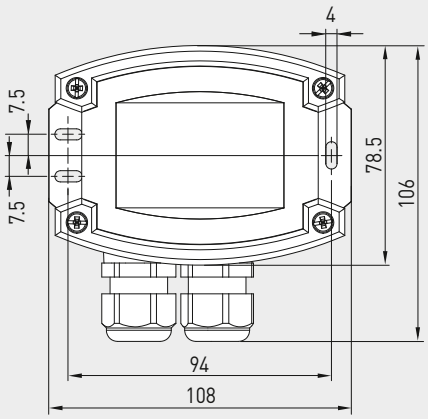
TM 65 - Modbus - T3

with display



without display





TM 65 - Modbus - T3
with display



High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION





THERMASGARD® TM 65 - Modbus - T3 Temperature sensor (basic device)

Type / WG01	Output	Inserted Length (EL)	Display	Item No.	Price
TM65 - Modbus - T3					
TM65-Modbus-T3 50mm	Modbus	**50 mm**		1101-7236-0010-000	**167,04 €**
TM65-Modbus-T3 50mm **LCD**	Modbus	**50 mm**	■	1101-7236-4010-000	**221,24 €**
TM65-Modbus-T3 100mm	Modbus	**100 mm**		1101-7236-0020-000	**167,33 €**
TM65-Modbus-T3 100mm **LCD**	Modbus	**100 mm**	■	1101-7236-4020-000	**221,52 €**
TM65-Modbus-T3 150mm	Modbus	**150 mm**		1101-7236-0030-000	**167,55 €**
TM65-Modbus-T3 150mm **LCD**	Modbus	**150 mm**	■	1101-7236-4030-000	**221,78 €**
TM65-Modbus-T3 200mm	Modbus	**200 mm**		1101-7236-0040-000	**167,78 €**
TM65-Modbus-T3 200mm **LCD**	Modbus	**200 mm**	■	1101-7236-4040-000	**221,98 €**
TM65-Modbus-T3 250mm	Modbus	**250 mm**		1101-7236-0050-000	**168,09 €**
TM65-Modbus-T3 250mm **LCD**	Modbus	**250 mm**	■	1101-7236-4050-000	**222,32 €**
TM65-Modbus-T3 300mm	Modbus	**300 mm**		1101-7236-0060-000	**168,89 €**
TM65-Modbus-T3 300mm **LCD**	Modbus	**300 mm**	■	1101-7236-4060-000	**223,08 €**
TM65-Modbus-T3 350mm	Modbus	**350 mm**		1101-7236-0070-000	**169,93 €**
TM65-Modbus-T3 350mm **LCD**	Modbus	**350 mm**	■	1101-7236-4070-000	**185,23 €**
TM65-Modbus-T3 400mm	Modbus	**400 mm**		1101-7236-0080-000	**170,99 €**
TM65-Modbus-T3 400mm **LCD**	Modbus	**400 mm**	■	1101-7236-4080-000	**225,24 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101			on request	
Note:	System of units **SI** (default) or **imperial** (can be changed via Modbus).				
ACCESSORIES					
KA2 - Modbus	**Communication adapter** (USB/RS485) for system connection			1906-1200-0000-100	**213,99 €**
LA - Modbus	**Line termination device** (with terminating resistor) as an active bus termination			1906-1300-0000-100	**79,81 €**

S+S REGELTECHNIK

Immersion / screw-in / duct temperature measuring transducer, calibratable, with Modbus connection

One basic device in four variants ...



TM 65 - Modbus - T3 + TH 08 - ms / xx

Immersion / screw-in temperature sensor with immersion sleeve, brass, nickel-plated



TM 65 - Modbus - T3 + TH 08 - VA / xx

Immersion / screw-in temperature sensor with immersion sleeve, stainless steel, V4A



TM 65 - Modbus - T3 + TH 08 - VA / xx / 90

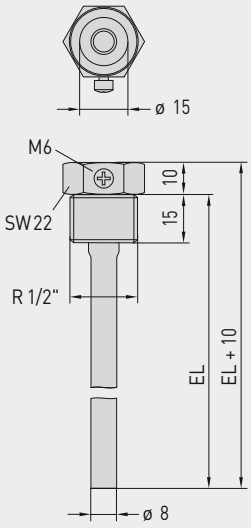
Immersion / screw-in temperature sensor with immersion sleeve with neck tube, stainless steel, V4A



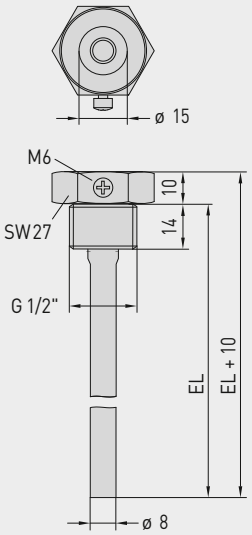
TM 65 - Modbus - T3 + MF - 15 - K

Duct temperature sensor with mounting flange, plastic

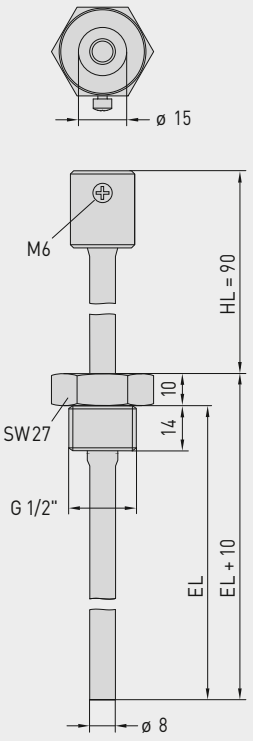
Dimensional drawing [mm]
TH 08 - ms / xx



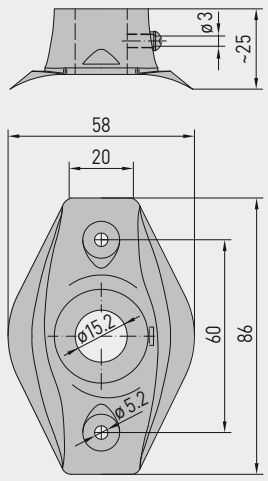
Dimensional drawing [mm]
TH 08 - VA / xx



Dimensional drawing [mm]
TH 08 - VA / xx / 90



Dimensional drawing [mm]
MF - 15 - K



... through combination with accessories:



TH 08 - ms / xx

Immersion sleeve, brass, nickel-plated, thread-sealing, conical, according to DIN 10226



TH 08 - VA / xx

Immersion sleeve, stainless steel, V4A, flat-sealing, cylindrical, according to DIN 228



TH 08 - VA / xx / 90

Immersion sleeve with neck tube, stainless steel, V4A, flat-sealing, cylindrical, according to DIN 228



MF - 15 - K

Mounting flange, plastic

THERMASGARD® TH 08 Immersion sleeve Ø 8 mm (Accessories)					
Type / WG01B	**p_{max} (static)**	**T_{max}**	**Inserted Length (EL)**	**Item No.**	**Price**
TH 08 - ms / xx	**Brass nickel-plated**			without neck tube	
TH08-MS 50MM	10 bar	+150 °C	**50 mm**	7100-0011-0010-132	**9,31 €**
TH08-MS 100MM	10 bar	+150 °C	**100 mm**	7100-0011-0020-132	**10,61 €**
TH08-MS 150MM	10 bar	+150 °C	**150 mm**	7100-0011-0030-132	**11,20 €**
TH08-MS 200MM	10 bar	+150 °C	**200 mm**	7100-0011-0040-132	**11,56 €**
TH08-MS 250MM	10 bar	+150 °C	**250 mm**	7100-0011-0050-132	**13,39 €**
TH08-MS 300MM	10 bar	+150 °C	**300 mm**	7100-0011-0060-132	**13,76 €**
TH08-MS 350MM	10 bar	+150 °C	**350 mm**	7100-0011-0070-132	**13,87 €**
TH08-MS 400MM	10 bar	+150 °C	**400 mm**	7100-0011-0080-132	**14,00 €**
TH 08 - VA / xx	**Stainless steel V4A** (1.4571)			without neck tube	
TH08-VA 50MM	40 bar	+600 °C	**50 mm**	7100-0012-0010-132	**20,28 €**
TH08-VA 100MM	40 bar	+600 °C	**100 mm**	7100-0012-0020-132	**22,41 €**
TH08-VA 150MM	40 bar	+600 °C	**150 mm**	7100-0012-0030-132	**24,08 €**
TH08-VA 200MM	40 bar	+600 °C	**200 mm**	7100-0012-0040-132	**25,38 €**
TH08-VA 250MM	40 bar	+600 °C	**250 mm**	7100-0012-0050-132	**31,55 €**
TH08-VA 300MM	40 bar	+600 °C	**300 mm**	7100-0012-0060-132	**32,97 €**
TH08-VA 350MM	40 bar	+600 °C	**350 mm**	7100-0012-0070-132	**33,19 €**
TH08-VA 400MM	40 bar	+600 °C	**400 mm**	7100-0012-0080-132	**33,78 €**
TH 08 - VA / xx / 90	**Stainless steel V4A** (1.4571)			**with neck tube** (90 mm)	
TH08-VA 50/90MM	40 bar	+600 °C	**50 mm**	7100-0012-0012-132	**29,04 €**
TH08-VA 100/90MM	40 bar	+600 °C	**100 mm**	7100-0012-0022-132	**30,35 €**
TH08-VA 150/90MM	40 bar	+600 °C	**150 mm**	7100-0012-0032-132	**31,84 €**
TH08-VA 200/90MM	40 bar	+600 °C	**200 mm**	7100-0012-0042-132	**33,19 €**
TH08-VA 250/90MM	40 bar	+600 °C	**250 mm**	7100-0012-0052-132	**34,79 €**
TH08-VA 300/90MM	40 bar	+600 °C	**300 mm**	7100-0012-0062-132	**37,71 €**
Note:	inner diameter of socket 15.0 mm For further information see last chapter!				

Mounting flange (Accessories)			
Type / WG01B		**Item No.**	**Price**
MF			
MF - 15 - K	**Mounting flange,** plastic, 56.8 x 84.3 mm, Ø 15.2 mm tube gland, T_{max} +100°C	7100-0032-0000-000	**6,12 €**
Note:	For information see last chapter!		

THERMASGARD® MWTM - Modbus - T3

**Mean value temperature measuring transducers,
incl. mounting flange, calibratable,
with Modbus connection**

S+S REGELTECHNIK

Calibratable mean value temperature measuring transducer **THERM**ASGARD® **MWTM - Modbus - T3**, with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, with flexible sensor rod (0.4...20m, fully active) in a robust protective plastic-coated copper tube, incl. mounting flange, optionally with / without display, measures temperature (–50...+150 °C). International system of units **SI** (default) can be changed to **imperial** (via Modbus).

The rod sensor is used to detect the mean temperature (mean value) in gaseous media. It is used in ventilation and air conditioning ducts over the entire cross-section or on a defined length (laid along a meandering route, it uniformly detects the surrounding temperature). For proper mounting of the rod, mounting clamps **MK-05-M** (accessories) are available.

Innovative Modbus sensor with galvanically separated RS485 Modbus interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in current-free state, internal LEDs for telegram status display, two separate push-in terminals and large three-line display (illuminated, with customised programming in the 7-segment range and dot-matrix range). Uses **internal diagnostics** to detect sensor breakage or sensor short circuit as errors. The error messages can be retrieved via Modbus and are shown on the display. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

MWTM - Modbus - T3
Rod length
3 m / 6 m



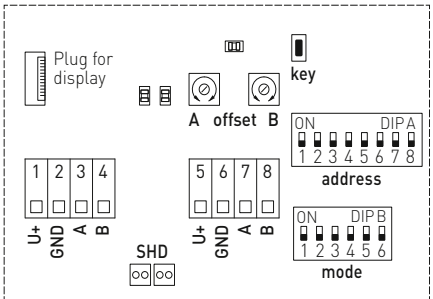
Device version
with **M12 connector**
(optional on request)



TECHNICAL DATA

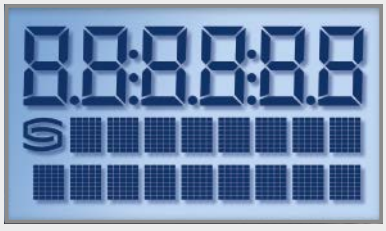
Voltage supply:	24 V AC (± 20 %); 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
System of units:	**SI** (default) or **Imperial** (switchable via Modbus)
Data points:	Temperature [°C] [°F]
Sensor:	Pt1000, DIN EN 60751, class B
Measuring range:	– 50...+ 150 °C; T_{min} **–50 °C**, T_{max} **+ 80 °C**
Deviation, temperature:	typically ± 0.2 K at +25 °C
Zero point offset:	± 10 °C
Ambient temperature:	Measuring transducer –30...+70 °C
Medium:	clean air and non-aggressive, non-combustible gases
Bus protocol:	Modbus (RTU mode), address range 0...**247** selectable
Baud rate:	9600, 19200, 38400 Baud
Signal filtering:	0.3 s / 1 s / 10 s
Sensor:	active across the entire length (averaging)
Rod material:	**protective tube made from copper, plastic-coated,** with anti-kink spring and sleeve, stainless steel V4A (1.4571)
Rod dimensions:	Ø = 5.0 mm, nominal length (NL) = 0.4 m / 3 m / 6 m (nominal length optional up to max. 20 m)
Rod laying:	Bending radius: **> 35 mm** Vibration load: **≤ 0.5 g** Tensile load: **< 480 N**
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45,8 mm (Tyr 3 with display)
Cable connection:	**cable gland**, plastic (2x M 20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) **or M12 connector** according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.2 - 1.5 mm², using push-in terminals
Process connection:	by mounting flange, plastic (galvanised steel optional, see accessories) and mounting clamps **MK-05-M**
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
according to:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU
Features:	**Display with illumination**, three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual temperature or an individually programmable display value
Internal diagnostics:	**Error 1** at sensor breakage **Error 2** at sensor short circuit

Schematic diagram **Modbus Tyr 3**



DIP A: Bus address
DIP B: Bus parameters (Baud rate, parity...)
Telegram indicator Reception (LED green) Error (LED red)
LED (internal status)
Offset correction
Button „**key**" (auto zero)
Shielding

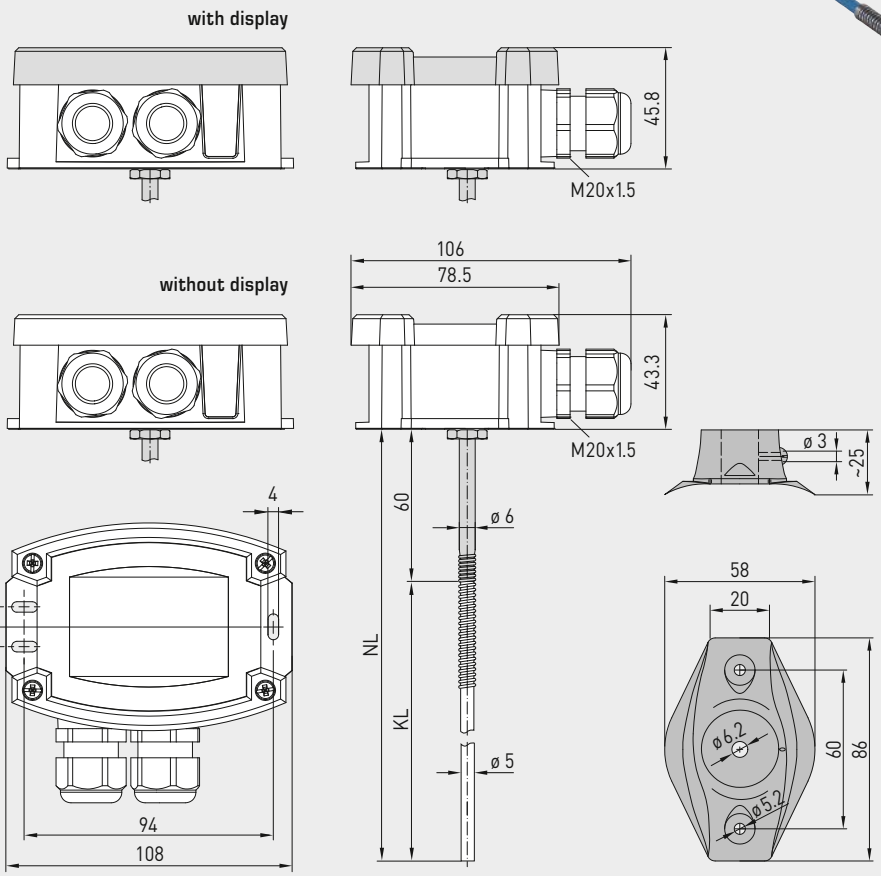
Programmable display screen **Modbus Tyr 3**



Mean value temperature measuring transducers, incl. mounting flange, calibratable, with Modbus connection

Dimensional drawing [mm]

MWTM-Modbus-T3



MWTM-Modbus-T3
Rod length 0.4 m



MF-06-K
Mounting flange, plastic
(included in the scope of delivery)



MK-05-M
Galvanised steel mounting clamps
(optional)



MF-06-M
Mounting flange, metal
(optional)



KRD-04
Capillary tube gland bracket, plastic
(optional)



THERMASGARD® MWTM-Modbus-T3 Mean value temperature measuring transducers

Type / WG01	Sensor	Output	Rod length (NL)	Display	Item No.	Price
MWTM-Modbus-T3					**IP 65**	
MWTM-Modbus-T3 0,4m	Pt1000	Modbus	**0.4 m**		1101-3266-0080-000	**240,35 €**
MWTM-Modbus-T3 0,4m **LCD**	Pt1000	Modbus	**0.4 m**	■	1101-3266-4080-000	**294,11 €**
MWTM-Modbus-T3 3m	Pt1000	Modbus	**3.0 m**		1101-3266-0230-000	**293,32 €**
MWTM-Modbus-T3 3m **LCD**	Pt1000	Modbus	**3.0 m**	■	1101-3266-4230-000	**347,61 €**
MWTM-Modbus-T3 6m	Pt1000	Modbus	**6.0 m**		1101-3266-0260-000	**331,35 €**
MWTM-Modbus-T3 6m **LCD**	Pt1000	Modbus	**6.0 m**	■	1101-3266-4260-000	**385,98 €**
Extra charge:	Per meter sensor cable (from 6 m to max. 20 m)				on request	
	Cable connection with **M12 connector** according to DIN EN 61076-2-101				on request	
Note:	System of units **SI** (default) or **imperial** (can be changed via Modbus).					

ACCESSORIES			
KA2-Modbus	**Communication adapter** (USB/RS485) for system connection	1906-1200-0000-100	**213,99 €**
LA-Modbus	**Line termination device** (with terminating resistor) as an active bus termination	1906-1300-0000-100	**79,81 €**
MF-06-K	**Mounting flange,** plastic (included in the scope of delivery)	7100-0030-1000-000	**6,12 €**
MF-06-M	**Mounting flange,** metal, galvanised steel, Ø = 35 mm	7100-0030-5000-100	**9,56 €**
KRD-04	**Capillary tube gland bracket,** plastic	7100-0030-7000-000	**8,91 €**
MK-05-M	Galvanised steel **mounting clamps** (6 pieces)	7100-0034-0000-000	**9,88 €**
	For further information, see last chapter Accessories!		

THERMASGARD® HFTM - Modbus - T3

Sleeve sensor with temperature measuring transducer, calibratable, with Modbus connection

S+S REGELTECHNIK

Calibratable sleeve temperature measuring transducer **THERM**ASGARD® **HFTM - Modbus - T3**, with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, cable sensor with a stainless steel sleeve, optionally with / without display, measures temperature (–50...+150 °C). International system of units **SI** (default) can be changed to **imperial** (via Modbus).

The sleeve sensor is used to detect the temperature in liquid and gaseous media. It is used as a duct sensor or, if installed in immersion sleeve **THE** (accessories), as an immersion and screw-in sensor in liquids.

Innovative Modbus sensor with galvanically separated RS485 Modbus interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in current-free state, internal LEDs for telegram status display, two separate push-in terminals and large three-line display (illuminated, with customised programming in the 7-segment range and dot-matrix range). Uses **internal diagnostics** to detect sensor breakage or sensor short circuit as errors. The error messages can be retrieved via Modbus and are shown on the display. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

Voltage supply:	24 V AC (± 20 %); 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
System of units:	**SI** (default) or **Imperial** (switchable via Modbus)
Data points:	Temperature [°C] [°F]
Sensor:	Pt1000, DIN EN 60751, class B (**Perfect Sensor Protection**)
Measuring range:	–50...+150 °C
Deviation, temperature:	typically ± 0.2 K at +25 °C
Zero point offset:	± 10 °C
Ambient temperature:	Measuring transducer –30...+70 °C
Medium:	clean air and non-aggressive, non-combustible gases; liquids depending on selected immersion sleeve (accessory)
Bus protocol:	Modbus (RTU mode), address range 0...**247** selectable
Baud rate:	9600, 19200, 38400 Baud
Signal filtering:	0.3 s / 1 s / 10 s
Sensor protection:	Sensor sleeve made from stainless steel V4A (1.4571), Ø = 6 mm, nominal length (NL) = 50 mm (optional 30...400 mm)
Sensor cable:	silicone, SiHF, 2 x 0.25mm²; cable length (KL) = 1.5m (other lengths and jacket materials, e.g. PTFE or glass fibre with steel mesh, available on request)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45.8 mm (Tyr 3 with display)
Cable connection:	**cable gland**, plastic (2x M 20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) **or M12 connector** according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.2 - 1.5 mm², using push-in terminals
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type housing:	**IP 65** (according to EN 60 529)
Protection type sensor:	**IP 65** (according to EN 60 529) **sleeve** humidity-tight (standard) **IP 68** (according to EN 60 529) **sleeve** water-tight (optional) **IP 54** (according to EN 60 529) with **glass fibre** cable (optional)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU
Features:	**Display with illumination**, three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual temperature, error message or an individually programmable display value
Internal diagnostics:	**Error 1** at sensor breakage **Error 2** at sensor short circuit

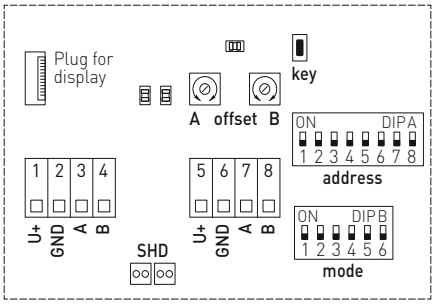
HFTM - Modbus - T3



Device version with **M12 connector** (optional on request)

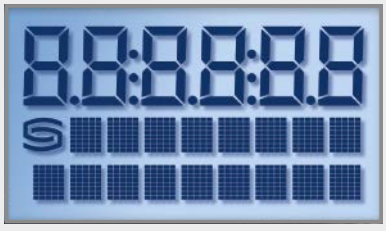


Schematic diagram **Modbus Tyr 3**



DIP A: Bus address
DIP B: Bus parameters (Baud rate, parity...)
Telegram indicator Reception (LED green) Error (LED red)
LED (internal status)
Offset correction
Button „**key**" (auto zero)
Shielding

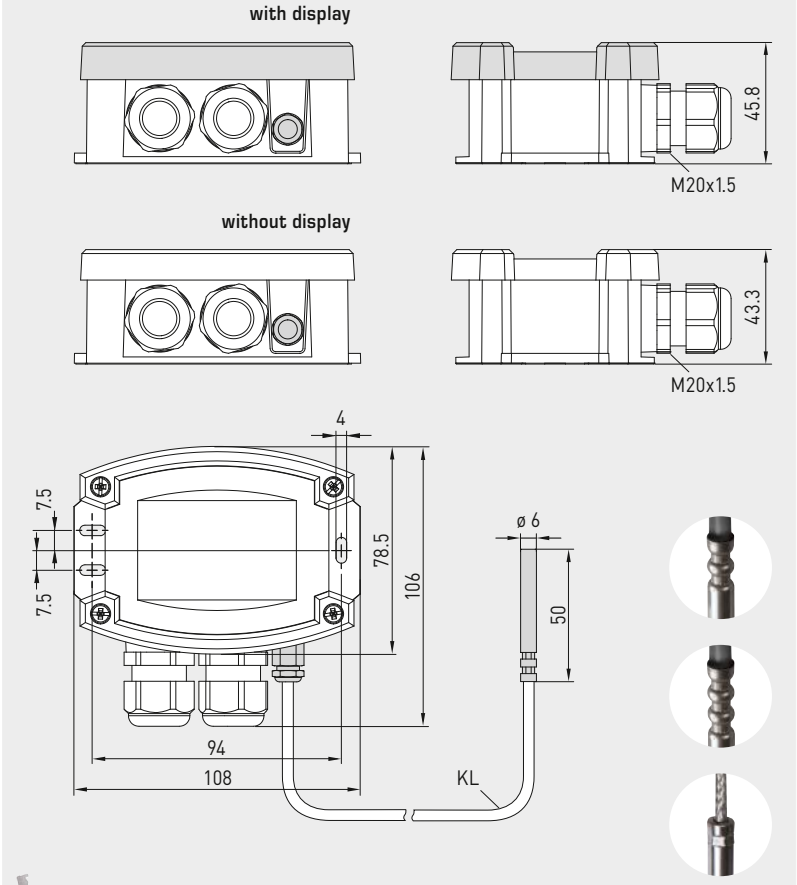
Programmable display screen **Modbus Tyr 3**



Sleeve sensor with temperature measuring transducer, calibratable, with Modbus connection

Dimensional drawing
[mm]

HFTM-Modbus-T3



HFTM-Modbus-T3
with display



IP65 (standard)
humidity-tight

IP68 (optional)
water-tight
Perfect Sensor Protection

IP54 (optional)
with **glass fibre** cable



High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

THERMASGARD® HFTM-Modbus-T3 Sleeve sensor with temperature measuring transducer

Type / WG01	Sensor	Output	Type	Display	Item No.	Price
HFTM-Modbus-T3						
HFTM-Modbus-T3	Pt1000	Modbus	Remote sensor		1101-62A6-0210-000	**171,50 €**
HFTM-Modbus-T3 **LCD**	Pt1000	Modbus	Remote sensor	■	1101-62A6-4210-000	**225,76 €**
Extra charge:	Protection type **IP68** (sensor sleeve watertight compound-filled)					**3,40 €**
	per running metre of connecting lead (**silicone / PTFE / glass fibre**)				on request	
	other protection sleeve lengths optional				on request	
	Cable connection with **M12 connector** according to DIN EN 61076-2-101				on request	
Note:	System of units **SI** (default) or **imperial** (can be changed via Modbus).					

ACCESSORIES			
KA2-Modbus	**Communication adapter** (USB/RS485) for system connection	1906-1200-0000-100	**213,99 €**
LA-Modbus	**Line termination device** (with terminating resistor) as an active bus termination	1906-1300-0000-100	**79,81 €**
THE-xx	**Immersion sleeve**, stainless steel **V4A** (1.4571) or nickel-plated brass, Ø = 9 mm, inner diameter of socket 5.2 mm, with **adjusting screw** M12 x 1.5		
	For further information, see last chapter Accessories!		

THERMASGARD® ALTM1 - Modbus - T3

Surface-contact temperature measuring transducer / pipe surface-contact sensor incl. strap, compact variant, calibratable, with Modbus connection

S+S REGELTECHNIK

Calibratable surface-contact temperature measuring transducer (compact variant) **THERM**ASGARD® **ALTM 1 - Modbus - T3** with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, pipe feeder, incl. strap, optionally with / without display, measures temperature (–50...+150 °C). International system of units **SI** (default) can be changed to **imperial** (via Modbus).

The pipe surface-contact sensor is used to detect the temperature on lines, pipes (e.g., cold and warm water) or on heating sections for heating control.

Innovative Modbus sensor with galvanically separated RS485 Modbus interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in current-free state, internal LEDs for telegram status display, two separate push-in terminals and large three-line display (illuminated, with customised programming in the 7-segment range and dot-matrix range). Uses **internal diagnostics** to detect sensor breakage or sensor short circuit as errors. The error messages can be retrieved via Modbus and are shown on the display. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

Voltage supply:	24 V AC (± 20 %); 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
System of units:	**SI** (default) or **Imperial** (switchable via Modbus)
Data points:	Temperature [°C] [°F]
Sensor:	Pt1000, DIN EN 60751, class B
Measuring range:	–50...+150 °C, T_{max} **at +100 °C** (compact variant)
Deviation, temperature:	typically ± 0.2 K at +25 °C
Zero point offset:	± 10 °C
Ambient temperature:	Measuring transducer –30...+70 °C
Medium:	clean air and non-aggressive, non-combustible gases
Bus protocol:	Modbus (RTU mode), address range 0...**247** selectable
Baud rate:	9600, 19200, 38400 Baud
Signal filtering:	0.3 s / 1 s / 10 s
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45.8 mm (Tyr 3 with display)
Cable connection:	**cable gland**, plastic (2x M 20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) **or M12 connector** according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.2 - 1.5 mm², using push-in terminal
Process connection:	Endless strap with metal tightener (included in scope of delivery) Ø = 13 - 92 mm (¼ - 3"), L = 300 mm
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU
Features:	**Display with illumination**, three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual temperature, error message or an individually programmable display value
Internal diagnostics:	**Error 1** at sensor breakage **Error 2** at sensor short circuit

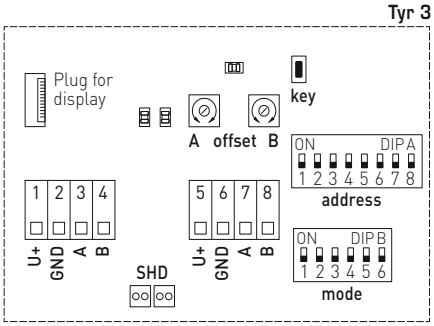
ALTM 1 - Modbus - T3



Device version with **M12 connector** (optional on request)

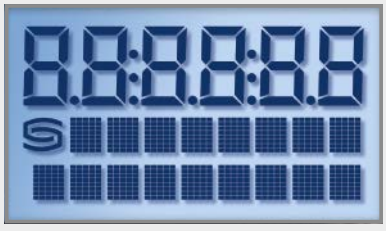


Schematic diagram **Modbus Tyr 3**



DIP A: Bus address
DIP B: Bus parameters (Baud rate, parity...)
Telegram indicator Reception (LED green) Error (LED red)
LED (internal status)
Offset correction
Button „**key**" (auto zero)
Shielding

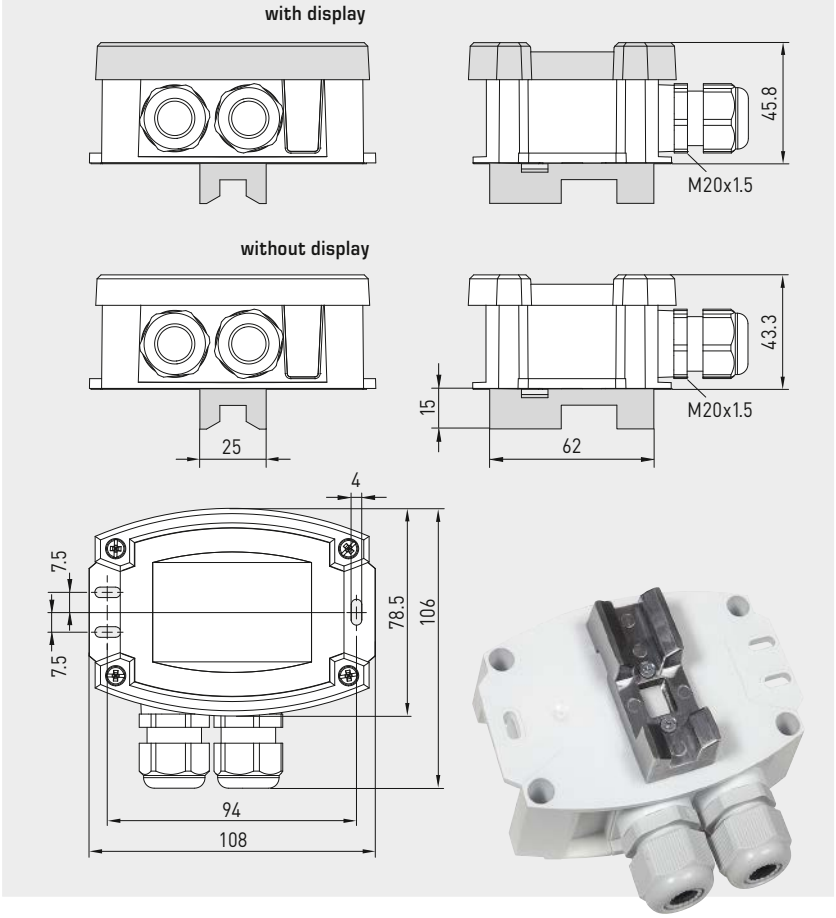
Programmable display screen **Modbus Tyr 3**



Surface-contact temperature measuring transducer / pipe surface-contact sensor incl. strap, compact variant, calibratable, with Modbus connection

Dimensional drawing [mm]

ALTM 1 - Modbus - T3



ALTM 1 - Modbus - T3
with display







THERMASGARD® ALTM 1 - Modbus - T3 Surface contact temperature / tube contact temperature measuring transducers

Type / WG01	Sensor	Output	Type	Display	Item No.	Price
ALTM 1 - Modbus - T3						
ALTM1-Modbus-T3	Pt1000	Modbus	Compact		1101-12B6-0000-000	**172,03 €**
ALTM1-Modbus-T3 **LCD**	Pt1000	Modbus	Compact	■	1101-12B6-4000-000	**227,55 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101				on request	
Note:	System of units **SI** (default) or **imperial** (can be changed via Modbus).					
ACCESSORIES						
KA2 - Modbus	**Communication adapter** (USB/RS485) for system connection				1906-1200-0000-100	**213,99 €**
LA - Modbus	**Line termination device** (with terminating resistor) as an active bus termination				1906-1300-0000-100	**79,81 €**
WLP-1	**Heat-conductive paste**, silicone-free				7100-0060-1000-000	**3,38 €**
	For further information, see last chapter Accessories!					

THERMASGARD® ALTM 2 - Modbus - T3

Surface-contact temperature measuring transducer / pipe surface-contact sensor incl. strap, with detached sensor head, calibratable, with Modbus connection

S+S REGELTECHNIK

Calibratable surface-contact temperature measuring transducer (detached variant) **THERM**ASGARD® **ALTM 2 - Modbus - T3**, with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, cable sensor with pipe feeder, incl. strap, optionally with / without display, measures temperature (–50...+150 °C). International system of units **SI** (default) can be changed to **imperial** (via Modbus).

The pipe surface-contact sensor is used to detect the temperature on lines, pipes (e.g., cold and warm water) or on heating sections for heating control.

Innovative Modbus sensor with galvanically separated RS485 Modbus interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in current-free state, internal LEDs for telegram status display, two separate push-in terminals and large three-line display (illuminated, with customised programming in the 7-segment range and dot-matrix range). Uses **internal diagnostics** to detect sensor breakage or sensor short circuit as errors. The error messages can be retrieved via Modbus and are shown on the display. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

Voltage supply:	24 V AC (± 20 %); 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
System of units:	**SI** (default) or **Imperial** (switchable via Modbus)
Data points:	Temperature [°C] [°F]
Sensor:	Pt1000, DIN EN 60751, class B (**Perfect Sensor Protection** at IP68)
Measuring range:	–50...+150 °C, T_{max} **at +150 °C** (detached sensor variant)
Deviation, temperature:	typically ± 0.2 K at +25 °C
Zero point offset:	± 10 °C
Ambient temperature:	Measuring transducer –30...+70 °C
Medium:	clean air and non-aggressive, non-combustible gases
Bus protocol:	Modbus (RTU mode), address range 0...**247** selectable
Baud rate:	9600, 19200, 38400 Baud
Signal filtering:	0.3 s / 1 s / 10 s
Sensor protection:	pipe feeder made of stainless steel **V4A** (1.4571), Ø = 6 mm, L = 50 mm
Sensor cable:	Silicone, SiHF, 2 x 0.25 mm²; cable length (KL) = 1.5m (other lengths and jacket materials, e.g. PTFE or glass fibre with steel mesh, available on request)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45.8 mm (Tyr 3 with display)
Cable connection:	**cable gland**, plastic (2x M 20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) **or M12 connector** according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.2 - 1.5 mm², using push-in terminal
Process connection:	Endless strap with metal tightener (included in scope of delivery) Ø = 13 - 92 mm (¼ - 3"), L = 300 mm
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type housing:	**IP 65** (according to EN 60 529)
Protection type sensor:	**IP 65** (according to EN 60 529) **sleeve** humidity-tight (standard) **IP 68** (according to EN 60 529) **sleeve** water-tight (optional)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU
Features:	**Display with illumination**, three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual temperature, error message or an individually programmable display value
Internal diagnostics:	**Error 1** at sensor breakage **Error 2** at sensor short circuit

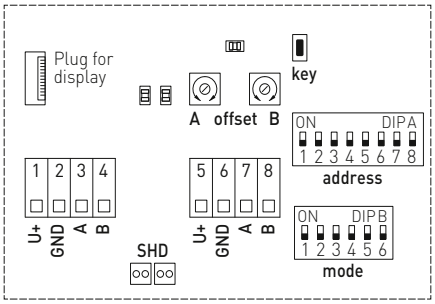
ALTM 2 - Modbus - T3



Device version with **M12 connector** (optional on request)

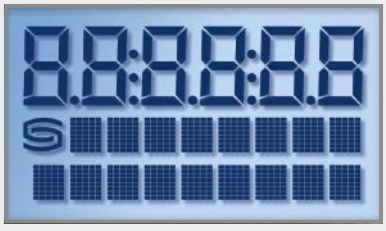


Schematic diagram **Modbus Tyr 3**



DIP A: Bus address
DIP B: Bus parameters (Baud rate, parity...)
Telegram indicator Reception (LED green) Error (LED red)
LED (internal status)
Offset correction
Button „**key**" (auto zero)
Shielding

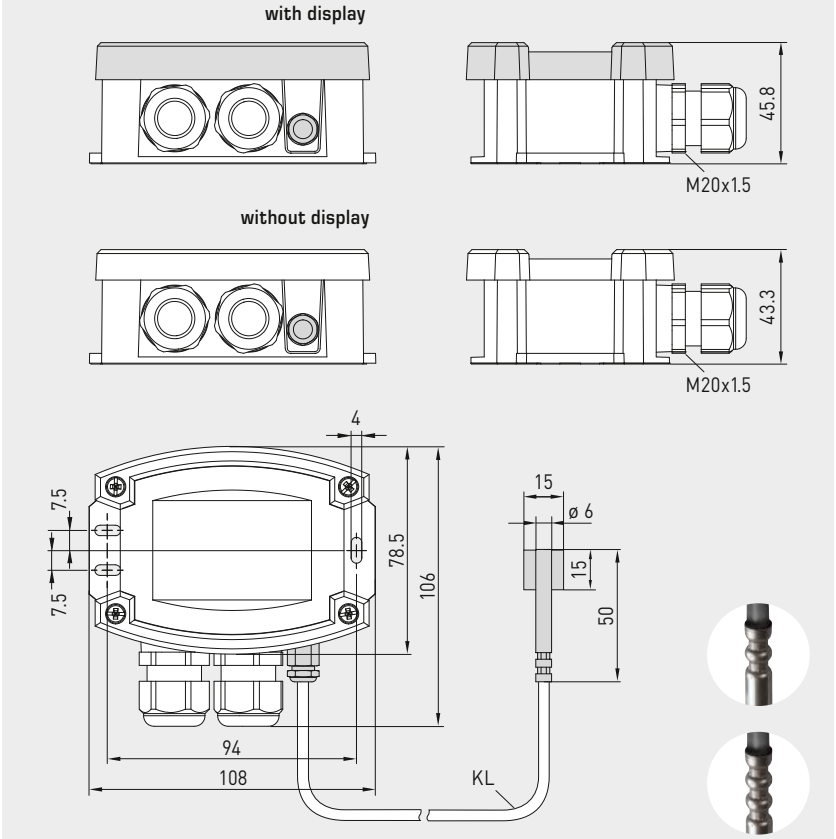
Programmable display screen **Modbus Tyr 3**



Surface-contact temperature measuring transducer / pipe surface-contact sensor incl. strap, with detached sensor head, calibratable, with Modbus connection

Dimensional drawing [mm]

ALTM 2 - Modbus - T3



ALTM 2 - Modbus - T3
with display



IP 65 (standard)
humidity-tight

IP 68 (optional)
water-tight
Perfect Sensor Protection





High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

THERMASGARD® ALTM 2 - Modbus - T3	Surface contact temperature / tube contact temperature measuring transducers					
Type / WG01	**Sensor**	**Output**	**Type**	**Display**	**Item No.**	**Price**
ALTM 2 - Modbus - T3						
ALTM2-Modbus-T3	Pt1000	Modbus	Remote sensor		1101-62B6-0210-000	**179,25 €**
ALTM2-Modbus-T3 **LCD**	Pt1000	Modbus	Remote sensor	■	1101-62B6-4210-000	**233,56 €**
Extra charge:	Protection type **IP 68** (sensor sleeve watertight compound-filled)					**3,40 €**
	per running metre of connecting lead (**silicone / PTFE / glass fibre**)				on request	
	Cable connection with **M12 connector** according to DIN EN 61076-2-101				on request	
Note:	System of units **SI** (default) or **imperial** (can be changed via Modbus).					
ACCESSORIES						
KA2-Modbus	**Communication adapter** (USB/RS485) for system connection				1906-1200-0000-100	**213,99 €**
LA-Modbus	**Line termination device** (with terminating resistor) as an active bus termination				1906-1300-0000-100	**79,81 €**
WLP-1	**Heat-conductive paste**, silicone-free				7100-0060-1000-000	**3,38 €**
	For further information, see last chapter Accessories!					

THERMASGARD® RPTM 1 - Modbus - T3

**Pendulum room temperature measuring transducer,
(with stainless steel sleeve), calibratable,
with Modbus connection**

S+S REGELTECHNIK

Calibratable room pendulum temperature measuring transducer (with sleeve) **THERM**ASGARD® **RPTM 1 - Modbus - T3**, with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, cable sensor with stainless steel sleeve and plastic sinter filter (exchangeable), optionally with / without display, measures temperature (–50...+150 °C). International system of units **SI** (default) can be changed to **imperial** (via Modbus).

The pendulum sensor has been specially designed to detect the temperature in larger rooms or halls. The resistance thermometer achieves a very good representative measurement result due to its positioning in the room.

Innovative Modbus sensor with galvanically separated RS485 Modbus interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in current-free state, internal LEDs for telegram status display, two separate push-in terminals and large three-line display (illuminated, with customised programming in the 7-segment range and dot-matrix range). Uses **internal diagnostics** to detect sensor breakage or sensor short circuit as errors. The error messages can be retrieved via Modbus and are shown on the display. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

Voltage supply:	24 V AC (± 20 %); 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
System of units:	**SI** (default) or **Imperial** (switchable via Modbus)
Data points:	Temperature [°C] [°F]
Sensor:	Pt1000, DIN EN 60751, class B
Sensor protection:	**plastic** sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional **metal** sinter filter, Ø 16 mm, L = 32 mm)
Measuring range:	–50...+150 °C
Deviation, temperature:	typically ± 0.2 K at +25 °C
Zero point offset:	± 10 °C
Ambient temperature:	Measuring transducer –30...+70 °C
Medium:	clean air and non-aggressive, non-combustible gases
Bus protocol:	Modbus (RTU mode), address range 0...**247** selectable
Baud rate:	9600, 19200, 38400 Baud
Signal filtering:	0.3 s / 1 s / 10 s
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45.8 mm (Tyr 3 with display)
Cable connection:	**cable gland**, plastic (2x M 20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) **or M12 connector** according to DIN EN 61076-2-101 (optional on request)
Connection cable:	PVC, H03VV-F, 2 x 0.5 mm², cable length (KL) = approx. 1.5 m (other lengths optional)
Protective tube:	stainless steel **V2A** (1.4301), Ø = 16 mm, NL = 142 mm
Electrical connection:	0.2 - 1.5 mm², using push-in terminals
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU
Features:	**Display with illumination**, three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual temperature, error message or an individually programmable display value
Internal diagnostics:	**Error 1** at sensor breakage **Error 2** at sensor short circuit

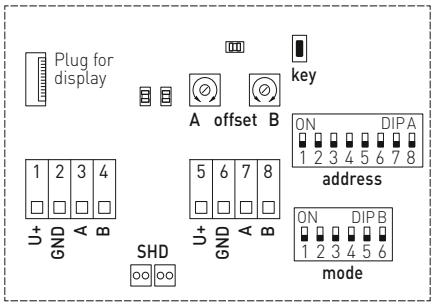
RPTM 1 - Modbus - T3



Device version
with **M12 connector**
(optional on request)

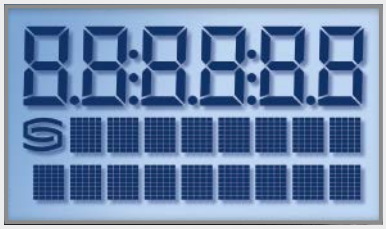


Schematic diagram **Modbus Tyr 3**



DIP A: Bus address
DIP B: Bus parameters (Baud rate, parity...)
Telegram indicator Reception (LED green) Error (LED red)
LED (internal status)
Offset correction
Button „**key**" (auto zero)
Shielding

Programmable display screen **Modbus Tyr 3**

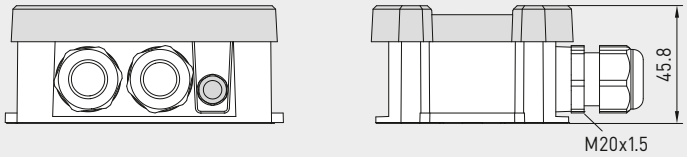


Pendulum room temperature measuring transducer, (with stainless steel sleeve), calibratable, with Modbus connection

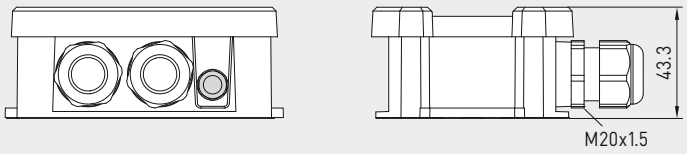
Dimensional drawing [mm]

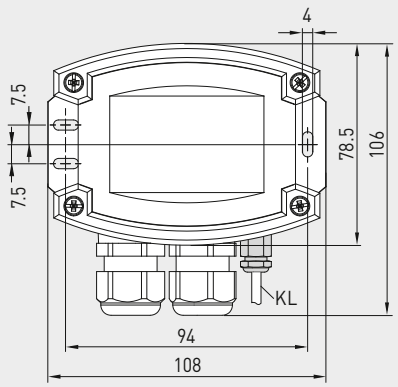
RPTM1 - Modbus - T3

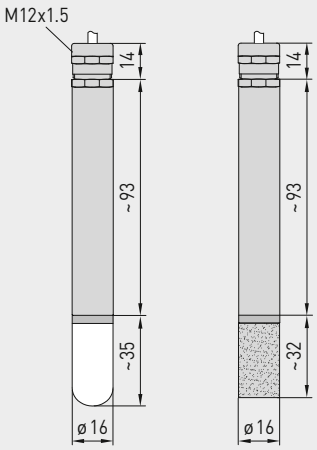
with display



without display







RPTM1 - Modbus - T3
with display



MF-16-K
Mounting flange, plastic (optional)







SF-K
with plastic sinter filter (standard)



SF-M
with metal sinter filter (optional)



THERMASGARD® **RPTM 1 - Modbus - T3** Pendulum room temperature measuring transducer (with stainless steel sleeve)						
Type / WG01	**Sensor**	**Output**	**Type**	**Display**	**Item No.**	**Price**
RPTM 1 - Modbus - T3						
RPTM1-Modbus-T3	Pt1000	Modbus	Remote sensor		1101-6286-0210-000	**214,66 €**
RPTM1-Modbus-T3 **LCD**	Pt1000	Modbus	Remote sensor	■	1101-6286-4210-000	**269,43 €**
Extra charge:	per running metre of connecting lead (**PVC**)				on request	
	Cable connection with **M12 connector** according to DIN EN 61076-2-101				on request	
Note:	System of units **SI** (default) or **imperial** (can be changed via Modbus).					
ACCESSORIES						
KA2-Modbus	**Communication adapter** (USB/RS485) for system connection				1906-1200-0000-100	**213,99 €**
LA-Modbus	**Line termination device** (with terminating resistor) as an active bus termination				1906-1300-0000-100	**79,81 €**
SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel **V4A** (1.4404)				7000-0050-2200-100	**42,33 €**
MF-16-K	**Mounting flange** plastic (optional)				7100-0030-0000-000	**9,56 €**
	For further information, see last chapter Accessories!					

THERMASGARD® RPTM 2 - Modbus - T3

**Pendulum room temperature measuring transducer,
(with globe), calibratable,
with Modbus connection**

S+S REGELTECHNIK

Calibratable room pendulum temperature measuring transducer (with globe) **THERM**ASGARD® **RPTM 2 - Modbus - T3**, with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, cable sensor with a black plastic globe, optionally with / without display, measures temperature (–50...+150 °C). International system of units **SI** (default) can be changed to **imperial** (via Modbus).

The pendulum sensor has been specially designed to detect the temperature in larger rooms or halls. The resistance thermometer (globe thermometer) achieves a very good, representative measurement result due to its positioning in the room. The dark radiation sensor determines the effective radiation heat at the measured location. This is relevant for calculating the thermal comfort (operative room temperature) taking into account the co-action of thermal radiation and thermal convection. The ratio of globe temperature / air temperature is approx. 70% / 30%.

Innovative Modbus sensor with galvanically separated RS485 Modbus interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in current-free state, internal LEDs for telegram status display, two separate push-in terminals and large three-line display (illuminated, with customised programming in the 7-segment range and dot-matrix range). Uses **internal diagnostics** to detect sensor breakage or sensor short circuit as errors. The error messages can be retrieved via Modbus and are shown on the display. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

Voltage supply:	24 V AC (± 20 %); 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
System of units:	**SI** (default) or **Imperial** (switchable via Modbus)
Data points:	Temperature [°C] [°F]
Sensor:	Pt1000, DIN EN 60751, class B
Measuring range:	–50...+150 °C; T_{min} **–50 °C**, T_{max} **+ 80 °C**
Deviation, temperature:	typically ± 0.2 K at +25 °C
Zero point offset:	± 10 °C
Ambient temperature:	Measuring transducer –30...+70 °C
Medium:	clean air and non-aggressive, non-combustible gases
Bus protocol:	Modbus (RTU mode), address range 0...**247** selectable
Baud rate:	9600, 19200, 38400 Baud
Signal filtering:	0,3 s / 1 s / 10 s
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45.8 mm (Tyr 3 with display)
Cable connection:	**cable gland**, plastic (2x M 20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) **or M12 connector** according to DIN EN 61076-2-101 (optional on request)
Connection cable:	PVC, H03VV-F, 2 x 0.5 mm², cable length (KL) = approx. 1.5 m (other lengths optional)
Globe:	plastic, colour black, Ø = 50 mm
Electrical connection:	0.2 - 1.5 mm², using push-in terminals
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU
Features:	**Display with illumination**, three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual temperature, error message or an individually programmable display value
Internal diagnostics:	**Error 1** at sensor breakage **Error 2** at sensor short circuit

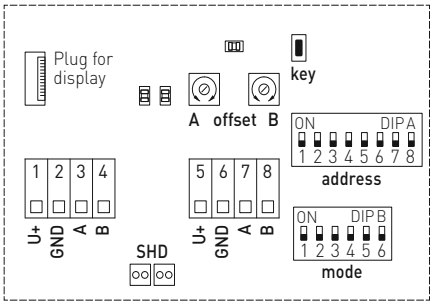
RPTM 2 - Modbus - T3



Device version
with **M12 connector**
(optional on request)

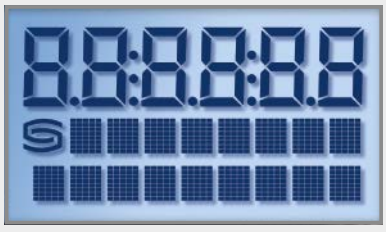


Schematic diagram **Modbus Tyr 3**



DIP A: Bus address
DIP B: Bus parameters (Baud rate, parity...)
Telegram indicator Reception (LED green) Error (LED red)
LED (internal status)
Offset correction
Button „**key**" (auto zero)
Shielding

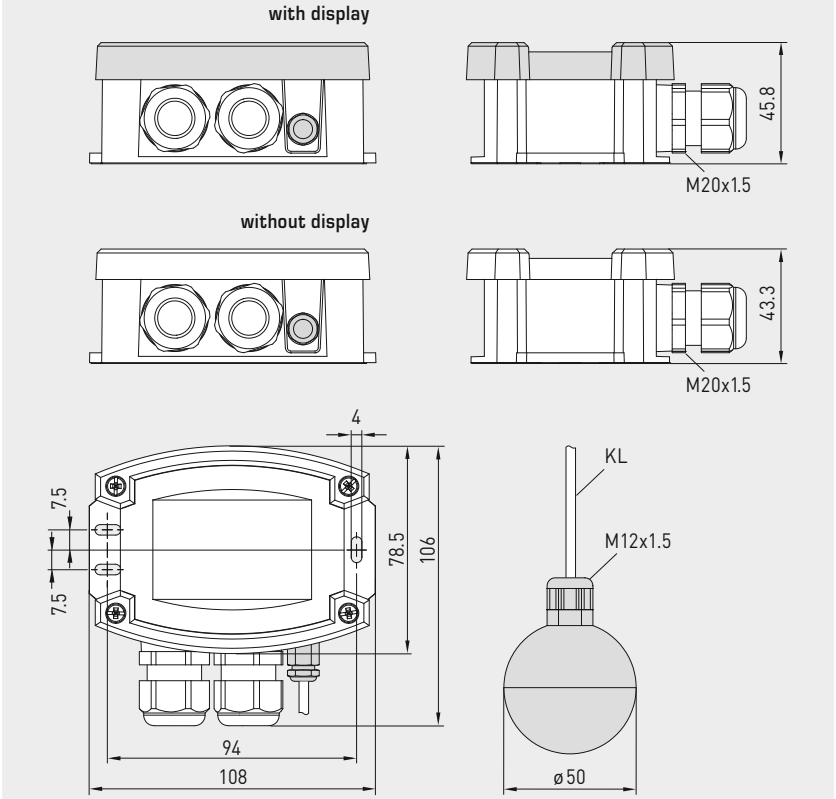
Programmable display screen **Modbus Tyr 3**



Pendulum room temperature measuring transducer, (with globe), calibratable, with Modbus connection

Dimensional drawing [mm]

RPTM2 - Modbus - T3



RPTM2 - Modbus - T3
with display







THERMASGARD® RPTM 2 - Modbus - T3 Pendulum room temperature measuring transducer (with globe)						
Type / WG01	**Sensor**	**Output**	**Type**	**Display**	**Item No.**	**Price**
RPTM 2 - Modbus - T3						
RPTM2-Modbus-T3	Pt1000	Modbus	Remote sensor		1101-6296-0210-000	**221,19 €**
RPTM2-Modbus-T3 **LCD**	Pt1000	Modbus	Remote sensor	■	1101-6296-4210-000	**276,06 €**
Extra charge:	per running metre of connecting lead (**PVC**)				on request	
	Cable connection with **M12 connector** according to DIN EN 61076-2-101				on request	
Note:	System of units **SI** (default) or **imperial** (can be changed via Modbus).					
ACCESSORIES						
KA2-Modbus	**Communication adapter** (with USB and RS485 interface) for system connection (incl. quick-start software)				1906-1200-0000-100	**213,99 €**
LA-Modbus	**Line termination device** (with terminating resistor) as an active bus termination of RS485 networks				1906-1300-0000-100	**79,81 €**

HYGRASGARD® RFTF-Modbus

Room humidity and temperature sensor (± 2.0 %), on-wall, for temperature, relative / absolute humidity, dew point, mixture ratio, enthalpy, calibratable, with Modbus connection

S+S REGELTECHNIK

The calibratable room sensor **HYGR**ASGARD® **RFTF-Modbus** with Modbus connection, in an elegant plastic housing (Baldur 2) with snap-on lid, base with 4-hole attachment, optionally with/without display, measures air humidity (0...100 % RH) and temperature (0...+50 °C). International system of units **SI** (default) can be changed to **imperial** (via Modbus). These measured values are used to internally calculate the following parameters that can be retrieved via Modbus: relative humidity, absolute humidity, mixture ratio, dew point temperature, enthalpy (ignoring atmospheric air pressure) and temperature.

A long-term stable, **digital humidity and temperature sensor** guarantees exact measurement results. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible. **Modbus sensor** with galvanically separated RS485 Modbus interface, selectable bus termination resistance, DIP switches for setting the bus parameters and bus address in a currentless state, internal LEDs for telegram status display and two-line display (illuminated, in the 7-segment and dot-matrix range, individually programmable).

RFTF-Modbus
Standard



TECHNICAL DATA

Power supply:	24 V AC (± 20 %) and 15...36 V DC
Power consumption:	< 1.0 W / 24 V DC; < 2.2 VA / 24 V AC
Sensor:	**Digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
System of units:	**SI** (default) or **Imperial** (switchable via Modbus)
Data points:	Temperature [°C] [°F], relative humidity [% RH], absolute humidity [g/m³] [gr/ft³], dew point [°C] [°F], mixture ratio [g/kg] [gr/lb], enthalpy [kJ/kg] [Btu/lb], setpoint potentiometer, rotary switch and presence button
Measuring range:	0...100 % RH (humidity) 0...+ 50 °C (temperature)
Deviation, humidity:	typically **± 2.0** % (20...80 % RH) at +25 °C, otherwise ± 3.0 %
Deviation, temperature:	typically ± 0.2 K at +25 °C
Zero point offset:	± 10 % RH (humidity) ± 10 °C (temperature) adjustable using potentiometer
Ambient temperature:	storage –35...+85 °C; operation 0...+50 °C
Medium:	clean air and **non-aggressive**, non-combustible gases
Bus protocol:	Modbus (RTU mode), address range 0...**247** selectable
Baud rate:	9600, 19200, 38400 Baud
Signal filtering:	4 s / 32 s
Electrical connection:	0.2 - 1.5 mm², via terminal screws
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010)
Dimensions:	98 x 98 x 33 mm (Baldur 2)
Installation:	wall mounting or on in-wall flush box, Ø 55 mm, base with 4 holes, for attachment to vertically or horizontally installed in-wall flush boxes for rear cable entry, with predetermined breaking point for cable entry from top / bottom in case of plain on-wall installation
Long-term stability:	± 1 % per year
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 30** (according to EN 60 529)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU, according to EN 61 326
Features:	**Display with illumination,** two-line, programmable, cutout approx. 36 x 15 mm (W x H), to display actual humidity and temperature or a selectable parameter or an individually programmable display value
ACCESSORIES	see table

Display
Standard

RFTF-Modbus
Display



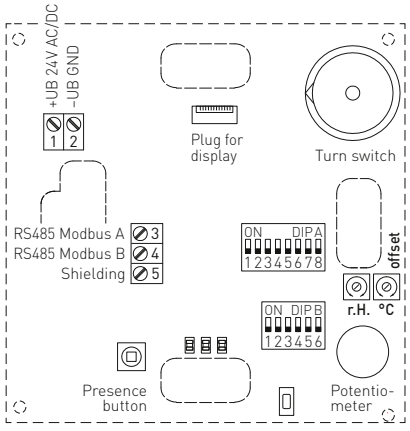


Temperature [°C] [°F]



Humidity [% RH]

Schematic diagram **RFTF-Modbus**

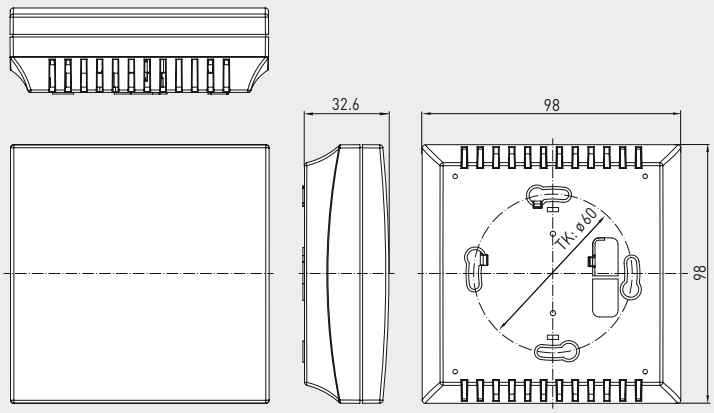


DIP A: Bus address
DIP B: Bus parameters (Baud rate, parity ...)
Telegram indicator
Reception (LED green)
Error (LED red)
LED (internal status)

Room humidity and temperature sensor (± 2.0 %), on-wall, for temperature, relative / absolute humidity, dew point, mixture ratio, enthalpy, calibratable, with Modbus connection

Dimensional drawing
[mm]

Housing **Baldur 2**



SI IMP

RFTF-Modbus
with display



Display
alternative output variables

RFTF-Modbus
Display



The display value depends on the set unit system.
By default, the display alternates between the **actual temperature** and the **actual humidity** (relative humidity).

The Modbus interface allows the display to be **individually** configured both in the 7-segment area and in the dot-matrix area.

The **Modbus configuration** can be used to program an alternative output variable instead of the standard display.
In this case, the first line displays the value and index while the second line displays the corresponding unit.
The index identifies the display type:

Index 1 = temperature
Index 2 = setpoint potentiometer
Index 3 = dew point
Index 4 = relative humidity
Index 5 = absolute humidity
Index 6 = mixture ratio
Index 7 = enthalpy

HYGRASGARD® RFTF-Modbus — Room humidity and temperature sensor

Type / WG01	Measuring Range / Readout Humidity (switchable)		Temperature	Output	Display	Item No.	Price
RFTF-Modbus							
RFTF-Modbus	0...100 % RH 0...80 g / kg 0...80 g / m³ 0...85 kJ / kg –20...+80 °C	(default) (MR) (A.H.) (ENT.) (DP)	0...+50 °C	Modbus		1201-42B6-6000-000	**164,21 €**
RFTF-Modbus **LCD**	0...100 % RH 0...80 g / kg 0...80 g / m³ 0...85 kJ / kg –20...+80 °C	(default) (MR) (A.H.) (ENT.) (DP)	0...+50 °C	Modbus	■	1201-42B6-7000-000	**202,41 €**
Note:	System of units **SI** (default) or **imperial** (can be changed via Modbus).						
ACCESSORIES							
KA2-Modbus	**Communication adapter** (with USB and RS485 interface) for system connection					1906-1200-0000-100	**213,99 €**
LA-Modbus	**Line termination device** (with terminating resistor) as an active bus termination					1906-1300-0000-100	**79,81 €**

HYGRASGARD® FSFTM - Modbus

Room, humidity and temperature sensor or measuring transducer for temperature, relative / absolute humidity, dew point, mixture ratio, enthalpy, in-wall in the panel switch programme, with Modbus connection

S+S REGELTECHNIK

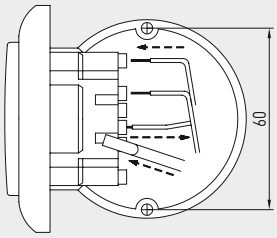
The room sensor and measuring transducer **HYGR**ASGARD® **FSFTM - Modbus** in the in-wall housing, optionally with potentiometer, is used to measure the relative humidity and temperature of the air, and for setpoint adjustment. The following parameters are calculated internally from the measured values: relative humidity [% RH], absolute humidity [g / m³], mixture ratio [g / kg], dew point temperature [°C], enthalpy [kJ / kg] (ignoring atmospheric air pressure) and room temperature [°C]. The parameters are queried via the Modbus interface.

A digital, long-term stable sensor is used for humidity and temperature measurement. Relative humidity [% RH] is the quotient of water vapour partial pressure divided by the saturation vapour pressure at the respective gas temperature.

The in-wall sensor is mounted in high-quality panel switch programmes, ideally of the brands Gira, Berker, Merten, Jung, Siemens or Busch-Jaeger (using in-wall adapters, no setpoint adjustment possible) either individually or in combination with light switches, socket outlets, etc.

It is used in non-aggressive, dust-free environments, in refrigeration, air conditioning and clean room technology, and in interior rooms, such as living rooms, offices, hotels, etc.

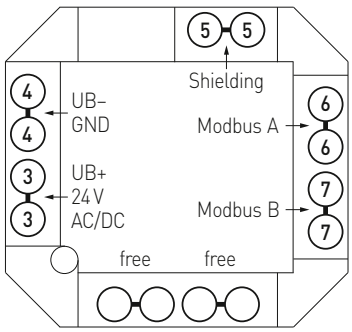
Mounting diagram **in-wall**



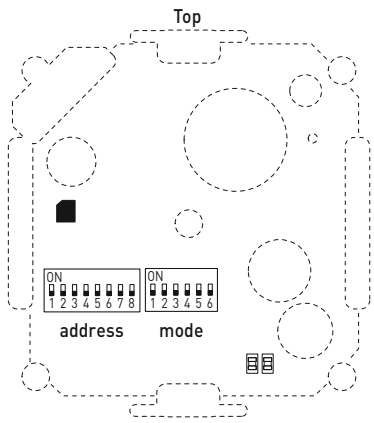
TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %)
Power consumption:	< 1.1 W / 24 V DC ; < 2.2 VA / 24 V AC
Data points:	temperature [°C], relative humidity [% RH] absolute humidity [g / m³], dew point [°C], mixing ratio [g / kg], enthalpy [kJ / kg] and setpoint potentiometer (no setpoint adjustment possible with Busch-Jaeger)
Bus protocol:	Modbus (RTU mode), address range 0…**247** selectable
Signal filtering:	4 s / 32 s
HUMIDITY	
Sensor:	**digital humidity sensor,** **with integrated temperature sensor,** low hysteresis, high long-term stability
Long-term stability:	± 1 % per year
Measuring range, humidity::	0…100 % RH
Operating range, humidity:	0…95 % RH (non-precipitating air)
Deviation, humidity:	typically ± 3.0 % (20…80 % RH) at +25 °C, otherwise ± 5.0 %
TEMPERATURE	
Measuring range:	0…+50 °C
Deviation, temperature:	typically ± 0.8 K at +25 °C
Mounting:	in-wall flush box Ø 55 mm
Electrical connection:	1.0 - 2.5 mm², via plug terminals
Ambient temperature:	Storage –35…+85 °C; Operation 0…+50 °C
Permitted humidity:	max. 90 % RH, non-precipitating air
Medium:	clean air and other non-aggressive, non-combustible gases
Protection class:	III (according to EN 60 730)
Protection type:	**IP 20** (according to 60 529)
Standards:	CE-conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU
SWITCH PROGRAMME	
Manufacturer:	GIRA System 55 (other switch programmes, manufacturers, colours as well as prices available upon request)
Housing:	plastic, the standard colour is pure glossy white (similar to RAL 9010) (other colours are available upon request with colour variants depending on the respective light switch programme)

Connection diagram **FSFTM - Modbus**

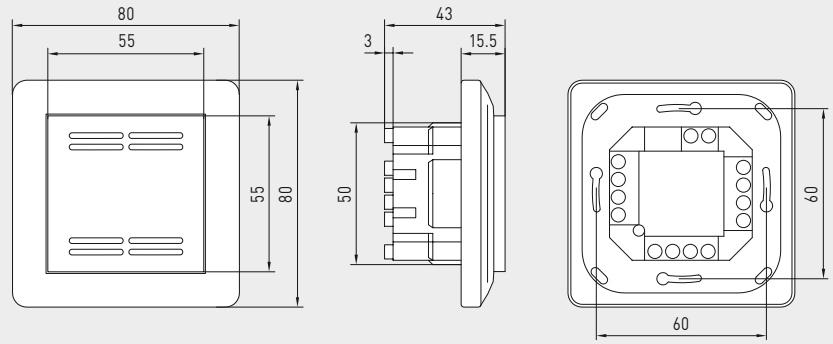


Schematic diagram **FSFTM - Modbus**



Room, humidity and temperature sensor or measuring transducer for temperature, relative / absolute humidity, dew point, mixture ratio, enthalpy, in-wall in the panel switch programme, with Modbus connection

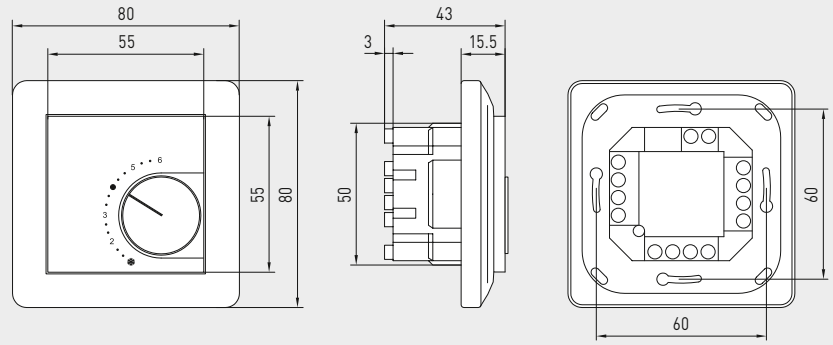
Dimensional drawing **FSFTM - Modbus**



FSFTM - Modbus
Standard



Dimensional drawing **FSFTM - Modbus - P**



FSFTM - Modbus - P
with potentiometer



HYGRASGARD® FSFTM - Modbus Room temperature and humidity sensor, in-wall

Type / WG02	Measuring Range Humidity (base value)		Temperature	Control element	Output	Item No.	Price
FSFTM - Modbus							
FSFTM-Modbus	0...100 % RH 0...80 g / kg 0...80 g / m³ 0...85 kJ / kg –20...+80 °C	(default) (MV) (a.F.) (ENT.) (TP)	0...+50 °C	–	Modbus	1201-9226-1000-162	**290,47 €**
FSFTM-Modbus P	0...100 % RH 0...80 g / kg 0...80 g / m³ 0...85 kJ / kg –20...+80 °C	(default) (MV) (a.F.) (ENT.) (TP)	0...+50 °C	Potentiometer	Modbus	1201-9226-1400-282	**314,18 €**
Data points:	relative humidity [% RH], absolute humidity [g / m³], mixture ratio [g / kg], dew point temperature [°C], enthalpy [kJ / kg] (ignoring atmospheric air pressure), temperature [°C] and setpoint potentiometer						

ACCESSORIES			
KA2 - Modbus	**Communication adapter** (with USB and RS485 interface) for system connection (incl. quick-start software)	1906-1200-0000-100	**213,99 €**
LA - Modbus	**Line termination device** (with terminating resistor) as an active bus termination of RS485 networks	1906-1300-0000-100	**79,81 €**

HYGRASGARD® AFTF - Modbus - T3

On-wall-humidity- and temperature sensors (± 2.0 %), for mixture ratio, relative / absolute humidity, dew point, enthalpy and temperature, calibratable, with Modbus connection

S+S REGELTECHNIK

Calibratable outside humidity and temperature sensor **HYGR**ASGARD® **AFTF - Modbus - T3**, with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, optionally with / without display, with a plastic sinter filter (exchangeable), to exactly detect the relative humidity (0...100 % RH) and the temperature (–35...+80 °C) and to detect various parameters in humidity measurement. International system of units **SI** (default) can be switched to **Imperial** (via Modbus). The on-wall sensor is applied in a non-aggressive, dust-free environment. It is used in the refrigeration, air conditioning and clean room technology, engineering rooms, hotels and conference facilities.

A long-term stable, **digital humidity and temperature sensor** guarantee exact measurement results. These measurands are used to internally calculate the following parameters that can be retrieved via Modbus: relative humidity, absolute humidity, mixture ratio, dew point, enthalpy (ignoring atmospheric air pressure) and ambient temperature.

Innovative Modbus sensor with galvanically separated RS485-Modbus-interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in curent-free state, internal LEDs for telegram status display, two separate push-in terminals and large three-line display (illuminated; with customised programming in the 7-segment and dot-matrix range). The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

AFTF - Modbus - T3



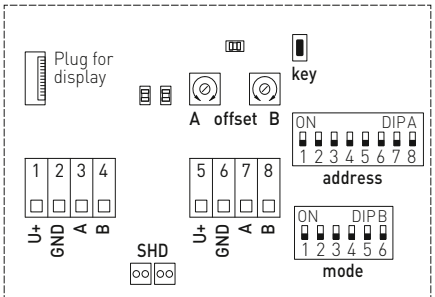
Device version with **M12 connector** (optional on request)



TECHNICAL DATA

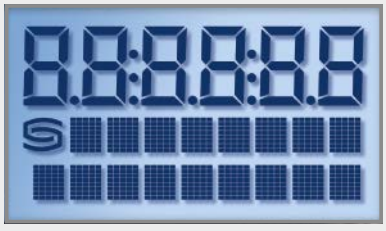
Voltage supply:	24 V AC (± 20 %); 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
System of units:	**SI** (default) or **Imperial** (switchable via Modbus)
Data points:	temperature [°C] [°F], relative humidity [% RH], dew point [°C] [°F], absolute humidity [g/m³] [gr/ft³], mixing ratio [g/kg] [gr/lb], enthalpy [kJ/kg] [Btu/lb]
Sensor:	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
Sensor protection:	**plastic** sinter filter, Ø 16 mm, L = 35 mm, exchangeable
Measuring range:	0...100 % RH (humidity) –35...+80 °C (temperature)
Deviation, humidity:	typically **± 2.0** % (20...80 % RH) at +25 °C, otherwise ± 3.0 %
Temperature deviation:	typically ± 0.4 K at +25 °C
Zero point offset:	± 10 % RH (humidity) ± 5 °C (temperature)
Ambient temperature:	–30...+70 °C
Medium:	clean air and non-aggressive, non-combustible gases
Bus protocol:	Modbus (RTU mode), address range 0...**247** selectable
Baud rate:	9600, 19200, 38400 Baud
Signal filtering:	4 s / 32 s
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45.8 mm (Tyr 3 with display)
Cable connection:	**cable gland**, plastic (2x M 20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) **or M12 connector** according to DIN EN 61076-2-101 (optional on request)
Process connection:	by screws
Electrical connection:	0.2 - 1.5 mm², using push-in terminals
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU
Features:	**Display with illumination**, three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual humidity and actual temperature (cyclic) or a selectable parameter (static) or an individually programmable display value

Schematic diagram **Modbus Tyr 3**



DIP A: Bus address
DIP B: Bus parameters (Baud rate, parity...)
Telegram indicator Reception (LED green) Error (LED red)
LED (internal status)
Offset correction
Button „**key**" (auto zero)
Shielding

Programmable display screen **Modbus Tyr 3**

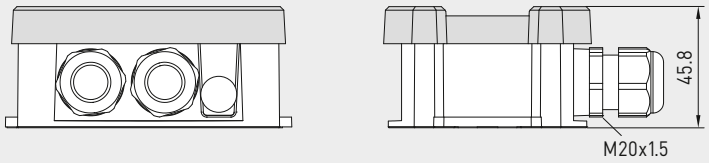


On-wall-humidity- and temperature sensors (± 2.0 %), for mixture ratio, relative/absolute humidity, dew point, enthalpy and temperature, calibratable, with Modbus connection

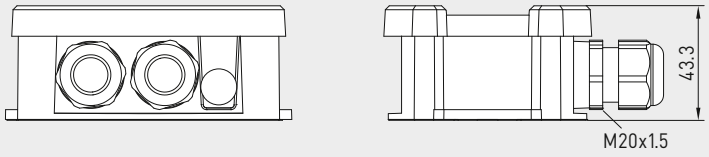
Dimensional drawing [mm]

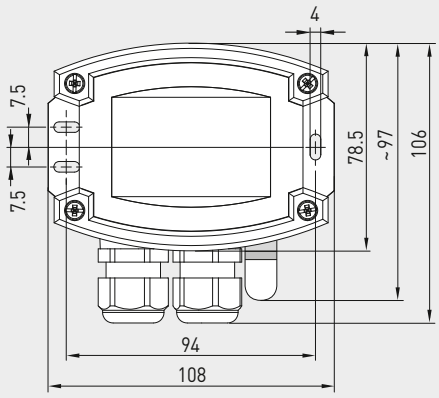
AFTF-Modbus-T3

with display



without display







SF-14-K
Plastic sinter filter exchangeable

AFTF-Modbus-T3
with display



WS-04
Weather and sun protection hood (optional)







HYGRASGARD® AFTF-Modbus-T3 On-wall-humidity- and temperature sensors (± 2.0 %)

Type / WG01	Measuring Range / Readout Humidity (switchable)	Temperature	Output	Display	Item No.	Price
AFTF-Modbus-T3						
AFTF-Modbus-T3	0 ...100 % RH (default) 0 ... 80 g / kg (MV) 0 ... 80 g / m³ (a.F.) 0 ... 85 kJ / kg (ENT.) –20...+80 °C (TP)	–35...+80 °C	Modbus		1201-12C6-1000-000	**211,10 €**
AFTF-Modbus-T3 **LCD**	(5 x as above)	(1 x as above)	Modbus	■	1201-12C6-1400-000	**266,11 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101				on request	
Note:	System of units **SI** (default) or **imperial** (can be changed via Modbus).					

ACCESSORIES			
KA2-Modbus	**Communication adapter** (USB/RS485) for system connection	1906-1200-0000-100	**213,99 €**
LA-Modbus	**Line termination device** (with terminating resistor) as an active bus termination	1906-1300-0000-100	**79,81 €**
WS-01	**Sun and ball-impact protection hood,** 184 x 180 x 80 mm, stainless steel **V2A** (1.4301)	7100-0040-2000-000	**31,77 €**
WS-04	**Weather and sun protection hood,** 130 x 180 x 135 mm, stainless steel **V2A** (1.4301)	7100-0040-7000-000	**37,49 €**
	For further information, see last chapter Accessories!		

HYGRASGARD® KFTF-Modbus-T3
HYGRASGARD® KFTF-20-Modbus-T3

Duct humidity- and temperature sensors (± 1.8 % / ± 2.0 %), incl. mounting flange, for mixture ratio, relative / absolute humidity, dew point, enthalpy and temperature, calibratable, with Modbus connection

S+S REGELTECHNIK

Calibratable duct humidity and temperature sensor **HYGR**ASGARD® **KFTF-Modbus-T3** (± 2.0%) or **KFTF-20-Modbus-T3** (± 1.8%), with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, optionally with / without display, with a plastic sinter filter (exchangeable), incl. mounting flange, to exactly detect the relative humidity (0...100% RH) and the temperature (–35...+80 °C) and to detect various parameters in humidity measurement. International system of units **SI** (default) can be switched to **Imperial** (via Modbus).

The duct sensor is applied in a non-aggressive, dust-free environment and is suitable for installation in ceilings, ducts and devices. It is used in the refrigeration, air conditioning and clean room technology, engineering rooms, hotels and conference facilities.

A long-term stable, **digital humidity and temperature sensor** guarantee exact measurement results. These measurands are used to internally calculate the following parameters that can be retrieved via Modbus: relative humidity, absolute humidity, mixture ratio, dew point, enthalpy (ignoring atmospheric air pressure) and ambient temperature.

Innovative Modbus sensor with galvanically separated RS485-Modbus-interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in curent-free state, internal LEDs for telegram status display, two separate push-in terminals and large three-line display (illuminated; with customised programming in the 7-segment and dot-matrix range). The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

KFTF-Modbus-T3 (± 2,0 %)
KFTF-20-Modbus-T3 (± 1,8 %)



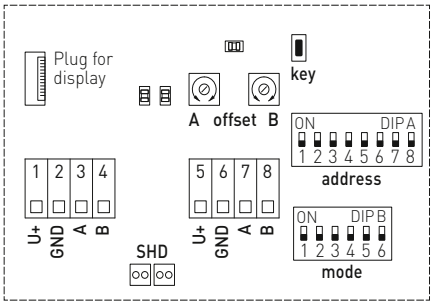
TECHNICAL DATA

Voltage supply:	24 V AC (± 20 %); 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
System of units:	**SI** (default) or **Imperial** (switchable via Modbus)
Data points:	temperature [°C] [°F], relative humidity [% RH], dew point [°C] [°F], absolute humidity [g/m³] [gr/ft³], mixing ratio [g/kg] [gr/lb], enthalpy [kJ/kg] [Btu/lb]
Sensor:	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
Sensor protection:	**plastic** sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional **metal** sinter filter, Ø 16 mm, L = 32 mm)
Measuring range:	0...100 % RH (humidity); –35...+80 °C (temperature)
Deviation, humidity:	**KFTF-Modbus:** typically **± 2.0** % (20...80 % RH) at +25 °C, otherwise ± 3.0 % **KFTF-20-Modbus:** typically **± 1.8** % (10...90 % RH) at +25 °C, otherwise ± 2.0 %
Temperature deviation:	typically ± 0.2 K at +25 °C
Zero point offset:	± 10 % RH (humidity); ± 5 °C (temperature)
Ambient temperature:	–30...+70 °C
Medium:	clean air and non-aggressive, non-combustible gases
Bus protocol:	Modbus (RTU mode), address range 0...**247** selectable
Baud rate:	9600, 19200, 38400 Baud
Signal filtering:	4 s / 32 s
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45.8 mm (Tyr 3 with display)
Cable connection:	**cable gland**, plastic (2x M 20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) **or M12 connector** according to DIN EN 61076-2-101 (optional on request)
Protective tube:	**PLEUROFORM**™, material polyamide (PA6), with torsion protection, Ø 20 mm, NL = 235 mm (optionally 100 mm), v_{max} = 30 m/s (air) (optionally made of stainless steel **V2A** (1.4301), Ø 16 mm)
Process connection:	by mounting flange, plastic (included in the scope of delivery)
Electrical connection:	0.2 - 1.5 mm², using push-in terminals
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU
Features:	**Display with illumination**, three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual humidity and actual temperature (cyclic) or a selectable parameter (static) or an individually programmable display value

Device version with **M12 connector** (optional on request)

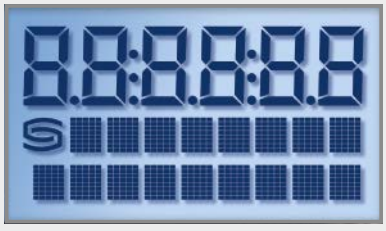


Schematic diagram **Modbus Tyr 3**



DIP A: Bus address
DIP B: Bus parameters (Baud rate, parity...)
Telegram indicator Reception (LED green) Error (LED red)
LED (internal status)
Offset correction
Button „**key**" (auto zero)
Shielding

Programmable display screen **Modbus Tyr 3**



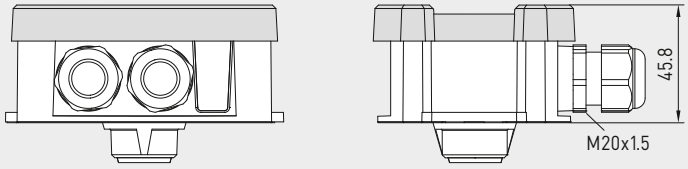
HYGRASGARD® KFTF-Modbus-T3
HYGRASGARD® KFTF-20-Modbus-T3

Duct humidity- and temperature sensors (± 1.8 % / ± 2.0 %), incl. mounting flange, for mixture ratio, relative / absolute humidity, dew point, enthalpy and temperature, calibratable, with Modbus connection

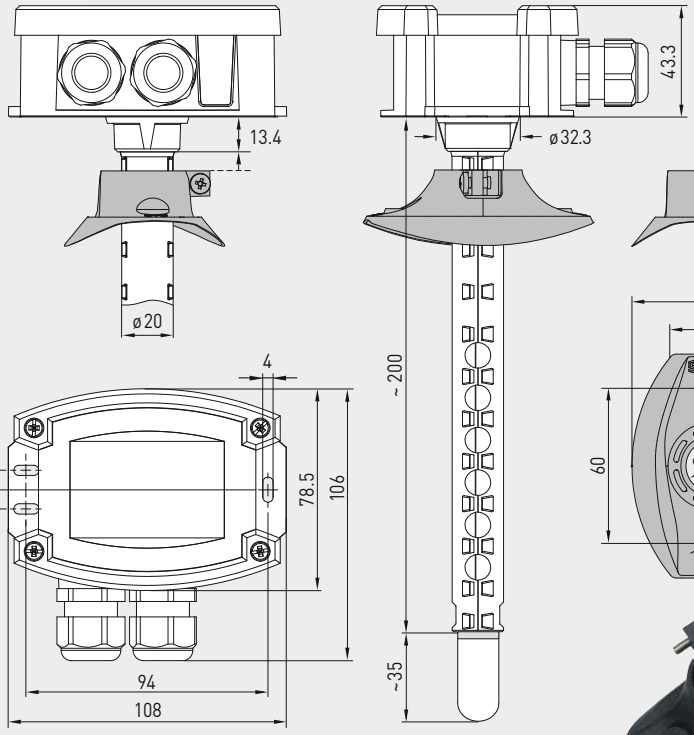
Dimensional drawing
[mm]

KFTF-Modbus-T3
KFTF-20-Modbus-T3

with display



without display



KFTF-Modbus-T3 (± 2,0 %)
KFTF-20-Modbus-T3 (± 1,8 %)
with display



SF-K
Plastic sinter filter
(standard)



SF-M
Metal sinter filter
(optional)

stainless steel protective tube
(optional on request)





MFT-20-K
Mounting flange,
plastic

HYGRASGARD® KFTF-Modbus-T3 Duct humidity- and temperature sensors (± 2.0 %)
HYGRASGARD® KFTF-20-Modbus-T3 Duct humidity- and temperature sensors (± 1.8 %)

Type / WG01	Measuring Range / Readout Humidity (switchable)	Temperature	Output	Display	Item No.	Price
KFTF-Modbus-T3					**(± 2,0 %)**	
KFTF-Modbus-T3	0 ...100 % RH (default) 0 ... 80 g / kg (MV) 0 ... 80 g / m³ (a.F.) 0 ... 85 kJ / kg (ENT.) 0...+50 °C (TP)	–35...+80 °C	Modbus		1201-32C6-1000-029	**209,14 €**
KFTF-Modbus-T3 **LCD**	(5 x as above)	(1 x as above)	Modbus	■	1201-32C6-1400-029	**264,14 €**
KFTF-20-Modbus-T3					**(± 1,8 %)**	
KFTF-20-Modbus-T3	(5 x as above)	(1 x as above)	Modbus		1201-32C6-1000-030	**273,39 €**
KFTF-20-Modbus-T3 **LCD**	(5 x as above)	(1 x as above)	Modbus	■	1201-32C6-1400-030	**411,88 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101 shortened protective tube **PLEUROFORM**™, NL = 100 mm				on request on request	
Note:	System of units **SI** (default) or **imperial** (can be changed via Modbus).					
ACCESSORIES						
KA2-Modbus	**Communication adapter** (USB/RS485) for system connection				1906-1200-0000-100	**213,99 €**
LA-Modbus	**Line termination device** (with terminating resistor) as an active bus termination				1906-1300-0000-100	**79,81 €**
SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable, stainless steel				7000-0050-2200-100	**42,33 €**
MFT-20-K	**Mounting flange**, plastic (included in the scope of delivery)				7000-0031-0000-000	**9,56 €**
	For further information, see last chapter Accessories!					

HYGRASGARD® RPFTF-Modbus-T3
HYGRASGARD® RPFTF-20-Modbus-T3

Pendulum room humidity and temperature sensors (± 1.8 % / ± 2.0 %), for mixture ratio, relative / absolute humidity, dew point, enthalpy and temperature, calibratable, with Modbus connection

S+S REGELTECHNIK

Calibratable room pendulum humidity and temperature sensor **HYGR**ASGARD® **RPFTF-Modbus-T3** (± 2,0 %) or RPFTF-**20-Modbus-T3** (± 1,8 %), with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, optionally with / without display, cable sensor with a stainless steel pendulum and a plastic sinter filter (exchangeable), to exactly detect the relative humidity (0...100 % RH) and the temperature (–35...+80 °C) and to detect various parameters in humidity measurement. International system of units **SI** (default) can be switched to **Imperial** (via Modbus).

The pendulum sensor is applied in a non-aggressive, dust-free environment and is suitable for installation in ceilings, ducts and devices. It is used in the refrigeration, air conditioning and clean room technology, engineering rooms, hotels and conference facilities.

A long-term stable, **digital humidity and temperature sensor** guarantee exact measurement results. These measurands are used to internally calculate the following parameters that can be retrieved via Modbus: relative humidity, absolute humidity, mixture ratio, dew point, enthalpy (ignoring atmospheric air pressure) and ambient temperature.

Innovative Modbus sensor with galvanically separated RS485-Modbus-interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in curent-free state, internal LEDs for telegram status display, two separate push-in terminals and large three-line display (illuminated; with customised programming in the 7-segment and dot-matrix range). The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

RPFTF-Modbus-T3 (± 2,0 %)
RPFTF-20-Modbus-T3 (± 1,8 %)



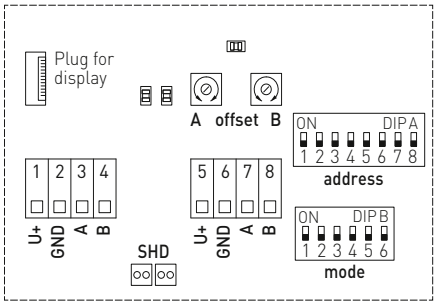
Device version with **M12 connector** (optional on request)



TECHNICAL DATA

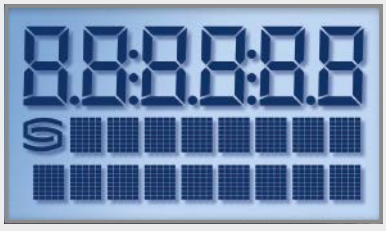
Voltage supply:	24 V AC (± 20 %); 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
System of units:	**SI** (default) or **Imperial** (switchable via Modbus)
Data points:	temperature [°C] [°F], relative humidity [% RH], dew point [°C] [°F], absolute humidity [g/m³] [gr/ft³], mixing ratio [g/kg] [gr/lb], enthalpy [kJ/kg] [Btu/lb]
Sensor:	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
Sensor protection:	**plastic** sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional **metal** sinter filter, Ø 16 mm, L = 32 mm)
Measuring range:	0...100 % RH (humidity); –35...+80 °C (temperature)
Deviation, humidity:	**RFTF-Modbus:** typically **± 2.0** % (20...80 % RH) at +25 °C, otherwise ± 3.0 % **RFTF-20-Modbus:** typically **± 1.8** % (10...90 % RH) at +25 °C, otherwise ± 2.0 %
Temperature deviation:	typically ± 0.2 K at +25 °C
Zero point offset:	± 10 % RH (humidity); ± 5 °C (temperature)
Ambient temperature:	–30...+70 °C
Medium:	clean air and non-aggressive, non-combustible gases
Bus protocol:	Modbus (RTU mode), address range 0...**247** selectable
Baud rate:	9600, 19200, 38400 Baud
Signal filtering:	4 s / 32 s
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45.8 mm (Tyr 3 with display)
Cable connection:	**cable gland**, plastic (2x M 20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) **or M12 connector** according to DIN EN 61076-2-101 (optional on request)
Connection cable:	PVC, LiYY, 6 x 0.14 mm², KL = approx. 2 m (other lengths optional)
Protective tube:	stainless steel **V2A** (1.4301), Ø = 16 mm, NL = 142 mm
Electrical connection:	0.2 - 1.5 mm², using push-in terminals
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU
Features:	**Display with illumination**, three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual humidity and actual temperature (cyclic) or a selectable parameter (static) or an individually programmable display value

Schematic diagram **Modbus Tyr 3**



DIP A: Bus address
DIP B: Bus parameters (Baud rate, parity...)
Telegram indicator Reception (LED green) Error (LED red)
LED (internal status)
Offset correction
Shielding

Programmable display screen **Modbus Tyr 3**

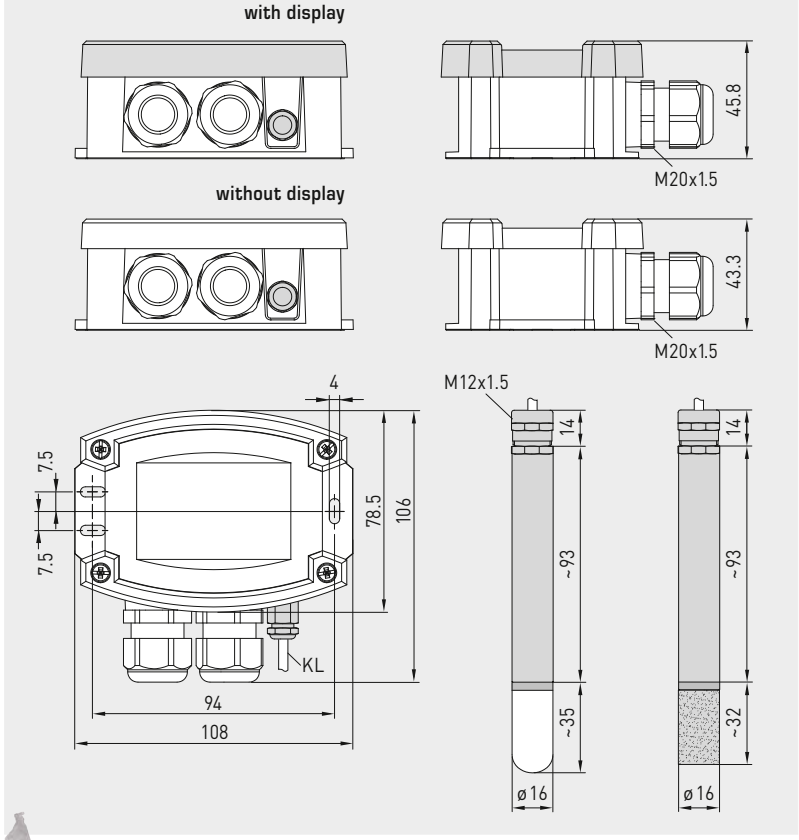


HYGRASGARD® RPFTF-Modbus-T3
HYGRASGARD® RPFTF-20-Modbus-T3

Pendulum room humidity and temperature sensors (± 1.8 % / ± 2.0 %), for mixture ratio, relative / absolute humidity, dew point, enthalpy and temperature, calibratable, with Modbus connection

Dimensional drawing [mm]

RPFTF-Modbus-T3
RPFTF-20-Modbus-T3



RPFTF-Modbus-T3 (± 2,0 %)
RPFTF-20-Modbus-T3 (± 1,8 %)
with display



MF-16-K
Mounting flange, plastic (optional)







SF-K
plastic sinter filter (standard)



SF-M
metal sinter filter (optional)



HYGRASGARD® RPFTF-Modbus-T3 Pendulum room humidity and temperature sensors (± 2.0 %)
HYGRASGARD® RPFTF-20-Modbus-T3 Pendulum room humidity and temperature sensors (± 1.8 %)

Type / WG01	Measuring Range / Readout Humidity (switchable)	Temperature	Output	Display	Item No.	Price
RPFTF-Modbus-T3					**(± 2,0 %)**	
RPFTF-Modbus-T3	0 ... 100 % RH (default) 0 ... 80 g / kg (MV) 0 ... 80 g / m³ (a.F.) 0 ... 85 kJ / kg (ENT.) –20...+80 °C (TP)	–35...+80 °C	Modbus		1201-6246-1000-000	**296,32 €**
RPFTF-Modbus-T3 **LCD**	(5 x as above)	(1 x as above)	Modbus	■	1201-6246-1400-000	**381,36 €**
RPFTF-20-Modbus-T3					**(± 1,8 %)**	
RPFTF-20-Modbus-T3	(5 x as above)	(1 x as above)	Modbus		1201-6246-1000-001	**385,81 €**
RPFTF-20-Modbus-T3 **LCD**	(5 x as above)	(1 x as above)	Modbus	■	1201-6246-1400-001	**441,07 €**
Extra charge:	per running metre of connecting lead (**PVC**)				on request	
	Cable connection with **M12 connector** according to DIN EN 61076-2-101				on request	
Note:	System of units **SI** (default) or **imperial** (can be changed via Modbus).					
ACCESSORIES						
KA2-Modbus	**Communication adapter** (USB/RS485) for system connection				1906-1200-0000-100	**213,99 €**
LA-Modbus	**Line termination device** (with terminating resistor) as an active bus termination				1906-1300-0000-100	**79,81 €**
SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable, stainless steel **V4A** (1.4404)				7000-0050-2200-100	**42,33 €**
MF-16-K	**Mounting flange** plastic (optional)				7100-0030-0000-000	**9,56 €**

HYGRASGARD® VFTF-Modbus-T3

Showcase humidity and temperature sensor (± 2.0 %), for mixture ratio, relative / absolute humidity, dew point, enthalpy and temperature, calibratable, with Modbus connection

S+S REGELTECHNIK

Calibratable display cases humidity and temperature sensor **HYGR**ASGARD® **VFTF-Modbus-T3**, with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, optionally with / without display, cable sensor with a flat stainless steel probe (pluggable), to exactly detect the relative humidity (0...100 % RH) and the temperature (–35...+80 °C) and to detect various parameters in humidity measurement. International system of units **SI** (default) can be switched to **Imperial** (via Modbus).

The display cases sensor is applied in a non-aggressive, dust-free environment and is specially suitable for installation in ceilings, walls, display cases or showcases. It is used in museums, galleries, cinemas, lecture halls or laboratories.

A long-term stable, **digital humidity and temperature sensor** guarantee exact measurement results. These measurands are used to internally calculate the following parameters that can be retrieved via Modbus: relative humidity, absolute humidity, mixture ratio, dew point, enthalpy (ignoring atmospheric air pressure) and ambient temperature.

Innovative Modbus sensor with galvanically separated RS485-Modbus-interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in curent-free state, internal LEDs for telegram status display, two separate push-in terminals and large three-line display (illuminated; with customised programming in the 7-segment and dot-matrix range). The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

Voltage supply:	24 V AC (± 20 %); 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
System of units:	**SI** (default) or **Imperial** (switchable via Modbus)
Data points:	temperature [°C] [°F], relative humidity [% RH], dew point [°C] [°F], absolute humidity [g/m³] [gr/ft³], mixing ratio [g/kg] [gr/lb], enthalpy [kJ/kg] [Btu/lb]
Sensor:	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
Measuring range:	0...100 % RH (humidity); –35...+80 °C (temperature)
Deviation, humidity:	**± 2.0** % (20...80 % RH) at +25 °C, otherwise ± 3.0 %
Deviation, temperature:	typically ± 0.2 K at +25 °C
Zero point offset:	± 10 % RH (humidity); ± 5 °C (temperature)
Ambient temperature:	–30...+70 °C
Medium:	clean air and non-aggressive, non-combustible gases
Bus protocol:	Modbus (RTU mode), address range 0...**247** selectable
Baud rate:	9600, 19200, 38400 Baud
Signal filtering:	4 s / 32 s
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45.8 mm (Tyr 3 with display)
Cable connection:	**cable gland**, plastic (2x M 20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) **or M12 connector** according to DIN EN 61076-2-101 (optional on request)
Connection cable:	PVC, LiYY, 4 x 0.14 mm², KL = approx. 2 m (other lengths optional)
Sensor protection:	**probe** made of stainless steel, **V4A** (1.4571), **pluggable**; sensor head Ø = 17 mm, H = approx. 2.5 mm; protective sleeve Ø = 10 mm, NL = approx. 25 mm, M10 x 1.0; with plastic plug connector Ø = approx. 11 mm, NL = approx. 25 mm
Mounting (sensor):	cut-out Ø = 11 - 15 mm, (EL) = approx. 50 mm, lock nut for fixing is included in the scope of delivery.
Electrical connection:	0.2 - 1.5 mm², using push-in terminals
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU
Features:	**Display with illumination**, three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual humidity and actual temperature (cyclic) or a selectable parameter (static) or an individually programmable display value

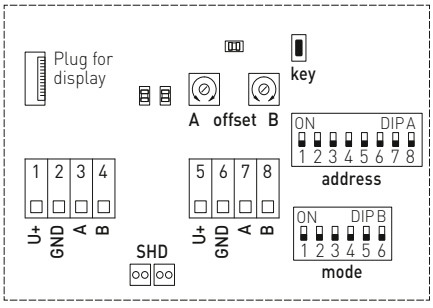
VFTF-Modbus-T3



Device version with **M12 connector** (optional on request)

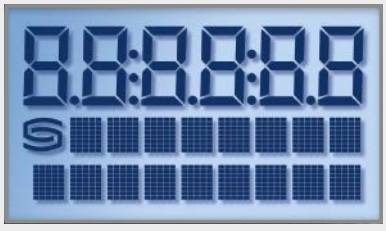


Schematic diagram **Modbus Tyr 3**



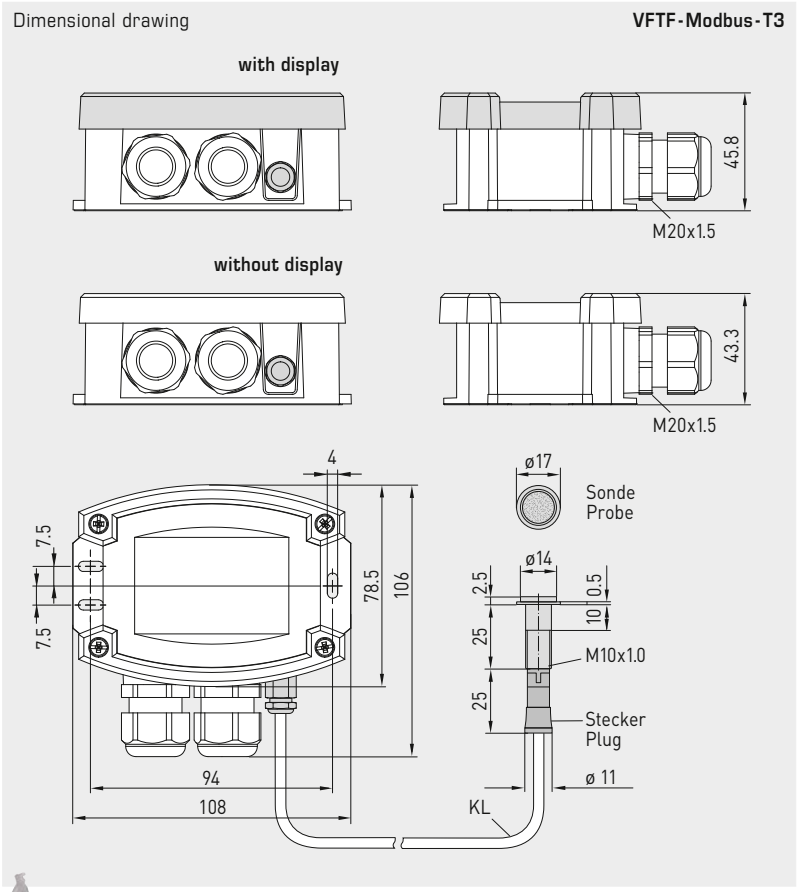
DIP A: Bus address
DIP B: Bus parameters (Baud rate, parity...)
Telegram indicator Reception (LED green) Error (LED red)
LED (internal status)
Offset correction
Button „**key**" (auto zero)
Shielding

Programmable display screen **Modbus Tyr 3**



Showcase humidity and temperature sensor (± 2.0 %), for mixture ratio, relative / absolute humidity, dew point, enthalpy and temperature, calibratable, with Modbus connection

Dimensional drawing **VFTF-Modbus-T3**



VFTF-Modbus-T3
with display







Probe
made of stainless steel, pluggable



HYGRASGARD® VFTF-Modbus-T3 Showcase humidity and temperature sensor (± 2.0 %), *Premium*						
Type / WG01	**Measuring Range / Readout** Humidity (switchable)	Temperature	**Output**	**Display**	**Item no.**	**Price**
VFTF-Modbus-T3						
VFTF-Modbus-T3	0 ...100 % RH (default) 0 ... 80 g / kg (MV) 0 ... 80 g / m³ (a.F.) 0 ... 85 kJ / kg (ENT.) –20...+80 °C (TP)	–35...+80 °C	Modbus		1201-6256-1000-000	**540,44 €**
VFTF-Modbus-T3 **LCD**	(5 x as above)	(1 x as above)	Modbus	■	1201-6256-1400-000	**598,76 €**
Extra charge:	**cable length** (KL = approx. 2 m), other lengths optional Cable connection with **M12 connector** according to DIN EN 61076-2-101				on request on request	
Note:	System of units **SI** (default) or **imperial** (can be changed via Modbus).					
ACCESSORIES						
KA2-Modbus	**Communication adapter** (with USB and RS485 interface) for system connection (incl. quick-start software)				1906-1200-0000-100	**213,99 €**
LA-Modbus	**Line termination device** (with terminating resistor) as an active bus termination of RS485 networks				1906-1300-0000-100	**79,81 €**

HYGRASGARD® TW-Modbus-T3

Dew point control switches, incl. strap / with detached sensor head (± 2.0 %), for mixture ratio, relative / absolute humidity, dew point, enthalpy and temperature, calibratable, with Modbus connection

S+S REGELTECHNIK

Patented quality product
(pro-dynamic cross convection patent no. DE 10 2012 015 726.6)

Calibratable dew point control switch **HYGR**ASGARD® **TW-Modbus-T3** (compact variant incl. strap) or **TW-Modbus-external** (detached variant), with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, optionally with / without display, to exactly detect the relative humidity (0…100 % RH) and the temperature (–35…+80 °C) and to detect various parameters in humidity measurement.
The dew formation in particular is reliably determined thanks to its patented measuring method, the **pro-dynamic cross-convection** (no conductivity measurement).
International system of units **SI** (default) can be switched to **Imperial** (via Modbus).

The surface-contact sensor is applied in a non-aggressive, dust-free environment and is suitable for installation in ceilings, ducts and devices. It is used in the refrigeration, air conditioning and clean room technology, engineering rooms, hotels and conference facilities.

A long-term stable, **digital humidity and temperature sensor** guarantee exact measurement results. These measurands are used to internally calculate the following parameters that can be retrieved via Modbus: relative humidity, absolute humidity, mixture ratio, dew point, enthalpy (ignoring atmospheric air pressure) and ambient temperature.

Innovative Modbus sensor with galvanically separated RS485-Modbus-interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in curent-free state, internal LEDs for telegram status display, two separate push-in terminals and large three-line display (illuminated; with customised programming in the 7-segment and dot-matrix range). The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

Voltage supply:	24 V AC (± 20 %); 15…36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
System of units:	**SI** (default) or **Imperial** (switchable via Modbus)
Data points:	temperature [°C] [°F], relative humidity [% RH], dew point [°C] [°F], absolute humidity [g/m³] [gr/ft³], mixing ratio [g/kg] [gr/lb], enthalpy [kJ/kg] [Btu/lb]
Sensor:	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
Measuring range:	0…100 % RH (humidity); –35…+80 °C (temperature)
Deviation, humidity:	**± 2.0** % (20…80 % RH) at +25 °C, otherwise ± 3.0 %
Deviation, temperature:	typically ± 0.2 K at +25 °C
Zero point offset:	± 10 % RH (humidity); ± 5 °C (temperature)
Ambient temperature:	–30…+70 °C
Medium:	clean air and non-aggressive, non-combustible gases
Bus protocol:	Modbus (RTU mode), address range 0…**247** selectable
Baud rate:	9600, 19200, 38400 Baud
Signal filtering:	4 s / 32 s
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45.8 mm (Tyr 3 with display)
Cable connection:	**cable gland**, plastic (2x M 20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) **or M12 connector** according to DIN EN 61076-2-101 (optional on request)
Prozessanschluss:	endless strap with metal tightener, 300 mm, for pipes up to 3 '''
Sensor protection:	membrane filter
Mounting:	**TW-Modbus** with strap for direct mounting on pipes or for direct mounting on flat surfaces (e.g. walls, ceilings) **TW-Modbus-external** with detached sensor head (cable length KL = 1.5 m) for mounting on pipes
Electrical connection:	0.2 - 1.5 mm², using push-in terminals
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU
Features:	**Display with illumination**, three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual humidity and actual temperature (cyclic) or a selectable parameter (static) or an individually programmable display value

TW-Modbus-T3
(compact variant)



Device version
with **M12 connector**
(optional on request)



TW-extern-Modbus-T3
(detached variant)

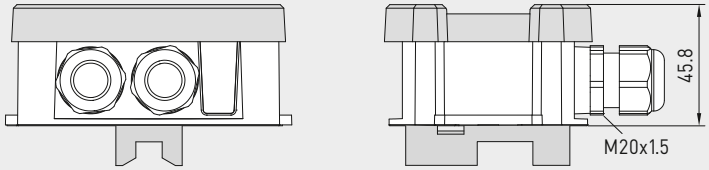


Dew point control switches, incl. strap / with detached sensor head (± 2.0 %), for mixture ratio, relative / absolute humidity, dew point, enthalpy and temperature, calibratable, with Modbus connection

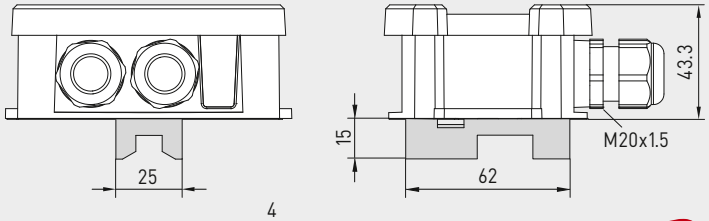
Dimensional drawing
[mm]

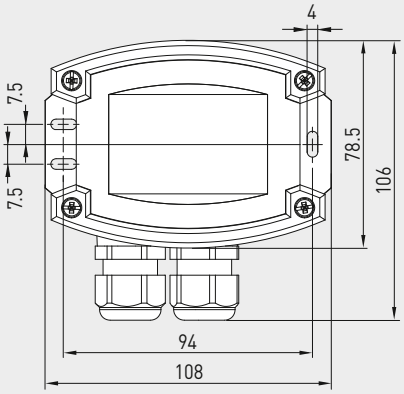
TW - Modbus - T3

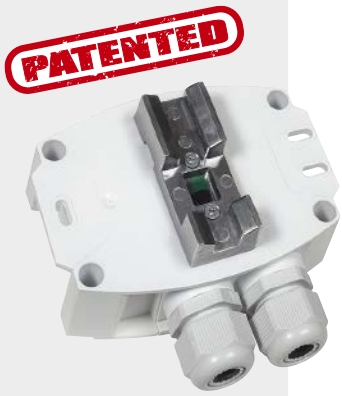
with display



without display







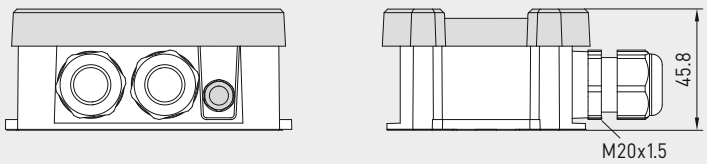
TW - Modbus - T3
(compact variant)
with display



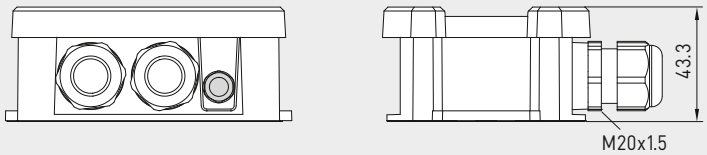
Dimensional drawing
[mm]

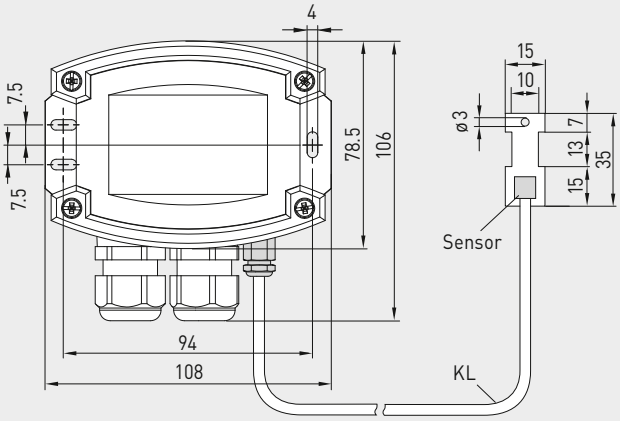
TW - extern - Modbus - T3

with display



without display





TW - extern - Modbus - T3
(detached variant)
with display

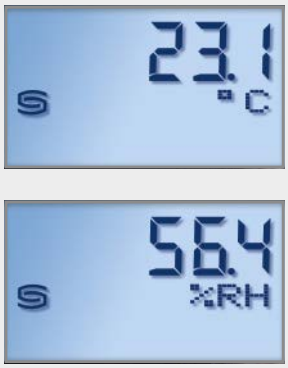


HYGRASGARD® TW - Modbus - T3

Dew point control switches, incl. strap / with detached sensor head (± 2.0 %), for mixture ratio, relative / absolute humidity, dew point, enthalpy and temperature, calibratable, with Modbus connection

S+S REGELTECHNIK

Display screen (cyclic)
standard



Display screen (static)
alternative output variables

HYGRASGARD® Modbus-T3



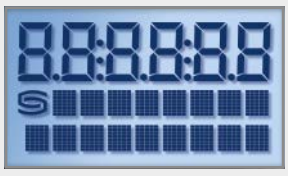
The display value depends on the set **unit system.**
By default, the display alternates between the **actual temperature** and the **actual humidity** (relative humidity).

The Modbus interface can be used to program an **alternative output variable** instead of the standard display.
In this case, the first line indicates the value while the second line indicates the corresponding unit **statically**.
The index in the third line indicates the display type:

Index 1 = dew point
Index 2 = absolute humidity
Index 3 = mixture ratio
Index 4 = enthalpy
Index 5 = temperature
Index 6 = relative humidity

Programmable display screen

Modbus Tyr 3



The Modbus interface allows the display to be **individually** configured both in the 7-segment area and in the dot-matrix area.

SI IMP



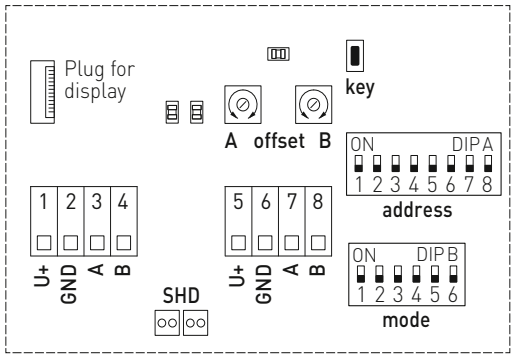
Switchable system of units

Measured values / data points			
	SI (default)	→	**Imperial**
Temperature	[°C]	→	[°F]
Humidity	[% RH]	→	[% RH]
Dew point	[°C]	→	[°F]
Absolute humidity	[g/m³]	→	[gr/ft³]
Mixing ratio	[g/kg]	→	[gr/lb]
Enthalpy	[kJ/kg]	→	[Btu/lb]

Measuring ranges		
SI (default)	→	**Imperial**
–35…+80 °C		–3…+176 °F
0…100 % RH		0…100 % RH
Alternative parameters are calculated.		

Dew point control switches, incl. strap / with detached sensor head (± 2.0 %), for mixture ratio, relative / absolute humidity, dew point, enthalpy and temperature, calibratable, with Modbus connection

Schematic diagram **Modbus Tyr 3**



DIP A: Bus address
DIP B: Bus parameters (Baud rate, parity...)
Telegram indicator Reception (LED green) Error (LED red)
LED (internal status)
Offset correction
Button „**key**" (auto zero)
Shielding

TW-Modbus-T3
with display





HYGRASGARD® TW-Modbus-T3 Dew point control switches, incl. strap (± 2.0 %)
HYGRASGARD® TW-external-Modbus-T3 Dew point control switches, with detached sensor head (± 2.0 %)

Type / WG01	Measuring Range / Readout Humidity (switchable)	Temperature	Output	Display	Item No.	Price
TW-Modbus-T3						
TW-Modbus-T3	0 ...100 % RH (default) 0 ... 80 g / kg (MR) 0 ... 80 g / m³ (A.H.) 0 ... 85 kJ / kg (ENT.) –20...+80 °C (DP)	–35...+80 °C	Modbus		1201-1281-3001-020	**190,46 €**
TW-Modbus-T3 **LCD**	(5 x as above)	(1 x as above)	Modbus	■	1201-1281-3401-020	**245,25 €**
TW-external-Modbus-T3						
TW-extern-Modbus-T3	0 ...100 % RH (default) 0 ... 80 g / kg (MR) 0 ... 80 g / m³ (A.H.) 0 ... 85 kJ / kg (ENT.) –20...+80 °C (DP)	–35...+80 °C	Modbus		1201-1281-3001-030	**208,38 €**
TW-extern-Modbus-T3 **LCD**	(5 x as above)	(1 x as above)	Modbus	■	1201-1281-3401-030	**249,03 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101				on request	
Note:	System of units **SI** (default) or **imperial** (can be changed via Modbus).					
ACCESSORIES						
KA2-Modbus	**Communication adapter** (with USB and RS485 interface) for system connection (incl. quick-start software)				1906-1200-0000-100	**213,99 €**
LA-Modbus	**Line termination device** (with terminating resistor) as an active bus termination of RS485 networks				1906-1300-0000-100	**79,81 €**

PREMASGARD® 232x - Modbus - T3

**Pressure and differential pressure measuring transducers,
incl. connection set,
with Modbus connection**

S+S REGELTECHNIK

Maintenance-free pressure sensor **PREM**ASGARD® **232x - Modbus - T3** (series) with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, connection nozzles for pressure hose (Ø 6 mm), with cable gland (optionally M12 connector according to DIN EN 61076-2-101), optionally with/without display, for measuring the differential pressure (max. 7000 Pa) in air. International system of units **SI** (default) can be switched to **Imperial** (via Modbus). Incl. mounting flange and connection set **ASD-06** (2 m connecting hose, two pressure port nipples, screws).

The sensor is applied to measure positive, negative or differential pressure in clean air and gaseous media. It is used in the clean room, medical and filter technology, ventilation and air conditioning ducts, spray booths, large-scale catering facilities, for filter monitoring and level measurement or for triggering frequency converters. A **pressure sensor** with piezoresistive measuring element guarantees exact measurement results.

Innovative Modbus sensor with galvanically separated RS485 Modbus interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in current-free state, internal LEDs for telegram status display, two separate push-in terminals and large three-line display (illuminated; with customised programming in the 7-segment and dot-matrix range). The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

PREMASGARD® **232x - Modbus - T3**





TECHNICAL DATA

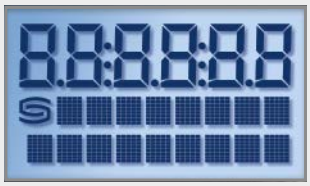
Power supply:	24 V AC (± 20 %) and 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
System of units:	**SI** (default) or **Imperial** (switchable via Modbus)
Data points:	Differential pressure [Pa] [inWC]
Pressure type:	Differential pressure
Pressure connection:	with **connection nozzles** for pressure hose Ø 6 mm
Measuring range, pressure:	**–500**... **+500 Pa** or **–7000**...**+7000 Pa** depending on the device type, see table
Pressure accuracy:	**Type 2328** (500 Pa): typical ± 3 Pa at +25 °C **Type 2327** (7000 Pa): typical ± 35 Pa at +25 °C compared to a calibrated reference device
Above- / below-pressure:	max. ± 50 kPa
Zero point offset:	± 5 % measuring range
Hysteresis:	0.3 % of final value
Linearity:	< ± 1 % of final value
Temp. drift values:	± 0.1 % per °C
Long-term stability:	± 1 % per year
Bus protocol:	Modbus (RTU mode), address range 0...**247** adjustable
Baud rate:	9600, 19200, 38400 Baud
Signal filtering:	0 s / 1 s / 10 s
Medium:	clean air and non-aggressive, non-combustible gases
Media contacting parts:	Brass, Ni, Duroplast, Si, epoxy, RTV, BSG, UV silicone gel
Media temperature:	–20...+50 °C (temperature-compensated 0...+50°C)
Housing:	plastic, UV-resistant, polyamide material, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45.8 mm (Tyr 3 with display)
Cable connection:	**cable gland**, plastic (2x M 20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.2 - 1.5 mm², via push-in terminals
Permissible humidity:	< 95 % RH, (non-precipitating air)
Protection class:	III (according to EN 60 730)
Safety class:	**IP 65** (according to EN 60 529)
Standards:	CE-conformity, electromagnetic compatibility according to EN 61326, EMC directive 2014 / 30 / EU
Optional:	three-line **display with illumination,** programmable, cut-out approx. 51 x 29 mm (W x H), to display the actual pressure or an individually programmable display value
ACCESSORIES	see table

Device version
with **M12 connector**
(optional on request)



Programmable
display screen

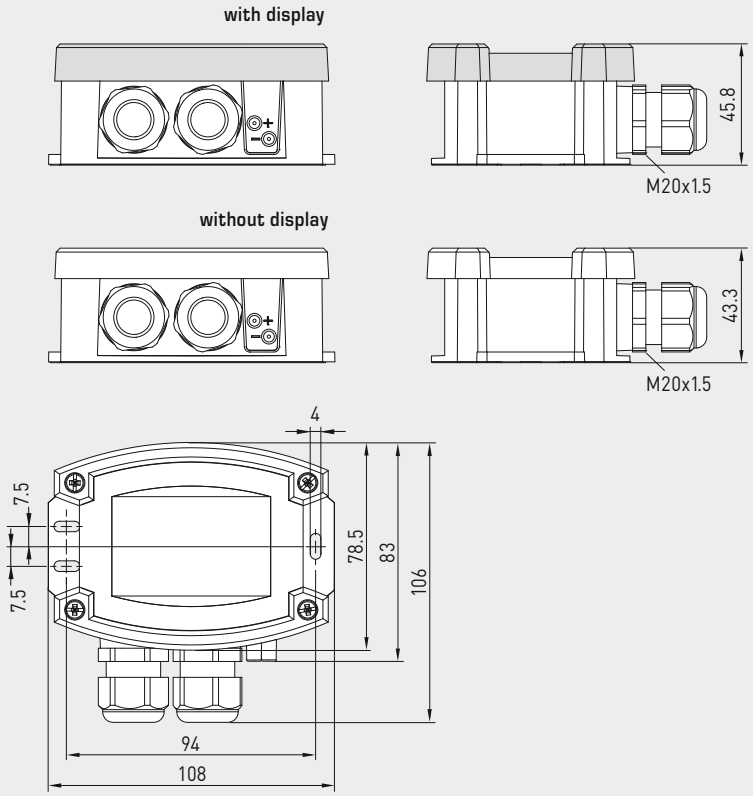
Modbus
Tyr 3



Pressure and differential pressure measuring transducers, incl. connection set, with Modbus connection

Dimensional drawing [mm]

PREMASGARD® 232x - Modbus - T3



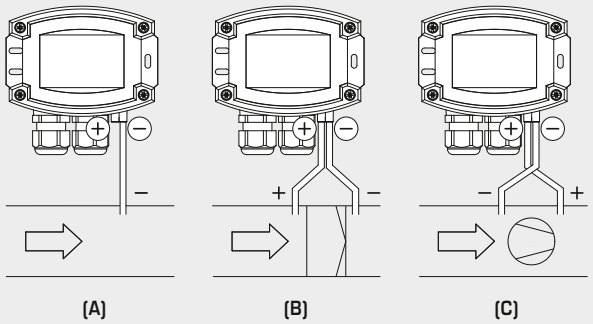
PREMASGARD® 232x - Modbus - T3
with display





Mounting diagram

PREMASGARD® 232x - Modbus - T3



TYPES OF MONITORING

Pressure connections at the pressure switch are marked with
P1 (+) for higher pressure and
P2 (–) for lower pressure.

(A) Below-atmospheric pressure
P1 (+) is not connected, but open to the atmosphere
P2 (–) connected to inside of duct

(B) Filter
P1 (+) connected upstream of filter
P2 (–) connected downstream of filter

(C) Ventilator
P1 (+) connected downstream of ventilator
P2 (–) connected upstream of ventilator

Switchable system of units

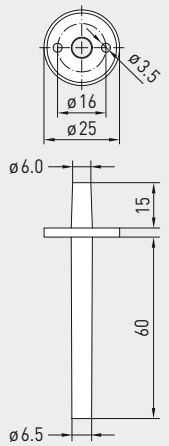
Measurements / Data points	SI (default)	→	Imperial
Differential pressure	[Pa]	→	[inWC]

Measuring ranges	SI (default)	→	Imperial
Type 2328	–500…+500 Pa	→	–2.0…+2.0 inWC
Type 2327	–7000…+7000 Pa	→	–28…+28 inWC

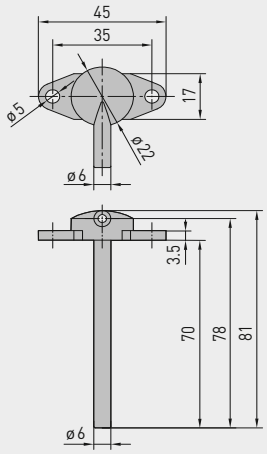
**Pressure and differential pressure measuring transducers,
incl. connection set,
with Modbus connection**

S+S REGELTECHNIK

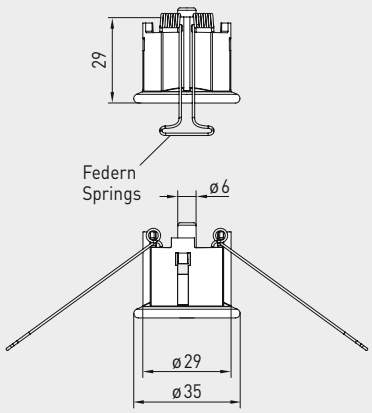
Dimensional drawing [mm] **ASD-06**



Dimensional drawing [mm] **ASD-07**



Dimensional drawing [mm] **DAL-01**



ASD-06
Connection set



ASD-07
Connection nipple



DAL-01
Pressure outlet



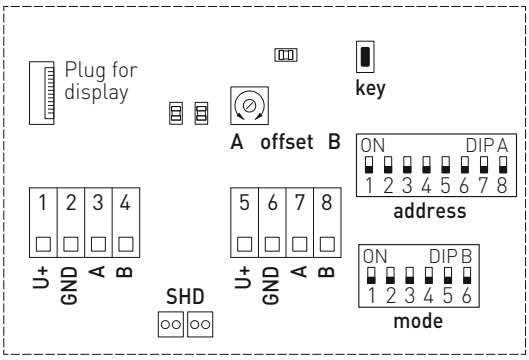


WS-04
Weather and sun protection hood
(optional)

ACCESSORIES

KA2-Modbus	**Communication adapter** (USB/RS485) for system connection	1906-1200-0000-100	**213,99 €**
LA-Modbus	**Line termination device** (with terminating resistor) as an active bus termination	1906-1300-0000-100	**79,81 €**
ASD-06	**Connection set (included in the scope of delivery),** consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose (soft, UV-resistant) and 4 screws	7100-0060-3000-000	**7,64 €**
ASD-07	**2 connection nipples** (at 90 degree angle) made of plastic, ABS	7100-0060-7000-000	**7,64 €**
DAL-01	**Pressure outlet** for ceiling or in-wall installation (e.g. in clean rooms)	7300-0060-3000-001	**35,77 €**
WS-04	**Weather and sun protection hood**, 130 x 180 x 135 mm, stainless steel **V2A** (1.4301)	7100-0040-7000-000	**37,49 €**
	For further information, see chapter Accessories!		

Schematic diagram **PREMASGARD® 232x - Modbus - T3**



DIP A: Bus address
DIP B: Bus parameters (Baud rate, parity...)
Telegram indicator Reception (LED green) Error (LED red)
LED (internal status)
Offset correction
Button „**key**" (auto zero)
Shielding

PREMASGARD® 232x - Modbus - T3
with display







PREMASGARD® 232x - Modbus - T3	Pressure sensor, differential pressure measuring transducer				
Measuring Range Pressure	**Type / WG02**	**Output**	**Display**	**Item No.**	**Price**
± 500 Pa	**Type 2328**				
– 500 ... + 500 Pa	PREMASGARD 2328-Modbus	Modbus		1301-12C4-0910-200	**202,87 €**
	PREMASGARD 2328-Modbus **LCD**	Modbus	■	1301-12C4-4910-200	**255,23 €**
± 7000 Pa	**Type 2327**				
– 7000 ... + 7000 Pa	PREMASGARD 2327-Modbus	Modbus		1301-12C4-0950-200	**202,87 €**
	PREMASGARD 2327-Modbus **LCD**	Modbus	■	1301-12C4-4950-200	**255,23 €**
Optional:	Cable connection with **M12 connector** (male, **5-pin**, A-code)				
Note:	System of units **SI** (default) or **Imperial** (switchable via Modbus).				

PREMASGARD® 714x - Modbus

NEW

S+S REGELTECHNIK

Pressure sensor and measuring transducer for differential pressure and volume flow, incl. connection set, calibratable, with Modbus connection

Maintenance-free, microprocessor-controlled **PREM**ASGARD® **714x - Modbus** (series) with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, connection nozzles for pressure hose (Ø 6 mm), with cable gland or M12 connector according to DIN EN 61076-2-101, optionally with/without display, for measuring the differential pressure (max. ± 7000 Pa) in air. International system of units **SI** (default) can be switched to **Imperial** (via Modbus). Incl. mounting flange and connection set **ASD-06** (2 m connecting hose, two pressure port nipples, screws).

The pressure sensor is applied to measure positive, negative or differential pressure in clean air and gaseous media. It is used in the clean room, medical and filter technology, ventilation and air conditioning ducts, spray booths, large-scale catering facilities, for filter monitoring and level measurement or for triggering frequency converters. A **pressure sensor** with piezoresistive measuring element guarantees exact measurement results. The following measured values can be accessed via the Modbus: Differential pressure, volume flow.

Innovative Modbus sensor with galvanically separated RS485 Modbus interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in current-free state, internal LEDs for telegram status display, two separate push-in terminals and large three-line display (illuminated; with customised programming in the 7-segment and dot-matrix range). The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

PREMASGARD® **714x - Modbus**



Device version with **M12 connector** (optional)



TECHNICAL DATA

Power supply:	24 V AC (± 20 %) and 15...36 V DC
Power consumption:	< 4.8 W / 24 V DC typical; < 6.8 VA / 24 V AC typical
System of units:	**SI** (default) or **Imperial** (switchable via Modbus)
Data points:	Differential pressure [Pa] [inWC], Volume flow [m³/h] [CFM]
Pressure type:	Differential pressure
Pressure connection:	with **connection nozzles** for pressure hose Ø 6 mm (optional on request with **quick** connect for PVC fabric pressure hose Ø 6 mm)
Measuring range, pressure:	**–500**... **+500 Pa** or **–7000**...**+7000 Pa** depending on the device type, see table
Pressure accuracy:	**Type 7148** (500 Pa): typical ± 13 Pa **Type 7147** (7000 Pa): typical ± 105 Pa compared to a calibrated reference device
Above- / below-pressure:	max. ± 50 kPa
Zero point offset:	± 10 % measuring range
Hysteresis:	0.3 % of final value
Linearity:	< ± 1 % of final value
Temp. drift values:	± 0.1 % per °C
Long-term stability:	± 1 % per year
Bus protocol:	Modbus (RTU mode), address range 0...**247** adjustable
Baud rate:	9600, 19200, 38400 Baud
Signal filtering:	0 s / 1 s / 10 s
Medium:	clean air and non-aggressive, non-combustible gases
Media contacting parts:	Brass, Ni, Duroplast, Si, epoxy, RTV, BSG, UV silicone gel
Media temperature:	–20...+50 °C (temperature-compensated 0...+50°C)
Ambient temperature:	–30...+70 °C
Permissible humidity:	0...95 % RH (non-precipitating air)
Housing:	plastic, UV-resistant, polyamide material, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Cable connection:	**cable gland** plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional)
Electrical connection:	0.2 - 1.5 mm², via push-in terminals
Protection class:	III (according to EN 60 730)
Safety class:	**IP 65** (according to EN 60 529) in the built-in state
Standards:	CE-conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU
Optional:	three-line **display with illumination,** programmable, cut-out approx. 70 x 40 mm (W x H), to display the actual pressure or volume flow or an individually programmable display value
ACCESSORIES	see table
ASD-06	**Connection set** (nipple straight) (included in the scope of delivery)

Display screen (SI or Imperial) **Modbus Tyr 2**



Pressure [Pa] [inWC]



Volume flow rate [m³/h] [CFM]

Programmable display screen **Modbus Tyr 2**



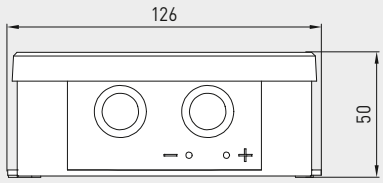
NEW

S+S REGELTECHNIK

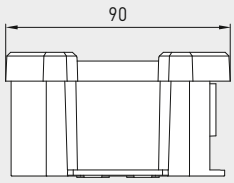
Pressure sensor and measuring transducer for differential pressure and volume flow, incl. connection set, calibratable, with Modbus connection

Dimensional drawing
[mm]

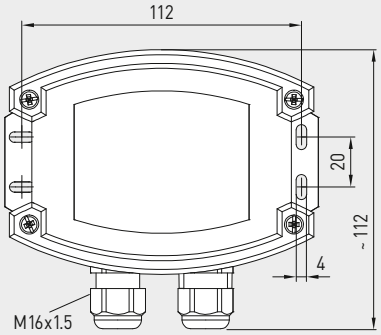
PREMASGARD® **714x-Modbus**

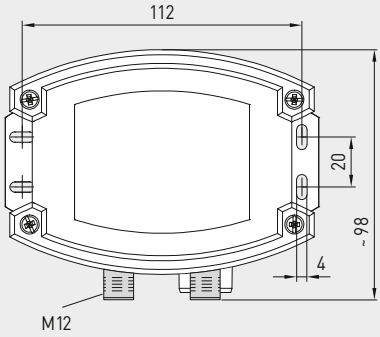


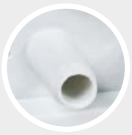
Housing with
pressure port nozzles
and **cable gland**



Housing with
pressure port nozzles
and **M12 connector**







Pressure port
for pressure hose



M12 connector
(male)

PREMASGARD® **714x-Modbus**
with display

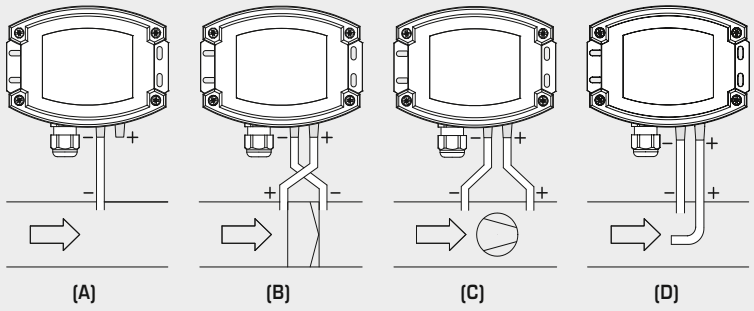


Device version
with **cable gland**
(as standard)



Mounting diagram

PREMASGARD® **714x-Modbus**



TYPES OF MONITORING:

Pressure connections at the pressure switch are marked with
P1 (+) for higher pressure and
P2 (–) for lower pressure.

(A) Below-atmospheric pressure
P1 (+) is not connected,
but open to the atmosphere
P2 (–) connected to inside of duct

(B) Filter
P1 (+) connected upstream of filter
P2 (–) connected downstream of filter

(C) Ventilator
P1 (+) connected downstream of ventilator
P2 (–) connected upstream of ventilator

(D) Volume flow
P1 (+) dynamic pressure,
connected in flow direction
P2 (–) static pressure, connected free of
dynamic pressure components

Switchable system of units

Measurements / Data points	**SI** (default)	→	**Imperial**
Differential pressure	[Pa]	→	[inWC]
Volume flow	[m^3/h]	→	[CFM]

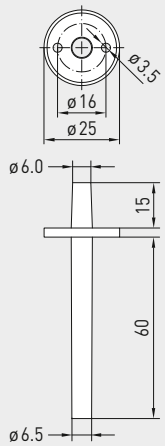
Measuring ranges	**SI** (default)	→	**Imperial**
Type 7148	–500…+500 Pa	→	–2.0…+2.0 inWC
Type 7147	–7000…+7000 Pa	→	–28…+28 inWC

NEW

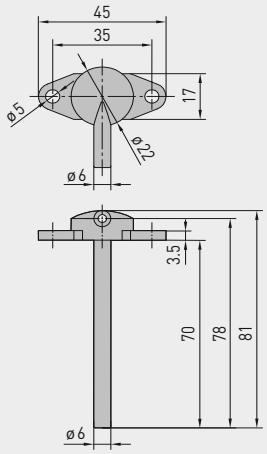
S+S REGELTECHNIK

Pressure sensor and measuring transducer for differential pressure and volume flow, incl. connection set, calibratable, with Modbus connection

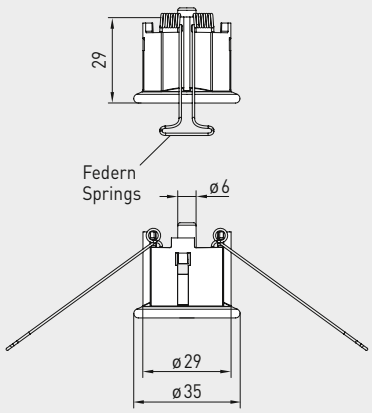
Dimensional drawing [mm] **ASD-06**



Dimensional drawing [mm] **ASD-07**



Dimensional drawing [mm] **DAL-01**



ASD-06
Connection set



ASD-07
Connection nipple



DAL-01
Pressure outlet





WS-03
Weather and sun protection hood (optional)

ACCESSORIES

KA2-Modbus	**Communication adapter** (USB/RS485) for system connection	1906-1200-0000-100	**213,99 €**
LA-Modbus	**Line termination device** (with terminating resistor) as an active bus termination	1906-1300-0000-100	**79,81 €**
ASD-06	**Connection set (included in the scope of delivery),** consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose (soft, UV-resistant) and 4 screws	7100-0060-3000-000	**7,64 €**
ASD-07	**2 connection nipples** (at 90 degree angle) made of plastic, ABS	7100-0060-7000-000	**7,64 €**
DAL-01	**Pressure outlet** for ceiling or in-wall installation (e.g. in clean rooms)	7300-0060-3000-001	**35,77 €**
WS-03	**Weather and sun protection hood**, 200 x 180 x 150 mm, stainless steel **V2A** (1.4301)	7100-0040-6000-000	**44,74 €**

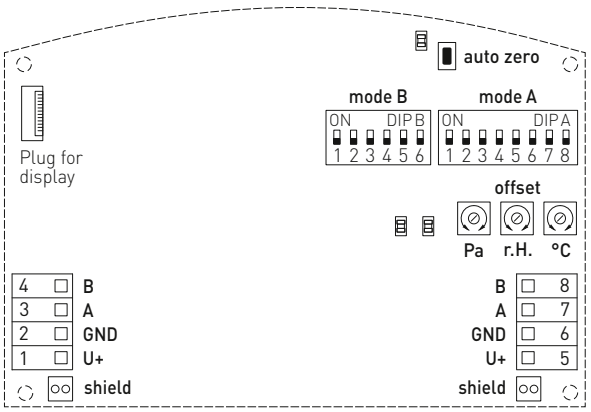
For further information, see chapter Accessories!

NEW

S+S REGELTECHNIK

Pressure sensor and measuring transducer for differential pressure and volume flow, incl. connection set, calibratable, with Modbus connection

Schematic diagram **PREMASGARD® 714x-Modbus**



DIP A: Bus address
DIP B: Bus parameters (Baud rate, parity...)
Telegram indicator Reception (LED green) Error (LED red)
LED (internal status)
Reset button
Offset correction
Shielding

PREMASGARD® 714x-Modbus with display



PREMASGARD® 714x-Modbus		Pressure sensor and measuring transducer for differential pressure and volume flow, *Deluxe*				
Measuring Range Pressure / Volume Flow		**Type / WG02**	**Output**	**Display**	**Item no.**	**Price**
± 500 Pa		**Type 7148**				
– 500 … + 500 Pa	44721 m³/h (k = 2000)	PREMASGARD 7148-Modbus	Modbus		1301-7164-0910-20V	**407,11 €**
		PREMASGARD 7148-Modbus **LCD**	Modbus	■	1301-7164-4910-20V	**452,47 €**
		with automatic zero-point calibration as standard				
± 7000 Pa		**Type 7147**				
– 7000 … + 7000 Pa	167332 m³/h (k = 2000)	PREMASGARD 7147-Modbus	Modbus		1301-7164-0950-200	**350,41 €**
		PREMASGARD 7147-Modbus **LCD**	Modbus	■	1301-7164-4950-200	**395,77 €**
		with optional automatic zero point calibration (Please specify in your order)			Extra charge	**72,56 €**
Optional:		Cable connection with **M12 connector** (male, **5-pin**, A-code)				
Note:		System of units **SI** (default) or **Imperial** (switchable via Modbus).				

PREMASGARD® 724x-Modbus

NEW

**Dual pressure sensor (2 measuring channels),
measuring transducer for differential pressure and volume flow,
incl. connection set, calibratable, with Modbus connection**

S+S REGELTECHNIK

Maintenance-free, microprocessor-controlled **PREM**ASGARD® **724x-Modbus** (series) with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, connection nozzles for pressure hose (Ø 6 mm), with cable gland or M12 connector according to DIN EN 61076-2-101, optionally with/without display, for measuring the differential pressure (2 measuring channels, max. ± 7000 Pa) in air. Type variant **724xT** with connection facility for external **Pt1000** sensor (sensor element not included in the scope of delivery) for detecting the temperature (–50...+150°C). International system of units **SI** (default) can be switched to **Imperial** (via Modbus). Incl. connection set **ASD-06** (2 m connecting hose, two pressure port nipples, screws).

The pressure sensor is applied to measure positive, negative or differential pressure in clean air and gaseous media. It is used in the clean room, medical and filter technology, ventilation and air conditioning ducts, spray booths, large-scale catering facilities, for filter monitoring and level measurement or for triggering frequency converters. A **pressure sensor** with piezoresistive measuring element guarantees exact measurement results. The following measured values can be accessed via the Modbus: Differential pressure, volume flow and temperature.

Innovative Modbus sensor with galvanically separated RS485 Modbus interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in current-free state, internal LEDs for telegram status display, two separate push-in terminals and large three-line display (illuminated; with customised programming in the 7-segment and dot-matrix range). The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

PREMASGARD® **724x-Modbus**
with cable gland



PREMASGARD® **724x-Modbus-Q**
with M12 connector





TECHNICAL DATA

Power supply:	24 V AC (± 20 %) and 15...36 V DC
Power consumption:	< 4.8 W / 24 V DC typical; < 6.8 VA / 24 V AC typical
System of units:	**SI** (default) or **Imperial** (switchable via Modbus)
Data points:	differential pressure [Pa] [inWC], volume flow [m³/h] [CFM], temperature [°C] [°F] – **Type 724xT** with connection facility for external **Pt1000** sensor (–50...+150°C) (sensor element not included in the scope of delivery)
Pressure type:	differential pressure **(2 measuring channels)**
Pressure connection:	with connection **nozzles** for pressure hose Ø 6 mm
Measuring range, pressure:	**–500**... **+500 Pa** or **–7000**...**+7000 Pa** depending on the device type, see table
Pressure accuracy:	**Type 7249** (500 Pa): typically ± 13 Pa at +25 °C **Type 724x** (7000 Pa): typically ± 105 Pa at +25 °C verglichen zu kalibriertem Referenzgerät
Above- / below-pressure:	max. ± 50 kPa
Zero point offset:	± 10 % measuring range
Hysteresis:	0.3 % of final value
Linearity:	< ± 1 % of final value
Temp. drift values:	± 0.1 % per °C
Long-term stability:	± 1 % per year
Bus protocol:	Modbus (RTU mode), address range 0...**247** adjustable
Baud rate:	9600, 19200, 38400 Baud
Signal filtering:	0 s / 1 s / 10 s
Medium:	clean air and non-aggressive, non-combustible gases
Media contacting parts:	Brass, Ni, Duroplast, Si, epoxy, RTV, BSG, UV silicone gel
Media temperature:	–20...+50 °C (temperature-compensated 0...+50°C)
Ambient temperature:	–30...+70 °C
Permissible humidity:	0...95 % RH (non-precipitating air)
Housing:	plastic, UV-resistant, polyamide material, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Typ 2)
Cable connection:	**cable gland** plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional)
Electrical connection:	0.2 - 1.5 mm², via push-in terminals
Protection class:	III (according to EN 60 730)
Safety class:	**IP 65** (according to EN 60 529) in the built-in state
Standards:	CE-conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU
Optional:	three-line **display with illumination,** programmable, cut-out approx. 70 x 40 mm (W x H), to display the actual pressure or volume flow or an individually programmable display value
ACCESSORIES	see table
ASD-06	**Connection set** (nipple straight) (included in the scope of delivery)

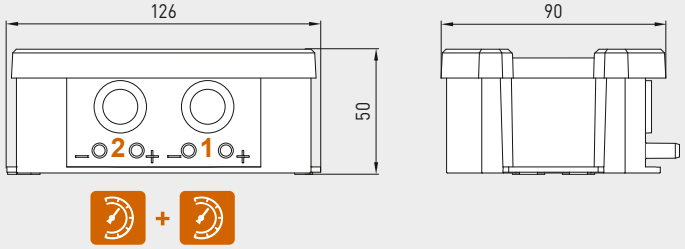
PREMASGARD® **724xT-Modbus**
with cable gland



Dual pressure sensor (2 measuring channels), measuring transducer for differential pressure and volume flow, incl. connection set, calibratable, with Modbus connection

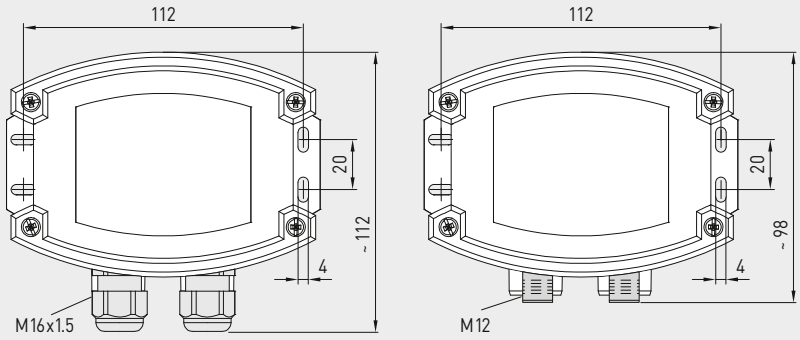
Dimensional drawing
[mm]

PREMASGARD® 724x-Modbus



Housing with
dual pressure connection
(2 measuring channels)
and **cable gland**

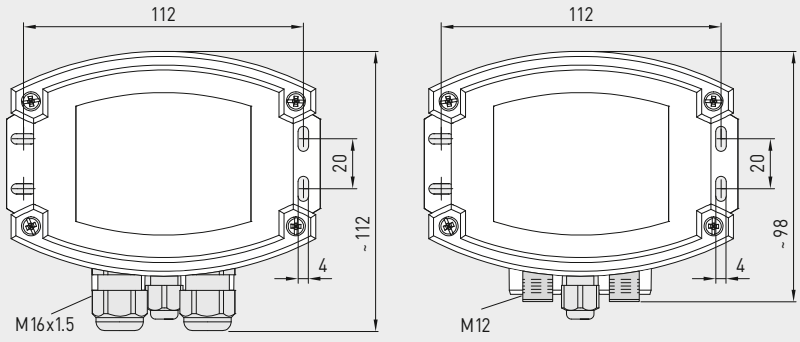
Housing with
dual pressure connection
(2 measuring channels)
and **M12 connector** (male)





Dimensional drawing
[mm]

PREMASGARD® 724xT-Modbus
with connection facility
for external **Pt1000** sensor





PREMASGARD® 724x-Modbus
with cable gland
and display



PREMASGARD® 724x-Modbus-Q
with M12 connector
and display





PREMASGARD® 724xT-Modbus
with cable gland
and display



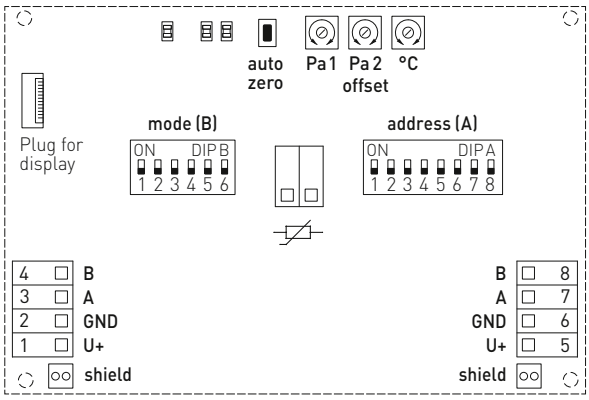
PREMASGARD® 724x-Modbus

Dual pressure sensor (2 measuring channels), measuring transducer for differential pressure and volume flow, incl. connection set, calibratable, with Modbus connection

NEW

S+S REGELTECHNIK

Schematic diagram — **PREMASGARD® 724x-Modbus**

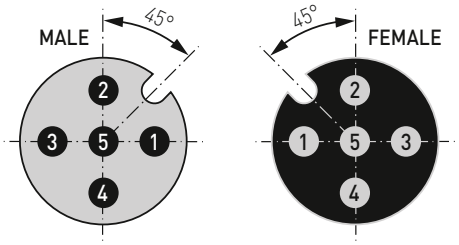


DIP A: Bus address
DIP B: Bus parameters (Baud rate, parity...)

Telegram indicator
Reception (LED green)
Error (LED red)

LED (internal status)
Reset button
Offset correction
Shielding

Pin assignment (M12) — **PREMASGARD® 724x-Modbus**



1. +UB
2. Modbus A
3. –UB GND
4. Modbus B
5. Shield

Display screen (SI or Imperial) — **PREMASGARD® 724x-Modbus**



Pressure (channel 1) [Pa] [inWC]



Volume flow rate [m³/h] [CFM]



Pressure (channel 2) [Pa] [inWC]



Temperature (type "**T**") [°C] [°F]

The display value depends on the set **unit system SI** (default) or **imperial** (can be changed via Modbus.

Actual **pressure** of both channels is shown alternately.
The associated measuring channel is visible at the bottom left.

Alternatively, the calculated **volume flow** can also be issued for channel 1 (via the index).

For the device type "**T**", the actual **temperature** of an external **Pt1000** temperature sensor can also be displayed as cyclic (standard) or static (via the index).

Programmable display screen — **Modbus Tyr 2**



NEW

PREMASGARD® 724x-Modbus

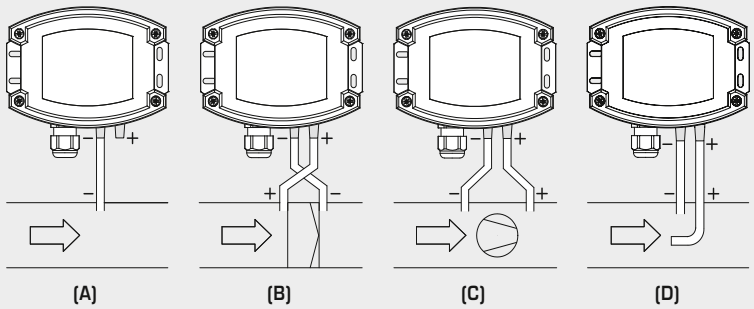
Dual pressure sensor (2 measuring channels), measuring transducer for differential pressure and volume flow, incl. connection set, calibratable, with Modbus connection

SI IMP

PREMASGARD® 724x-Modbus
with display



Mounting diagram — **PREMASGARD® 724x-Modbus**



TYPES OF MONITORING:
Pressure connections at the pressure switch are marked with
P1 (+) for higher pressure and
P2 (–) for lower pressure.

(A) Below-atmospheric pressure
P1 (+) is not connected, but open to the atmosphere
P2 (–) connected to inside of duct

(B) Filter
P1 (+) connected upstream of filter
P2 (–) connected downstream of filter

(C) Ventilator
P1 (+) connected downstream of ventilator
P2 (–) connected upstream of ventilator

(D) Volume flow
P1 (+) dynamic pressure, connected in flow direction
P2 (–) static pressure, connected free of dynamic pressure components

Switchable system of units

Measurements / Data points	**SI** (default)	→	**Imperial**
Differential pressure	[Pa]	→	[inWC]
Volume flow	[m^3/h]	→	[CFM]
Temperature	[°C]	→	[°F]

Measuring ranges	**SI** (default)	→	**Imperial**
Typ 7249	–500…+500 Pa	→	–2.0…+2.0 inWC
Typ 724x	–7000…+7000 Pa	→	–28…+28 inWC
Typ 724xT	–50…+150 °C	→	–58…+302 °F

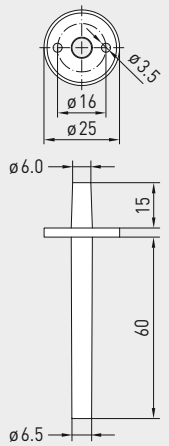
PREMASGARD® 724x - Modbus

NEW

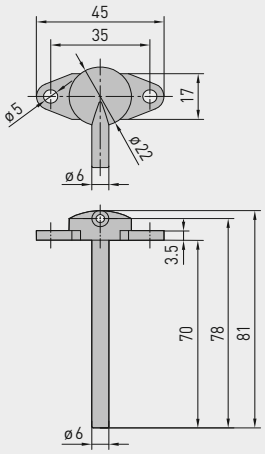
S+S REGELTECHNIK

Dual pressure sensor (2 measuring channels), measuring transducer for differential pressure and volume flow, incl. connection set, calibratable, with Modbus connection

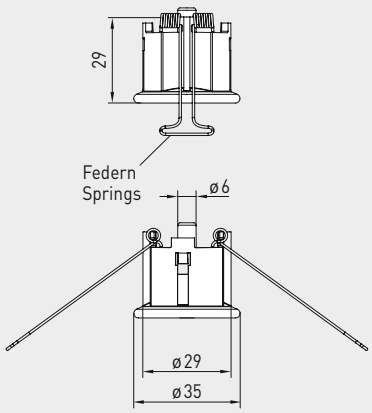
Dimensional drawing [mm] **ASD-06**



Dimensional drawing [mm] **ASD-07**



Dimensional drawing [mm] **DAL-01**



ASD-06
Connection set



ASD-07
Connection nipple



DAL-01
Pressure outlet





WS-03
Weather and sun protection hood (optional)

ACCESSORIES

KA2-Modbus	**Communication adapter** (USB/RS485) for system connection	1906-1200-0000-100	**213,99 €**
LA-Modbus	**Line termination device** (with terminating resistor) as an active bus termination	1906-1300-0000-100	**79,81 €**
ASD-06	**Connection set** (included in the scope of delivery), consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose (soft, UV-resistant) and 4 screws	7100-0060-3000-000	**7,64 €**
ASD-07	**2 connection nipples** (at 90 degree angle) made of plastic, ABS	7100-0060-7000-000	**7,64 €**
DAL-01	**Pressure outlet** for ceiling or in-wall installation (e.g. in clean rooms)	7300-0060-3000-001	**35,77 €**
WS-03	**Weather and sun protection hood**, 200 x 180 x 150 mm, stainless steel **V2A** (1.4301)	7100-0040-6000-000	**44,74 €**
	For further information, see chapter Accessories!		

Dual pressure sensor (2 measuring channels), measuring transducer for differential pressure and volume flow, incl. connection set, calibratable, with Modbus connection

PREMASGARD® **724xT - Modbus**
with cable gland
or M12 connector
and connection facility for **Pt1000**



SI IMP

PREMASGARD® **724x - Modbus**
with cable gland
or M12 connector



PREMASGARD® **724x - Modbus**	Dual pressure sensor (2 measuring channels), measuring transducer for differential pressure and volume flow, *Deluxe*				
Measuring Range Pressure / Volume Flow	**Type / WG02**	**Output**	**Display ● = Q**	**Item No.**	**Price**
(1) max. ± 7000 Pa (2) max. ± 7000 Pa	**Type 7247**				
Channel (1) and (2): – 7000 … + 7000 Pa (167332 m³/h (k = 2000))	PREMASGARD 7247-Modbus	Modbus		1301-7224-0950-200	**255,15 €**
	PREMASGARD 7247-Modbus LCD	Modbus	■	1301-7224-4950-200	**303,91 €**
	PREMASGARD 7247**T**-Modbus	Modbus		1301-7224-0950-2W0	**289,17 €**
	PREMASGARD 7247**T**-Modbus LCD	Modbus	■	1301-7224-4950-2W0	**337,93 €**
	PREMASGARD 7247-Modbus **Q**	Modbus	●	2004-6331-6100-011	**332,26 €**
	PREMASGARD 7247-Modbus **Q** LCD	Modbus	● ■	2004-6332-6100-011	**381,02 €**
	PREMASGARD 7247**T**-Modbus **Q**	Modbus	●	2005-6331-6100-011	**366,28 €**
	PREMASGARD 7247**T**-Modbus **Q** LCD	Modbus	● ■	2005-6332-6100-011	**415,04 €**
(1) max. ± 500 Pa (2) max. ± 7000 Pa	**Type 7249**				
Channel (1): – 500 … + 500 Pa (44721 m³/h) Channel (2): – 7000 … + 7000 Pa (167332 m³/h (k = 2000))	PREMASGARD 7249-Modbus	Modbus		1301-7224-0930-200	**255,15 €**
	PREMASGARD 7249-Modbus LCD	Modbus	■	1301-7224-4930-200	**303,91 €**
	PREMASGARD 7249**T**-Modbus	Modbus		1301-7224-0930-2W0	**289,17 €**
	PREMASGARD 7249**T**-Modbus LCD	Modbus	■	1301-7224-4930-2W0	**337,93 €**
	PREMASGARD 7249-Modbus **Q**	Modbus	●	2004-6331-6100-001	**332,26 €**
	PREMASGARD 7249-Modbus **Q** LCD	Modbus	● ■	2004-6332-6100-001	**381,02 €**
	PREMASGARD 7249**T**-Modbus **Q**	Modbus	●	2005-6331-6100-001	**366,28 €**
	PREMASGARD 7249**T**-Modbus **Q** LCD	Modbus	● ■	2005-6332-6100-001	**415,04 €**
Note:	System of units **SI** (default) or **Imperial** (switchable via Modbus).				
Housing variant "Q":	Cable connection with **M12 connector** (male, **5-pin**, A-code)				
Housing variant "T":	Connection facility for external **Pt1000** sensor (–50…+150°C) (sensor element not included in the scope of delivery)				

PREMASGARD® 814x - Modbus

Multifunctional duct sensors and measuring transducers for humidity, temperature, pressure, differential pressure and volume flow, incl. mounting flange and connection set, calibratable, with Modbus connection

S+S REGELTECHNIK

Maintenance-free microprocessor-controlled **PREM**ASGARD® **814x - Modbus** (Series) with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, connection nozzles for pressure hose (Ø 6 mm), plastic sinter filter (exchangeable), optionally with / without display, to exactly detect the relative humidity (0…100 % RH) and the temperature (–35…+80 °C) in ducts and to measure the differential pressure (max. ± 7000 Pa) in air. International system of units SI (default) can be switched to Imperial (via Modbus). Incl. mounting flange and connection set **ASD-06** (2 m connecting hose, two pressure port nipples, screws).

The pressure sensor is applied to measure positive, negative or differential pressure in clean air and gaseous media. It is used in the clean room, medical and filter technology, ventilation and air conditioning ducts, spray booths, large-scale catering facilities, for filter monitoring and level measurement or for triggering frequency converters.

A long-term stable, **digital humidity and temperature sensor** and a **pressure sensor** with piezoresistive measuring element guarantee exact measurement results. These measurands are used to internally calculate the following parameters that can be retrieved via Modbus: temperature, relative humidity, dew point, absolute humidity, mixture ratio, enthalpy (ignoring atmospheric air pressure), differential pressure, volume flow, air density.

Innovative Modbus sensor with galvanically separated RS485-Modbus-interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in current-free state, internal LEDs for telegram status display, two separate push-in terminals and large three-line display (illuminated; with customised programming in the 7-segment and dot-matrix range).
The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

PREMASGARD® **814x - Modbus**



TECHNICAL DATA

Power supply:	24 V AC (± 20 %) and 15…36 V DC
Power consumption:	< 4.8 W / 24 V DC typical; < 6.8 VA / 24 V AC typical
System of units:	**SI** (default) or **Imperial** (switchable via Modbus)
Data points:	differential pressure [Pa] [inWC], volume flow [m^3/h] [CFM], temperature [°C] [°F], relative humidity [% RH], dew point [°C] [°F], absolute humidity [g/m^3] [gr/ft^3], mixing ratio [g/kg] [gr/lb], enthalpy [kJ/kg] [Btu/lb], air density [kg/m^3] [lb/ft^3]
HUMIDITY & TEMPERATURE	
Sensors:	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
Sensor protection:	**plastic** sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional **metal** sinter filter, Ø 16 mm, L = 32 mm)
Measuring range, humidity:	0…100 % RH
Operating range, humidity:	0…95 % RH (without dew formation)
Deviation in humidity:	typically **± 2.0** % (20…80 % RH) at +25 °C, otherwise ± 3.0 %
Measuring range, temperature:	–35…+80 °C
Deviation in temperature:	typically ± 0.2 K at +25 °C
PRESSURE	
Type of pressure:	differential pressure
Pressure connection:	with **connection nozzles** for pressure hose Ø 6 mm (optional on request with **quick** connect for PVC fabric pressure hose Ø 6 mm)
Measuring range, pressure:	**–500… +500 Pa** or **–7000…+7000 Pa** depending on the type of device, see table
Accuracy, pressure:	**Typ 8148** (500 Pa): typically ± 13 Pa at +25 °C **Typ 8147** (7000 Pa): typically ± 105 Pa at +25 °C compared to the calibrated reference device
Above- / below-pressure:	max. ± 50 kPa
Zero point offset:	± 10 % of final value
Hysteresis:	0.3 % of final value
Linearity:	< ± 1 % of final value
Temp. drift values:	± 0.1 % per °C
Long-term stability:	± 1 % per year
Medium:	clean air and non-aggressive, non-combustible gases
Media contacting parts:	Brass, Ni, thermoset plastic, Si, epoxy, RTV, BSG, UV silicone gel
Media temperature:	–20…+50 °C (temperature-compensated 0…+50 °C)

Continued on next page!

Display screen (SI or Imperial) — **Modbus Tyr 2**



Pressure [Pa] [inWC]



Temperature [°C] [°F]



Humidity [% RH]



Volume flow rate [m^3/h] [CFM]

Programmable display screen — **Modbus Tyr 2**

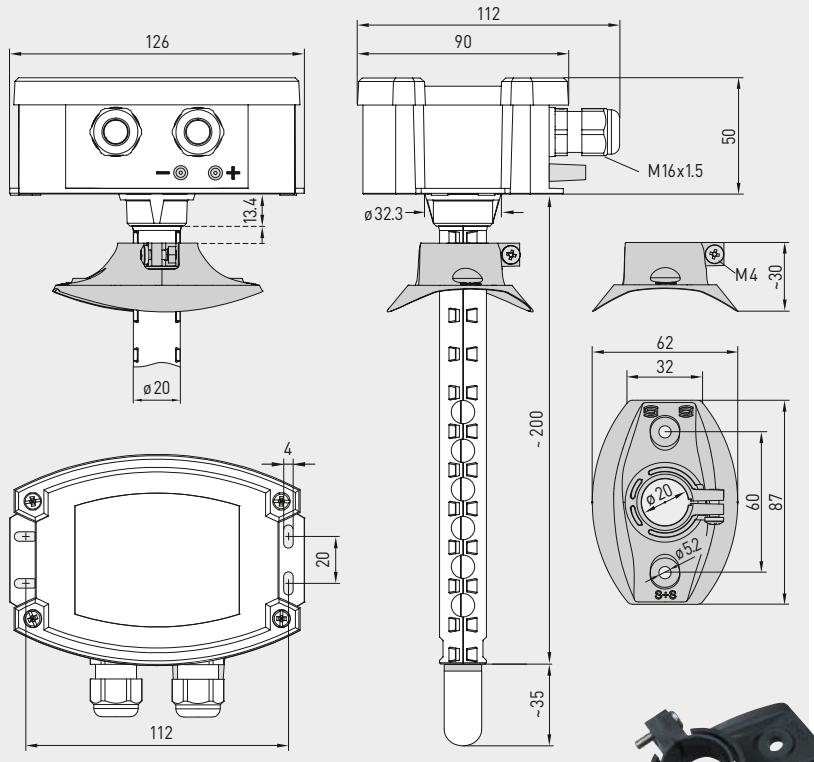


PREMASGARD® 814x-Modbus

Multifunctional duct sensors and measuring transducers for humidity, temperature, pressure, differential pressure and volume flow, incl. mounting flange and connection set, calibratable, with Modbus connection

Dimensional drawing [mm]

PREMASGARD® 814x-Modbus



PREMASGARD® 814x-Modbus
with display



MFT-20-K
Mounting flange, plastic



Device version with **M12 connector** (optional on request)



TECHNICAL DATA (continued)

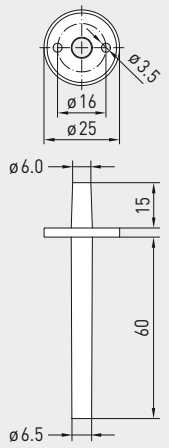
Bus protocol:	Modbus (RTU mode), address range 0...**247** adjustable
Baud rate:	9600, 19200, 38400 Baud
Signal filtering:	4 s / 32 s at temperature / humidity 0 s / 1 s / 10 s at pressure
Ambient temperature:	–30...+70 °C
Electrical connection:	0.2 - 1.5 mm², via push-in terminal
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Protective tube:	**PLEUROFORM**™, material: polyamide (PA6), with torsion protection, Ø 20 mm, NL = 235 mm (optional 100 mm), v_{max} = 30 m/s (air) (on request, optional stainless steel **V2A** (1.4301), Ø 16 mm)
Process connection:	via mounting flange made of plastic (included in the scope of delivery)
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529) housing only! (PLEUROFORM IP 30)
Standards:	CE-conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU
Optional:	three-line **display with illumination,** programmable, cut-out approx. 70 x 40 mm (W x H), for display actual humidity, actual temperature and ACTUAL pressure (cyclic) or a selectable parameter (static) or an individually programmable display value
ACCESSORIES	see table
ASD-06	**Connection set** (nipple straight) (included in the scope of delivery)
MFT-20K	**Mounting flange** plastic (included in the scope of delivery)

PREMASGARD® 814x - Modbus

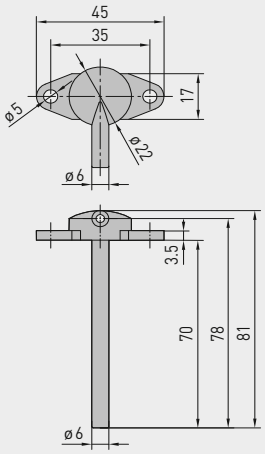
**Multifunctional duct sensors and measuring transducers
for humidity, temperature, pressure, differential pressure and volume flow,
incl. mounting flange and connection set,
calibratable, with Modbus connection**

S+S REGELTECHNIK

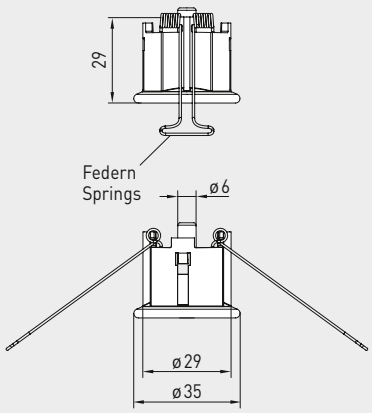
Dimensional drawing [mm] **ASD-06**



Dimensional drawing [mm] **ASD-07**



Dimensional drawing [mm] **DAL-01**



ASD-06
Connection set



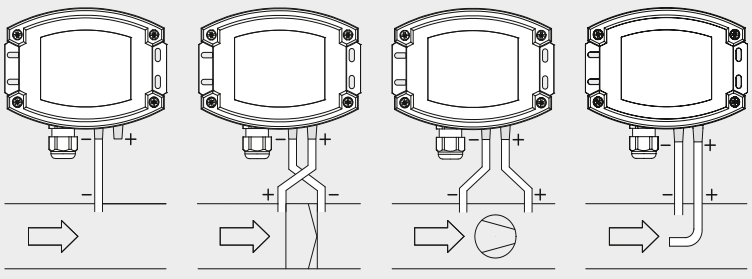
ASD-07
Connection nipple



DAL-01
Pressure outlet



Mounting diagram **PREMASGARD® 814x - Modbus**



TYPES OF MONITORING:

Pressure connections at the pressure switch are marked with
P1 (+) for higher pressure and
P2 (–) for lower pressure.

(A) Below-atmospheric pressure
P1 (+) is not connected, but open to the atmosphere
P2 (–) connected to inside of duct

(B) Filter
P1 (+) connected upstream of filter
P2 (–) connected downstream of filter

(C) Ventilator
P1 (+) connected downstream of ventilator
P2 (–) connected upstream of ventilator

(D) Volume flow
P1 (+) dynamic pressure, connected in flow direction
P2 (–) static pressure, connected free of dynamic pressure components

Switchable system of units

Measurements / Data points	SI (default)	→	Imperial
Differential pressure	[Pa]	→	[inWC]
Volume flow	[m³/h]	→	[CFM]
Temperature	[°C]	→	[°F]
Humidity	[%RH]	→	[%RH]
Dew point	[°C]	→	[°F]
Absolute humidity	[g/m³]	→	[gr/ft³]
Mixture ratio	[g/kg]	→	[gr/lb]
Enthalpy	[kJ/kg]	→	[Btu/lb]
Air density	[kg/m³]	→	[lb/ft³]

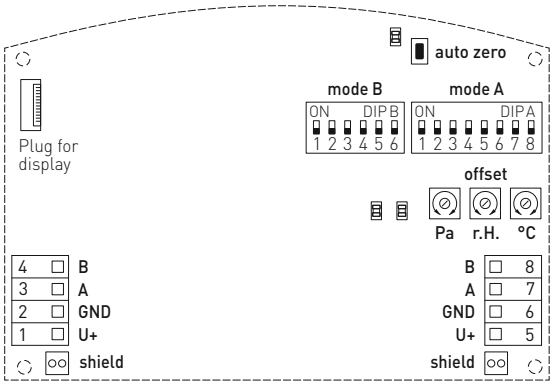
Measuring ranges	SI (default)	→	Imperial
Type 8148	–500…+500 Pa	→	–2.0…+2.0 inWC
Type 8147	–7000…+7000 Pa	→	–28…+28 inWC
Type 814x	–35…+80 °C	→	–31…+176 °F
Type 814x	0…100 %RH	→	0…100 %RH

Alternative parameters are calculated internally.

PREMASGARD® 814x-Modbus

Multifunctional duct sensors and measuring transducers for humidity, temperature, pressure, differential pressure and volume flow, incl. mounting flange and connection set, calibratable, with Modbus connection

Schematic diagram **PREMASGARD® 814x-Modbus**



DIP A: Bus address
DIP B: Bus parameters (Baud rate, parity...)
Telegram indicator Reception (LED green) Error (LED red)
LED (internal status)
Reset button
Offset correction
Shielding

PREMASGARD® 814x-Modbus with display





SF-K
Plastic sinter filter (standard)



SF-M
Metal sinter filter (optional)

stainless steel protective tube (optional on request)

PREMASGARD® 814x-Modbus	Multifunctional duct sensor for humidity, temperature, pressure, differential pressure and volume flow rate, *Deluxe*					
Type / WG02	**Measuring ranges** Pressure	Humidity	Temperature	**Output** **Display**	**Item no.**	**Price**
Type 8148	**± 500 Pa**					
PREMASGARD 8148-Modbus	–500...+500 Pa	0...100 % RH	–35...+80°C	Modbus	1301-8144-0910-20V	**516,31 €**
PREMASGARD 8148-Modbus **LCD**	–500...+500 Pa	0...100 % RH	–35...+80°C	Modbus ■	1301-8144-4910-20V	**563,85 €**
	Equipped as standard with automatic zero point calibration					
Type 8147	**± 7000 Pa**					
PREMASGARD 8147-Modbus	–7000...+7000 Pa	0...100 % RH	–35...+80°C	Modbus	1301-8144-0950-200	**456,46 €**
PREMASGARD 8147-Modbus **LCD**	–7000...+7000 Pa	0...100 % RH	–35...+80°C	Modbus ■	1301-8144-4950-200	**504,59 €**
Extra charge:	**with optional automatic zero point calibration** (please specify in your order)					**72,56 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101 shortened protective tube **PLEUROFORM**™, NL = 100 mm				on request on request	
Note:	System of units **SI** (default) or **imperial** (can be changed via Modbus).					
ACCESSORIES						
KA2-Modbus	**Communication adapter** (USB/RS485) for system connection				1906-1200-0000-100	**213,99 €**
LA-Modbus	**Line termination device** (with terminating resistor) as an active bus termination				1906-1300-0000-100	**79,81 €**
ASD-06	**Connection set** (included in the scope of delivery), consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose (soft, UV-resistant) and 4 screws				7100-0060-3000-000	**7,64 €**
ASD-07	**2 connection nipples** (at 90° angle) made of ABS				7100-0060-7000-000	**7,64 €**
DAL-01	**Pressure outlet** for ceiling or in-wall installation (e.g. in clean rooms)				7300-0060-3000-001	**35,77 €**
SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable, stainless steel **V4A** (1.4404)				7000-0050-2200-100	**42,33 €**
MFT-20-K	**Mounting flange**, plastic (included in the scope of delivery)				7000-0031-0000-000	**9,56 €**
	For further information see last chapter!					

AERASGARD® RCO2 / RLQ - CO2 - Modbus
AERASGARD® RFTM - LQ - PS - CO2 - Modbus

Multifunctional room sensor and measuring transducer for humidity, temperature, air quality (VOC), fine dust (PM) and CO2 content, calibratable, with Modbus connection

S+S REGELTECHNIK

Multifunctional indoor climate sensor **AER**ASGARD® **RFTM - LQ - PS - CO2 - Modbus** (maximum expansion level) with Modbus connection, in an elegant plastic housing with snap-on lid, base with 4-hole attachment, optionally with / without display, type variant **RFTM - CO2 - Modbus** optionally with / without setpoint potentiometer. The room sensor is used for detecting the air humidity (0…100 % RH), room temperature (0…+50 °C), air quality (VOC) (0…100 %), the fine dust (PM) (0…1000 µg/m³) and CO2 content (0…5000 ppm) as well as a room control unit (% setpoint). International system of units **SI** (default) can be changed to **imperial** (via Modbus). The following parameters can be accessed via the Modbus: Temperature, relative humidity, air quality (VOC), fine dust (PM) and carbon dioxide (CO2). Use just one device to monitor and control the entire indoor climate effectively. This enables energy-saving room ventilation on an as-needed basis, thereby reducing operating costs and improving well-being. It is used in offices, hotels, convention centres, apartments, shops, etc. One sensor for every 30 m² of room area is recommended.

A long-term stable, **digital humidity and temperature sensor** guarantees exact measurement results. The air quality is determined based on a (VOC) **mixed gas sensor**. The CO2 content of the air is measured using an optical **NDIR sensor** (non-dispersive infra-red technology). An optical **fine dust sensor** precisely detects **particulate (PM)** of the size category 0.3 to 10 micrometres.

Innovative Modbus sensor with galvanically separated RS485-Modbus-interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in current-free state, internal LEDs for telegram status display, two separate push-in terminals and two-line display (illuminated; with customised programming in the 7-segment and dot-matrix range).
The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

RFTM - CO2 - Modbus - P
with display and potentiometer



TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %)
Power consumption:	typically < 4.4 W / 24 V DC; < 6.4 VA / 24 V AC; peak current 200 mA
System of units:	**SI** (default) or **imperial** (can be changed via Modbus)
Data points:	temperature [°C] [°F], relative humidity [% RH], fine dust (PM) [µg/m³], air quality (VOC) [%], carbon dioxide (CO2) [ppm], setpoint potentiometer [%]
HUMIDITY & TEMPERATURE	
Sensor:	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
Measuring range:	0…100 % RH (humidity) 0…+50 °C (temperature)
Deviation, humidity:	typically **± 2,0** % (20…80 % RH) at +25 °C, otherwise ± 3,0 %
Deviation, temperature:	typically ± 0,2 K at +25 °C
AIR QUALITY (VOC)	
Sensor (VOC):	**VOC sensor** (metal oxide) **with automatic calibration** (VOC = volatile organic compounds)
Measuring range (VOC):	0…100 % air quality; with reference to calibration gas; multi-range switching VOC sensitivity low, medium, high
Measuring accuracy (VOC):	typically ± 20 % final value (with reference to the calibration gas)
Service life (VOC):	> 60 months (under normal load conditions)
FINE DUST (PM)	
Sensor (PM):	optical **particulate sensor** (**PM** = particulate matter), **fine-dust sensor** with laser- and soiling-resistant technology
Measuring range (PM):	0…1000 µg/m³
Particle size (PM):	**PM 2.5** (0.3…2.5 µm); **PM 10** (0.3…10 µm)
Measuring accuracy (PM):	typically ± 10 µg/m³ (± 10 % of measured value) at PM 2.5 typically ± 25 µg/m³ (± 25 % of measured value) at PM 10
Long-term stability (PM):	± 1.25 µg/m³ (± 1.25 % of measured value/year)
Service life (PM):	> 10 years
CARBON DIOXIDE (CO2)	
Sensor (CO2):	optical **NDIR sensor** (non-dispersive infra-red technology) **with manual calibration** (via zero button), **with automatic calibration** (can be deactivated via Modbus)
Measuring range (CO2):	0…5000 ppm
Measuring accuracy (CO2):	typically ± 30 ppm (± 3 % of measured value)
Temperature dependence (CO2):	± 5 ppm per °C or ± 0.5 % of measured value per °C (whichever is greater)
Pressure dependence (CO2):	± 0.13 % per mm Hg
Long-term stability (CO2):	< 2 % in 15 years
Gas exchange (CO2):	Diffusion

Continued on next page!

Display screen **standard** — **Modbus** (Baldur)



Carbon dioxide (CO2) [ppm]



Air quality (VOC) [%]



Temperature [°C] [°F]



Humidity [% RH]



Fine dust (PM) [µg/m³]

Display screen **programmable** — **Modbus** (Baldur)



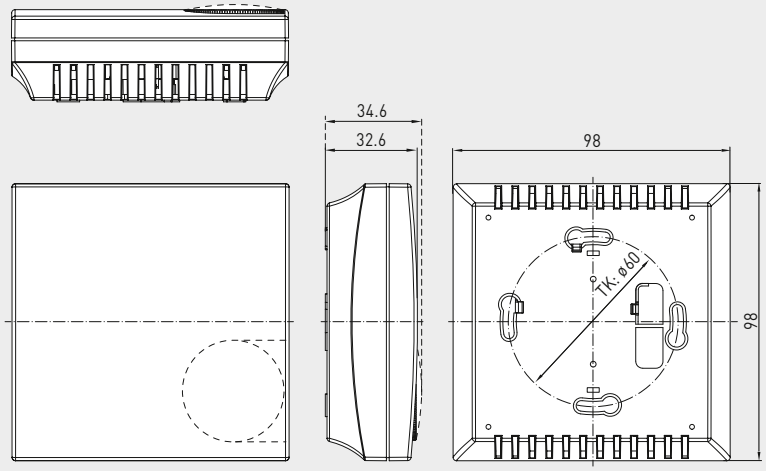
Symbols

AERASGARD® RCO2 / RLQ - CO2 - Modbus
AERASGARD® RFTM - LQ - PS - CO2 - Modbus

Multifunctional room sensor and measuring transducer for humidity, temperature, air quality (VOC), fine dust (PM) and CO2 content, calibratable, with Modbus connection

Dimensional drawing [mm]

Housing **Baldur 2**

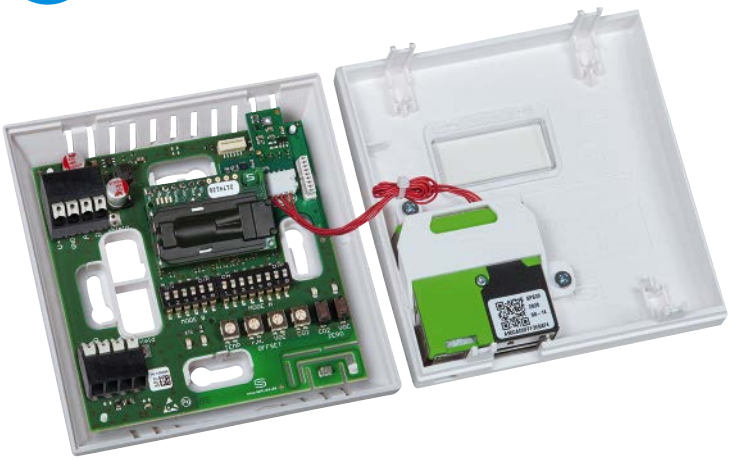


R xx CO2 - Modbus
without display



RFTM - LQ - PS - CO2 - Modbus
with display





TECHNICAL DATA (continued)

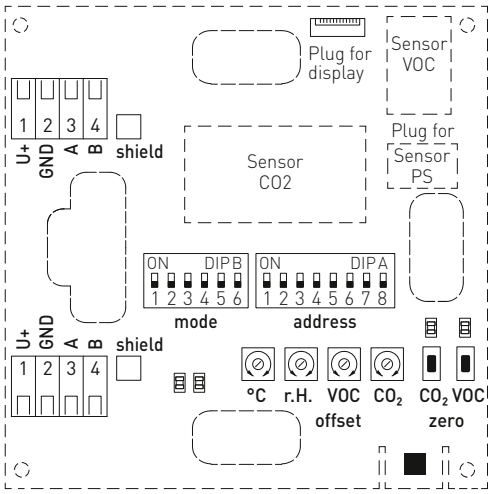
Bus protocol:	Modbus (RTU mode), address range 0...**247** selectable
Baud rate:	9600, 19200, 38400 Baud
Signal filtering:	4 s / 32 s
Warm up time:	approx. 1 hour
Response time:	< 2 minutes
Ambient temperature:	0...+ 50 °C
Permissible air humidity:	0...95 % RH (non-precipitating air)
Electrical connection:	0.2 - 1.5 mm², via push-in terminal
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010)
Dimensions:	98 x 98 x 33 mm (Baldur 2)
Mounting:	wall mounting or on in-wall flush box, Ø 55 mm, base with 4 holes, for attachment to vertically or horizontally installed in-wall flush boxes for rear cable entry, with predetermined breaking point for top/bottom cable entry for surface-mounted installation
Protection class:	III (according to EN 60 730)
Protection type:	**IP 30** (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU, Low Voltage Directive 2014 / 35 / EU
Optional:	**Display with illumination,** 2-line, cutout approx. 36 x 15 mm (W x H), to display actual humidity, actual temperature, air quality, of the fine-dust and CO2 content (cyclic) or a selectable parameter (static) or an individually programmable display value

AERASGARD® RCO2 / RLQ - CO2 - Modbus
AERASGARD® RFTM - LQ - PS - CO2 - Modbus

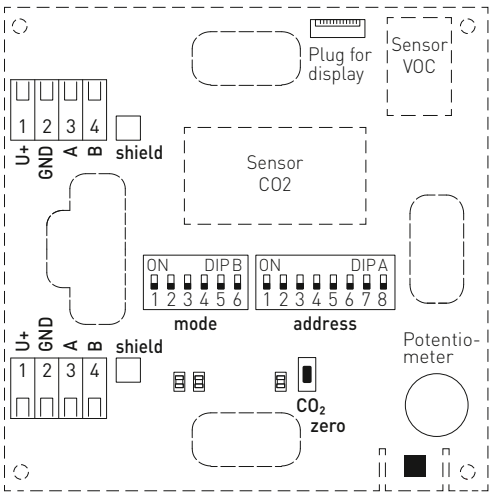
Multifunctional room sensor and measuring transducer for humidity, temperature, air quality (VOC), fine dust (PM) and CO2 content, calibratable, with Modbus connection

S+S REGELTECHNIK

Schematic diagram **R xx - Modbus**



Schematic diagram with potentiometer **RFTM - CO2 - Modbus - P**



Display screen **standard (cyclic)**



Carbon dioxide (CO2)



Air quality (VOC)



Temperature [°C]



Temperature [°F]



Humidity



Fine dust (PM)

Display screen **alternative (static)**



Carbon dioxide (CO2)



Air quality (VOC)



Temperature [°C]



Temperature [°F]



Humidity



Fine dust (PM)

Display screen **programmable** **Modbus** (Baldur)



Symbols

The Modbus interface allows the display to be **individually** configured both in the 7-segment range and in the dot-matrix range.
For improved legibility, backlighting is provided.

SI IMP

By default, the display indicates the measurements with the corresponding units **cyclically** and consecutively:

CO2 content, **air quality** (VOC), **temperature**, **relative humidity**, **fine dust** (PM).

The **Modbus** configuration can be used to program an **alternative output variable** instead of the standard display. In this case, the first line indicates the value and index while the second line indicates the corresponding unit **statically**. The index identifies the display type:

Index 1 = carbon dioxide (CO2) [ppm]
Index 2 = air quality (VOC) [%]
Index 3 = temperature [°C] [°F]
Index 4 = relative humidity [% RH]
Index 6 = fine dust (PM) [µg/m³]

AERASGARD® RCO2 / RLQ-CO2-Modbus
AERASGARD® RFTM-LQ-PS-CO2-Modbus

Multifunctional room sensor and measuring transducer for humidity, temperature, air quality (VOC), fine dust (PM) and CO2 content, calibratable, with Modbus connection

RFTM-CO2-Modbus-P
with setpoint potentiometer (room control unit)



RFTM-LQ-PS-CO2-Modbus
with display



Rxx CO2-Modbus
without display



AERASGARD® Rxx-Modbus	Room sensor and measuring transducer for humidity, temperature, air quality (VOC), fine dust (PM) and CO2 content, *Deluxe*							
Type / WG02	**Measuring Range** Humidity	Temperature*	PM	CO2	VOC	**Display** ☼=P	**Item No.**	**Price**
RCO2-Modbus								
RCO2-Modbus	–	–	–	5000 ppm	–		1501-61B0-6001-200	**272,61 €**
RCO2-Modbus **LCD**	–	–	–	5000 ppm	–	■	1501-61B0-6021-200	**322,46 €**
RLQ-CO2-Modbus								
RLQ-CO2-Modbus	–	–	–	5000 ppm	0...100 %		1501-61B1-6001-500	**399,60 €**
RLQ-CO2-Modbus **LCD**	–	–	–	5000 ppm	0...100 %	■	1501-61B1-6021-500	**449,43 €**
RFTM-PS-Modbus								
RFTM-PS-Modbus	0...100 % RH	0...+50 °C	0...1000 µg/m³	–	–		1501-2116-6001-200	**371,54 €**
RFTM-PS-Modbus **LCD**	0...100 % RH	0...+50 °C	0...1000 µg/m³	–	–	■	1501-2116-6021-200	**426,92 €**
RFTM-CO2-Modbus								
RFTM-CO2-Modbus	0...100 % RH	0...+50 °C	–	5000 ppm	–		1501-61B6-6001-200	**321,67 €**
RFTM-CO2-Modbus **LCD**	0...100 % RH	0...+50 °C	–	5000 ppm	–	■	1501-61B6-6021-200	**371,26 €**
RFTM-CO2-Modbus-P								
RFTM-CO2-Modbus-**P**	0...100 % RH	0...+50 °C	–	5000 ppm	–	☼	1501-61B6-6501-271	**355,97 €**
RFTM-CO2-Modbus-**P LCD**	0...100 % RH	0...+50 °C	–	5000 ppm	–	☼ ■	1501-61B6-6521-271	**405,80 €**
RFTM-LQ-CO2-Modbus								
RFTM-LQ-CO2-Modbus	0...100 % RH	0...+50 °C	–	5000 ppm	0...100 %		1501-61B8-6001-500	**435,89 €**
RFTM-LQ-CO2-Modbus **LCD**	0...100 % RH	0...+50 °C	–	5000 ppm	0...100 %	■	1501-61B8-6021-500	**485,72 €**
RFTM-LQ-PS-CO2-Modbus								
RFTM-LQ-PS-CO2-Modbus	0...100 % RH	0...+50 °C	0...1000 µg/m³	5000 ppm	0...100 %		1501-2119-6001-500	**563,13 €**
RFTM-LQ-PS-CO2-Modbus **LCD**	0...100 % RH	0...+50 °C	0...1000 µg/m³	5000 ppm	0...100 %	■	1501-2119-6021-500	**612,95 €**
Housing variant "P":	**Room control unit** with potentiometer (standard printing is a widening arrow with central position unfilled)							
Note:	These units must **not** be used as safety-relevant devices!							
	* International system of units **SI** (default) can be changed to **imperial** (via Modbus).							

ACCESSORIES			
KA2-Modbus	**Communication adapter** (USB/RS485) for system connection	1906-1200-0000-100	**213,99 €**
LA-Modbus	**Line termination device** (with terminating resistor) as an active bus termination	1906-1300-0000-100	**79,81 €**

AERASGARD® FSFTM - CO2 - Modbus

Room humidity, temperature and CO2 sensor or measuring transducer, in-wall in the panel switch programme, with Modbus connection

S+S REGELTECHNIK

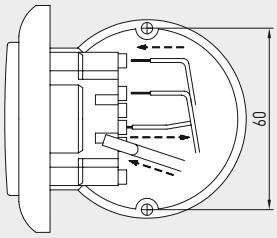
The room sensor and measuring transducer **AER**ASGARD® **FSFTM - CO2 - Modbus** in the in-wall housing, optionally with potentiometer, is used to measure the CO2 content, relative humidity and temperature of the air, and for setpoint adjustment.
The measured values are queried via the Modbus interface.

The CO2 content of the air is measured using an optical NDIR sensor (non-dispersive infra-red technology). A digital, long-term stable sensor is used for humidity and temperature measurement. Relative humidity (% RH) is the quotient of water vapour partial pressure divided by the saturation vapour pressure at the respective gas temperature.

The in-wall sensor is mounted in high-quality panel switch programmes, ideally of the brands Gira, Berker, Merten, Jung, Siemens or Busch-Jaeger (using in-wall adapters, no setpoint adjustment possible) either individually or in combination with light switches, socket outlets, etc.

It is used in non-aggressive, dust-free environments, in refrigeration, air conditioning and clean room technology, and in interior rooms, such as living rooms, offices, hotels, etc.

Mounting diagram **in-wall**

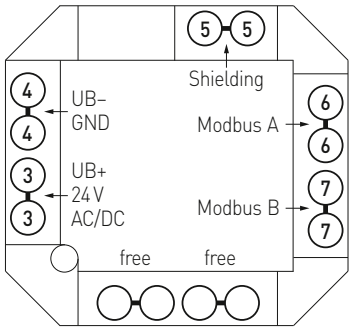


TECHNICAL DATA

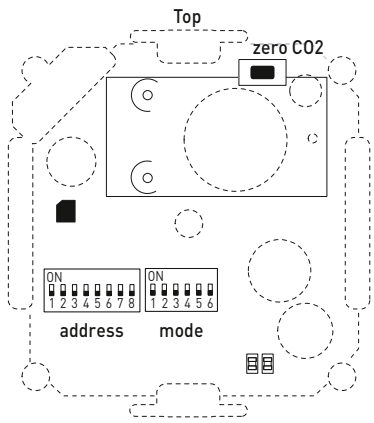
Power supply:	24 V AC / DC (± 10 %)
Power consumption:	< 4.4 W / 24 V DC; < 6.4 VA / 24 V AC
Data points:	relative humidity [% RH], temperature [°C], CO2 content of the air [ppm] as well as setpoint potentiometer (no setpoint adjustment possible with Busch-Jaeger)
Bus protocol:	Modbus (RTU mode), address range 0...**247** selectable
Signal filtering:	4 s / 32 s
CARBON DIOXIDE (CO2)	
Sensor, CO2:	**optical NDIR sensor** (non-dispersive infra-red technology), with manual calibration (via zero button) and automatic calibration
Long-term stability:	< 2 % in 15 years
Measuring range, CO2:	0...5000 ppm
Measuring accuracy, CO2:	typically ± 30 ppm ± 3 % of measured value
Temperature dependence, CO2:	± 5 ppm / °C or ± 0.5 % of measured value / °C (whichever is higher)
Pressure dependence:	± 0.13 % / mm Hg
Gas exchange:	by diffusion
Warm up time:	approx. 1 hour
Response time:	< 2 minutes
HUMIDITY	
Sensor:	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
Long-term stability:	± 1 % per year
Measuring range, humidity::	0...100 % RH
Operating range, humidity:	0...95 % RH (non-precipitating air)
Deviation, humidity:	typically ± 3.0 % (20...80 % RH) at +25 °C, otherwise ± 5.0 %
TEMPERATURE	
Measuring range:	0...+50 °C
Deviation, temperature:	typically ± 0.8 K at +25 °C

Mounting:	in-wall flush box Ø 55 mm
Electrical connection:	1.0 - 2.5 mm², via plug terminals
Ambient temperature:	Storage –35...+85 °C; Operation 0...+50 °C
Permitted humidity:	max. 90 % RH, non-precipitating air
Medium:	clean air and other non-aggressive, non-combustible gases
Protection class:	III (according to EN 60 730)
Protection type:	**IP 20** (according to 60 529)
Standards:	CE-conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU
SWITCH PROGRAMME	
Manufacturer:	GIRA System 55 (other switch programmes, manufacturers, colours as well as prices available upon request)
Housing:	plastic, the standard colour is pure glossy white (similar to RAL 9010) (other colours are available upon request with colour variants depending on the respective light switch programme)

Connection diagram **FSFTM - CO2 - Modbus**

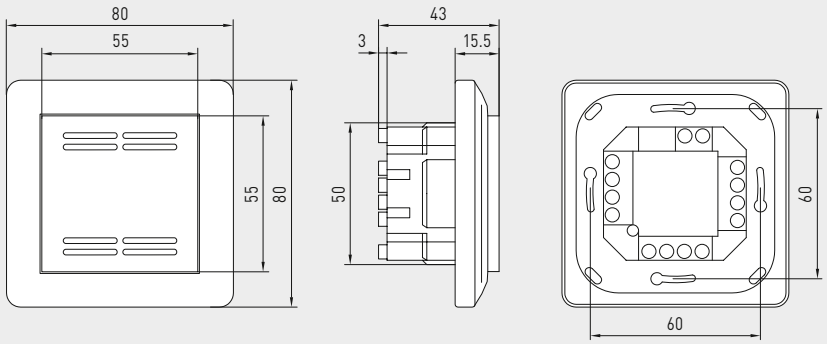


Schematic diagram **FSFTM - CO2 - Modbus**



Room humidity, temperature and CO2 sensor or measuring transducer, in-wall in the panel switch programme, with Modbus connection

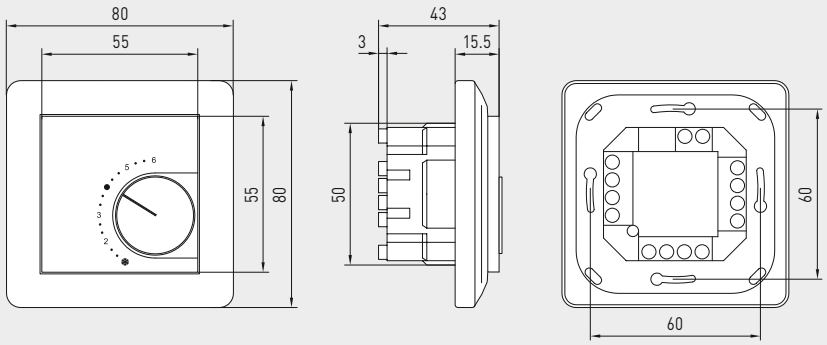
Dimensional drawing **FSFTM-CO2-Modbus**



FSFTM-CO2-Modbus
Standard



Dimensional drawing **FSFTM-CO2-Modbus-P**



FSFTM-CO2-Modbus-P
with potentiometer



AERASGARD® FSFTM-CO2-Modbus Room temperature humidity and CO2 sensor, in-wall

Type / WG02	Measuring Range CO2	Humidity	Temperature	Control element	Output	Item No.	Price
FSTFM-CO2-Modbus							
FSFTM-CO2-Modbus	0...5000 ppm	0...100 % RH	0...+50 °C	–	Modbus	1501-9226-6001-162	**374,65 €**
FSFTM-CO2-Modbus P	0...5000 ppm	0...100 % RH	0...+50 °C	Potentiometer	Modbus	1501-9226-6501-282	**462,39 €**
Data points:	relative humidity [% RH], temperature [°C], CO2 content of the air [ppm] and setpoint potentiometer						

ACCESSORIES			
KA2-Modbus	**Communication adapter** (with USB and RS485 interface) for system connection (incl. quick-start software)	1906-1200-0000-100	**213,99 €**
LA-Modbus	**Line termination device** (with terminating resistor) as an active bus termination of RS485 networks	1906-1300-0000-100	**79,81 €**

AERASGARD® ACO2 / ALQ-CO2-Modbus
AERASGARD® AFTM-(LQ)-CO2-Modbus

Multifunctional on-wall sensors and measuring transducers, for humidity, temperature, CO2 content and air quality (VOC), calibratable, with Modbus connection

S+S REGELTECHNIK

The maintenance-free on-wall sensor **AER**ASGARD® **AFTM-LQ-CO2-Modbus** (max. expansion level) and **ACO2 / ALQ-CO2 / AFTM-CO2-Modbus** with Modbus connection, automatic calibration, in an impact-resistant plastic housing with quick-locking screws, plastic sinter filter (replaceable), optionally with/without display, for determining the CO2-content of the air (0...5000 ppm), of the air quality (0...100 % VOC), the temperature (–35...+80 °C) and the relative air humidity (0...100 % RH). International system of units **SI** (default) can be changed to **imperial** (via Modbus). The following parameters can be accessed via the Modbus: Temperature, relative humidity, air quality (VOC), carbon dioxide (CO2) and atmospheric pressure. The sensor is used in offices, hotels, convention centres, apartments, shops, etc. for the purpose of evaluating the indoor climate. This enables energy-saving room ventilation on an as-needed basis, thereby reducing operating costs and improving well-being. One sensor for every 30 m² of space is recommended.

A long-term stable, **digital humidity and temperature sensor** guarantees exact measurement results. The CO2 measurement is performed using an optical **NDIR sensor** (non-dispersive infra-red technology). The detection range is calibrated for standard applications such as monitoring residential rooms and conference rooms. The air quality is detected by a **VOC sensor** (mixed gas sensor for volatile organic substances). This sensor determines the loading of the room air due to contaminated gases such as cigarette smoke, body perspiration, exhaled breathing air, solvent vapours, emissions etc. With regard to the expected air contamination, low, medium or high VOC sensitivity can be selected.

Innovative Modbus sensor with galvanically separated RS485-Modbus-interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in current-free state, internal LEDs for telegram status display, two separate push-in terminals and large three-line display (illuminated; with customised programming in the 7-segment and dot-matrix range).
The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

Voltage supply:	24 V AC / DC (± 10 %)
Power consumption:	< 4.8 W / 24 V DC typically; < 6.8 VA / 24 V AC typically; peak current 200 mA
System of units:	**SI** (default) or **Imperial** (switchable via Modbus)
Data points:	temperature [°C] [°F], relative humidity [% RH], atmospheric pressure [hPa], air quality (VOC) [%], carbon dioxide (CO2) [ppm]
HUMIDITY	
Sensors:	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
Sensor protection:	**plastic** sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional **metal** sinter filter, Ø 16 mm, L = 32 mm)
Measuring range, humidity:	0...100 % RH
Operating range, humidity:	0...95 % RH (without dew formation)
Deviation in humidity:	typically **± 2.0** % (20...80 % RH) at +25 °C, otherwise ± 3.0 %
TEMPERATURE	
Measuring range, temperature:	–35...+80 °C
Operating range, temperature:	–10...+60 °C
Deviation in temperature:	typically ± 0.4 K at +25 °C
AIR QUALITY (VOC)	
Sensor (VOC):	VOC sensor (metal oxide) **with automatic calibration** (VOC = volatile organic compounds)
Measuring range (VOC):	0...100 % air quality; referred to calibrating gas; **multi-range switching** VOC sensitivities (low/medium/high)
Measuring accuracy (VOC):	typically ± 20 % of final value (referred to calibrating gas)
Service life (VOC):	> 60 months (under normal load conditions)
CARBON DIOXIDE (CO2)	
Sensor (CO2):	optical NDIR sensor (non-dispersive infra-red technology) including atmospheric pressure compensation (up to 1100 mbar) **with manual calibration** (via zero button), **with automatic calibration** (can be deactivated via Modbus)
Measuring range (CO2):	0...5000 ppm
Measuring accuracy (CO2):	typically ± 30 ppm (± 3 % of measured value)
Temperature dependence (CO2):	± 5 ppm per °C or ± 0,5 % of measured value per °C (whichever is higher)
Pressure dependence (CO2):	± 0.13 % per mm Hg
Long-term stability (CO2):	< 2 % in 15 years
Gas exchange (CO2):	by diffusion

Continued on next page!

Display screen (cyclic) **Modbus Tyr 2**



Temperature [°C]



Temperature [°F]



Humidity



Air quality (VOC)



Carbon dioxide (CO2)

Display screen (static)



Atmospheric pressure (Example Index 5)

Programmable display screen

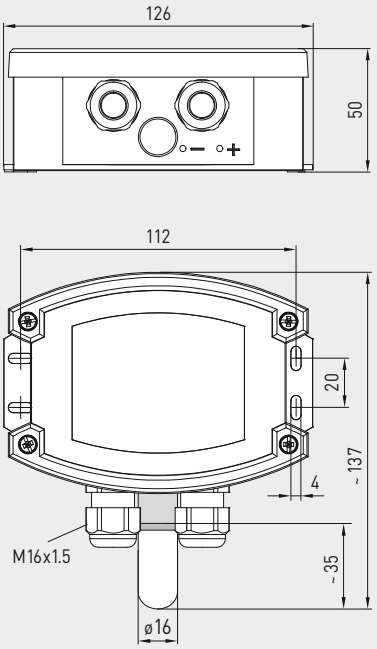


AERASGARD® ACO2 / ALQ - CO2 - Modbus
AERASGARD® AFTM - (LQ) - CO2 - Modbus

Multifunctional on-wall sensors and measuring transducers, for humidity, temperature, CO2 content and air quality (VOC), calibratable, with Modbus connection

Dimensional drawing

AFTM - LQ - CO2 - Modbus
AFTM - CO2 - Modbus



AFTM - LQ - CO2 - Modbus
AFTM - CO2 - Modbus
with plastic sinter filter (standard)



AFTM - LQ - CO2 - Modbus
AFTM - CO2 - Modbus
with display and plastic sinter filter (standard)





SF-K
Plastic sinter filter (standard)



SF-M
Metal sinter filter (optional)

TECHNICAL DATA (continued)

Bus protocol:	Modbus (RTU mode), address range 0...**247** selectable
Baud rate:	9600, 19200, 38400 Baud
Signal filtering:	4 s / 32 s
Response time:	< 2 minutes
Ambient temperature:	–10...+60 °C
Electrical connection:	0.2 - 1.5 mm², ia push-in terminal
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Protective tube:	**stainless steel V2A** (1.4301), Ø 16 mm, NL = 55 mm
Process connection:	by screws
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU
Optional:	**Display with illumination,** three-line, cutout approx. 70 x 40 mm (W x H), for displaying actual humidity, actual temperature, air quality and the actual CO2 content (cyclic) or a selectable parameter (static) or an individually programmable display value
ACCESSORIES	see table

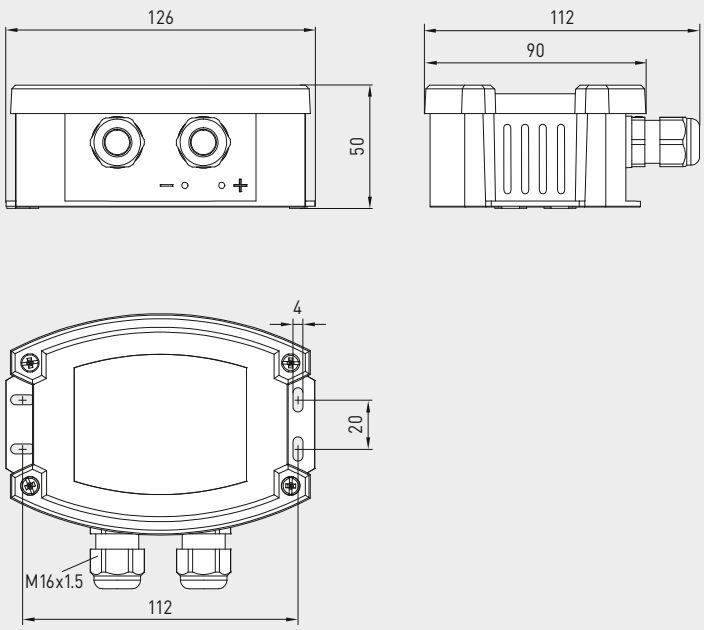
AERASGARD® ACO2 / ALQ - CO2 - Modbus
AERASGARD® AFTM - (LQ) - CO2 - Modbus

Multifunctional on-wall sensors and measuring transducers, for humidity, temperature, CO2 content and air quality (VOC), calibratable, with Modbus connection

S+S REGELTECHNIK

Dimensional drawing

ACO2-Modbus
ALQ - CO2-Modbus



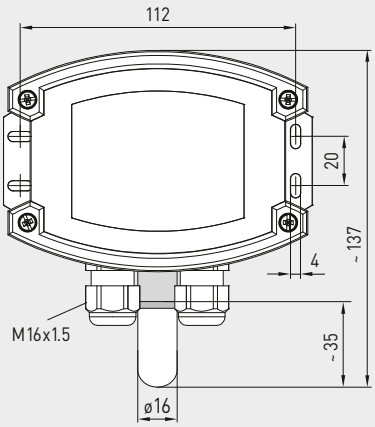
ACO2-Modbus
ALQ - CO2-Modbus





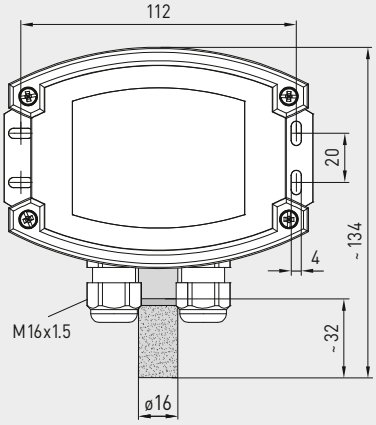
Dimensional drawing

AFTM - LQ - CO2 - Modbus
AFTM - CO2 - Modbus



SF-K
plastic sinter filter
(standard)





SF-M
metal sinter filter
(optional)



AFTM - LQ - CO2 - Modbus
AFTM - CO2 - Modbus
with metal sinter filter
(optional)

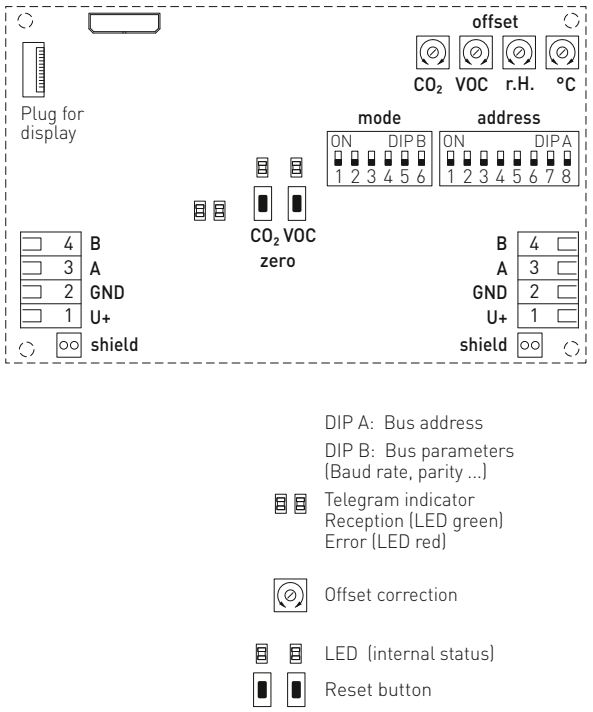




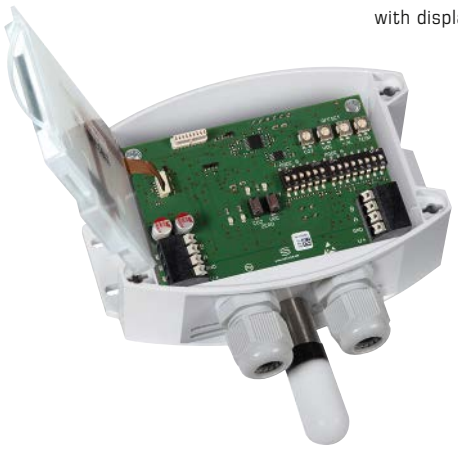
AERASGARD® ACO2 / ALQ-CO2-Modbus
AERASGARD® AFTM-(LQ)-CO2-Modbus

Multifunctional on-wall sensors and measuring transducers, for humidity, temperature, CO2 content and air quality (VOC), calibratable, with Modbus connection

Schematic diagram **AFTM-LQ-CO2-Modbus**



AFTM-LQ-CO2-Modbus
with display





AERASGARD® ACO2-Modbus	On-wall sensor for CO2 content, *Deluxe*
AERASGARD® ALQ-CO2-Modbus	On-wall sensor for CO2 content and air quality (VOC), *Deluxe*
AERASGARD® AFTM-CO2-Modbus	Multifunctional on-wall sensor for humidity, temperature and CO2 content, *Deluxe*
AERASGARD® AFTM-LQ-CO2-Modbus	Multifunctional on-wall sensor for humidity, temperature, CO2 content and air quality (VOC), *Deluxe*

Type / WG02	Measuring Range Humidity	Temperature*	CO2	VOC	Display	Item No.	Price
ACO2-Modbus							
ACO2-Modbus	–	–	5000 ppm	–		1501-7110-6001-200	**375,41 €**
ACO2-Modbus **LCD**	–	–	5000 ppm	–	■	1501-7110-6071-200	**447,21 €**
ALQ-CO2-Modbus							
ALQ-CO2-Modbus	–	–	5000 ppm	0...100 %		1501-7111-6001-500	**506,02 €**
ALQ-CO2-Modbus **LCD**	–	–	5000 ppm	0...100 %	■	1501-7111-6071-500	**591,86 €**
AFTM-CO2-Modbus							
AFTM-CO2-Modbus	0...100 % RH	–35...+80 °C	5000 ppm	–		1501-7116-6001-200	**470,94 €**
AFTM-CO2-Modbus **LCD**	0...100 % RH	–35...+80 °C	5000 ppm	–	■	1501-7116-6071-200	**564,06 €**
AFTM-LQ-CO2-Modbus							
AFTM-LQ-CO2-Modbus	0...100 % RH	–35...+80 °C	5000 ppm	0...100 %		1501-7118-6001-500	**601,81 €**
AFTM-LQ-CO2-Modbus **LCD**	0...100 % RH	–35...+80 °C	5000 ppm	0...100 %	■	1501-7118-6071-500	**711,60 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101					on request	
Note:	This unit **must not** be used as safety-relevant device!						
	* International system of units **SI** (default) can be changed to **imperial** (via Modbus).						

ACCESSORIES			
KA2-Modbus	**Communication adapter** (USB/RS485) for system connection	1906-1200-0000-100	**213,99 €**
LA-Modbus	**Line termination device** (with terminating resistor) as an active bus termination	1906-1300-0000-100	**79,81 €**
SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable, stainless steel **V4A** (1.4404)	7000-0050-2200-100	**42,33 €**
WS-03	**Weather and sun protection hood**, 200 x 180 x 150 mm, stainless steel **V2A** (1.4301)	7100-0040-6000-000	**44,74 €**
	For further information see last chapter!		

AERASGARD® KCO2 / KLQ-CO2-Modbus
AERASGARD® KFTM-(LQ)-CO2-Modbus

Multifunctional duct sensors and measuring transducers incl. mounting flange, for humidity, temperature, CO2 content and air quality (VOC), calibratable, with Modbus connection

S+S REGELTECHNIK

Patented quality product (patent no. DE 10 2014 010 719.1)

The maintenance-free duct sensor **AER**ASGARD® **KFTM-LQ-CO2-Modbus** (max. expansion level) and **KCO2 / KLQ-CO2 / KFTM-CO2-Modbus** with Modbus connection, automatic calibration, in an impact-resistant plastic housing with quick-locking screws, plastic sinter filter (replaceable), incl. mounting flange, optionally with/without display, for determining the CO2-content of the air (0...5000 ppm), of the air quality (0...100 % VOC), the temperature (–35...+80 °C) and the relative air humidity (0...100 % RH). International system of units **SI** (default) can be changed to **imperial** (via Modbus). The following parameters can be accessed via the Modbus: Temperature, relative humidity, air quality (VOC), carbon dioxide (CO2) and atmospheric pressure. The sensor is used in offices, hotels, convention centres, apartments, shops, etc. for the purpose of evaluating the indoor climate. This enables energy-saving room ventilation on an as-needed basis, thereby reducing operating costs and improving well-being. One sensor for every 30 m² of space is recommended.

A long-term stable, **digital humidity and temperature sensor** guarantees exact measurement results. The CO2 measurement is performed using an optical **NDIR sensor** (non-dispersive infra-red technology). The detection range is calibrated for standard applications such as monitoring residential rooms and conference rooms. The air quality is detected by a **VOC sensor** (mixed gas sensor for volatile organic substances). This sensor determines the loading of the room air due to contaminated gases such as cigarette smoke, body perspiration, exhaled breathing air, solvent vapours, emissions etc. With regard to the expected air contamination, low, medium or high VOC sensitivity can be selected.

Innovative Modbus sensor with galvanically separated RS485-Modbus-interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in current-free state, internal LEDs for telegram status display, two separate push-in terminals and large three-line display (illuminated; with customised programming in the 7-segment and dot-matrix range). The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

Voltage supply:	24 V AC / DC (± 10 %)
Power consumption:	< 4.8 W / 24 V DC typically; < 6.8 VA / 24 V AC typically; peak current 200 mA
System of units:	**SI** (default) or **Imperial** (switchable via Modbus)
Data points:	temperature [°C] [°F], relative humidity [% RH], atmospheric pressure [hPa], air quality (VOC) [%], carbon dioxide (CO2) [ppm]
HUMIDITY	
Sensors:	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
Sensor protection:	**plastic** sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional **metal** sinter filter, Ø 16 mm, L = 32 mm)
Measuring range, humidity:	0...100 % RH
Operating range, humidity:	0...95 % RH (without dew formation)
Deviation in humidity:	typically **± 2.0** % (20...80 % RH) at +25 °C, otherwise ± 3.0 %
TEMPERATURE	
Measuring range, temperature:	–35...+80 °C
Operating range, temperature:	–10...+60 °C
Deviation in temperature:	typically ± 0.2 K at +25 °C
AIR QUALITY (VOC)	
Sensor:	VOC sensor (metal oxide) **with automatic calibration** (VOC = volatile organic compounds)
Measuring range:	0...100 % air quality; referred to calibrating gas; **multi-range switching** VOC sensitivities (low/medium/high)
Measuring accuracy:	typically ± 20 % of final value (referred to calibrating gas)
Service life	> 60 months (under normal load conditions)
CARBON DIOXIDE (CO2)	
Sensor:	optical NDIR sensor (non-dispersive infra-red technology) including atmospheric pressure compensation (up to 1100 mbar) **with manual calibration** (via zero button), **with automatic calibration** (can be deactivated via Modbus)
Measuring range:	0...5000 ppm
Measuring accuracy:	typically ± 30 ppm (± 3 % of measured value)
Temperature dependence:	± 5 ppm per °C or ± 0,5 % of measured value per °C (whichever is higher)
Pressure dependence:	± 0.13 % per mm Hg
Long-term stability:	< 2 % in 15 years
Gas exchange:	by diffusion

Continued on next page!

Display screen (cyclic) **Modbus Tyr 2**



Temperature [°C]



Temperature [°F]



Humidity



Air quality (VOC)



Carbon dioxide (CO2)

Display screen (static)



Atmospheric pressure (Example Index 5)

Programmable display screen

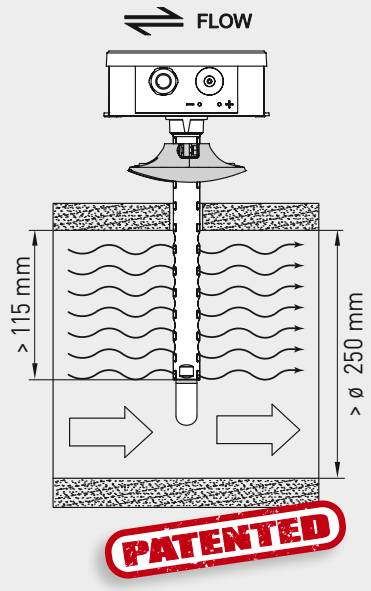


AERASGARD® KCO2 / KLQ - CO2 - Modbus
AERASGARD® KFTM - (LQ) - CO2 - Modbus

Multifunctional duct sensors and measuring transducers incl. mounting flange, for humidity, temperature, CO2 content and air quality (VOC), calibratable, with Modbus connection

Mounting diagram [mm]

KCO2 - Modbus
KLQ - CO2 - Modbus
KFTM - CO2 - Modbus
KFTM - LQ - CO2 - Modbus



KFTM - CO2 - Modbus
KFTM - LQ - CO2 - Modbus
with plastic sinter filter (standard)





MFT-20-K
Mounting flange, plastic

KFTM - CO2 - Modbus
KFTM - LQ - CO2 - Modbus
with display and plastic sinter filter (standard)





SF-K
Plastic sinter filter (standard)



SF-M
Metal sinter filter (optional)

TECHNICAL DATA (continued)

Bus protocol:	Modbus (RTU mode), address range 0...**247** selectable
Baud rate:	9600, 19200, 38400 Baud
Signal filtering:	4 s / 32 s
Response time:	< 2 minutes, minimal flow velocity 0.3 m/s (air)
Ambient temperature:	–10...+60 °C
Electrical connection:	0.2 - 1.5 mm², ia push-in terminal
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Protective tube:	**PLEUROFORM**™, material polyamide (PA6), with torsion protection, v_{max} = 30 m/s (air) Ø 20 mm, NL = 202.5 mm without filter, NL = 235 mm with plastic filter (optional 100 mm)
Process connection:	via mounting flange made of plastic (included in scope of delivery)
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) housing in the built-in state (permeable PLEUROFORM: IP 30)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU
Optional:	**Display with illumination,** three-line, cutout approx. 70 x 40 mm (W x H), for displaying actual humidity, actual temperature, air quality and the actual CO2 content (cyclic) or a selectable parameter (static) or an individually programmable display value
ACCESSORIES	see table

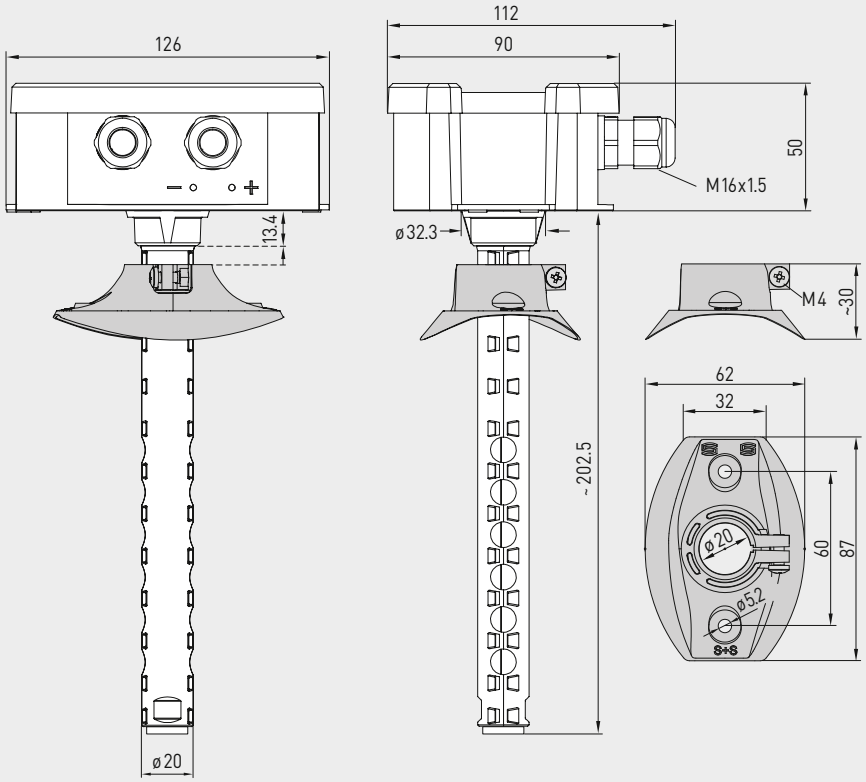
AERASGARD® KCO2 / KLQ - CO2 - Modbus
AERASGARD® KFTM - (LQ) - CO2 - Modbus

Multifunctional duct sensors and measuring transducers incl. mounting flange, for humidity, temperature, CO2 content and air quality (VOC), calibratable, with Modbus connection

S+S REGELTECHNIK

Dimensional drawing
[mm]

KCO2-Modbus
KLQ - CO2-Modbus

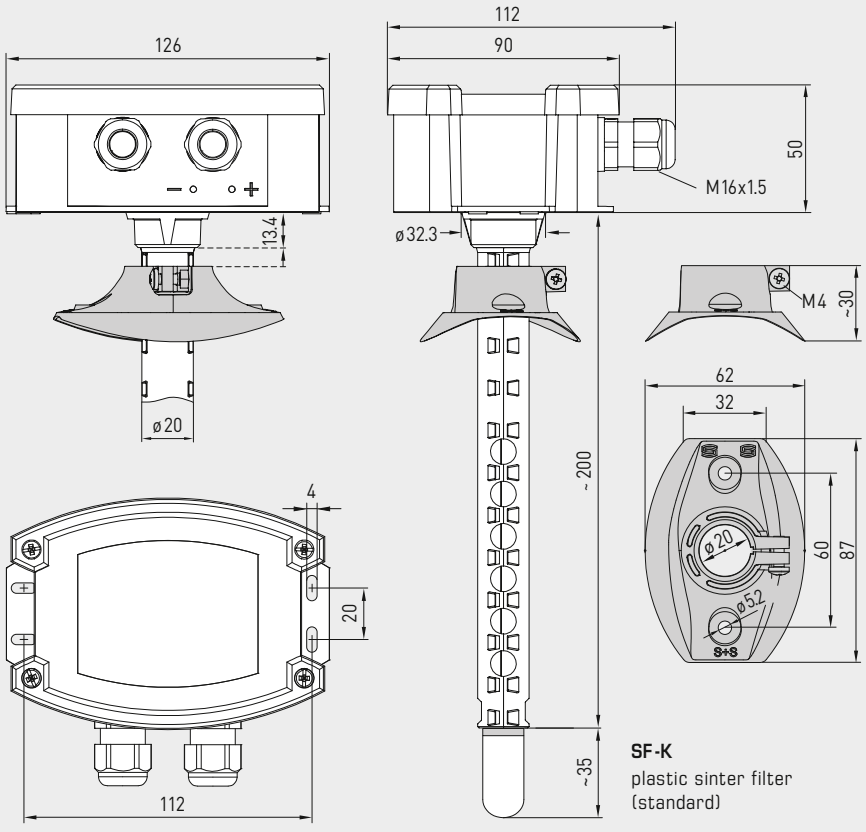


KCO2-Modbus
KLQ - CO2-Modbus



Dimensional drawing
[mm]

KFTM - CO2 - Modbus
KFTM - LQ - CO2 - Modbus



SF-K
plastic sinter filter
(standard)

KFTM - CO2 - Modbus
KFTM - LQ - CO2 - Modbus



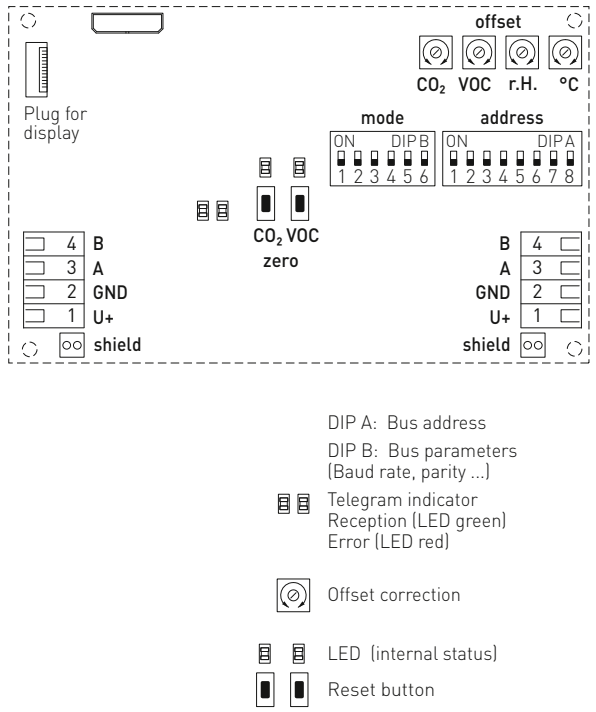
SF-M
metal sinter filter
(optional)



AERASGARD® KCO2 / KLQ-CO2-Modbus
AERASGARD® KFTM-(LQ)-CO2-Modbus

Multifunctional duct sensors and measuring transducers incl. mounting flange, for humidity, temperature, CO2 content and air quality (VOC), calibratable, with Modbus connection

Schematic diagram **KFTM-LQ-CO2-Modbus**



KFTM-LQ-CO2-Modbus
with display



AERASGARD® KCO2-Modbus	Duct sensor for CO2 content, *Deluxe*
AERASGARD® KLQ-CO2-Modbus	Duct sensor for air quality (VOC) and CO2 content, *Deluxe*
AERASGARD® KFTM-CO2-Modbus	Multifunctional duct sensor for humidity, temperature and CO2 content, *Deluxe*
AERASGARD® KFTM-LQ-CO2-Modbus	Multifunctional duct sensor for humidity, temperature, air quality (VOC) and CO2 content, *Deluxe*

Type / WG02	Measuring Range Humidity	Temperature*	CO2	VOC	Display	Item No.	Price
KCO2-Modbus							
KCO2-Modbus	–	–	5000 ppm	–		1501-8110-6001-200	**375,41 €**
KCO2-Modbus **LCD**	–	–	5000 ppm	–	■	1501-8110-6071-200	**435,63 €**
KLQ-CO2-Modbus							
KLQ-CO2-Modbus	–	–	5000 ppm	0...100 %		1501-8111-6001-500	**423,79 €**
KLQ-CO2-Modbus **LCD**	–	–	5000 ppm	0...100 %	■	1501-8111-6071-500	**495,13 €**
KFTM-CO2-Modbus							
KFTM-CO2-Modbus	0...100 % RH	–35...+80 °C	5000 ppm	–		1501-8116-6001-200	**385,09 €**
KFTM-CO2-Modbus **LCD**	0...100 % RH	–35...+80 °C	5000 ppm	–	■	1501-8116-6071-200	**469,74 €**
KFTM-LQ-CO2-Modbus							
KFTM-LQ-CO2-Modbus	0...100 % RH	–35...+80 °C	5000 ppm	0...100 %		1501-8118-6001-500	**503,60 €**
KFTM-LQ-CO2-Modbus **LCD**	0...100 % RH	–35...+80 °C	5000 ppm	0...100 %	■	1501-8118-6071-500	**591,86 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101 shortened protective tube **PLEUROFORM**™, NL = 100 mm					on request on request	
Note:	This unit **must not** be used as safety-relevant device!						
*	International system of units **SI** (default) can be changed to **imperial** (via Modbus).						

ACCESSORIES			
KA2-Modbus	**Communication adapter** (USB/RS485) for system connection	1906-1200-0000-100	**213,99 €**
LA-Modbus	**Line termination device** (with terminating resistor) as an active bus termination	1906-1300-0000-100	**79,81 €**
SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable, stainless steel **V4A** (1.4404)	7000-0050-2200-100	**42,33 €**
MFT-20-K	**Mounting flange,** plastic (included in the scope of delivery)	7000-0031-0000-000	**9,56 €**
	For further information, see last chapter Accessories!		

RHEASGARD® KLGF-Modbus
RHEASGARD® KLGFVT-Modbus

Duct air flow sensor or measuring transducer for flow velocity, volume flow and temperature, incl. mounting flange, calibratable, Modbus connector

NEW

S+S REGELTECHNIK

Calibratable duct air flow sensor **RHE**ASGARD® **KLGF-Modbus** with Modbus connector, housing made of impact-resistant plastic with quick-locking screws, with cable gland (optional M12-connector as per DIN EN 61076-2-101) optionally with / without display, to determine the flow velocity (0.1...20 m/s).

Calibratable duct air flow sensor **RHE**ASGARD® **KLGFVT-Modbus** with Modbus connector, housing made of impact-resistant plastic with quick-locking screws, with cable gland (optional M12-connector as per DIN EN 61076-2-101) optionally with/ without display, to determine the flow velocity (0.1...20 m/s) and temperature (0...+50 °C).
The following parameters can be retrieved from the Modbus:
flow velocity, volume flow (calculated) and temperature.

The flow sensors are suitable for monitoring or controlling airflows in ducts, at fans and dampers, for flow-dependent monitoring of humidifiers and electric heating registers according to DIN 57100, Sect. 420, or for use in connection with DDC systems.

Innovative Modbus sensor with galvanically separated RS485 Modbus interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in current-free state, internal LEDs for telegram status display, two separate push-in terminals and large three-line display (illuminated; with customised programming in the 7-segment and dot-matrix range). The sensor is factory-calibrated.

TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %)
Current consumption:	approx. 4 VA
Data points:	Flow velocity [m/s], volume flow [m³/h], temperature [°C]
AIR FLOW	
Sensor:	Calorimetric, temperature compensated, sensor breakage protection, with manual zero-point calibration (via button)
Measuring range:	0.1...20 m/s
Accuracy:	0.5 m/s + 3 % measured value
Long-term stability:	± 0.5 % final value per year
Reproducibility:	± 1.0 % final value
Warm-up time:	< 2 min
Response time:	< 60 s
Start-up override:	0...120 s (can be set via Modbus)
TEMPERATURE	**KLGF(V)T**
Sensor:	NTC 10k
Measuring range:	0...+50 °C
Accuracy:	typical ± 0.5 K at +25 °C
Bus protocol:	Modbus (RTU mode), address range 0...**247** selectable
Signal filtering:	0...30 values
Protective tube:	**PLEUROFORM**™, material polyamide (PA6), with torsion protection, Ø 20mm, NL = 221 mm, v_{max} = 30 m/s (air), **stainless steel V2A** (1.4301), Ø 16 mm available upon request as an option
Housing:	Plastic, UV-resistant, polyamide material, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Cable connection:	**Cable gland** made of plastic (M 16 x 1.5; with strain relief, replaceable, max. inner diameter 10.4 mm), optionally with **M12 connector** as per DIN EN 61076-2-101
Electrical connection:	0.2 - 1.5 mm², via push-in terminal
Process connection:	by means of plastic mounting flange (included in the scope of delivery)
Ambient temperature:	Storage –20...+50 °C; operation 0...+50 °C
Medium temperature:	0...+70 °C
Permitted humidity:	< 98 % RH, non-precipitating air free of harmful substances
Protection class:	III (as per EN 60 730
Protection type:	**IP 65** (as per EN 60 529) housing; IP 20 sensor technology
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3
Optional:	**Display with illumination,** three-line, cutout approx. 70 x 40 mm (W x H), to display the flow velocity, volume flow and temperature (cyclical) or a selectable parameter (static)
ACCESSORIES	see last chapter

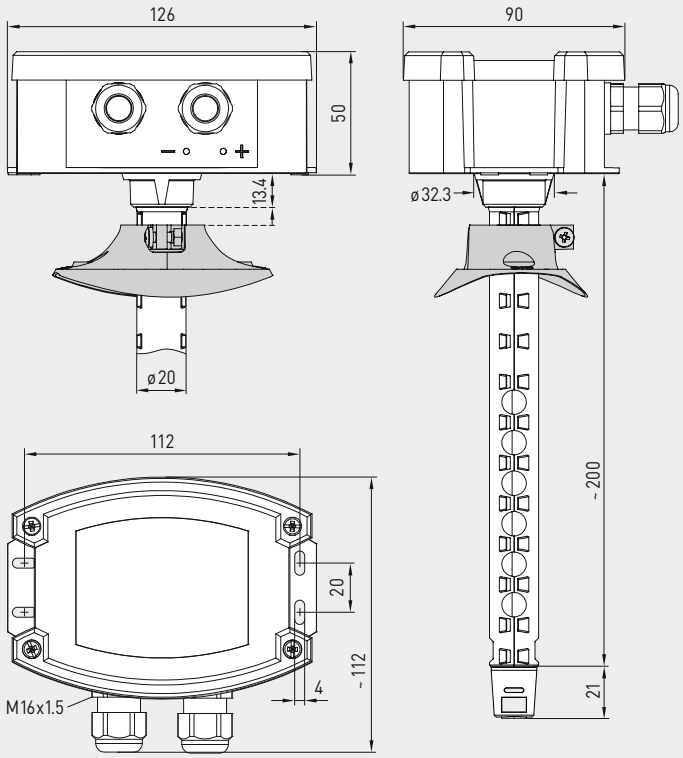
NEW

RHEASGARD® KLGF-Modbus
RHEASGARD® KLGFVT-Modbus

Duct air flow sensor or measuring transducer for flow velocity, volume flow and temperature, incl. mounting flange, calibratable, Modbus connector

Dimensional drawing [mm]

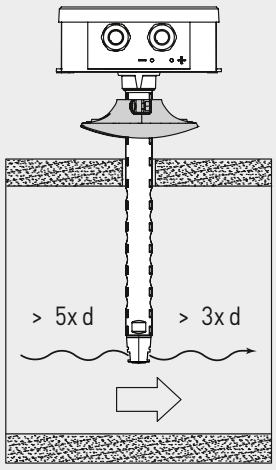
KLGF-Modbus
KLGFVT-Modbus





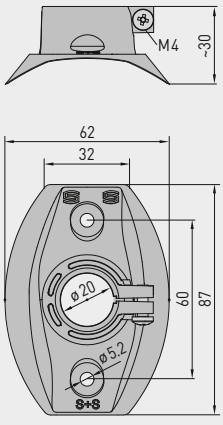
KLGF-Modbus
KLGFVT-Modbus

Installation diagram



Dimensional drawing [mm]

MFT-20-K





MFT-20-K
Mounting flange
made of plastic



KLGF-Modbus
with display



KLGFVT-Modbus
with display

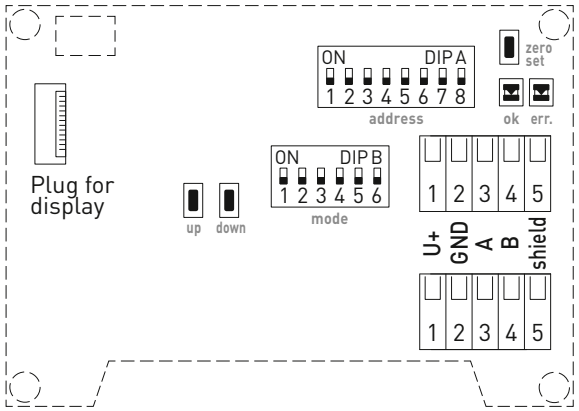
RHEASGARD® KLGF-Modbus
RHEASGARD® KLGFVT-Modbus

Duct air flow sensor or measuring transducer for flow velocity, volume flow and temperature, incl. mounting flange, calibratable, Modbus connector

NEW

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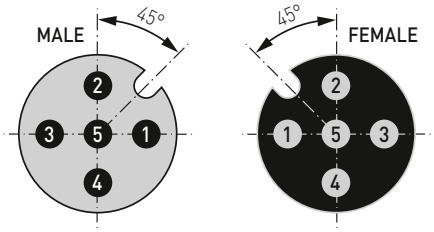
Schematic diagram — **KLGF-Modbus** **KLGFVT-Modbus**



Connecting diagram — **KLGF-Modbus** **KLGFVT-Modbus**

1	+UB 24 V AC/DC
2	–UB GND
3	A
4	B
5	Shield

Pin assignment (M12) — **xx-Modbus**



1	+UB
2	Modbus A
3	–UB GND
4	Modbus B
5	Shield

NEW

RHEASGARD® KLGF-Modbus
RHEASGARD® KLGFVT-Modbus

Duct air flow sensor or measuring transducer for flow velocity, volume flow and temperature, incl. mounting flange, calibratable, Modbus connector

KLGFVT-Modbus
with display



KLGF-Modbus
with display



RHEASGARD®
KLGF-Modbus Duct air flow sensor or measuring transducer, *Deluxe*
KLGFVT-Modbus Duct air flow sensor or measuring transducer for flow velocity, volume flow and temperature, *Deluxe*

Type / WG01	Measuring ranges Flow velocity	Volume flow	Temperature	Output	Display	Item no.	Price
KLGF-Modbus							
KLGF-Modbus	0,1...20 m/s	–	–	Modbus		1701-4216-0101-000	**292,00 €**
KLGF-Modbus **LCD**	0,1...20 m/s	–	–	Modbus	■	1701-4216-1101-000	**354,00 €**
KLGFVT-Modbus							
KLGFVT-Modbus	0,1...20 m/s	0...200.000 m³/h	0...+50 °C	Modbus		1701-4216-0401-000	**309,00 €**
KLGFVT-Modbus **LCD**	0,1...20 m/s	0...200.000 m³/h	0...+50 °C	Modbus	■	1701-4216-1401-000	**378,00 €**
Optional:	Cable connection with **M12 connector** as per DIN EN 61076-2-101					on request	
ACCESSORIES							
KA2-Modbus	**Communication adapter** (USB/RS485) for system connection					1906-1200-0000-100	**213,99 €**
LA-Modbus	**Line termination device** (with terminating resistor) as an active bus termination					1906-1300-0000-100	**79,81 €**
MFT-20-K	**Mounting flange**, plastic (included in the scope of delivery)					7000-0031-0000-000	**9,56 €**
	For further information see last chapter!						

MODKON® LA-Modbus

Line termination device with terminating resistor for the active bus termination of RS485 networks

S+S REGELTECHNIK

Line termination device **MOD**KON® **LA-Modbus T3** with terminating resistor, in an impact-resistant plastic housing with quick-locking screws.

The line termination serves as an active bus termination for RS485 networks (ANSI TIA/EIA-485), such as Modbus RTU. It contains a terminating resistor with a biasing network, which pre-defines the bus signals to a safe value (fail-safe biasing) during bus idle time.

The bus termination can be fully switched on or off via DIP switches. This allows various operating scenarios to be tested in a simple manner whenever servicing is needed.

For very long network cables, both end points can also be provided with an active bus termination to improve interference immunity under harsh environmental conditions.

LA-Modbus



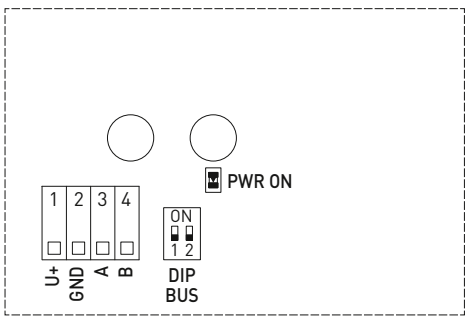
TECHNICAL DATA

Power supply:	24 V AC (±20 %) and 15...36 V DC
Power consumption:	< 0.5 W / 24 V DC; < 0.5 VA / 24 V AC
Housing:	Plastic, UV-resistant, polyamide material, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display)
Cable connection:	Cable gland, plastic (2x M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm)
Electrical connection:	0.2 - 1.5 mm², using push-in terminals
Ambient temperature:	–30...+70 °C
Permitted humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Operation display:	Status LED **PWR ON** (supply voltage)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU

DIP 1	DIP 2	Resistance (type adjustable)	Bus termination (explanation)
ON	**ON**	**R_{AB} active** and **R_{BIAS} active**	Line termination and BIAS active
ON	OFF	**R_{AB} active**	Line termination active
OFF	OFF	**Deactivated**	Bus termination switched off

Connecting diagram

LA-Modbus



Push-in terminal

+UB Terminal 1: +UB 24V

GND Terminal 2: –UB GND

A / B Terminal 3/4: RS485 Modbus

Status LED

PWR ON Supply voltage

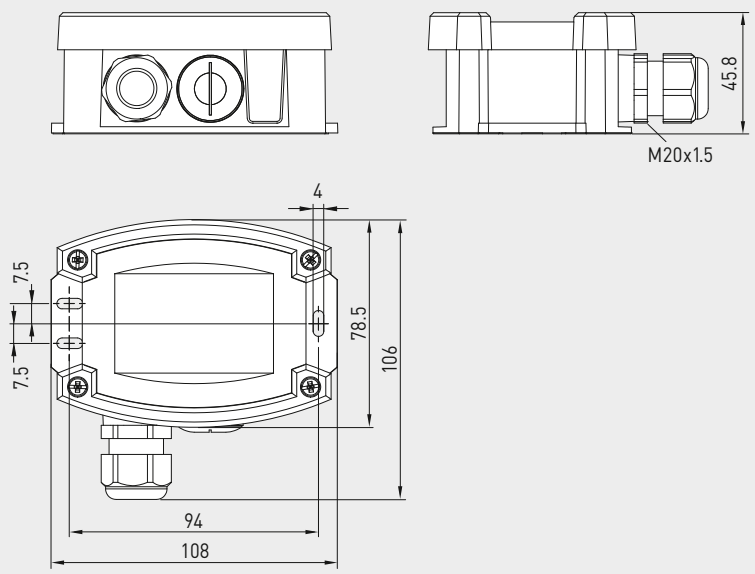
DIP switch

DIP BUS Activation or deactivation of the bus termination

S+S REGELTECHNIK

Line termination device with terminating resistor for the active bus termination of RS485 networks

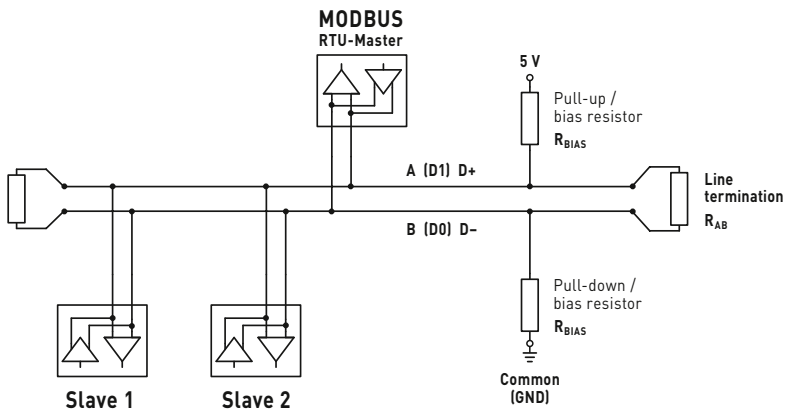
Dimensional drawing **LA-Modbus**



LA-Modbus



Bus topology with terminating and bias resistors **LA-Modbus**



MODKON® LA-Modbus Line termination device with terminating resistor

Type / WG01	Bus termination (adjustable)	Item No.	Price
LA-Modbus			
LA-Modbus	1. Line termination and BIAS active 2. Line termination active 3. Bus termination deactivated	1906-1300-0000-100	**79,81 €**

Note: The bus termination can be fully switched on or off (via DIP switches).

MODKON® KA2-Modbus

**Communication adapter incl. software MODKON RTU,
with USB and RS485 interface,
for system connection of S+S Modbus sensors**

S+S REGELTECHNIK

Communication adapter **MOD**KON® **KA2-Modbus T3** with USB and RS485 interface, in an impact-resistant plastic housing with quick-locking screws, incl. software.

The communication adapter serves as connecting element between an S+S Modbus sensor and a PC (Windows). A standard USB port enables quick and straightforward connection to the system; there is no need for an additional power supply.

When used in combination with the S+S software **MODKON RTU** (included in delivery), it offers a very convenient way to test the response behaviour of the sensor.
The Auto Scan function of the software automatically detects the device type, the device address and the set bus parameters. In this way, communication with the connected S+S Modbus sensor is possible without the need for additional settings. The ideal first step to gain experience with Modbus technology.

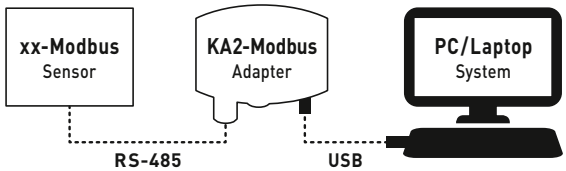
KA2-Modbus



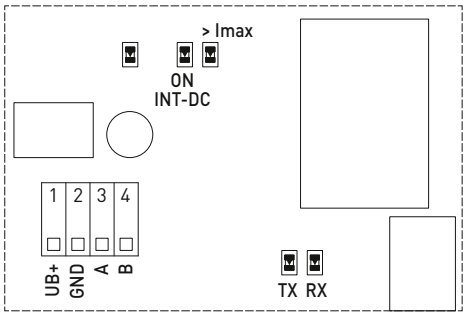
TECHNICAL DATA

Power supply:	Takes place via USB connection
Output:	Voltage: 15 V; Current: 100 mA
Interfaces:	Standard **USB** port for system connection, power supply **RS485** interface for connection of an S+S Modbus sensor
Compatibility:	S+S Modbus sensors for the device classes **THERM**ASGARD®, **HYGR**ASGARD®, **PREM**ASGARD®, **AER**ASGARD®
Housing:	Plastic, UV-resistant, polyamide material, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 78.5 x 45.8 mm (Tyr 3)
Cable connection:	Cable gland, plastic (2x M 20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm)
Electrical connection:	0.2 - 1.5 mm², using push-in terminals
Ambient temperature:	-30...+70 °C
Permitted humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 54** (according to EN 60 529) housing only!
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU

Mounting diagram **KA2-Modbus**



Connecting diagram **KA2-Modbus**



Push-in terminal

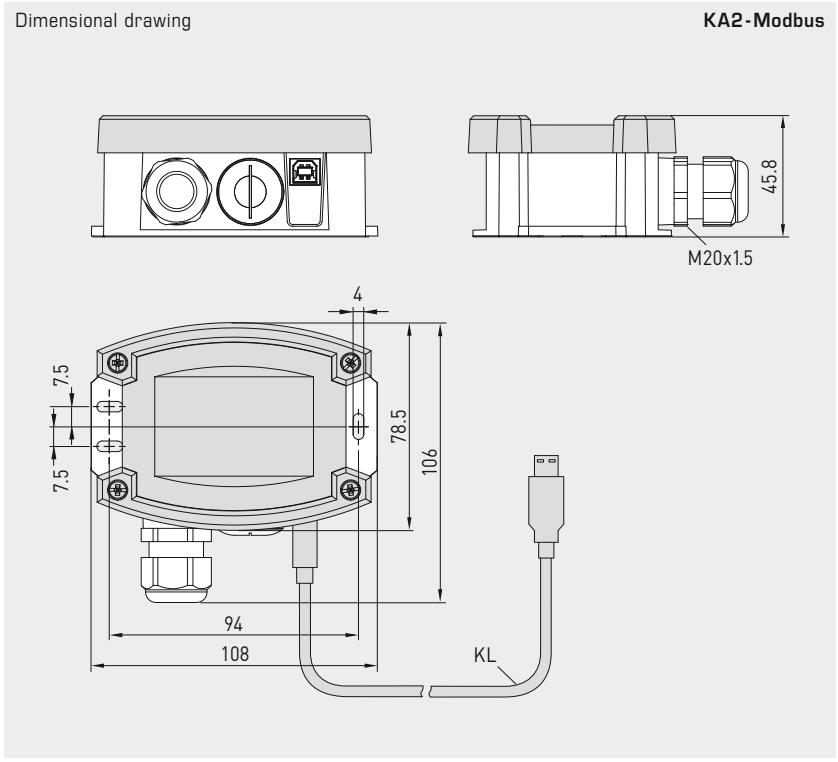
+UB	Output supply for S+S Modbus sensor
GND	approx. 15V (max. 100mA) with supply via USB
A / B	RS485 Modbus

Status LEDs

>Imax	Electronic fuse approx. 150mA
INT-DC	Internal supply (USB)
TX	Transmit telegrams
RX	Receive telegrams

**Communication adapter incl. software MODKON RTU,
with USB and RS485 interface,
for system connection of S+S Modbus sensors**

Dimensional drawing **KA2-Modbus**



KA2-Modbus



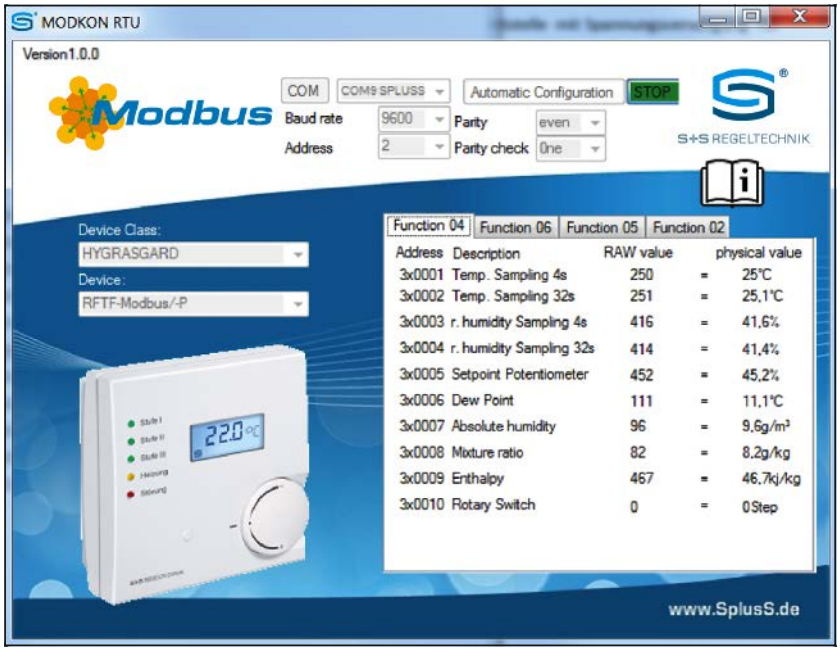


Fig. shows the input screen of the S+S software **MODKON RTU** (included in the scope of delivery) based on the example of the S+S Modbus sensor **HYGR**ASGARD® **RFTF-Modbus**

MODKON® KA2-Modbus Communication adapter incl. software				
Type / WG01	**Interfaces**	**Software**	**Item No.**	**Price**
KA 2 - Modbus				
KA2-Modbus	USB + RS485	MODKON RTU	1906-1200-0000-100	**213,99 €**
Note: You can find information on how to operate the software on the USB stick included or in the online shop.				

Temperature

THERMASGARD® **passive sensors** – tracking the perceived temperature

Our passive temperature sensors have proven themselves countless times in all temperature measurement applications. Technology and quality for precise measurement results you can rely on.

The units are available in a wide range of designs and individual variants to suit your requirements.

Application Areas

- Hospitals, museums, schools, hotels and administration buildings
- Power plants and district heating facilities
- Pharmaceutical and food industry
- Production plants
- Heating systems





THERMASGARD®
PASSIVE TEMPERATURE SENSORS

Room sensors

DTF	In-ceiling temperature sensor	**199**
RTF	Room temperature sensor, on-wall	**182**
RTF 1	Room temperature sensor, on-wall	**184**
FSTF	Room temperature sensor, in-wall	**192**
FSTF 1	Room temperature sensor, in-wall	**193**
RPTF 1	Pendulum room temperature sensor	**256**
RPTF 2	Pendulum room temperature sensor	**257**
RSTF	Room radiation temperature sensor	**259**
RTF-xx	Room control units, on-wall	**186**
FSTF-xx	Room control units, in-wall	**194**

Outdoor sensor, on-wall sensor

ATF 01	Outside temperature sensor	**200**
ATF 1	Outside temperature sensor	**201**
ATF 2	Outside temperature sensor	**203**
ASTF	On-wall radiation temperature sensor	**258**

Duct sensors, surface-contact sensors

HTF	Sleeve temperature sensor with cable	**246**
OFTF	Surface temperature sensor	**251**
ALTF 1	Surface-contact temperature sensor with cable	**252**
ALTF 02	Surface-contact temperature sensor	**254**
ALTF 2	Surface-contact temperature sensor	**255**

Duct, immersion, screw-in sensors

TF 43	Duct / immersion / screw-in sensor	**208**
TF 65	Duct / immersion / screw-in sensor	**206**
TF 54	Duct / immersion / screw-in sensor	**220**
MWTF	Mean-value temperature sensor	**215**
MWTF-SD	Mean-value temperature sensor	**215**
ETF 6	Screw-in sensor with neck tube	**228**
ETF 7	Screw-in sensor, fast-acting	**217**
RGTF 2	Smoke gas screw-in sensor	**241**
RGTF 1	Smoke gas duct sensor	**235**
HTF	Duct / immersion / screw-in sensor with cable	**248**

Immersion sleeves and accessories

see chapter Accessories		**644**



Temperature

THERMASGARD® & **THERM**ASREG®
Sensor technology for heat and cold

Broad Spectrum

Our passive temperature sensors have a proven fit in countless applications across all areas of temperature measurement. Technology for best measuring results you can rely on. Available in various different models and individual versions to meet your precise requirements.

Optimum Precision

The devices are calibrated in-house in climate cabinets and are tested according to the latest criteria. Each sensor is precisely re-adjustable using offset potentiometers. Take advantage of our experience, our development, manufacturing and product know-how and order these products directly from the manufacturer.

Approved Safety

The **THERM**ASGARD® **1101-I** with current output (Test No. 69871-01939-1) and the **THERM**ASGARD® **1101-U** with voltage output (Test No. 69871-01940-1) are tested and certified according to DIN EN 61326-1:2006 and EN 61326-2-3:2006 by TÜV SÜD.

THERMASREG® **ETR** and **KTR** are tested and certified to DIN EN 14597:2015-01.

DIN tested / certified devices

RoHS conforming materials

ESD compliant manufacturing

CE compliance tested by external laboratories

Certified Quality

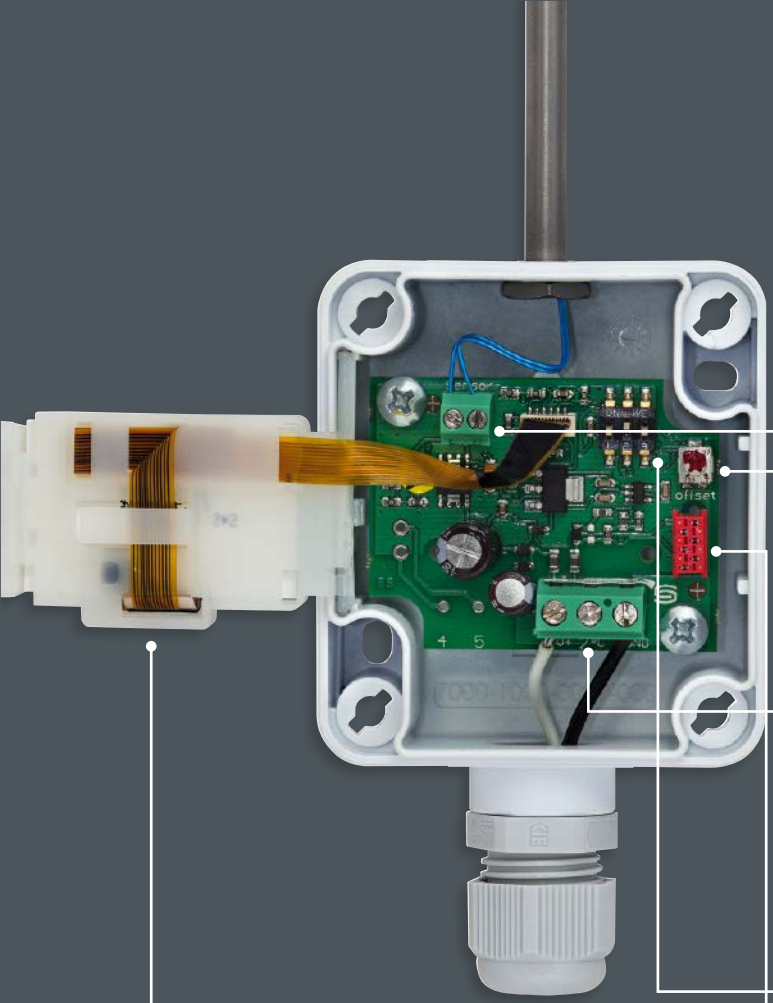
Our development and production in Nuremberg/Germany is certified by TÜV Thüringen according to DIN EN ISO 9001:2015.

GOST certified

EAC certified

MADE IN GERMANY

S+S REGELTECHNIK



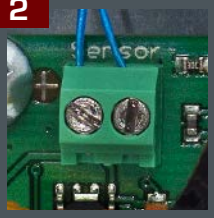
1



Illuminated Display

With backlighting as well as display of range violation, sensor breakage, sensor short circuit and physical units

2



Sensors

Internal sensors / external sensors

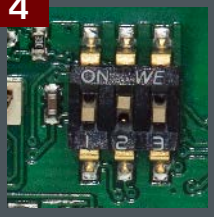
3



Screw Terminals

Active output signals 0-10 V, 4...20 mA or switched as well as passive outputs (e.g. Pt1000, Ni1000 etc.)

4



DIP Switches

For multi-range toggling and setting of measuring ranges

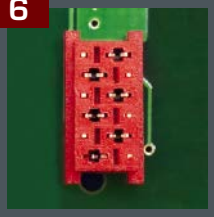
5



Offset Potentiometer

For fine adjustment (zero point offset) and readjustment upon recalibration

6



Quality Assurance

Calibration and balancing are done by means of the bus system in climate cabinets







Configuration variants of room operating units

Room temperature sensors and measuring transducers, on-wall, device series Baldur

S+S REGELTECHNIK

Housing temperature sensors are electric contact thermometers for measuring temperatures in the gases (air) surrounding them on all sides. Room temperature sensors / measuring transducers are used for measuring air temperature (in non-precipitating air), for changing setpoint values, for presence detection, or as operating panels with push-buttons, switches, potentiometers, status indicators (LEDs) in residential, working, office and business facilities as well as in the industrial sector.

Here are some design and configuration examples of variants of the new Baldur series devices that can be individually customized ...

DEVICE SERIES

Baldur 1 (85 x 85 x 27 mm)
Baldur 2 (98 x 98 x 33 mm)

Baldur lying



Baldur 1
without operating elements



Baldur 1
with display



Baldur 1
with display and potentiometer



Baldur 1 with potentiometer, push-button, and LED



Baldur 1 with potentiometer and rocker switch



Baldur 1 with potentiometer and push-buttons



Baldur 1 with potentiometer and LEDs



Baldur 1 with potentiometer and LEDs



Baldur 1 with potentiometer and LEDs



Baldur 2 without operating elements



Baldur 2 with display



Baldur 2 with display, potentiometer, and LEDs



Baldur 2 with LEDs and push-buttons



Baldur 2 with LEDs and push-buttons



Baldur 2 with potentiometer, turn switch, and LEDs



Baldur 2 with potentiometer, turn switch, and LEDs



Baldur 2 with potentiometer, push-buttons, LEDs, and rocker switch



Baldur 2 with potentiometer, turn switch, and LEDs



Baldur 2 with potentiometer and turn switch



Baldur 2 with potentiometer, turn switch, LEDs, and push-buttons



Baldur 2 with potentiometer, turn switch, LEDs, and push-buttons



S+S REGELTECHNIK

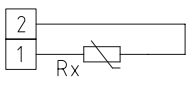
Room temperature sensors and measuring transducers, on-wall

Room temperature sensor **THERM**ASGARD® **RTF 1** with passive output, in an elegant housing made of plastic, with snap-on lid, base with 4-hole attachment for installation on vertically or horizontally installed in-wall flush boxes, with predetermined breaking point for on-wall cable entry, or in enclosures made of stainless steel (top and bottom part are of stainless steel, the lid is screwed on), vandal-proof version e.g. for schools, military barracks, and public buildings. This residential room temperature sensor is used to detect / display temperatures in closed dry rooms, in apartments, in cinemas, supermarkets, storage rooms, office and business facilities.

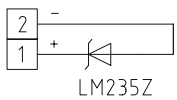
TECHNICAL DATA

Measuring range:	–30...+70 °C
Sensor / output:	see table, passive
Connection type:	2-wire connection (4-wire connection on PT100 / PT1000A, optional on other sensors)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Process connection:	by screws
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010), optional stainless steel **V2A** (1.4301)
Dimensions:	85 x 85 x 27 mm (Baldur 1) Standard 98 x 98 x 33 mm (Baldur 2) optional 75 x 75 x 25 mm (stainless steel **V2A** (1.4301) optional
Installation:	wall mounting or on in-wall flush box Ø 55 mm, base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes for cable entry from the back, with predetermined breaking point for on-wall cable entry from top / bottom in case of plain on-wall installation
Electrical connection:	0.14 - 1.5 mm² via terminal screws, secured against loss due to unscrewing, on safety extra-low voltage max. 24 V DC only
Humidity:	max. 90 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 30 (according to EN 60 529)
ACCESSORIES	see last chapter

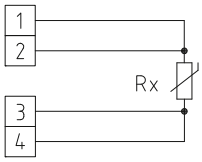
1x two-wire connection **standard**



1x two-wire connection **LM 235 Z (KP 10)**



1x four-wire connection (optional)



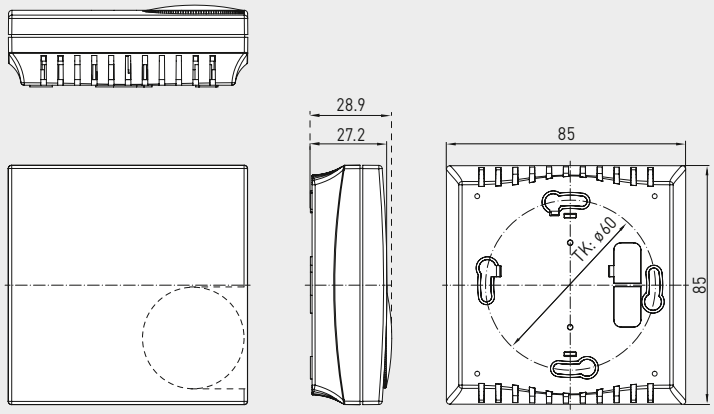


THERMASGARD® RTF 1 Room temperature sensors (Standard)

Type / WG03	Sensor / Output	Item No.	Price
RTF1 xx	**passive**	**IP 30** (–30...+70 °C)	
RTF1 Pt100	Pt100 (according to DIN EN 60 751, class B)	1101-40A0-1003-000	**23,35 €**
RTF1 Pt1000	Pt1000 (according to DIN EN 60 751, class B)	1101-40A0-5000-000	**25,97 €**
RTF1 Pt1000A	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-40A0-6003-000	**27,75 €**
RTF1 Ni1000	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-40A0-9000-000	**25,61 €**
RTF1 NiTK	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-40A1-0000-000	**25,61 €**
RTF1 LM235Z	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-40A2-1000-000	**23,95 €**
RTF1 NTC1,8K	NTC 1.8 K	1101-40A1-2000-000	**21,82 €**
RTF1 NTC10K	NTC 10K	1101-40A1-5000-000	**21,82 €**
RTF1 NTC20K	NTC 20K	1101-40A1-6000-000	**21,82 €**
Extra charge:	**Stainless steel housing** optional		**109,68 €**
	Other sensors optional	on request	

Dimensional drawing

Housing **Baldur 1**
(only one potentiometer possible)

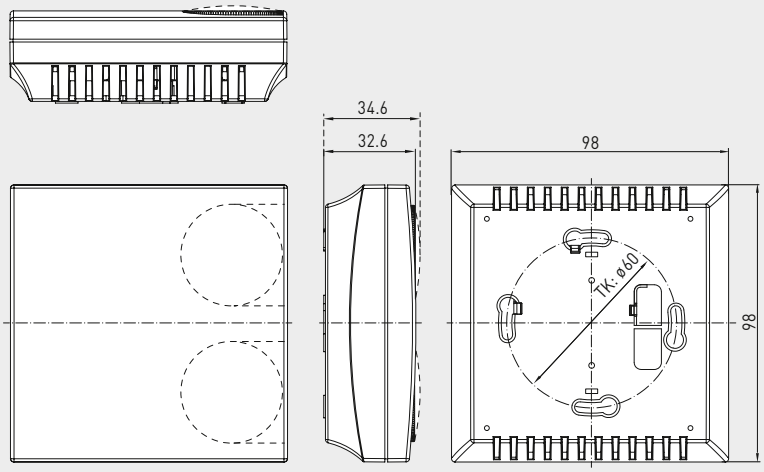


RTF
(Baldur 1)



Dimensional drawing

Housing **Baldur 2**
(one or two potentiometers possible)

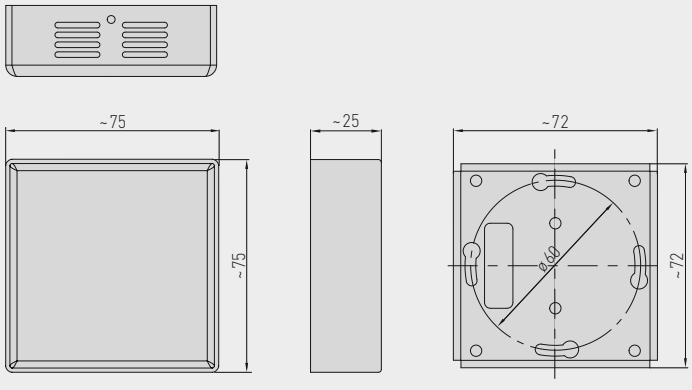


RTF
(Baldur 2)



Dimensional drawing

Housing stainless steel



RTF
(stainless steel)



Room temperature sensors and measuring transducers, on-wall, different versions

S+S REGELTECHNIK

TECHNICAL DATA

Measuring ranges:	–30...+70 °C (passive sensors) and 0...+50 °C (for U-variant)
Sensor:	for types, see table
Potentiometer:	standard 1kΩ, max. 0.1 W other ratings optional on request, e. g. 100 Ω, 2.5 kΩ, 5 kΩ, 10 kΩ, (optional potentiometer 0...10 V, linear), with angle of rotation limiter
Turn switch:	max. 24 V AC / DC, max. 130 mA, up to 5 steps (0, Auto, I, II, III), with angle of rotation limiter
Rocker switch:	max. 24 V AC / DC, max. 130 mA
Push-buttons:	normally open contact, max. 24 V DC, max. 10 mA
LEDs:	max. 24 V DC (optional max. 24 V AC), standard green (optional red, yellow, or two-colour)
Housing:	plastic, ABS, pure white (similar to RAL 9010), (optional stainless steel **V2A** (1.4301)
Dimensions:	85 x 85 x 27 mm (Baldur 1) Standard 98 x 98 x 33 mm (Baldur 2) 75 x 75 x 25 mm (stainless steel **V2A** (1.4301)
Installation:	wall mounting or on in-wall flush box Ø 55 mm, base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes for cable entry from the back, with predetermined breaking point for on-wall cable entry from top / bottom in case of plain on-wall installation
Electrical connection:	0.14 - 1.5 mm² via terminal screws, on safety extra-low voltage max. 24 V DC only
Humidity:	max. 90 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 30 (according to EN 60 529)
Lettering:	standard is swelling arrow with centre position, unfilled (optional special printing – see last chapter "Accessories")
ACCESSORIES	see last chapter

Potentiometer and
turn switch with
limited angle of rotation

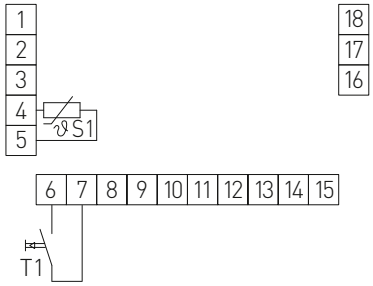




RTF xx T
(Baldur 1)

Version with sensor and
push-button (max. 24 V DC, max. 10 mA)

Connecting diagram **RTF xx T**



THERMASGARD® RTF xx T Room temperature sensors

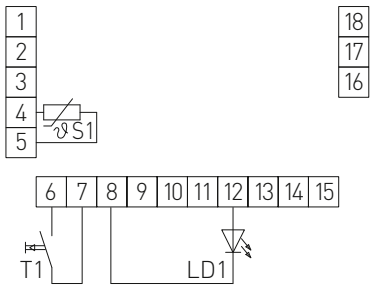
Type / WG01	Sensor / Output	Item No.	Price
RTF xx T	**passive**	**IP 30** (–30...+70 °C)	
RTF Pt100 T	Pt100 (according to DIN EN 60751, class B)	1101-40A0-1617-000	**44,55 €**
RTF Pt1000 T	Pt1000 (according to DIN EN 60751, class B)	1101-40A0-5617-000	**44,55 €**
RTF Ni1000 T	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm / K)	1101-40A0-9617-000	**46,34 €**
RTF NiTK T	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-40A1-0617-000	**47,49 €**
RTF LM235Z T	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-40A2-1617-000	**46,98 €**
RTF NTC1,8K T	NTC 1.8 K	1101-40A1-2617-000	**47,24 €**
RTF NTC10K T	NTC 10K	1101-40A1-5617-000	**43,92 €**
RTF NTC20K T	NTC 20K	1101-40A1-6617-000	**43,92 €**



RTF xx LT
(Baldur 1)

Version with sensor, LED (green) and
push-button (max. 24 V DC, max. 10 mA)

Connecting diagram **RTF xx LT**



THERMASGARD® RTF xx LT Room temperature sensors

Type / WG01	Sensor / Output	Item No.	Price
RTF xx LT	**passive**	**IP 30** (–30...+70 °C)	
RTF Pt100 L T	Pt100 (according to DIN EN 60751, class B)	1101-40A0-1593-002	**47,09 €**
RTF Pt1000 L T	Pt1000 (according to DIN EN 60751, class B)	1101-40A0-5593-002	**48,81 €**
RTF Ni1000 L T	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm / K)	1101-40A0-9593-002	**49,15 €**
RTF NiTK L T	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-40A1-0593-002	**52,76 €**
RTF LM235Z L T	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-40A2-1593-002	**48,20 €**
RTF NTC1,8K L T	NTC 1.8 K	1101-40A1-2593-002	**52,46 €**
RTF NTC10K L T	NTC 10K	1101-40A1-5593-002	**47,54 €**
RTF NTC20K L T	NTC 20K	1101-40A1-6593-002	**47,54 €**

S+S REGELTECHNIK

Room temperature sensors and measuring transducers, on-wall, different versions



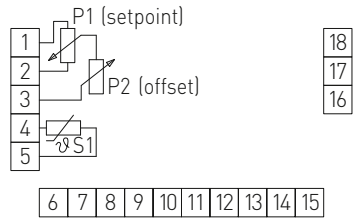




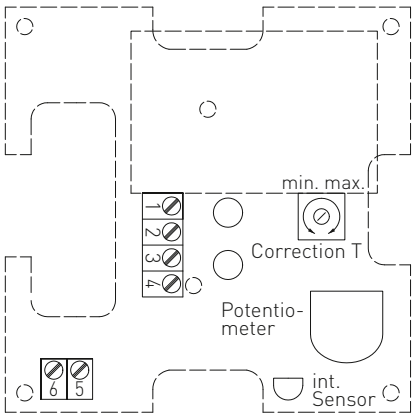
RTF xx P
RTF xx PU
RTM-U PU
(Baldur 1)

Version with sensor and potentiometer (1 kOhm, max. 0.1 W)

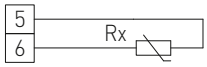
Connecting diagram **RTF xx P**



Circuit diagram **RTM-U PU Display**



1 UB+ supply voltage 24V AC/DC
2 Output temperature 0-10V
3 Output potentiometer 0-10V
4 UB- GND



THERMASGARD® RTF xx P Room temperature sensors

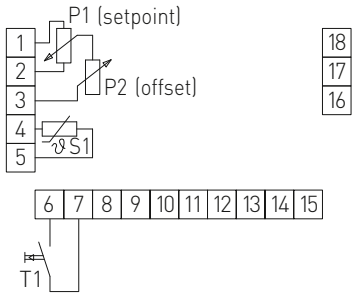
Type / WG01	Sensor / Output	Display	Item No.	Price
RTF xx P	**passive**		**IP 30** (–30...+70 °C)	
RTF Pt100 P	Pt100 (according to DIN EN 60751, class B)		1101-40A0-1001-345	**47,09 €**
RTF Pt1000 P	Pt1000 (according to DIN EN 60751, class B)		1101-40A0-5001-345	**48,37 €**
RTF Ni1000 P	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm / K)		1101-40A0-9001-345	**49,65 €**
RTF NiTK P	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000		1101-40A1-0001-345	**50,31 €**
RTF LM235Z P	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10		1101-40A2-1001-345	**48,37 €**
RTF NTC1,8K P	NTC 1.8 K		1101-40A1-2001-345	**48,50 €**
RTF NTC10K P	NTC 10K		1101-40A1-5001-345	**47,09 €**
RTF NTC20K P	NTC 20K		1101-40A1-6001-345	**47,09 €**
RTF xx PU	**passive / active**		**IP 30** (0...+50 °C)	
RTF Pt1000 PU	Pt1000 / 0-10 V (potentiometer)*		1101-40A0-5004-345	**112,02 €**
RTF Pt1000 PU	Pt1000 / 0-10 V (potentiometer, central position)*		1101-40A0-5004-642	**112,02 €**
RTF Pt1000 PU	Pt1000 / 0-10 V (potentiometer, marking points)*		1101-40A0-5004-050	**112,02 €**
RTM PU	**aktive**		**IP 30** (0...+50 °C)	
RTM-U PU	0-10 V (temperature and potentiometer)*		1101-41A1-0004-346	**146,79 €**
RTM-U PU LCD	0-10 V (temperature and potentiometer)*	■	1101-41A1-1004-346	**248,63 €**
For special orders please specify:	**Ohm rating** of potentiometer (standard is 1kOhm; optional 100 Ohm, 2.5 kOhm, 5 kOhm, 10 kOhm, 0-10 V), **type of swelling arrow*** (standard = wedge-shaped, optional with central position or marking points) and differing specific **wiring requests**			



RTF xx P T
(Baldur 1)

Version with sensor,
potentiometer (1 kOhm, max. 0.1 W) and
push-button (max. 24 V DC, max. 10 mA)

Connecting diagram **RTF xx PT**



THERMASGARD® RTF xx PT Room temperature sensors

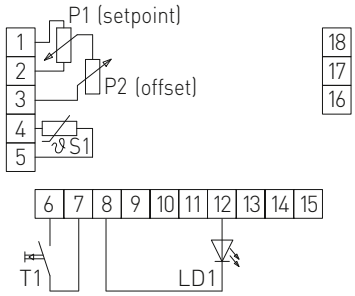
Type / WG01	Sensor / Output	Item No.	Price
RTF xx PT	**passive**	**IP 30** (–30...+70 °C)	
RTF Pt100 P T	Pt100 (according to DIN EN 60 751, class B)	1101-40A0-1021-345	**52,08 €**
RTF Pt1000 P T	Pt1000 (according to DIN EN 60 751, class B)	1101-40A0-5021-345	**54,05 €**
RTF Ni1000 P T	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-40A0-9021-345	**54,37 €**
RTF NiTK P T	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-40A1-0021-345	**56,66 €**
RTF LM235Z P T	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-40A2-1021-345	**56,02 €**
RTF NTC1,8K P T	NTC 1.8 K	1101-40A1-2021-345	**56,13 €**
RTF NTC10K P T	NTC 10K	1101-40A1-5021-345	**54,68 €**
RTF NTC20K P T	NTC 20K	1101-40A1-6021-345	**54,68 €**
RTF xx PUT	**passive / active**	**IP 30** (0...+50 °C)	
RTF Pt1000 PU T	Pt1000 / 0-10 V (potentiometer)	1101-40B0-5033-345	**119,79 €**



RTF xx PLT
(Baldur 1)

Version with sensor,
potentiometer (1 kOhm, max. 0.1 W),
LED (green) and
push-button (max. 24 V DC, max. 10 mA)

Connecting diagram **RTF xx PLT**



THERMASGARD® RTF xx PLT Room temperature sensors

Type / WG01	Sensor / Output	Item No..	Price
RTF xx PLT	**passive**	**IP 30** (–30...+70 °C)	
RTF Pt100 P L T	Pt100 (according to DIN EN 60 751, class B)	1101-40A0-1663-347	**66,38 €**
RTF Pt1000 P L T	Pt1000 (according to DIN EN 60 751, class B)	1101-40A0-5663-347	**69,71 €**
RTF Ni1000 P L T	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-40A0-9663-347	**70,02 €**
RTF NiTK P L T	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-40A1-0663-347	**73,06 €**
RTF LM235Z P L T	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-40A2-1663-347	**68,37 €**
RTF NTC1,8K P L T	NTC 1.8 K	1101-40A1-2663-347	**72,56 €**
RTF NTC10K P L T	NTC 10K	1101-40A1-5663-347	**66,38 €**
RTF NTC20K P L T	NTC 20K	1101-40A1-6663-347	**66,38 €**
RTF xx PULT	**passive / active**	**IP 30** (–30...+70 °C)	
RTF Pt1000 PU L T	Pt1000 / 0-10 V (potentiometer)	1101-40B0-5669-347	**137,50 €**

Room temperature sensors and measuring transducers, on-wall, different versions

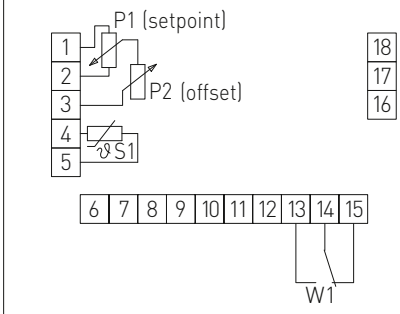
S+S REGELTECHNIK



RTF xxP W
(Baldur 1)

Version with sensor,
potentiometer (1 kOhm, max. 0.1 W) and
rocker switch (max. 24 V AC/DC, max. 130 mA)

Connecting diagram **RTF xx PW**



THERMASGARD® RTF xx PW Room temperature sensors

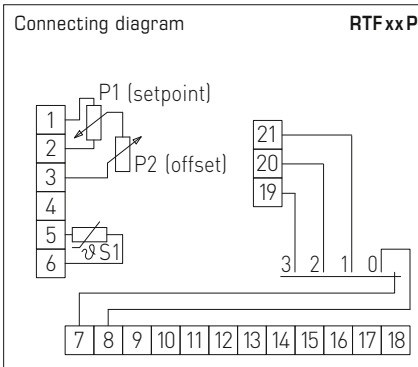
Type / WG01	Sensor / Output	Item No.	Price
RTF xx PW	**passive**	**IP 30** (–30...+70 °C)	
RTF Pt100 P W	Pt100 (according to DIN EN 60751, class B)	1101-40A0-1061-348	**52,84 €**
RTF Pt1000 P W	Pt1000 (according to DIN EN 60751, class B)	1101-40A0-5061-348	**54,74 €**
RTF Ni1000 P W	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm / K)	1101-40A0-9061-348	**55,26 €**
RTF NiTK P W	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-40A1-0061-348	**57,29 €**
RTF LM235Z P W	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-40A2-1061-348	**56,66 €**
RTF NTC1,8K P W	NTC 1.8 K	1101-40A1-2061-348	**57,17 €**
RTF NTC10K P W	NTC 10K	1101-40A1-5061-348	**55,40 €**
RTF NTC20K P W	NTC 20K	1101-40A1-6061-348	**55,40 €**
RTF xx PUW	**passive / active**	**IP 30** (0...+50 °C)	
RTF Pt1000 PU W2	Pt1000 / 0-10 V (potentiometer)	1101-40B0-5067-348	**120,44 €**



RTF xx PD
(Baldur 2)

Version with sensor,
potentiometer (1 kOhm, max. 0.1 W) and
and turn switch (max. 24 V AC/DC, max. 130 mA)

Connecting diagram **RTF xx PD**



THERMASGARD® RTF xx PD Room temperature sensors

Type / WG01	Sensor / Output	Item No.	Price
RTF xx PD	**passive**	**IP 30** (–30...+70 °C)	
RTF Pt100 P D4	Pt100 (according to DIN EN 60751, class B)	1101-40B0-1007-349	**53,35 €**
RTF Pt1000 P D4	Pt1000 (according to DIN EN 60751, class B)	1101-40B0-5007-349	**55,31 €**
RTF Ni1000 P D4	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm / K)	1101-40B0-9007-349	**55,62 €**
RTF NiTK P D4	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-40B1-0007-349	**57,93 €**
RTF LM235Z P D4	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-40B2-1007-349	**57,29 €**
RTF NTC1,8K P D4	NTC 1.8 K	1101-40B1-2007-349	**57,40 €**
RTF NTC10K P D4	NTC 10K	1101-40B1-5007-349	**55,97 €**
RTF NTC20K P D4	NTC 20K	1101-40B1-6007-349	**55,97 €**
RTF xx PUD	**passive / active**	**IP 30** (0 ... +50 °C)	
RTF Pt1000 PU D4	Pt1000 / 0-10 V (potentiometer)	1101-40B0-5019-349	**120,93 €**

Operating elements Baldur 1 — Possible combinations	1	2	3	4	5	6
Sensor 1	●	●	●	●	●	●
Sensor 2	●		●			
Sensor 3 LM235Z with calibrating pot (4-wire)	●			●	●	
Potentiometer 1 with / without series resistor	●	●	●	●		
Potentiometer 2 with calibrating pot					●	●
LED 1 (max. one LED)						
LED 2 (max. two LEDs)						
LED 3 (max. three LEDs)						
LED 4 (max. four LEDs)	●	●	●	●	●	●
Rocker switch		●	●			●
Push-button 1 (max. one button)	●		●		●	●
Push-button 2 (max. two buttons)		●		●		

With 4-conductor-circuitry, Sensor 3 is used, thus a maximum of 3 LEDs is possible.
LM235Z with calibrating pot = calibration of sensor output signal.
Satchwell switching possible with sensor 2.
Turn switches are not possible with Baldur 1!

Please specify in your order:
Ohm rating of potentiometer (e. g. 100 Ohm, 1 kOhm, 2.5 kOhm, 5 kOhm, 10 kOhm)
Colour of LED (e. g. green, red, yellow)
Printing, form of swelling arrow (wedge-shaped or with central position, points or numerical scale)
Requested features regarding operating and / or display elements and wiring
We offer special designs on request in written form including approval drawing.
Special printing: See last chapter "Accessories"

Operating elements Baldur 2 — Possible combinations	1	2	3	4	5	6	7	8	9	10
Sensor 1	●	●	●	●	●	●	●	●	●	●
Sensor 2 LM235Z with calibrating pot	●						●			
Sensor 3 with heat sink (4-wire)										
Potentiometer 1 (at bottom) with / without series resistor	●	●		●		●	●	●		●
Potentiometer 2 (at top)		●						●		
Key switch (at bottom)			●						●	
Turn switch 1 (at top) with / without series resistor				●						●
Turn switch 2 (at bottom)					●					
LED 1 (max. one LED)										
LED 2 (max. two LEDs)										
LED 3 (max. three LEDs)		●						●		
LED 4 (max. four LEDs)				●						●
LED 5 (max. five LEDs)	●		●		●		●		●	
LED 6 (max. six LEDs)						●				
Rocker switch	●	●	●	●	●	●				
Push-button 1 (max. one button)										
Push-button 2 (max. two buttons)	●	●	●		●	●				●
Push-button 3 (max. three buttons)										
Push-button 4 (max. four buttons)							●	●	●	

Sensor 3 can also be used instead of sensor 1.
LM235Z with calibrating pot = calibration of sensor output signal.
In the case cascade connections with turn switch 1, LEDs are not possible!
With the Baldur 2 housing, only one operating element is possible at each of the positions "(at bottom)" and "(at top)"!

THERMASGARD® FSTF

Room temperature sensors
in-wall, panel switch programme,
general

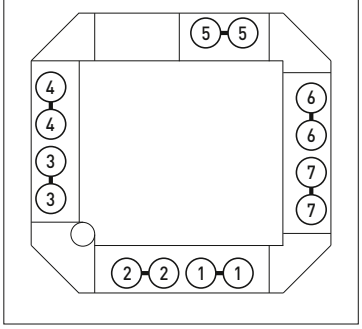
S+S REGELTECHNIK

A room temperature sensor **THERM**ASGARD® **FSTF** is used for air temperature measurement or setpoint adjustment, for presence detection or as room control and operating panel with temperature sensor, push-buttons, potentiometers, status indicators (LEDs).

The in-wall sensor is mounted in high-quality panel switch programmes, ideally of the brands Gira, Berker, Merten, Jung, Siemens or Busch-Jaeger (using in-wall adapters) either individually or in combination with light switches, socket outlets, etc.

It is used in non-aggressive, dust-free environments, in refrigeration, air conditioning and clean room technology, and in interior rooms, such as living rooms, offices, hotels, etc.

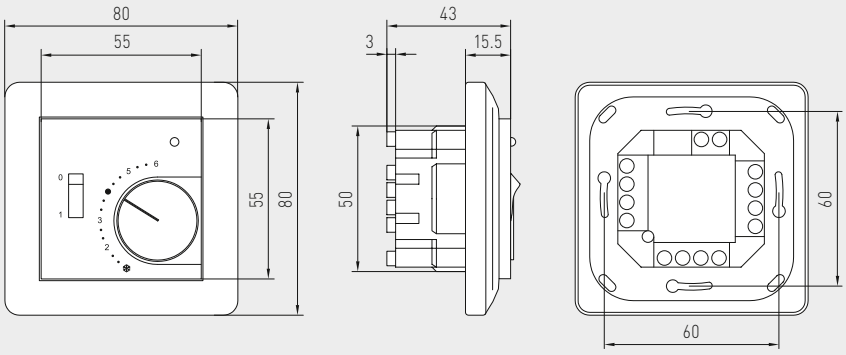
Circuit diagram **FSTF -xx**



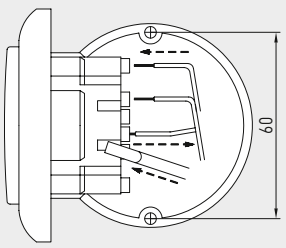
TECHNICAL DATA

Measuring ranges:	–30...+60 °C
Sensor / output:	see table, assembled on board, passive
Range suppression:	in the button
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Potentiometers:	standard 1 kΩ, max. 0.1 W (other ratings optional on request, e. g. 100 Ω, 2.5 kΩ, 5 kΩ, 10 kΩ optional 0-10 V linear)
Turn switches:	max. 24 V AC / DC, max. 130 mA, max. 5 steps (0, Auto, I, II, III)
Rocker switch:	max. 24 V AC / DC, max. 130 mA
Push-buttons:	normally open contact, max. 24 V DC / 10 mA
LEDs:	max. 24 V DC (optional max. 24 V AC), standard green (red, yellow or two-colour optional)
Installation:	in in-wall flush box Ø 55 mm
Electrical connection:	**FSTF-1** via screw terminals 0.14 - 1.5 mm², **FSTF xx** via plug terminals 1.0 - 2.5 mm²
Humidity:	max. 90 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 20** (according to EN 60 529)
SWITCH PROGRAMMES	
Manufacturer:	GIRA System 55 Standard (other switch programmes, manufacturers, and prices upon request)
Housing:	plastic, colour pure white glossy (similar to RAL 9010) (other colours are possible on request with colour variants depending on the respective switch programme)

Dimensional drawing **FSTF -xx**



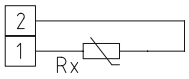
Installation scheme **FSTF -xx**



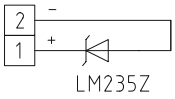


FSTF 1
Standard version
with sensor

1x two-wire connection
Standard



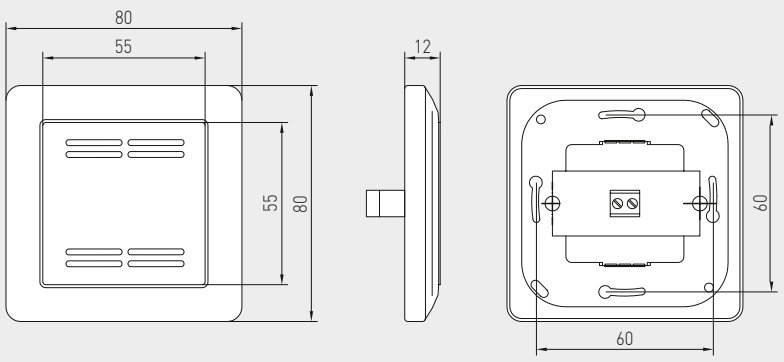
1x two-wire connection
LM 235 Z (KP 10)



THERMASGARD® FSTF 1 Room temperature sensors

Type / WG01	Sensor / Output	Item No.	Price
FSTF1	**passive**	**IP 20** (–30...+60 °C)	
FSTF1 Pt100	Pt100 (according to DIN EN 60 751, class B)	1101-5020-1000-162	**50,79 €**
FSTF1 Pt1000	Pt1000 (according to DIN EN 60 751, class B)	1101-5020-5000-162	**50,79 €**
FSTF1 Ni1000	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-5020-9000-162	**52,31 €**
FSTF1 NiTK	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-5021-0000-162	**54,74 €**
FSTF1 LM235Z	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-5022-1000-162	**50,93 €**
FSTF1 NTC1,8K	NTC 1.8 K	1101-5021-2000-162	**50,31 €**
FSTF1 NTC10K	NTC 10K	1101-5021-5000-162	**49,78 €**
FSTF1 NTC20K	NTC 20K	1101-5021-6000-162	**49,78 €**

Dimensional drawing **FSTF - 1**



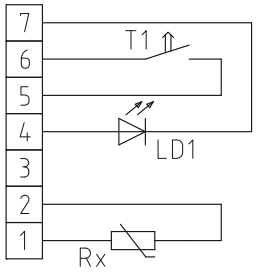
**Room temperature sensors
in-wall, panel switch programme,
different versions**

S+S REGELTECHNIK



FSTF xx LT
Version with sensor,
LED (green), and push-button
(max. 24 V DC, max. 10 mA)

Connecting diagram **FSTF xx LT**



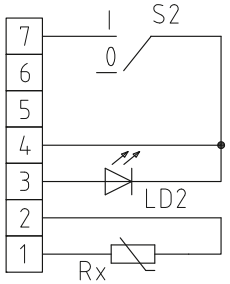
THERMASGARD® FSTF xx LT Room temperature sensors

Type / WG01	Sensor / Output	Item No.	Price
FSTF xx LT	**passive**	**IP 20** (–30...+60 °C)	
FSTF Pt100 L T	Pt100 (according to DIN EN 60751, class B)	1101-5020-1593-350	**66,85 €**
FSTF Pt1000 L T	Pt1000 (according to DIN EN 60751, class B)	1101-5020-5593-350	**66,85 €**
FSTF Ni1000 L T	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm / K)	1101-5020-9593-350	**68,74 €**
FSTF NiTK L T	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-5021-0593-350	**68,74 €**
FSTF LM235Z L T	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-5022-1593-350	**67,47 €**
FSTF NTC1,8K L T	NTC 1.8 K	1101-5021-2593-350	**66,85 €**
FSTF NTC10K L T	NTC 10K	1101-5021-5593-350	**66,20 €**
FSTF NTC20K L T	NTC 20K	1101-5021-6593-350	**66,20 €**



FSTF xx LD2
Version with sensor,
LED (green), and turn switch (2-step)
(max. 24 V AC / DC, max. 130 mA)

Connecting diagram **FSTF xx LD2**



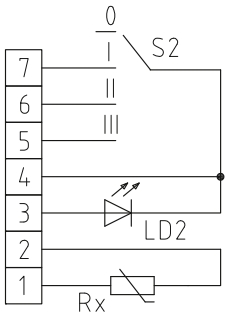
THERMASGARD® FSTF xx LD2 Room temperature sensors

Type / WG01	Sensor / Output	Item No.	Price
FSTF xx LD2	**passive**	**IP 20** (–30...+60 °C)	
FSTF Pt100 D2 L	Pt100 (according to DIN EN 60751, class B)	1101-5020-1631-351	**76,50 €**
FSTF Pt1000 D2 L	Pt1000 (according to DIN EN 60751, class B)	1101-5020-5631-351	**76,50 €**
FSTF Ni1000 D2 L	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm / K)	1101-5020-9631-351	**78,92 €**
FSTF NiTK D2 L	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-5021-0631-351	**78,92 €**
FSTF LM235Z D2 L	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-5022-1631-351	**77,02 €**
FSTF NTC1,8K D2 L	NTC 1.8 K	1101-5021-2631-351	**77,02 €**
FSTF NTC10K D2 L	NTC 10K	1101-5021-5631-351	**76,39 €**
FSTF NTC20K D2 L	NTC 20K	1101-5021-6631-351	**76,39 €**



FSTF xx LD4
Version with sensor,
LED (green) and turn switch (4-step)
(max. 24 V AC / DC, max. 130 mA)

Connecting diagram **FSTF xx LD4**



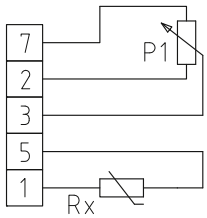
THERMASGARD® FSTF xx LD4 Room temperature sensors

Type / WG01	Sensor / Output	Item No.	Price
FSTF xx LD4	**passive**	**IP 20** (–30...+60 °C)	
FSTF Pt100 D4 L	Pt100 (according to DIN EN 60 751, class B)	1101-5020-1643-352	**79,58 €**
FSTF Pt1000 D4 L	Pt1000 (according to DIN EN 60 751, class B)	1101-5020-5643-352	**79,58 €**
FSTF Ni1000 D4 L	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-5020-9643-352	**81,48 €**
FSTF NiTK D4 L	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-5021-0643-352	**81,48 €**
FSTF LM235Z D4 L	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-5022-1643-352	**80,21 €**
FSTF NTC1,8K D4 L	NTC 1.8 K	1101-5021-2643-352	**79,58 €**
FSTF NTC10K D4 L	NTC 10K	1101-5021-5643-352	**78,92 €**
FSTF NTC20K D4 L	NTC 20K	1101-5021-6643-352	**78,92 €**



FSTF xx P
Version with sensor
and potentiometer
(1 kOhm, max. 0.1 W)

Connecting diagram **FSTF xx P**



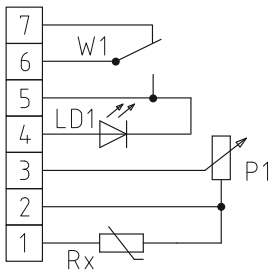
THERMASGARD® FSTF xx P Room temperature sensors

Type / WG01	Sensor / Output	Item No.	Price
FSTF xx P	**passive**	**IP 20** (–30...+60 °C)	
FSTF Pt100 P	Pt100 (according to DIN EN 60 751, class B)	1101-5020-1001-282	**82,11 €**
FSTF Pt1000 P	Pt1000 (according to DIN EN 60 751, class B)	1101-5020-5001-162	**82,11 €**
FSTF Ni1000 P	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-5020-9001-162	**82,89 €**
FSTF NiTK P	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-5021-0001-162	**85,68 €**
FSTF LM235Z P	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-5022-1001-162	**78,29 €**
FSTF NTC1,8K P	NTC 1.8 K	1101-5021-2001-162	**79,58 €**
FSTF NTC10K P	NTC 10K	1101-5021-5001-162	**78,29 €**
FSTF NTC20K P	NTC 20K	1101-5021-6001-162	**78,29 €**



FSTF xx PLW
Version with sensor,
potentiometer (1 kOhm, max. 0.1 W),
LED (green), and rocker switch
(max. 24 V AC / DC, max. 130 mA)

Connecting diagram **FSTF xx PLW**



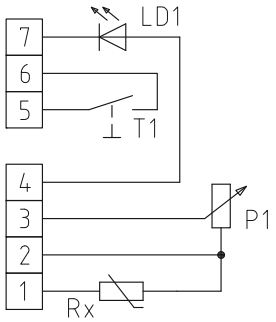
THERMASGARD® FSTF xx PLW Room temperature sensors

Type / WG01	Sensor / Output	Item No.	Price
FSTF xx PLW	**passive**	**IP 20** (–30...+60 °C)	
FSTF Pt100 P L W	Pt100 (according to DIN EN 60751, class B)	1101-5020-1655-353	**104,20 €**
FSTF Pt1000 P L W	Pt1000 (according to DIN EN 60751, class B)	1101-5020-5655-353	**106,82 €**
FSTF Ni1000 P L W	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm / K)	1101-5020-9655-353	**107,45 €**
FSTF NiTK P L W	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-5021-0655-353	**110,04 €**
FSTF LM235Z P L W	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-5022-1655-353	**104,84 €**
FSTF NTC1,8K P L W	NTC 1.8 K	1101-5021-2655-353	**110,57 €**
FSTF NTC10K P L W	NTC 10K	1101-5021-5655-353	**104,20 €**
FSTF NTC20K P L W	NTC 20K	1101-5021-6655-353	**104,20 €**



FSTF xx PLT
Version with sensor,
potentiometer (1 kOhm, max. 0.1 W),
LED (green), and push-button
(max. 24 V DC, max. 10 mA)

Connecting diagram **FSTF xx PLT**



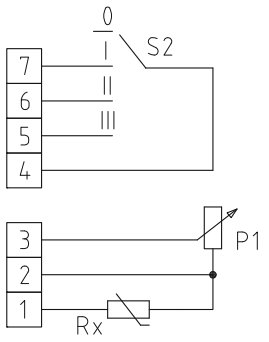
THERMASGARD® FSTF xx PLT Room temperature sensors

Type / WG01	Sensor / Output	Item No.	Price
FSTF xx PLT	**passive**	**IP 20** (–30...+60 °C)	
FSTF Pt100 P L T	Pt100 (according to DIN EN 60751, class B)	1101-5020-1663-162	**104,14 €**
FSTF Pt1000 P L T	Pt1000 (according to DIN EN 60751, class B)	1101-5020-5663-162	**106,75 €**
FSTF Ni1000 P L T	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm / K)	1101-5020-9663-350	**107,38 €**
FSTF NiTK P L T	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-5021-0663-350	**109,99 €**
FSTF LM235Z P L T	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-5022-1663-350	**104,77 €**
FSTF NTC1,8K P L T	NTC 1.8 K	1101-5021-2663-350	**110,50 €**
FSTF NTC10K P L T	NTC 10K	1101-5021-5663-350	**104,14 €**
FSTF NTC20K P L T	NTC 20K	1101-5021-6663-350	**104,14 €**



FSTF xx PD4
Version with sensor,
potentiometer (1 kOhm, max. 0.1 W)
and turn switch
(max. 24 V AC / DC, max. 130 mA)

Connecting diagram **FSTF xx PD4**



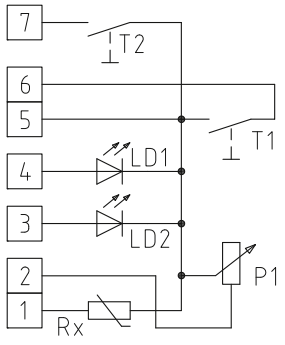
THERMASGARD® FSTF xx PD4 Room temperature sensors

Type / WG01	Sensor / Output	Item No.	Price
FSTF xx PD4	**passive**	**IP 20** (–30...+60 °C)	
FSTF Pt100 P D4	Pt100 (according to DIN EN 60 751, class B)	1101-5020-1007-354	**107,39 €**
FSTF Pt1000 P D4	Pt1000 (according to DIN EN 60 751, class B)	1101-5020-5007-354	**110,00 €**
FSTF Ni1000 P D4	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-5020-9007-354	**110,65 €**
FSTF NiTK P D4	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-5021-0007-354	**113,26 €**
FSTF LM235Z P D4	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-5022-1007-354	**107,39 €**
FSTF NTC1,8K P D4	NTC 1.8 K	1101-5021-2007-354	**109,33 €**
FSTF NTC10K P D4	NTC 10K	1101-5021-5007-354	**106,75 €**
FSTF NTC20K P D4	NTC 20K	1101-5021-6007-354	**106,75 €**



FSTF xx P 2L 2T
Version with sensor,
potentiometer (1 kOhm, max. 0.1 W),
2 LEDs (green, red), and 2 push-buttons (max.
24 V DC, max. 10 mA)

Connecting diagram **FSTF xx P 2L 2T**



THERMASGARD® FSTF xx P 2L 2T Room temperature sensors

Type / WG01	Sensor / Output	Item No.	Price
FSTF xx P 2L 2T	**passive**	**IP 20** (–30...+60 °C)	
FSTF Pt100 P 2L 2T	Pt100 (according to DIN EN 60 751, class B)	1101-5020-1672-256	**109,99 €**
FSTF Pt1000 P 2L 2T	Pt1000 (according to DIN EN 60 751, class B)	1101-5020-5672-256	**113,55 €**
FSTF Ni1000 P 2L 2T	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-5020-9672-256	**117,24 €**
FSTF NiTK P2L2T	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-5021-0672-256	**119,41 €**
FSTF LM235Z P 2L 2T	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-5022-1672-256	**112,54 €**
FSTF NTC1,8K P 2L 2T	NTC 1.8 K	1101-5021-2672-256	**116,12 €**
FSTF NTC10K P 2L 2T	NTC 10K	1101-5021-5672-256	**110,50 €**
FSTF NTC20K P 2L 2T	NTC 20K	1101-5021-6672-256	**110,50 €**

S+S REGELTECHNIK

In-ceiling temperature sensors with passive output

THERMASGARD® **DTF** is a small in-ceiling resistance thermometer with passive output for in-wall installation, e.g. in plasterboard walls or suspended ceilings. The in-ceiling temperature sensor DTF is preferably installed in ceilings and walls, blends in seamlessly with the overall architectural design and detects the temperature at the surface.
The connecting head is pluggable for quick, easy mounting.

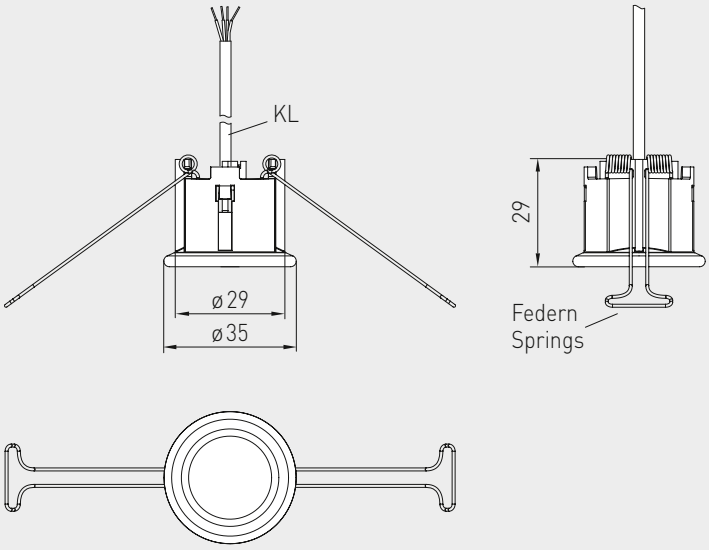
DTF
Connecting head, pluggable



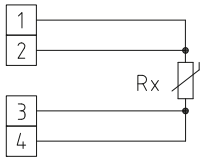
TECHNICAL DATA

Measuring range:	–20...+90 °C
Sensors / output:	see table, passive
Connection type:	4-wire connection **terminal 1 / 2: +** (marked red, wire colours: yellow, brown) **terminal 3 / 4: –** (marked black, wire colours: white, green)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Connecting head:	plastic, material polycarbonate (PC), colour white (can be painted as an option), **pluggable**
Connecting cable:	PVC, LiYY, 4 x 0.14 mm², KL = approx. 2 m
Process connection:	inside suspended ceiling, ceiling cutout Ø = 30 mm, cover Ø = < 35 mm
Insulating resistance:	≥ 100 MΩ, at +20 °C (500V DC)
Humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 30** (according EN 60 529) Sensor in the built-in state

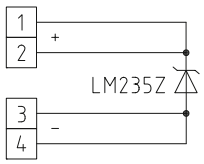
Dimensional drawing **DTF**



1x four-wire connection
standard



1x four-wire connection
LM 235 Z (KP 10)



DTF



THERMASGARD® DTF	In-ceiling temperature sensors		
Type / WG03	**Sensor / Output**	**Item No.**	**Price**
DTF		**IP 30**	
DTF Pt100	Pt100 (according to DIN EN 60 751, class B)	1101-60C0-1003-000	**40,74 €**
DTF Pt1000	Pt1000 (according to DIN EN 60 751, class B)	1101-60C0-5003-000	**40,74 €**
DTF Ni1000	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-60C0-9003-000	**40,48 €**
DTF NiTK	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-60C1-0003-000	**44,45 €**
DTF LM235Z	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-60C2-1003-000	**41,69 €**
DTF NTC1,8K	NTC 1.8 K	1101-60C1-2003-000	**41,69 €**
DTF NTC10K	NTC 10K	1101-60C1-5003-000	**41,69 €**
DTF NTC20K	NTC 20K	1101-60C1-6003-000	**41,69 €**
Note:	Other sensors optional	on request	

THERMASGARD® ATF 1
THERMASGARD® ATF 01

Outside temperature sensors / wet room temperature sensors with passive output

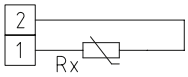
S+S REGELTECHNIK

Outside wall resistance thermometer / weather sensor **THERM**ASGARD® **ATF 1** (internal sensor) with passive output, housing made of impact-resistant plastic and quick-locking screws.

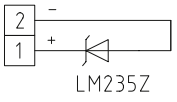
Outside wall resistance thermometer / weather sensor **THERM**ASGARD® **ATF 01** (internal sensor) with passive output, housing made of impact-resistant plastic and snap-on lid.

It is used to measure outside temperatures, temperatures in wet room areas, e.g. as an outdoor sensor, weather sensor for installation on outside walls, in cold storage buildings and greenhouses, in halls, in the industrial sector and in agriculture. Installation in outdoor areas preferably at the north side of a building or in a protected place. In cases of direct solar irradiation, we recommend the use of our **WS01** or **WS04** sun protection hood (accessory).

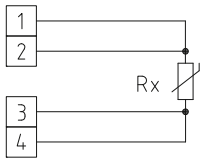
1x two-wire connection
standard



1x two-wire connection
LM235Z (KP10)



1x four-wire connection
(optional)





TECHNICAL DATA

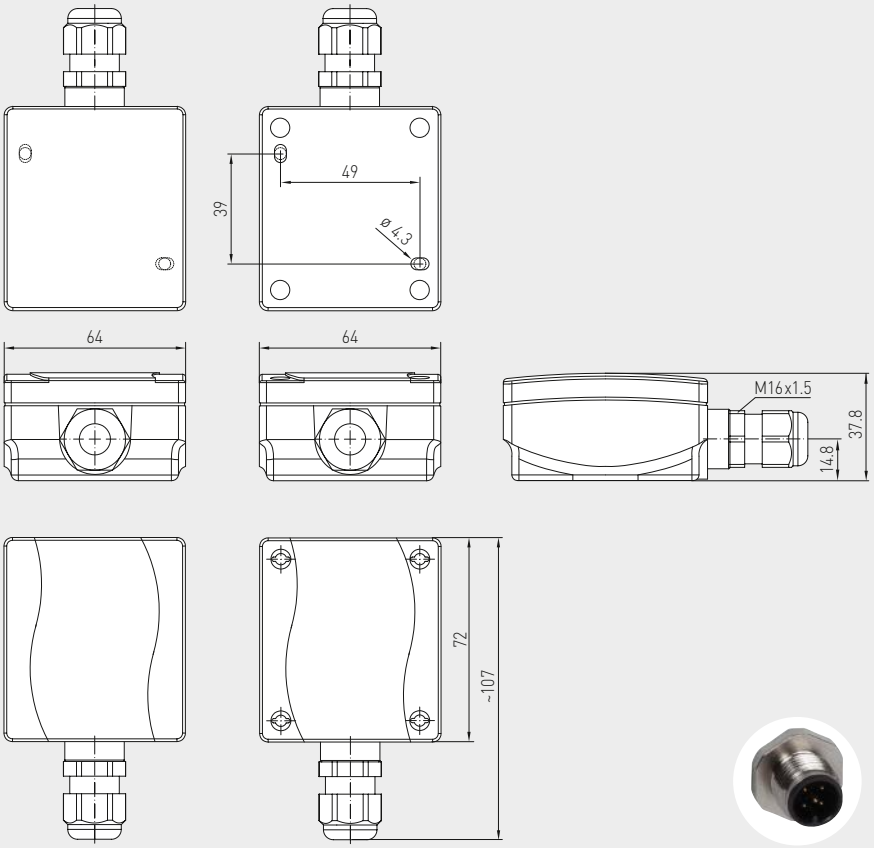
Measuring range:	–50...+90 °C
Sensors / output:	passive (see table), sensors internal
Connection type:	2-wire connection (4-wire connection on PT100 / PT1000A, optional on other sensors)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016), **ATF 01 with snap-on lid,** **ATF 1 with quick-locking screws** (slotted / Phillips head combination)
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 / Tyr 01)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**ATF 01 IP 54** (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713160960A (Tyr 01) **ATF 1 IP 67** (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)

THERMASGARD® ATF 01 Outside temperature sensors / wet room temperature sensors, *Standard* with snap-on lid

Type / WG03	Sensor / Output	Item No.	Price
ATF 01		**IP 54**	
ATF01 Pt100	Pt100 (according to DIN EN 60 751, class B)	1101-1030-1003-000	**15,29 €**
ATF01 Pt1000	Pt1000 (according to DIN EN 60 751, class B)	1101-1030-5001-000	**17,90 €**
ATF01 Ni1000	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-1030-9001-000	**18,70 €**
ATF01 NiTK	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-1031-0001-000	**21,70 €**
ATF01 LM235Z	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-1032-1001-000	**15,76 €**
ATF01 NTC1,8K	NTC 1.8 K	1101-1031-2001-000	**14,52 €**
ATF01 NTC10K	NTC 10K	1101-1031-5001-000	**14,52 €**
ATF01 NTC20K	NTC 20K	1101-1031-6001-000	**14,52 €**
Extra charge:	Other sensors optional Cable connection with **M12 connector** according to DIN EN 61076-2-101	on request on request	
ACCESSORIES			
WS-01	**Sun and ball-impact protection hood,** 184 x 180 x 80 mm, stainless steel **V2A** (1.4301)	7100-0040-2000-000	**31,77 €**
WS-04	**Weather and sun protection hood,** 130 x 180 x 135 mm, stainless steel **V2A** (1.4301)	7100-0040-7000-000	**37,49 €**
	For further information see last chapter!		

Dimensional drawing

ATF 1
ATF 01



with snap-on lid

with quick-locking screws

M12 connector
(optional on request)

ATF 01
with snap-on lid
(IP 54)



ATF 1
with quick-locking screws
(IP 67)



THERMASGARD® ATF 1 — Outside temperature sensors / wet room temperature sensors, *Premium* with quick-locking screws

Type / WG03	Sensor / Output	Item No.	Price
ATF 1		**IP 67**	
ATF1 Pt100	Pt100 (according to DIN EN 60 751, class B)	1101-1040-1003-000	**17,67 €**
ATF1 Pt1000	Pt1000 (according to DIN EN 60 751, class B)	1101-1040-5001-000	**20,28 €**
ATF1 Pt1000A	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-1040-6003-000	**23,71 €**
ATF1 Ni1000	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-1040-9001-000	**19,80 €**
ATF1 NiTK	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-1041-0001-000	**24,08 €**
ATF1 LM235Z	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-1042-1001-000	**18,13 €**
ATF1 NTC1,8K	NTC 1.8 K	1101-1041-2001-000	**16,13 €**
ATF1 NTC10K	NTC 10K	1101-1041-5001-000	**16,13 €**
ATF1 NTC20K	NTC 20K	1101-1041-6001-000	**16,13 €**
Extra charge::	Other sensors optional Cable connection with **M12 connector** according to DIN EN 61076-2-101	on request on request	
ACCESSORIES			
WS-01	**Sun and ball-impact protection hood,** 184 x 180 x 80 mm, stainless steel **V2A** (1.4301)	7100-0040-2000-000	**31,77 €**
WS-04	**Weather and sun protection hood,** 130 x 180 x 135 mm, stainless steel **V2A** (1.4301)	7100-0040-7000-000	**37,49 €**
	For further information see last chapter!		

THERMASGARD® ATF 2

Outside temperature sensors / wet room temperature sensors with passive output

S+S REGELTECHNIK

Outside wall resistance thermometers / weather sensors **THERM**ASGARD® **ATF 2** (external sensor) with passive output and housing made of impact-resistant plastic and with quick-locking screws.

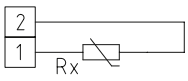
It is used to measure outside temperatures, temperatures in wet room areas, e.g. as a weather sensor, for installation on outside walls, in cold storage buildings and greenhouses, in halls, in the industrial sector and in agriculture. Outdoor installation should preferably be performed at the north side of a building or in a protected place.

In cases of direct solar irradiation, we recommend the use of our **WS01** or **WS04** sun protection hood (accessory) or the device version with installed sun protection hood **SS02** (available upon request).

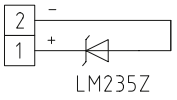
TECHNICAL DATA

Measuring range:	–50...+90 °C
Sensors / output:	passive (see table), sensor inside external sensor tube, stainless steel **V4A** (1.4571) (**Perfect Sensor Protection**)
Connection type:	2-wire connection (4-wire connection on PT100 / PT1000A, optional on other sensors)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016)
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101
Electrical connection:	0.14 - 1.5 mm² via terminal screws
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Permissible humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)
Optional:	with sun protection hood **SS 02** (available on request)

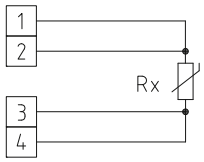
1x two-wire connection
standard



1x two-wire connection
LM 235 Z (KP 10)



1x four-wire connection
(optional)





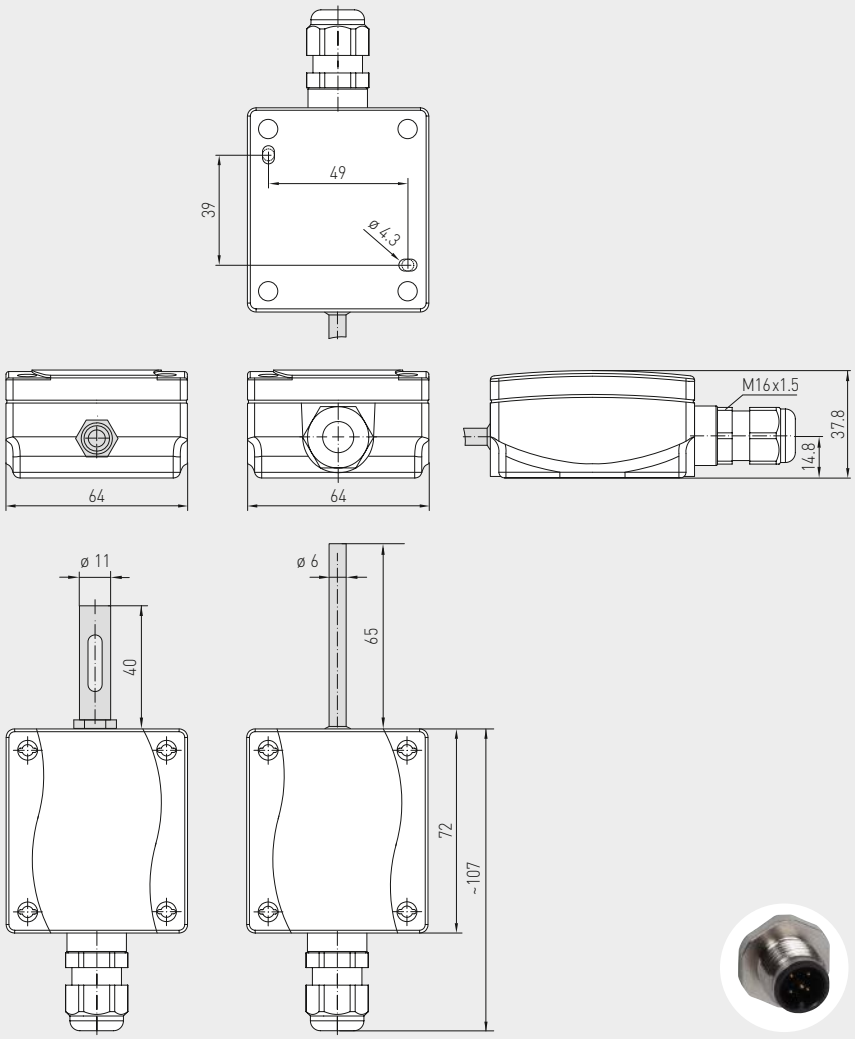


High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

Dimensional drawing

ATF 2



with SS-02

without SS-02

M12 connector
(optional on request)

ATF 2



ATF 2
with SS-02



THERMASGARD® ATF 2 Outside temperature sensors / wet room temperature sensors			
Type / WG03	**Sensor / Output**	**Item No.**	**Price**
ATF 2			
ATF2 Pt100	Pt100 (according to DIN EN 60 751, class B)	1101-1050-1003-000	**38,54 €**
ATF2 Pt1000	Pt1000 (according to DIN EN 60 751, class B)	1101-1050-5001-000	**38,54 €**
ATF2 Pt1000A	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-1050-6003-000	**47,86 €**
ATF2 Ni1000	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-1050-9001-000	**40,79 €**
ATF2 NiTK	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-1051-0001-000	**40,79 €**
ATF2 LM235Z	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-1052-1001-000	**37,95 €**
ATF2 NTC1,8K	NTC 1.8 K	1101-1051-2001-000	**37,17 €**
ATF2 NTC10K	NTC 10K	1101-1051-5001-000	**37,17 €**
ATF2 NTC20K	NTC 20K	1101-1051-6001-000	**37,17 €**
Extra charge:	Other sensors optional with sun protection hood **SS 02** Cable connection with **M12 connector** according to DIN EN 61076-2-101	on request on request on request	**9,74 €**
ACCESSORIES			
WS-01	**Sun and ball-impact protection hood,** 184 x 180 x 80 mm, stainless steel **V2A** (1.4301)	7100-0040-2000-000	**31,77 €**
WS-04	**Weather and sun protection hood,** 130 x 180 x 135 mm, stainless steel **V2A** (1.4301)	7100-0040-7000-000	**37,49 €**
	For further information see last chapter!		

THERMASGARD® TF 43
THERMASGARD® TF 65

Immersion / screw-in / duct temperature sensors with passive output

S+S REGELTECHNIK

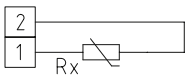
Patented quality product (Immersion sensor patent no. DE 10 2012 017 500.0)

THERMASGARD® **TF 43** is a resistance thermometer with a passive output, housing made from impact-resistant plastic with snap-on lid, and straight protective tube.

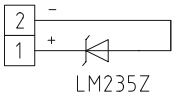
THERMASGARD® **TF 65** is a resistance thermometer with a passive output, housing made from impact-resistant plastic with quick-locking screws, and straight protective tube.

These immersion / screw-in / duct temperature sensors are electric contact thermometers for temperature measurement in liquids and gases, which are installed for example in piping systems and vessels. For aggressive media, stainless steel immersion sleeves must be used.
Applications of these temperature sensors in piping systems, in heating technology, in storage tanks, in district heating compact stations, in hot and cold-water systems, in oil and lubricant circulation systems, in mechanical, apparatus and plant engineering as well as in the entire industrial sector.

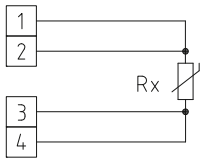
1x two-wire connection
Standard



1x two-wire connection
LM 235 Z (KP 10)



1x four-wire connection
(optional)



TECHNICAL DATA

Measuring range:	–30...+150 °C (T_{max} NTC = +150 °C, T_{max} LM235Z = +125 °C)
Sensors / output:	see table, passive (**Perfect Sensor Protection**) (optional also with two sensors)
Connection type:	2-wire connection (4-wire connection on PT100 / PT1000A, optional on other sensors)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Ambient temperature:	–20...+100 °C
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016) **TF 43 with snap-on lid** **TF 65 with quick-locking screws** (slotted / Phillips head combination)
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 / Tyr 01)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Protective tube:	stainless steel, **V4A** (1.4571), Ø = 6 mm, inserted length (EL) = 50 - 400 mm (see table)
Permissible humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**TF 43 IP 54** (according to EN 60 529)* Housing tested, TÜV SÜD, Report No. 713160960A (Tyr 01) **TF 65 IP 67** (according to EN 60 529)* Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1) * Housing in the built-in state





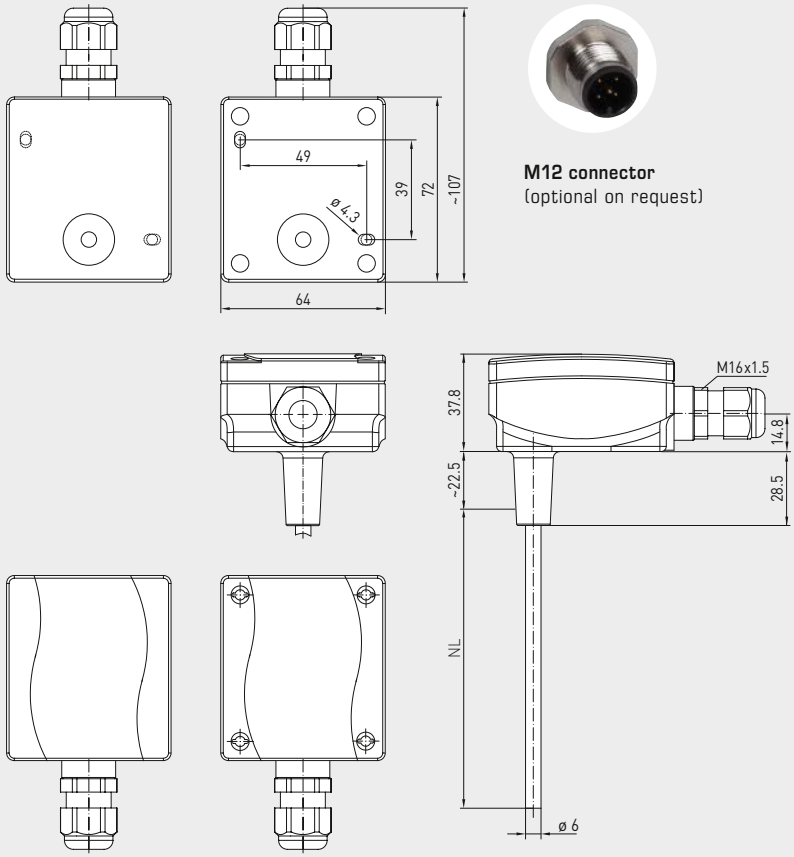
ACCESSORIES	
MF-15-K	**Mounting flange,** plastic, 56.8 x 84.3 mm, Ø = 15.2 mm tube gland, T_{max} = +100 °C
TH 08-ms / xx	**Immersion sleeve,** brass, nickel-plated, Ø = 8 mm, T_{max} = +150 °C, p_{max} = 10 bar
TH 08-VA / xx	**Immersion sleeve,** stainless steel, **V4A** (1.4571), Ø = 8 mm, T_{max} = +600 °C, p_{max} = 40 bar
TH 08-VA / xx / 90	**Immersion sleeve,** stainless steel, **V4A** (1.4571), with neck tube (90 mm), Ø = 8 mm, T_{max} = +600 °C, p_{max} = 40 bar

High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

Dimensional drawing

TF 43
TF 65



M12 connector
(optional on request)

with snap-on lid

with quick-locking screws

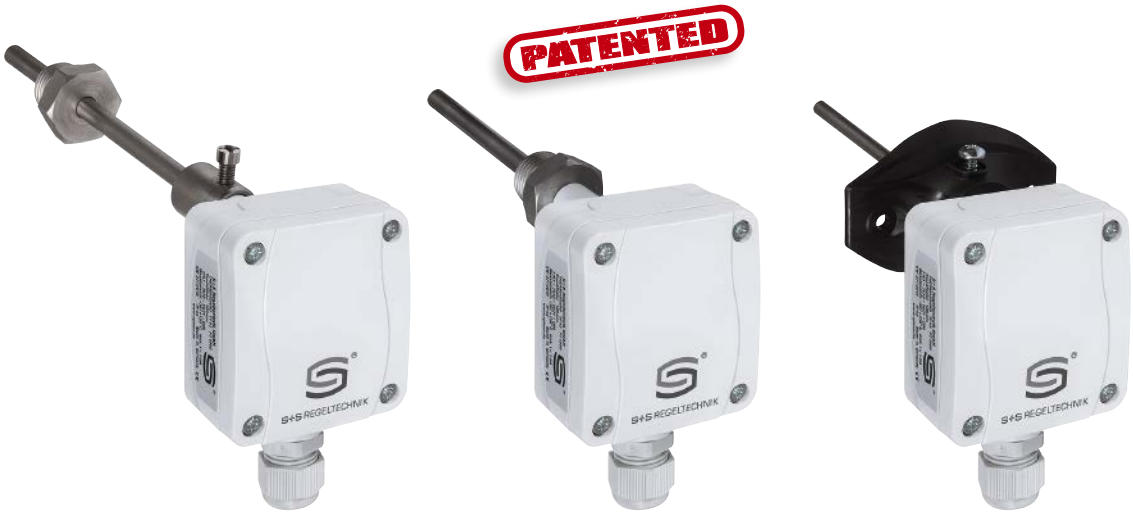
TF 43
with snap-on lid
(IP 54)



TF 65
with quick-locking screws
(IP 67)



PATENTED



TF xx
Basic device
with accessories

THERMASGARD® TF 65	Temperature sensors (Basic device with quick-locking screws), *Premium*		
Type / WG03 / EL	**Sensor / Output**	**Item No.**	**Price**
TF65 PT100 xx	**Pt100**	**IP 67**	
TF65 Pt100 50mm	Pt100 (according to DIN EN 60 751, class B)	1101-7020-1013-000	**37,82 €**
TF65 Pt100 100mm	Pt100 (according to DIN EN 60 751, class B)	1101-7020-1023-000	**39,36 €**
TF65 Pt100 150mm	Pt100 (according to DIN EN 60 751, class B)	1101-7020-1033-000	**40,91 €**
TF65 Pt100 200mm	Pt100 (according to DIN EN 60 751, class B)	1101-7020-1043-000	**41,51 €**
TF65 Pt100 250mm	Pt100 (according to DIN EN 60 751, class B)	1101-7020-1053-000	**43,40 €**
TF65 Pt100 300mm	Pt100 (according to DIN EN 60 751, class B)	1101-7020-1063-000	**44,82 €**
TF65 Pt100 350mm	Pt100 (according to DIN EN 60 751, class B)	1101-7020-1073-000	**45,64 €**
TF65 Pt100 400mm	Pt100 (according to DIN EN 60 751, class B)	1101-7020-1083-000	**46,73 €**
TF65 PT1000 xx	**Pt1000**	**IP 67**	
TF65 Pt1000 50mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7020-5011-000	**40,43 €**
TF65 Pt1000 100mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7020-5021-000	**41,98 €**
TF65 Pt1000 150mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7020-5031-000	**43,51 €**
TF65 Pt1000 200mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7020-5041-000	**44,10 €**
TF65 Pt1000 250mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7020-5051-000	**46,01 €**
TF65 Pt1000 300mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7020-5061-000	**47,43 €**
TF65 Pt1000 350mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7020-5071-000	**48,02 €**
TF65 Pt1000 400mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7020-5081-000	**48,85 €**
TF65 PT1000A xx	**Pt1000A**	**IP 67**	
TF65 Pt1000A 50mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7020-6013-000	**42,37 €**
TF65 Pt1000A 100mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7020-6023-000	**43,05 €**
TF65 Pt1000A 150mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7020-6033-000	**45,30 €**
TF65 Pt1000A 200mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7020-6043-000	**45,89 €**
TF65 Pt1000A 250mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7020-6053-000	**47,79 €**
TF65 Pt1000A 300mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7020-6063-000	**49,32 €**
TF65 Pt1000A 350mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7020-6073-000	**50,86 €**
TF65 Pt1000A 400mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7020-6083-000	**51,09 €**
TF65 Ni1000 xx	**Ni 1000**	**IP 67**	
TF65 Ni1000 50mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7020-9011-000	**39,72 €**
TF65 Ni1000 100mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7020-9021-000	**41,62 €**
TF65 Ni1000 150mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7020-9031-000	**43,16 €**
TF65 Ni1000 200mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7020-9041-000	**43,75 €**
TF65 Ni1000 250mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7020-9051-000	**45,64 €**
TF65 Ni1000 300mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7020-9061-000	**47,06 €**
TF65 Ni1000 350mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7020-9071-000	**48,02 €**
TF65 Ni1000 400mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7020-9081-000	**48,62 €**
TF65 NI1000TK xx	**Ni1000 TK5000**	**IP 67**	
TF65 NiTK 50mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-7021-0011-000	**39,72 €**
TF65 NiTK 100mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-7021-0021-000	**41,62 €**
TF65 NiTK 150mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-7021-0031-000	**43,16 €**
TF65 NiTK 200mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-7021-0041-000	**43,75 €**
TF65 NiTK 250mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-7021-0051-000	**45,64 €**
TF65 NiTK 300mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-7021-0061-000	**47,06 €**
TF65 NiTK 350mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-7021-0071-000	**48,02 €**
TF65 NiTK 400mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-7021-0081-000	**44,38 €**

Continued on next page...

High-performance encapsulation against
vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

THERMASGARD® TF 65	Temperature sensors (Basic device with quick-locking screws), *Premium*		
Type / WG03 / EL	**Sensor / Output**	**Item No.**	**Price**
TF 65 LM235Z xx	**LM235Z**	**IP 67**	
TF65 LM235Z 50mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7022-1011-000	**38,41 €**
TF65 LM235Z 100mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7022-1021-000	**39,84 €**
TF65 LM235Z 150mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7022-1031-000	**41,38 €**
TF65 LM235Z 200mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7022-1041-000	**41,98 €**
TF65 LM235Z 250mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7022-1051-000	**43,98 €**
TF65 LM235Z 300mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7022-1061-000	**45,41 €**
TF65 LM235Z 350mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7022-1071-000	**46,24 €**
TF65 LM235Z 400mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7022-1081-000	**46,83 €**
TF 65 NTC 1.8 K xx	**NTC 1.8 K**	**IP 67**	
TF65 NTC1,8K 50mm	NTC 1.8 K	1101-7021-2011-000	**36,29 €**
TF65 NTC1,8K 100mm	NTC 1.8 K	1101-7021-2021-000	**37,82 €**
TF65 NTC1,8K 150mm	NTC 1.8 K	1101-7021-2031-000	**39,36 €**
TF65 NTC1,8K 200mm	NTC 1.8 K	1101-7021-2041-000	**39,84 €**
TF65 NTC1,8K 250mm	NTC 1.8 K	1101-7021-2051-000	**41,84 €**
TF65 NTC1,8K 300mm	NTC 1.8 K	1101-7021-2061-000	**43,27 €**
TF65 NTC1,8K 350mm	NTC 1.8 K	1101-7021-2071-000	**44,05 €**
TF65 NTC1,8K 400mm	NTC 1.8 K	1101-7021-2081-000	**45,06 €**
TF 65 NTC10K xx	**NTC 10K**	**IP 67**	
TF65 NTC10K 50mm	NTC 10K	1101-7021-5011-000	**36,29 €**
TF65 NTC10K 100mm	NTC 10K	1101-7021-5021-000	**37,82 €**
TF65 NTC10K 150mm	NTC 10K	1101-7021-5031-000	**39,36 €**
TF65 NTC10K 200mm	NTC 10K	1101-7021-5041-000	**39,84 €**
TF65 NTC10K 250mm	NTC 10K	1101-7021-5051-000	**41,84 €**
TF65 NTC10K 300mm	NTC 10K	1101-7021-5061-000	**43,27 €**
TF65 NTC10K 350mm	NTC 10K	1101-7021-5071-000	**44,05 €**
TF65 NTC10K 400mm	NTC 10K	1101-7021-5081-000	**45,06 €**
TF 65 NTC20K xx	**NTC 20K**	**IP 67**	
TF65 NTC20K 50mm	NTC 20K	1101-7021-6011-000	**36,29 €**
TF65 NTC20K 100mm	NTC 20K	1101-7021-6021-000	**37,82 €**
TF65 NTC20K 150mm	NTC 20K	1101-7021-6031-000	**39,36 €**
TF65 NTC20K 200mm	NTC 20K	1101-7021-6041-000	**39,84 €**
TF65 NTC20K 250mm	NTC 20K	1101-7021-6051-000	**41,73 €**
TF65 NTC20K 300mm	NTC 20K	1101-7021-6061-000	**43,27 €**
TF65 NTC20K 350mm	NTC 20K	1101-7021-6071-000	**44,05 €**
TF65 NTC20K 400mm	NTC 20K	1101-7021-6081-000	**45,06 €**
Note:	Other sensors optional	on request	
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101	on request	

TF 65
with quick-locking screws
(IP 67)



Immersion / screw-in / duct temperature sensors with passive output

S+S REGELTECHNIK

THERMASGARD® TF 43	Temperature sensors (Basic device with snap-on lid), *Standard*		
Type / WG03 / EL	**Sensor / Output**	**Item No.**	**Price**
TF43 PT100 xx	**Pt100**	**IP 54**	
TF43 Pt100 50mm	Pt100 (according to DIN EN 60751, class B)	1101-7010-1013-000	**28,27 €**
TF43 Pt100 100mm	Pt100 (according to DIN EN 60751, class B)	1101-7010-1023-000	**28,39 €**
TF43 Pt100 150mm	Pt100 (according to DIN EN 60751, class B)	1101-7010-1033-000	**29,30 €**
TF43 Pt100 200mm	Pt100 (according to DIN EN 60751, class B)	1101-7010-1043-000	**30,11 €**
TF43 Pt100 250mm	Pt100 (according to DIN EN 60751, class B)	1101-7010-1053-000	**31,65 €**
TF43 Pt100 300mm	Pt100 (according to DIN EN 60751, class B)	1101-7010-1063-000	**34,25 €**
TF43 Pt100 350mm	Pt100 (according to DIN EN 60751, class B)	1101-7010-1073-000	**35,30 €**
TF43 Pt100 400mm	Pt100 (according to DIN EN 60751, class B)	1101-7010-1083-000	**36,42 €**
TF43 PT1000 xx	**Pt1000**	**IP 54**	
TF43 Pt1000 50mm	Pt1000 (according to DIN EN 60751, class B)	1101-7010-5011-000	**28,27 €**
TF43 Pt1000 100mm	Pt1000 (according to DIN EN 60751, class B)	1101-7010-5021-000	**28,39 €**
TF43 Pt1000 150mm	Pt1000 (according to DIN EN 60751, class B)	1101-7010-5031-000	**29,30 €**
TF43 Pt1000 200mm	Pt1000 (according to DIN EN 60751, class B)	1101-7010-5041-000	**30,11 €**
TF43 Pt1000 250mm	Pt1000 (according to DIN EN 60751, class B)	1101-7010-5051-000	**31,65 €**
TF43 Pt1000 300mm	Pt1000 (according to DIN EN 60751, class B)	1101-7010-5061-000	**34,25 €**
TF43 Pt1000 350mm	Pt1000 (according to DIN EN 60751, class B)	1101-7010-5071-000	**35,30 €**
TF43 Pt1000 400mm	Pt1000 (according to DIN EN 60751, class B)	1101-7010-5081-000	**36,42 €**
TF43 PT1000A xx	**Pt1000A**	**IP 54**	
TF43 Pt1000A 50mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7010-6013-000	**30,04 €**
TF43 Pt1000A 100mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7010-6023-000	**30,18 €**
TF43 Pt1000A 150mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7010-6033-000	**31,07 €**
TF43 Pt1000A 200mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7010-6043-000	**31,89 €**
TF43 Pt1000A 250mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7010-6053-000	**33,42 €**
TF43 Pt1000A 300mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7010-6063-000	**36,03 €**
TF43 Pt1000A 350mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7010-6073-000	**37,09 €**
TF43 Pt1000A 400mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7010-6083-000	**38,21 €**
TF43 Ni1000 xx	**Ni 1000**	**IP 54**	
TF43 Ni1000 50mm	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm / K)	1101-7010-9011-000	**28,97 €**
TF43 Ni1000 100mm	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm / K)	1101-7010-9021-000	**31,71 €**
TF43 Ni1000 150mm	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm / K)	1101-7010-9031-000	**31,94 €**
TF43 Ni1000 200mm	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm / K)	1101-7010-9041-000	**32,64 €**
TF43 Ni1000 250mm	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm / K)	1101-7010-9051-000	**33,56 €**
TF43 Ni1000 300mm	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm / K)	1101-7010-9061-000	**35,77 €**
TF43 Ni1000 350mm	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm / K)	1101-7010-9071-000	**36,79 €**
TF43 Ni1000 400mm	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm / K)	1101-7010-9081-000	**38,44 €**
TF43 NI1000TK xx	**Ni1000 TK5000**	**IP 54**	
TF43 NiTK 50mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-7011-0011-000	**29,02 €**
TF43 NiTK 100mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-7011-0021-000	**31,77 €**
TF43 NiTK 150mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-7011-0031-000	**32,10 €**
TF43 NiTK 200mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-7011-0041-000	**32,78 €**
TF43 NiTK 250mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-7011-0051-000	**33,67 €**
TF43 NiTK 300mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-7011-0061-000	**35,91 €**
TF43 NiTK 350mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-7011-0071-000	**37,03 €**
TF43 NiTK 400mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-7011-0081-000	**38,58 €**

Continued on next page...

High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

THERMASGARD® TF 43	Temperature sensors (Basic device with snap-on lid), *Standard*		
Type / WG03 / EL	**Sensor / Output**	**Item No.**	**Price**
TF 43 LM235Z xx	**LM235Z**	**IP 54**	
TF43 LM235Z 50mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7012-1011-000	**29,54 €**
TF43 LM235Z 100mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7012-1021-000	**29,86 €**
TF43 LM235Z 150mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7012-1031-000	**30,94 €**
TF43 LM235Z 200mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7012-1041-000	**31,65 €**
TF43 LM235Z 250mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7012-1051-000	**32,01 €**
TF43 LM235Z 300mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7012-1061-000	**34,76 €**
TF43 LM235Z 350mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7012-1071-000	**35,18 €**
TF43 LM235Z 400mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7012-1081-000	**37,38 €**
TF 43 NTC 1.8 K xx	**NTC 1.8 K**	**IP 54**	
TF43 NTC1,8K 50mm	NTC 1.8 K	1101-7011-2011-000	**28,27 €**
TF43 NTC1,8K 100mm	NTC 1.8 K	1101-7011-2021-000	**29,80 €**
TF43 NTC1,8K 150mm	NTC 1.8 K	1101-7011-2031-000	**30,56 €**
TF43 NTC1,8K 200mm	NTC 1.8 K	1101-7011-2041-000	**31,27 €**
TF43 NTC1,8K 250mm	NTC 1.8 K	1101-7011-2051-000	**32,78 €**
TF43 NTC1,8K 300mm	NTC 1.8 K	1101-7011-2061-000	**33,86 €**
TF43 NTC1,8K 350mm	NTC 1.8 K	1101-7011-2071-000	**35,01 €**
TF43 NTC1,8K 400mm	NTC 1.8 K	1101-7011-2081-000	**35,91 €**
TF 43 NTC10K xx	**NTC 10K**	**IP 54**	
TF43 NTC10K 50mm	NTC 10K	1101-7011-5011-000	**28,27 €**
TF43 NTC10K 100mm	NTC 10K	1101-7011-5021-000	**29,80 €**
TF43 NTC10K 150mm	NTC 10K	1101-7011-5031-000	**30,56 €**
TF43 NTC10K 200mm	NTC 10K	1101-7011-5041-000	**31,27 €**
TF43 NTC10K 250mm	NTC 10K	1101-7011-5051-000	**32,78 €**
TF43 NTC10K 300mm	NTC 10K	1101-7011-5061-000	**33,86 €**
TF43 NTC10K 350mm	NTC 10K	1101-7011-5071-000	**35,01 €**
TF43 NTC10K 400mm	NTC 10K	1101-7011-5081-000	**35,91 €**
TF43 NTC20K xx	**NTC 20K**	**IP 54**	
TF43 NTC20K 50mm	NTC 20K	1101-7011-6011-000	**28,27 €**
TF43 NTC20K 100mm	NTC 20K	1101-7011-6021-000	**29,80 €**
TF43 NTC20K 150mm	NTC 20K	1101-7011-6031-000	**30,56 €**
TF43 NTC20K 200mm	NTC 20K	1101-7011-6041-000	**31,27 €**
TF43 NTC20K 250mm	NTC 20K	1101-7011-6051-000	**32,78 €**
TF43 NTC20K 300mm	NTC 20K	1101-7011-6061-000	**33,86 €**
TF43 NTC20K 350mm	NTC 20K	1101-7011-6071-000	**35,01 €**
TF43 NTC20K 400mm	NTC 20K	1101-7011-6081-000	**35,91 €**
Note	Other sensors optional	on request	
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101	on request	

TF 43
with snap-on lid
(IP 54)



One basic device in four variants ...



TFxx +
TH08-ms/xx

Immersion / screw-in temperature sensor with immersion sleeve, brass, nickel-plated



TFxx +
TH08-VA/xx

Immersion / screw-in temperature sensor with immersion sleeve, stainless steel, V4A



TFxx +
TH08-VA/xx/90

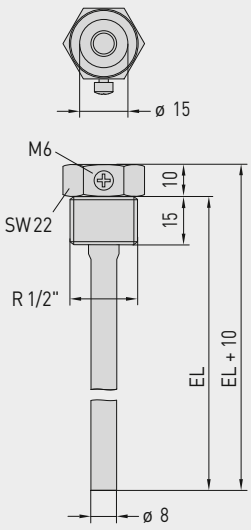
Immersion / screw-in temperature sensor with immersion sleeve with neck tube, stainless steel, V4A



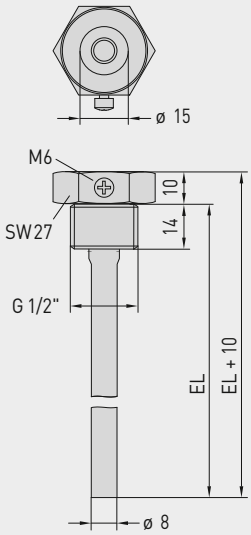
TFxx +
MF-15-K

Duct temperature sensor with mounting flange, plastic

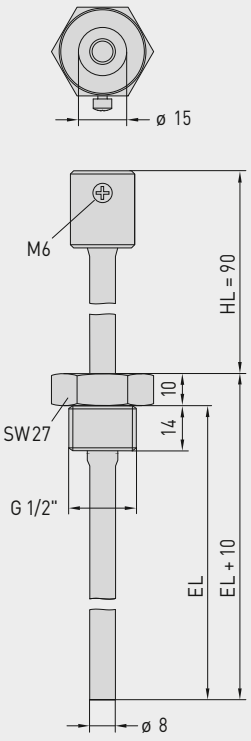
Dimensional drawing
TH08-ms/xx



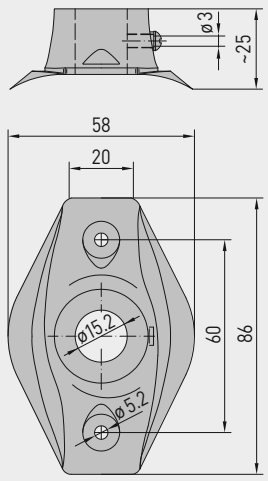
Dimensional drawing
TH08-VA/xx



Dimensional drawing
TH08-VA/xx/90



Dimensional drawing
MF-15-K



...through combination with accessories:



TH08-ms/xx
Immersion sleeve,
brass, nickel-plated,
thread-sealing, conical,
according to DIN 10226



TH08-VA/xx
Immersion sleeve,
stainless steel, V4A,
flat-sealing, cylindrical,
according to DIN 228



TH08-VA/xx/90
Immersion sleeve with neck tube,
stainless steel, V4A,
flat-sealing, cylindrical,
according to DIN 228



MF-15-K
Mounting flange,
plastic

THERMASGARD® TH08 Immersion sleeve Ø 8 mm (Accessories)					
Type / WG01B	**p_{max} (static)**	**T_{max}**	**Inserted Length (EL)**	**Item No.**	**Price**
TH08-ms/xx	**Brass, nickel-plated**			without neck tube	
TH08-MS 50MM	10 bar	+150 °C	**50 mm**	7100-0011-0010-132	**9,31 €**
TH08-MS 100MM	10 bar	+150 °C	**100 mm**	7100-0011-0020-132	**10,61 €**
TH08-MS 150MM	10 bar	+150 °C	**150 mm**	7100-0011-0030-132	**11,20 €**
TH08-MS 200MM	10 bar	+150 °C	**200 mm**	7100-0011-0040-132	**11,56 €**
TH08-MS 250MM	10 bar	+150 °C	**250 mm**	7100-0011-0050-132	**13,39 €**
TH08-MS 300MM	10 bar	+150 °C	**300 mm**	7100-0011-0060-132	**13,76 €**
TH08-MS 350MM	10 bar	+150 °C	**350 mm**	7100-0011-0070-132	**13,87 €**
TH08-MS 400MM	10 bar	+150 °C	**400 mm**	7100-0011-0080-132	**14,00 €**
TH08-VA/xx	**Stainless steel, V4A** (1.4571)			without neck tube	
TH08-VA 50MM	40 bar	+600 °C	**50 mm**	7100-0012-0010-132	**20,28 €**
TH08-VA 100MM	40 bar	+600 °C	**100 mm**	7100-0012-0020-132	**22,41 €**
TH08-VA 150MM	40 bar	+600 °C	**150 mm**	7100-0012-0030-132	**24,08 €**
TH08-VA 200MM	40 bar	+600 °C	**200 mm**	7100-0012-0040-132	**25,38 €**
TH08-VA 250MM	40 bar	+600 °C	**250 mm**	7100-0012-0050-132	**31,55 €**
TH08-VA 300MM	40 bar	+600 °C	**300 mm**	7100-0012-0060-132	**32,97 €**
TH08-VA 350MM	40 bar	+600 °C	**350 mm**	7100-0012-0070-132	**33,19 €**
TH08-VA 400MM	40 bar	+600 °C	**400 mm**	7100-0012-0080-132	**33,78 €**
TH08-VA/xx/90	**Stainless steel, V4A** (1.4571)			**with neck tube** (90 mm)	
TH08-VA 50/90MM	40 bar	+600 °C	**50 mm**	7100-0012-0012-132	**29,04 €**
TH08-VA 100/90MM	40 bar	+600 °C	**100 mm**	7100-0012-0022-132	**30,35 €**
TH08-VA 150/90MM	40 bar	+600 °C	**150 mm**	7100-0012-0032-132	**31,84 €**
TH08-VA 200/90MM	40 bar	+600 °C	**200 mm**	7100-0012-0042-132	**33,19 €**
TH08-VA 250/90MM	40 bar	+600 °C	**250 mm**	7100-0012-0052-132	**34,79 €**
TH08-VA 300/90MM	40 bar	+600 °C	**300 mm**	7100-0012-0062-132	**37,71 €**
Note:	inner diameter of socket 15.0 mm For further information see last chapter!				

Mounting flange (Accessories)				
Type / WG01B		**T_{max}**	**Item No.**	**Price**
MF				
MF-15-K	**Mounting flange,** plastic, 56.8 x 84.3 mm, Ø 15.2 mm tube gland	+100 °C	7100-0032-0000-000	**6,12 €**
Note:	For further information see last chapter!			

THERMASGARD® MWTF
THERMASGARD® MWTF-SD

Mean value / rod / duct temperature sensor including mounting flange, with passive output

S+S REGELTECHNIK



MWTF
Rod length 0,4 m
(IP 65)

Mean-value temperature sensor **THERM**ASGARD® **MWTF** (rod sensor 0.4...20 m) with passive output, in an impact-resistant plastic housing with quick-locking screws, with bendable sensor rod (fully active), protective tube made from copper, plastic-coated, and anti-kink spring, incl. mounting flange.

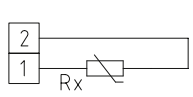
Mean-value temperature sensor **THERM**ASGARD® **MWTF-SD** (rod sensor 3 m / 6 m) with passive output, in an impact-resistant plastic housing with snap-on lid, with bendable sensor rod (fully active), protective tube made from reinforced thermoplastic hose and anti-kink spring, incl. mounting flange.

The sensor is used to detect the mean temperature (mean value) in gaseous media, e.g. in ventilation and air conditioning ducts over the entire cross section or over a defined length. Laid along a meandering route, it uniformly detects the surrounding temperature, as a duct temperature sensor. For proper mounting of the rod, mounting clamps **MK-05-M** (accessories) are available.

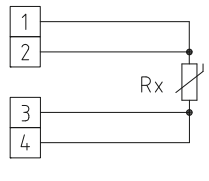
TECHNICAL DATA

Measuring range:	–30...+80 °C
Sensors / output:	see table, passive
Connection type:	2-wire connection (4-wire connection on PT100, optional on other sensors)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000)
Sensor:	active over the entire length (averaging)
Rod material:	**protective tube made from copper, plastic-coated,** (**MWTF**) (made from reinforced thermoplastic hose on the **MWTF-SD**), with anti-kink spring and sleeve, stainless steel, V4A (1.4571)
Rod dimensions:	Ø = 5.0 mm, nominal length (NL) = 0.4 m / 3 m / 6 m, see table (nominal length optionally up to max. 20 m)
Rod laying:	**Observe the admissible values!** Bending radius: **> 35 mm** Vibration load: **≤ 0.5 g** Tensile load: **< 480 N** for the **MWTF** **< 100 N** for the **MWTF-SD**
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016)
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.14 - 1.5 mm² via terminal screws
Process connection:	by mounting flange, plastic, (galvanised steel optional, see accessories) and mounting clamps **MK-05-M**
Ambient temperature:	–20...+80 °C
Humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 54** (according to EN 60 529) for the **MWTF-SD** **IP 65** (according to EN 60 529) for the **MWTF** Housing tested, TÜV SÜD, report no. 713139052 (Tyr 1)
ACCESSORIES	see table

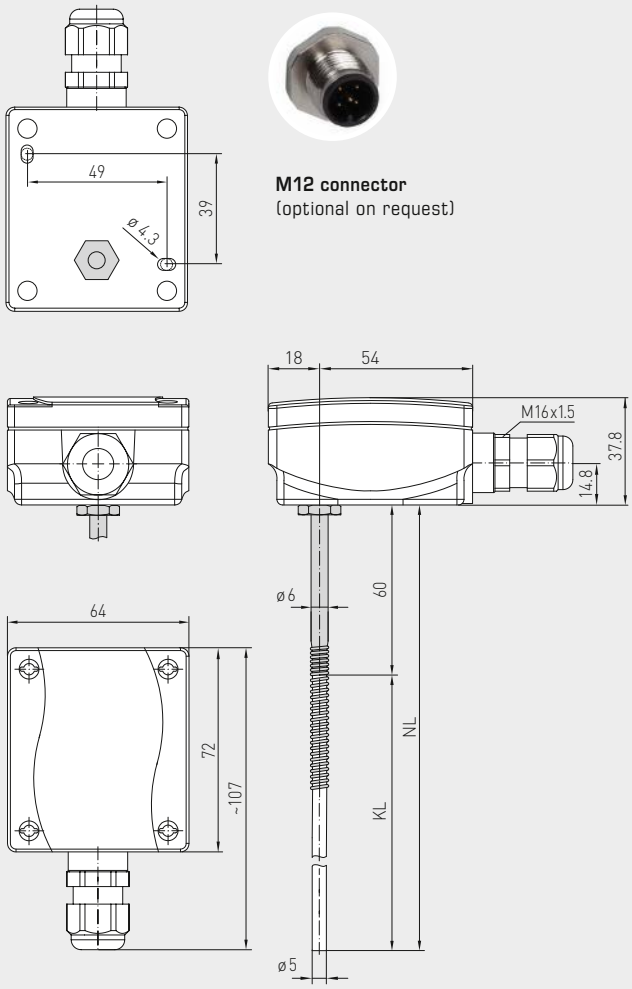
1x two-wire connection
standard



1x four-wire connection
(optional)



Dimensional drawing **MWTF**



M12 connector
(optional on request)

MWTF
Rod length 3 m / 6 m
(IP 65)



MWTF-SD
Rod length 3 m / 6 m
(IP 54)





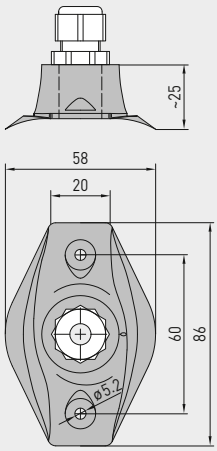
THERMASGARD® MWTF
THERMASGARD® MWTF-SD

Mean value / rod / duct temperature sensor including mounting flange, with passive output

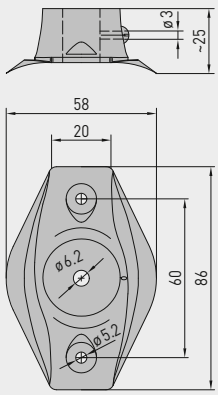


MWTF
Rod length 0,4 m
(IP 65)

Dimensional drawing **KRD-04**



Dimensional drawing **MF-06-K**



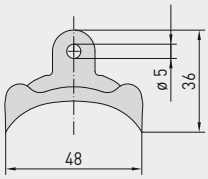
MF-06-K
Mounting flange, plastic
(Included in the scope of delivery)



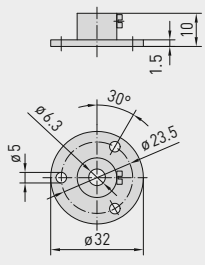
KRD-04
Capillary tube bushing, plastic
(optional)



Dimensional drawing **MK-05-M**



Dimensional drawing **MF-06-M**



MF-06-M
Mounting flange, metal
(optional)



MK-05-M
Mounting clamps, galvanised steel
(from 3 m rod length, included in the scope of delivery)



MWTF
Rod length 3 m / 6 m
(IP 65)



MWTF-SD
Rod length 3 m / 6 m
(IP 54)



THERMASGARD® MWTF-SD	Mean-value temperature sensor with rod made from reinforced **thermoplastic hose**, *Standard*			
Type / WG03B	**Sensor / Output**	**Rod length**	**Item No.**	**Price**
MWTF-SD	**Pt 1000**		**IP 54**	
MWTF-SD Pt1000 3m	Pt1000 (according to DIN EN 60 751, class B)	**3.0 m**	1101-3050-5231-200	**94,63 €**
MWTF-SD Pt1000 6m	Pt1000 (according to DIN EN 60 751, class B)	**6.0 m**	1101-3050-5261-200	**105,28 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101		on request	

THERMASGARD® MWTF	Mean-value temperature sensor with rod made from **copper, plastic-coated**, *Premium*			
Type / WG03	**Sensor / Output**	**Rod length**	**Item No.**	**Price**
MWTF	**Pt 100**		**IP 65**	
MWTF Pt100 0,4m	Pt100 (according to DIN EN 60 751, class B)	**0.4 m**	1101-3050-1083-000	**82,76 €**
MWTF Pt100 3m	Pt100 (according to DIN EN 60 751, class B)	**3.0 m**	1101-3050-1233-000	**145,12 €**
MWTF Pt100 6m	Pt100 (according to DIN EN 60 751, class B)	**6.0 m**	1101-3050-1263-000	**194,79 €**
MWTF	**Pt 1000**		**IP 65**	
MWTF Pt1000 0,4m	Pt1000 (according to DIN EN 60 751, class B)	**0.4 m**	1101-3050-5081-000	**82,76 €**
MWTF Pt1000 3m	Pt1000 (according to DIN EN 60 751, class B)	**3.0 m**	1101-3050-5231-000	**145,12 €**
MWTF Pt1000 6m	Pt1000 (according to DIN EN 60 751, class B)	**6.0 m**	1101-3050-5261-000	**194,79 €**
MWTF	**Ni 1000**		**IP 65**	
MWTF Ni1000 0,4m	Ni1000 (according to DIN EN 43 760, class B)	**0.4 m**	1101-3050-9081-000	**94,88 €**
MWTF Ni1000 3m	Ni1000 (according to DIN EN 43 760, class B)	**3.0 m**	1101-3050-9231-000	**152,13 €**
MWTF Ni1000 6m	Ni1000 (according to DIN EN 43 760, class B)	**6.≠0 m**	1101-3050-9261-000	**194,79 €**
Extra charge:	Per meter sensor cable (from 6 m to max. 20 m)		on request	
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101		on request	

ACCESSORIES			
MF-06-K	**Mounting flange,** plastic (included in the scope of delivery)	7100-0030-1000-000	**6,12 €**
MF-06-M	**Mounting flange,** metal, galvanised steel, Ø = 35 mm	7100-0030-5000-100	**9,56 €**
KRD-04	**Capillary tube gland bracket,** plastic	7100-0030-7000-000	**8,91 €**
MK-05-M	**Mounting clamps**, galvanised steel (6 pieces) (from 3 m rod length, included in the scope of delivery)	7100-0034-0000-000	**9,88 €**
	For further information see last chapter!		

THERMASGARD® ETF 7

Screw-in / immersion temperature sensors
with neck tube (stepped once)
with passive output

S+S REGELTECHNIK

Very quickly responding screw-in resistance thermometer / immersion temperature sensor **THERM**ASGARD® **ETF 7** with passive output, neck tube and a single-tapered stainless steel protective tube, housing cover with quick-locking screws, very short reaction time, particularly suitable for very quick temperature changes and control operations, e.g. in hydraulic systems.

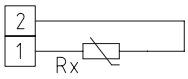
ETF 7



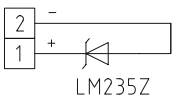
TECHNICAL DATA

Measuring range:	–35...+150 °C
Sensors / output:	see table, passive (**Perfect Sensor Protection**)
Response times:	$t_{0.5}$ = 2.8 s $t_{0.9}$ = 10 s (for water at a flow rate of 2 m/s)
Connection type:	2-wire connection (4-wire connection on PT100, optional on other sensors)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000)
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Electrical connection:	0.14 - 1.5 mm² via terminal screws
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016)
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1)
Protective tube:	stainless steel **V4A** (1.4571), G ½" straight pipe thread, wrench size 27 mm, p_{max} = 6 bar, Ø = 6 mm, single-tapered to Ø = 4 mm (see dimensional drawing) length of neck tube (HL) = 25 mm inserted length (EL) = 100 - 250 mm (see table)
Process connection:	screwed socket with G ½" straight pipe thread
Humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)

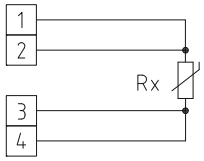
1x two-wire connection
standard



1x two-wire connection
LM 235 Z (KP 10)

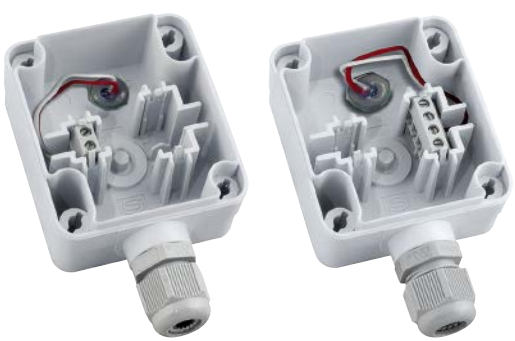


1x four-wire connection
(optional)

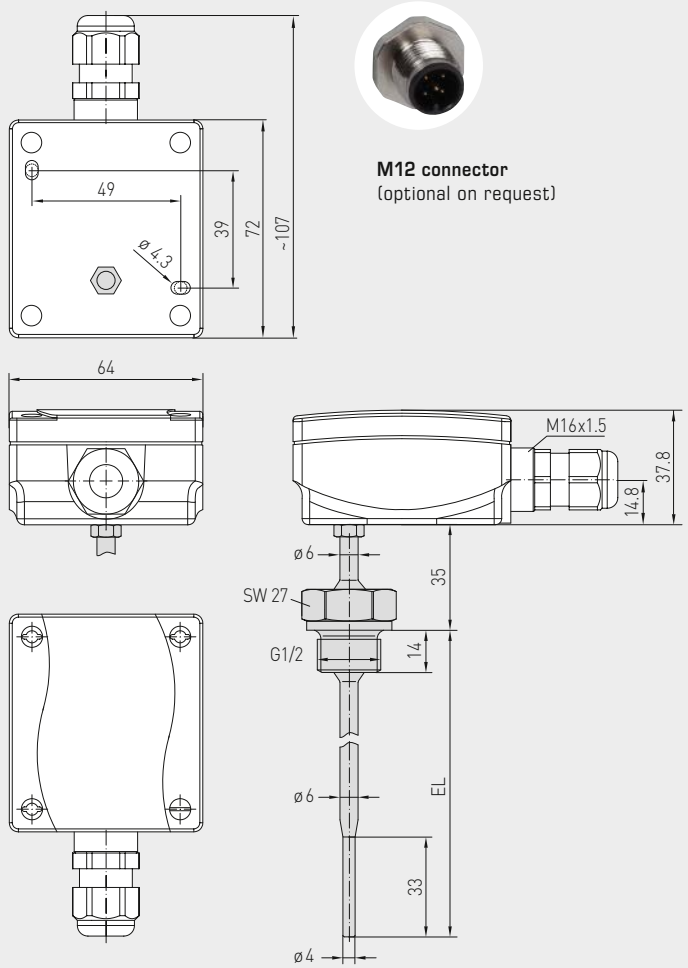


High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION



Dimensional drawing ETF 7



M12 connector
(optional on request)

ETF 7



THERMASGARD® **ETF 7**	Screw-in / immersion temperature sensor with neck tube		
Type / WG01	**Sensor / Output**	**Item No.**	**Price**
ETF7 PT100 xx	**Pt100**		
ETF7 Pt100 100mm	Pt100 (according to DIN EN 60751, class B)	1101-2080-1023-000	**142,71 €**
ETF7 Pt100 150mm	Pt100 (according to DIN EN 60751, class B)	1101-2080-1033-000	**144,12 €**
ETF7 Pt100 250mm	Pt100 (according to DIN EN 60751, class B)	1101-2080-1053-000	**147,41 €**
ETF7 PT1000 xx	**Pt1000**		
ETF7 Pt1000 100mm	Pt1000 (according to DIN EN 60751, class B)	1101-2080-5021-000	**144,24 €**
ETF7 Pt1000 150mm	Pt1000 (according to DIN EN 60751, class B)	1101-2080-5031-000	**145,18 €**
ETF7 Pt1000 250mm	Pt1000 (according to DIN EN 60751, class B)	1101-2080-5051-000	**148,11 €**
ETF7 NI1000 xx	**Ni1000**		
ETF7 Ni1000 100mm	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm / K)	1101-2084-2021-000	**159,08 €**
ETF7 Ni1000 150mm	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm / K)	1101-2084-2031-000	**160,61 €**
ETF7 Ni1000 250mm	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm / K)	1101-2084-2051-000	**162,62 €**
ETF7 NI1000TK xx	**Ni1000 TK5000**		
ETF7 NiTK 100mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-2081-0021-000	**149,95 €**
ETF7 NiTK 150mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-2081-0031-000	**150,35 €**
ETF7 NiTK 250mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-2081-0051-000	**151,74 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101	on request	

THERMASGARD® TF 54

Immersion / screw-in / duct temperature sensor, with passive output

S+S REGELTECHNIK

Resistance thermometer / temperature sensor **THERM**ASGARD® **TF 54** with passive output, with connecting head made from aluminium (optionally with **cable gland** or **M12 connector** according to DIN EN 61076-2-101) and straight protective tube.

A basic unit in four variants through combination with accessories, eg, for robust applications with a separate immersion sleeve made from stainless steel.

The duct sensor is used to detect temperatures in liquid or gaseous media. It is used in pipes, heating engineering, storage systems, compact district heating stations, warm and cold water systems, oil and lubrication cycle systems, mechanical, apparatus and plant engineering and throughout the industrial sector.

TF 54
Basic unit



TECHNICAL DATA

Measuring range:	–35...+180 °C (T_{max} NTC = +150 °C, T_{max} LM235Z = +125 °C)
Sensors / output:	see table, passive (**Perfect Sensor Protection**) (optionally also with two or other sensors)
Connection type:	2-wire connection (4-wire connection on PT100, optional on other sensors)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Electrical connection:	0.14 - 2.5 mm², via terminal screws on ceramic bas
Cable connection:	**TF 54** (standard) adjusting screw made of metal (M 20 x 1,5) **TF 54-KV** (optional) cable gland, brass, nickel-plated (M 20 x 1.5 ; with strain relief, exchangeable, inner diameter 6 - 12 mm) **TF 54-Q** (optional) M12 connector according to DIN EN 61076-2-101 (male, 5-pin, A-code)
Dimensions:	see dimensional drawing
Connecting head:	form B, material aluminium, colour white aluminium (similar RAL 9006), ambient temperature –20...+100° C
Protective tube:	stainless steel, V4A (1.4571), Ø = 6 mm, inserted length (EL) = 50 - 400 mm (see table)
Process connection:	by means of immersion sleeve or mounting flange (accessories)
Humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 54** (according to EN 60 529) **TF 54** **IP 65** (according to EN 60 529) **TF 54-KV** / **TF 54-Q**
ACCESSORIES	(see table)
TH-ms / xx	**Immersion sleeve, brass, nickel-plated,** Ø = 8 mm, T_{max} = +150 °C, p_{max} = 10 bar
TH-VA / xx	**Immersion sleeve, stainless steel, V4A** (1.4571), Ø = 8 mm, T_{max} = +600 °C, p_{max} = 40 bar
TH-VA / xx / 90	**Immersion sleeve, stainless steel, V4A** (1.4571), with neck tube (90 mm), Ø = 8 mm, T_{max} = +600 °C, p_{max} = 40 bar
MF-06-M	**Mounting flange,** metal, galvanised steel, Ø = 32 mm, Ø = 6.3 mm tube gland, T_{max} = +700 °C

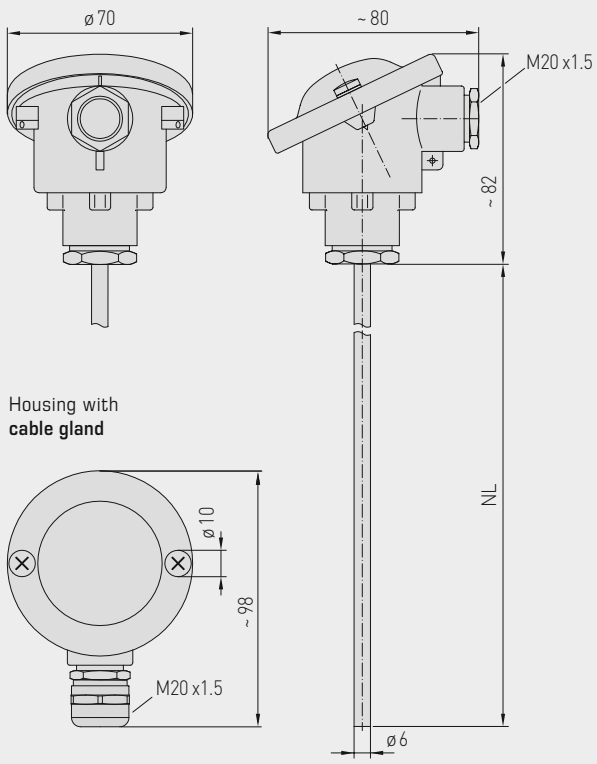
2-wire connection



4-wire connection

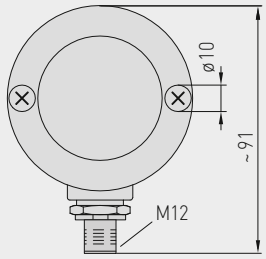


Dimensional drawing **TF 54**



Housing with
cable gland

Housing with
M12 connector





M12 connector
(male)

High-performance encapsulation against
vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

TF 54
Standard
(IP 54)



TF 54 - KV
with cable gland
(IP 65)



TF 54 - Q
with M12 connector
(IP 65)

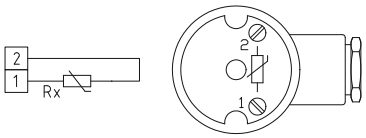




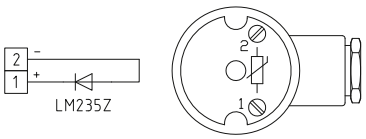
S+S REGELTECHNIK

Immersion / screw-in / duct temperature sensor, with passive output

1x two-wire connection
standard



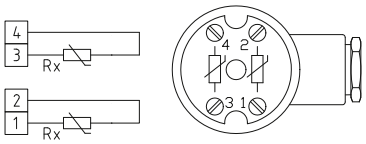
1x two-wire connection
LM235Z (KP10)



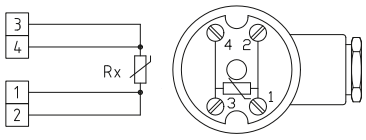
TM54
standard
(IP54)



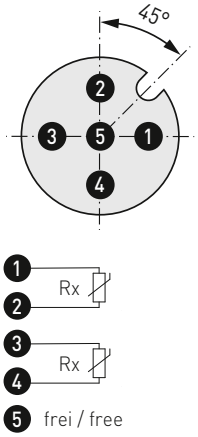
2x two-wire connection
(optional)



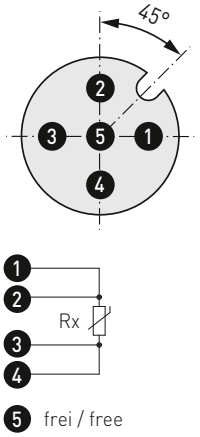
1x four-wire connection
(Pt100 / optional)



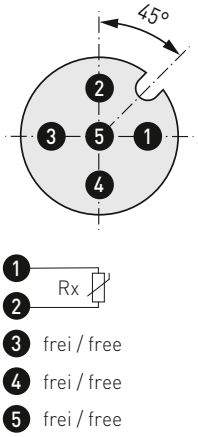
2x two-wire connection
pin assignment (M12)



1x four-wire connection
pin assignment (M12)



1x two-wire connection
pin assignment (M12)



THERMASGARD® TF 54	Temperature sensor (Basic unit)			
Type / WG03	**Sensor / Output**	**Installation length (EL)**	**Item No.**	**Price**
TF 54 Pt100 xx	**Pt100** (according to DIN EN 60751, class B)		**IP54**, 4-wire	
TF54 Pt100 50mm	Pt100	**50 mm**	1101-7050-1013-000	**66,38 €**
TF54 Pt100 100mm	Pt100	**100 mm**	1101-7050-1023-000	**67,99 €**
TF54 Pt100 150mm	Pt100	**150 mm**	1101-7050-1033-000	**69,45 €**
TF54 Pt100 200mm	Pt100	**200 mm**	1101-7050-1043-000	**72,12 €**
TF54 Pt100 250mm	Pt100	**250 mm**	1101-7050-1053-000	**72,43 €**
TF54 Pt100 300mm	Pt100	**300 mm**	1101-7050-1063-000	**72,69 €**
TF54 Pt100 400mm	Pt100	**400 mm**	1101-7050-1083-000	**73,70 €**
TF 54 Pt1000 xx	**Pt1000** (according to DIN EN 60751, class B)		**IP54**, 2-wire	
TF54 Pt1000 50mm	Pt1000	**50 mm**	1101-7050-5011-000	**66,38 €**
TF54 Pt1000 100mm	Pt1000	**100 mm**	1101-7050-5021-000	**67,99 €**
TF54 Pt1000 150mm	Pt1000	**150 mm**	1101-7050-5031-000	**69,45 €**
TF54 Pt1000 200mm	Pt1000	**200 mm**	1101-7050-5041-000	**72,12 €**
TF54 Pt1000 250mm	Pt1000	**250 mm**	1101-7050-5051-000	**72,49 €**
TF54 Pt1000 300mm	Pt1000	**300 mm**	1101-7050-5061-000	**72,69 €**
TF54 Pt1000 400mm	Pt1000	**400 mm**	1101-7050-5081-000	**73,70 €**

Continued on next page...

THERMASGARD® TF 54	Temperature sensor (Basic unit)			
Type / WG03	**Sensor / Output**	**Installation length (EL)**	**Item No.**	**Price**
TF 54 Ni1000 xx	**Ni 1000** (according to DIN EN 43760, class B, TCR = 6180 ppm / K)		**IP 54**, 2-wire	
TF54 Ni1000 50mm	Ni1000	**50 mm**	1101-7050-9011-000	**67,53 €**
TF54 Ni1000 100mm	Ni1000	**100 mm**	1101-7050-9021-000	**69,46 €**
TF54 Ni1000 150mm	Ni1000	**150 mm**	1101-7050-9031-000	**70,58 €**
TF54 Ni1000 200mm	Ni1000	**200 mm**	1101-7050-9041-000	**72,18 €**
TF54 Ni1000 250mm	Ni1000	**250 mm**	1101-7050-9051-000	**72,63 €**
TF54 Ni1000 300mm	Ni1000	**300 mm**	1101-7050-9061-000	**72,89 €**
TF54 Ni1000 400mm	Ni1000	**400 mm**	1101-7050-9081-000	**73,97 €**
TF 54 NI1000TK xx	**Ni1000 TK5000** (TCR = 5000 ppm / K), LG-Ni1000		**IP 54**, 2-wire	
TF54 NiTK 50mm	Ni1000 TK5000	**50 mm**	1101-7051-0011-000	**67,80 €**
TF54 NiTK 100mm	Ni1000 TK5000	**100 mm**	1101-7051-0021-000	**70,28 €**
TF54 NiTK 150mm	Ni1000 TK5000	**150 mm**	1101-7051-0031-000	**71,45 €**
TF54 NiTK 200mm	Ni1000 TK5000	**200 mm**	1101-7051-0041-000	**72,44 €**
TF54 NiTK 250mm	Ni1000 TK5000	**250 mm**	1101-7051-0051-000	**72,89 €**
TF54 NiTK 300mm	Ni1000 TK5000	**300 mm**	1101-7051-0061-000	**73,12 €**
TF54 NiTK 400mm	Ni1000 TK5000	**400 mm**	1101-7051-0081-000	**74,22 €**
TF 54 LM235Z xx	**LM235Z** (TCR = 10 mV / K; 2.73 V at 0 °C), KP10		**IP 54**, 2-wire	
TF54 LM235Z 50mm	LM235Z	**50 mm**	1101-7052-1011-000	**67,75 €**
TF54 LM235Z 100mm	LM235Z	**100 mm**	1101-7052-1021-000	**68,18 €**
TF54 LM235Z 150mm	LM235Z	**150 mm**	1101-7052-1031-000	**68,30 €**
TF54 LM235Z 200mm	LM235Z	**200 mm**	1101-7052-1041-000	**69,07 €**
TF54 LM235Z 250mm	LM235Z	**250 mm**	1101-7052-1051-000	**70,85 €**
TF54 LM235Z 300mm	LM235Z	**300 mm**	1101-7052-1061-000	**71,43 €**
TF54 LM235Z 400mm	LM235Z	**400 mm**	1101-7052-1081-000	**72,63 €**
TF 54 NTC 1,8 K xx	**NTC 1,8 K**		**IP 54**, 2-wire	
TF54 NTC1,8K 50mm	NTC 1,8 K	**50 mm**	1101-7051-2011-000	**67,42 €**
TF54 NTC1,8K 100mm	NTC 1,8 K	**100 mm**	1101-7051-2021-000	**71,43 €**
TF54 NTC1,8K 150mm	NTC 1,8 K	**150 mm**	1101-7051-2031-000	**71,79 €**
TF54 NTC1,8K 200mm	NTC 1,8 K	**200 mm**	1101-7051-2041-000	**72,30 €**
TF54 NTC1,8K 250mm	NTC 1,8 K	**250 mm**	1101-7051-2051-000	**73,52 €**
TF54 NTC1,8K 300mm	NTC 1,8 K	**300 mm**	1101-7051-2061-000	**74,22 €**
TF54 NTC1,8K 400mm	NTC 1,8 K	**400 mm**	1101-7051-2081-000	**74,50 €**
TF 54 NTC10K xx	**NTC 10K**		**IP 54**, 2-wire	
TF54 NTC10K 50mm	NTC 10K	**50 mm**	1101-7051-5011-000	**67,42 €**
TF54 NTC10K 100mm	NTC 10K	**100 mm**	1101-7051-5021-000	**71,43 €**
TF54 NTC10K 150mm	NTC 10K	**150 mm**	1101-7051-5031-000	**71,79 €**
TF54 NTC10K 200mm	NTC 10K	**200 mm**	1101-7051-5041-000	**72,30 €**
TF54 NTC10K 250mm	NTC 10K	**250 mm**	1101-7051-5051-000	**73,52 €**
TF54 NTC10K 300mm	NTC 10K	**300 mm**	1101-7051-5061-000	**74,22 €**
TF54 NTC10K 400mm	NTC 10K	**400 mm**	1101-7051-5081-000	**74,50 €**
TF 54 NTC20K xx	**NTC 20K**		**IP 54**, 2-wire	
TF54 NTC20K 50mm	NTC 20K	**50 mm**	1101-7051-6011-000	**67,42 €**
TF54 NTC20K 100mm	NTC 20K	**100 mm**	1101-7051-6021-000	**71,43 €**
TF54 NTC20K 150mm	NTC 20K	**150 mm**	1101-7051-6031-000	**71,79 €**
TF54 NTC20K 200mm	NTC 20K	**200 mm**	1101-7051-6041-000	**72,30 €**
TF54 NTC20K 250mm	NTC 20K	**250 mm**	1101-7051-6051-000	**73,52 €**
TF54 NTC20K 300mm	NTC 20K	**300 mm**	1101-7051-6061-000	**74,22 €**
TF54 NTC20K 400mm	NTC 20K	**400 mm**	1101-7051-6081-000	**74,50 €**
Housing variant:	equipped as standard with pressure screw **(IP 54)**, optional housing variants with cable gland **(IP 65)** or **M12 connector (IP65)** see the next page!			
Extra charge:	optionally also with two or other sensors		on request	

Immersion / screw-in / duct temperature sensor, with passive output

S+S REGELTECHNIK

TF 54 - Q
with M12 connector
(IP 65)



THERMASGARD® **TF 54 - Q**	Temperature sensor (Basic unit **with M12 connector**)				
Type / WG03	**Sensor / Output**	**Installation length (EL)**	**Q**	**Item No.**	**Price**
TF 54 Pt100 xx Q	**Pt100** (according to DIN EN 60751, class B)			**IP 65**, 4-wire	
TF54 Pt100 50mm **Q**	Pt100	**50 mm**	●	2Z01-4111-0100-011	**108,30 €**
TF54 Pt100 100mm **Q**	Pt100	**100 mm**	●	2Z01-4111-0100-021	**109,90 €**
TF54 Pt100 150mm **Q**	Pt100	**150 mm**	●	2Z01-4111-0100-031	**111,38 €**
TF54 Pt100 200mm **Q**	Pt100	**200 mm**	●	2Z01-4111-0100-041	**114,03 €**
TF54 Pt100 250mm **Q**	Pt100	**250 mm**	●	2Z01-4111-0100-051	**114,36 €**
TF54 Pt100 300mm **Q**	Pt100	**300 mm**	●	2Z01-4111-0100-061	**114,62 €**
TF54 Pt100 400mm **Q**	Pt100	**400 mm**	●	2Z01-4111-0100-081	**115,64 €**
TF 54 Pt1000 xx Q	**Pt1000** (according to DIN EN 60751, class B)			**IP 65**, 2-wire	
TF54 Pt1000 50mm **Q**	Pt1000	**50 mm**	●	2Z05-4111-0100-011	**108,30 €**
TF54 Pt1000 100mm **Q**	Pt1000	**100 mm**	●	2Z05-4111-0100-021	**109,90 €**
TF54 Pt1000 150mm **Q**	Pt1000	**150 mm**	●	2Z05-4111-0100-031	**111,38 €**
TF54 Pt1000 200mm **Q**	Pt1000	**200 mm**	●	2Z05-4111-0100-041	**114,03 €**
TF54 Pt1000 250mm **Q**	Pt1000	**250 mm**	●	2Z05-4111-0100-051	**114,36 €**
TF54 Pt1000 300mm **Q**	Pt1000	**300 mm**	●	2Z05-4111-0100-061	**114,62 €**
TF54 Pt1000 400mm **Q**	Pt1000	**400 mm**	●	2Z05-4111-0100-081	**115,64 €**
Housing variant "Q":	Cable connection **with M12 connector** (male, **5-pin**, A-code)				
Extra charge:	optionally also with two or other sensors			on request	

ACCESSORIES

Special accessories for M12 connector
see chapter Accessories!

TF 54 - KV
with cable gland
(IP 65)



THERMASGARD® **TF 54 - KV**	Temperature sensor (Basic unit **with cable gland**)			
Type / WG03	**Sensor / Output**	**Installation length (EL)**	**Item No.**	**Price**
TF 54 Pt100 xx KV	**Pt100** (according to DIN EN 60751, class B)		**IP 65**, 4-wire	
TF54 Pt100 50mm **KV**	Pt100	**50 mm**	1101-7070-1013-000	**75,81 €**
TF54 Pt100 100mm **KV**	Pt100	**100 mm**	1101-7070-1023-000	**77,41 €**
TF54 Pt100 150mm **KV**	Pt100	**150 mm**	1101-7070-1033-000	**78,87 €**
TF54 Pt100 200mm **KV**	Pt100	**200 mm**	1101-7070-1043-000	**78,28 €**
TF54 Pt100 250mm **KV**	Pt100	**250 mm**	1101-7070-1053-000	**81,87 €**
TF54 Pt100 300mm **KV**	Pt100	**300 mm**	1101-7070-1063-000	**82,11 €**
TF54 Pt100 400mm **KV**	Pt100	**400 mm**	1101-7070-1083-000	**83,15 €**
TF 54 Pt1000 xx KV	**Pt1000** (according to DIN EN 60751, class B)		**IP 65**, 2-wire	
TF54 Pt1000 50mm **KV**	Pt1000	**50 mm**	1101-7070-5011-000	**75,82 €**
TF54 Pt1000 100mm **KV**	Pt1000	**100 mm**	1101-7070-5021-000	**77,41 €**
TF54 Pt1000 150mm **KV**	Pt1000	**150 mm**	1101-7070-5031-000	**75,63 €**
TF54 Pt1000 200mm **KV**	Pt1000	**200 mm**	1101-7070-5041-000	**81,55 €**
TF54 Pt1000 250mm **KV**	Pt1000	**250 mm**	1101-7070-5051-000	**81,88 €**
TF54 Pt1000 300mm **KV**	Pt1000	**300 mm**	1101-7070-5061-000	**79,07 €**
TF54 Pt1000 400mm **KV**	Pt1000	**400 mm**	1101-7070-5081-000	**83,15 €**
Housing variant "KV":	Cable connection **with cable gland**			
Extra charge:	optionally also with two or other sensors		on request	

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Immersion / screw-in / duct temperature sensor, with passive output

One basic device in four variants ...



TF 54 +
TH-ms/xx

Immersion / screw-in temperature sensor with immersion sleeve, brass, nickel-plated



TF 54 +
TH-VA/xx

Immersion / screw-in temperature sensor with immersion sleeve, stainless steel, V4A



TF 54 +
TH-VA/xx/90

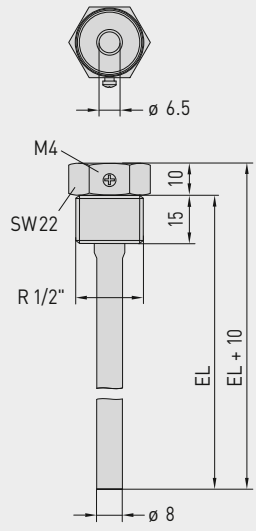
Immersion / screw-in temperature sensor with immersion sleeve with neck tube, stainless steel, V4A



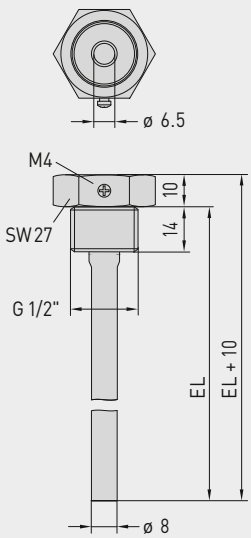
TF 54 +
MF-06-M

Duct temperature sensor with mounting flange, metal

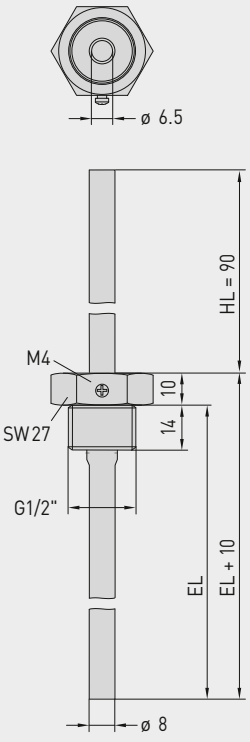
Dimensional drawing
TH-ms/xx



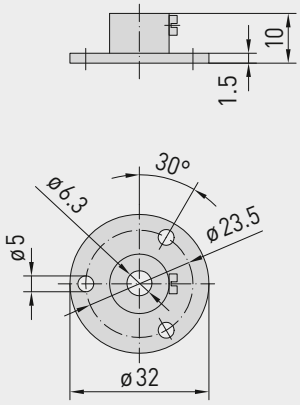
Dimensional drawing
TH-VA/xx



Dimensional drawing
TH-VA/xx/90



Dimensional drawing
MF-06-M



...through combination with accessories:



TH-ms/xx

Immersion sleeve, brass, nickel-plated, thread-sealing, conical, according to DIN 10226



TH-VA/xx

Immersion sleeve, stainless steel, V4A, flat-sealing, cylindrical, according to DIN 228



TH-VA/xx/90

Immersion sleeve with neck tube, stainless steel, V4A, flat-sealing, cylindrical, according to DIN 228



MF-06-M

Mounting flange, metal

THERMASGARD® **TH**	Immersion sleeve Ø 8 mm (accessories)				
Type / WG01	**p_{max} (static)**	**T_{max}**	**Inserted Length (EL)**	**Item No.**	**Price**
TH-ms/xx	**Brass nickel-plated**			without neck tube	
TH-MS 50MM	10 bar	+150 °C	**50 mm**	7100-0011-0010-001	**9,31 €**
TH-MS 100MM	10 bar	+150 °C	**100 mm**	7100-0011-0020-001	**10,61 €**
TH-MS 150MM	10 bar	+150 °C	**150 mm**	7100-0011-0030-001	**11,20 €**
TH-MS 200MM	10 bar	+150 °C	**200 mm**	7100-0011-0040-001	**11,56 €**
TH-MS 250MM	10 bar	+150 °C	**250 mm**	7100-0011-0050-001	**13,39 €**
TH-MS 300MM	10 bar	+150 °C	**300 mm**	7100-0011-0060-001	**13,76 €**
TH-MS 350MM	10 bar	+150 °C	**350 mm**	7100-0011-0070-001	**13,87 €**
TH-MS 400MM	10 bar	+150 °C	**400 mm**	7100-0011-0080-001	**14,00 €**
TH-VA/xx	**Stainless steel, V4A** (1.4571)			without neck tube	
TH-VA 50MM	40 bar	+600 °C	**50 mm**	7100-0012-0010-001	**20,28 €**
TH-VA 100MM	40 bar	+600 °C	**100 mm**	7100-0012-0020-001	**22,41 €**
TH-VA 150MM	40 bar	+600 °C	**150 mm**	7100-0012-0030-001	**24,08 €**
TH-VA 200MM	40 bar	+600 °C	**200 mm**	7100-0012-0040-001	**25,38 €**
TH-VA 250MM	40 bar	+600 °C	**250 mm**	7100-0012-0050-001	**31,55 €**
TH-VA 300MM	40 bar	+600 °C	**300 mm**	7100-0012-0060-001	**32,97 €**
TH-VA 350MM	40 bar	+600 °C	**350 mm**	7100-0012-0070-001	**33,19 €**
TH-VA 400MM	40 bar	+600 °C	**400 mm**	7100-0012-0080-001	**33,78 €**
TH-VA/xx/90	**Stainless steel, V4A** (1.4571)			**with neck tube** (90 mm)	
TH-VA 50/90MM	40 bar	+600 °C	**50 mm**	7100-0012-2010-001	**29,04 €**
TH-VA 100/90MM	40 bar	+600 °C	**100 mm**	7100-0012-2020-001	**30,35 €**
TH-VA 150/90MM	40 bar	+600 °C	**150 mm**	7100-0012-2030-001	**31,84 €**
TH-VA 200/90MM	40 bar	+600 °C	**200 mm**	7100-0012-2040-001	**33,19 €**
TH-VA 250/90MM	40 bar	+600 °C	**250 mm**	7100-0012-2050-001	**34,79 €**
TH-VA 300/90MM	40 bar	+600 °C	**300 mm**	7100-0012-2060-001	**37,71 €**
Note:	inner diameter of socket 6.5 mm For further information see last chapter!				

Mounting flange (accessories)				
Type / WG01		**T_{max}**	**Item No.**	**Price**
MF				
MF-06-M	**Mounting flange,** metal (galvanised steel) Ø 32 mm, tube gland Ø 6.3 mm	+700 °C	7100-0030-5000-100	**9,56 €**
Note:	For further information see last chapter!			

THERMASGARD® ETF 6

Screw-in / immersion temperature sensor with neck tube, with passive output

S+S REGELTECHNIK

Screw-in resistance thermometer / temperature sensor with neck tube **THERM**ASGARD® **ETF 6** with passive output, with connecting head made from aluminium (optionally with **cable gland** or **M12 connector** according to DIN EN 61076-2-101) and straight protective tube.

The duct sensor is used to detect temperatures in liquid or gaseous media. It is used in pipes, tanks or storage systems, preferably where tubes or tanks must be isolated.

ETF 6
standard

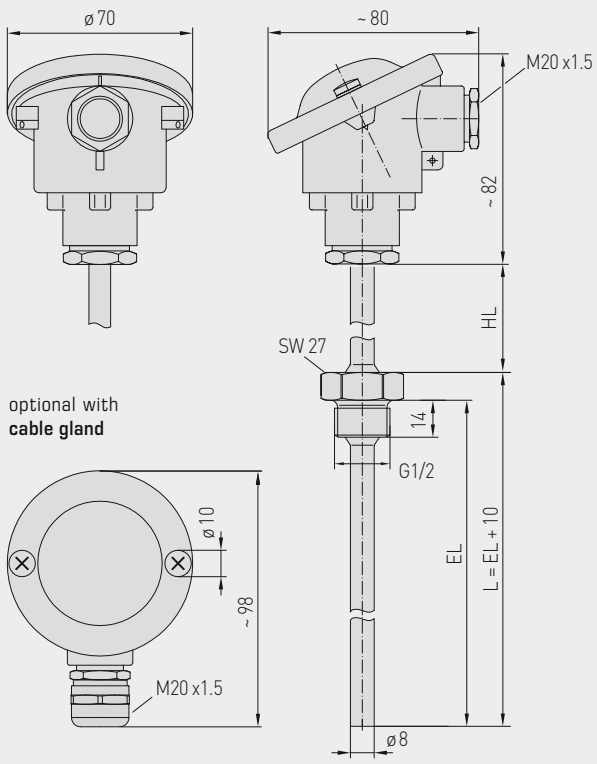


TECHNICAL DATA

Measuring range:	–35...+180 °C (T_{max} NTC = +150 °C, T_{max} LM235Z = +125 °C)
Sensors / output:	see table, passive (**Perfect Sensor Protection**) (optionally also with two or other sensors)
Connection type:	2-wire connection (4-wire connection on PT100, optional on other sensors)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Electrical connection:	0.14 - 2.5 mm², via terminal screws on ceramic bas
Cable connection:	**ETF 6** (standard) adjusting screw made of metal (M 20 x 1,5) **ETF 6-KV** (optional) cable gland, brass, nickel-plated (M 20 x 1.5 ; with strain relief, exchangeable, inner diameter 6 - 12 mm) **ETF 6-Q** (optional) M12 connector according to DIN EN 61076-2-101 (male, 5-pin, A-code)
Dimensions:	see dimensional drawing
Connecting head:	form B, material aluminium, colour white aluminium (similar RAL 9006), ambient temperature –20...+100° C
Protective tube:	stainless steel **V4A** (1.4571), G ½" straight pipe thread, wrench size 27 mm, p_{max} = 40 bar, Ø = 8 mm length of neck tube (HL) = 80 mm inserted length (EL) = 100 - 400 mm (see table)
Process connection:	screwed socket with G ½"
Humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 54** (according to EN 60 529) **ETF 6** **IP 65** (according to EN 60 529) **ETF 6-KV** / **ETF 6-Q**

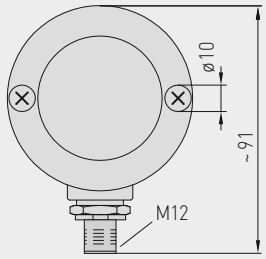
Screw-in / immersion temperature sensor with neck tube, with passive output

Dimensional drawing **ETF 6**



optional with **cable gland**

optional with **M12 connector**





M12 connector
(optional on request)

High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

ETF 6
standard
(IP 54)



ETF 6 - KV
with cable gland
(IP 65)



ETF 6 - Q
with M12 connector
(IP 65)

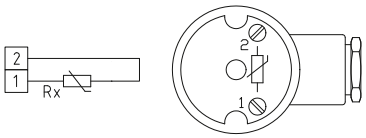




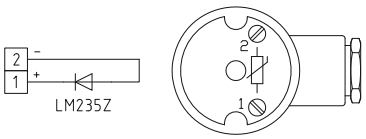
S+S REGELTECHNIK

Screw-in / immersion temperature sensor with neck tube, with passive output

1x two-wire connection
standard



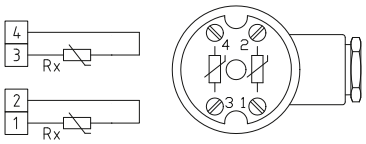
1x two-wire connection
LM235Z (KP10)



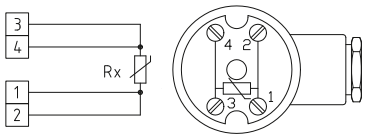
ETF6
standard
(IP54)



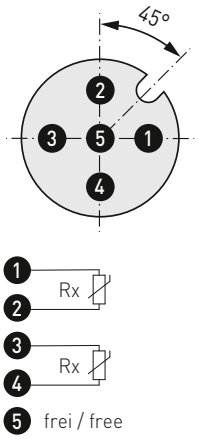
2x two-wire connection
(optional)



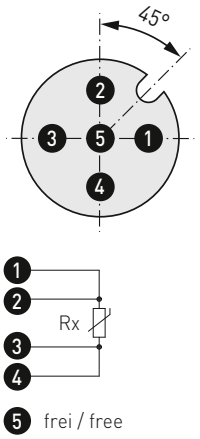
1x four-wire connection
(Pt100 / optional)



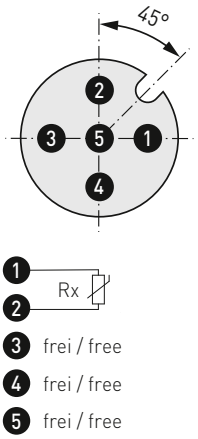
2x two-wire connection
pin assignment (M12)



1x four-wire connection
pin assignment (M12)



1x two-wire connection
pin assignment (M12)



THERMASGARD® ETF 6	Screw-in / immersion temperature sensor with neck tube (standard)			
Type / WG03	**Sensor / Output**	**Installation length (EL)**	**Item No.**	**Price**
ETF6 Pt100 xx	**Pt100** (according to DIN EN 60751, class B)		**IP54**, 4-wire	
ETF6 Pt100 100/80	Pt100	**100 mm**	1101-2070-1023-000	**84,67 €**
ETF6 Pt100 150/80	Pt100	**150 mm**	1101-2070-1033-000	**89,12 €**
ETF6 Pt100 200/80	Pt100	**200 mm**	1101-2070-1043-000	**91,65 €**
ETF6 Pt100 250/80	Pt100	**250 mm**	1101-2070-1053-000	**94,08 €**
ETF6 Pt100 400/80	Pt100	**400 mm**	1101-2070-1083-000	**97,02 €**
ETF6 Pt1000 xx	**Pt1000** (according to DIN EN 60751, class B)		**IP54**, 2-wire	
ETF6 Pt1000 100/80	Pt1000	**100 mm**	1101-2070-5021-000	**86,70 €**
ETF6 Pt1000 150/80	Pt1000	**150 mm**	1101-2070-5031-000	**91,65 €**
ETF6 Pt1000 200/80	Pt1000	**200 mm**	1101-2070-5041-000	**93,11 €**
ETF6 Pt1000 250/80	Pt1000	**250 mm**	1101-2070-5051-000	**94,22 €**
ETF6 Pt1000 400/80	Pt1000	**400 mm**	1101-2070-5081-000	**97,95 €**

Continued on next page...

THERMASGARD® ETF 6	Screw-in / immersion temperature sensor with neck tube (standard)			
Type / WG03	**Sensor / Output**	**Installation length (EL)**	**Item No.**	**Price**
ETF6 Ni1000 xx	**Ni 1000** (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)		**IP 54**, 2-wire	
ETF6 Ni1000 100/80	Ni1000	**100 mm**	1101-2070-9021-000	**89,99 €**
ETF6 Ni1000 150/80	Ni1000	**150 mm**	1101-2070-9031-000	**91,58 €**
ETF6 Ni1000 200/80	Ni1000	**200 mm**	1101-2070-9041-000	**94,06 €**
ETF6 Ni1000 250/80	Ni1000	**250 mm**	1101-2070-9051-000	**94,54 €**
ETF6 Ni1000 400/80	Ni1000	**400 mm**	1101-2070-9081-000	**99,31 €**
ETF6 NI1000TK xx	**Ni1000 TK5000** (TCR = 5000 ppm / K), LG - Ni1000		**IP 54**, 2-wire	
ETF6 NiTK 100/80	Ni1000 TK5000	**100 mm**	1101-2071-0021-000	**90,39 €**
ETF6 NiTK 150/80	Ni1000 TK5000	**150 mm**	1101-2071-0031-000	**92,52 €**
ETF6 NiTK 200/80	Ni1000 TK5000	**200 mm**	1101-2071-0041-000	**94,92 €**
ETF6 NiTK 250/80	Ni1000 TK5000	**250 mm**	1101-2071-0051-000	**97,83 €**
ETF6 NiTK 400/80	Ni1000 TK5000	**400 mm**	1101-2071-0081-000	**100,32 €**
ETF6 LM235Z xx	**LM235Z** (TCR = 10 mV / K; 2.73 V at 0 °C), KP10		**IP 54**, 2-wire	
ETF6 LM235Z 100/80	LM235Z	**100 mm**	1101-2072-1021-000	**85,94 €**
ETF6 LM235Z 150/80	LM235Z	**150 mm**	1101-2072-1031-000	**89,74 €**
ETF6 LM235Z 200/80	LM235Z	**200 mm**	1101-2072-1041-000	**91,65 €**
ETF6 LM235Z 250/80	LM235Z	**250 mm**	1101-2072-1051-000	**92,94 €**
ETF6 LM235Z 400/80	LM235Z	**400 mm**	1101-2072-1081-000	**98,79 €**
ETF6 NTC 1,8 K xx	**NTC 1,8 K**		**IP 54**, 2-wire	
ETF6 NTC1,8K 100/80	NTC 1,8 K	**100 mm**	1101-2071-2021-000	**90,13 €**
ETF6 NTC1,8K 150/80	NTC 1,8 K	**150 mm**	1101-2071-2031-000	**91,48 €**
ETF6 NTC1,8K 200/80	NTC 1,8 K	**200 mm**	1101-2071-2041-000	**92,87 €**
ETF6 NTC1,8K 250/80	NTC 1,8 K	**250 mm**	1101-2071-2051-000	**96,87 €**
ETF6 NTC1,8K 400/80	NTC 1,8 K	**400 mm**	1101-2071-2081-000	**99,61 €**
ETF6 NTC10K xx	**NTC 10K**		**IP 54**, 2-wire	
ETF6 NTC10K 100/80	NTC 10K	**100 mm**	1101-2071-5021-000	**90,13 €**
ETF6 NTC10K 150/80	NTC 10K	**150 mm**	1101-2071-5031-000	**91,48 €**
ETF6 NTC10K 200/80	NTC 10K	**200 mm**	1101-2071-5041-000	**92,87 €**
ETF6 NTC10K 250/80	NTC 10K	**250 mm**	1101-2071-5051-000	**96,87 €**
ETF6 NTC10K 400/80	NTC 10K	**400 mm**	1101-2071-5081-000	**99,61 €**
ETF6 NTC20K xx	**NTC 20K**		**IP 54**, 2-wire	
ETF6 NTC20K 100/80	NTC 20K	**100 mm**	1101-2071-6021-000	**90,13 €**
ETF6 NTC20K 150/80	NTC 20K	**150 mm**	1101-2071-6031-000	**91,48 €**
ETF6 NTC20K 200/80	NTC 20K	**200 mm**	1101-2071-6041-000	**92,87 €**
ETF6 NTC20K 250/80	NTC 20K	**250 mm**	1101-2071-6051-000	**96,87 €**
ETF6 NTC20K 400/80	NTC 20K	**400 mm**	1101-2071-6081-000	**99,61 €**
Housing variant:	equipped as standard with pressure screw **(IP 54)**, optional housing variants with cable gland **(IP 65)** or **M12 connector (IP65)** see the next page!			
Extra charge:	optionally also with two or other sensors		on request	

Screw-in / immersion temperature sensor with neck tube, with passive output

S+S REGELTECHNIK

ETF 6 - Q
with M12 connector
(IP 65)



THERMASGARD® ETF 6 - Q	Screw-in / immersion temperature sensor with neck tube (with M12 connector)				
Type / WG03	**Sensor / Output**	**Installation length (EL)**	**Q** ●	**Item No.**	**Price**
ETF6 Pt100 xx Q	**Pt100** (according to DIN EN 60751, class B)			**IP 65**, 4-wire	
ETF6 Pt100 100/80mm **Q**	Pt100	**100 mm**	●	2Z01-4121-0100-041	**126,60 €**
ETF6 Pt100 150/80mm **Q**	Pt100	**150 mm**	●	2Z01-4121-0100-051	**131,04 €**
ETF6 Pt100 200/80mm **Q**	Pt100	**200 mm**	●	2Z01-4121-0100-061	**133,58 €**
ETF6 Pt100 250/80mm **Q**	Pt100	**250 mm**	●	2Z01-4121-0100-071	**136,00 €**
ETF6 Pt100 400/80mm **Q**	Pt100	**400 mm**	●	2Z01-4121-0100-101	**139,04 €**
ETF6 Pt1000 xx Q	**Pt1000** (according to DIN EN 60751, class B)			**IP 65**, 2-wire	
ETF6 Pt1000 100/80mm **Q**	Pt1000	**100 mm**	●	2Z05-4121-0100-041	**126,60 €**
ETF6 Pt1000 150/80mm **Q**	Pt1000	**150 mm**	●	2Z05-4121-0100-051	**131,04 €**
ETF6 Pt1000 200/80mm **Q**	Pt1000	**200 mm**	●	2Z05-4121-0100-061	**133,58 €**
ETF6 Pt1000 250/80mm **Q**	Pt1000	**250 mm**	●	2Z05-4121-0100-071	**136,00 €**
ETF6 Pt1000 400/80mm **Q**	Pt1000	**400 mm**	●	2Z05-4121-0100-101	**138,94 €**
Housing variant "Q":	Cable connection **with M12 connector** (male, **5-pin**, A-code)				
Extra charge:	optionally also with two or other sensors			on request	

ACCESSORIES

Special accessories for M12 connector
see chapter Accessories!

Screw-in / immersion temperature sensor with neck tube, with passive output

ETF 6 - KV
with cable gland
(IP 65)



THERMASGARD® **ETF 6 - KV**	Screw-in / immersion temperature sensor with neck tube **(with cable gland)**			
Type / WG03	**Sensor / Output**	**Installation length (EL)**	**Item No.**	**Price**
ETF6 Pt100 xx KV	**Pt100** (according to DIN EN 60751, class B)		**IP 65**, 4-wire	
ETF6 Pt100 100/80mm **KV**	Pt100	**100 mm**	1101-20C0-1023-000	**94,11 €**
ETF6 Pt100 150/80mm **KV**	Pt100	**150 mm**	1101-20C0-1033-000	**98,55 €**
ETF6 Pt100 200/80mm **KV**	Pt100	**200 mm**	1101-20C0-1043-000	**101,09 €**
ETF6 Pt100 250/80mm **KV**	Pt100	**250 mm**	1101-20C0-1053-000	**103,51 €**
ETF6 Pt100 400/80mm **KV**	Pt100	**400 mm**	1101-20C0-1083-000	**106,45 €**
ETF6 Pt1000 xx KV	**Pt1000** (according to DIN EN 60751, class B)		**IP 65**, 2-wire	
ETF6 Pt1000 100/80mm **KV**	Pt1000	**100 mm**	1101-20C0-5021-000	**96,13 €**
ETF6 Pt1000 150/80mm **KV**	Pt1000	**150 mm**	1101-20C0-5031-000	**101,09 €**
ETF6 Pt1000 200/80mm **KV**	Pt1000	**200 mm**	1101-20C0-5041-000	**102,54 €**
ETF6 Pt1000 250/80mm **KV**	Pt1000	**250 mm**	1101-20C0-5051-000	**103,65 €**
ETF6 Pt1000 400/80mm **KV**	Pt1000	**400 mm**	1101-20C0-5081-000	**107,39 €**
Housing variant "KV":	Cable connection **with cable gland**			
Extra charge:	optionally also with two or other sensors		on request	

Duct temperature sensors / smoke gas temperature sensors, including mounting flange, with passive output

S+S REGELTECHNIK

Resistance thermometer / smoke gas temperature sensor **THERM**ASGARD® **RGTF 1** with passive output, with connecting head made from aluminium (optionally with **cable gland** or **M12 connector** according to DIN EN 61076-2-101) and straight protective tube, incl. mounting flange.

The duct sensor is used to detect relatively high temperatures in gaseous media, eg, for exhaust air and smoke gas temperature measurement.

TECHNICAL DATA

Measuring range:	–35...+600 °C (extended range limits from –100...+750 °C optional)
Sensor / output:	Pt100 / Pt1000 (according to DIN EN 60 751, class B) (**Perfect Sensor Protection**)
Connection type:	2-wire connection (Pt1000) 4-wire connection (Pt100; optional Pt1000)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100)
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Electrical connection:	0.14 - 2.5 mm² via terminal screws on ceramic base
Cable connection:	**RGTF 1** (standard) adjusting screw made of metal (M 20 x 1.5); **RGTF 1-KV** (optional) cable gland, brass, nickel-plated (M 20 x 1.5 ; with strain relief, exchangeable, inner diameter 6 - 12 mm) **RGTF 1-Q** (optional) M12 connector according to DIN EN 61076-2-101 (male, 5-pin, A-code)
Dimensions:	see dimensional drawing
Connecting head:	form B, material aluminium, colour white aluminium (similar to RAL 9006), ambient temperature –20...+100 °C
Protective tube:	stainless steel **V4A** (1.4571), Ø = 8 mm inserted length (EL) = 200 - 500 mm (see table)
Process connection:	by mounting flange, stainless steel **V2A** (1.4305) (included in the scope of delivery)
Humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 54** (according to EN 60 529) **RGTF 1** **IP 65** (according to EN 60 529) **RGTF1-KV** / **RGTF1-Q**

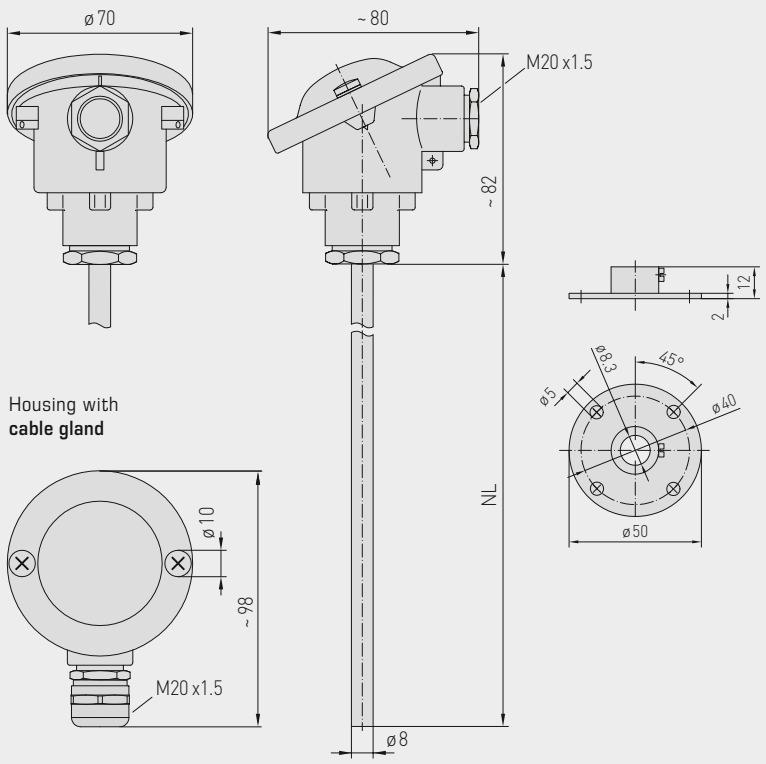
RGTF 1
standard



RGTF 1
Measuring insert with ceramic tubelet

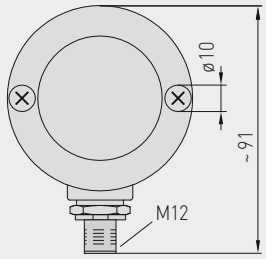
Duct temperature sensors / smoke gas temperature sensors, including mounting flange, with passive output

Dimensional drawing **RGTF 1**



Housing with **cable gland**

Housing with **M12 connector**





M12 connector (male)

RGTF 1
standard
(IP 54)



RGTF 1 - KV
with cable gland
(IP 65)



RGTF 1 - Q
with M12 connector
(IP 65)





High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

Duct temperature sensors / smoke gas temperature sensors, including mounting flange, with passive output

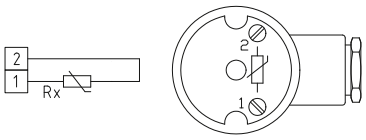
2-wire connection
(Pt1000)



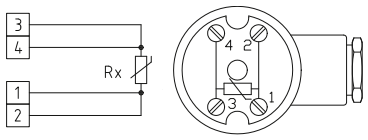
4-wire connection
(Pt100 / Pt1000 optional)



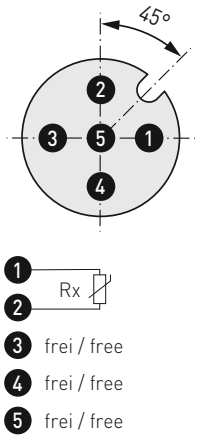
1x two-wire connection
(Pt1000)



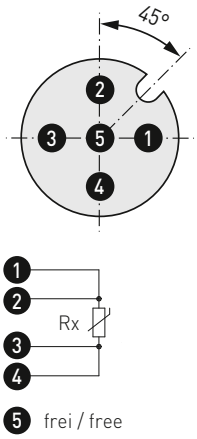
1x four-wire connection
(Pt100 / Pt1000) optional)



1x two-wire connection
pin assignment (M12)



1x four-wire connection
pin assignment (M12)



RGTF 1
standard
(IP 54)



THERMASGARD® **RGTF 1**	Duct temperature sensors / smoke gas temperature sensors, including mounting flange (Standard)			
Type / WG01	**Sensor / Output**	**Installation length (EL)**	**Item No.**	**Price**
RGTF1 Pt100 xx	**Pt100** (according to DIN EN 60751, class B)		**IP 54**, 4-wire	
RGTF1 Pt100 200mm	Pt100	**200 mm**	1101-3040-1043-000	**184,46 €**
RGTF1 Pt100 250mm	Pt100	**250 mm**	1101-3040-1053-000	**186,39 €**
RGTF1 Pt100 300mm	Pt100	**300 mm**	1101-3040-1063-000	**190,58 €**
RGTF1 Pt100 500mm	Pt100	**500 mm**	1101-3040-1103-000	**205,36 €**
RGTF1 Pt1000 xx	**Pt1000** (according to DIN EN 60751, class B)		**IP 54**, 2-wire	
RGTF1 Pt1000 200mm	Pt1000	**200 mm**	1101-3040-5041-000	**178,22 €**
RGTF1 Pt1000 250mm	Pt1000	**250 mm**	1101-3040-5051-000	**180,14 €**
RGTF1 Pt1000 300mm	Pt1000	**300 mm**	1101-3040-5061-000	**184,33 €**
RGTF1 Pt1000 500mm	Pt1000	**500 mm**	1101-3040-5101-000	**189,80 €**
Housing variant:	equipped as standard with pressure screw **(IP 54),** optional housing variants with cable gland **(IP 65)** or **M12 connector (IP65)** see the next page!			
Extra charge:	other measuring ranges optional		on request	

Duct temperature sensors / smoke gas temperature sensors, including mounting flange, with passive output

S+S REGELTECHNIK

RGTF 1 - Q
with M12 connector
(IP 65)



THERMASGARD® **RGTF 1 - Q**	Duct temperature sensors / smoke gas temperature sensors, including mounting flange **(with M12 connector)**				
Type / WG03	**Sensor / Output**	**Installation length (EL)**	**Q** ●	**Item No.**	**Price**
RGTF1 Pt100 xx Q	**Pt100** (according to DIN EN 60751, class B)			**IP 65**, 4-wirer	
RGTF1 Pt100 200mm **Q**	Pt100	**200 mm**	●	2Z01-4131-0100-011	**220,04 €**
RGTF1 Pt100 250mm **Q**	Pt100	**250 mm**	●	2Z01-4131-0100-021	**222,06 €**
RGTF1 Pt100 300mm **Q**	Pt100	**300 mm**	●	2Z01-4131-0100-031	**226,24 €**
RGTF1 Pt100 500mm **Q**	Pt100	**500 mm**	●	2Z01-4131-0100-041	**231,74 €**
RGTF1 Pt1000 xx Q	**Pt1000** (according to DIN EN 60751, class B)			**IP 65**, 2-wire	
RGTF1 Pt1000 200mm **Q**	Pt1000	**200 mm**	●	2Z05-4131-0100-011	**220,04 €**
RGTF1 Pt1000 250mm **Q**	Pt1000	**250 mm**	●	2Z05-4131-0100-021	**222,06 €**
RGTF1 Pt1000 300mm **Q**	Pt1000	**300 mm**	●	2Z05-4131-0100-031	**226,24 €**
RGTF1 Pt1000 500mm **Q**	Pt1000	**500 mm**	●	2Z05-4131-0100-041	**231,74 €**
Housing variant "Q":	Cable connection **with M12 connector** (male, **5-pin**, A-code)				
Extra charge:	other measuring ranges optional			on request	

ACCESSORIES

Special accessories for M12 connector
see chapter Accessories!

RGTF 1 - KV
with cable gland
(IP 65)



THERMASGARD® **RGTF 1 - KV**	Duct temperature sensors / smoke gas temperature sensors, including mounting flange **(with cable gland)**			
Type / WG01	**Sensor / Output**	**Installation length (EL)**	**Item No.**	**Price**
RGTF1 Pt100 xx KV	**Pt100** (according to DIN EN 60751, class B)		**IP 65**, 4-wire	
RGTF1 Pt100 200mm **KV**	Pt100	**200 mm**	1101-30D0-1043-000	**187,66 €**
RGTF1 Pt100 250mm **KV**	Pt100	**250 mm**	1101-30D0-1053-000	**189,58 €**
RGTF1 Pt100 300mm **KV**	Pt100	**300 mm**	1101-30D0-1063-000	**193,77 €**
RGTF1 Pt100 500mm **KV**	Pt100	**500 mm**	1101-30D0-1103-000	**199,25 €**
RGTF1 Pt1000 xx KV	**Pt1000** (according to DIN EN 60751, class B)		**IP 65**, 2-wire	
RGTF1 Pt1000 200mm **KV**	Pt1000	**200 mm**	1101-30D0-5041-000	**187,66 €**
RGTF1 Pt1000 250mm **KV**	Pt1000	**250 mm**	1101-30D0-5051-000	**189,58 €**
RGTF1 Pt1000 300mm **KV**	Pt1000	**300 mm**	1101-30D0-5061-000	**193,77 €**
RGTF1 Pt1000 500mm **KV**	Pt1000	**500 mm**	1101-30D0-5101-000	**199,25 €**
Housing variant "KV":	Cable connection **with cable gland**			
Extra charge:	other measuring ranges optional		on request	

S+S REGELTECHNIK

Screw-in temperature sensors / smoke gas temperature sensors with neck tube and passive output

Screw-in resistance thermometer / smoke gas temperature sensor with neck tube **THERM**ASGARD® **RGTF 2** with passive output, with connecting head made from aluminium (optionally with **cable gland** or **M12 connector** according to DIN EN 61076-2-101) and straight protective tube.

The duct sensor is used to detect relatively high temperatures in liquid or gaseous media, eg, for exhaust air and smoke gas temperature measurement..

TECHNICAL DATA

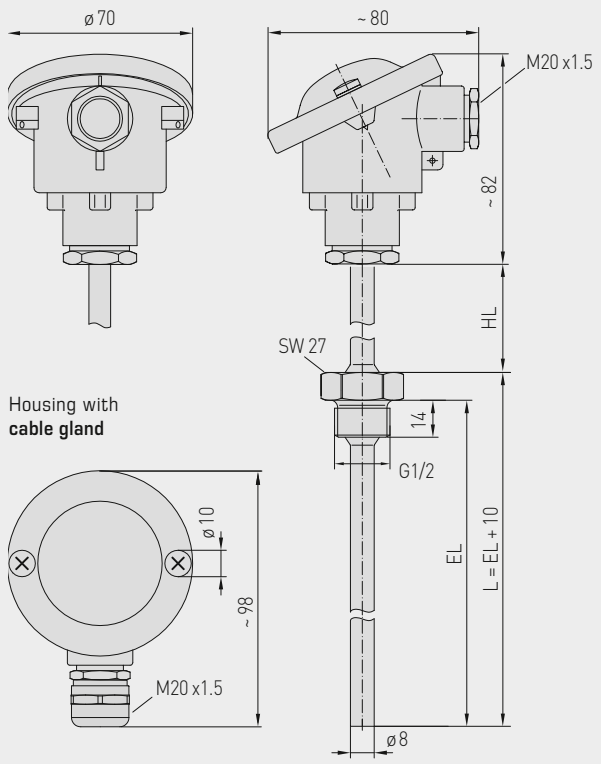
Measuring range:	–35...+600 °C (extended range limits from –100...+750 °C optional)
Sensor / output:	Pt100 / Pt1000 (according to DIN EN 60 751, class B) (**Perfect Sensor Protection**)
Connection type:	2-wire connection (Pt1000) 4-wire connection (Pt100; optional Pt1000)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100)
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Electrical connection:	0.14 - 2.5 mm² via terminal screws on ceramic base
Cable connection:	**RGTF 2** (Standard) adjusting screw made of metal (M 20 x 1.5); **RGTF 2-KV** (optional) **cable gland,** brass, nickel-plated (M 20 x 1.5 ; with strain relief, exchangeable, inner diameter 6 - 12 mm) **RGTF 2-Q** (optional) M12 connector according to DIN EN 61076-2-101 (male, 5-pin, A-code)
Dimensions:	see dimensional drawing
Connecting head:	form B, material aluminium, colour white aluminium (similar to RAL 9006), ambient temperature –20...+100 °C
Protective tube:	stainless steel **V4A** (1.4571), G ½" straight pipe thread, wrench size 27 mm, p_{max} = 40 bar, Ø = 8 mm length of neck tube (HL) = 80 mm inserted length (EL) = 100 - 500 mm (see table)
Process connection:	screwed socket with G ½" straight pipe thread
Humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 54** (according to EN 60 529) **RGTF 2** **IP 65** (according to EN 60 529) **RGTF 2-KV** / **RGTF 2-Q**

RGTF 2
standard



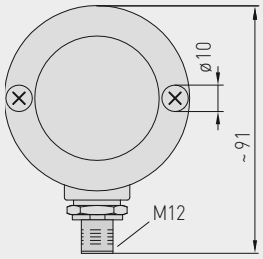
RGTF 2
Measuring insert with ceramic tubelet

Dimensional drawing **RGTF 2**



Housing with
cable gland

Housing with
M12 connector





M12 connector
(male)

High-performance encapsulation against
vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

RGTF 2
standard
(IP 54)



RGTF 2 - KV
with cable gland
(IP 65)



RGTF 2 - Q
with M12 connector
(IP 65)





Screw-in temperature sensors / smoke gas temperature sensors with neck tube and passive output

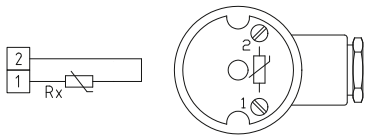
2-wire connection
(Pt1000)



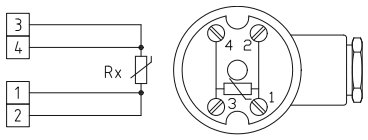
4-wire connection
(Pt100 / Pt1000 optional)



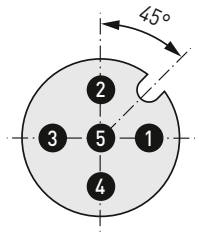
1x two-wire connection
(Pt1000)



1x four-wire connection
(Pt100 / Pt1000) optional)

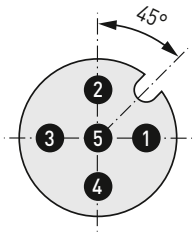


1x two-wire connection
pin assignment (M12)



1 2 Rx
3 frei / free
4 frei / free
5 frei / free

1x four-wire connection
pin assignment (M12)



1 2 3 4 Rx
5 frei / free

RGTF 2
standard
(IP 54)



THERMASGARD® **RGTF 2**	Screw-in temperature sensors / smoke gas temperature sensors with neck tube (standard)			
Type / WG01	**Sensor / Output**	**Installation length (EL)**	**Item No.**	**Price**
RGTF2 Pt100 xx	**Pt100** (according to DIN EN 60751, class B)		**IP 54**, 4-wire	
RGTF2 Pt100 100/80mm	Pt100	**100 mm**	1101-2090-1023-000	**204,84 €**
RGTF2 Pt100 150/80mm	Pt100	**150 mm**	1101-2090-1033-000	**205,98 €**
RGTF2 Pt100 200/80mm	Pt100	**200 mm**	1101-2090-1043-000	**212,34 €**
RGTF2 Pt100 250/80mm	Pt100	**250 mm**	1101-2090-1053-000	**207,50 €**
RGTF2 Pt100 300/80mm	Pt100	**300 mm**	1101-2090-1063-000	**222,53 €**
RGTF2 Pt100 500/80mm	Pt100	**500 mm**	1101-2090-1103-000	**236,54 €**
RGTF2 Pt1000 xx	**Pt1000** (according to DIN EN 60751, class B)		**IP 54**, 2-wire	
RGTF2 Pt1000 100/80	Pt1000	**100 mm**	1101-2090-5021-000	**198,59 €**
RGTF2 Pt1000 150/80	Pt1000	**150 mm**	1101-2090-5031-000	**199,87 €**
RGTF2 Pt1000 200/80	Pt1000	**200 mm**	1101-2090-5041-000	**206,24 €**
RGTF2 Pt1000 250/80	Pt1000	**250 mm**	1101-2090-5051-000	**207,51 €**
RGTF2 Pt1000 300/80	Pt1000	**300 mm**	1101-2090-5061-000	**216,41 €**
RGTF2 Pt1000 500/80	Pt1000	**500 mm**	1101-2090-5101-000	**230,42 €**
Housing variant:	equipped as standard with pressure screw **(IP 54)**, optional housing variants with cable gland **(IP 65)** or **M12 connector (IP65)** see the next page!			
Extra charge:	other measuring ranges optional		on request	

Screw-in temperature sensors / smoke gas temperature sensors with neck tube and passive output

S+S REGELTECHNIK

RGTF 2 - Q
with M12 connector
(IP 65)



THERMASGARD® **RGTF 2 - Q**	Screw-in temperature sensors / smoke gas temperature sensors with neck tube **(with M12 connector)**				
Type / WG03	**Sensor / Output**	**Installation length (EL)**	**Q** ●	**Item No.**	**Price**
RGTF2 Pt100 xx Q	**Pt100** (according to DIN EN 60751, class B)			**IP 65**, 4-wirer	
RGTF2 Pt100 100/80mm **Q**	Pt100	**100 mm**	●	2Z01-4141-0100-011	**240,51 €**
RGTF2 Pt100 150/80mm **Q**	Pt100	**150 mm**	●	2Z01-4141-0100-021	**241,79 €**
RGTF2 Pt100 200/80mm **Q**	Pt100	**200 mm**	●	2Z01-4141-0100-031	**248,16 €**
RGTF2 Pt100 250/80mm **Q**	Pt100	**250 mm**	●	2Z01-4141-0100-041	**249,43 €**
RGTF2 Pt100 300/80mm **Q**	Pt100	**300 mm**	●	2Z01-4141-0100-051	**258,33 €**
RGTF2 Pt100 500/80mm **Q**	Pt100	**500 mm**	●	2Z01-4141-0100-061	**272,34 €**
RGTF2 Pt1000 xx Q	**Pt1000** (according to DIN EN 60751, class B)			**IP 65**, 2-wire	
RGTF2 Pt1000 100/80mm **Q**	Pt1000	**100 mm**	●	2Z05-4141-0100-011	**240,51 €**
RGTF2 Pt1000 150/80mm **Q**	Pt1000	**150 mm**	●	2Z05-4141-0100-021	**241,79 €**
RGTF2 Pt1000 200/80mm **Q**	Pt1000	**200 mm**	●	2Z05-4141-0100-031	**248,16 €**
RGTF2 Pt1000 250/80mm **Q**	Pt1000	**250 mm**	●	2Z05-4141-0100-041	**249,43 €**
RGTF2 Pt1000 300/80mm **Q**	Pt1000	**300 mm**	●	2Z05-4141-0100-051	**258,33 €**
RGTF2 Pt1000 500/80mm **Q**	Pt1000	**500 mm**	●	2Z05-4141-0100-061	**272,34 €**
Housing variant "Q":	Cable connection **with M12 connector** (male, **5-pin**, A-code)				
Extra charge:	other measuring ranges optional			on request	

ACCESSORIES

Special accessories for M12 connector
see chapter Accessories!

RGTF 2 - KV
with cable gland
(IP 65)



THERMASGARD® RGTF 2 - KV	Screw-in temperature sensors / smoke gas temperature sensors with neck tube (with cable gland)			
Type / WG01	**Sensor / Output**	**Installation length (EL)**	**Item No.**	**Price**
RGTF2 Pt100 xx KV	**Pt100** (according to DIN EN 60751, class B)		**IP 65**, 4-wire	
RGTF2 Pt100 100/80mm **KV**	Pt100	**100 mm**	1101-20D0-1023-000	**208,04 €**
RGTF2 Pt100 150/80mm **KV**	Pt100	**150 mm**	1101-20D0-1033-000	**209,31 €**
RGTF2 Pt100 200/80mm **KV**	Pt100	**200 mm**	1101-20D0-1043-000	**215,68 €**
RGTF2 Pt100 250/80mm **KV**	Pt100	**250 mm**	1101-20D0-1053-000	**216,93 €**
RGTF2 Pt100 300/80mm **KV**	Pt100	**300 mm**	1101-20D0-1063-000	**225,84 €**
RGTF2 Pt100 500/80mm **KV**	Pt100	**500 mm**	1101-20D0-1103-000	**239,86 €**
RGTF2 Pt1000 xx KV	**Pt1000** (according to DIN EN 60751, class B)		**IP 65**, 2-wire	
RGTF2 Pt1000 100/80mm **KV**	Pt1000	**100 mm**	1101-20D0-5021-000	**208,04 €**
RGTF2 Pt1000 150/80mm **KV**	Pt1000	**150 mm**	1101-20D0-5031-000	**209,31 €**
RGTF2 Pt1000 200/80mm **KV**	Pt1000	**200 mm**	1101-20D0-5041-000	**215,68 €**
RGTF2 Pt1000 250/80mm **KV**	Pt1000	**250 mm**	1101-20D0-5051-000	**216,93 €**
RGTF2 Pt1000 300/80mm **KV**	Pt1000	**300 mm**	1101-20D0-5061-000	**225,84 €**
RGTF2 Pt1000 500/80mm **KV**	Pt1000	**500 mm**	1101-20D0-5101-000	**239,86 €**
Housing variant "KV":	Cable connection **with cable gland**			
Extra charge:	other measuring ranges optional		on request	

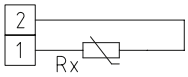
THERMASGARD® HTF 50
THERMASGARD® HTF 200

Sleeve sensor / cable temperature sensor duct / immersion / screw-in temperature sensor, with passive output

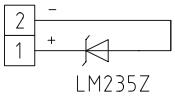
S+S REGELTECHNIK

The sleeve sensor / cable sensor **THERM**ASGARD® **HTF** is used to measure temperatures in liquid and gaseous media. It can be used as a duct sensor and - if installed in an immersion sleeve - as an immersion and screw-in sensor. The sleeve length varies, depending on request, from 30...400 mm (standard is 50 mm respectively 200 mm), the cable length is arbitrary (standard is 1.5 m). Depending on application, with silicone, glass fibre, or PVC leads, for two-wire or four-wire connection. For direct, continuous use in liquids, please use our **THE** immersion sleeves (see type table).

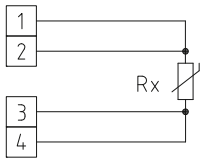
1x two-wire connection
standard



1x two-wire connection
LM 235 Z (KP 10)



1x four-wire connection
(optional)



TECHNICAL DATA

Measuring ranges:	–35...+105 °C **PVC**, LiYY, 2 x 0.25 mm² –50...+180 °C **Silicone**, SiHF, 2 x 0.25 mm² –50...+250 °C **PTFE**, 2 x 1.0 mm² –50...+350 °C **glass fibre**, 2 x 0.25 mm² ends stripped with wire end sleeves (extended measuring range limits optional, depending on connection leads, T_{max} Ni1000 = **+180 °C**, T_{max} NTC / Ni1000 TK5000 = **+150 °C**, T_{max} LM235Z = **+125 °C**)
Sensors / output:	see table, passive (optional also with 2 sensors) (**Perfect Sensor Protection** with IP68)
Connection type:	2-wire connection (4-wire connection optional)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Protective tube	sensor sleeve made of stainless steel, **V4A** (1.4571), Ø = 6 mm **HTF 50** nominal length (NL) = 50 mm **HTF 200** nominal length (NL) = 200 mm (other optional dimensions also available, nominal length (NL) = 30...400 mm)
Connection cable:	cable length (KL) = 1.5 m (optional also 3 m, 5 m, 8 m, 10 m)
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Process connection:	using immersion sleeves **THE** (see table) or mounting flange, plastic (see table) (optionally in galvanised steel, see chapter Accessories)
Permitted humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) **sleeve** humidity-tight (standard) **IP 68** (according to EN 60 529) **sleeve** water-tight (optional) **IP 54** (according to EN 60 529) with **glass fibre** cable (optional)
ACCESSORIES	
MF-06-K	**Mounting flange,** plastic, 56.8 x 84.3 mm, Ø = 6.2 mm tube gland, T_{max} = +100 °C (is **not** included in scope of delivery)
THE-ms / xx	**Immersion sleeve, brass, nickel-plated,** Ø = 9 mm, inserted length (EL) = 50 - 250 mm (see table), inner diameter of socket Ø = 5.2 mm, with **adjusting screw** M12 x 1.5 T_{max} = +130 °C, p_{max} = 16 bar
THE-VA / xx	**Immersion sleeve, stainless steel, V4A** (1.4571), Ø = 9 mm, inserted length (EL) = 50 - 400 mm (see table), inner diameter of socket Ø = 5.2 mm, with **adjusting screw** M12 x 1.5 T_{max} = +200 °C, p_{max} = 40 bar



IP 65 (standard)
humidity-tight



IP 68 (optional)
water-tight
Perfect Sensor Protection



IP 54 (optional)
with **glass fibre** cable

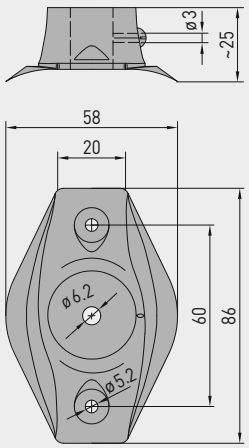
MF-06-K
Mounting flange,
plastic
(optional)



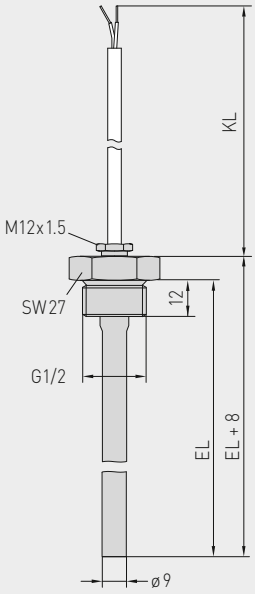
High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

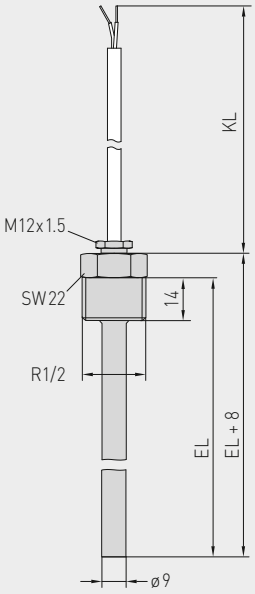
Dimensional drawing **MF-06-K**



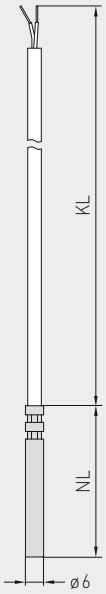
HTF 50 + THE-VA



HTF 50 + THE-ms



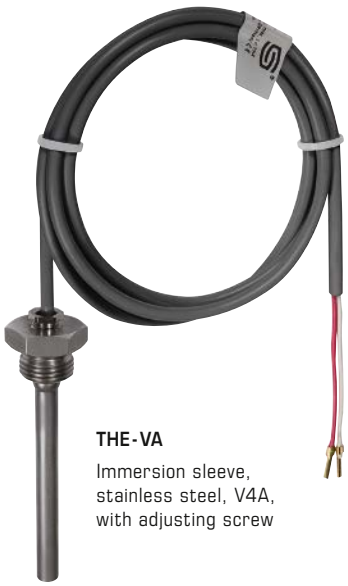
HTF 50 / HTF 200



HTF 200 + MF-06-K
with accessory mounting flange
(see type table)
as duct temperature sensor



HTF 50 + THE-xx
with accessory immersion sleeve
(see type table)
as immersion / screw-in temperature sensor



THE-VA
Immersion sleeve,
stainless steel, V4A,
with adjusting screw



THE-ms
Immersion sleeve,
brass, nickel-plated,
with adjusting screw

HTF 50
with PVC / silicone cable
(standard)



HTF 50
with glass fibre cable



Sleeve sensor / cable temperature sensor duct / immersion / screw-in temperature sensor, with passive output

S+S REGELTECHNIK

THERMASGARD® HTF 50	sleeve sensor / cable temperature sensor (NL = 50 mm)					
Type / WG03	Cable material	Cable length	Measuring Range	Protection class	Item No. Sensor	Price
HTF50 PT100					**Pt 100, class B**	
HTF50 Pt100 PVC 1,5M	**PVC**	**1.5 m**	–35...+105 °C	IP65 *	1101-6030-1211-110	**13,69 €**
HTF50 Pt100 Silikon 1,5M	**Silicone**	**1.5 m**	–50...+180 °C	IP65 *	1101-6030-1211-120	**17,20 €**
HTF50 Pt100 PTFE 1,5M	**PTFE**	**1.5 m**	–50...+250 °C	IP65 *	1101-6030-1211-140	**57,73 €**
HTF50 Pt100	**Glass Fibre**	**1.5 m**	–50...+350 °C	**IP54**	1101-6030-1211-050	**47,94 €**
HTF50 Pt100 PVC 3M	**PVC**	**3 m**	–35...+105 °C	IP65 *	1101-6030-1231-110	**16,57 €**
HTF50 Pt100 Silikon 3M	**Silicone**	**3 m**	–50...+180 °C	IP65 *	1101-6030-1231-120	**21,45 €**
HTF50 Pt100 PVC 5M	**PVC**	**5 m**	–35...+105 °C	IP65 *	1101-6030-1251-110	**20,39 €**
HTF50 Pt100 Silikon 5M	**Silicone**	**5 m**	–50...+180 °C	IP65 *	1101-6030-1251-120	**27,13 €**
HTF50 Pt100 PVC 8M	**PVC**	**8 m**	–35...+105 °C	IP65 *	1101-6030-1281-110	**26,15 €**
HTF50 Pt100 Silikon 8M	**Silicone**	**8 m**	–50...+180 °C	IP65 *	1101-6030-1281-120	**35,67 €**
HTF50 Pt100 PVC 10M	**PVC**	**10 m**	–35...+105 °C	IP65 *	1101-6030-1301-110	**29,97 €**
HTF50 Pt100 Silikon 10M	**Silicone**	**10 m**	–50...+180 °C	IP65 *	1101-6030-1301-120	**41,37 €**
HTF50 PT1000					**Pt 1000, class B**	
HTF50 Pt1000 PVC 1,5M	**PVC**	**1.5 m**	–35...+105 °C	IP65 *	1101-6030-5211-110	**16,12 €**
HTF50 Pt1000 Silikon 1,5M	**Silicone**	**1.5 m**	–50...+180 °C	IP65 *	1101-6030-5211-120	**19,80 €**
HTF50 Pt1000 PTFE 1,5M	**PTFE**	**1.5 m**	–50...+250 °C	IP65 *	1101-6030-5211-140	**57,87 €**
HTF50 Pt1000	**Glass Fibre**	**1.5 m**	–50...+350 °C	**IP54**	1101-6030-5211-050	**47,94 €**
HTF50 Pt1000 PVC 3M	**PVC**	**3 m**	–35...+105 °C	IP65 *	1101-6030-5231-110	**18,99 €**
HTF50 Pt1000 Silikon 3M	**Silicone**	**3 m**	–50...+180 °C	IP65 *	1101-6030-5231-120	**24,08 €**
HTF50 Pt1000 PVC 5M	**PVC**	**5 m**	–35...+105 °C	IP65 *	1101-6030-5251-110	**22,82 €**
HTF50 Pt1000 Silikon 5M	**Silicone**	**5 m**	–50...+180 °C	IP65 *	1101-6030-5251-120	**29,76 €**
HTF50 Pt1000 PVC 8M	**PVC**	**8 m**	–35...+105 °C	IP65 *	1101-6030-5281-110	**28,57 €**
HTF50 Pt1000 Silikon 8M	**Silicone**	**8 m**	–50...+180 °C	IP65 *	1101-6030-5281-120	**38,28 €**
HTF50 Pt1000 PVC 10M	**PVC**	**10 m**	–35...+105 °C	IP65 *	1101-6030-5301-110	**32,40 €**
HTF50 Pt1000 Silikon 10M	**Silicone**	**10 m**	–50...+180 °C	IP65 *	1101-6030-5301-120	**43,96 €**
HTF50 PT1000 A					**Pt 1000 A, class A-TGA**	
HTF50 Pt1000A PVC 1,5M	**PVC**	**1.5 m**	–35...+105 °C	IP65 *	1101-6030-6211-110	**23,64 €**
HTF50 Pt1000A Silikon 1,5M	**Silicone**	**1.5 m**	–50...+180 °C	IP65 *	1101-6030-6211-120	**27,15 €**
HTF50 NI1000					**Ni 1000**	
HTF50 Ni1000 PVC 1,5M	**PVC**	**1.5 m**	–35...+105 °C	IP65 *	1101-6030-9211-110	**15,66 €**
HTF50 Ni1000 Silikon 1,5M	**Silicone**	**1.5 m**	–50...+180 °C	IP65 *	1101-6030-9211-120	**19,50 €**
HTF50 Ni1000 PVC 3M	**PVC**	**3 m**	–35...+105 °C	IP65 *	1101-6030-9231-110	**18,54 €**
HTF50 Ni1000 Silikon 3M	**Silicone**	**3 m**	–50...+180 °C	IP65 *	1101-6030-9231-120	**23,75 €**
HTF50 Ni1000 PVC 5M	**PVC**	**5 m**	–35...+105 °C	IP65 *	1101-6030-9251-110	**22,38 €**
HTF50 Ni1000 Silikon 5M	**Silicone**	**5 m**	–50...+180 °C	IP65 *	1101-6030-9251-120	**29,43 €**
HTF50 Ni1000 PVC 8M	**PVC**	**8 m**	–35...+105 °C	IP65 *	1101-6030-9281-110	**28,12 €**
HTF50 Ni1000 Silikon 8M	**Silicone**	**8 m**	–50...+180 °C	IP65 *	1101-6030-9281-120	**37,97 €**
HTF50 Ni1000 PVC 10M	**PVC**	**10 m**	–35...+105 °C	IP65 *	1101-6030-9301-110	**31,94 €**
HTF50 Ni1000 Silikon 10M	**Silicone**	**10 m**	–50...+180 °C	IP65 *	1101-6030-9301-120	**43,65 €**
HTF50 NITK					**Ni 1000 TK 5000**	
HTF50 NiTK PVC 1,5M	**PVC**	**1.5 m**	–35...+105 °C	IP65 *	1101-6031-0211-110	**19,74 €**
HTF50 NiTK Silikon 1,5M	**Silicone**	**1.5 m**	**– 50...+150 °C**	IP65 *	1101-6031-0211-120	**23,29 €**
HTF50 NiTK PVC 3M	**PVC**	**3 m**	–35...+105 °C	IP65 *	1101-6031-0231-110	**22,63 €**
HTF50 NiTK Silikon 3M	**Silicone**	**3 m**	**– 50...+150 °C**	IP65 *	1101-6031-0231-120	**27,56 €**
HTF50 NiTK PVC 5M	**PVC**	**5 m**	–35...+105 °C	IP65 *	1101-6031-0251-110	**26,46 €**
HTF50 NiTK Silikon 5M	**Silicone**	**5 m**	**– 50...+150 °C**	IP65 *	1101-6031-0251-120	**33,23 €**
HTF50 NiTK PVC 8M	**PVC**	**8 m**	–35...+105 °C	IP65 *	1101-6031-0281-110	**32,20 €**
HTF50 NiTK Silikon 8M	**Silicone**	**8 m**	**– 50...+150 °C**	IP65 *	1101-6031-0281-120	**41,78 €**
HTF50 NiTK PVC 10M	**PVC**	**10 m**	–35...+105 °C	IP65 *	1101-6031-0301-110	**36,03 €**
HTF50 NiTK Silikon 10M	**Silicone**	**10 m**	**– 50...+150 °C**	IP65 *	1101-6031-0301-120	**47,46 €**
HTF50 LM235Z					**LM 235 Z**	
HTF50 LM235Z PVC 1,5M	**PVC**	**1.5 m**	–35...+105 °C	IP65 *	1101-6032-1211-110	**14,02 €**
HTF50 LM235Z Silikon 1,5M	**Silicone**	**1.5 m**	**– 40...+125 °C**	IP65 *	1101-6032-1211-120	**17,84 €**
HTF50 LM235Z PVC 3M	**PVC**	**3 m**	–35...+105 °C	IP65 *	1101-6032-1231-110	**16,88 €**
HTF50 LM235Z Silikon 3M	**Silicone**	**3 m**	**– 40...+125 °C**	IP65 *	1101-6032-1231-120	**22,09 €**
HTF50 LM235Z PVC 5M	**PVC**	**5 m**	–35...+105 °C	IP65 *	1101-6032-1251-110	**20,73 €**
HTF50 LM235Z Silikon 5M	**Silicone**	**5 m**	**– 40...+125 °C**	IP65 *	1101-6032-1251-120	**27,77 €**
HTF50 LM235Z PVC 8M	**PVC**	**8 m**	–35...+105 °C	IP65 *	1101-6032-1281-110	**26,47 €**
HTF50 LM235Z Silikon 8M	**Silicone**	**8 m**	**– 40...+125 °C**	IP65 *	1101-6032-1281-120	**36,32 €**
HTF50 LM235Z PVC 10M	**PVC**	**10 m**	–35...+105 °C	IP65 *	1101-6032-1301-110	**30,30 €**
HTF50 LM235Z Silikon 10M	**Silicone**	**10 m**	**– 40...+125 °C**	IP65 *	1101-6032-1301-120	**42,00 €**

Continued on next page ...

THERMASGARD® HTF 50 sleeve sensor / cable temperature sensor (NL = 50 mm)

Type / WG03	Cable material	Cable length	Measuring Range	Protection class	Item No. Sensor	Price
HTF50 NTC1.8K					**NTC 1.8K**	
HTF50 NTC1,8K PVC 1,5M	**PVC**	**1.5 m**	–35...+105 °C	IP65 *	1101-6031-2211-110	**13,24 €**
HTF50 NTC1,8K Silikon 1,5M	**Silicone**	**1.5 m**	**– 50...+150 °C**	IP65 *	1101-6031-2211-120	**15,21 €**
HTF50 NTC1,8K PVC 3M	**PVC**	**3 m**	–35...+105 °C	IP65 *	1101-6031-2231-110	**16,13 €**
HTF50 NTC1,8K Silikon 3M	**Silicone**	**3 m**	**– 50...+150 °C**	IP65 *	1101-6031-2231-120	**19,50 €**
HTF50 NTC1,8K PVC 5M	**PVC**	**5 m**	–35...+105 °C	IP65 *	1101-6031-2251-110	**19,96 €**
HTF50 NTC1,8K Silikon 5M	**Silicone**	**5 m**	**– 50...+150 °C**	IP65 *	1101-6031-2251-120	**25,18 €**
HTF50 NTC1,8K PVC 8M	**PVC**	**8 m**	–35...+105 °C	IP65 *	1101-6031-2281-110	**25,69 €**
HTF50 NTC1,8K Silikon 8M	**Silicone**	**8 m**	**– 50...+150 °C**	IP65 *	1101-6031-2281-120	**33,69 €**
HTF50 NTC1,8K PVC 10M	**PVC**	**10 m**	–35...+105 °C	IP65 *	1101-6031-2301-110	**29,53 €**
HTF50 NTC1,8K Silikon 10M	**Silicone**	**10 m**	**– 50...+150 °C**	IP65 *	1101-6031-2301-120	**39,39 €**
HTF50 NTC10K					**NTC 10K**	
HTF50 NTC10K PVC 1,5M	**PVC**	**1.5 m**	–35...+105 °C	IP65 *	1101-6031-5211-110	**13,24 €**
HTF50 NTC10K Silikon 1,5M	**Silicone**	**1.5 m**	**– 50...+150 °C**	IP65 *	1101-6031-5211-120	**15,21 €**
HTF50 NTC10K PVC 3M	**PVC**	**3 m**	–35...+105 °C	IP65 *	1101-6031-5231-110	**16,13 €**
HTF50 NTC10K Silikon 3M	**Silicone**	**3 m**	**– 50...+150 °C**	IP65 *	1101-6031-5231-120	**19,50 €**
HTF50 NTC10K PVC 5M	**PVC**	**5 m**	–35...+105 °C	IP65 *	1101-6031-5251-110	**19,96 €**
HTF50 NTC10K Silikon 5M	**Silicone**	**5 m**	**– 50...+150 °C**	IP65 *	1101-6031-5251-120	**25,18 €**
HTF50 NTC10K PVC 8M	**PVC**	**8 m**	–35...+105 °C	IP65 *	1101-6031-5281-110	**25,69 €**
HTF50 NTC10K Silikon 8M	**Silicone**	**8 m**	**– 50...+150 °C**	IP65 *	1101-6031-5281-120	**33,69 €**
HTF50 NTC10K PVC 10M	**PVC**	**10 m**	–35...+105 °C	IP65 *	1101-6031-5301-110	**29,53 €**
HTF50 NTC10K Silikon 10M	**Silicone**	**10 m**	**– 50...+150 °C**	IP65 *	1101-6031-5301-120	**39,39 €**
HTF50 NTC20K					**NTC 20K**	
HTF50 NTC20K PVC 1,5M	**PVC**	**1.5 m**	–35...+105 °C	IP65 *	1101-6031-6211-110	**13,24 €**
HTF50 NTC20K Silikon 1,5M	**Silicone**	**1.5 m**	**– 50...+150 °C**	IP65 *	1101-6031-6211-120	**15,21 €**
HTF50 NTC20K PVC 3M	**PVC**	**3 m**	–35...+105 °C	IP65 *	1101-6031-6231-110	**16,13 €**
HTF50 NTC20K Silikon 3M	**Silicone**	**3 m**	**– 50...+150 °C**	IP65 *	1101-6031-6231-120	**19,50 €**
HTF50 NTC20K PVC 5M	**PVC**	**5 m**	–35...+105 °C	IP65 *	1101-6031-6251-110	**19,96 €**
HTF50 NTC20K Silikon 5M	**Silicone**	**5 m**	**– 50...+150 °C**	IP65 *	1101-6031-6251-120	**25,18 €**
HTF50 NTC20K PVC 8M	**PVC**	**8 m**	–35...+105 °C	IP65 *	1101-6031-6281-110	**25,69 €**
HTF50 NTC20K Silikon 8M	**Silicone**	**8 m**	**– 50...+150 °C**	IP65 *	1101-6031-6281-120	**33,69 €**
HTF50 NTC20K PVC 10M	**PVC**	**10 m**	–35...+105 °C	IP65 *	1101-6031-6301-110	**29,53 €**
HTF50 NTC20K Silikon 10M	**Silicone**	**10 m**	**– 50...+150 °C**	IP65 *	1101-6031-6301-120	**39,39 €**
Extra charge:	* Protection type **IP68** (Sensor sleeve watertight compound-filled)					**3,40 €**
	Other sensors optional				on request	
	Cable length (KL) 3 m, 5 m, 8 m, 10 m (standard lengths)				on request	
	Connection type **4-wire** (4-conductor)				on request	
For special orders please specify: (possible for 25 or more pieces)	Type sensor length (NL), sensor, cable material, connection type, cable length (KL), protection type e. g. HTF-30mm, Pt1000, PVC, 2-wire, 10 m, IP68; HTF-50mm, Ni1000 TK5000, silicon, 4-wire, 5 m, IP65					



IP65 (standard)
humidity-tight



IP68 (optional)
water-tight
Perfect Sensor Protection



IP54 (optional)
with **glass fibre** cable

HTF 50
(NL = 50 mm)
with PVC / silicone cable



HTF 50
(NL = 50 mm)
with glass fibre cable



THERMASGARD® HTF 200

Sleeve sensor / cable temperature sensor
duct / immersion / screw-in temperature sensor,
with passive output

S+S REGELTECHNIK

THERMASGARD® HTF 200 sleeve sensor / cable temperature sensor (NL = 200 mm)						
Type / WG03	**Cable material**	**Cable length**	**Measuring Range**	**Protection class**	**Item No. Sensor**	**Price**
HTF200 PT100					**Pt 100, class B**	
HTF200 Pt100 PVC 1,5M	**PVC**	**1.5 m**	–35...+105 °C	IP65 *	1101-6090-1211-110	**20,37 €**
HTF200 Pt100 Silikon 1,5M	**Silicone**	**1.5 m**	–50...+180 °C	IP65 *	1101-6090-1211-120	**24,19 €**
HTF200 PT1000					**Pt 1000, class B**	
HTF200 Pt1000 PVC 1,5M	**PVC**	**1.5 m**	–35...+105 °C	IP65 *	1101-6090-5211-110	**20,37 €**
HTF200 Pt1000 Silikon 1,5M	**Silicone**	**1.5 m**	–50...+180 °C	IP65 *	1101-6090-5211-120	**24,19 €**
HTF200 PT1000 A					**Pt 1000 A, class A-TGA**	
HTF200 Pt1000A PVC 1,5M	**PVC**	**1.5 m**	–35...+105 °C	IP65 *	1101-6090-6211-110	**27,72 €**
HTF200 Pt1000A Silikon 1,5M	**Silicone**	**1.5 m**	–50...+180 °C	IP65 *	1101-6090-6211-120	**31,56 €**
HTF200 NI1000					**Ni 1000**	
HTF200 Ni1000 PVC 1,5M	**PVC**	**1.5 m**	–35...+105 °C	IP65 *	1101-6090-9211-110	**20,76 €**
HTF200 Ni1000 Silikon 1,5M	**Silicone**	**1.5 m**	–50...+180 °C	IP65 *	1101-6090-9211-120	**24,19 €**
HTF200 NI TK					**Ni 1000 TK 5000**	
HTF200 NiTK PVC 1,5M	**PVC**	**1.5 m**	–35...+105 °C	IP65 *	1101-6091-0211-110	**21,78 €**
HTF200 NiTK Silikon 1,5M	**Silicone**	**1.5 m**	**– 50...+150 °C**	IP65 *	1101-6091-0211-120	**25,21 €**
HTF200 LM235Z					**LM 235 Z**	
HTF200 LM235Z PVC 1,5M	**PVC**	**1.5 m**	–35...+105 °C	IP65 *	1101-6092-1211-110	**21,00 €**
HTF200 LM235Z Silikon 1,5M	**Silicone**	**1.5 m**	**– 40...+125 °C**	IP65 *	1101-6092-1211-120	**24,83 €**
HTF200 NTC1,8K					**NTC 1.8K**	
HTF200 NTC1,8K PVC 1,5M	**PVC**	**1.5 m**	–35...+105 °C	IP65 *	1101-6091-2211-110	**20,37 €**
HTF200 NTC1,8K Silikon 1,5M	**Silicone**	**1.5 m**	**– 50...+150 °C**	IP65 *	1101-6091-2211-120	**24,19 €**
HTF200 NTC10K					**NTC 10K**	
HTF200 NTC10K PVC 1,5M	**PVC**	**1.5 m**	–35...+105 °C	IP65 *	1101-6091-5211-110	**20,37 €**
HTF200 NTC10K Silikon 1,5M	**Silicone**	**1.5 m**	**– 50...+150 °C**	IP65 *	1101-6091-5211-120	**24,19 €**
HTF200 NTC20K					**NTC 20K**	
HTF200 NTC20K PVC 1,5M	**PVC**	**1.5 m**	–35...+105 °C	IP65 *	1101-6091-6211-110	**20,37 €**
HTF200 NTC20K Silikon 1,5M	**Silicone**	**1.5 m**	**– 50...+150 °C**	IP65 *	1101-6091-6211-120	**24,19 €**
Extra charge:	*	Protection type **IP 68** (Sensor sleeve watertight compound-filled) Other sensors optional **Cable length** (KL) 3 m, 5 m, 8 m, 10 m (standard lengths) Connection type **4-wire** (4-conductor)			on request on request on request	**3,40 €**
For special orders please specify: (possible for 25 or more pieces)		Type sensor length (NL), sensor, cable material, connection type, cable length (KL), protection type e. g. HTF-200 mm, Pt1000, PVC, 2-wire, 10 m, IP68; HTF-400 mm, Ni1000 TK5000, silicon, 4-wire, 5 m, IP65				



HTF 200
(NL = 200 mm)
with PVC/silicone cable



IP 65 (standard)
humidity-tight



IP 68 (optional)
water-tight
Perfect Sensor Protection

THERMASGARD® HTF 50 accessory as immersion / screw-in sensor temperature sensor (ESTF)

Type / WG01	Description		Item No.	Price
THE-ms / xx				
	Immersion sleeve, brass, nickel-plated, Ø 9 mm, inner diameter of socket Ø = 5.2 mm, with **adjusting screw** M12 x 1.5			
THE-MS 50MM	p_{max} = 16 bar, T_{max} = +130 °C	EL = **50 mm**	7100-0011-6010-002	**10,46 €**
THE-MS 100MM	p_{max} = 16 bar, T_{max} = +130 °C	EL = **100 mm**	7100-0011-6020-002	**11,30 €**
THE-MS 150MM	p_{max} = 16 bar, T_{max} = +130 °C	EL = **150 mm**	7100-0011-6030-002	**11,72 €**
THE-MS 200MM	p_{max} = 16 bar, T_{max} = +130 °C	EL = **200 mm**	7100-0011-6040-002	**12,54 €**
THE-MS 250MM	p_{max} = 16 bar, T_{max} = +130 °C	EL = **250 mm**	7100-0011-6050-002	**14,05 €**
THE-VA / xx				
	Immersion sleeve, stainless steel, V4A (1.4571), Ø 9 mm, inner diameter of socket Ø = 5.2 mm, with **adjusting screw** M12 x 1.5			
THE-VA 50MM	p_{max} = 40 bar, T_{max} = +200 °C	EL = **50 mm**	7100-0012-6010-002	**20,70 €**
THE-VA 100MM	p_{max} = 40 bar, T_{max} = +200 °C	EL = **100 mm**	7100-0012-6020-002	**22,86 €**
THE-VA 150MM	p_{max} = 40 bar, T_{max} = +200 °C	EL = **150 mm**	7100-0012-6030-002	**24,55 €**
THE-VA 200MM	p_{max} = 40 bar, T_{max} = +200 °C	EL = **200 mm**	7100-0012-6040-002	**25,89 €**
THE-VA 250MM	p_{max} = 40 bar, T_{max} = +200 °C	EL = **250 mm**	7100-0012-6050-002	**32,18 €**
THE-VA 300MM	p_{max} = 40 bar, T_{max} = +200 °C	EL = **300 mm**	7100-0012-6060-002	**33,62 €**
THE-VA 400MM	p_{max} = 40 bar, T_{max} = +200 °C	EL = **400 mm**	7100-0012-6080-002	**34,71 €**
xx = (EL)	Other installation lengths on request			

HTF 50
(NL = 50 mm)
with **THE** immersion sleeve
as immersion / screw-in temperature sensor



THE-ms
Immersion sleeve,
brass, nickel-plated,
with adjusting screw



THE-VA
Immersion sleeve,
stainless steel, V4A,
with adjusting screw

MF-06-K
Mounting flange,
plastic
(optional)



THERMASGARD® HTF 50 accessories (standard)
THERMASGARD® HTF 200 accessories (standard)

Type / WG01	Description	T_{max}	Item No.	Price
MF				
MF-06-K	**Mounting flange** plastic, 56.8 x 84.3 mm, Ø 6.2 mm tube gland (**not** included in scope of delivery)	+100 °C	7100-0030-1000-000	**6,12 €**
Note:	For further information see last chapter!			

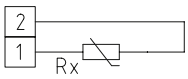
THERMASGARD® OFTF

Surface contact temperature sensors /
surface temperature sensors,
with passive output

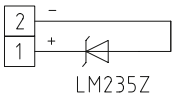
S+S REGELTECHNIK

Small surface contact resistance thermometer in aluminium enclosure (cable sensor).
The surface sensor **THERM**ASGARD® **OFTF** is used for temperature detection on flat or slightly convex surfaces, for instance for surface temperature measurement at windows, for monitoring formation of condensate, or as heating surface sensor, e.g. at windows or walls.

1x two-wire connection
standard



1x two-wire connection
LM 235 Z (KP 10)



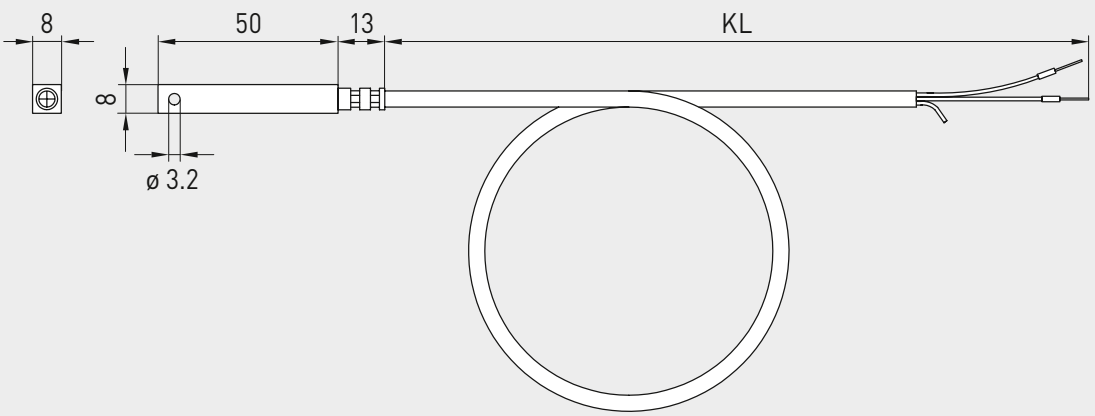
TECHNICAL DATA

Measuring range:	–30...+105 °C
Sensors / output:	see table, passive (**Perfect Sensor Protection** with IP68)
Connection type:	2-wire connection
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Process connection:	attachment to the surface to be measured through fixing hole in the sensor head or by suitable adhesive
Protective sleeve:	aluminium
Dimensions:	8 x 8 x 50 mm
Connecting cable:	PVC; 1.5 m, LiYY, 2 x 0.25 mm², ends stripped with wire end sleeves (optional with silicone cable SiHF, up to +180 °C)
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) **sleeve** humidity-tight (standard) **IP 68** (according to EN 60 529) **sleeve** water-tight (optional)

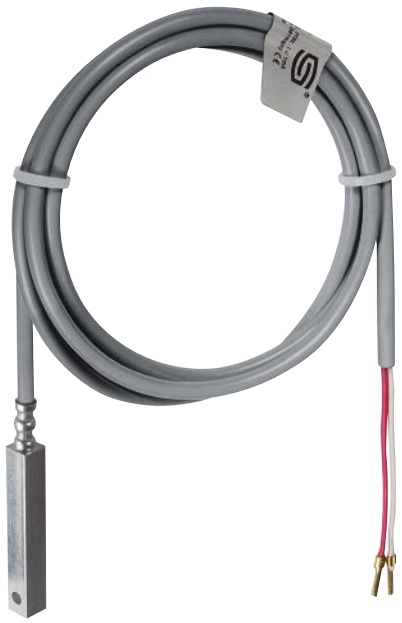
High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

Dimensional drawing **OFTF**



OFTF



THERMASGARD® OFTF	Surface contact temperature sensors / surface temperature sensors		
Type / WG03	**Sensor / output**	**Item No.**	**Price**
OFTF		**IP 65**	
OFTF Pt100 PVC 1,5M	Pt100 (according to DIN EN 60 751, class B)	1101-6010-1211-110	**36,99 €**
OFTF Pt1000 PVC 1,5M	Pt1000 (according to DIN EN 60 751, class B)	1101-6010-5211-110	**36,99 €**
OFTF Ni1000 PVC 1,5M	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-6010-9211-110	**39,13 €**
OFTF NiTK PVC 1,5M	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-6011-0211-110	**43,27 €**
OFTF LM235Z PVC 1,5M	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-6012-1211-110	**37,71 €**
OFTF NTC1,8K PVC 1,5M	NTC 1.8 K	1101-6011-2211-110	**35,57 €**
OFTF NTC10K PVC 1,5M	NTC 10K	1101-6011-5211-110	**35,57 €**
OFTF NTC20K PVC 1,5M	NTC 20K	1101-6011-6211-110	**35,57 €**
Extra charge:	Protection type **IP 68** (sensor sleeve watertight compound-filled) 2-wire connecting leads (**PVC / silicone**) per running metre 4-wire connecting leads (**PVC / silicone**) per running metre	 on request on request	**3,40 €**
For special orders please specify:	Type, sensor type, cable length e.g. OFTF Pt100, 3 m; OFTF Pt100 1 / 3 DIN, 4 m; OFTF KTY 81-210, 6 m		

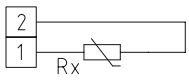
THERMASGARD® ALTF 1

Surface contact temperature sensors / tube contact temperature sensors, including strap, with passive output

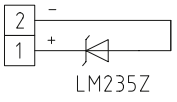
S+S REGELTECHNIK

THERMASGARD® **ALTF 1** surface contact sensors are electric contact thermometers and are used for measuring surface temperatures of solids, having at least one so-called contact area that is brought into contact with the surface to be measured. The surface contact temperature sensor ALTF 1 with connection cable and passive output determines the temperature of a medium flowing inside a pipe (e.g. water temperature) via the surface temperature. ALTF 1 is a tube contact resistance thermometer with strap and axial feeler tube for measuring temperature on piping and tubes (e.g. cold-water and hot-water), or at heating sections for heating system control.

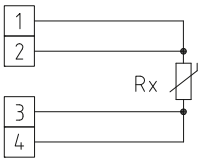
1x two-wire connection **standard**



1x two-wire connection **LM 235 Z (KP 10)**



1x four-wire connection (optional)



TECHNICAL DATA

Measuring range:	–35...+105 °C PVC –35...+180 °C silicone (T_{max} NTC = +150 °C, T_{max} LM 235 Z = +125 °C)
Sensors / output:	see table, passive (optional also with 2 sensors) (**Perfect Sensor Protection** with IP68)
Connection type:	2-wire connection (4-wire connection optional)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Connecting cable:	PVC; 1.5 m, LiYY, 2 x 0.25 mm² or silicone, SiHF, 2 x 0.25 mm² ends stripped, with wire end sleeves
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Sensor protection:	pipe feeder made of stainless steel **V4A** (1.4571), Ø = 6 mm, L = 50 mm
Process connection:	with **endless strap** with metal tightener (included in the scope of delivery) Ø = 13 - 92 mm (¼ - 3"); length 300 mm
Humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) **sleeve** humidity-tight (standard) **IP 68** (according to EN 60 529) **sleeve** water-tight (optional)



IP 65 (standard)
humidity-tight



IP 68 (optional)
water-tight
Perfect Sensor Protection

THERMASGARD® ALTF 1 Surface contact temperature sensors / tube contact temperature sensors (PVC)

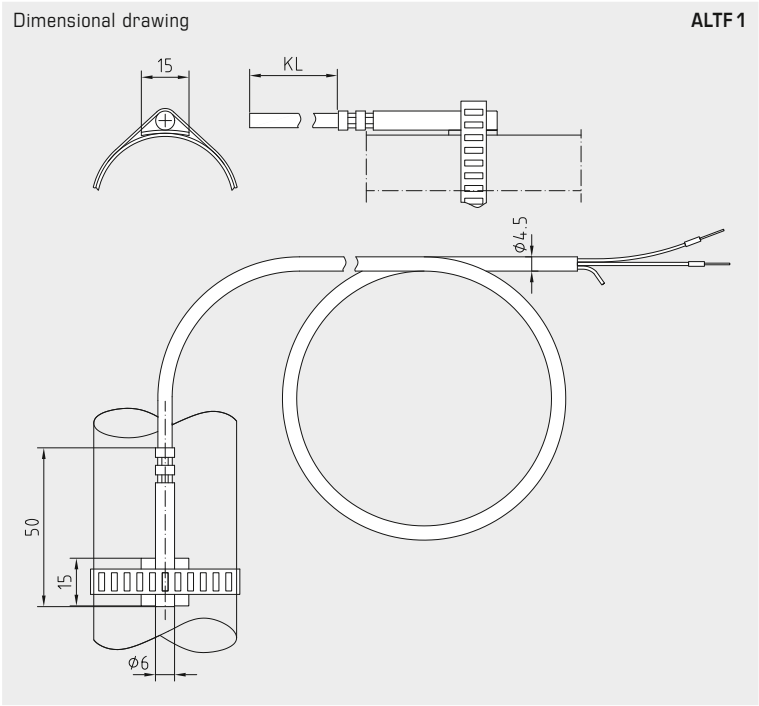
Type / WG03	Sensor / Output	Item No.	Price
ALTF 1 xx PVC		**IP 65, PVC**	
ALTF1 Pt100 PVC 1,5M	Pt100 (according to DIN EN 60 751, class B)	1101-6020-1211-110	**20,25 €**
ALTF1 Pt1000 PVC 1,5M	Pt1000 (according to DIN EN 60 751, class B)	1101-6020-5211-110	**20,25 €**
ALTF1 Ni1000 PVC 1,5M	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-6020-9211-110	**21,00 €**
ALTF1 NiTK PVC 1,5M	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-6021-0211-110	**21,78 €**
ALTF1 LM235Z PVC 1,5M	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-6022-1211-110	**21,39 €**
ALTF1 NTC1,8K PVC 1,5M	NTC 1.8 K	1101-6021-2211-110	**20,76 €**
ALTF1 NTC10K PVC 1,5M	NTC 10K	1101-6021-5211-110	**20,76 €**
ALTF1 NTC20K PVC 1,5M	NTC 20K	1101-6021-6211-110	**20,76 €**
Note:	including strap, connecting cable **PVC** (KL = 1.5 m)		
Extra charge:	Protection type **IP 68** (Sensor sleeve watertight compound-filled) 2-wire connecting leads, per running meter (**PVC**) Other sensors optional	 on request on request	**3,40 €**

ACCESSORIES

WLP-1	Heat-conductive paste, silicone-free	7100-0060-1000-000	**3,38 €**

Surface contact temperature sensors / tube contact temperature sensors, including strap, with passive output

Dimensional drawing **ALTF 1**



ALTF 1



High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

THERMASGARD® ALTF 1 Surface contact temperature sensors / tube contact temperature sensors (silicone)			
Type / WG03	**Sensor / Output**	**Item No.**	**Price**
ALTF 1 xx SILIKON		**IP65, silicone**	
ALTF1 Pt100 Silikon 1,5M	Pt100 (according to DIN EN 60751, class B)	1101-6020-1211-120	**21,00 €**
ALTF1 Pt1000 Silikon 1,5M	Pt1000 (according to DIN EN 60751, class B)	1101-6020-5211-120	**21,00 €**
ALTF1 Ni1000 Silikon 1,5M	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm / K)	1101-6020-9211-120	**22,42 €**
ALTF1 NiTK Silikon 1,5M	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-6021-0211-120	**23,56 €**
ALTF1 LM235Z Silikon 1,5M	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-6022-1211-120	**21,78 €**
ALTF1 NTC1,8K Silikon 1,5M	NTC 1.8 K	1101-6021-2211-120	**21,65 €**
ALTF1 NTC10K Silikon 1,5M	NTC 10K	1101-6021-5211-120	**21,65 €**
ALTF1 NTC20K Silikon 1,5M	NTC 20K	1101-6021-6211-120	**21,65 €**
Note:	including strap, connecting cable **silicone** (KL = 1.5 m)		
Extra charge:	Protection type **IP68** (Sensor sleeve watertight compound-filled) 2-wire connecting leads, per running meter (**silicone**) Other sensors optional	 on request on request	**3,40 €**

ACCESSORIES			
WLP-1	Heat-conductive paste, silicone-free	7100-0060-1000-000	**3,38 €**

THERMASGARD® ALTF 2
THERMASGARD® ALTF 02

**Surface contact temperature sensors /
tube contact temperature sensors, including strap,
with passive output**

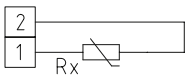
S+S REGELTECHNIK

THERMASGARD® **ALTF 2** is a tube contact resistance thermometer with passive output, in an impact-resistant plastic housing with quick-locking screws, incl.strap.

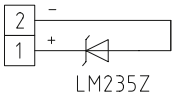
THERMASGARD® **ALTF 02** is a cost-saving tube contact resistance thermometer with passive output, in an impact-resistant plastic housing with snap-on lid, incl.strap.

Surface contact sensors are electric contact thermometers used for surface temperature measurement on solids, having at least one so-called contact area that is brought into contact with the surface to be measured. This surface contact temperature sensor measures the temperature of a medium flowing inside a pipe (e.g. the water temperature). This tube surface sensor is used for measuring temperature on piping and tubes (e.g. cold-water and hot-water), wor on heating sections for heating system control.

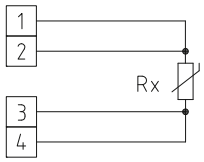
1x two-wire connection
standard



1x two-wire connection
LM 235 Z (KP 10)



1x four-wire connection
(optional)





TECHNICAL DATA

Measuring range:	–30...+110 °C
Sensors / output:	see table, passive (**Perfect Sensor Protection**) (optional also with two sensors)
Connection type:	2-wire connection (4-wire connection on PT100 / PT1000A, optional on other sensors)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016), **ALTF 02 with snap-on lid,** **ALTF 2 with quick-locking screws** (slotted / Phillips head combination)
Dimensions:	72 x 64 x 37.8 mm (Tyr 1 / Tyr 01)
Electrical connection:	0.14 - 1.5 mm² via terminal screws
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Process connection:	with **endless strap** with metal tightener (included in the scope of delivery) Ø = 13 - 92 mm (¼ - 3"), length L = 300 mm
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**ALTF 02 IP 54** (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713160960A (Tyr 01) **ALTF 2 IP 65** (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)

THERMASGARD® ALTF 02 Surface contact temperature sensors / tube contact temperature sensors, *Standard* including strap, with snap-on lid

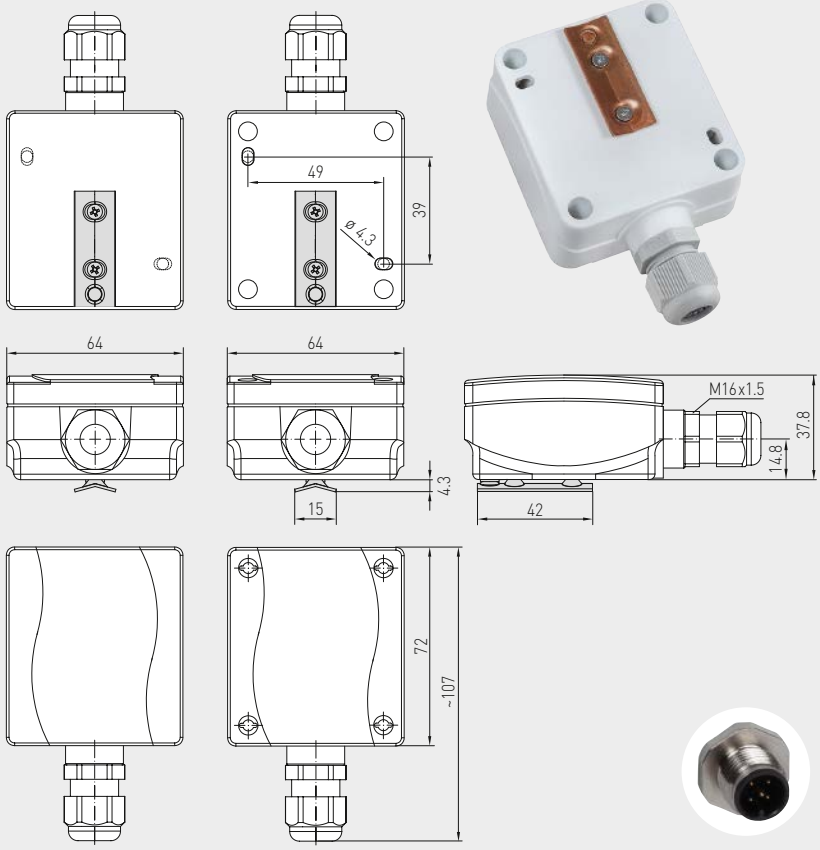
Type / WG03B	Sensor / Output	Item No.	Price
ALTF 02		**IP 54**	
ALTF02 Pt100	Pt100 (according to DIN EN 60 751, class B)	1101-1010-1003-000	**21,65 €**
ALTF02 Pt1000	Pt1000 (according to DIN EN 60 751, class B)	1101-1010-5001-000	**21,65 €**
ALTF02 Ni1000	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-1010-9001-000	**22,02 €**
ALTF02 NiTK	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-1011-0001-000	**25,21 €**
ALTF02 LM235Z	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-1012-1001-000	**22,28 €**
ALTF02 NTC1,8K	NTC 1.8 K	1101-1011-2001-000	**21,00 €**
ALTF02 NTC10K	NTC 10K	1101-1011-5001-000	**21,00 €**
ALTF02 NTC20K	NTC 20K	1101-1011-6001-000	**21,00 €**
Extra charge:	two or other sensors optional cable connection with **M12 connector** according to DIN EN 61076-2-101	on request on request	

ACCESSORIES

WLP-1	Heat-conductive paste, silicone-free	7100-0060-1000-000	**3,38 €**

Dimensional drawing

ALTF 2
ALTF 02



with snap-on lid

with quick-locking screws

M12 connector
(optional on request)



ALTF 02
with snap-on lid
(IP 54)



ALTF 2
with quick-locking screws
(IP 65)

High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

THERMASGARD® ALTF 2	Surface contact temperature sensors / tube contact temperature sensors, *Premium* including strap, with quick-locking screws		
Type / WG03	**Sensor / Output**	**Item No.**	**Price**
ALTF 2		**IP 65**	
ALTF2 Pt100	Pt100 (according to DIN EN 60751, class B)	1101-1020-1003-000	**25,14 €**
ALTF2 Pt1000	Pt1000 (according to DIN EN 60751, class B)	1101-1020-5001-000	**25,85 €**
ALTF2 Pt1000A	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-1020-6003-000	**29,40 €**
ALTF2 Ni1000	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm / K)	1101-1020-9001-000	**25,49 €**
ALTF2 NiTK	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-1021-0001-000	**29,88 €**
ALTF2 LM235Z	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-1022-1001-000	**24,66 €**
ALTF2 NTC1,8K	NTC 1.8 K	1101-1021-2001-000	**21,45 €**
ALTF2 NTC10K	NTC 10K	1101-1021-5001-000	**21,45 €**
ALTF2 NTC20K	NTC 20K	1101-1021-6001-000	**21,45 €**
Extra charge:	two or other sensors optional cable connection with **M12 connector** according to DIN EN 61076-2-101	on request on request	

ACCESSORIES			
WLP-1	Heat-conductive paste, silicone-free	7100-0060-1000-000	**3,38 €**

THERMASGARD® RPTF 1

Pendulum room temperature sensors with passive output

S+S REGELTECHNIK

Resistance thermometer **THERM**ASGARD® **RPTF 1** with passive output is specifically used for temperature detection in larger rooms and halls. Due to the measuring method employed by this pendulum room temperature sensor in combination with its positioning in the room, excellent and room-representative measuring results are achieved as ambient air of the room is steadily washing around the sensor.

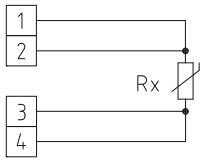
RPTF 1



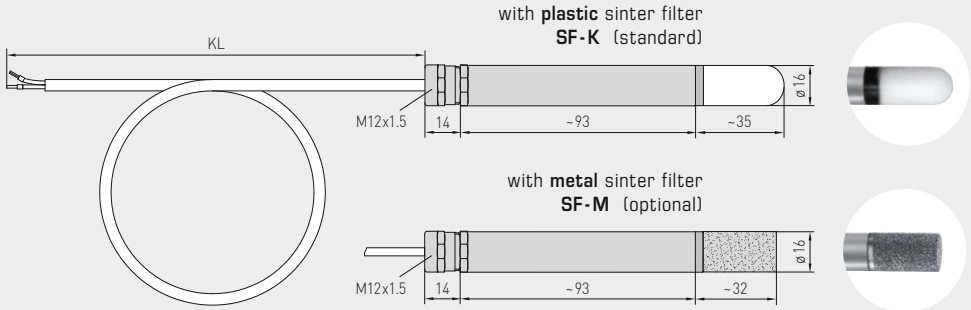
TECHNICAL DATA

Measuring range:	–5...+60 °C
Sensors / output:	see table, passive (optional also with two sensors)
Sensor protection:	**plastic** sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional **metal** sinter filter, Ø 16 mm, L = 32 mm)
Connection type:	2-wire connection (4-wire connection optional)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Connection cable:	PVC, H03VV-F, 2 x 0.5 mm², ends stripped with wire end sleeves KL = approx. 1.5 m (other lengths optional)
Protective tube:	**stainless steel V2A** (1.4301), Ø =16 mm, NL = 142 mm
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Humidity:	< 95 % RH
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)

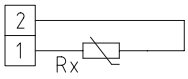
1x four-wire connection (optional)



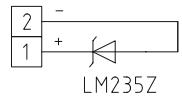
Dimensional drawing **RPTF 1**



1x two-wire connection **standard**



1x two-wire connection **LM 235 Z (KP 10)**



THERMASGARD® RPTF 1 Pendulum room temperature sensors (with metal sleeve)

Type / WG03	Sensor / Output	Item No.	Price
RPTF 1		IP 65	
RPTF1 Pt100 PVC 1,5M	Pt100 (according to DIN EN 60 751, class B)	1101-6060-1211-010	**58,68 €**
RPTF1 Pt1000 PVC 1,5M	Pt1000 (according to DIN EN 60 751, class B)	1101-6060-5211-010	**61,76 €**
RPTF1 Ni1000 PVC 1,5M	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-6060-9211-010	**60,72 €**
RPTF1 NiTK PVC 1,5M	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-6061-0211-010	**64,54 €**
RPTF1 LM235Z PVC 1,5M	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-6062-1211-110	**58,83 €**
RPTF1 NTC1,8K PVC 1,5M	NTC 1.8 K	1101-6061-2211-010	**64,30 €**
RPTF1 NTC10K PVC 1,5M	NTC 10K	1101-6061-5211-010	**64,30 €**
RPTF1 NTC20K PVC 1,5M	NTC 20K	1101-6061-6211-010	**64,30 €**
ACCESSORIES			
SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel **V4A** (1.4404)	7000-0050-2200-100	**42,33 €**
Extra charge:	2-wire connecting leads, per running meter (**PVC**) 4-wire connecting leads, per running meter (**PVC**)	on request on request	
For special orders please specify:	Type, sensor type and cable length e. g. RPTF1 Pt100, 3 m; RPTF1 Pt1000, 4 m; RPTF1 KTY 81-210, 6 m		

Resistance thermometer **THERM**ASGARD® **RPTF 2** with passive output is specifically used for temperature detection in larger rooms and halls, as dark radiation sensor for example. The pendulum room sensor RPTF-2 (globe thermometer) determines the effective portion of active radiation or also the effective radiant heat at the measured location. Due to the measuring method employed by this pendulum room temperature sensor in combination with its positioning in the room, an excellent and room-representative measuring result is achieved. The globe temperature is determined to take heat radiation into consideration and to estimate the degree of thermal comfort (operative room temperature).
The operative room temperature describes the coaction of heat radiation and heat convection (the ratio of globe temperature / air temperature is approx. 70 % / 30 %).

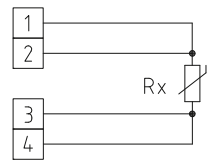
RPTF 2



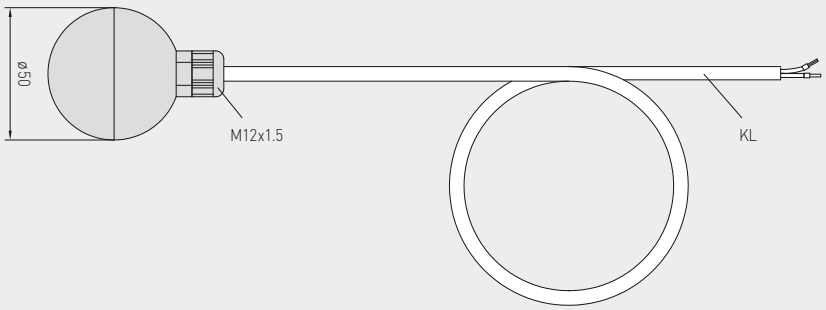
TECHNICAL DATA

Measuring range:	–5...+60 °C
Sensors / output:	see table, passive (optional also with two sensors)
Connection type:	2-wire connection (4-wire connection optional)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Globe:	plastic, colour black, Ø = 50 mm
Connection cable:	PVC, H03VV-F, 2 x 0.5 mm², ends stripped with wire end sleeves KL = approx. 1.5 m (other lengths optional)
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Humidity:	< 95 % RH
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)

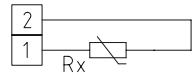
1x four-wire connection (optional)



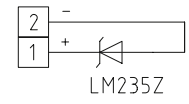
Dimensional drawing **RPTF 2**



1x two-wire connection **standard**



1x two-wire connection **LM 235 Z (KP 10)**



THERMASGARD® RPTF 2 Pendulum room temperature sensors (with globe)

Type / WG03	Sensor / Output	Item No.	Price
RPTF 2		**IP 65**	
RPTF2 Pt100 PVC 1,5M	Pt100 (according to DIN EN 60 751, class B)	1101-6070-1211-010	**58,83 €**
RPTF2 Pt1000 PVC 1,5M	Pt1000 (according to DIN EN 60 751, class B)	1101-6070-5211-010	**61,87 €**
RPTF2 Ni1000 PVC 1,5M	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-6070-9211-010	**60,84 €**
RPTF2 NiTK PVC 1,5M	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-6071-0211-010	**64,66 €**
RPTF2 LM235Z PVC 1,5M	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-6072-1211-010	**58,95 €**
RPTF2 NTC1,8K PVC 1,5M	NTC 1.8 K	1101-6071-2211-010	**64,42 €**
RPTF2 NTC10K PVC 1,5M	NTC 10K	1101-6071-5211-010	**64,42 €**
RPTF2 NTC20K PVC 1,5M	NTC 20K	1101-6071-6211-010	**64,42 €**
Extra charge::	2-wire connecting leads, per running meter (**PVC**) 4-wire connecting leads, per running meter (**PVC**)	on request on request	
For special orders please specify:	Type, sensor type and cable length e. g. RPTF2 Pt100, 3 m; RPTF2 Pt1000, 4 m; RPTF2 KTY 81-210, 6 m		

S+S REGELTECHNIK

On-wall radiation temperature sensors with passive output

Resistance thermometer **THERM**ASGARD® **ASTF** with passive output, terminal box housing made of impact-resistant plastic and housing cover with quick-locking screws. This radiation sensor is specifically designed for temperature detection in wet areas or in larger rooms or halls. The on-wall radiation temperature sensor ASTF determines the effective portion of active radiation or the effective radiant heat at the measured location. Due to the measuring method employed by the dark radiation temperature sensor, excellent and room-representative measuring results are achieved.

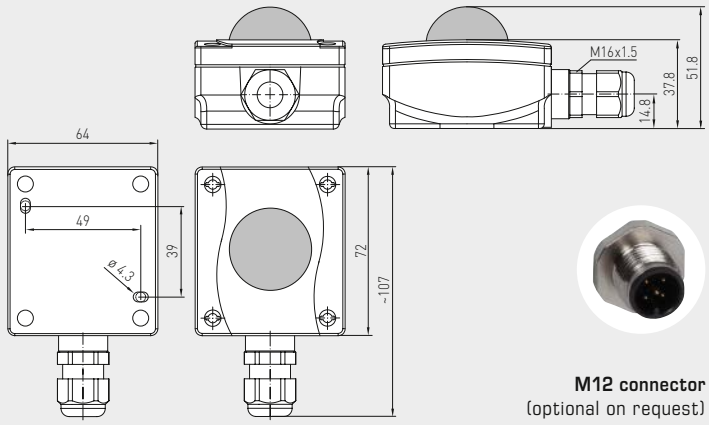
ASTF



TECHNICAL DATA

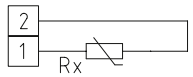
Measuring range:	–30 ...+ 75 °C
Sensors / output:	see table, passive (optional also with two sensors)
Connection type:	2-wire connection (4-wire connection on PT100, optional on other sensors)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Process connection:	by screws
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), semi-globe: black
Housing dimensions:	72 x 64 x 37.8 (51.8) mm (Tyr 1)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Humidity:	< 95 % RH
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)

Dimensional drawing **ASTF**

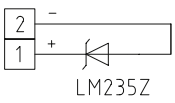


M12 connector
(optional on request)

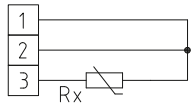
1x two-wire connection **standard**



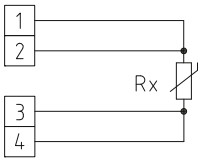
1x two-wire connection **LM 235 Z (KP 10)**



1x three-wire connection (optional)



1x four-wire connection (optional)



THERMASGARD® ASTF On-wall radiation temperature sensors

Type / WG03	Sensor / Output	Item No.	Price
ASTF		**IP 65**	
ASTF Pt100	Pt100 (according to DIN EN 60 751, B)	1101-1060-1003-000	**70,49 €**
ASTF Pt1000	Pt1000 (according to DIN EN 60 751, class B)	1101-1060-5001-000	**70,49 €**
ASTF Ni1000	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-1060-9001-000	**71,73 €**
ASTF NiTK	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-1061-0001-000	**74,10 €**
ASTF LM235Z	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-1062-1001-000	**69,18 €**
ASTF NTC1,8K	NTC 1.8 K	1101-1061-2001-000	**74,10 €**
ASTF NTC10K	NTC 10K	1101-1061-5001-000	**74,10 €**
ASTF NTC20K	NTC 20K	1101-1061-6001-000	**74,10 €**
Extra charge:	two or other sensors optional cable connection with **M12 connector** according to DIN EN 61076-2-101	on request on request	

Resistance thermometer **THERM**ASGARD® **RSTF** with passive output in an elegant housing made of plastic, with snap-on lid, base with 4-hole attachment for installation on vertically or horizontally installed in-wall flush boxes, with predetermined breaking point for on-wall cable entry, specifically used for temperature detection in larger rooms. The room radiation temperature sensor RSTF determines the effective portion of active radiation or the effective radiant heat at the measured location. Due to the measuring method employed by the dark radiation temperature sensor, an excellent and room-representative measuring result is achieved. In addition there is an independent passive output available to determinate the reference temperature.

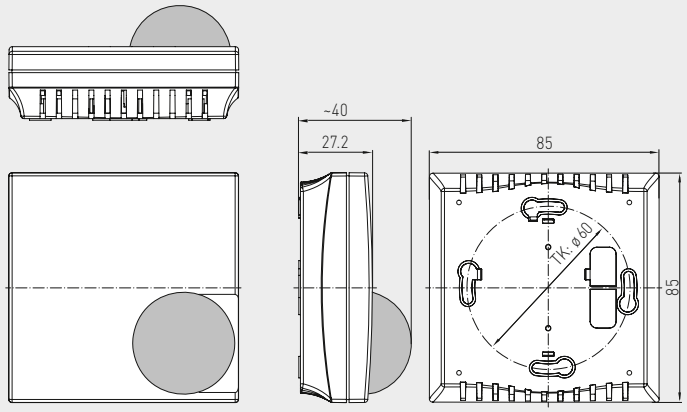
RSTF



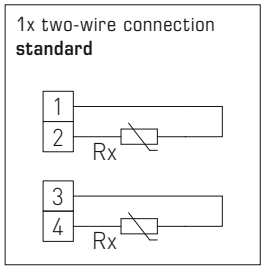
TECHNICAL DATA

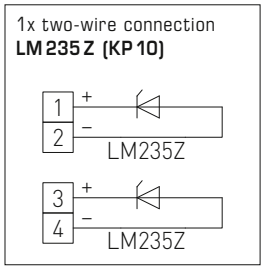
Measuring range:	–30...+75 °C
Sensors / output:	see table, passive (optional also with two sensors)
Connection type:	2-wire connection (4-wire connection on PT100, optional on other sensors)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Process connection:	by screws
Housing:	plastic, material ABS Housing: pure white (similar to RAL 9010), Semi-globe: black
Dimensions:	85 x 85 x 27 (40) mm (Baldur 1)
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Humidity:	< 95 % RH
Protection class:	III (according to EN 60 730)
Protection type:	**IP 30** (according to EN 60 529)

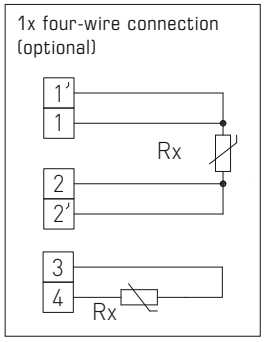
Dimensional drawing **RSTF**

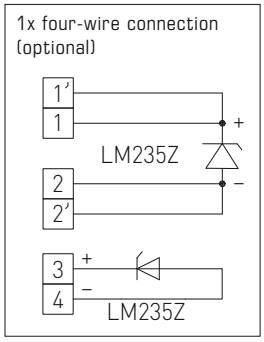


Terminals 3 and 4:
Sensor for reference temperature









THERMASGARD® RSTF Room radiation temperature sensors

Type / WG03	Sensor / Output	Item No.	Price
RSTF		**IP 30**	
RSTF Pt100	Pt100 (according to DIN EN 60 751, class B)	1101-40C0-1003-000	**69,18 €**
RSTF Pt1000	Pt1000 (according to DIN EN 60 751, class B)	1101-40C0-5001-000	**69,18 €**
RSTF Ni1000	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-40C0-9001-000	**71,73 €**
RSTF NiTK	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-40C1-0001-000	**73,75 €**
RSTF LM235Z	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-40C2-1001-000	**69,18 €**
RSTF NTC1,8K	NTC 1.8 K	1101-40C1-2001-000	**73,00 €**
RSTF NTC10K	NTC 10K	1101-40C1-5001-000	**73,00 €**
RSTF NTC20K	NTC 20K	1101-40C1-6001-000	**73,00 €**
Extra charge:	two or other sensors optional	on request	

Temperature

THERMASGARD® **active sensors** – precise thermal management

Our active temperature sensors are easy to install, versatile and meet all requirements important to you.

Adjustable and calibratable temperature transmitters with self-diagnostics provide additional flexibility.

Application Areas

- Hospitals, museums, schools, hotels, public authorities, institutes and banks
- Sports arenas, holiday centers and movie theaters
- Car dealers
- Ships and shipyards
- Industrial plants and assembly halls
- Power plants and refineries





THERMASGARD®
ACTIVE TEMPERATURE SENSORS

Room sensors, room control units

RTM 1	Room temperature measuring transducer	**263**
FSTM	Room temperature measuring transducer, in-wall	**265**
FSTM-P	Room control units, in-wall	**265**
RPTM 1	Pendulum room temperature measuring transducer	**323**
RPTM 2	Pendulum room temperature measuring transducer	**325**

Outdoor sensors, on-wall sensors

ATM 2	Outside temperature measuring transducer	**269**
ATM 2-VA	Outside temperature measuring transducer (Stainless steel housing Tyr 2E)	**273**

Cable sensors, surface-contact sensors

HFTM	Sleeve sensor with cable, temperature measuring transducer	**307**
HFTM-VA	Sleeve sensor with cable, temperature measuring transducer (Stainless steel housing Tyr 2E)	**311**
ALTM 1	Surface-contact temperature measuring transducer	**313**
ALTM 2	Surface-contact temperature measuring transducer with cable	**317**
ALTM 2-VA	Surface-contact temperature measuring transducer with cable (Stainless steel housing Tyr 2E)	**321**

Duct / immersion / screw-in sensors

TM 43	Duct / immersion / screw-in temperature measuring transducer	**277**
TM 65	Duct / immersion / screw-in temperature measuring transducer	**277**
TM 54	Duct / immersion / screw-in temperature measuring transducer	**287**
RGTM 2	Smoke gas temperature measuring transducer, screw-in sensor	**301**
RGTM 1	Smoke gas temperature measuring transducer, duct sensor	**295**
MWTM	Mean-value temperature measuring transducer, rod sensor	**283**
MWTM-SD	Mean-value temperature measuring transducer, rod sensor	**283**

Immersion sleeves and accessories

see chapter Accessories		**644**



THERMASGARD® RTM 1

Room temperature measuring transducers, calibratable, with multi-range switching and active output

S+S REGELTECHNIK

Calibratable room temperature measuring transducer **THERM**ASGARD® **RTM 1** with continuous output, with or without optional display for displaying the actual temperature in an elegant housing made of plastic, with snap-on lid, base with 4-hole attachment for installation on vertically or horizontally installed in-wall flush boxes, with predetermined breaking point for on-wall cable entry, or in housing made of stainless steel (top and bottom part are of stainless steel, the lid is screwed on), vandal-proof version e.g. for schools, military barracks, and public buildings. This room temperature transmitter / residential room temperature sensor is used to detect / display temperatures in closed dry rooms, in apartments, in offices, supermarkets and business facilities.

RTM 1



TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %) for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (ohm) = (U_b -14 V) / 0.02 A for I variant
Load resistance:	R_L > 5 kOhm for U variant
Power consumption:	< 1.0 W / 24 V DC; < 2.2 VA / 24 V AC
Sensor:	Pt1000, DIN EN 60751, class B
Measuring ranges:	**multi-range switching with 8 switchable measuring ranges,** see table (other ranges optional) operating range –30...+70 °C **with manual zero point correction (± 10 K)**
Deviation, temperature:	typically ± 0.2 K at +25 °C
Output:	0 - 10 V or 4...20 mA
Ambient temperature:	measuring transducer –30...+70 °C
Connection type:	2- or 3-wire connection
Process connection:	by screws
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010), (optional stainless steel) **V2A** (1.4301)
Dimensions:	85 x 85 x 27 mm (Baldur 1) 75 x 75 x 25 mm (stainless steel)
Electrical connection:	0.14 - 1.5 mm² via terminal screws
Installation:	wall mounting or on in-wall flush box Ø 55 mm, base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes for cable entry from the back, with predetermined breaking point for on-wall cable entry from top / bottom in case of plain on-wall installation
Humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 30** (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC directive 2014 / 30 / EU
Optional:	Two-line **display with illumination**, cutout 36 x 15 mm (W x H), for displaying the **ACTUAL temperature** and the **internal diagnostics** (sensor breakage, sensor short circuit) see beginning of this chapter!

Measuring ranges (adjustable)	DIP 1	DIP 2	DIP 3
–20 °C...+150 °C	**ON**	**ON**	**ON**
–50 °C... +50 °C	OFF	**ON**	**ON**
–20 °C... +80 °C	**ON**	OFF	**ON**
–30 °C... +60 °C	OFF	OFF	**ON**
0 °C... +40 °C	**ON**	**ON**	OFF
0 °C... +50 °C*	OFF	**ON**	OFF
0 °C...+100 °C	**ON**	OFF	OFF
0 °C...+150 °C	OFF	OFF	OFF

* (default / fixed with display)

Display and internal diagnostics — **RTM 1 - U - Display** / **RTM 1 - I - Display**



Standard

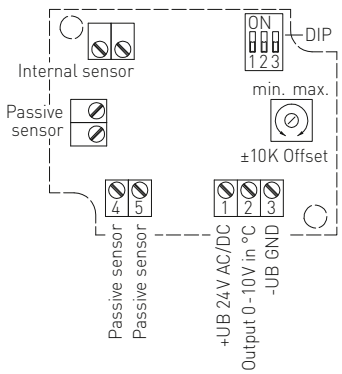


Sensor breakage

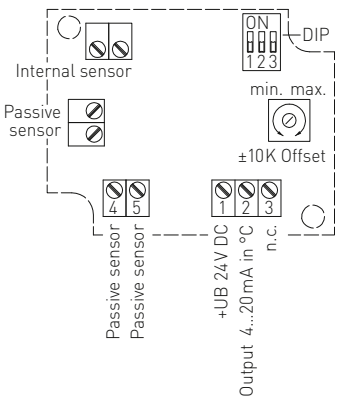


Sensor short circuit

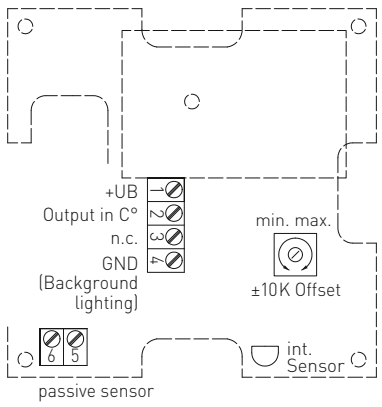
3-wire connection — **RTM 1 - U without display**



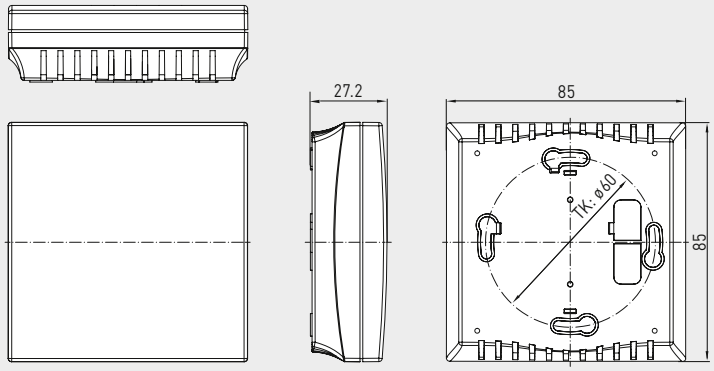
2-wire connection — **RTM 1 - I without display**



2- or 3-wire connection — **RTM 1 - xx with display**



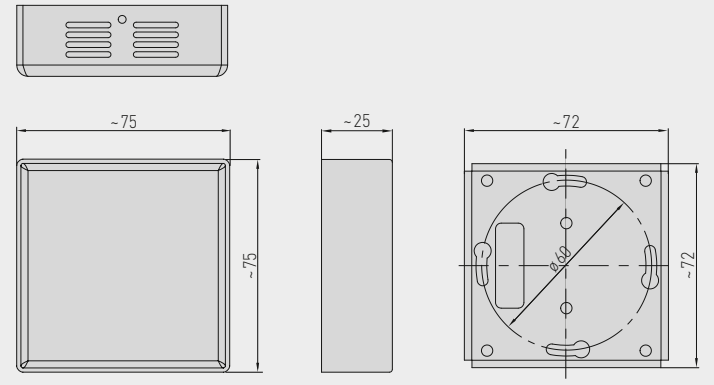
Dimensional drawing — Housing **Baldur 1**



RTM 1
with display



Dimensional drawing — Housing **stainless steel**



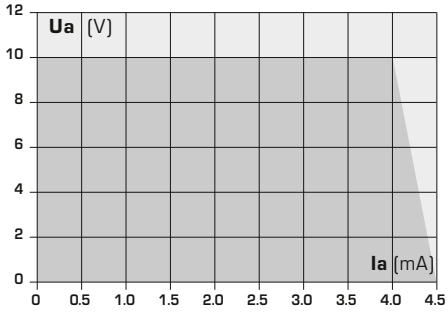
RTM 1
(stainless steel)







Dependency of output voltage on output current



THERMASGARD® RTM 1 Room temperature measuring transducers

Type / WG01	Sensor	Output	Features	Display	Item No.	Price
RTM1-U					**IP30, U-variant**	
RTM1-U	Pt1000	0-10 V	–		1101-41A1-0000-200	**76,59 €**
RTM1-U **LCD**	Pt1000	0-10 V	Display*	■	1101-41A1-2000-200	**120,81 €**
RTM1-U VA	Pt1000	0-10 V	Stainless steel housing **V2A** (1.4301)		1101-4151-0000-200	**199,25 €**
RTM1-I					**IP30, I-variant**	
RTM1-I	Pt1000	4...20 mA	–		1101-41A2-0000-200	**76,59 €**
RTM1-I **LCD**	Pt1000	4...20 mA	Display*	■	1101-41A2-2000-200	**120,81 €**
RTM1-I VA	Pt1000	4...20 mA	Stainless steel housing **V2A** (1.4301)		1101-4152-0000-200	**199,25 €**
Extra charge:	Other ranges optional					**25,40 €**
Note:	* When equipped with display, the measuring range of 0...+50 °C is fixed.					

THERMASGARD® FSTM
THERMASGARD® FSTM-P

**Room temperature sensor or measuring transducer,
in-wall in the panel switch programme,
with active output**

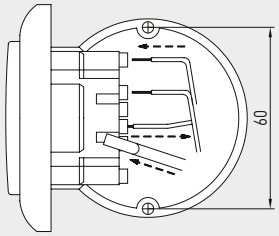
S+S REGELTECHNIK

The room sensor **THERM**ASGARD® **FSTM / FSTM-P** in the in-wall housing, optionally with potentiometer, is used for measuring the room temperature, and for setpoint adjustment. It converts the measured values into a standard signal of 0-10 V. A digital, long-term stable sensor is used for temperature measurement.

The in-wall sensor is mounted in high-quality panel switch programmes, ideally of the brands Gira, Berker, Merten, Jung, Siemens or Busch-Jaeger (using in-wall adapters, no setpoint adjustment possible) either individually or in combination with light switches, socket outlets, etc.

It is used in non-aggressive, dust-free environments, in refrigeration, air conditioning and clean room technology, and in interior rooms, such as living rooms, offices, hotels, etc.

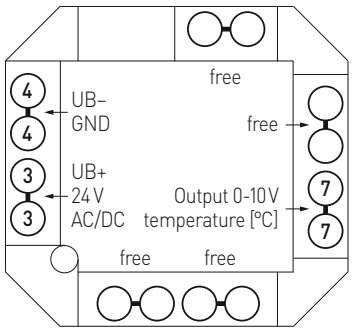
Mounting diagram **in-wall**



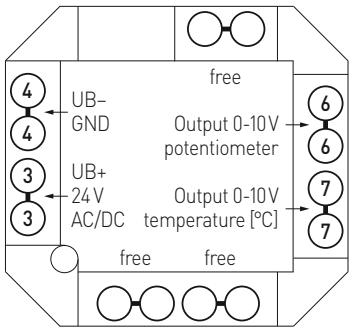
TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %)
Power consumption:	< 1.1 W / 24 V DC; < 2.2 VA / 24 V AC
TEMPERATURE	
Sensor:	**digital temperature sensor,** low hysteresis, high long-term stability
Long-term stability:	± 1 % per year
Measuring range:	0...+50 °C
Deviation, temperature:	typically ± 0.8 K at +25 °C
Output, temperature:	0-10 V
POTENTIOMETER	
Output, potentiometer:	0-10 V
Mounting:	in-wall flush box Ø 55 mm
Electrical connection:	1,0-2,5 mm², via plug terminals
Ambient temperature:	Storage –35...+85 °C; Operation 0...+50 °C
Permitted humidity:	max. 90 % RH, non-precipitating air
Medium:	clean air and other non-aggressive, non-combustible gases
Protection class:	III (according to EN 60 730)
Protection type:	**IP 20** (according to 60 529)
Standards:	CE-conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU
SWITCH PROGRAMME	
Manufacturer:	GIRA System 55 (other switch programmes, manufacturers, colours as well as prices available upon request)
Housing:	plastic, the standard colour is pure glossy white (similar to RAL 9010) (other colours are available upon request with colour variants depending on the respective light switch programme)

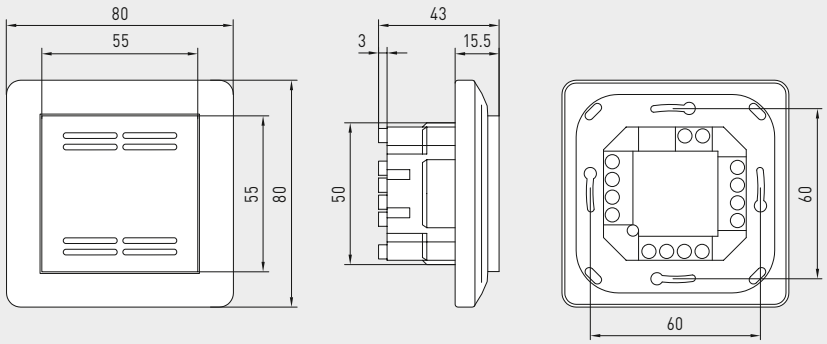
Connection diagram **FSTM**



Connection diagram **FSTM-P**



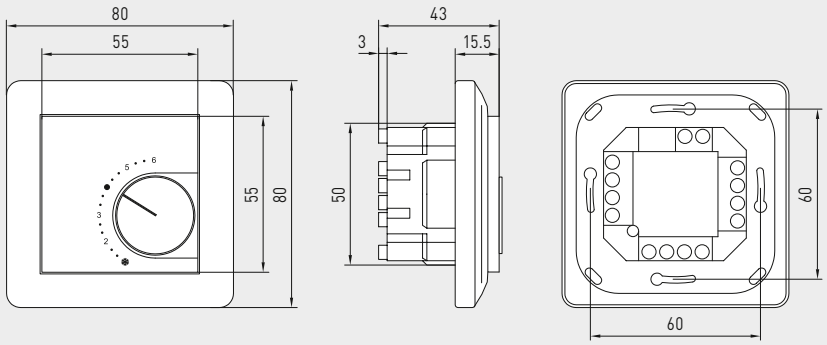
Dimensional drawing **FSTM**



FSTM
Standard



Dimensional drawing **FSTM-P**



FSTM-P
with potentiometer



Temperature table
MR: 0...+50 °C

°C	U_A [V]
0	0.0
5	1.0
10	2.0
15	3.0
20	4.0
25	5.0
30	6.0
35	7.0
40	8.0
45	9.0
50	10.0

THERMASGARD® FSTM Room temperature sensor or measuring transducer, in-wall
THERMASGARD® FSTM-P Room temperature sensor or measuring transducer, in-wall with potentiometer

Type / WG02	Measuring Range Temperature	Output Temperature	Potentiometer	Item No.	Price
FSTM					
FSTM-U	0...+50 °C	0-10 V	–	1101-9121-0000-162	**125,67 €**
FSTM-P					
FSTM-U P	0...+50 °C	0-10 V	0-10 V	1101-9121-0004-282	**149,38 €**

THERMASGARD® ATM 2

Outside temperature / wet room temperature measuring transducers, calibratable, with multi-range switching and active output

S+S REGELTECHNIK

Calibratable outside temperature measuring transducer **THERM**ASGARD® **ATM 2** with eight switchable measuring ranges, external sensor, continuous output, housing made from impact-resistant plastic with quick-release screws, optionally **with / without display**, with **cable gland** or **M12 connector** according to DIN EN 61076-2-101.

It is used to detect outside temperatures, temperatures in wet rooms, e.g. for installation on outside walls, in cold storage buildings and greenhouses, in the industrial sector and in agriculture. Installation in outdoor areas preferably at the north side of a building or in a protected place. In case of direct solar irradiation, we recommend the use of our sun and ball-impact protection hood **WS01** or **WS04** (accessories) or the device version with the installed sun protection hood **SS02** (on request).

The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

ATM 2
with cable gland
and SS-02



TECHNICAL DATA

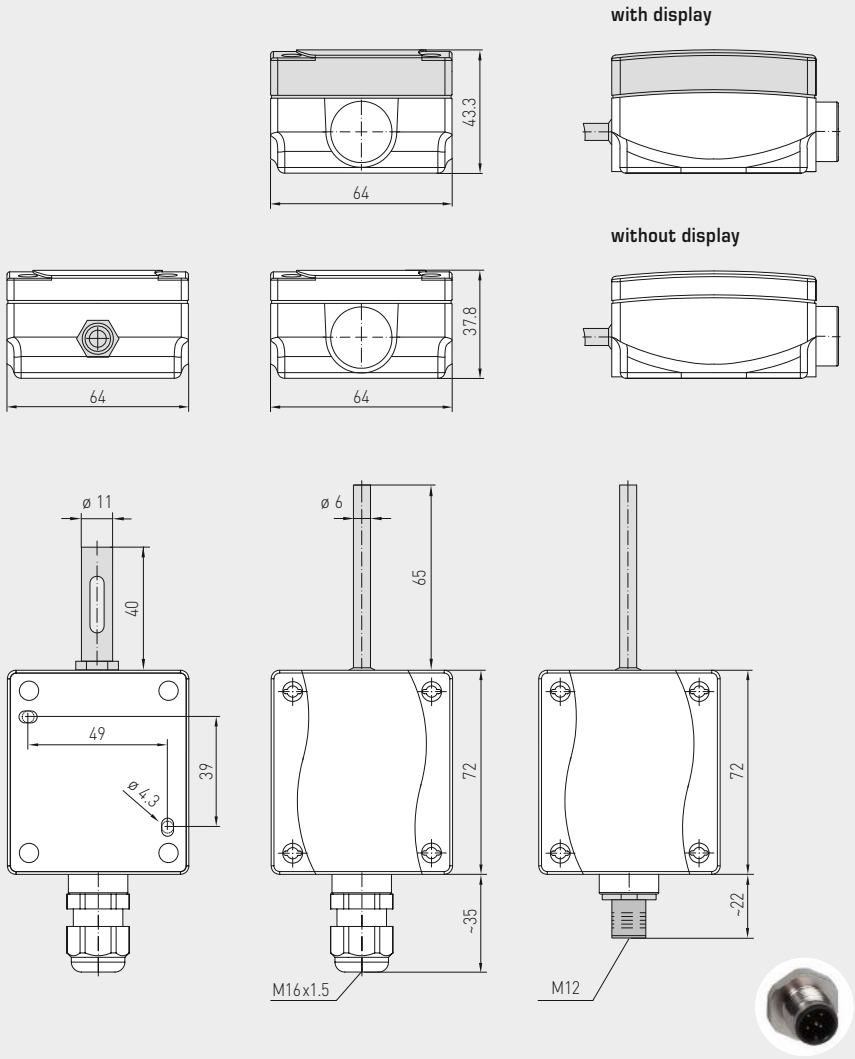
Power supply:	24 V AC / DC (± 10 %) for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (ohm) = (U_b -14 V) / 0.02 A for I variant, see load resistance diagram
Load resistance:	R_L > 5 kOhm for U variant
Power consumption:	< 1.0 VA / 24 V DC; < 2.2 VA / 24 V AC
Sensor:	Pt1000, DIN EN 60751, class B, (**Perfect Sensor Protection**) Sensor external
Measuring ranges:	**multi-range switching** **with 8 switchable measuring ranges** see table (other measuring ranges optional) operating range –30...+70 °C **with manual zero point correction (± 10 K)**
Deviation in temperature:	typically ± 0.2 K at +25 °C
Output:	0 - 10 V or 4...20 mA
Connection type:	2- or 3-wire connection
Electrical connection:	0.14 - 1.5 mm², via screw terminals
Cable connection:	**cable gland, stainless steel V2A** (1.4305) (M 20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) **or** **M12 connector** (male, 5-pin, A-code) according to DIN EN 61076-2-101
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-release screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), cover for display is transparent!
Housing dimensions:	72 x 64 x 37.8 mm (Typ 1 without display) 72 x 64 x 43.3 mm (Typ 1 with display)
Protective tube:	made from stainless steel **V4A** (1.4571), Ø 6 mm, NL = 65 mm
Process connection:	by means of screws (on the housing base)
Ambient temperature:	measuring transducer –30...+70 °C
Permissible humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) Housing tested, TÜV SÜD, Report No.713139052 (Typ 1)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU
Optional:	**display with illumination,** two-line, cut-out approx. 36 x 15 mm (B x H), to display the **actual temperature** and **internal diagnostics** (measuring range exceeded, measuring range not reached, sensor breakage, sensor short circuit)
ACCESSORIES	(see table)

ATM 2 - Q
with M12 connector



Outside temperature / wet room temperature measuring transducers, calibratable, with multi-range switching and active output

Dimensional drawing **ATM 2**



Housing with **SS-02** (on request)

Housing with **cable gland**

Housing with **M12 connector**

ATM 2
with cable gland and display



ATM 2 - Q
with M12 connector and display





Display and internal diagnostics
THERMASGARD®
Measuring transducer with display



Standard



Measuring range exceeded



Measuring range not reached



Sensor breakage



Sensor short circuit

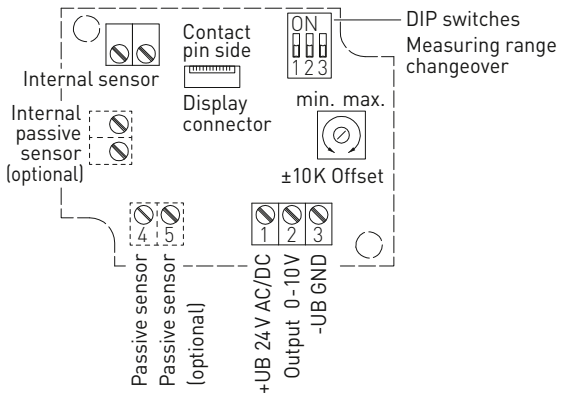
High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

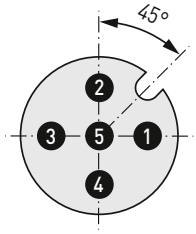
Outside temperature / wet room temperature measuring transducers, calibratable, with multi-range switching and active output

S+S REGELTECHNIK

Schematic diagram **ATM 2 - U**

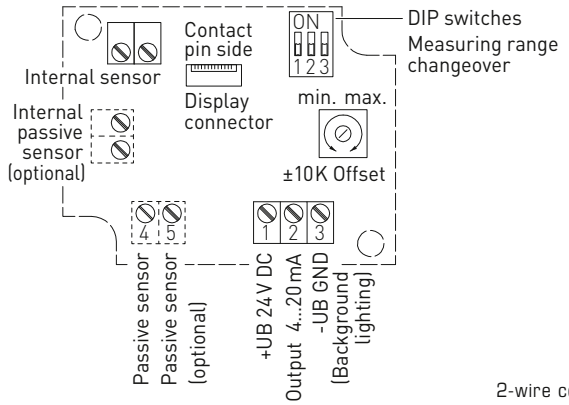


Pin assignment (M12) **ATM 2 - U**



1. +UB 24 V AC/DC
2. Output temperature 0-10 V [°C]
3. free
4. -UB GND
5. Shield

Schematic diagram * **ATM 2 - I**

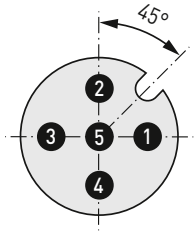


Connection*:

2-wire connection for devices with / without display (not illuminated)

3-wire connection for devices with illuminated display

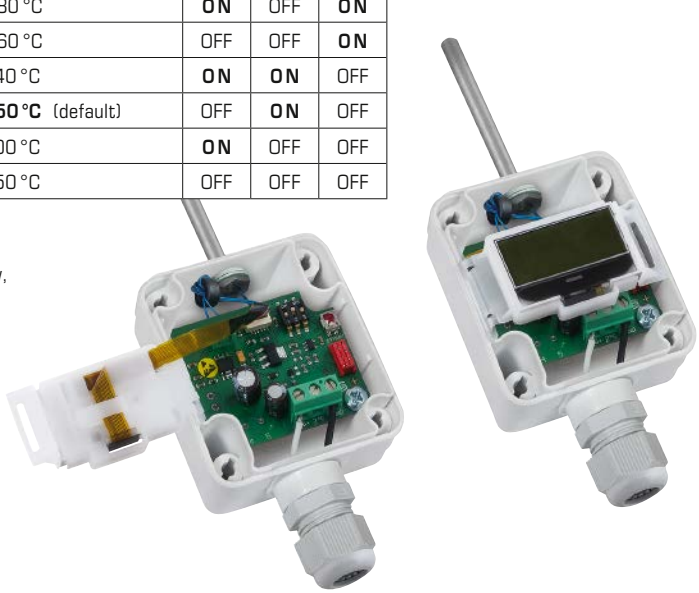
Pin assignment (M12) **ATM 2 - I**



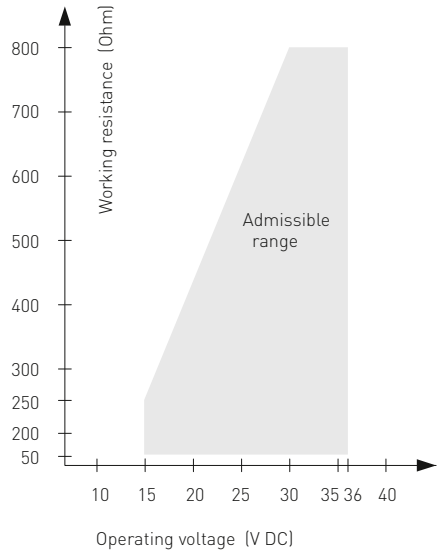
1. +UB 24 V DC
2. Output temperature 4...20 mA [°C]
3. free
4. -UB GND (optional for LCD backlighting)
5. Shield

Measuring ranges (adjustable)	**DIP 1**	**DIP 2**	**DIP 3**
-20...+150 °C	**ON**	**ON**	**ON**
-50... +50 °C	OFF	**ON**	**ON**
-20... +80 °C	**ON**	OFF	**ON**
-30... +60 °C	OFF	OFF	**ON**
0... +40 °C	**ON**	**ON**	OFF
0... +50 °C (default)	OFF	**ON**	OFF
0...+100 °C	**ON**	OFF	OFF
0...+150 °C	OFF	OFF	OFF

ATM 2-xx
with display, hinged



Load resistance diagram 4..20 mA **ATM 2 - I**



Outside temperature / wet room temperature measuring transducers, calibratable, with multi-range switching and active output

ATM 2 - Q
with M12 connector





ATM 2
with cable gland

THERMASGARD® ATM 2	Outside temperature / wet room temperature measuring transducers (with cable gland)				
Type / WG01	**Sensor**	**Output**	**Display**	**Item No.**	**Price**
ATM 2					
ATM2-I	Pt1000	4...20 mA		1101-1142-0009-900	**100,53 €**
ATM2-I **LCD**	Pt1000	4...20 mA	■	1101-1142-2009-900	**151,44 €**
ATM2-U	Pt1000	0-10 V		1101-1141-0009-900	**100,53 €**
ATM2-U **LCD**	Pt1000	0-10 V	■	1101-1141-2009-900	**151,44 €**
Housing variant:	Cable connection **with cable gland**				
Extra charge:	other measuring ranges optional with sun protection hood SS 02			on request	**25,40 €** **9,74 €**

THERMASGARD® ATM 2-Q	Outside temperature / wet room temperature measuring transducers (with M12 connector)				
Type / WG01	**Sensor**	**Output**	**Display ● = Q**	**Item No.**	**Price**
ATM 2 - Q					
ATM2-I **Q**	Pt1000	4...20 mA	●	2001-6111-2100-001	**142,44 €**
ATM2-I **Q LCD**	Pt1000	4...20 mA	● ■	2001-6112-2100-001	**193,37 €**
ATM2-U **Q**	Pt1000	0-10 V	●	2001-6111-1100-001	**142,44 €**
ATM2-U **Q LCD**	Pt1000	0-10 V	● ■	2001-6112-1100-001	**193,37 €**
Housing variant "Q":	Cable connection **with M12 connector** (male, **5-pin**, A-code)				
Extra charge:	see table above!				

ACCESSORIES			
WS-01	**protection contre le soleil et pare-balle,** 184 x 180 x 80 mm, en acier inox **V2A** (1.4301)	7100-0040-2000-000	**31,77 €**
WS-04	**protection contre le soleil et les intempéries,** 130 x 180 x 135 mm, en acier inox **V2A** (1.4301)	7100-0040-7000-000	**37,49 €**
	Special accessories for M12 connector see chapter Accessories!		

THERMASGARD® ATM 2 - VA

Outside temperature / wet room temperature measuring transducers, calibratable, with multi-range switching and active output

S+S REGELTECHNIK

Calibratable outside temperature measuring transducer **THERM**ASGARD® **ATM 2 - VA** with eight switchable measuring ranges, external sensor, continuous output, rugged housing made from **stainless steel V4A**, with **cable gland** or **M12 connector** according to DIN EN 61076-2-101.

It is used to detect outside temperatures, temperatures in wet rooms, e.g. for installation on outside walls, in cold storage buildings and greenhouses, in the industrial sector and in agriculture. Installation in outdoor areas preferably at the north side of a building or in a protected place. In case of direct solar irradiation, we recommend using our sun and ball-impact protection hood **WS01** or **WS03** (accessories).

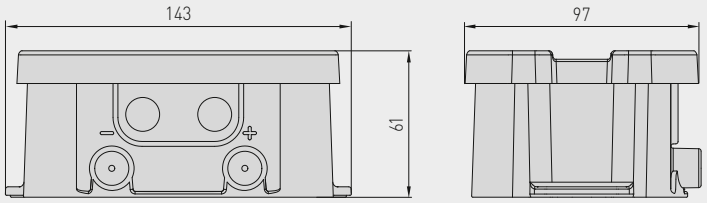
The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

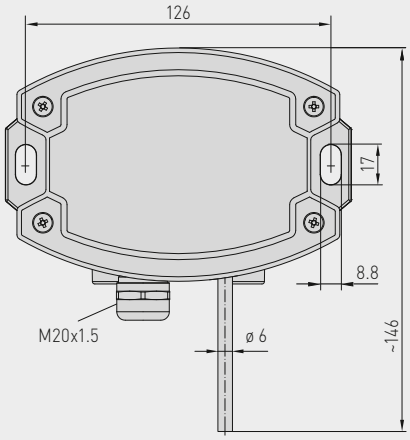
Power supply:	24 V AC / DC (± 10 %) for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (ohm) = (U_b -14 V) / 0.02 A for I variant, see load resistance diagram
Load resistance:	R_L > 5 kOhm for U variant
Power consumption:	< 1.0 VA / 24 V DC; < 2.2 VA / 24 V AC
Sensor:	Pt1000, DIN EN 60751, class B, (**Perfect Sensor Protection**) Sensor external
Measuring ranges:	**multi-range switching** **with 8 switchable measuring ranges** see table (other measuring ranges optional) operating range –30...+70 °C **with manual zero point correction (± 10 K)**
Deviation in temperature:	typically ± 0.2 K at +25 °C
Output:	0 - 10 V or 4...20 mA
Connection type:	2-wire connection
Electrical connection:	0.14 - 1.5 mm², via screw terminals
Cable connection:	**cable gland, stainless steel V2A** (1.4305) (M 20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) **or** **M12 connector** (male, 5-pin, A-code) according to DIN EN 61076-2-101
Housing:	**stainless steel V4A** (1.4571), with non-distortion cover bolting, impact resistant, high EMI shielding, corrosion, temperature, weather- and UV-resistant
Housing dimensions:	143 x 97 x 61 mm (Typ 2E)
Protective tube:	made from stainless steel **V4A** (1.4571), Ø 6 mm, NL = 65 mm
Process connection:	by screws
Ambient temperature:	measuring transducer –30...+70 °C
Permissible humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60730)
Protection type:	**IP 65** (according to EN 60529) Housing tested, TÜV SÜD, Report No. 713160960B (Skadi2)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU
ACCESSORIES	(see table)

Outside temperature / wet room temperature measuring transducers, calibratable, with multi-range switching and active output

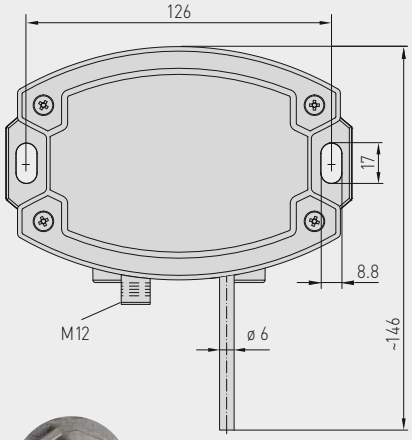
Dimensional drawing **ATM 2 - VA**



Housing with
cable gland



Housing with
M12 connector





M12 connector
(male)

High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

ATM 2 - VA
with cable gland



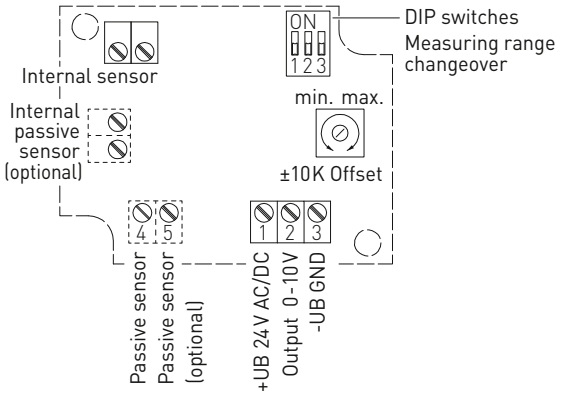
ATM 2 - VAQ
with M12 connector



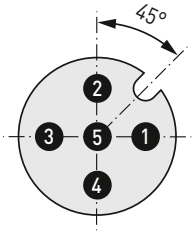
Outside temperature / wet room temperature measuring transducers, calibratable, with multi-range switching and active output

S+S REGELTECHNIK

Schematic diagram **ATM 2 - U**

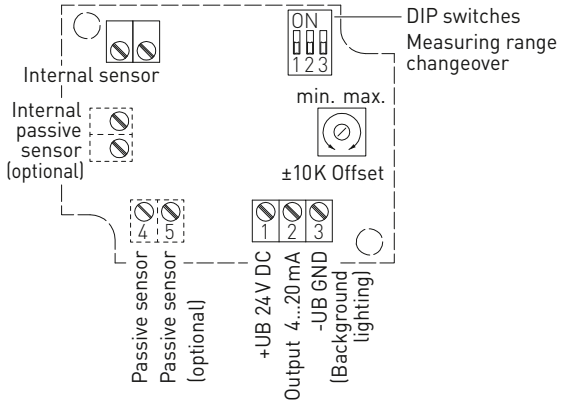


Pin assignment (M12) **ATM 2 - U**

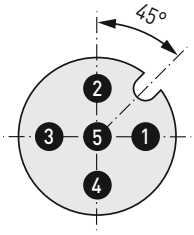


1. +UB 24 V AC/DC
2. Output temperature 0-10 V [°C]
3. free
4. -UB GND
5. Shield

Schematic diagram **ATM 2 - I**



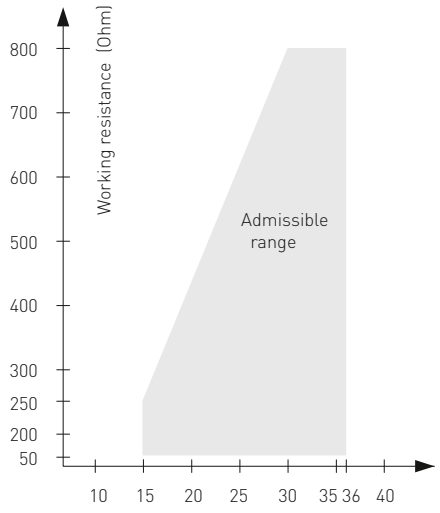
Pin assignment (M12) **ATM 2 - I**



1. +UB 24 V DC
2. Output temperature 4...20 mA [°C]
3. free
4. -UB GND (optional)
5. Shield

Measuring ranges (adjustable)	DIP 1	DIP 2	DIP 3
−20...+150 °C	**ON**	**ON**	**ON**
−50... +50 °C	OFF	**ON**	**ON**
−20... +80 °C	**ON**	OFF	**ON**
−30... +60 °C	OFF	OFF	**ON**
0... +40 °C	**ON**	**ON**	OFF
0... +50 °C (default)	OFF	**ON**	OFF
0...+100 °C	**ON**	OFF	OFF
0...+150 °C	OFF	OFF	OFF

Load resistance diagram 4.. 20 mA **ATM 2 - I**



ATM 2 - VAQ
with M12 connector



ATM 2 - VA
with cable gland



THERMASGARD® **ATM 2 - VA**	Outside temperature / wet room temperature measuring transducers, *ID* (Stainless steel housing **with cable gland**)			
Type / WG02I	**Sensor**	**Output**	**Item No.**	**Price**
ATM 2 - VA				
ATM2-I VA	Pt1000	4...20 mA	2001-6171-2200-001	**377,35 €**
ATM2-U VA	Pt1000	0-10 V	2001-6171-1200-001	**377,35 €**
Housing variant:	Cable connection **with cable gland**			
Extra charge:	other measuring ranges optional			**25,40 €**

THERMASGARD® **ATM 2 - VAQ**	Outside temperature / wet room temperature measuring transducers, *ID* (Stainless steel housing **with M12 connector**)				
Type / WG02I	**Sensor**	**Output**	**● = Q**	**Item No.**	**Price**
ATM 2 - VAQ					
ATM2-I VA**Q**	Pt1000	4...20 mA	●	2001-6171-2100-001	**415,88 €**
ATM2-U VA**Q**	Pt1000	0-10 V	●	2001-6171-1100-001	**415,88 €**
Housing variant "Q":	Cable connection **with M12 connector** (male, **5-pin**, A-code)				
Extra charge:	see table above!				

ACCESSORIES	
	Special accessories for M12 connector see chapter Accessories !

THERMASGARD® TM 43
THERMASGARD® TM 65

Immersion / screw-in / duct temperature measuring transducer, calibratable, with multi-range switching and active output

S+S REGELTECHNIK

Patented quality product (Immersion sensor patent no. DE 10 2012 017 500.0)

Calibratable temperature measuring transducer **THERM**ASGARD® **TM 43** with eight switchable measuring ranges, continuous linear output, straight protective tube, housing made from impact-resistant plastic with snap-on lid.

Calibratable temperature measuring transducer **THERM**ASGARD® **TM 65** with eight switchable measuring ranges, continuous linear output, straight protective tube, housing made from impact-resistant plastic with quick-locking screws, **with/without optional display**.

For the detection of temperatures in liquid or gaseous media. For aggressive media, stainless steel immersion sleeves must be used. It is used e.g. in piping systems, in heating technology, in storage tanks, in district heating compact stations, in hot-water and cold-water systems, in oil and lubricant circulation systems, in mechanical, apparatus and plant engineering as well as in the entire industrial sector. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TM 43
with snap-on lid
(IP 54)



TECHNICAL DATA

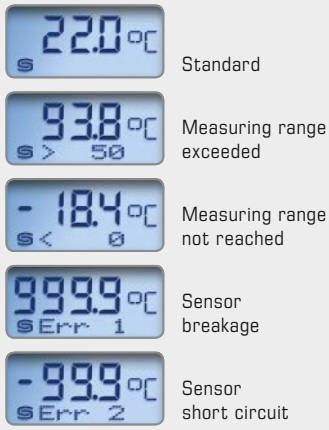
Power supply:	24 V AC / DC (± 10 %) for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (ohm) = (U_b -14 V) / 0.02 A for I variant
Load resistance:	R_L > 5 kOhm for U variant
Power consumption:	< 1.0 VA / 24 V DC; < 2.2 VA / 24 V AC
Sensor:	Pt1000, DIN EN 60751, class B (**Perfect Sensor Protection**)
Measuring ranges:	**multi-range switching with 8 switchable measuring ranges,** see table (other ranges optional) **with manual zero point correction (± 10 K)**
Deviation, temperature:	typically ± 0.2 K at +25 °C
Output:	0 - 10 V or 4...20 mA
Ambient temperature:	measuring transducer –30...+70 °C
Connection type:	2- or 3-wire connection
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016), **TM 43 with snap-on lid** **TM 65 with quick-locking screws** (slotted / Phillips head combination), housing cover for display is transparent!
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 / Tyr 01 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.14 - 1.5 mm² via terminal screws on circuit board
Protective tube:	stainless steel, **V4A** (1.4571), Ø = 6 mm, inserted length (EL) = 50 - 400 mm (see table)
Humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**TM 43 IP 54** (according to EN 60 529)* Housing tested, TÜV SÜD, Report No. 713160960A (Tyr 01) **TM 65 IP 67** (according to EN 60 529)* Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1) * Housing in the built-in state
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC directive 2014 / 30 / EU
Optional:	two-line **display with illumination**, cutout approx. 36 x 15 mm (W x H), for displaying the **ACTUAL temperature** and the **internal diagnostics** (measuring range exceeded, measuring range not reached, sensor breakage, sensor short circuit)

ACCESSORIES	
MF-15-K	**Mounting flange,** plastic, 56.8 x 84.3 mm, Ø = 15.2 mm tube gland, T_{max} = +100 °C
TH08-ms / xx	**Immersion sleeve, brass, nickel-plated,** Ø = 8 mm, T_{max} = +150 °C, p_{max} = 10 bar
TH08-VA / xx	**Immersion sleeve, stainless steel, V4A** (1.4571), Ø = 8 mm, T_{max} = +600 °C, p_{max} = 40 bar
TH08-VA / xx / 90	**Immersion sleeve, stainless steel, V4A** (1.4571), with neck tube (90 mm), Ø = 8 mm, T_{max} = +600 °C, p_{max} = 40 bar

High-performance encapsulation against vibration, mechanical stress and humidity

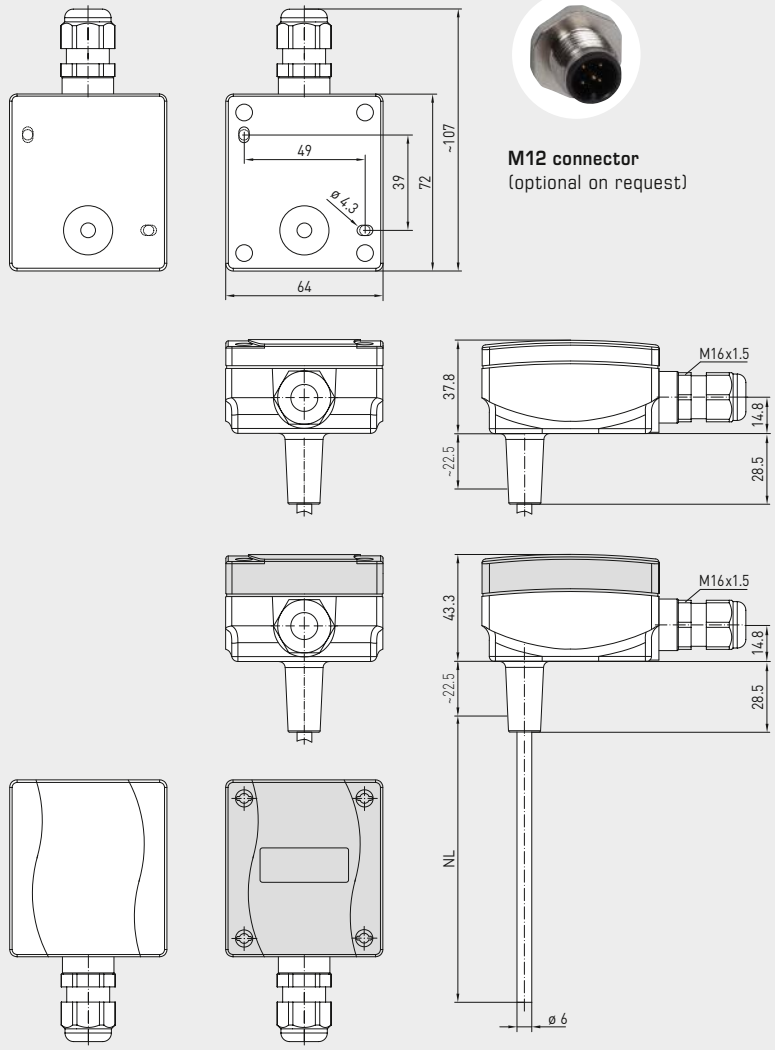
PS-PROTECTION
PERFECT SENSOR PROTECTION

Display and internal diagnostics
THERMASGARD®
Measuring transducer with display



Dimensional drawing

TM 43
TM 65



M12 connector
(optional on request)

with snap-on lid

with quick-locking screws

TM 65
with quick-locking screws
(IP 67)



TM 65
with display and
quick-locking screws
(IP 67)



PATENTED



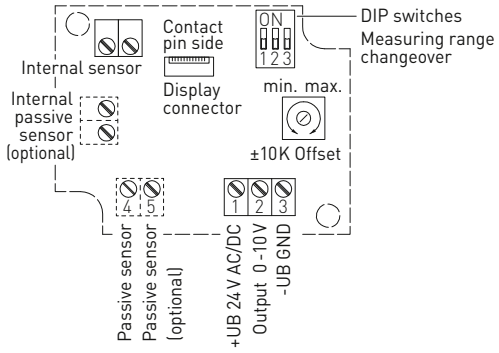
TM 65
Basic device
with accessories

THERMASGARD® TM 43
THERMASGARD® TM 65

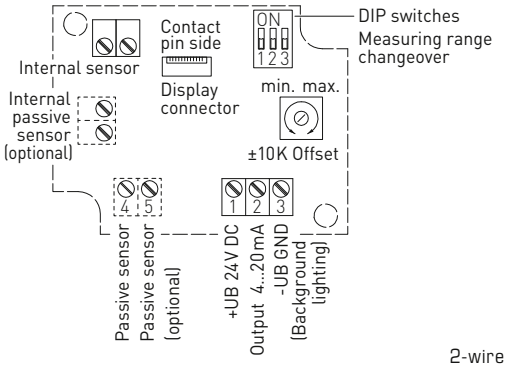
Immersion / screw-in / duct temperature measuring transducer, calibratable, with multi-range switching and active output

S+S REGELTECHNIK

3-wire connection **TM 43-U TM 65-U**



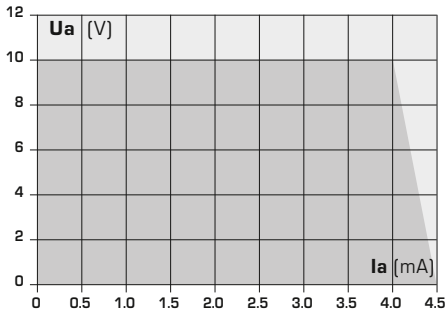
2- or 3-wire connection* **TM 43-I TM 65-I**



Connection*:
2-wire connection for devices with / without display (not illuminated)
3-wire connection for devices with illuminated display

Measuring ranges (adjustable)	DIP 1	DIP 2	DIP 3
–20...+150 °C	**ON**	**ON**	**ON**
–50... +50 °C	OFF	**ON**	**ON**
–20... +80 °C	**ON**	OFF	**ON**
–30... +60 °C	OFF	OFF	**ON**
0... +40 °C	**ON**	**ON**	OFF
0... +50 °C (default)	OFF	**ON**	OFF
0...+100 °C	**ON**	OFF	OFF
0...+150 °C	OFF	OFF	OFF

Dependency of output voltage on output current







TM 65
with display and quick-locking screws (IP 67)



TM 65
with quick-locking screws (IP 67)



TM 43
with snap-on lid (IP 54)



THERMASGARD® TM 43	Temperature measuring transducer (basic device with snap-on lid), *Standard*				
Type / WG01B	**Output**	**Inserted Length (EL)**		**Item No.**	**Price**
TM 43-I				**IP 54, I-variant**	
TM43-I 50mm	4...20 mA	**50 mm**		1101-7112-0019-900	**72,29 €**
TM43-I 100mm	4...20 mA	**100 mm**		1101-7112-0029-900	**73,48 €**
TM43-I 150mm	4...20 mA	**150 mm**		1101-7112-0039-900	**74,55 €**
TM43-I 200mm	4...20 mA	**200 mm**		1101-7112-0049-900	**74,91 €**
TM43-I 250mm	4...20 mA	**250 mm**		1101-7112-0059-900	**76,16 €**
TM43-I 300mm	4...20 mA	**300 mm**		1101-7112-0069-900	**77,40 €**
TM 43-U				**IP 54, U-variant**	
TM43-U 50mm	0-10 V	**50 mm**		1101-7111-0019-900	**72,29 €**
TM43-U 100mm	0-10 V	**100 mm**		1101-7111-0029-900	**73,48 €**
TM43-U 150mm	0-10 V	**150 mm**		1101-7111-0039-900	**74,55 €**
TM43-U 200mm	0-10 V	**200 mm**		1101-7111-0049-900	**74,91 €**
TM43-U 250mm	0-10 V	**250 mm**		1101-7111-0059-900	**76,16 €**
TM43-U 300mm	0-10 V	**300 mm**		1101-7111-0069-900	**77,40 €**

THERMASGARD® TM 65	Temperature measuring transducer (basic device with quick-locking screws), *Premium*				
Type / WG01	**Output**	**Inserted Length (EL)**	**Display**	**Item No.**	**Price**
TM 65-I				**IP 67, I-variant**	
TM65-I 50mm	4...20 mA	**50 mm**		1101-7122-0019-900	**100,18 €**
TM65-I 50mm **LCD**	4...20 mA	**50 mm**	■	1101-7122-2019-900	**151,11 €**
TM65-I 100mm	4...20 mA	**100 mm**		1101-7122-0029-900	**100,46 €**
TM65-I 100mm **LCD**	4...20 mA	**100 mm**	■	1101-7122-2029-900	**151,37 €**
TM65-I 150mm	4...20 mA	**150 mm**		1101-7122-0039-900	**100,68 €**
TM65-I 150mm **LCD**	4...20 mA	**150 mm**	■	1101-7122-2039-900	**151,62 €**
TM65-I 200mm	4...20 mA	**200 mm**		1101-7122-0049-900	**100,89 €**
TM65-I 200mm **LCD**	4...20 mA	**200 mm**	■	1101-7122-2049-900	**151,82 €**
TM65-I 250mm	4...20 mA	**250 mm**		1101-7122-0059-900	**101,21 €**
TM65-I 250mm **LCD**	4...20 mA	**250 mm**	■	1101-7122-2059-900	**152,13 €**
TM65-I 300mm	4...20 mA	**300 mm**		1101-7122-0069-900	**101,97 €**
TM65-I 300mm **LCD**	4...20 mA	**300 mm**	■	1101-7122-2069-900	**152,87 €**
TM65-I 400mm	4...20 mA	**400 mm**		1101-7122-0089-900	**104,02 €**
TM65-I 400mm **LCD**	4...20 mA	**400 mm**	■	1101-7122-2089-900	**154,95 €**
TM 65-U				**IP 67, U-variant**	
TM65-U 50mm	0-10 V	**50 mm**		1101-7121-0019-900	**100,18 €**
TM65-U 50mm **LCD**	0-10 V	**50 mm**	■	1101-7121-2019-900	**151,11 €**
TM65-U 100mm	0-10 V	**100 mm**		1101-7121-0029-900	**100,46 €**
TM65-U 100mm **LCD**	0-10 V	**100 mm**	■	1101-7121-2029-900	**151,37 €**
TM65-U 150mm	0-10 V	**150 mm**		1101-7121-0039-900	**100,68 €**
TM65-U 150mm **LCD**	0-10 V	**150 mm**	■	1101-7121-2039-900	**151,62 €**
TM65-U 200mm	0-10 V	**200 mm**		1101-7121-0049-900	**100,89 €**
TM65-U 200mm **LCD**	0-10 V	**200 mm**	■	1101-7121-2049-900	**151,82 €**
TM65-U 250mm	0-10 V	**250 mm**		1101-7121-0059-900	**101,21 €**
TM65-U 250mm **LCD**	0-10 V	**250 mm**	■	1101-7121-2059-900	**152,13 €**
TM65-U 300mm	0-10 V	**300 mm**		1101-7121-0069-900	**101,97 €**
TM65-U 300mm **LCD**	0-10 V	**300 mm**	■	1101-7121-2069-900	**152,87 €**
TM65-U 400mm	0-10 V	**400 mm**		1101-7121-0089-900	**104,02 €**
TM65-U 400mm **LCD**	0-10 V	**400 mm**	■	1101-7121-2089-900	**154,95 €**
Extra charge:	Other ranges optional Cable connection with **M12 connector** according to DIN EN 61076-2-101			on request	**25,40 €**

High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

THERMASGARD® TM 43
THERMASGARD® TM 65

Immersion / screw-in / duct temperature measuring transducer, calibratable, with multi-range switching and active output

S+S REGELTECHNIK

One basic device in four variants ...



TM xx +
TH 08-ms/xx

Immersion / screw-in temperature sensor with immersion sleeve, brass, nickel-plated



TM xx +
TH 08-VA/xx

Immersion / screw-in temperature sensor with immersion sleeve, stainless steel, V4A



TM xx +
TH 08-VA/xx/90

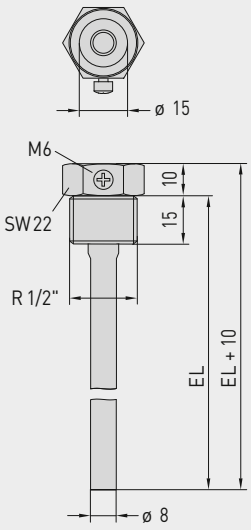
Immersion / screw-in temperature sensor with immersion sleeve with neck tube, stainless steel, V4A



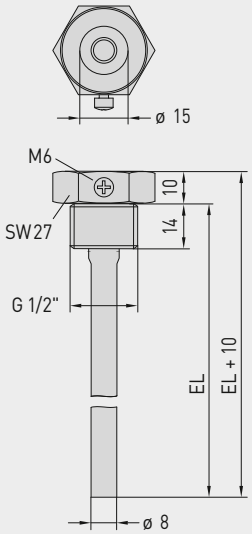
TM xx +
MF-15-K

Duct temperature sensor with mounting flange, plastic

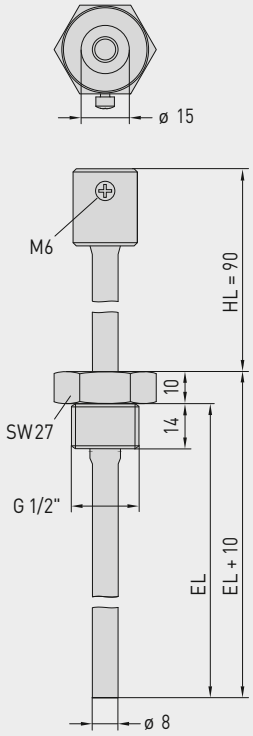
Dimensional drawing
TH 08-ms/xx



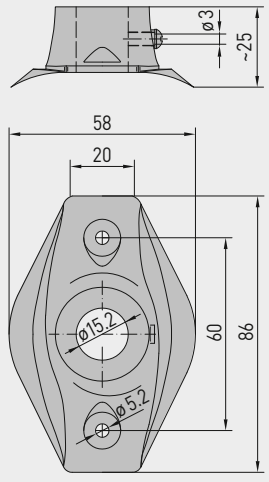
Dimensional drawing
TH 08-VA/xx



Dimensional drawing
TH 08-VA/xx/90



Dimensional drawing
MF-15-K



... through combination with accessories:



TH 08-ms/xx

Immersion sleeve, brass, nickel-plated, thread-sealing, conical, according to DIN 10226



TH 08-VA/xx

Immersion sleeve, stainless steel, V4A, flat-sealing, cylindrical, according to DIN 228



TH 08-VA/xx/90

Immersion sleeve with neck tube, stainless steel, V4A, flat-sealing, cylindrical, according to DIN 228



MF-15-K

Mounting flange, plastic

THERMASGARD® TH 08 Immersion sleeve Ø 8 mm (Accessories)

Type / WG01B	p_{max} (static)	T_{max}	Inserted Length (EL)	Item No.	Price
TH 08-ms/xx	**Brass nickel-plated**			without neck tube	
TH08-MS 50MM	10 bar	+150 °C	**50 mm**	7100-0011-0010-132	**9,31 €**
TH08-MS 100MM	10 bar	+150 °C	**100 mm**	7100-0011-0020-132	**10,61 €**
TH08-MS 150MM	10 bar	+150 °C	**150 mm**	7100-0011-0030-132	**11,20 €**
TH08-MS 200MM	10 bar	+150 °C	**200 mm**	7100-0011-0040-132	**11,56 €**
TH08-MS 250MM	10 bar	+150 °C	**250 mm**	7100-0011-0050-132	**13,39 €**
TH08-MS 300MM	10 bar	+150 °C	**300 mm**	7100-0011-0060-132	**13,76 €**
TH08-MS 350MM	10 bar	+150 °C	**350 mm**	7100-0011-0070-132	**13,87 €**
TH08-MS 400MM	10 bar	+150 °C	**400 mm**	7100-0011-0080-132	**14,00 €**
TH 08-VA/xx	**Stainless steel, V4A** (1.4571)			without neck tube	
TH08-VA 50MM	40 bar	+600 °C	**50 mm**	7100-0012-0010-132	**20,28 €**
TH08-VA 100MM	40 bar	+600 °C	**100 mm**	7100-0012-0020-132	**22,41 €**
TH08-VA 150MM	40 bar	+600 °C	**150 mm**	7100-0012-0030-132	**24,08 €**
TH08-VA 200MM	40 bar	+600 °C	**200 mm**	7100-0012-0040-132	**25,38 €**
TH08-VA 250MM	40 bar	+600 °C	**250 mm**	7100-0012-0050-132	**31,55 €**
TH08-VA 300MM	40 bar	+600 °C	**300 mm**	7100-0012-0060-132	**32,97 €**
TH08-VA 350MM	40 bar	+600 °C	**350 mm**	7100-0012-0070-132	**33,19 €**
TH08-VA 400MM	40 bar	+600 °C	**400 mm**	7100-0012-0080-132	**33,78 €**
TH 08-VA/xx/90	**Stainless steel, V4A** (1.4571)			**with neck tube** (90 mm)	
TH08-VA 50/90MM	40 bar	+600 °C	**50 mm**	7100-0012-0012-132	**29,04 €**
TH08-VA 100/90MM	40 bar	+600 °C	**100 mm**	7100-0012-0022-132	**30,35 €**
TH08-VA 150/90MM	40 bar	+600 °C	**150 mm**	7100-0012-0032-132	**31,84 €**
TH08-VA 200/90MM	40 bar	+600 °C	**200 mm**	7100-0012-0042-132	**33,19 €**
TH08-VA 250/90MM	40 bar	+600 °C	**250 mm**	7100-0012-0052-132	**34,79 €**
TH08-VA 300/90MM	40 bar	+600 °C	**300 mm**	7100-0012-0062-132	**37,71 €**
Note:	inner diameter of socket 15.0 mm For further information see last chapter!				

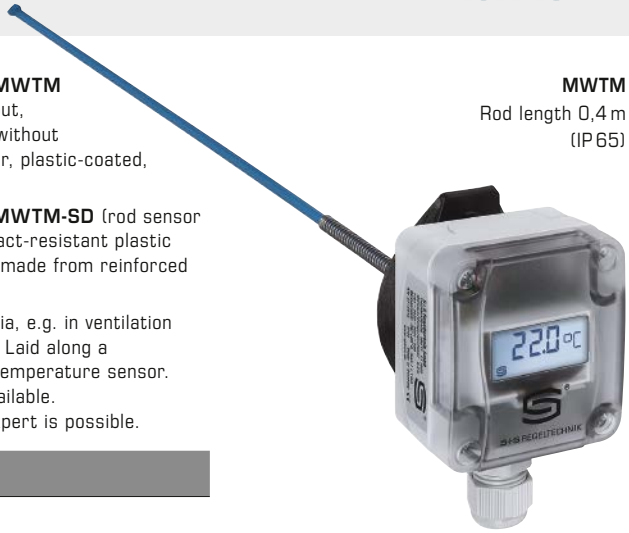
Mounting flange (Accessories)

Type / WG01B		T_{max}	Item No.	Price
MF				
MF-15-K	**Mounting flange,** plastic, 56.8 x 84.3 mm, Ø 15.2 mm tube gland	+100 °C	7100-0032-0000-000	**6,12 €**
Note:	For further information see last chapter!			

THERMASGARD® MWTM
THERMASGARD® MWTM-SD

Mean value / rod / duct temperature measuring transducer, including mounting flange, calibratable, with multi-range switching and active output

S+S REGELTECHNIK



MWTM
Rod length 0,4 m
(IP 65)

Calibratable mean-value temperature measuring transducer **THERM**ASGARD® **MWTM** (rod sensor 0.4...20 m) with eight switchable measuring ranges, continuous output, in an impact-resistant plastic housing with quick-locking screws, optionally with/without display, with bendable sensor rod (fully active), protective tube made from copper, plastic-coated, and anti-kink spring, incl. mounting flange.

Calibratable mean-value temperature measuring transducer **THERM**ASGARD® **MWTM-SD** (rod sensor 3 m / 6 m) with eight switchable measuring ranges, continuous output, in an impact-resistant plastic housing with snap-on lid, with bendable sensor rod (fully active), protective tube made from reinforced thermoplastic hose and anti-kink spring, incl. mounting flange.

The sensor is used to detect the mean temperature (mean value) in gaseous media, e.g. in ventilation and air conditioning ducts over the entire cross section or over a defined length. Laid along a meandering route, it uniformly detects the surrounding temperature, as a duct temperature sensor. For proper mounting of the rod, mounting clamps **MK-05-M** (accessories) are available. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %) for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (ohm) = (U_b -14 V) / 0.02 A for I variant
Load resistance:	R_L > 5 kOhm for U variant
Power consumption:	< 1.0 VA / 24 V DC; < 2.2 VA / 24 V AC
Sensor:	Pt1000, DIN EN 60751, class B
Measuring ranges:	**multi-range switching with 8 switchable measuring ranges,** see table (other ranges optional) T_{min} –30 °C, T_{max} +80 °C **with manual zero point correction (± 10 K)**
Output:	0 - 10 V or 4...20 mA
Connection type:	2- or 3-wire connection
Sensors:	active across the entire length (averaging)
Rod material:	**protective tube made from copper, plastic-coated** (**MWTM**) (made from reinforced thermoplastic hose for the **MWTM-SD**), with anti-kink spring and sleeve, stainless steel V4A (1.4571)
Rod dimensions:	Ø = 5.0 mm, nominal length (NL) = 0.4 m / 3 m / 6 m, see table (nominal length optionally up to max. 20 m)
Rod laying:	**Observe the admissible values!** Bending radius: **> 35 mm** Vibration load: **≤ 0.5 g** Tensile load: **< 480 N** for the **MWTM** **< 100 N** for the **MWTM-SD**
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.14 - 1.5 mm² via terminal screws on circuit board
Process connection:	by mounting flange, plastic (galvanised steel optional, see accessories) and mounting clamps **MK-05-M**
Ambient temperature:	measuring transducer –30...+70 °C
Humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 54** (according to EN 60 529) for the **MWTM-SD** **IP 65** (according to EN 60 529) for the **MWTM** housing tested, TÜV SÜD, report no. 713139052 (Tyr 1)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC directive 2014 / 30 / EU
Optional:	Two-line **display with illumination,** cutout approx. 36 x 15 mm (W x H), for displaying the **ACTUAL temperature** and the **internal diagnostics** (measuring range exceeded, measuring range not reached, sensor breakage, sensor short circuit)
ACCESSORIES	see table

Display and internal diagnostics
THERMASGARD®
Measuring transducer with display



Standard



Measuring range exceeded



Measuring range not reached

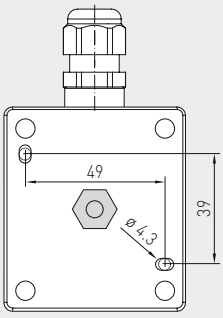


Sensor breakage



Sensor short circuit

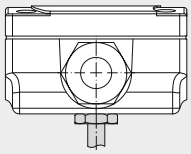
Dimensional drawing **MWTM**

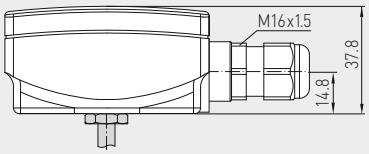




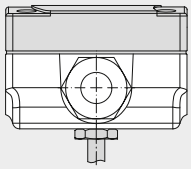
M12 connector
(optional on request)

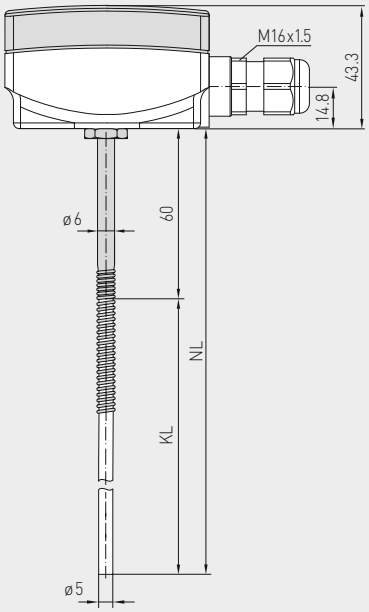
without display

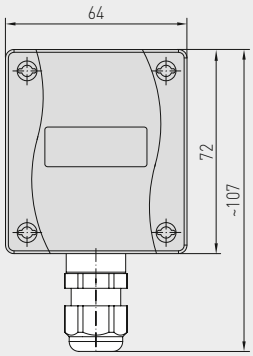




with display







Measuring ranges (adjustable)	DIP 1	DIP 2	DIP 3
–20…+150 °C	**ON**	**ON**	**ON**
–50… +50 °C	OFF	**ON**	**ON**
–20… +80 °C	**ON**	OFF	**ON**
–30… +60 °C	OFF	OFF	**ON**
0… +40 °C	**ON**	**ON**	OFF
0… +50 °C (default)	OFF	**ON**	OFF
0…+100 °C	**ON**	OFF	OFF
0…+150 °C	OFF	OFF	OFF

MWTM
Rod length 3 m / 6 m
(IP65)



MWTM
with Display
(IP65)



MWTM-SD
Rod length 3 m / 6 m
(IP54)

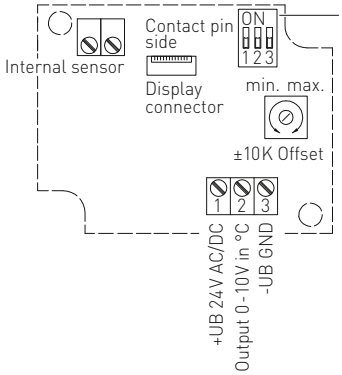


THERMASGARD® MWTM
THERMASGARD® MWTM-SD

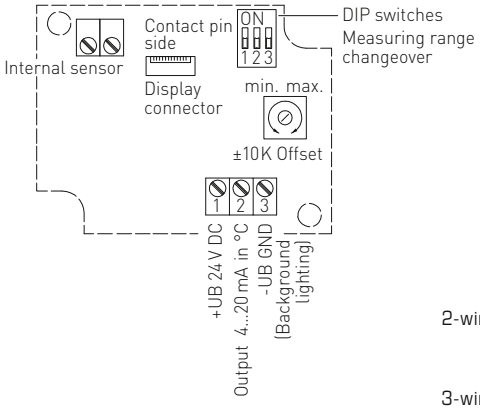
Mean value / rod / duct temperature measuring transducer, including mounting flange, calibratable, with multi-range switching and active output

S+S REGELTECHNIK

3-wire connection **MWTM-U**



2- or 3-wire connection* **MWTM-I**



Connection*:

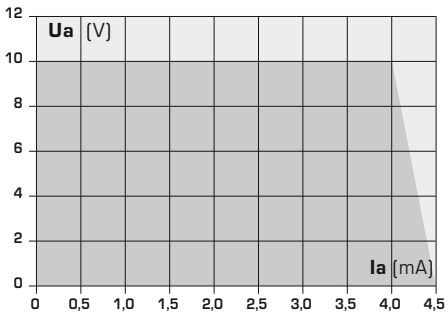
2-wire connection for devices with / without display (not illuminated)

3-wire connection for devices with illuminated display

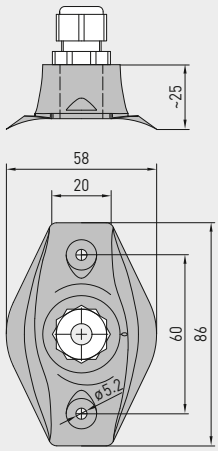
MWTM
display hinged (optional)



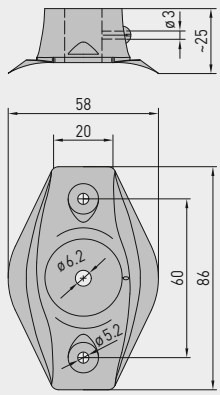
Dependency of output voltage on output current



Dimensional drawing **KRD-04**



Dimensional drawing **MF-06-K**



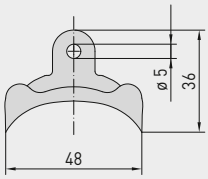


MF-06-K
Mounting flange, plastic
(Included in the scope of delivery)

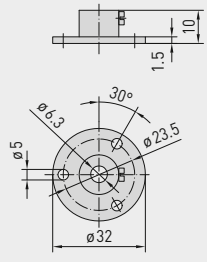


KRD-04
Capillary tube bushing, plastic
(optional)

Dimensional drawing **MK-05-M**



Dimensional drawing **MF-06-M**





MF-06-M
Mounting flange, metal
(optional)



MK-05-M
Mounting clamps, galvanised steel
(from 3 m rod length, included in the scope of delivery)

THERMASGARD® MWTM
THERMASGARD® MWTM-SD

Mean value / rod / duct temperature measuring transducer, including mounting flange, calibratable, with multi-range switching and active output

MWTM
Rod length 3 m / 6 m
with/without Display
(IP 65)



MWTM-SD
Rod length 3 m / 6 m
without Display
(IP 54)



THERMASGARD® MWTM-SD	Mean-value temperature measuring transducer with rod made from reinforced **thermoplastic hose**, *Standard*				
Type / WG01B	**Sensor**	**Output**	**Rod length**	**Item No.**	**Price**
MWTM-SD-I				**IP 54**, I variant	
MWTM-SD-I 3m	Pt1000	4...20 mA	**3.0 m**	1101-3132-0239-90K	**160,46 €**
MWTM-SD-I 6m	Pt1000	4...20 mA	**6.0 m**	1101-3132-0269-90K	**170,39 €**
MWTM-SD-U				**IP 54**, U variant	
MWTM-SD-U 3m	Pt1000	0-10 V	**3.0 m**	1101-3131-0239-90K	**157,09 €**
MWTM-SD-U 6m	Pt1000	0-10 V	**6.0 m**	1101-3131-0269-90K	**166,57 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101			on request	

THERMASGARD® MWTM	Mean-value temperature measuring transducer with rod made from **copper, plastic-coated**, *Premium*				
Type / WG01	**Sensor**	**Output**	**Rod length**	**Item No.**	**Price**
MWTM-I				**IP 65**, I variant	
MWTM-I 0,4m	Pt1000	4...20 mA	**0.4 m**	1101-3132-0089-900	**171,35 €**
MWTM-I 3m	Pt1000	4...20 mA	**3.0 m**	1101-3132-0239-900	**222,79 €**
MWTM-I 6m	Pt1000	4...20 mA	**6.0 m**	1101-3132-0269-900	**259,70 €**
MWTM-U				**IP 65**, U variant	
MWTM-U 0,4m	Pt1000	0-10 V	**0.4 m**	1101-3131-0089-900	**171,35 €**
MWTM-U 3m	Pt1000	0-10 V	**3.0 m**	1101-3131-0239-900	**222,79 €**
MWTM-U 6m	Pt1000	0-10 V	**6.0 m**	1101-3131-0269-900	**259,70 €**
Extra charge:	Other ranges optional Two-line **display** with illumination Per meter sensor cable (from 6 m to max. 20 m)			on request	**25,40 €** **49,83 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101			on request	

ACCESSORIES			
MF-06-K	**Mounting flange,** plastic (included in the scope of delivery)	7100-0030-1000-000	**6,12 €**
MF-06-M	**Mounting flange,** metal (Galvanised steel), Ø 35 mm	7100-0030-5000-100	**9,56 €**
KRD-04	**Capillary tube gland bracket,** plastic	7100-0030-7000-000	**8,91 €**
MK-05-M	**Mounting clamps**, galvanised steel (6 pieces) (from 3 m rod length, included in the scope of delivery)	7100-0034-0000-000	**9,88 €**
	For further information see last chapter!		

THERMASGARD® TM 54

Immersion / screw-in / duct temperature measuring transducer, calibratable, with multi-range switching and active output

S+S REGELTECHNIK

Calibratable temperature measuring transducer **THERM**ASGARD® **TM 54** with eight switchable measuring ranges and continuous output, with connecting head made from aluminium (optionally with **cable gland** or **M12 connector** according to DIN EN 61076-2-101) and straight protective tube.

A basic unit in four variants through combination with accessories, eg, for robust applications with a separate immersion sleeve made from stainless steel.

The duct sensor is used to detect temperatures in liquid or gaseous media. It is used in pipes, heating engineering, storage systems, compact district heating stations, warm and cold water systems, oil and lubrication cycle systems, mechanical, apparatus and plant engineering and throughout the industrial sector.

The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

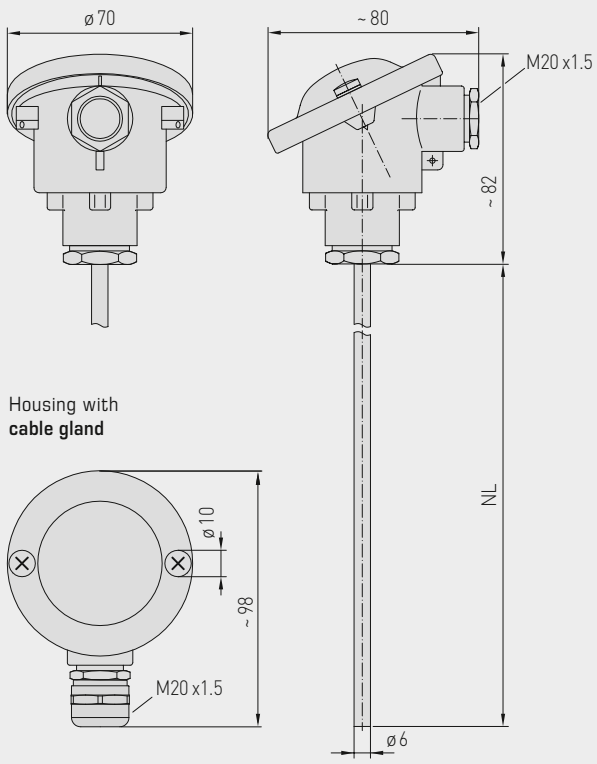
TM 54
Basic unit



TECHNICAL DATA

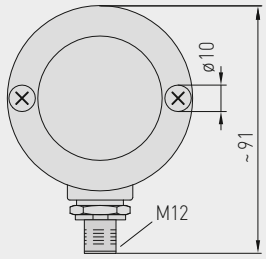
Power supply:	24 V AC / DC (± 10 %) for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (ohm) = (U_b -14 V) / 0.02 A for I variant
Load resistance:	R_L > 5 kOhm for U variant
Power consumption:	< 1.0 VA / 24 V AC / DC; < 0.55 VA / 24 V DC
Sensor:	Pt1000, DIN EN 60571, class B (**Perfect Sensor Protection**)
Measuring ranges:	**multi-range switching** **with 8 switchable measuring ranges,** see table (other ranges optional) T_{max} = +150°C **with manual zero point correction (± 10 K)**
Deviation, temperature:	typically ± 0.2 K at +25 °C
Output:	0 - 10 V or 4...20 mA
Connection type:	2- or 3-wire connection
Electrical connection:	0.2 - 1.5 mm², via push-in terminal
Cable connection:	**TM 54** (standard) adjusting screw made of metal (M 20 x 1.5) **TM 54-KV** (optional) cable gland, brass, nickel-plated (M 20 x 1.5 ; with strain relief, exchangeable, inner diameter 6 - 12 mm) **TM 54-Q** (optional) M12 connector according to DIN EN 61076-2-101 (male, 5-pin, A-code)
Dimensions:	see dimensional drawing
Connecting head:	form B, material aluminium, colour white aluminium (similar to RAL 9006), ambient temperature –30...+70 °C
Protective tube:	stainless steel, V4A (1.4571) Ø = 6 mm, inserted length (EL) = 50 - 400 mm (see table)
Process connection:	by means of immersion sleeve or mounting flange (accessories)
Humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 54** (according to EN 60 529) **TM 54** **IP 65** (according to EN 60 529) **TM 54-KV / TM 54-Q**
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU
ACCESSORIES	(see table)
TH-ms / xx	**Immersion sleeve, brass, nickel-plated,** Ø = 8 mm, T_{max} = +150 °C, p_{max} = 10 bar
TH-VA / xx	**Immersion sleeve, stainless steel, V4A** (1.4571), Ø = 8 mm, T_{max} = +600 °C, p_{max} = 40 bar
TH-VA / xx / 90	**Immersion sleeve, stainless steel, V4A** (1.4571), with neck tube (90 mm), Ø = 8 mm, T_{max} = +600 °C, p_{max} = 40 bar
MF-06-M	**Mounting flange,** metal, galvanised steel, Ø = 32 mm, Ø = 6.3 mm tube gland, T_{max} = +700 °C

Dimensional drawing **TM 54**



Housing with **cable gland**

Housing with **M12 connector**





M12 connector (male)

High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

TM 54
standard (IP 54)



TM 54 - KV
with cable gland (IP 65)



TM 54 - Q
with M12 connector (IP 65)



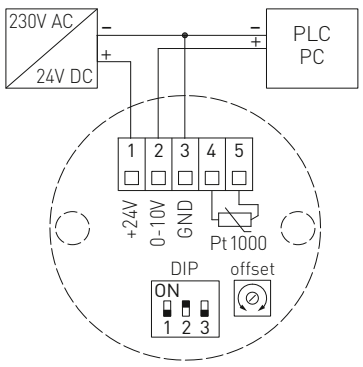


THERMASGARD® TM 54

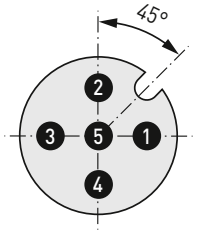
Immersion / screw-in / duct temperature measuring transducer, calibratable, with multi-range switching and active output

S+S REGELTECHNIK

Connecting diagram **TM 54-U**



Pin assignment (M12) **TM 54-U**

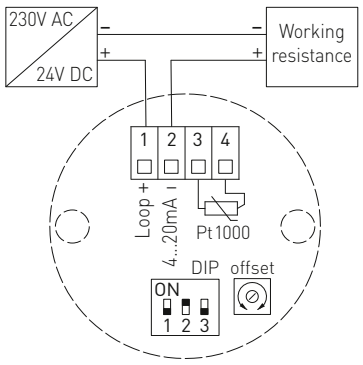


1. +UB 24 V AC/DC
2. Output temperature 0-10 V [°C]
3. free
4. –UB GND
5. Shield

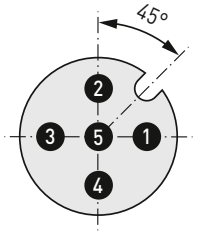
TM 54-U
Connecting head



Connecting diagram **TM 54-I**



Pin assignment (M12) **TM 54-I**



1. +UB 15...36 V DC
2. Output temperature 4...20 mA [°C]
3. free
4. –UB GND
5. Shield

TM 54-I
Connecting head



Measuring ranges (adjustable)	DIP 1	DIP 2	DIP 3
–20...+150 °C	**ON**	**ON**	**ON**
–50... +50 °C	OFF	**ON**	**ON**
–20... +80 °C	**ON**	OFF	**ON**
–30... +60 °C	OFF	OFF	**ON**
0... +40 °C	**ON**	**ON**	OFF
0... +50 °C (default)	OFF	**ON**	OFF
0...+100 °C	**ON**	OFF	OFF
0...+150 °C	OFF	OFF	OFF

Immersion / screw-in / duct temperature measuring transducer, calibratable, with multi-range switching and active output

TM 54
standard
(IP 54)



THERMASGARD® **TM 54**	Temperature measuring transducer (Basic unit)				
Type / WG01	**Sensor**	**Output**	**Installation length (EL)**	**Item No.**	**Price**
TM 54 - I				**IP 54**, I - variant	
TM54-I 50mm	Pt1000	4...20 mA	**50 mm**	1101-7152-0019-910	**151,87 €**
TM54-I 100mm	Pt1000	4...20 mA	**100 mm**	1101-7152-0029-910	**155,45 €**
TM54-I 150mm	Pt1000	4...20 mA	**150 mm**	1101-7152-0039-910	**162,45 €**
TM54-I 200mm	Pt1000	4...20 mA	**200 mm**	1101-7152-0049-910	**164,67 €**
TM54-I 250mm	Pt1000	4...20 mA	**250 mm**	1101-7152-0059-910	**166,71 €**
TM54-I 300mm	Pt1000	4...20 mA	**300 mm**	1101-7152-0069-910	**168,42 €**
TM54-I 350mm	Pt1000	4...20 mA	**350 mm**	1101-7152-0079-910	**171,85 €**
TM54-I 400mm	Pt1000	4...20 mA	**400 mm**	1101-7152-0089-910	**181,43 €**
TM 54 - U				**IP 54**, U - variant	
TM54-U 50mm	Pt1000	0 - 10 V	**50 mm**	1101-7151-0019-910	**151,87 €**
TM54-U 100mm	Pt1000	0 - 10 V	**100 mm**	1101-7151-0029-910	**155,45 €**
TM54-U 150mm	Pt1000	0 - 10 V	**150 mm**	1101-7151-0039-910	**162,45 €**
TM54-U 200mm	Pt1000	0 - 10 V	**200 mm**	1101-7151-0049-910	**164,67 €**
TM54-U 250mm	Pt1000	0 - 10 V	**250 mm**	1101-7151-0059-910	**166,71 €**
TM54-U 300mm	Pt1000	0 - 10 V	**300 mm**	1101-7151-0069-910	**168,42 €**
TM54-U 350mm	Pt1000	0 - 10 V	**350 mm**	1101-7151-0079-910	**171,86 €**
TM54-U 400mm	Pt1000	0 - 10 V	**400 mm**	1101-7151-0089-910	**181,43 €**
Housing variant:	equipped as standard with pressure screw **(IP 54)**, optional housing variants with cable gland **(IP 65)** or **M12 connector (IP65)** see the next page!				
Extra charge:	other measuring ranges optional				**25,40 €**

THERMASGARD® TM 54

Immersion / screw-in / duct temperature measuring transducer, calibratable, with multi-range switching and active output

S+S REGELTECHNIK

TM 54 - Q
with M12 connector
(IP 65)



THERMASGARD® TM 54 - Q	Temperature measuring transducer (Basic unit **with M12 connector**)					
Type / WG01	**Sensor**	**Output**	**Installation length (EL)**	**Q**	**Item No.**	**Price**
TM 54 - I xx Q					**IP 65**, I - variant	
TM54-I 50mm **Q**	Pt1000	4...20 mA	**50 mm**	●	2001-4111-2100-011	**193,80 €**
TM54-I 100mm **Q**	Pt1000	4...20 mA	**100 mm**	●	2001-4111-2100-021	**197,36 €**
TM54-I 150mm **Q**	Pt1000	4...20 mA	**150 mm**	●	2001-4111-2100-031	**204,36 €**
TM54-I 200mm **Q**	Pt1000	4...20 mA	**200 mm**	●	2001-4111-2100-041	**206,59 €**
TM54-I 250mm **Q**	Pt1000	4...20 mA	**250 mm**	●	2001-4111-2100-051	**208,64 €**
TM54-I 300mm **Q**	Pt1000	4...20 mA	**300 mm**	●	2001-4111-2100-061	**210,36 €**
TM54-I 350mm **Q**	Pt1000	4...20 mA	**350 mm**	●	2001-4111-2100-071	**213,79 €**
TM54-I 400mm **Q**	Pt1000	4...20 mA	**400 mm**	●	2001-4111-2100-081	**223,35 €**
TM 54 - U xx Q					**IP 65**, U - variant	
TM54-U 50mm **Q**	Pt1000	0 - 10 V	**50 mm**	●	2001-4111-1100-011	**167,55 €**
TM54-U 100mm **Q**	Pt1000	0 - 10 V	**100 mm**	●	2001-4111-1100-021	**197,36 €**
TM54-U 150mm **Q**	Pt1000	0 - 10 V	**150 mm**	●	2001-4111-1100-031	**204,36 €**
TM54-U 200mm **Q**	Pt1000	0 - 10 V	**200 mm**	●	2001-4111-1100-041	**206,59 €**
TM54-U 250mm **Q**	Pt1000	0 - 10 V	**250 mm**	●	2001-4111-1100-051	**208,64 €**
TM54-U 300mm **Q**	Pt1000	0 - 10 V	**300 mm**	●	2001-4111-1100-061	**210,36 €**
TM54-U 350mm **Q**	Pt1000	0 - 10 V	**350 mm**	●	2001-4111-1100-071	**213,79 €**
TM54-U 400mm **Q**	Pt1000	0 - 10 V	**400 mm**	●	2001-4111-1100-081	**223,35 €**
Housing variant "Q":	Cable connection **with M12 connector** (male, **5-pin**, A-code)					
Extra charge:	other measuring ranges optional					**25,40 €**

ACCESSORIES

Special accessories for M12 connector
see chapter Accessories!

Immersion / screw-in / duct temperature measuring transducer, calibratable, with multi-range switching and active output

TM 54 - KV
with cable gland
(IP 65)



THERMASGARD® **TM 54 - KV**	Temperature measuring transducer (Basic unit **with cable gland**)				
Type / WG01	**Sensor**	**Output**	**Installation length (EL)**	**Item No.**	**Price**
TM 54 - I xx KV				**IP 65**, I - variant	
TM54-I 50mm **KV**	Pt1000	4...20 mA	**50 mm**	1101-7172-0019-910	**161,31 €**
TM54-I 100mm **KV**	Pt1000	4...20 mA	**100 mm**	1101-7172-0029-910	**164,88 €**
TM54-I 150mm **KV**	Pt1000	4...20 mA	**150 mm**	1101-7172-0039-910	**171,86 €**
TM54-I 200mm **KV**	Pt1000	4...20 mA	**200 mm**	1101-7172-0049-910	**174,10 €**
TM54-I 250mm **KV**	Pt1000	4...20 mA	**250 mm**	1101-7172-0059-910	**176,15 €**
TM54-I 300mm **KV**	Pt1000	4...20 mA	**300 mm**	1101-7172-0069-910	**177,87 €**
TM54-I 350mm **KV**	Pt1000	4...20 mA	**350 mm**	1101-7172-0079-910	**181,29 €**
TM54-I 400mm **KV**	Pt1000	4...20 mA	**400 mm**	1101-7172-0089-910	**190,85 €**
TM 54 - U xx KV				**IP 65**, U - variant	
TM54-U 50mm **KV**	Pt1000	0 - 10 V	**50 mm**	1101-7171-0019-910	**161,31 €**
TM54-U 100mm **KV**	Pt1000	0 - 10 V	**100 mm**	1101-7171-0029-910	**164,88 €**
TM54-U 150mm **KV**	Pt1000	0 - 10 V	**150 mm**	1101-7171-0039-910	**171,86 €**
TM54-U 200mm **KV**	Pt1000	0 - 10 V	**200 mm**	1101-7171-0049-910	**174,10 €**
TM54-U 250mm **KV**	Pt1000	0 - 10 V	**250 mm**	1101-7171-0059-910	**176,15 €**
TM54-U 300mm **KV**	Pt1000	0 - 10 V	**300 mm**	1101-7171-0069-910	**177,87 €**
TM54-U 350mm **KV**	Pt1000	0 - 10 V	**350 mm**	1101-7171-0079-910	**181,29 €**
TM54-U 400mm **KV**	Pt1000	0 - 10 V	**400 mm**	1101-7171-0089-910	**190,85 €**
Housing variant "KV":	Cable connection **with cable gland**				
Extra charge:	other measuring ranges optional				**25,40 €**

Immersion / screw-in / duct temperature measuring transducer, calibratable, with multi-range switching and active output

S+S REGELTECHNIK

One basic device in four variants ...



TM 54 +
TH - ms / xx

Immersion / screw-in temperature sensor with immersion sleeve, brass, nickel-plated



TM 54 +
TH - VA / xx

Immersion / screw-in temperature sensor with immersion sleeve, stainless steel, V4A



TM 54 +
TH - VA / xx / 90

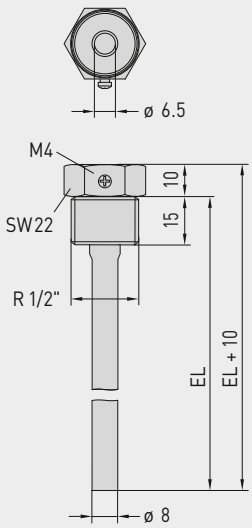
Immersion / screw-in temperature sensor with immersion sleeve with neck tube, stainless steel, V4A



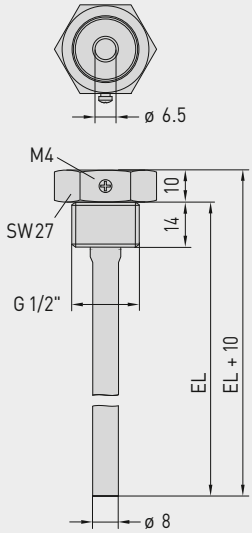
TM 54 +
MF - 06 - M

Duct temperature sensor with mounting flange, metal

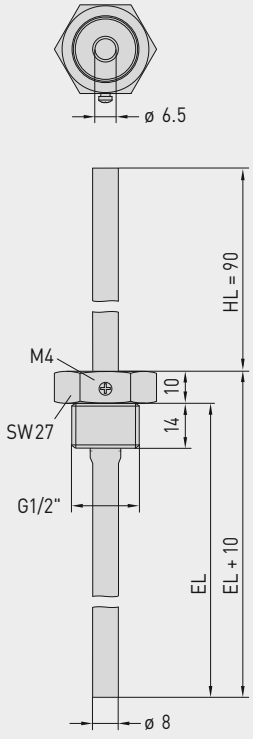
Dimensional drawing
TH - ms / xx



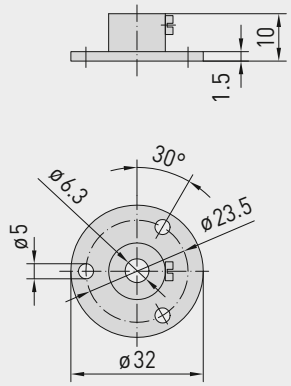
Dimensional drawing
TH - VA / xx



Dimensional drawing
TH - VA / xx / 90



Dimensional drawing
MF - 06 - M



...through combination with accessories:



TH-ms/xx

Immersion sleeve, brass, nickel-plated, thread-sealing, conical, according to DIN 10226



TH-VA/xx

Immersion sleeve, stainless steel, V4A, flat-sealing, cylindrical, according to DIN 228



TH-VA/xx/90

Immersion sleeve with neck tube, stainless steel, V4A, flat-sealing, cylindrical, according to DIN 228



MF-06-M

Mounting flange, metal

THERMASGARD® **TH**	Immersion sleeve Ø 8 mm (accessories)				
Type / WG01	**p_{max} (static)**	**T_{max}**	**Inserted Length (EL)**	**Item No.**	**Price**
TH-ms/xx	**Brass nickel-plated**			without neck tube	
TH-MS 50MM	10 bar	+150 °C	**50 mm**	7100-0011-0010-001	**9,31 €**
TH-MS 100MM	10 bar	+150 °C	**100 mm**	7100-0011-0020-001	**10,61 €**
TH-MS 150MM	10 bar	+150 °C	**150 mm**	7100-0011-0030-001	**11,20 €**
TH-MS 200MM	10 bar	+150 °C	**200 mm**	7100-0011-0040-001	**11,56 €**
TH-MS 250MM	10 bar	+150 °C	**250 mm**	7100-0011-0050-001	**13,39 €**
TH-MS 300MM	10 bar	+150 °C	**300 mm**	7100-0011-0060-001	**13,76 €**
TH-MS 350MM	10 bar	+150 °C	**350 mm**	7100-0011-0070-001	**13,87 €**
TH-MS 400MM	10 bar	+150 °C	**400 mm**	7100-0011-0080-001	**14,00 €**
TH-VA/xx	**Stainless steel, V4A** (1.4571)			without neck tube	
TH-VA 50MM	40 bar	+600 °C	**50 mm**	7100-0012-0010-001	**20,28 €**
TH-VA 100MM	40 bar	+600 °C	**100 mm**	7100-0012-0020-001	**22,41 €**
TH-VA 150MM	40 bar	+600 °C	**150 mm**	7100-0012-0030-001	**24,08 €**
TH-VA 200MM	40 bar	+600 °C	**200 mm**	7100-0012-0040-001	**25,38 €**
TH-VA 250MM	40 bar	+600 °C	**250 mm**	7100-0012-0050-001	**31,55 €**
TH-VA 300MM	40 bar	+600 °C	**300 mm**	7100-0012-0060-001	**32,97 €**
TH-VA 350MM	40 bar	+600 °C	**350 mm**	7100-0012-0070-001	**33,19 €**
TH-VA 400MM	40 bar	+600 °C	**400 mm**	7100-0012-0080-001	**33,78 €**
TH-VA/xx/90	**Stainless steel, V4A** (1.4571)			**with neck tube** (90 mm)	
TH-VA 50/90MM	40 bar	+600 °C	**50 mm**	7100-0012-2010-001	**29,04 €**
TH-VA 100/90MM	40 bar	+600 °C	**100 mm**	7100-0012-2020-001	**30,35 €**
TH-VA 150/90MM	40 bar	+600 °C	**150 mm**	7100-0012-2030-001	**31,84 €**
TH-VA 200/90MM	40 bar	+600 °C	**200 mm**	7100-0012-2040-001	**33,19 €**
TH-VA 250/90MM	40 bar	+600 °C	**250 mm**	7100-0012-2050-001	**34,79 €**
TH-VA 300/90MM	40 bar	+600 °C	**300 mm**	7100-0012-2060-001	**37,71 €**
Note:	inner diameter of socket 6.5 mm For further information see last chapter!				

Mounting flange (accessories)				
Type / WG01		**T_{max}**	**Item No.**	**Price**
MF				
MF-06-M	**Mounting flange,** metal (galvanised steel) Ø 32 mm, tube gland Ø 6.3 mm	+700 °C	7100-0030-5000-100	**9,56 €**
Note:	For further information see last chapter!			

THERMASGARD® RGTM 1

Duct / smoke gas temperature measuring transducer, including mounting flange, calibratable, with multi-range switching and active output

S+S REGELTECHNIK

Calibratable smoke gas temperature measuring transducer **THERM**ASGARD® **RGTM 1** with eight switchable measuring ranges and continuous output, with connecting head made from aluminium (optionally with **cable gland** or **M12 connector** according to DIN EN 61076-2-101), spring-mounted measuring insert and straight protective tube, incl. mounting flange.

The duct sensor is used to detect high temperatures in gaseous media, eg. for exhaust air or smoke gas temperature measurement.

The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

RGTM 1
Basic unit



RGTM 1
Measuring insert with ceramic tubelet

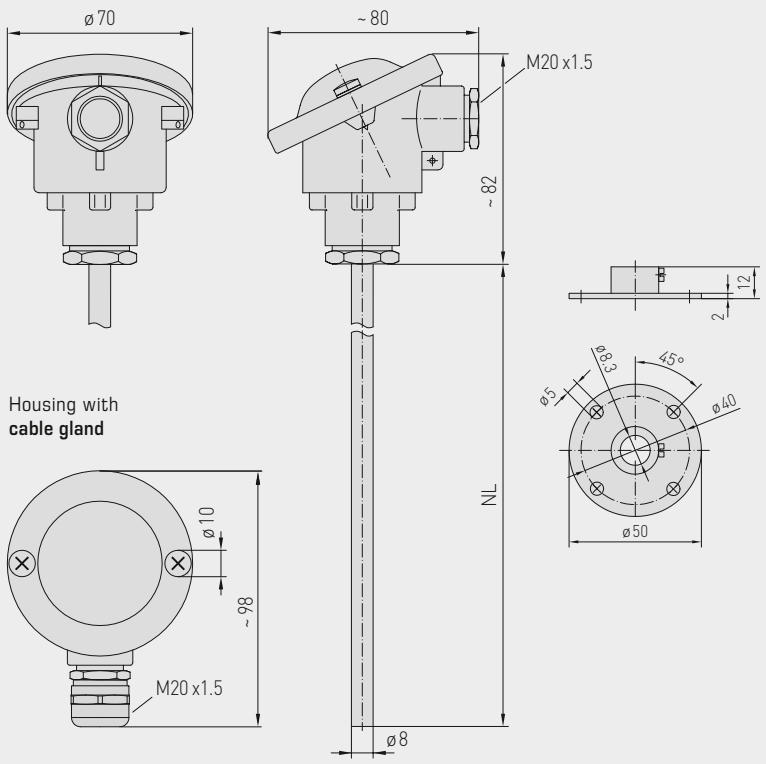


TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %) for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (Ohm) = (U_b -14 V) / 0.02 A for I variant
Load resistance:	10 kOhm (load max. 1 mA) for U variant
Power consumption:	< 1.0 VA / 24 V AC / DC; < 0.55 VA / 24 V DC
Sensor:	Pt1000 (according to DIN EN 60751, class B) (**Perfect Sensor Protection**)
Measuring ranges:	**multi-range switching** **with 8 switchable measuring ranges,** see table (other ranges optional) **with manual zero point correction (± 10 K)**
Deviation, temperature:	typically ± 0.2 K at +25 °C
Output:	0 - 10 V or 4...20 mA
Connection type:	2- or 3-wire connection
Electrical connection:	0.2 - 1.5 mm², via push-in terminal
Cable connection:	**RGTM 1** (Standard) adjusting screw made of metal (M 20 x 1.5); **RGTM 1-KV** (optional) cable gland, brass, nickel-plated (M 20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) **RGTM 1-Q** (optional) M12 connector according to DIN EN 61076-2-101 (male, 5-pin, A-code)
Dimensions:	see dimensional drawing
Connecting head:	form B, material aluminium, colour white aluminium (similar to RAL 9006), ambient temperature –30...+70 °C
Protective tube:	stainless steel, V4A (1.4571), Ø = 8 mm inserted length (EL) = 200 - 400 mm (see table)
Process connection:	by mounting flange stainless steel **V2A** (1.4305) (included in the scope of delivery)
Humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 54** (according to EN 60 529) **RGTM 1** **IP 65** (according to EN 60 529) **RGTM 1-KV / RGTM 1-Q**
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU

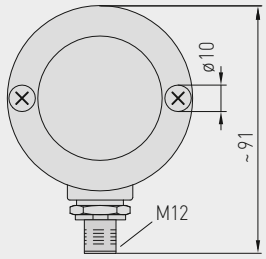
Duct/smoke gas temperature measuring transducer, including mounting flange, calibratable, with multi-range switching and active output

Dimensional drawing **RGTM 1**



Housing with **cable gland**

Housing with **M12 connector**





M12 connector (male)

RGTM 1
standard (IP 54)



RGTM 1 - KV
with cable gland (IP 65)



RGTM 1 - Q
with M12 connector (IP 65)





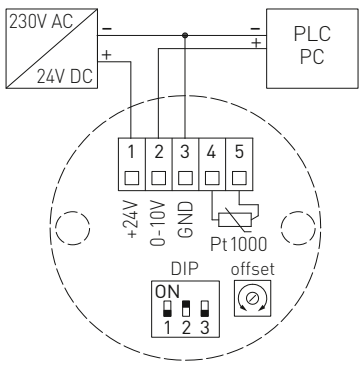
High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

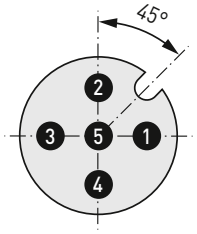
Duct/smoke gas temperature measuring transducer, including mounting flange, calibratable, with multi-range switching and active output

S+S REGELTECHNIK

Connecting diagram **RGTM 1-U**



Pin assignment (M12) **RGTM 1-U**

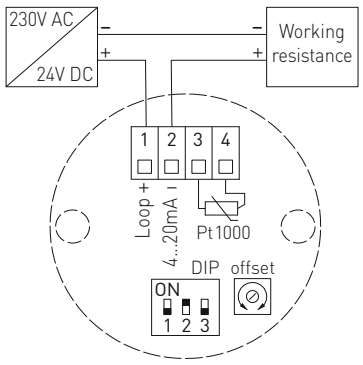


1. +UB 24 V AC/DC
2. Output temperature 0-10 V [°C]
3. free
4. –UB GND
5. Shield

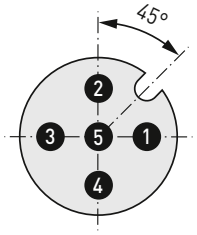
RGTM 1-U
Connecting head



Connecting diagram **RGTM 1-I**



Pin assignment (M12) **RGTM 1-I**



1. +UB 15...36 V DC
2. Output temperature 4...20 mA [°C]
3. free
4. –UB GND
5. Shield

RGTM 1-I
Connecting head



Measuring ranges (adjustable)	DIP 1	DIP 2	DIP 3
–20...+150 °C	**ON**	**ON**	**ON**
0... +50 °C (default)	OFF	**ON**	**ON**
0...+100 °C	**ON**	OFF	**ON**
0...+200 °C	OFF	OFF	**ON**
0...+300 °C	**ON**	**ON**	OFF
0...+400 °C	OFF	**ON**	OFF
0...+500 °C	**ON**	OFF	OFF
0...+600 °C	OFF	OFF	OFF

Duct / smoke gas temperature measuring transducer, including mounting flange, calibratable, with multi-range switching and active output

RGTM 1
standard
(IP 54)



THERMASGARD® **RGTM 1**	Duct / smoke gas temperature sensor, incl. mounting flange (standard)				
Type / WG01	**Sensor**	**Output**	**Installation length (EL)**	**Item No.**	**Price**
RGTM 1 - I				**IP 54**, I - variant	
RGTM1-I 200mm	Pt1000	4...20 mA	**200 mm**	1101-3122-0049-810	**288,34 €**
RGTM1-I 250mm	Pt1000	4...20 mA	**250 mm**	1101-3122-0059-810	**299,80 €**
RGTM1-I 300mm	Pt1000	4...20 mA	**300 mm**	1101-3122-0069-810	**302,98 €**
RGTM1-I 400mm	Pt1000	4...20 mA	**400 mm**	1101-3122-0089-810	**305,52 €**
RGTM 1 - U				**IP 54**, U - variant	
RGTM1-U 200mm	Pt1000	0 - 10 V	**200 mm**	1101-3121-0049-810	**288,34 €**
RGTM1-U 250mm	Pt1000	0 - 10 V	**250 mm**	1101-3121-0059-810	**299,80 €**
RGTM1-U 300mm	Pt1000	0 - 10 V	**300 mm**	1101-3121-0069-810	**302,98 €**
RGTM1-U 400mm	Pt1000	0 - 10 V	**400 mm**	1101-3121-0089-810	**305,52 €**
Housing variant:	equipped as standard with pressure screw **(IP 54)**, optional housing variants with cable gland **(IP 65)** or **M12 connector (IP65)** see the next page!				
Extra charge:	other measuring ranges optional				**25,40 €**

THERMASGARD® RGTM 1

Duct / smoke gas temperature measuring transducer, including mounting flange, calibratable, with multi-range switching and active output

S+S REGELTECHNIK

RGTM 1 - Q
with M12 connector
(IP 65)



THERMASGARD® **RGTM 1 - Q**	Duct / smoke gas temperature sensor, incl. mounting flange **(with M12 connector)**					
Type / WG01	**Sensor**	**Output**	**Installation length (EL)**	**Q** ●	**Item No.**	**Price**
RGTM 1 - I xx Q					**IP 65**, I - variant	
RGTM1-I 200mm **Q**	Pt1000	4...20 mA	**200 mm**	●	2001-4131-2100-011	**330,26 €**
RGTM1-I 250mm **Q**	Pt1000	4...20 mA	**250 mm**	●	2001-4131-2100-021	**341,73 €**
RGTM1-I 300mm **Q**	Pt1000	4...20 mA	**300 mm**	●	2001-4131-2100-031	**344,89 €**
RGTM1-I 400mm **Q**	Pt1000	4...20 mA	**400 mm**	●	2001-4131-2100-041	**347,46 €**
RGTM 1 - U xx Q					**IP 54**, U - variant	
RGTM1-U 200mm **Q**	Pt1000	0 - 10 V	**200 mm**	●	2001-4131-1100-011	**330,26 €**
RGTM1-U 250mm **Q**	Pt1000	0 - 10 V	**250 mm**	●	2001-4131-1100-021	**341,73 €**
RGTM1-U 300mm **Q**	Pt1000	0 - 10 V	**300 mm**	●	2001-4131-1100-031	**344,89 €**
RGTM1-U 400mm **Q**	Pt1000	0 - 10 V	**400 mm**	●	2001-4131-1100-041	**347,46 €**
Housing variant "Q":	Cable connection **with M12 connector** (male, **5-pin**, A-code)					
Extra charge:	other measuring ranges optional					**25,40 €**

ACCESSORIES

Special accessories for M12 connector
see chapter Accessories!

Duct / smoke gas temperature measuring transducer, including mounting flange, calibratable, with multi-range switching and active output

RGTM 1 - KV
with cable gland
(IP 65)



THERMASGARD® **RGTM 1 - KV**	Duct / smoke gas temperature sensor, incl. mounting flange **(with cable gland)**				
Type / WG01	**Sensor**	**Output**	**Installation length (EL)**	**Item No.**	**Price**
RGTM 1 - I xx KV				**IP 65**, I - variant	
RGTM1-I 200mm **KV**	Pt1000	4...20 mA	**200 mm**	1101-31D2-0049-810	**297,78 €**
RGTM1-I 250mm **KV**	Pt1000	4...20 mA	**250 mm**	1101-31D2-0059-810	**309,25 €**
RGTM1-I 300mm **KV**	Pt1000	4...20 mA	**300 mm**	1101-31D2-0069-810	**312,42 €**
RGTM1-I 400mm **KV**	Pt1000	4...20 mA	**400 mm**	1101-31D2-0089-810	**314,97 €**
RGTM 1 - U xx KV				**IP 65**, U - variant	
RGTM1-U 200mm **KV**	Pt1000	0 - 10 V	**200 mm**	1101-31D1-0049-810	**297,78 €**
RGTM1-U 250mm **KV**	Pt1000	0 - 10 V	**250 mm**	1101-31D1-0059-810	**309,25 €**
RGTM1-U 300mm **KV**	Pt1000	0 - 10 V	**300 mm**	1101-31D1-0069-810	**312,42 €**
RGTM1-U 400mm **KV**	Pt1000	0 - 10 V	**400 mm**	1101-31D1-0089-810	**314,97 €**
Housing variant "KV":	Cable connection **with cable gland**				
Extra charge:	other measuring ranges optional				**25,40 €**

THERMASGARD® RGTM 2

Screw-in / smoke gas temperature measuring transducer, with neck tube, calibratable, with multi-range switching and active output

S+S REGELTECHNIK

Calibratable smoke gas / screw-in temperature measuring transducer with neck tube **THERM**ASGARD® **RGTM 2** with eight switchable measuring ranges and continuous output, with connecting head made from aluminium (optionally with **cable gland** or **M12 connector** according to DIN EN 61076-2-101), spring-mounted measuring insert and straight protective tube.

The duct sensor is used to detect high temperatures in gaseous or liquid media, eg. for exhaust air or smoke gas temperature measurement.

The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %) for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (Ohm) = (U_b -14 V) / 0.02 A for I variant
Load resistance:	10 kOhm (load max. 1 mA) for U variant
Power consumption:	< 1.0 VA / 24 V AC / DC; < 0.55 VA / 24 V DC
Sensor:	Pt1000 (according to DIN EN 60 751, class B) (**Perfect Sensor Protection**)
Measuring ranges:	**multi-range switching** **with 8 switchable measuring ranges,** see table (other ranges optional) **with manual zero point correction (± 10 K)**
Deviation, temperature:	typically ± 0.2 K at +25 °C
Output:	0 - 10 V or 4...20 mA
Connection type:	2- or 3-wire connection
Electrical connection:	0.2 - 1.5 mm², via push-in terminal
Cable connection:	**RGTM 2** (Standard) adjusting screw made of metal (M 20 x 1.5); **RGTM 2-KV** (optional) cable gland, brass, nickel-plated (M 20 x 1.5 ; with strain relief, exchangeable, inner diameter 6 - 12 mm) **RGTM 2-Q** (optional) M12 connector according to DIN EN 61076-2-101 (male, 5-pin, A-code)
Dimensions:	see dimensional drawing
Connecting head:	form B, material aluminium, colour white aluminium (similar to RAL 9006), ambient temperature –30...+70 °C
Protective tube:	stainless steel, **V4A** (1.4571), G ½" straight pipe thread, wrench size 27 mm, p_{max} = 40 bar, Ø = 8 mm length of neck tube (HL) = 80 mm inserted length (EL) = 100 - 400 mm (see table)
Process connection:	screwed socked with G ½"
Humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 54** (according to EN 60 529) **RGTM 2** **IP 65** (according to EN 60 529) **RGTM 2-KV / RGTM 2-Q**
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU

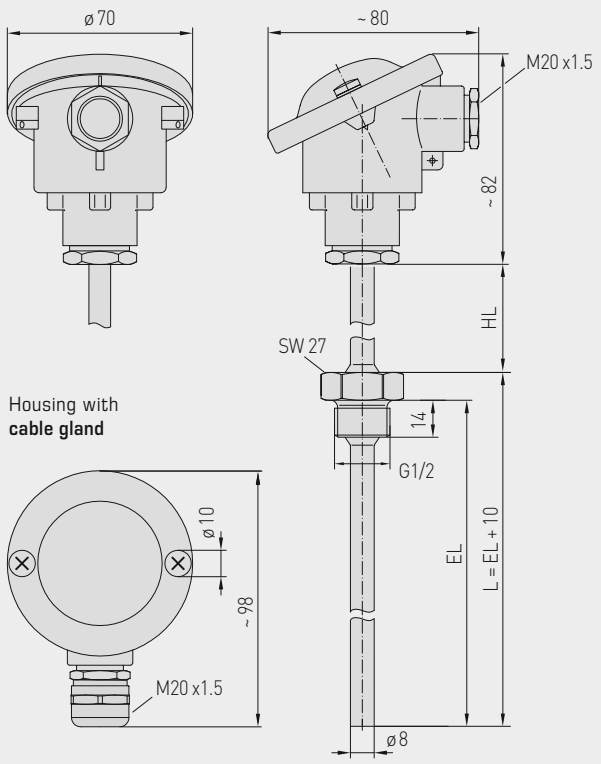
RGTM 2
Basic unit



RGTM 2
Measuring insert with ceramic tubelet

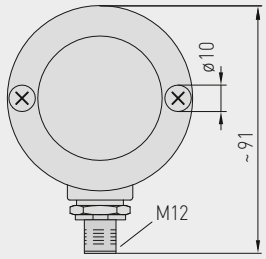
Screw-in / smoke gas temperature measuring transducer, with neck tube, calibratable, with multi-range switching and active output

Dimensional drawing **RGTM 2**



Housing with **cable gland**

Housing with **M12 connector**





M12 connector (male)

High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

RGTM 2
standard (IP 54)



RGTM 2 - KV
with cable gland (IP 65)



RGTM 2 - Q
with M12 connector (IP 65)

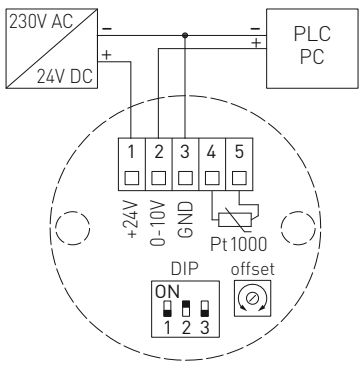




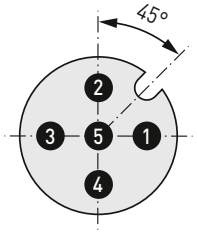
Screw-in / smoke gas temperature measuring transducer, with neck tube, calibratable, with multi-range switching and active output

S+S REGELTECHNIK

Connecting diagram **RGTM 2-U**



Pin assignment (M12) **RGTM 2-U**

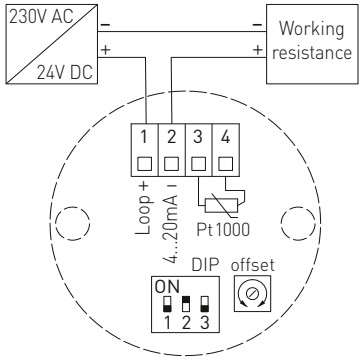


1. +UB 24 V AC/DC
2. Output temperature 0-10 V [°C]
3. free
4. –UB GND
5. Shield

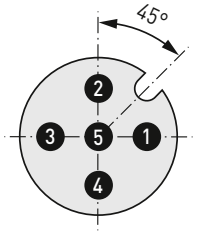
RGTM 2-U
Connecting head



Connecting diagram **RGTM 2-I**



Pin assignment (M12) **RGTM 2-I**



1. +UB 15...36 V DC
2. Output temperature 4...20 mA [°C]
3. free
4. –UB GND
5. Shield

RGTM 2-I
Connecting head



Measuring ranges (adjustable)	DIP 1	DIP 2	DIP 3
–20...+150 °C	**ON**	**ON**	**ON**
0... +50 °C (default)	OFF	**ON**	**ON**
0...+100 °C	**ON**	OFF	**ON**
0...+200 °C	OFF	OFF	**ON**
0...+300 °C	**ON**	**ON**	OFF
0...+400 °C	OFF	**ON**	OFF
0...+500 °C	**ON**	OFF	OFF
0...+600 °C	OFF	OFF	OFF

Screw-in / smoke gas temperature measuring transducer, with neck tube, calibratable, with multi-range switching and active output

RGTM 2
standard
(IP 54)



THERMASGARD® RGTM 2	Screw-in / smoke gas temperature measuring transducer with neck tube (standard)				
Type / WG01	**Sensor**	**Output**	**Installation length (EL)**	**Item No.**	**Price**
RGTM 2 - I				**IP 54**, I - variant	
RGTM2-I 100/80mm	Pt1000	4...20 mA	**100 mm**	1101-2162-0029-810	**280,08 €**
RGTM2-I 150/80mm	Pt1000	4...20 mA	**150 mm**	1101-2162-0039-810	**285,16 €**
RGTM2-I 200/80mm	Pt1000	4...20 mA	**200 mm**	1101-2162-0049-810	**287,70 €**
RGTM2-I 250/80mm	Pt1000	4...20 mA	**250 mm**	1101-2162-0059-810	**299,16 €**
RGTM2-I 300/80mm	Pt1000	4...20 mA	**300 mm**	1101-2162-0069-810	**302,98 €**
RGTM2-I 400/80mm	Pt1000	4...20 mA	**400 mm**	1101-2162-0089-810	**304,26 €**
RGTM 2 - U				**IP 54**, U - variant	
RGTM2-U 100/80mm	Pt1000	0 - 10 V	**100 mm**	1101-2161-0029-810	**280,08 €**
RGTM2-U 150/80mm	Pt1000	0 - 10 V	**150 mm**	1101-2161-0039-810	**285,16 €**
RGTM2-U 200/80mm	Pt1000	0 - 10 V	**200 mm**	1101-2161-0049-810	**287,70 €**
RGTM2-U 250/80mm	Pt1000	0 - 10 V	**250 mm**	1101-2161-0059-810	**299,16 €**
RGTM2-U 300/80mm	Pt1000	0 - 10 V	**300 mm**	1101-2161-0069-810	**302,98 €**
RGTM2-U 400/80mm	Pt1000	0 - 10 V	**400 mm**	1101-2161-0089-810	**304,26 €**
Housing variant:	equipped as standard with pressure screw **(IP 54)**, optional housing variants with cable gland **(IP 65)** or **M12 connector (IP65)** see the next page!				
Extra charge:	other measuring ranges optional				**25,40 €**

THERMASGARD® RGTM 2

Screw-in / smoke gas temperature measuring transducer, with neck tube, calibratable, with multi-range switching and active output

S+S REGELTECHNIK

RGTM 2 - Q
with M12 connector
(IP 65)



THERMASGARD® **RGTM 2 - Q**	Screw-in / smoke gas temperature measuring transducer with neck tube **(with M12 connector)**					
Type / WG01	**Sensor**	**Output**	**Installation length (EL)**	**Q** ●	**Item No.**	**Price**
RGTM 2 - I xx Q					**IP 65**, I - variant	
RGTM2-I 100/80mm **Q**	Pt1000	4...20 mA	**100 mm**	●	2001-4141-2100-011	**322,00 €**
RGTM2-I 150/80mm **Q**	Pt1000	4...20 mA	**150 mm**	●	2001-4141-2100-021	**327,10 €**
RGTM2-I 200/80mm **Q**	Pt1000	4...20 mA	**200 mm**	●	2001-4141-2100-031	**330,81 €**
RGTM2-I 250/80mm **Q**	Pt1000	4...20 mA	**250 mm**	●	2001-4141-2100-041	**341,08 €**
RGTM2-I 300/80mm **Q**	Pt1000	4...20 mA	**300 mm**	●	2001-4141-2100-051	**344,89 €**
RGTM2-I 400/80mm **Q**	Pt1000	4...20 mA	**400 mm**	●	2001-4141-2100-061	**346,19 €**
RGTM 2 - U xx Q					**IP 65**, U - variant	
RGTM2-U 100/80mm **Q**	Pt1000	0 - 10 V	**100 mm**	●	2001-4141-1100-011	**322,00 €**
RGTM2-U 150/80mm **Q**	Pt1000	0 - 10 V	**150 mm**	●	2001-4141-1100-021	**327,10 €**
RGTM2-U 200/80mm **Q**	Pt1000	0 - 10 V	**200 mm**	●	2001-4141-1100-031	**330,81 €**
RGTM2-U 250/80mm **Q**	Pt1000	0 - 10 V	**250 mm**	●	2001-4141-1100-041	**341,08 €**
RGTM2-U 300/80mm **Q**	Pt1000	0 - 10 V	**300 mm**	●	2001-4141-1100-051	**344,89 €**
RGTM2-U 400/80mm **Q**	Pt1000	0 - 10 V	**400 mm**	●	2001-4141-1100-061	**346,19 €**
Housing variant "Q":	Cable connection **with M12 connector** (male, **5-pin**, A-code)					
Extra charge:	other measuring ranges optional					**25,40 €**

ACCESSORIES

Special accessories for M12 connector
see chapter Accessories!

Screw-in / smoke gas temperature measuring transducer, with neck tube, calibratable, with multi-range switching and active output

RGTM 2 - KV
with cable gland
(IP 65)



THERMASGARD® **RGTM 2 - KV**	Screw-in / smoke gas temperature measuring transducer with neck tube **(with cable gland)**				
Type / WG01	**Sensor**	**Output**	**Installation length (EL)**	**Item No.**	**Price**
RGTM 2 - I xx KV				**IP 65**, I - variant	
RGTM2-I 100/80mm **KV**	Pt1000	4...20 mA	**100 mm**	1101-21D2-0029-810	**289,51 €**
RGTM2-I 150/80mm **KV**	Pt1000	4...20 mA	**150 mm**	1101-21D2-0039-810	**294,59 €**
RGTM2-I 200/80mm **KV**	Pt1000	4...20 mA	**200 mm**	1101-21D2-0049-810	**297,14 €**
RGTM2-I 250/80mm **KV**	Pt1000	4...20 mA	**250 mm**	1101-21D2-0059-810	**308,61 €**
RGTM2-I 300/80mm **KV**	Pt1000	4...20 mA	**300 mm**	1101-21D2-0069-810	**312,42 €**
RGTM2-I 400/80mm **KV**	Pt1000	4...20 mA	**400 mm**	1101-21D2-0089-810	**313,69 €**
RGTM 2 - U xx KV				**IP 65**, U - variant	
RGTM2-U 100/80mm **KV**	Pt1000	0 - 10 V	**100 mm**	1101-21D1-0029-810	**289,51 €**
RGTM2-U 150/80mm **KV**	Pt1000	0 - 10 V	**150 mm**	1101-21D1-0039-810	**294,59 €**
RGTM2-U 200/80mm **KV**	Pt1000	0 - 10 V	**200 mm**	1101-21D1-0049-810	**297,14 €**
RGTM2-U 250/80mm **KV**	Pt1000	0 - 10 V	**250 mm**	1101-21D1-0059-810	**308,61 €**
RGTM2-U 300/80mm **KV**	Pt1000	0 - 10 V	**300 mm**	1101-21D1-0069-810	**312,42 €**
RGTM2-U 400/80mm **KV**	Pt1000	0 - 10 V	**400 mm**	1101-21D1-0089-810	**313,69 €**
Housing variant "KV":	Cable connection **with cable gland**				
Extra charge:	other measuring ranges optional				**25,40 €**

THERMASGARD® HFTM

Sleeve sensor with temperature measuring transducer, calibratable, with multi-range switching and active output

S+S REGELTECHNIK

Calibratable temperature measuring transducer with sleeve sensor **THERM**ASGARD® **HFTM** with eight switchable measuring ranges, continuous output, housing made from impact-resistant plastic with quick-release screws, optionally **with/without display**, with **cable gland** or **M12 connector** according to DIN EN 61076-2-101.

The temperature transmitter with remote sensor is used to detect temperatures in liquid and gaseous media e.g. if installed in an immersion sleeve or as a duct sensor. A direct, permanent use in liquids is possible in combination with immersion sleeves **THE** (see chapter Accessories).

The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

HFTM
with cable gland



HFTM-Q
with M12 connector



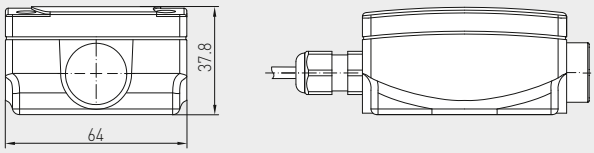
TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %) for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (ohm) = (U_b -14 V) / 0.02 A for I variant, see working resistance diagram
Load resistance:	R_L > 5 kOhm for U variant
Power consumption:	< 1.0 VA / 24 V DC; < 2.2 VA / 24 V AC
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Sensor:	Pt1000, DIN EN 60751, class B (**Perfect Sensor Protection** at IP68) sensor external
Measuring ranges:	**multi-range switching** **with 8 switchable measuring ranges** see table (other measuring ranges optional) **with manual zero point correction (± 10 K)**
Deviation in temperature:	typically ± 0.2 K at +25 °C
Output:	0 - 10 V or 4...20 mA
Connection type:	2- or 3-wire connection
Electrical connection:	0.14 - 1.5 mm², via screw terminals
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** (male, 5-pin, A-code) according to DIN EN 61076-2-101
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-release screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), cover for display is transparent!
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Sensor protection:	sensor sleeve, stainless steel V4A (1.4571), Ø = 6 mm, nominal length NL = 50 mm (optional 30...400 mm)
Sensor cable:	Silicone, SiHF, 2x 0.25mm²; cable length (KL) = 1.5m (other lengths and jacket materials, e.g. PTFE or glass fibre with steel mesh, available on request)
Ambient temperature:	measuring transducer –30...+70 °C
Permitted humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type housing:	**IP 65** (according to EN 60 529) Housing tested, TÜV SÜD, Report No.713139052 (Tyr 1)
Protection type sensor:	**IP 65** (according to EN 60 529) **sleeve** humidity-tight (standard) **IP 68** (according to EN 60 529) **sleeve** water-tight (optional) **IP 54** (according to EN 60 529) with **glass fibre** cable (optional)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU
Optional:	**display with illumination,** two-line, cut-out approx. 36 x 15 mm (B x H), to display the **actual temperature** and **internal diagnostics** (measuring range exceeded, measuring range not reached, sensor breakage, sensor short circuit)
ACCESSORIES	(see table)

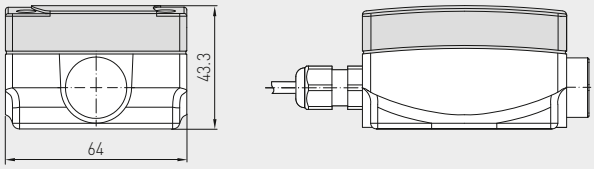
Sleeve sensor with temperature measuring transducer, calibratable, with multi-range switching and active output

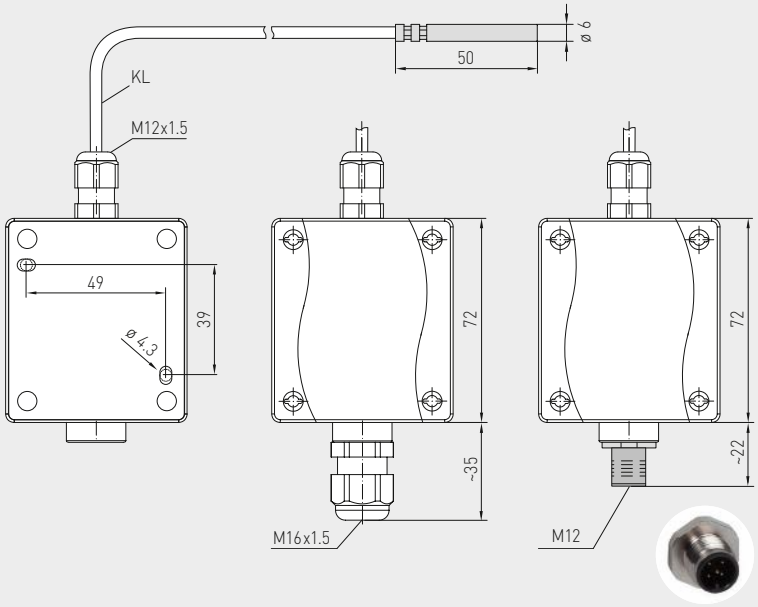
Dimensional drawing **HFTM**

without display



with display





Housing with **cable gland**

Housing with **M12 connector**

HFTM
with cable gland and display



HFTM-Q
with M12 connector and display





Display and internal diagnostics
THERMASGARD®
Measuring transducer with display



Standard



Measuring range exceeded



Measuring range not reached



Sensor breakage



Sensor short circuit



IP65 (standard)
humidity-tight



IP68 (optional)
water-tight
Perfect Sensor Protection



IP54 (optional)
with **glass fibre** cable

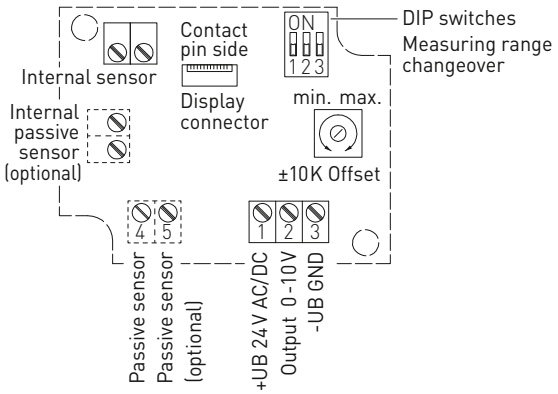
High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

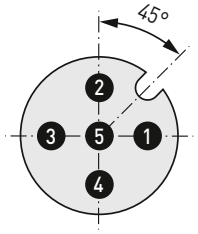
Sleeve sensor with temperature measuring transducer, calibratable, with multi-range switching and active output

S+S REGELTECHNIK

Schematic diagram **HFTM-U**

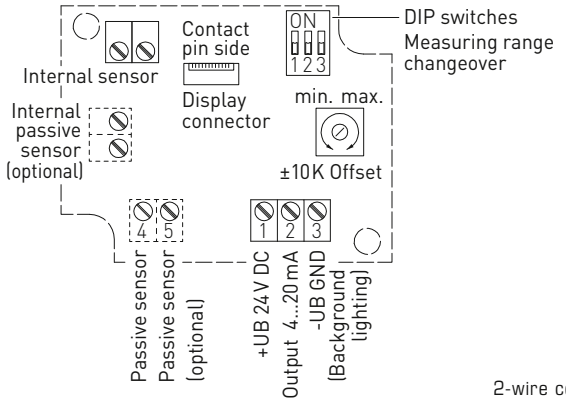


Pin assignment (M12) **HFTM-U**



1. +UB 24 V AC/DC
2. Output temperature 0-10 V [°C]
3. free
4. –UB GND
5. Shield

Schematic diagram * **HFTM-I**

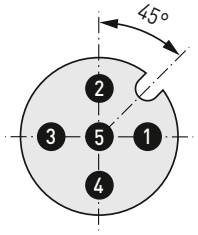


Connection*:

2-wire connection for devices with / without display (not illuminated)

3-wire connection for devices with illuminated display

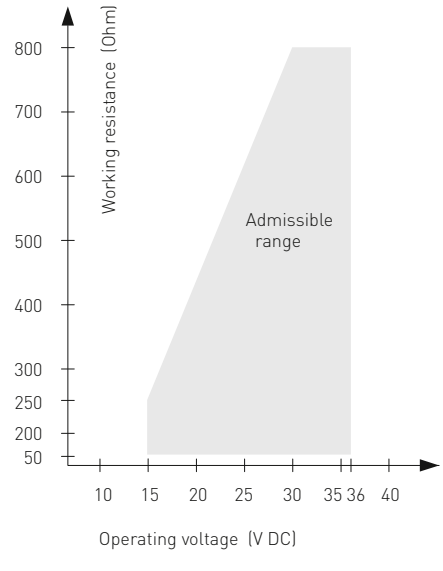
Pin assignment (M12) **HFTM-I**



1. +UB 24 V DC
2. Output temperature 4...20 mA [°C]
3. free
4. –UB GND (optional for LCD backlighting)
5. Shield

Measuring ranges (adjustable)	DIP 1	DIP 2	DIP 3
–20...+150 °C	**ON**	**ON**	**ON**
–50... +50 °C	OFF	**ON**	**ON**
–20... +80 °C	**ON**	OFF	**ON**
–30... +60 °C	OFF	OFF	**ON**
0... +40 °C	**ON**	**ON**	OFF
0... +50 °C (default)	OFF	**ON**	OFF
0...+100 °C	**ON**	OFF	OFF
0...+150 °C	OFF	OFF	OFF

Load resistance diagram 4..20 mA **HFTM-I**



HFTM-xx
with display, hinged



Sleeve sensor with temperature measuring transducer, calibratable, with multi-range switching and active output

HFTM-Q
with M12 connector





HFTM
with cable gland

THERMASGARD® **HFTM**	Sleeve sensor with temperature measuring transducer **(with cable gland)**					
Type / WG01	**Sensor**	**Output**	**Type**	**Display**	**Item No.**	**Price**
HFTM						
HFTM-I	Pt1000	4...20 mA	Remote sensor		1101-1152-0219-920	**104,51 €**
HFTM-I **LCD**	Pt1000	4...20 mA	Remote sensor	■	1101-1152-2219-920	**155,45 €**
HFTM-U	Pt1000	0-10 V	Remote sensor		1101-1151-0219-920	**104,51 €**
HFTM-U **LCD**	Pt1000	0-10 V	Remote sensor	■	1101-1151-2219-920	**155,45 €**
Housing variant:	Cable connection **with cable gland**					
Extra charge:	other measuring ranges optional					**25,40 €**
	Protection type **IP68** (Sensor sleeve watertight compound-filled)					**3,40 €**
	2-wire connecting leads, per running meter (**silicone / PTFE / glass fibre**)					on request
	Other lengths of protection sleeve optional					on request

THERMASGARD® **HFTM-Q**	Sleeve sensor with temperature measuring transducer **(with M12 connector)**					
Type / WG01I	**Sensor**	**Output**	**Type**	**Display ● = Q**	**Item No.**	**Price**
HFTM-Q						
HFTM-I **Q**	Pt1000	4...20 mA	Remote sensor	●	2001-2111-2100-001	**146,43 €**
HFTM-I **Q LCD**	Pt1000	4...20 mA	Remote sensor	● ■	2001-2112-2100-001	**197,36 €**
HFTM-U **Q**	Pt1000	0-10 V	Remote sensor	●	2001-2111-1100-001	**146,43 €**
HFTM-U **Q LCD**	Pt1000	0-10 V	Remote sensor	● ■	2001-2112-1100-001	**197,36 €**
Housing variant "Q":	Cable connection **with M12 connector** (male, **5-pin**, A-code)					
Extra charge:	see table above!					

ACCESSORIES	
THE-xx	**Immersion sleeve**, stainless steel **V4A** (1.4571) or nickel-plated brass, Ø = 9 mm see chapter Accessories!
	Special accessories for M12 connector see chapter Accessories !

THERMASGARD® HFTM - VA

Sleeve sensor with temperature measuring transducer, calibratable, with multi-range switching and active output

S+S REGELTECHNIK

Calibratable temperature measuring transducer with sleeve sensor **THERM**ASGARD® **HFTM - VA** with eight switchable measuring ranges, continuous output, rugged housing made from **stainless steel V4A** with **cable gland** or **M12 connector** according to DIN EN 61076-2-101.

The temperature transmitter with remote sensor is used to detect temperatures in liquid and gaseous media e.g. if installed in an immersion sleeve or as a duct sensor. The measuring transducer is factory-calibrated. Adjustment / fine adjustment by the user is possible (zero point offset is adjustable). A direct, permanent use in liquids is possible in combination with immersion sleeves **THE** (see chapter Accessories).

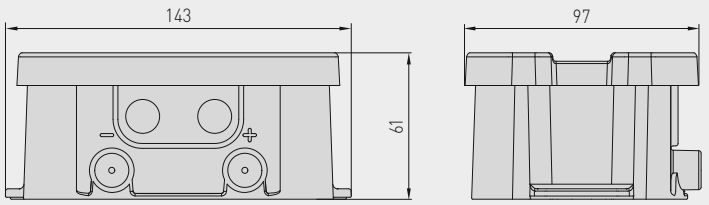
The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

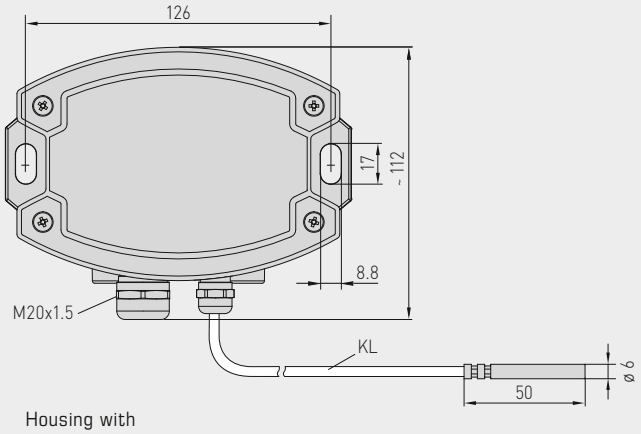
Power supply:	24 V AC / DC (± 10 %) for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (ohm) = (U_b -14 V) / 0.02 A for I variant, see working resistance diagram
Load resistance:	R_L > 5 kOhm for U variant
Power consumption:	< 1.0 VA / 24 V DC; < 2.2 VA / 24 V AC
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Sensor:	Pt1000, DIN EN 60751, class B (**Perfect Sensor Protection** with IP68) Sensor external
Measuring ranges:	**multi-range switching** **with 8 switchable measuring ranges,** see table (other ranges optional) **with manual zero point correction (± 10 K)**
Deviation, temperature:	typically ± 0.2 K at +25 °C
Output:	0 - 10 V or 4... 20 mA
Connection type:	2-wire connection
Electrical connection:	0.14 - 1.5 mm², via screw terminals
Cable connection:	**cable gland, stainless steel V2A** (1.4305) (M 20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) **or** **M12 connector** (male, 5-pin, A-code) according to DIN EN 61076-2-101
Housing:	**stainless steel V4A** (1.4571), with non-distortion cover bolting, impact-resistant, high EMI shielding, corrosion, temperature, weather- and UV-resistant
Housing dimensions:	143 x 97 x 61 mm (Typ 2E)
Sensor protection:	sensor sleeve, stainless steel V4A (1.4571), Ø = 6 mm, nominal length NL = 50 mm (optional 30...400 mm)
Sensor cable:	Silicone, SiHF, 2 x 0.25mm²; cable length (KL) = 1.5m (other lengths and jacket materials, e.g. PTFE or glass fibre with steel mesh, available on request)
Ambient temperature:	measuring transducer –30...+70 °C
Permitted humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type housing:	**IP 65** (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713160960B (Skadi2)
Protection type sensor:	**IP 65** (according to EN 60 529) **sleeve** humidity-tight (standard) **IP 68** (according to EN 60 529) **sleeve** water-tight (optional) **IP 54** (according to EN 60 529) with **glass fibre** cable (optional)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU
ACCESSORIES	(see table)

Sleeve sensor with temperature measuring transducer, calibratable, with multi-range switching and active output

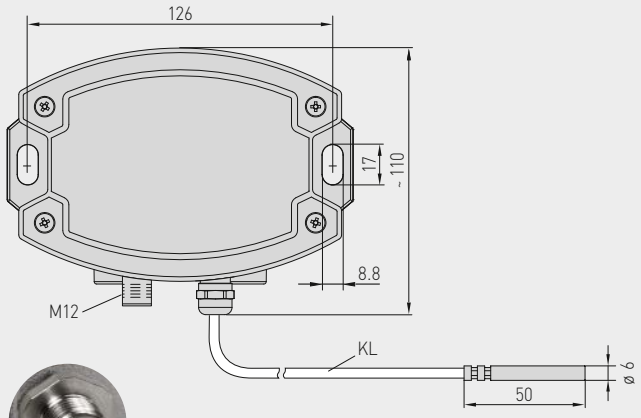
Dimensional drawing **HFTM - VA**



Housing with
cable gland



Housing with
M12 connector





M12 connector
(male)



IP 65 (standard)
humidity-tight



IP 68 (optional)
water-tight
Perfect Sensor Protection



IP 54 (optional)
with **glass fibre** cable

High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

HFTM - VA
with cable gland



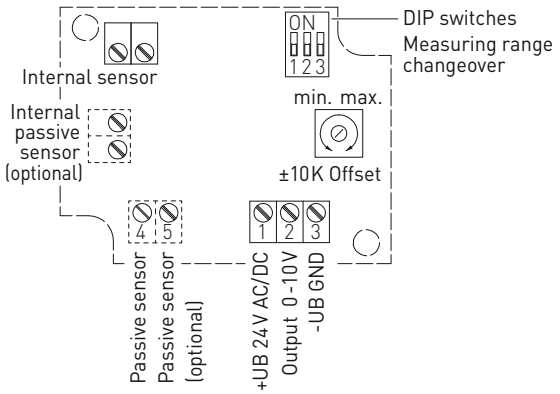
HFTM - VAQ
with M12 connector



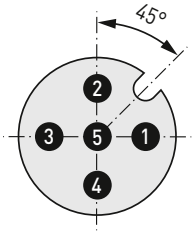
Sleeve sensor with temperature measuring transducer, calibratable, with multi-range switching and active output

S+S REGELTECHNIK

Schematic diagram **HFTM - U**

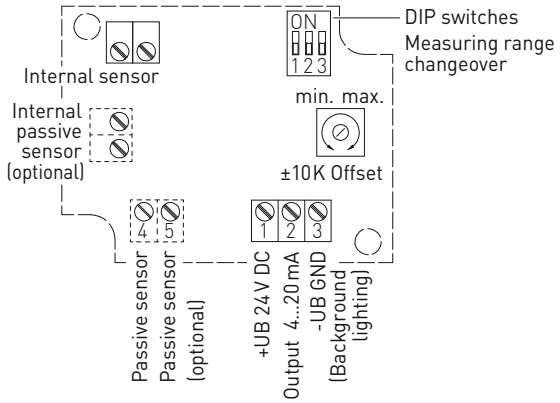


Pin assignment (M12) **HFTM - U**

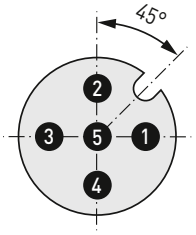


1. +UB 24 V AC/DC
2. Output temperature 0-10 V [°C]
3. free
4. -UB GND
5. Shield

Schematic diagram **HFTM - I**



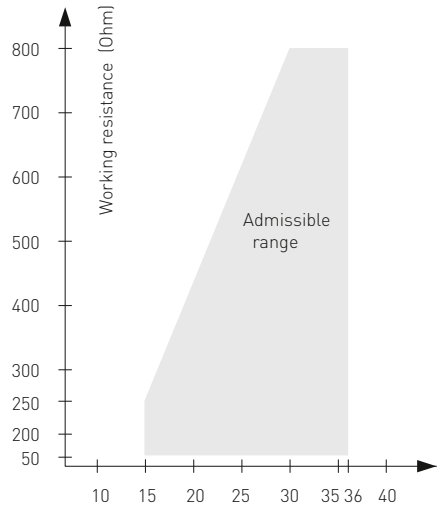
Pin assignment (M12) **HFTM - I**



1. +UB 24 V DC
2. Output temperature 4...20 mA [°C]
3. free
4. -UB GND (optional)
5. Shield

Measuring ranges (adjustable)	DIP 1	DIP 2	DIP 3
−20...+150 °C	**ON**	**ON**	**ON**
−50... +50 °C	OFF	**ON**	**ON**
−20... +80 °C	**ON**	OFF	**ON**
−30... +60 °C	OFF	OFF	**ON**
0... +40 °C	**ON**	**ON**	OFF
0... +50 °C (default)	OFF	**ON**	OFF
0...+100 °C	**ON**	OFF	OFF
0...+150 °C	OFF	OFF	OFF

Load resistance diagram 4.. 20 mA **HFTM - I**



HFTM - VAQ
with M12 connector



HFTM - VA
with cable gland



THERMASGARD® **HFTM - VA**	Sleeve sensor with temperature measuring transducer, *ID* (Stainless steel housing **with cable gland**)				
Type / WG02I	**Sensor**	**Output**	**Type**	**Item No.**	**Price**
HFTM - VA					
HFTM-I VA	Pt1000	4...20 mA	Remote sensor	2001-2141-2200-001	**383,32 €**
HFTM-U VA	Pt1000	0-10 V	Remote sensor	2001-2141-1200-001	**383,32 €**
Housing variant:	Cable connection **with cable gland**				
Extra charge:	other measuring ranges optional				**25,40 €**
	Protection type **IP68** (Sensor sleeve watertight compound-filled)				**3,40 €**
	2-wire connecting leads, per running meter (**silicone / PTFE / glass fibre**)				on request
	Other lengths of protection sleeve optional				on request

THERMASGARD® **HFTM - VAQ**	Sleeve sensor with temperature measuring transducer, *ID* (Stainless steel housing **with M12 connector**)					
Type / WG01I	**Sensor**	**Output**	**Type**	**● = Q**	**Item No.**	**Price**
HFTM - VAQ						
HFTM-I VA**Q**	Pt1000	4...20 mA	Remote sensor	●	2001-2141-2100-001	**421,87 €**
HFTM-U VA**Q**	Pt1000	0-10 V	Remote sensor	●	2001-2141-1100-001	**421,87 €**
Housing variant "Q":	Cable connection **with M12 connector** (male, **5-pin**, A-code)					
Extra charge:	see table above!					

ACCESSORIES	
THE-xx	**Immersion sleeve**, stainless steel **V4A** (1.4571) or nickel-plated brass, Ø = 9 mm see chapter Accessories!
	Special accessories for M12 connector see chapter Accessories !

THERMASGARD® ALTM 1

Surface contact / tube contact temperature measuring transducers, including strap, compact variant, calibratable, with multi-range switching and active output

S+S REGELTECHNIK

Calibratable surface-contact temperature measuring transducer (compact variant) **THERM**ASGARD® **ALTM 1** with eight switchable measuring ranges, continuous output, in an impact-resistant plastic housing with quick-locking screws, optionally with / without display, incl. strap.

The surface-contact sensor is used to detect the temperature on lines, pipes (e.g., cold and warm water) or on heating sections for heating control. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

ALTM 1





M12 connector
(optional on request)

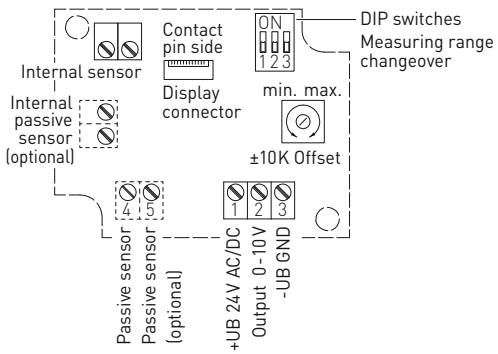
TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %) for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (ohm) = (U_b -14 V) / 0.02 A for I variant
Load resistance:	R_L > 5 kOhm for U variant
Power consumption:	< 1.0 VA / 24 V DC; < 2.2 VA / 24 V AC
Sensor:	Pt1000, DIN EN 60751, class B (**Perfect Sensor Protection**)
Measuring ranges:	**multi-range switching with 8 switchable measuring ranges,** see table (other ranges optional) compact variant: **T_{max} up to +100 °C,** operating range –50...+100 °C **with manual zero point correction (± 10 K)**
Deviation, temperature:	typically ± 0.2 K at +25 °C
Output:	0 - 10 V or 4...20 mA
Connection type:	2- or 3-wire connection
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.14 - 1.5 mm² via terminal screws
Process connection:	endless strap with metal tightener, (included in the scope of delivery) Ø = 13 - 92 mm (¼ - 3"), length L = 300 mm
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Ambient temperature:	measuring transducer –30...+70 °C
Humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC directive 2014 / 30 / EU
Optional:	Two-line **display with illumination,** cutout approx. 36 x 15 mm (W x H), for displaying the **ACTUAL temperature** and the **internal diagnostics** (measuring range exceeded, measuring range not reached, sensor breakage, sensor short circuit)

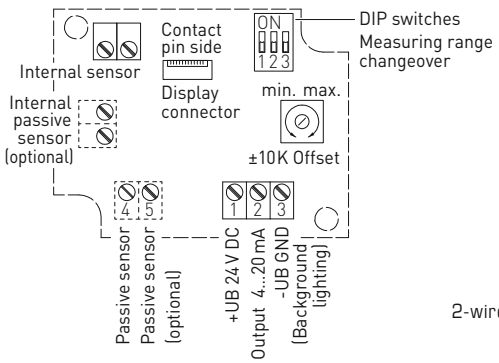
Display and internal diagnostics
THERMASGARD®
Measuring transducer with display



3-wire connection **ALTM 1 - U**



2- or 3-wire connection* **ALTM 1 - I**

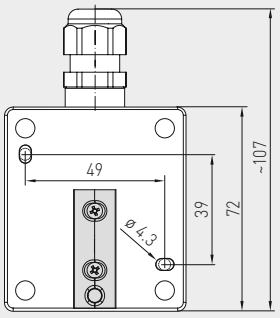


Connection*:
2-wire connection for devices with / without display (not illuminated)
3-wire connection for devices with illuminated display

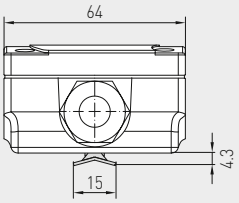
S+S REGELTECHNIK

Surface contact / tube contact temperature measuring transducers, including strap, compact variant, calibratable, with multi-range switching and active output

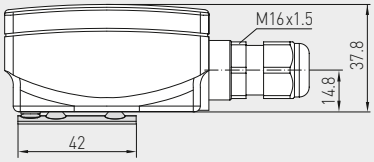
Dimensional drawing **ALTM 1**

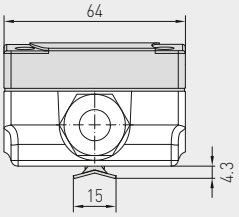




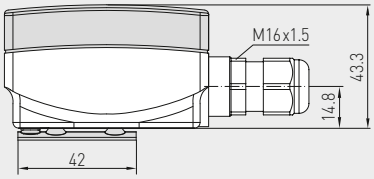


without display





with display



ALTM 1
with display

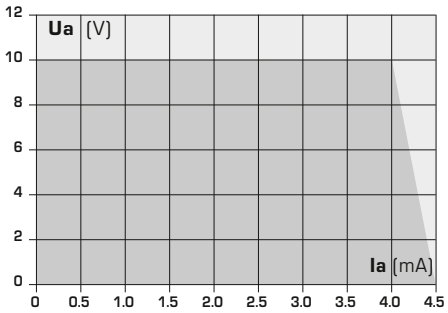


High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

Measuring ranges (adjustable)	DIP 1	DIP 2	DIP 3
–20…+150 °C	**ON**	**ON**	**ON**
–50… +50 °C	OFF	**ON**	**ON**
–20… +80 °C	**ON**	OFF	**ON**
–30… +60 °C	OFF	OFF	**ON**
0… +40 °C	**ON**	**ON**	OFF
0… +50 °C (default)	OFF	**ON**	OFF
0…+100 °C	**ON**	OFF	OFF
0…+150 °C	OFF	OFF	OFF

Dependency of output voltage on output current



THERMASGARD® ALTM 1 — Surface contact / tube contact temperature measuring transducers (compact)

Type / WG01	Sensor	Output	Type	Display	Item No.	Price
ALTM 1 - I					**IP 65, I -variant**	
ALTM1-I	Pt1000	4…20 mA	Compact		1101-1112-0219-920	**105,03 €**
ALTM1-I **LCD**	Pt1000	4…20 mA	Compact	■	1101-1112-2219-920	**155,96 €**
ALTM 1 - U					**IP 65, U -variant**	
ALTM1-U	Pt1000	0-10 V	Compact		1101-1111-0219-920	**105,03 €**
ALTM1-U **LCD**	Pt1000	0-10 V	Compact	■	1101-1111-2219-920	**155,96 €**
Extra charge:	Other ranges optional Cable connection with **M12 connector** according to DIN EN 61076-2-101				on request	**25,40 €**

ACCESSORIES			
WLP-1	Heat-conductive paste, silicone-free	7100-0060-1000-000	**3,38 €**

THERMASGARD® ALTM 2

Surface contact / tube contact temperature measuring transducers, incl. strap, with detached sensor head, calibratable, with multi-range switching and active output

S+S REGELTECHNIK

Calibratable tube contact temperature measuring transducer **THERM**ASGARD® **ALTM 2** with eight switchable, measuring ranges, external sensor, continuous output, housing made from impact-resistant plastic with quick-release screws, optionally **with / without display**, with **cable gland** or **M12 connector** according to DIN EN 61076-2-101.

The surface-contact sensor is used for temperature detection on lines, pipes (e.g. cold and hot water) or on heating sections for heating system control.

The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

ALTM 2
with cable gland



ALTM 2 - Q
with M12 connector



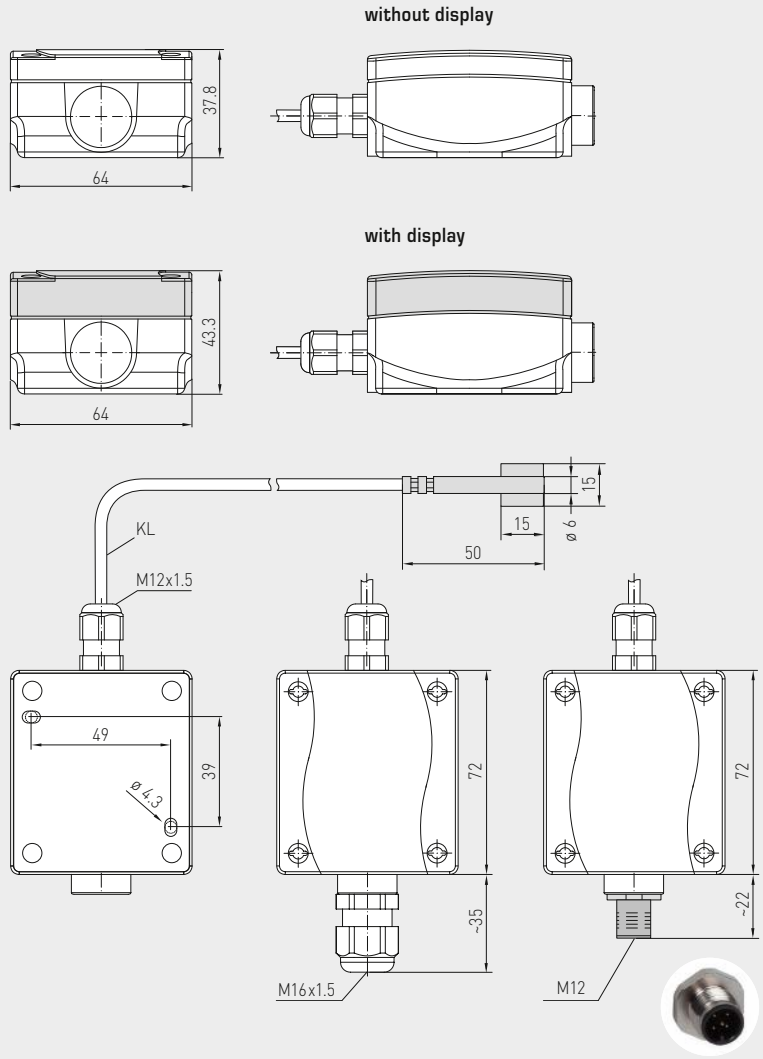


TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %) for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (ohm) = (U_b -14 V) / 0.02 A for I variant, see working resistance diagram
Load resistance:	R_L > 5 kOhm for U variant
Power consumption:	< 1.0 VA / 24 V DC; < 2.2 VA / 24 V AC
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Sensor:	Pt1000, DIN EN 60751, class B (**Perfect Sensor Protection** at IP68) sensor external
Measuring ranges:	**multi-range switching** **with 8 switchable measuring ranges** see table (other measuring ranges optional) T_{max} **above +100 °C**, operating range –50...+150 °C **with manual zero point correction (± 10 K)**
Deviation in temperature:	typically ± 0.2 K at +25 °C
Output:	0 - 10 V or 4...20 mA
Connection type:	2- or 3-wire connection
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** (male, 5-pin, A-code) according to DIN EN 61076-2-101
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-release screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), cover for display is transparent!
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Sensor cable:	Silicone, SiHF, 2 x 0,25 mm²; cable length (KL) = 1.5m (other lengths and jacket materials, e.g. PTFE or glass fibre with steel mesh, available on request)
Sensor protection:	pipe feeder made of stainless steel **V4A** (1.4571), Ø = 6 mm, L = 50 mm
Electrical connection:	0.14 - 1.5 mm², via screw terminals
Process connection:	endless strap with metal tightener (included in the scope of delivery) Ø = 13 - 92 mm (¼ - 3"), L = 300 mm
Ambient temperature:	measuring transducer –30...+70 °C
Permitted humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type housing:	**IP 65** (according to EN 60 529) Housing tested, TÜV SÜD, Report No.713139052 (Tyr 1)
Protection type sensor:	**IP 65** (according to EN 60 529) **sleeve** humidity-tight (standard) **IP 68** (according to EN 60 529) **sleeve** water-tight (optional)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU
Optional:	**display with illumination,** two-line, cut-out approx. 36 x 15 mm (B x H), to display the **actual temperature** and **internal diagnostics** (measuring range exceeded, measuring range not reached, sensor breakage, sensor short circuit)
ACCESSORIES	(see table)

Surface contact/tube contact temperature measuring transducers, incl. strap, with detached sensor head, calibratable, with multi-range switching and active output

Dimensional drawing **ALTM 2**



Housing with **cable gland**

Housing with **M12 connector**

ALTM 2
with cable gland and display



ALTM 2 - Q
with M12 connector and display





Display and internal diagnostics
THERMASGARD®
Measuring transducer with display



Standard



Measuring range exceeded



Measuring range not reached



Sensor breakage



Sensor short circuit


IP 65 (standard)
humidity-tight


IP 68 (optional)
water-tight
Perfect Sensor Protection

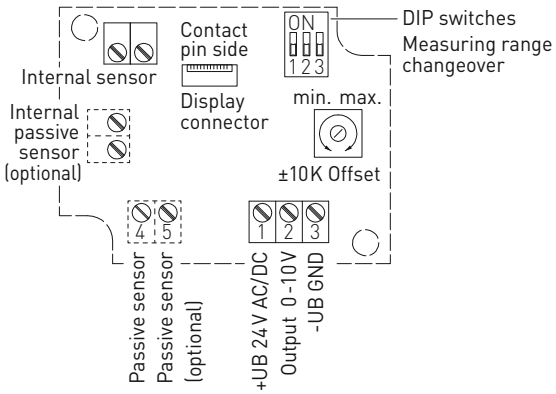
* High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

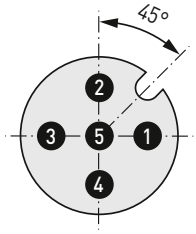
Surface contact / tube contact temperature measuring transducers, incl. strap, with detached sensor head, calibratable, with multi-range switching and active output

S+S REGELTECHNIK

Schematic diagram **ALTM 2 - U**

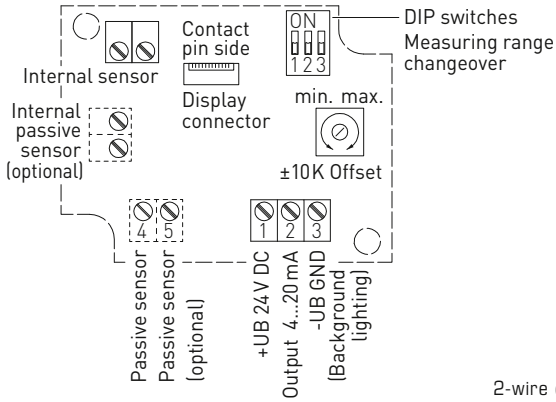


Pin assignment (M12) **ALTM 2 - U**



1. +UB 24 V AC/DC
2. Output temperature 0-10 V [°C]
3. free
4. –UB GND
5. Shield

Schematic diagram * **ALTM 2 - I**

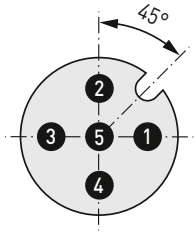


Connection*:

2-wire connection for devices with / without display (not illuminated)

3-wire connection for devices with illuminated display

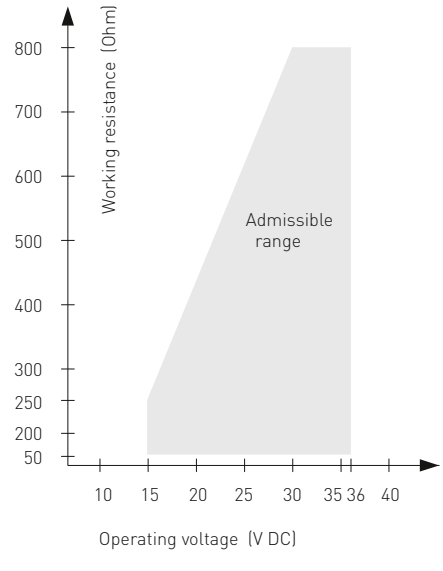
Pin assignment (M12) **ALTM 2 - I**



1. +UB 24 V DC
2. Output temperature 4...20 mA [°C]
3. free
4. –UB GND (optional for LCD backlighting)
5. Shield

Measuring ranges (adjustable)	DIP 1	DIP 2	DIP 3
–20...+150 °C	**ON**	**ON**	**ON**
–50... +50 °C	OFF	**ON**	**ON**
–20... +80 °C	**ON**	OFF	**ON**
–30... +60 °C	OFF	OFF	**ON**
0... +40 °C	**ON**	**ON**	OFF
0... +50 °C (default)	OFF	**ON**	OFF
0...+100 °C	**ON**	OFF	OFF
0...+150 °C	OFF	OFF	OFF

Load resistance diagram 4..20 mA **ALTM 2 - I**



ALTM 2-xx
with display, hinged



Surface contact / tube contact temperature measuring transducers, incl. strap, with detached sensor head, calibratable, with multi-range switching and active output

ALTM 2 - Q
with M12 connector





ALTM 2
with cable gland

THERMASGARD® **ALTM 2**	Surface contact / tube contact temperature measuring transducers **(with cable gland)**					
Type / WG01	**Sensor**	**Output**	**Type**	**Display**	**Item No.**	**Price**
ALTM 2						
ALTM2-I	Pt1000	4...20 mA	Remote sensor		1101-1122-0219-920	**112,02 €**
ALTM2-I **LCD**	Pt1000	4...20 mA	Remote sensor	■	1101-1122-2219-920	**162,96 €**
ALTM2-U	Pt1000	0-10 V	Remote sensor		1101-1121-0219-920	**112,02 €**
ALTM2-U **LCD**	Pt1000	0-10 V	Remote sensor	■	1101-1121-2219-920	**162,96 €**
Housing variant:	Cable connection **with cable gland**					
Extra charge:	other measuring ranges optional					**25,40 €**
	Protection type **IP 68** (Sensor sleeve watertight compound-filled)					**3,40 €**
	2-wire connecting leads, per running meter (**silicone / PTFE / glass fibre**)				on request	

THERMASGARD® **ALTM 2 - Q**	Surface contact / tube contact temperature measuring transducers **(with M12 connector)**					
Type / WG01	**Sensor**	**Output**	**Type**	**Display** ● = Q	**Item No.**	**Price**
ALTM 2 - Q						
ALTM2-I **Q**	Pt1000	4...20 mA	Remote sensor	●	2001-2121-2100-001	**153,95 €**
ALTM2-I **Q LCD**	Pt1000	4...20 mA	Remote sensor	● ■	2001-2122-2100-001	**204,87 €**
ALTM2-U **Q**	Pt1000	0-10 V	Remote sensor	●	2001-2121-1100-001	**153,95 €**
ALTM2-U **Q LCD**	Pt1000	0-10 V	Remote sensor	● ■	2001-2122-1100-001	**204,87 €**
Housing variant "Q":	Cable connection **with M12 connector** (male, **5-pin**, A-code)					
Extra charge:	see table above!					

ACCESSORIES			
WLP-1	Heat-conductive paste, silicone-free	7100-0060-1000-000	**3,38 €**
	Special accessories for M12 connector see chapter Accessories !		

THERMASGARD® ALTM 2 - VA

Surface contact / tube contact temperature measuring transducers, incl. strap, with detached sensor head, calibratable, with multi-range switching and active output

S+S REGELTECHNIK

Calibratable tube contact temperature measuring transducer **THERM**ASGARD® **ALTM 2 - VA** with eight switchable measuring ranges, external sensor, continuous output, rugged housing made from **stainless steel V4A**, with **cable gland** or **M12 connector** according to DIN EN 61076-2-101.

The surface-contact sensor is used for temperature detection on lines, pipes (e.g. cold and hot water) or on heating sections for heating system control.

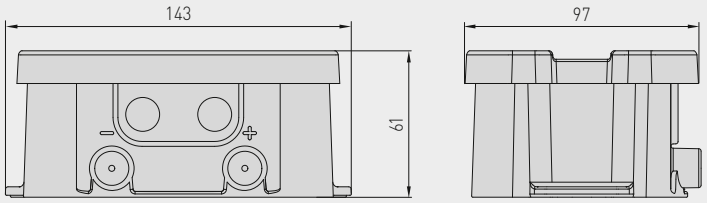
The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

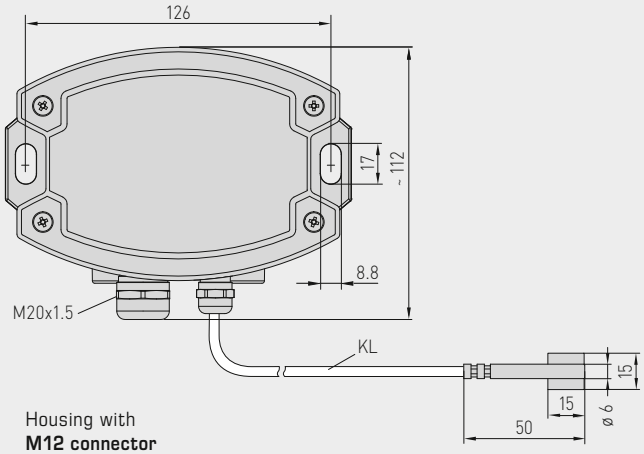
Power supply:	24 V AC / DC (± 10 %) for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (ohm) = (U_b -14 V) / 0.02 A for I variant, see working resistance diagram
Load resistance:	R_L > 5 kOhm for U variant
Power consumption:	< 1.0 VA / 24 V DC; < 2.2 VA / 24 V AC
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Sensor:	Pt1000, DIN EN 60751, class B (**Perfect Sensor Protection** with IP68) Sensor external
Measuring ranges:	**multi-range switching** **with 8 switchable measuring ranges** see table (other ranges optional) T_{max} **above +100 °C**, operating range –50...+150 °C **with manual zero point correction (± 10 K)**
Deviation, temperature:	typically ± 0.2 K at +25 °C
Output:	0 - 10 V or 4... 20 mA
Connection type:	2-wire connection
Cable connection:	**cable gland, stainless steel V2A** (1.4305) (M 20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) **or** **M12 connector** (male, 5-pin, A-code) according to DIN EN 61076-2-101
Housing:	**stainless steel V4A** (1.4571), with non-distortion cover bolting, impact-resistant, high EMI shielding, corrosion, temperature, weather- and UV-resistant
Housing dimensions:	143 x 97 x 61 mm (Tyr 2E)
Sensor cable:	Silicone, SiHF, 2 x 0,25 mm²; cable length (KL) = 1.5m (other lengths and jacket materials, e.g. PTFE or glass fibre with steel mesh, available on request)
Sensor protection:	pipe feeder, made of stainless steel **V4A** (1.4571), Ø = 6 mm, L = 50 mm
Electrical connection:	0.14 - 1.5 mm², via screw terminals
Process connection:	endless strap with metal tightener (included in the scope of delivery) Ø = 13 - 92 mm (¼ - 3"), L = 300 mm
Ambient temperature:	measuring transducer –30...+70 °C
Permitted humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type housing:	**IP 65** (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713160960B (Skadi2)
Protection type sensor:	**IP 65** (according to EN 60 529) **sleeve** humidity-tight (standard) **IP 68** (according to EN 60 529) **sleeve** water-tight (optional)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU
ACCESSORIES	(see table)

Surface contact / tube contact temperature measuring transducers, incl. strap, with detached sensor head, calibratable, with multi-range switching and active output

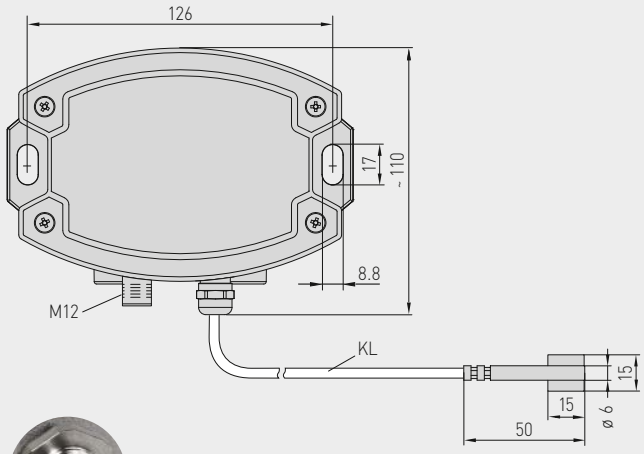
Dimensional drawing **ALTM 2 - VA**



Housing with
cable gland



Housing with
M12 connector





M12 connector
(male)



IP 65 (standard)
humidity-tight



IP 68 (optional)
water-tight
Perfect Sensor Protection

ALTM 2 - VA
with cable gland



ALTM 2 - VAQ
with M12 connector



High-performance encapsulation against vibration, mechanical stress and humidity

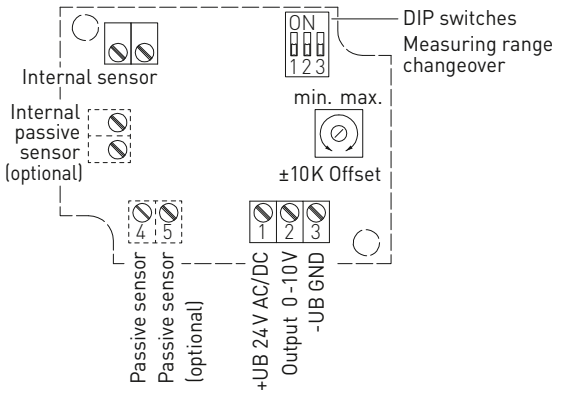
PS-PROTECTION
PERFECT SENSOR PROTECTION

THERMASGARD® ALTM 2 - VA

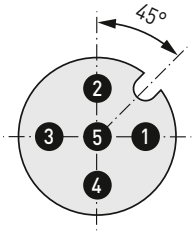
Surface contact / tube contact temperature measuring transducers, incl. strap, with detached sensor head, calibratable, with multi-range switching and active output

S+S REGELTECHNIK

Schematic diagram **ALTM 2 - U**

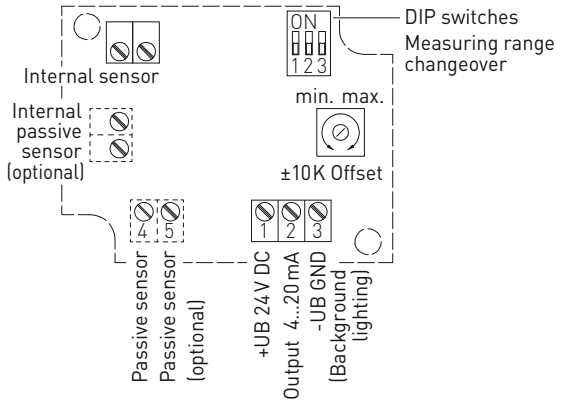


Pin assignment (M12) **ALTM 2 - U**

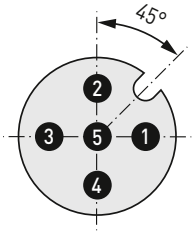


1. +UB 24 V AC/DC
2. Output temperature 0 - 10 V [°C]
3. free
4. -UB GND
5. Shield

Schematic diagram **ALTM 2 - I**



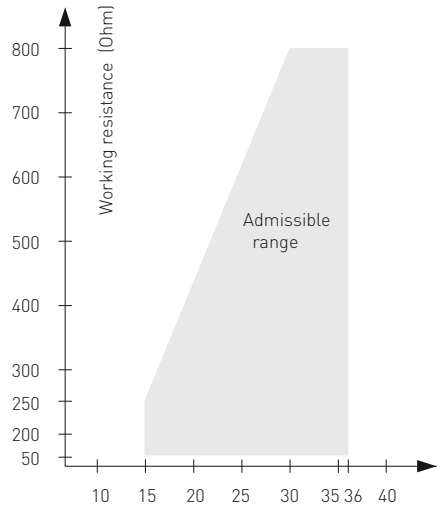
Pin assignment (M12) **ALTM 2 - I**



1. +UB 24 V DC
2. Output temperature 4...20 mA [°C]
3. free
4. -UB GND (optional)
5. Shield

Measuring ranges (adjustable)	DIP 1	DIP 2	DIP 3
−20...+150 °C	**ON**	**ON**	**ON**
−50... +50 °C	OFF	**ON**	**ON**
−20... +80 °C	**ON**	OFF	**ON**
−30... +60 °C	OFF	OFF	**ON**
0... +40 °C	**ON**	**ON**	OFF
0... +50 °C (default)	OFF	**ON**	OFF
0...+100 °C	**ON**	OFF	OFF
0...+150 °C	OFF	OFF	OFF

Load resistance diagram **ALTM 2 - I**
4.. 20 mA



Surface contact / tube contact temperature measuring transducers, incl. strap, with detached sensor head, calibratable, with multi-range switching and active output

ALTM 2 - VAQ
with M12 connector



ALTM 2 - VA
with cable gland



THERMASGARD® **ALTM 2 - VA**	Surface contact / tube contact temperature measuring transducers, *ID* (Stainless steel housing **with cable gland**)				
Type / WG02I	**Sensor**	**Output**	**Type**	**Item No.**	**Price**
ALTM 2 - VA					
ALTM2-I VA	Pt1000	4...20 mA	Remote sensor	2001-2151-2200-001	**394,61 €**
ALTM2-U VA	Pt1000	0-10 V	Remote sensor	2001-2151-1200-001	**394,61 €**
Housing variant:	Cable connection **with cable gland**				
Extra charge:	other measuring ranges optional				**25,40 €**
	Protection type **IP 68** (Sensor sleeve watertight compound-filled)				**3,40 €**
	2-wire connecting leads, per running meter (**silicone / PTFE / glass fibre**)			on request	

THERMASGARD® **ALTM 2 - VAQ**	Surface contact / tube contact temperature measuring transducers, *ID* (Stainless steel housing **with M12 connector**)					
Type / WG02I	**Sensor**	**Output**	**Type**	**● = Q**	**Item No.**	**Price**
ALTM 2 - VAQ						
ALTM2-I VAQ	Pt1000	4...20 mA	Remote sensor	●	2001-2151-2100-001	**433,15 €**
ALTM2-U VAQ	Pt1000	0-10 V	Remote sensor	●	2001-2151-1100-001	**204,87 €**
Housing variant "Q":	Cable connection **with M12 connector** (male, **5-pin**, A-code)					
Extra charge:	see table above!					

ACCESSORIES	
	Special accessories for M12 connector see chapter Accessories !

THERMASGARD® RPTM 1

Pendulum room temperature measuring transducers, calibratable, with multi-range switching and active output

S+S REGELTECHNIK

Calibratable room pendulum temperature measuring transducer (with sleeve) **THERM**ASGARD® **RPTM 1** with eight switchable measuring ranges, continuous output, in an impact-resistant plastic housing with quick-locking screws, optionally with / without display, cable sensor with stainless steel sleeve and plastic sinter filter (exchangeable).

The pendulum sensor has been specially designed to detect the temperature in larger rooms or halls. The resistance thermometer achieves a very good representative measurement result due to its positioning in the room. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

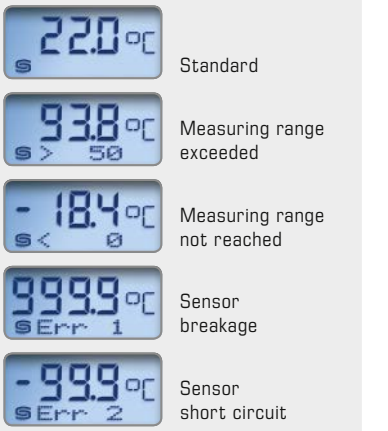
RPTM 1



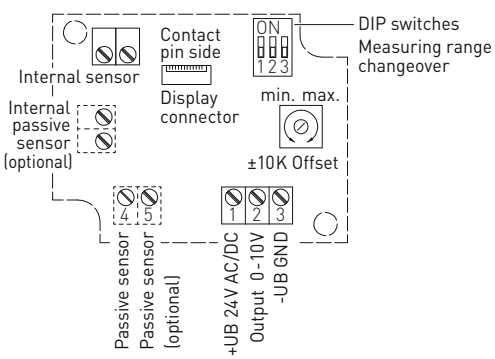
TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %) for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (ohm) = (U_b -14 V) / 0.02 A for I variant
Load resistance:	R_L > 5 kOhm for U variant
Power consumption:	< 1.0 VA / 24 V DC; < 2.2 VA / 24 V AC
Sensor:	Pt1000, DIN EN 60751, class B
Sensor protection:	**plastic** sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional **metal** sinter filter, Ø 16 mm, L = 32 mm)
Measuring ranges:	**multi-range switching with 8 switchable measuring ranges** see table (other ranges optional) **T_{min} –5 °C, T_{max} +60 °C, with manual zero point correction (± 10 K)**
Deviation, temperature:	typically ± 0.2 K at +25 °C
Output:	0 - 10 V or 4...20 mA
Ambient temperature:	measuring transducer –5...+60 °C
Connection type:	2- or 3-wire connection
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (on request)
Electrical connection:	0.14 -1.5 mm², via terminal screws
Connection cable:	PVC, H03VV-F, 2 x 0.5 mm², KL = approx. 1.5 m (other lengths optional)
Protective tube:	**stainless steel V2A** (1.4301), Ø =16 mm, NL = 142 mm
Humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 67** (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1) **IP 65** (according to EN 60 529) Pendulum with sleeve
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC directive 2014 / 30 / EU
Optional:	Two-line **display with illumination,** cutout approx. 36 x 15 mm (W x H), for displaying the **ACTUAL temperature** and the **internal diagnostics** (measuring range exceeded, measuring range not reached, sensor breakage, sensor short circuit)

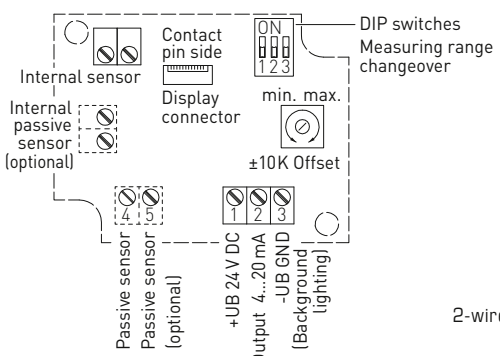
Display and internal diagnostics
THERMASGARD®
Measuring transducer with display



3-wire connection **RPTM 1 - U**



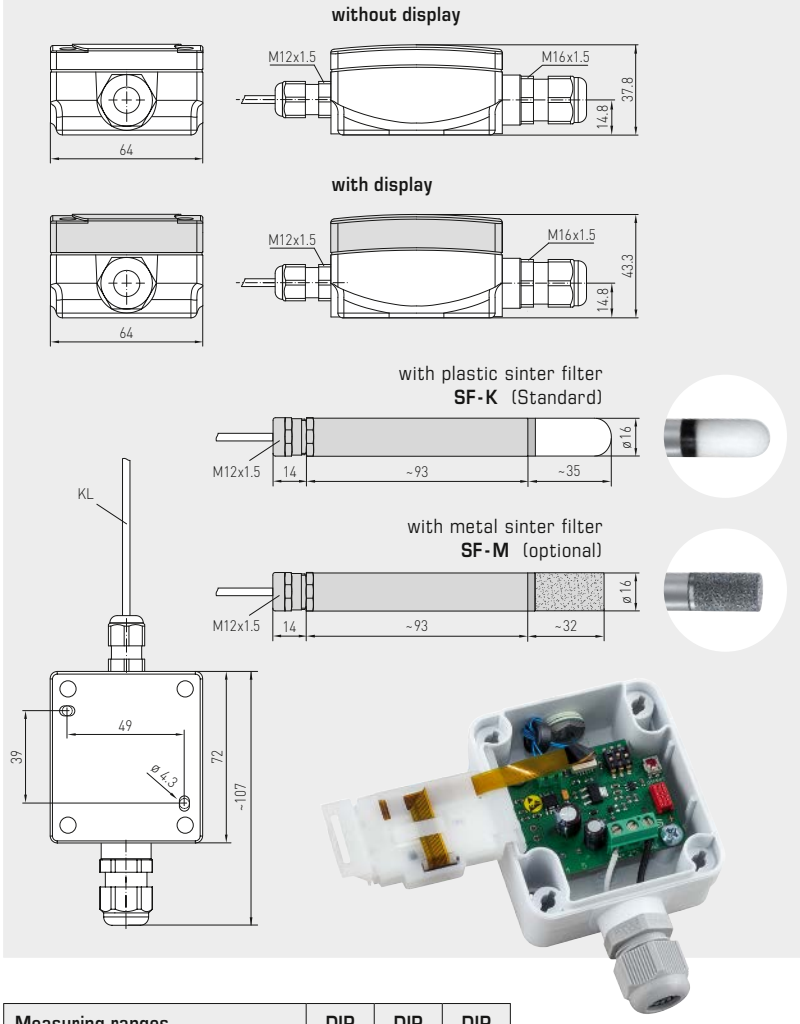
2- or 3-wire connection* **RPTM 1 - I**



Connection*:
2-wire connection for devices with / without display (not illuminated)
3-wire connection for devices with illuminated display

Pendulum room temperature measuring transducers, calibratable, with multi-range switching and active output

Dimensional drawing **RPTM 1**



RPTM 1
with display



M12 connector
(optional on request)

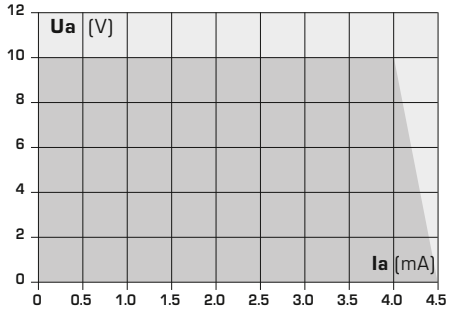


Measuring ranges (adjustable)	DIP 1	DIP 2	DIP 3
–20…+150 °C	**ON**	**ON**	**ON**
–50… +50 °C	OFF	**ON**	**ON**
–20… +80 °C	**ON**	OFF	**ON**
–30… +60 °C	OFF	OFF	**ON**
0… +40 °C	**ON**	**ON**	OFF
0… +50 °C (default)	OFF	**ON**	OFF
0…+100 °C	**ON**	OFF	OFF
0…+150 °C	OFF	OFF	OFF

(observe max. permissible temperature ranges!)



Dependency of output voltage on output current



THERMASGARD® RPTM 1 Pendulum room temperature measuring transducer (with stainless steel sleeve)

Type / WG01	Sensor	Output	Type	Item No.	Price
RPTM 1 - I				**IP 65, I-variant**	
RPTM1-I	Pt1000	4…20 mA	Remote sensor	1101-1162-0219-910	**151,76 €**
RPTM 1 - U				**IP 65, U-variant**	
RPTM1-U	Pt1000	0 - 10 V	Remote sensor	1101-1161-0219-910	**151,76 €**
Extra charge:	Other ranges optional				**25,40 €**
	Two-line **display** with illumination				**49,83 €**
	2-wire connecting leads, per running meter (**PVC**)			on request	
	Cable connection with **M12 connector** according to DIN EN 61076-2-101			on request	
ACCESSOIRES					
SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable, stainless steel **V4A** (1.4404)			7000-0050-2200-100	**42,33 €**

THERMASGARD® RPTM 2

Pendulum room temperature measuring transducers, calibratable, with multi-range switching and active output

S+S REGELTECHNIK

Calibratable room pendulum temperature measuring transducer (with globe) **THERM**ASGARD® **RPTM 2** with eight switchable measuring ranges, continuous output in an impact-resistant plastic housing with quick-locking screws, optionally with / without display, cable sensor with a black plastic globe.

The pendulum sensor has been specially designed to detect the temperature in larger rooms or halls. The resistance thermometer (globe thermometer) achieves a very good, representative measurement result due to its positioning in the room. The dark radiation sensor determines the effective radiation heat at the measured location. This is relevant for calculating the thermal comfort (operative room temperature) taking into account the co-action of thermal radiation and thermal convection. The ratio of globe temperature / air temperature is approx. 70% / 30%. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

RPTM 2



TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %) for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (ohm) = (U_b -14 V) / 0.02 A for I variant
Load resistance:	R_L > 5 kOhm for U variant
Power consumption:	< 1.0 VA / 24 V DC; < 2.2 VA / 24 V AC
Sensor:	Pt1000, DIN EN 60751, class B
Measuring ranges:	**multi-range switching with 8 switchable measuring ranges** see table (other ranges optional) **T_{min} –5 °C, T_{max} +60 °C, with manual zero point correction (± 10 K)**
Deviation, temperature:	typically ± 0.2 K at +25 °C
Output:	0 - 10 V or 4...20 mA
Ambient temperature:	measuring transducer –5...+60 °C
Connection type:	2- or 3-wire connection
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (on request)
Electrical connection:	0.14 -1.5 mm², via terminal screws
Connection cable:	PVC, H03VV-F, 2 x 0.5 mm², KL = approx. 1.5 m (other lengths optional)
Globe:	plastic, colour black, Ø = 50 mm
Humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 67** (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1) **IP 65** (according to EN 60 529) Pendulum with globe
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC directive 2014 / 30 / EU
Optional:	Two-line **display with illumination,** cutout approx. 36 x 15 mm (W x H), for displaying the **ACTUAL temperature** and the **internal diagnostics** (measuring range exceeded, measuring range not reached, sensor breakage, sensor short circuit)

Display and internal diagnostics
THERMASGARD®
Measuring transducer with display



Standard



Measuring range exceeded



Measuring range not reached

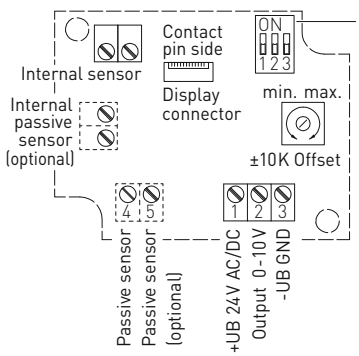


Sensor breakage

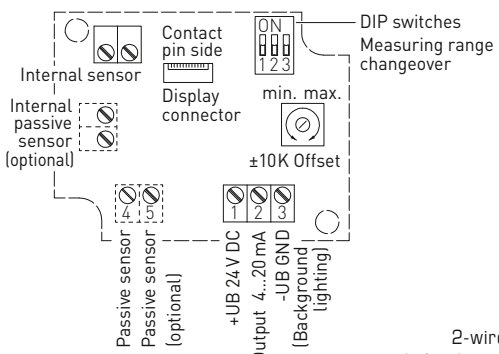


Sensor short circuit

3-wire connection **RPTM 2 - U**



2- or 3-wire connection* **RPTM 2 - I**

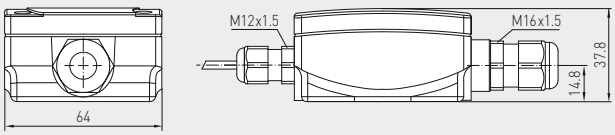


Connection*:
2-wire connection for devices with / without display (not illuminated)
3-wire connection for devices with illuminated display

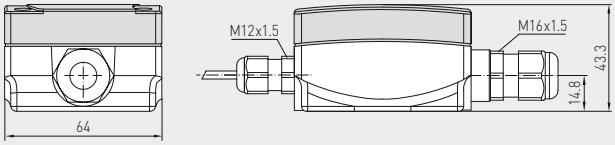
Pendulum room temperature measuring transducers, calibratable, with multi-range switching and active output

Dimensional drawing **RPTM 2**

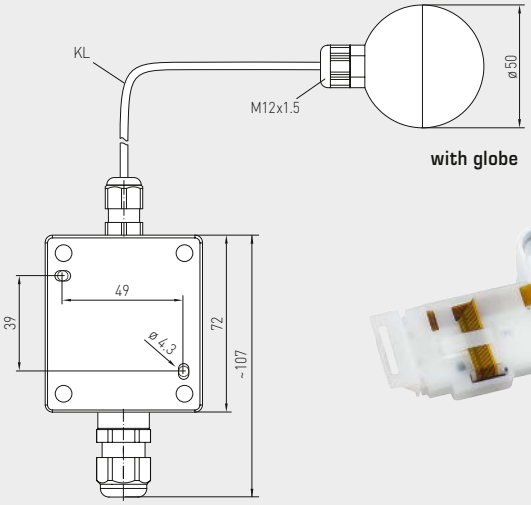
without display



with display



with globe





RPTM 2
with display



M12 connector
(optional on request)

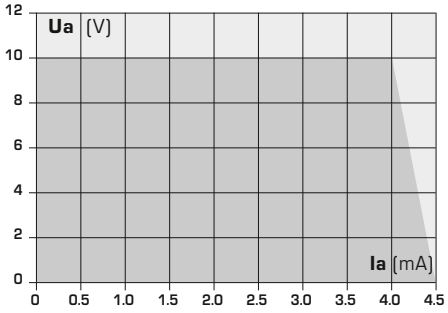


Measuring ranges (adjustable)	DIP 1	DIP 2	DIP 3
–20…+150 °C	**ON**	**ON**	**ON**
–50… +50 °C	OFF	**ON**	**ON**
–20… +80 °C	**ON**	OFF	**ON**
–30… +60 °C	OFF	OFF	**ON**
0… +40 °C	**ON**	**ON**	OFF
0… +50 °C (default)	OFF	**ON**	OFF
0…+100 °C	**ON**	OFF	OFF
0…+150 °C	OFF	OFF	OFF

(observe max. permissible temperature ranges!)



Dependency of output voltage on output current



THERMASGARD® RPTM 2 Pendulum room temperature measuring transducers (with globe)

Type / WG01	Sensor	Output	Type	Item No.	Price
RPTM 2-I				**IP65, I-variant**	
RPTM2-I	Pt1000	4…20 mA	Remote sensor	1101-1172-0219-910	**152,76 €**
RPTM 2-U				**IP65, U-variant**	
RPTM2-U	Pt1000	0-10 V	Remote sensor	1101-1171-0219-910	**152,76 €**
Extra charge:	Other ranges optional				**25,40 €**
	Two-line **display** with illumination				**49,83 €**
	2-wire connecting leads, per running meter (**PVC**)			on request	
	Cable connection with **M12 connector** according to DIN EN 61076-2-101			on request	

Temperature

THERMASREG® **Temperature controllers** – everything under control from hot to cold

Our temperature controllers and thermostats are known for their rugged, long-life and reliable measuring technology, widely field-proven in everyday use.

Well engineered and manufactured in customized versions, these devices have a perfect fit in high-end installations.

Application Areas

- Office and administration buildings
- Schools, hotels and public authorities
- Power plants and district heating plants
- Industrial buildings and production facilities
- Foodstuff industry
- Heating and ventilation systems



326 – 365

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THERMASREG®
TEMPERATURE CONTROLLERS, THERMOSTATS

Room temperature controllers

RTR-B	Room temperature controller	**329**
RTR-S	Room temperature controller, fan coil controller	**331**
TET	Top hat rail thermostat	**365**

Surface contact thermostats

ALTR 060	Surface-contact thermostat	**350**
ALTR 090	Surface-contact thermostat	**350**
ALTR 1	Surface-contact thermostat	**351**
ALTR 3	Surface-contact thermostat	**351**
ALTR 5	Surface-contact thermostat	**351**
ALTR 7	Surface-contact thermostat	**351**

Built-in controllers, duct controllers

ETR	Built-in temperature controller, one-step / two-step	**341**
KTR	Duct temperature controller, one-step / two-step	**347**
TR xx-F	Temperature controller with remote sensor	**337**
FST-K	Duct frost protection thermostat, mechanical, one-step, switching	**359**

Wet room temperature controllers

TR 040	Temperature controller	**334**
TR 060	Temperature controller	**334**
TR 22	Temperature controller	**335**
TR 04040	Temperature controller, two-step	**336**

Frost protection thermostats

FST	Frost protection thermostat, mechanical, one-step, switching	**355**
FST-K	Duct frost protection thermostat, mechanical, one-step, switching	**359**
FS-20	2-phase frost protection thermostat, with control and cascading input, two-step, switching	**363**

Immersion sleeves and accessories

see chapter Accessories		**644**

S+S REGELTECHNIK

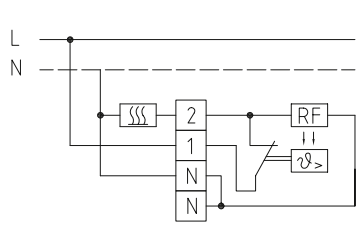
Room temperature controllers, mechanical, on-wall

One-step mechanical single room controller **THERM**ASREG® **RTR - B** in bi-metal technology with thermal feedback for monitoring or controlling temperatures in dry rooms, or for activating any kind of heating system as room thermostat. For currentless open radiator valves, the cooling output from the changeover contact (normally open contact) must be connected. At breaker contacts, a maximum of 10 valve actuators can be connected and at normally open contacts a maximum of 5 valve actuators.

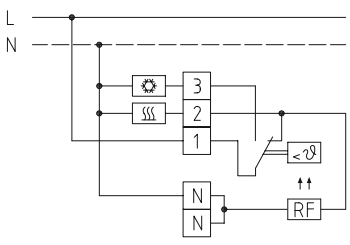
TECHNICAL DATA

Switching capacity: (Contact load)	230 V AC, 50 - 60 Hz heating: 10 mA...10 (4) A, DC 30 W cooling: 10 mA...5 (2) A
Sensor element:	bi-metal
Control range:	+5...+30 °C
Output:	breaker or changeover contact
Operating difference:	approx. 0.5 K
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010)
Dimensions:	75 x 75 x 25 mm (E1)
Electrical connection:	0.14 - 2.5 mm^2 via terminal screws
Installation:	wall mounting or on in-wall flush box Ø 55 mm, base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes for cable entry from the back, with predetermined breaking point for on-wall cable entry from top / bottom in case of plain on-wall installation
Protection class:	II (according to EN 60 730)
Protection type:	**IP 30** (according to EN 60 529)
Standards:	CE conformity, EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU

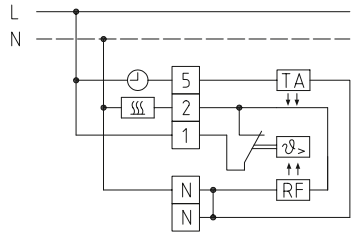
Connecting diagram **RTR - B 121**



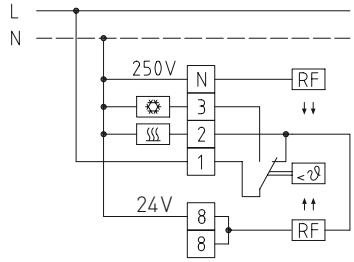
Connecting diagram **RTR - B 721**



Connecting diagram **RTR - B 124**

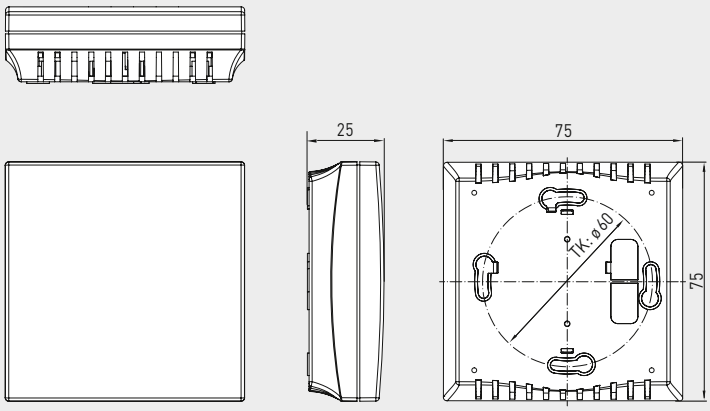


Connecting diagram **RTR - B 747**



Dimensional drawing

Housing **E 1**
(Picture similar)

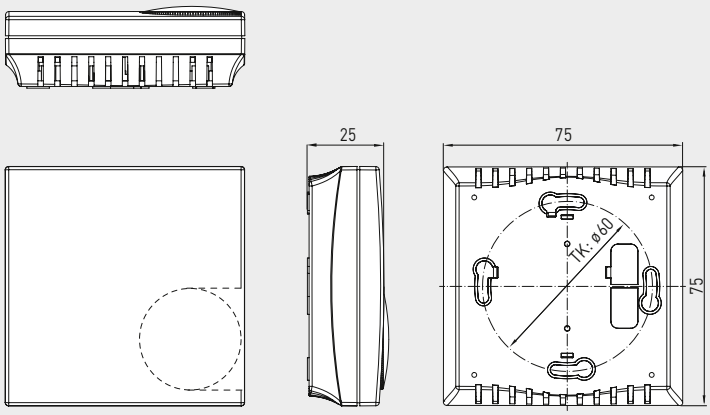


RTR-B 747
with internal setting



Dimensional drawing

Housing **E 1**
with one potentiometer
(Picture similar)



RTR-B 121
RTR-B 124
RTR-B 721
with external setting



THERMASREG® RTR - B Room temperature controllers

Type / WG01	Temperature Range	Function	Output	Item No.	Price
RTR-B 121 / B 124 / B 721				**External setting**	
RTR-B 121	+5...+30 °C	Heating	Breaker	1102-4011-2100-000	**37,79 €**
RTR-B 124	+5...+30 °C	Heating, temperature reduction - 5 K	Breaker	1102-4011-2400-000	**39,94 €**
RTR-B 721	+5...+30 °C	Heating, cooling	Changeover contact	1102-4017-2100-000	**41,59 €**
RTR-B 747				**Internal setting**	
RTR-B 747	+5...+30 °C	Heating, cooling	Changeover contact	1102-4017-4700-000	**45,37 €**

S+S REGELTECHNIK

Room temperature controllers, continuous, on-wall, general

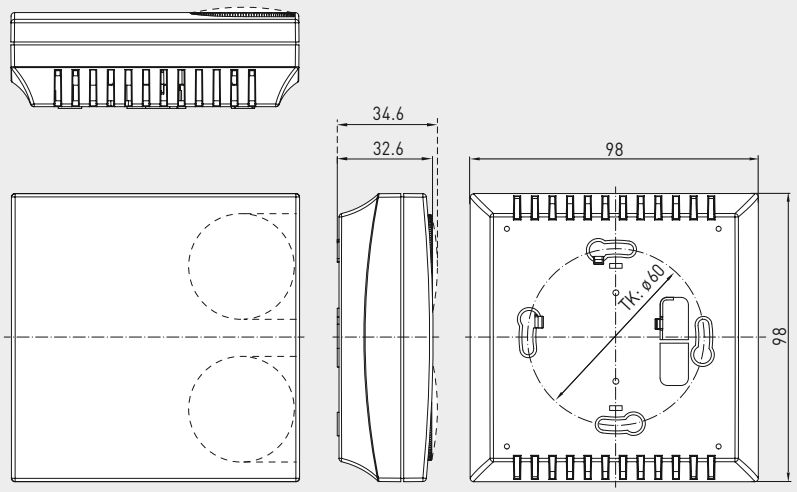
Electronic room temperature controllers, climate controllers **THERM**ASREG® **RTR - S** for monitoring or controlling temperatures with output 0 - 10 V for heating and cooling, optional as continuous climate controller with manual ventilator speed regulation, setpoint adjustment, and LED status indicators. Application in dry individual rooms heated or cooled by radiators, cooling ceilings, or ventilation, or air conditioning systems, or as remote control unit for air conditioners, e.g. in hotels, offices, or hospitals or as room thermostat.

TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %)
Temperature sensor:	internal or external (selectable via jumper) Pt 1000 according to DIN EN 60751, class B
Control range:	+5....+30 °C, adjustable via setpoint potentiometer with numerical scale or +21 °C (± 8 K), adjustable via setpoint potentiometer with swelling arrow (central position / + / –)
Output:	**1 x heating, 1 x cooling,** 0 - 10 V or 10 - 0 V repluggable, max. 5 mA
Proportional band:	internally adjustable via potentiometer **heating** +0.5...+3 K (1 K factory setting) **cooling** +0.5...+3 K (2 K factory setting)
Neutral zone:	internally adjustable via potentiometer, +1...+5 K (1K factory setting)
Control mode:	PI
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010)
Dimensions:	98 x 98 x 33 mm (Baldur 2)
Installation:	wall mounting or on in-wall flush box Ø 55 mm, base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes for cable entry from the back, with predetermined breaking point for on-wall cable entry from top / bottom in case of plain on-wall installation
Electrical connection:	0.14 - 2.5 mm² via terminal screws
Humidity:	max. 90 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 30** (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU

Dimensional drawing

Housing **Baldur 2**
(one or two potentiometers possible)

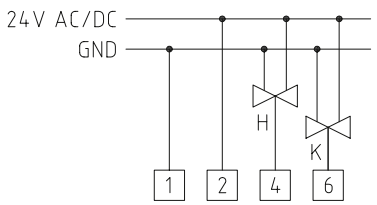




RTR-S 010
(Baldur 2)

Continuous room temperature controller for 2-channel single room control

Connecting diagram **RTR-S 010**



THERMASREG® RTR-S 010 Room temperature controller

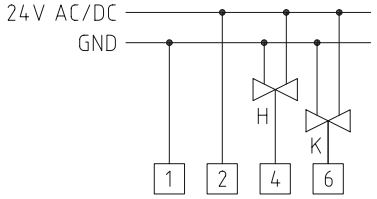
Type / WG01	Sensor internal / external	Output Heating	Output Cooling	Item No.	Price
RTR-S 010				External setting	
RTR-S 010	Pt1000	0 - 10 V	0 - 10 V	1102-40B0-1000-000	**181,10 €**
Features:	+5...+30 °C, via setpoint device, numerical scale				



RTR-S 011
(Baldur 2)

Continuous room temperature controller for 2-channel single room control

Connecting diagram **RTR-S 011**



THERMASREG® RTR-S 011 Room temperature controller

Type / WG01	Sensor internal / external	Output Heating	Output Cooling	Item No.	Price
RTR-S 011				External setting	
RTR-S 011	Pt1000	0 - 10 V	0 - 10 V	1102-40B0-1100-000	**181,10 €**
Features:	+21 °C (±8 K), via setpoint device, swelling arrow (central position /+/–)				

Room temperature controllers, continuous, on-wall, different versions

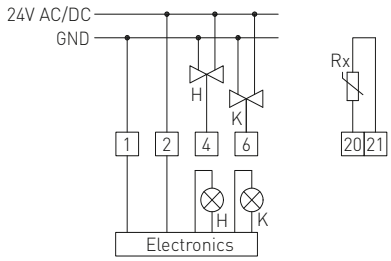
S+S REGELTECHNIK



RTR-S012
(Baldur 2)

Continuous room temperature controller for 2-channel single room control, with LED operating mode indicator

Connecting diagram **RTR-S012**



THERMASREG® RTR-S012 Room temperature controller

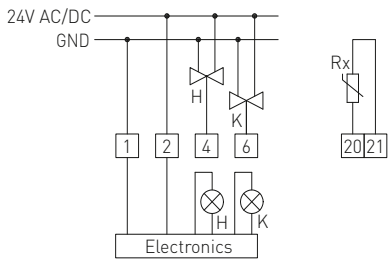
Type / WG01	Sensor internal / external	Output Heating	Output Cooling	Item No.	Price
RTR-S012				**External setting**	
RTR-S 012	Pt1000	0 - 10 V	0 - 10 V	1102-40B0-1200-000	**188,80 €**
Features:	+5...+30 °C, via setpoint device, numerical scale, LED red: operating mode heating, LED blue: operating mode cooling				



RTR-S013
(Baldur 2)

Continuous room temperature controller for 2-channel single room control, with LED operating mode indicator

Connecting diagram **RTR-S013**



THERMASREG® RTR-S013 Room temperature controller

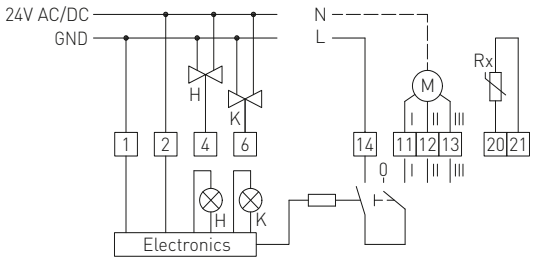
Type / WG01	Sensor internal / external	Output Heating	Output Cooling	Item No.	Price
RTR-S013				**External setting**	
RTR-S 013	Pt1000	0 - 10 V	0 - 10 V	1102-40B0-1300-000	**188,80 €**
Features:	+21 °C (± 8 K) via setpoint device, swelling arrow (central position / + / –), LED red: operating mode heating, LED blue: operating mode cooling				



RTR-S 014
(Baldur 2)

Continuous room temperature controller for 2-channel single room control with LED operating mode indicator and 3-speed selector switch for ventilators

Connecting diagram **RTR-S 014**



THERMASREG® RTR-S 014 Room temperature controller

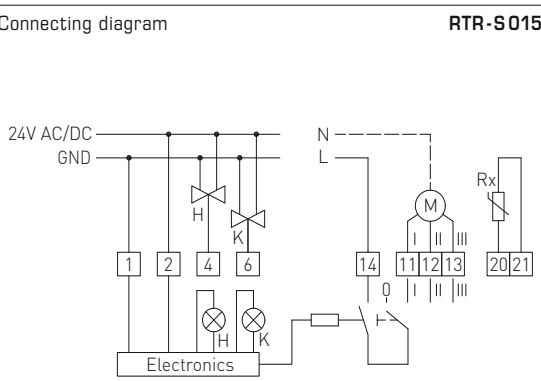
Type / WG01	Sensor internal / external	Output Heating	Output Cooling	Item No.	Price
RTR-S 014				**External setting**	
RTR-S 014	Pt1000	0 - 10 V	0 - 10 V	1102-40B0-1400-000	**196,51 €**
Features:	+5...+30 °C, via setpoint device, numerical scale, internal / external sensor selectable LED red: operating mode heating, LED blue: operating mode cooling, 4-step turn switch for ventilator speed (0 / I / II / III)				



RTR-S 015
(Baldur 2)

Continuous room temperature controller for 2-channel single room control with LED operating mode indicator and 3-speed selector switch for ventilators

Connecting diagram **RTR-S 015**



THERMASREG® RTR-S 015 Room temperature controller

Type / WG01	Sensor internal / external	Output Heating	Output Cooling	Item No.	Price
RTR-S 015				**External setting**	
RTR-S 015	Pt1000	0 - 10 V	0 - 10 V	1102-40B0-1500-000	**196,51 €**
Features:	+21 °C (± 8 K) via setpoint device, swelling arrow (central position / + / –), LED red: operating mode heating, LED blue: operating mode cooling, 4-step turn switch for ventilator speed (0 / I / II / III)				

THERMASREG® TR 040
THERMASREG® TR 060

**Temperature controllers, one-step,
with switching output**

S+S REGELTECHNIK

Mechanical temperature controllers / wet room temperature controllers **THERM**ASREG® **TR 040 / TR 060** with switching output (one-step) and stainless steel capillary (spiral coil sensor), working without external voltage. They are used for monitoring and controlling temperatures in heat generation plants, in heating, ventilation and air conditioning systems, for ventilation, cooling and climate control in halls, cold storage rooms, greenhouses, nurseries, stables, breeding rooms, as industrial room thermostat or surface-mounted thermostat in industrial applications as well as in wet room and outdoor areas.

TR 040
TR 060
(one-step)
TR



TR 040 U
TR 060 U
(one-step)
TW



TECHNICAL DATA

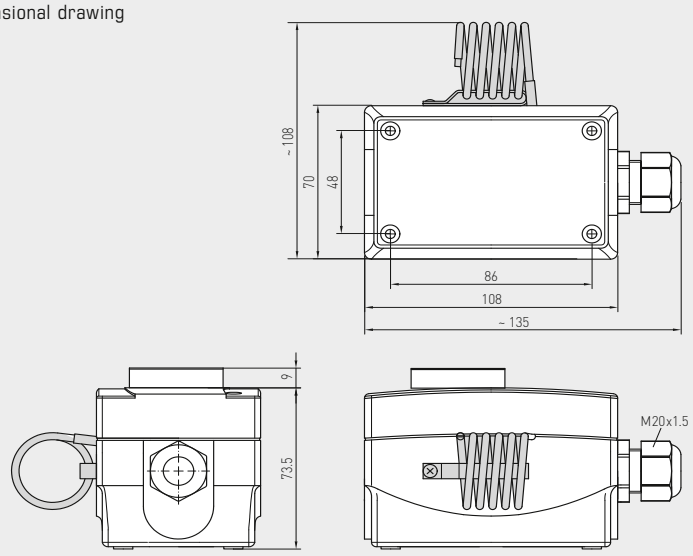
Switching capacity: (Contact load)	24…250 V AC +10 %, 16 A, cos φ = 1.0 24…250 V AC +10 %, 1.5 A, cos φ = 0.6 at 24 V AC min. 150 mA
Contact:	dust-proof switch block unit as potential-free, single-pole or two-pole changeover contact
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 70 x 73.5 mm (Thor 2)
Cable gland:	M 20 x 1.5; including strain relief
Housing temperature:	–35…+65 °C
Capillary:	stainless steel **V2A** (1.4303)
Tolerance:	T_{min} ± 3 K; T_{max} ± 3 K; at +20°C ± 1K
Electrical connection:	0.14 - 2.5 mm² via terminal screws
Routing:	admissible vibration load ≤ ½g
Protection class:	I (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU

FUNCTION

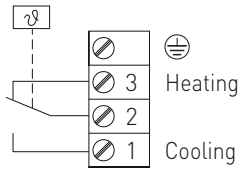
Heating: The preset setpoint (scale value) is equivalent to the switch-off value of the heating.
The switch-on value is lower by the amount of operating difference.
Contact 2 - 3 breaks when temperature rises to the preset value.

Cooling: The preset setpoint (scale value) is equivalent to the switch-on value of the cooling.
The switch-off value is lower by the amount of operating difference.
Contact 1 - 2 closes when temperature rises to the preset value.

Dimensional drawing **TR 040 TR 060**



Connecting diagram **TR 040 TR 060**



THERMASREG® TR 040 / TR 060 Temperature controllers, one-step

Type / WG01	Temperature Range	Thermal Operating Difference (fixed) approx.	Max. Capillary Temperature	Item No.	Price
TR 040 / 060				**TR** (External setting)	
TR-040	0…+40 °C	2 K	+65 °C	1102-1050-1100-200	**78,75 €**
TR-060	0…+60 °C	2 K	+75 °C	1102-1050-1100-300	**78,75 €**
TR 040 U / 060 U				**TW** (Internal setting)	
TR-040 U	0…+40 °C	2 K	+65 °C	1102-1050-2100-200	**77,48 €**
TR-060 U	0…+60 °C	2 K	+75 °C	1102-1050-2100-300	**77,48 €**

Mechanical temperature controller / wet room temperature controller **THERM**ASREG® **TR 22** with switching output (one-step) and copper capillary, working without external voltage.
It is used for monitoring and controlling temperatures in heat generation plants, in heating, ventilation and air conditioning systems, for ventilation, cooling and climate control in halls, cold storage rooms, greenhouses, nurseries, stables, breeding rooms, as industrial room thermostat or surface-mounted thermostat in industrial applications as well as in wet room and outdoor areas.

TR 22
(one-step)
TR



TR 22 U
(one-step)
TW



TECHNICAL DATA

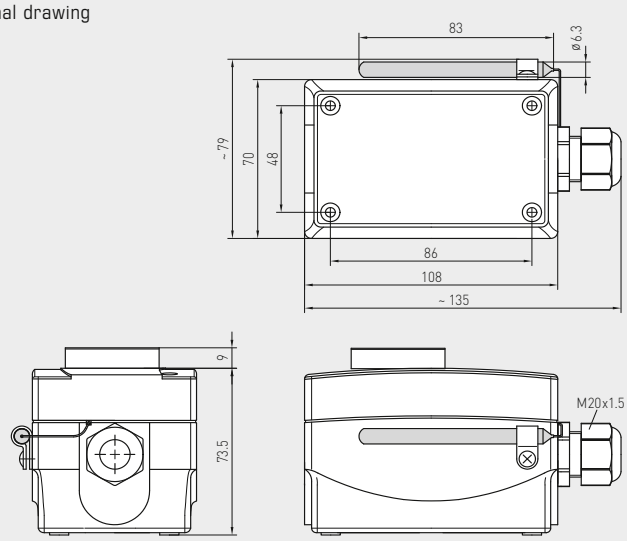
Switching capacity: (Contact load)	24…250 V AC +10 %, 16 A, cos φ = 1.0 24…250 V AC +10 %, 1.5 A, cos φ = 0.6 at 24 V AC min. 150 mA
Contact:	dust-proof switch block unit as potential-free single-pole changeover contact
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 70 x 73.5 mm (Thor 2)
Cable gland:	M 20 x 1.5; including strain relief
Housing temperature:	–35...+65 °C
Design principle:	torsion meter with liquid filling
Capillary:	copper
Tolerance:	T_{min} ± 3 K; T_{max} ± 3 K
Routing:	admissible vibration load ≤ ½g
Electrical connection:	0.14 - 2.5 mm² via terminal screws
Protection class:	I (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU

FUNCTION

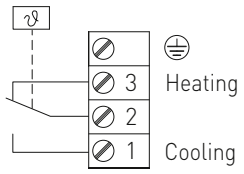
Heating: The preset setpoint (scale value) is equivalent to the switch-off value of the heating.
The switch-on value is lower by the amount of operating difference.
Contact 2 - 3 breaks when temperature rises to the preset value.

Cooling: The preset setpoint (scale value) is equivalent to the switch-on value of the cooling.
The switch-off value is lower by the amount of operating difference.
Contact 1 - 2 closes when temperature rises to the preset value.

Dimensional drawing **TR 22**



Connecting diagram **TR 22**



THERMASREG® TR 22 Temperature controllers, one-step

Type / WG01	Temperature Range	Thermal Operating Difference (fixed) approx.	Max. Capillary Temperature	Item No.	Price
TR 22				**TR** (External setting)	
TR-22	–35...+35 °C	3 K (± 1 K)	+60 °C	1102-1050-1100-100	**78,75 €**
TR 22 U				**TW** (Internal setting)	
TR-22 U	–35...+35 °C	3 K (± 1 K)	+60 °C	1102-1050-2100-100	**77,48 €**

**Temperature controllers, two-step,
with switching output**

S+S REGELTECHNIK

Mechanical temperature controller / wet room temperature controller **THERM**ASREG® **TR 04040** with two independently switching outputs, which are separately adjustable (e.g. for switching between day and night time) and stainless steel capillary (spiral coil sensor), working without external voltage. It is used for monitoring and controlling temperatures in heat generation plants, in heating, ventilation and air conditioning systems, for ventilation, cooling and climate control in halls, cold storage rooms, greenhouses, nurseries, stables, breeding rooms, as industrial room thermostat or surface-mounted thermostat in industrial applications as well as in wet room and outdoor areas.

TR 04040



TR 04040 U



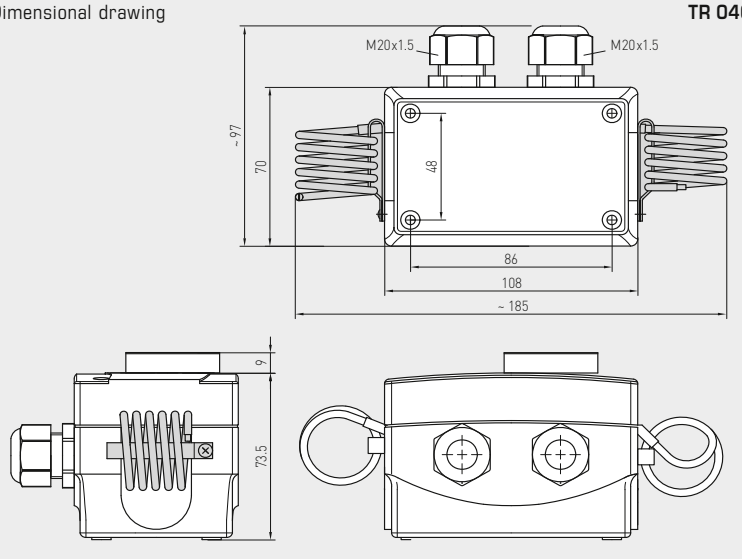
TECHNICAL DATA

Switching capacity: (Contact load)	24…250 V AC +10 %, 16 A, cos φ = 1.0 24…250 V AC +10 %, 1.5 A, cos φ = 0.6 at 24 V AC min. 150 mA
Contact:	dust-proof switch block unit as potential-free single-pole changeover contact (two changeover contacts, separately adjustable)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 70 x 73.5 mm (Thor 2)
Cable gland:	2x M 20 x 1.5; including strain relief
Housing temperature:	–10…+65 °C
Capillary:	stainless steel **V2A** (1.4303)
Tolerance:	T_{min} ± 3 K; T_{max} ± 3 K; at +20 °C ± 1K
Electrical connection:	0.14 - 2.5 mm² via terminal screws
Routing:	admissible vibration load ≤ ½g
Protection class:	I (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU

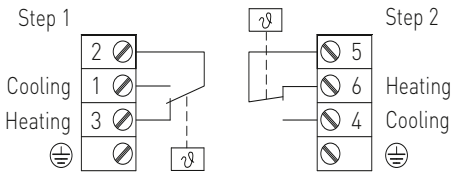
FUNCTION

Heating: Contacts 2 - 3 and 5 - 6 break when temperature rises to the preset value.
Cooling: Contacts 2 - 1 and 5 - 4 break when temperature drops to the preset value.

Dimensional drawing **TR 04040**



Connecting diagram **TR 04040**



THERMASREG® TR 04040 Temperature controllers, two-step

Type / WG01	Temperature Range (adjustable) 1.	2.	Thermal Operating Difference (fixed) approx. 1.	2.	Max. Capillary Temperature	Item No.	Price
TR 04040						**TR + TW** (External / Internal setting)	
TR-04040	0…+40 °C	0…+40 °C	2 K	2K	+65 °C	1102-1050-1200-200	**115,84 €**
TR 04040 U						**TW + TW** (Internal setting)	
TR-04040 U	0…+40 °C	0…+40 °C	2 K	2K	+65 °C	1102-1050-2200-200	**115,84 €**

Mechanical temperature controller **THERM**ASREG® **TR xx - F** with remote sensor and switching output (one-step), working as capillary thermostat / capillary controller without external voltage. This capillary controller is used for monitoring and to control temperatures of non-aggressive liquid or gaseous media in heating, ventilation and air conditioning technology as well as in mechanical and apparatus engineering, for installation in immersion sleeves or air conditioning ducts.

TRxx-F



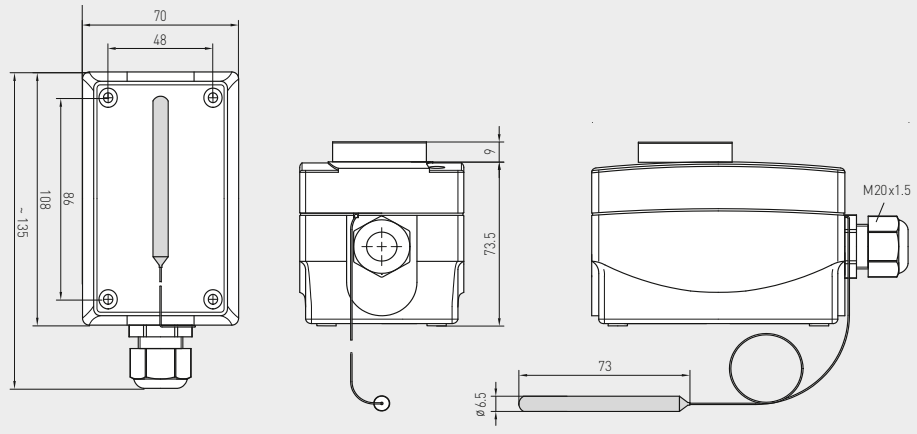
TRxx-F-U



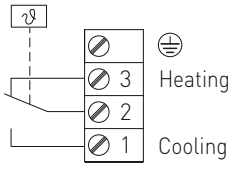
TECHNICAL DATA

Switching capacity: (Contact load)	24…250 V AC +10 %, 16 A, cos φ = 1.0 24…250 V AC +10 %, 1.5 A, cos φ = 0.6 at 24 V AC min. 150 mA
Contact:	dust-proof switch block unit as potential-free single-pole changeover contact
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 70 x 73.5 mm (Thor 2)
Cable gland:	M 20 x 1.5; including strain relief
Housing temperature:	–10...+65 °C
Design principle:	torsion meter with liquid filling
Sensor:	copper tube, length of capillary = 1 m with PVC protective hose, Ø 6.8 mm
Tolerance:	T_{min} ± 3 K; T_{max} ± 3 K
Inserted length:	immersion sleeves EL = 150 mm (accessories see table)
Routing:	bending radius > 35mm admissible vibration load ≤ ½g admissible tensile load < 100N
Electrical connection:	0.14 - 2.5 mm² via terminal screws
Protection class:	I (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU
FUNCTION	**Heating:** wire contacts 2 - 3 **Cooling:** wire contacts 2 - 1

Dimensional drawing **TRxx-F**



Connecting diagram **TRxx-F**



THERMASREG® TR xx - F Temperature controllers, one-step

Type / WG01	Temperature Range	Thermal Operating Difference (fixed) approx.	Max. Capillary Temperature	Item No.	Price
TRxx-F				**TR** (External setting)	
TR-1-F	–35… +35 °C	3 K (± 1 K)	+60 °C	1102-1056-1110-100	**79,81 €**
TR-060-F	0… +60 °C	3 K (± 1 K)	+75 °C	1102-1050-1110-300	**79,81 €**
TR-090-F	0… +90 °C	3 K (± 1 K)	+120 °C	1102-1050-1110-400	**79,81 €**
TR-0120-F	0…+120 °C	5 K (± 1 K)	+135 °C	1102-1050-1110-500	**79,81 €**
TR-50140-F	+50…+140 °C	5 K (± 1 K)	+150 °C	1102-1050-1110-600	**79,81 €**
Extra charge:	**U** = Internal setting (**TW**), e. g. TR - 090 - F - U				**9,95 €**
ACCESSORIES					
THR-MS-08/150	Brass immersion sleeve, EL = 150 mm, Ø 8 x 0.5 mm			7100-0011-3404-000	**15,55 €**
THR-VA-09/150	Stainless steel immersion sleeve **V2A** (1.4301), EL = 150 mm, Ø 9 x 1.0 mm			7100-0012-3032-000	**40,99 €**
	For further information, see the last chapter!				

THERMASREG® ETR

**Equipment sensor / controller, including immersion sleeve,
EC type-tested, TÜV tested,
with switching output**

S+S REGELTECHNIK

DIN-tested German quality product. Temperature control and limiting device for heat generation plants in accordance with DIN EN 14597. Safety temperature limiter (STB) with EC type test (module B) according to directive 2014 / 68 / EU.

Mechanical temperature control device / rod thermostat **THERM**ASREG® **ETR** with switching output, used for monitoring, controlling or limiting the temperatures of liquid or gaseous media as a boiler controller or in heating, air conditioning technology as well as in mechanical and apparatus engineering and in heat generation plants. It is available as one-step or two-step device, as adjustable temperature controller **TR**, temperature monitor **TW**, or as safety temperature limiter **STB**.





TECHNICAL DATA

Switching capacity: (Contact load)	24 ... 250 V AC + 10 %, 10 A, cos φ = 1.0 24 ... 250 V AC + 10 %, 1.5 A, cos φ = 0.6 at 24 V AC min. 150 mA
Contact:	dust-proof switch block unit as potential-free single-pole or two-pole changeover contact
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 70 x 73.5 mm (Thor 2)
Cable gland:	M 20 x 1.5; including strain relief
Measuring element:	torsion meter with liquid filling, liquid expansion temperature feeler
Mounting position:	arbitrary
Ambient temperature:	–10...+65 °C at the switch block housing
Tolerance:	T_{min} ± 5 K; T_{max} ± 3 K
Immersion sleeves:	**THR-ms-08 / xx**, Single sleeve brass, nickel-plated, Ø = 8 mm, R ½" straight pipe thread, wrench size 22, p_{max} = 10 bar, T_{max} = +150 °C **THR-VA-09 / xx**, Single sleeve stainless steel **V4A** (1.4571), Ø = 9 mm, G ½" straight pipe thread, wrench size 22, p_{max} = 25 bar, T_{max} = +150 °C **THR-VA-17 / xx**, Double sleeve stainless steel **V4A** (1.4571), Ø = 17 mm, G ½" straight pipe thread, wrench size 22, p_{max} = 25 bar, T_{max} = +150 °C (Depending on the type, the relevant immersion sleeve is included in the scope of delivery, see table)
Operating medium:	Water, oil, air and exhaust gas
Inserted length:	100 mm / 150 mm / 200 mm (see table)
Process connection:	screwed socket
Electrical connection:	0.14 - 2.5 mm² via terminal screws
Protection class:	I (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU
Tests:	**EC type test (module B) according to directive 2014 / 68 / EU,** certificate No.: IS-TAF-MUC 18 03 2652130 002, DIN EN 14597, register Nos.: **STB 1201, TR / STB 1202**
FUNCTION	**TW, TR:** Contact 2-3 breaks when temperature rises to the preset value. **STB:** Contact 2-1 or 5-4 (two-step) breaks when temperature rises to the preset value. Restart is possible only after cooling off by approx. 15 K - 20 K by pressing the reset button.

Equipment sensor / controller, including immersion sleeve, EC type-tested, TÜV tested, with switching output

Configuration variants:

TW
Temperature monitor
(internal setting)

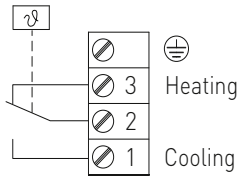
TR
Temperature controller
(external setting)

STB
Safety temperature limiter
(internal setting)

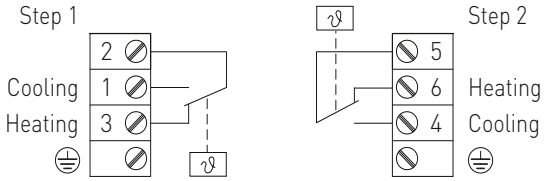
TW+TW
Double temperature monitor
(internal setting)

TR + STB
Temperature controller
(external setting) +
Safety temperature limiter
(internal setting)

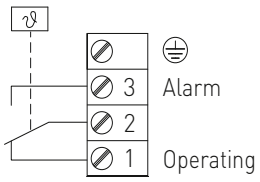
Connecting diagram **TW, TR** **ETR** (one-step)



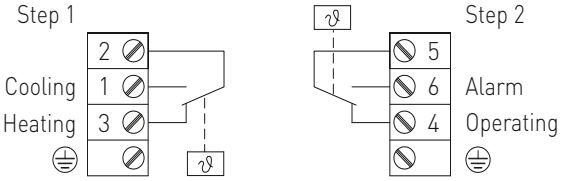
Connecting diagram **TW+TW** **ETR** (two-step)



Connecting diagram **STB** **ETR** (one-step)



Connecting diagram **TR + STB** **ETR** (two-step)





ZERTIFIKAT ◆ CERTIFICATE ◆ 合格证书 ◆ СЕРТИФИКАТ ◆ CERTIFICADO ◆ CERTIFICAT

TÜV SÜD Industrie Service

CERTIFICATE

valid until: 25.02.2028

ZERTIFIKAT

gültig bis: 25.02.2028

EU Type examination (module B) - production type - according to Directive 2014/68/EU

EU-Baumusterprüfung (Modul B) - Baumuster - nach Richtlinie 2014/68/EU

Certificate No.: Z-IS-TAF-MUC-18-03-2652130-002
Zertifikat-Nr.:

Name and address of manufacturer: S+S Regeltechnik GmbH
Name und Anschrift des Herstellers: Pirnaer Str. 20
90411 Nürnberg

We herewith certify that the type mentioned below meets the requirements of the Directive 2014/68/EU.

Hiermit wird bescheinigt, dass das unten genannte Baumuster die Anforderungen der Richtlinie 2014/68/EU erfüllt.

Evaluation report No.: C-T 1382-01/18 dated 2018-02-26
Prüfbericht Nr.:

Scope of examination: Safety temperature limiter as safety accessory
Geltungsbereich: type: ETR and KTR (see page 3)
basis of examination and details see page 3

Manufacturing plant: S+S Regeltechnik GmbH
Fertigungsstätte: Pirnaer Str. 20
90411 Nürnberg

München, 26.02.2018
(Place, date)
(Ort, Datum)

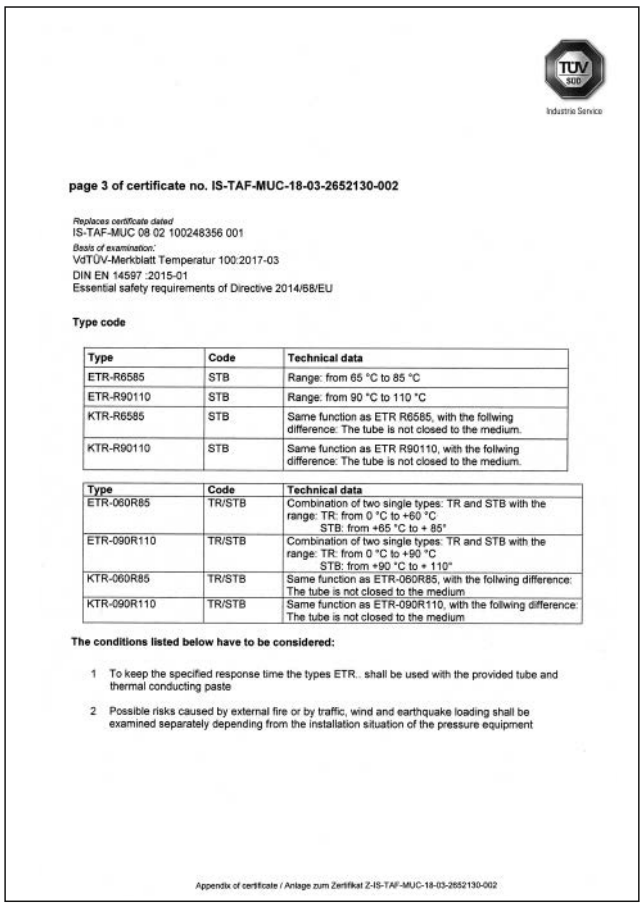
TÜV SÜD Industrie Service GmbH
Certification Body for pressure equipment
Johannes Steiglechner
089 5190-1027
feuerung@tuev-sued.de

Verification of Certificate by TÜV SÜD App Verify
Echtheitsprüfung durch App TÜV SÜD Verify

Notified Body, No. 0036
Notifizierte Stelle, Kennnummer 0036
TÜV SÜD Industrie Service GmbH
Westendstr. 199
80686 München
GERMANY

Page 1 of the certificate No. / Seite 1 zum Zertifikat Nr. Z-IS-TAF-MUC-18-03-2652130-002

TÜV®



TÜV SÜD Industrie Service

page 3 of certificate no. IS-TAF-MUC-18-03-2652130-002

Replaces certificate dated
IS-TAF-MUC 08 02 100248356 001
Basis of examination:
VdTÜV-Merkblatt Temperatur 100:2017-03
DIN EN 14597 :2015-01
Essential safety requirements of Directive 2014/68/EU

Type code

Type	Code	Technical data
ETR-R6585	STB	Range: from 65 °C to 85 °C
ETR-R90110	STB	Range: from 90 °C to 110 °C
KTR-R6585	STB	Same function as ETR R6585, with the follwing difference: The tube is not closed to the medium.
KTR-R90110	STB	Same function as ETR R90110, with the follwing difference: The tube is not closed to the medium.

Type	Code	Technical data
ETR-060R85	TR/STB	Combination of two single types: TR and STB with the range: TR: from 0 °C to +60 °C STB: from +65 °C to + 85°
ETR-090R110	TR/STB	Combination of two single types: TR and STB with the range: TR: from 0 °C to +90 °C STB: from +90 °C to + 110°
KTR-060R85	TR/STB	Same function as ETR-060R85, with the follwing difference: The tube is not closed to the medium
KTR-090R110	TR/STB	Same function as ETR-090R110, with the follwing difference: The tube is not closed to the medium

The conditions listed below have to be considered:

1 To keep the specified response time the types ETR.. shall be used with the provided tube and thermal conducting paste

2 Possible risks caused by external fire or by traffic, wind and earthquake loading shall be examined separately depending from the installation situation of the pressure equipment

Appendix of certificate / Anlage zum Zertifikat Z-IS-TAF-MUC-18-03-2652130-002

THERMASREG® ETR

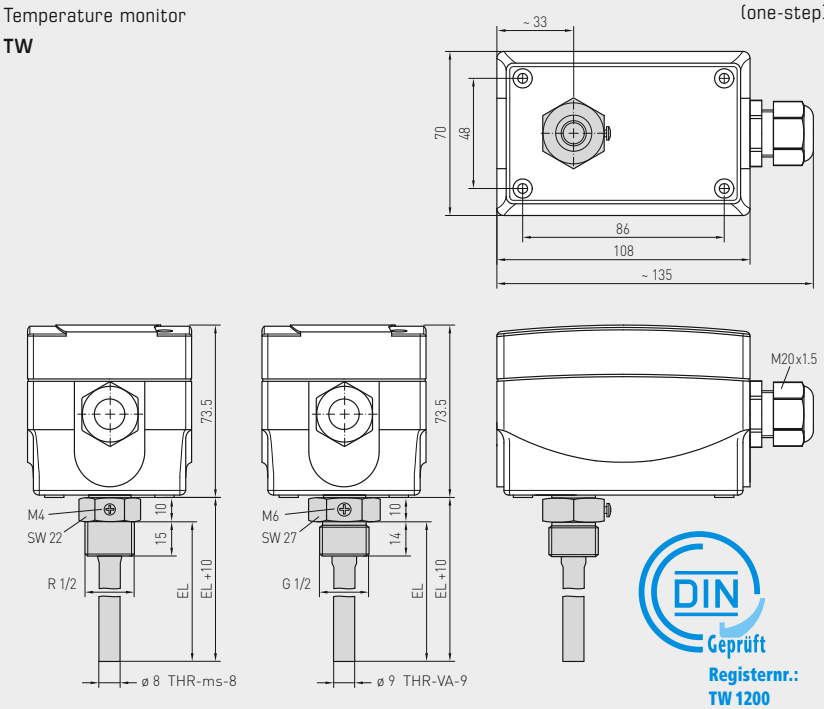
one-step

Equipment sensor / controller, including immersion sleeve,
EC type-tested, TÜV tested,
with switching output

S+S REGELTECHNIK

Dimensional drawing
Temperature monitor
TW

ETR-xxU
(one-step)



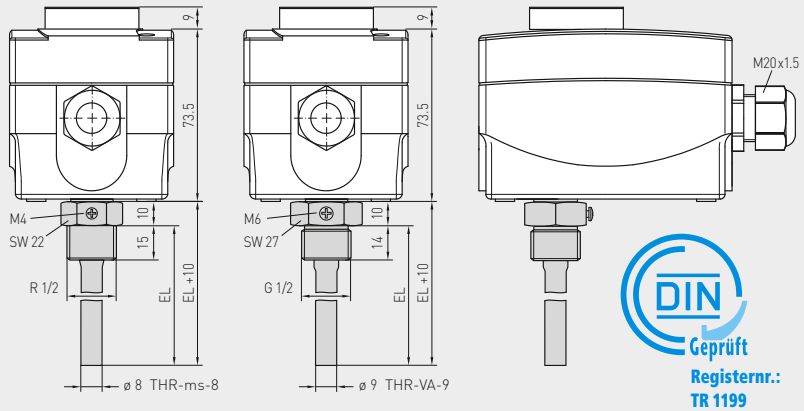
DIN Geprüft
Registernr.:
TW 1200



ETR-060U
ETR-090U
(one-step)
TW

Dimensional drawing
Temperature controller
TR

ETR-xx
(one-step)



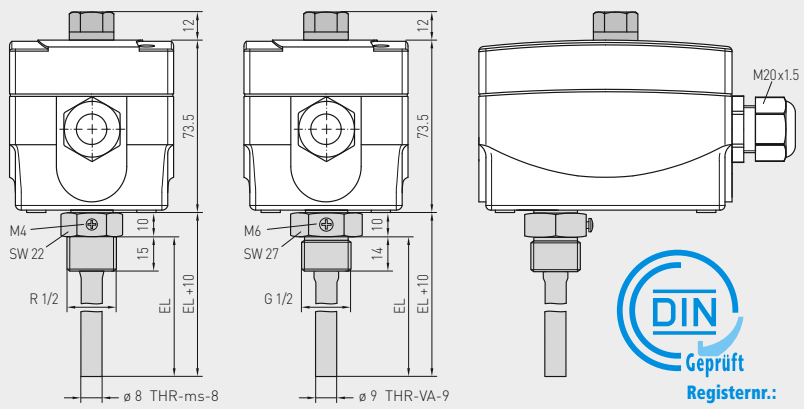
DIN Geprüft
Registernr.:
TR 1199



ETR-1
ETR-060
ETR-090
ETR-0120
ETR-50140
(one-step)
TR

Dimensional drawing
Safety temperature limiter
STB

ETR-Rxx
(one-step)



DIN Geprüft
Registernr.:
STB 1201



ETR-R6585
ETR-R90110
(one-step)
STB
selectable

THERMASREG® ETR	Equipment sensor / controller, one-step, including immersion sleeve					
Type / WG02	**Inserted Length (EL)**	**Temperature Ranges (adjustable)**	**Thermal Operating Difference (fixed) approx.**	**Maximum Capillary Temp.**	**Item No.**	**Price**
ETR-060 U					**TW**	
ETR-060 U MS/100	100 mm	0...+60 °C	3 K	+75 °C	1102-2010-2100-380	**70,83 €**
ETR-060 U MS/150	150 mm	0...+60 °C	3 K	+75 °C	1102-2010-2100-310	**73,21 €**
ETR-060 U MS/200	200 mm	0...+60 °C	3 K	+75 °C	1102-2010-2100-320	**77,40 €**
ETR-060 U VA/100	100 mm	0...+60 °C	3 K	+75 °C	1102-2010-2100-390	**98,46 €**
ETR-060 U VA/150	150 mm	0...+60 °C	3 K	+75 °C	1102-2010-2100-330	**100,82 €**
ETR-060 U VA/200	200 mm	0...+60 °C	3 K	+75 °C	1102-2010-2100-340	**105,03 €**
ETR-090 U					**TW**	
ETR-090 U MS/100	100 mm	0...+90 °C	3 K	+120 °C	1102-2010-2100-480	**70,83 €**
ETR-090 U MS/150	150 mm	0...+90 °C	3 K	+120 °C	1102-2010-2100-410	**73,21 €**
ETR-090 U MS/200	200 mm	0...+90 °C	3 K	+120 °C	1102-2010-2100-420	**77,40 €**
ETR-090 U VA/100	100 mm	0...+90 °C	3 K	+120 °C	1102-2010-2100-490	**98,46 €**
ETR-090 U VA/150	150 mm	0...+90 °C	3 K	+120 °C	1102-2010-2100-430	**100,82 €**
ETR-090 U VA/200	200 mm	0...+90 °C	3 K	+120 °C	1102-2010-2100-440	**105,03 €**
ETR-1					**TR**	
ETR-1 MS/100	100 mm	–35...+35 °C	3 K	+75 °C	1102-2010-1100-180	**70,83 €**
ETR-1 MS/150	150 mm	–35...+35 °C	3 K	+75 °C	1102-2010-1100-110	**73,21 €**
ETR-1 MS/200	200 mm	–35...+35 °C	3 K	+75 °C	1102-2010-1100-120	**77,40 €**
ETR-1 VA/100	100 mm	–35...+35 °C	3 K	+75 °C	1102-2010-1100-190	**98,46 €**
ETR-1 VA/150	150 mm	–35...+35 °C	3 K	+75 °C	1102-2010-1100-130	**100,82 €**
ETR-1 VA/200	200 mm	–35...+35 °C	3 K	+75 °C	1102-2010-1100-140	**105,03 €**
ETR-060					**TR**	
ETR-060 MS/100	100 mm	0...+60 °C	3 K	+75 °C	1102-2010-1100-380	**70,83 €**
ETR-060 MS/150	150 mm	0...+60 °C	3 K	+75 °C	1102-2010-1100-310	**73,21 €**
ETR-060 MS/200	200 mm	0...+60 °C	3 K	+75 °C	1102-2010-1100-320	**77,40 €**
ETR-060 VA/100	100 mm	0...+60 °C	3 K	+75 °C	1102-2010-1100-390	**98,46 €**
ETR-060 VA/150	150 mm	0...+60 °C	3 K	+75 °C	1102-2010-1100-330	**100,82 €**
ETR-060 VA/200	200 mm	0...+60 °C	3 K	+75 °C	1102-2010-1100-340	**105,03 €**
ETR-090					**TR**	
ETR-090 MS/100	100 mm	0...+90 °C	3 K	+120 °C	1102-2010-1100-480	**70,83 €**
ETR-090 MS/150	150 mm	0...+90 °C	3 K	+120 °C	1102-2010-1100-410	**73,21 €**
ETR-090 MS/200	200 mm	0...+90 °C	3 K	+120 °C	1102-2010-1100-420	**77,40 €**
ETR-090 VA/100	100 mm	0...+90 °C	3 K	+120 °C	1102-2010-1100-490	**98,46 €**
ETR-090 VA/150	150 mm	0...+90 °C	3 K	+120 °C	1102-2010-1100-430	**100,82 €**
ETR-090 VA/200	200 mm	0...+90 °C	3 K	+120 °C	1102-2010-1100-440	**105,03 €**
ETR-0120					**TR**	
ETR-0120 MS/100	100 mm	0...+120 °C	5 K	+135 °C	1102-2010-1100-580	**70,83 €**
ETR-0120 MS/150	150 mm	0...+120 °C	5 K	+135 °C	1102-2010-1100-510	**73,21 €**
ETR-0120 MS/200	200 mm	0...+120 °C	5 K	+135 °C	1102-2010-1100-520	**77,40 €**
ETR-0120 VA/100	100 mm	0...+120 °C	5 K	+135 °C	1102-2010-1100-590	**98,46 €**
ETR-0120 VA/150	150 mm	0...+120 °C	5 K	+135 °C	1102-2010-1100-530	**100,82 €**
ETR-0120 VA/200	200 mm	0...+120 °C	5 K	+135 °C	1102-2010-1100-540	**105,03 €**
ETR-50140					**TR**	
ETR-50140 MS/100	100 mm	+50...+140 °C	5 K	+150 °C	1102-2010-1100-680	**70,83 €**
ETR-50140 MS/150	150 mm	+50...+140 °C	5 K	+150 °C	1102-2010-1100-610	**73,21 €**
ETR-50140 MS/200	200 mm	+50...+140 °C	5 K	+150 °C	1102-2010-1100-620	**77,40 €**
ETR-50140 VA/100	100 mm	+50...+140 °C	5 K	+150 °C	1102-2010-1100-690	**98,46 €**
ETR-50140 VA/150	150 mm	+50...+140 °C	5 K	+150 °C	1102-2010-1100-630	**100,82 €**
ETR-50140 VA/200	200 mm	+50...+140 °C	5 K	+150 °C	1102-2010-1100-640	**105,03 €**
ETR-R6585					**STB**	
ETR-R6585 MS/100	100 mm	+65...+85 °C	+0 / –15...20 K	+120 °C	1102-2010-6100-780	**85,35 €**
ETR-R6585 MS/150	150 mm	+65...+85 °C	+0 / –15...20 K	+120 °C	1102-2010-6100-710	**87,73 €**
ETR-R6585 MS/200	200 mm	+65...+85 °C	+0 / –15...20 K	+120 °C	1102-2010-6100-720	**95,74 €**
ETR-R6585 VA/100	100 mm	+65...+85 °C	+0 / –15...20 K	+120 °C	1102-2010-6100-790	**103,41 €**
ETR-R6585 VA/150	150 mm	+65...+85 °C	+0 / –15...20 K	+120 °C	1102-2010-6100-730	**105,78 €**
ETR-R6585 VA/200	200 mm	+65...+85 °C	+0 / –15...20 K	+120 °C	1102-2010-6100-740	**110,12 €**
ETR-R90110					**STB**	
ETR-R90110 MS/100	100 mm	+90...+110 °C	+0 / –15...20 K	+120 °C	1102-2010-6100-880	**85,35 €**
ETR-R90110 MS/150	150 mm	+90...+110 °C	+0 / –15...20 K	+120 °C	1102-2010-6100-810	**87,73 €**
ETR-R90110 MS/200	200 mm	+90...+110 °C	+0 / –15...20 K	+120 °C	1102-2010-6100-820	**95,74 €**
ETR-R90110 VA/100	100 mm	+90...+110 °C	+0 / –15...20 K	+120 °C	1102-2010-6100-890	**103,41 €**
ETR-R90110 VA/150	150 mm	+90...+110 °C	+0 / –15...20 K	+120 °C	1102-2010-6100-830	**105,78 €**
ETR-R90110 VA/200	200 mm	+90...+110 °C	+0 / –15...20 K	+120 °C	1102-2010-6100-840	**110,12 €**

Type designation: **ETR-xx_immersion sleeve material / inserted length (mm)**
MS = Brass nickel-plated, **VA** = Stainless steel V4A (1.4571)

For further information and accessories see next page...

THERMASREG® ETR

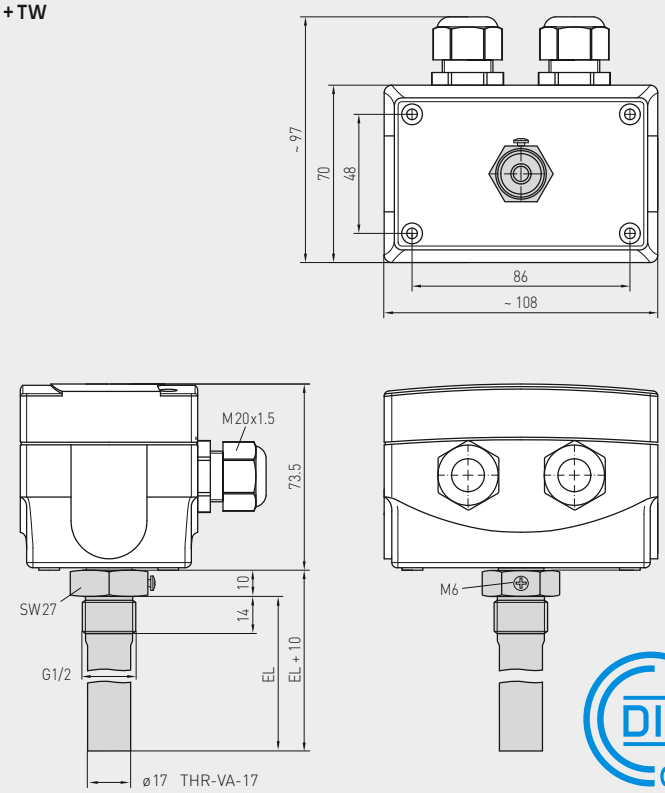
two-step

Equipment sensor / controller, including immersion sleeve,
EC type-tested, TÜV tested,
with switching output

S+S REGELTECHNIK

Dimensional drawing
Double temperature monitor
TW + TW

ETR-xxU
(two-step)



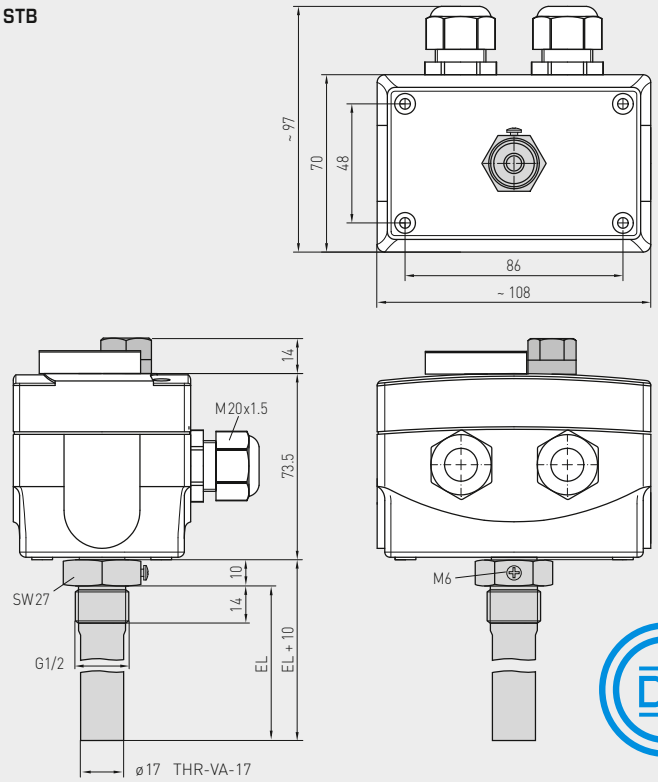
DIN Geprüft
Registernr.: TW / TW 1241



ETR-090090 U
(two-step)
TW + TW

Dimensional drawing
Temperature controller +
safety temperature limiter
TR + STB

ETR-xxRxx
(two-step)



DIN Geprüft
Registernr.: TR / STB 1202



ETR-060R85
ETR-090R110
(two-step)
TR + STB
selectable

THERMASREG® ETR Equipment sensor / controller, two-step, including immersion sleeve

Type / WG02	Inserted Length (EL)	Temperature Ranges (adjustable) 1.	2.	Thermal Operating Difference (fixed) approx. 1.	2.	Maximum Capillary Temp.	Item No.	Price
ETR-090090 U							**TW + TW**	
ETR-090090 U VA/150	**150 mm**	0...+90 °C	0...+90 °C	3 K	3K	+120 °C	1102-2010-2205-130	**146,41 €**
ETR-090090 U VA/200	**200 mm**	0...+90 °C	0...+90 °C	3 K	3K	+120 °C	1102-2010-2205-140	**159,14 €**
ETR-060 R 85							**TR + STB**	
ETR-060R85 VA/150	**150 mm**	0...+60 °C	+65...+85 °C	3 K	+0 / –15...20 K	+120 °C	1102-2010-7205-230	**146,41 €**
ETR-060R85 VA/200	**200 mm**	0...+60 °C	+65...+85 °C	3 K	+0 / –15...20 K	+120 °C	1102-2010-7205-240	**159,14 €**
ETR-090 R110							**TR + STB**	
ETR-090R110 VA/150	**150 mm**	0...+90 °C	+90...+110 °C	3 K	+0 / –15...20 K	+135 °C	1102-2010-7205-330	**146,41 €**
ETR-090R110 VA/200	**200 mm**	0...+90 °C	+90...+110 °C	3 K	+0 / –15...20 K	+135 °C	1102-2010-7205-340	**159,14 €**

Type designation:	**ETR-xx_immersion sleeve material / inserted length (mm)** **MS** = Brass nickel-plated, **VA** = Stainless steel V4A (1.4571)	
Extra charge:	**U** = Internal setting, unless included in a certain type **/2** = 2 steps, unless included in a certain type	**9,95 €** on request
Features:	**TR** = Temperature controller (**external setting**) **TW** = Temperature monitor (**internal setting**) **STB** = Safety temperature limiter (**internal setting**), **selectable,** with external switchpoint confirmation and restart interlock, restart by reset button at approx. 15...20 K below switching temperature (+0 K / - 15...20 K); **with EC type test (module B) according to directive 2014 / 68 / EU**	
Note:	To ensure **accurate responsiveness** series **ETR** devices must only be used in connection with the immersion sleeves included in the scope of delivery while applying heat-conductive paste	

ACCESSORIES

WLP-1	**Heat-conductive paste**, silicone-free	7100-0060-1000-000	**3,38 €**
	For further information see last chapter!		

THERMASGARD® THR Immersion sleeve Ø 8 / 9 / 17 mm

Type / WG01	p_{max} (static)	T_{max}	Time Constant for Medium: Air	Water	Oil	Inserted Length (EL)	Item No. Ø	Price
THR-ms-08 / xx	**Brass nickel-plated**						**Ø 8** x 0.5 mm	
THR-MS-08/100	10 bar	+150 °C	106 s	18 s	53 s	**100 mm**	7100-0011-3022-000	**15,42 €**
THR-MS-08/150	10 bar	+150 °C	106 s	18 s	53 s	**150 mm**	7100-0011-3404-000	**15,55 €**
THR-MS-08/200	10 bar	+150 °C	106 s	18 s	53 s	**200 mm**	7100-0011-3403-000	**18,47 €**
THR-VA-09 / xx	**Stainless steel V4A** (1.4571)						**Ø 9** x 1.0 mm	
THR-VA-09/100	25 bar	+150 °C	92 s	17 s	41 s	**100 mm**	7100-0012-3022-000	**39,72 €**
THR-VA-09/150	25 bar	+150 °C	92 s	17 s	41 s	**150 mm**	7100-0012-3032-000	**40,99 €**
THR-VA-09/200	25 bar	+150 °C	92 s	17 s	41 s	**200 mm**	7100-0012-3042-000	**43,92 €**
THR-VA-17 / xx	**Stainless steel V4A** (1.4571)						**Ø 17** x 1.0 mm	
THR-VA-17/150	25 bar	+150 °C	–	45 s	55 s	**150 mm**	7100-0012-3033-000	**40,99 €**
THR-VA-17/200	25 bar	+150 °C	–	45 s	55 s	**200 mm**	7100-0012-3404-000	**43,92 €**

Ordering example:	THR-ms-08 / **100**	(Brass immersion sleeve, Ø = 8 mm, **EL = 100** mm)
	THR-VA-09 / **150**	(Stainless steel immersion sleeve, Ø = 9 mm, **EL = 150** mm)
	THR-VA-17 / **200**	(Stainless steel immersion sleeve, Ø = 17 mm, **EL = 200** mm)
Note:	inner diameter of socket 15.0 mm	

THERMASREG® KTR

**Duct temperature controllers, including mounting flange,
EC type-tested, TÜV tested,
with switching output**

S+S REGELTECHNIK

DIN-tested German quality product. Temperature control and limiting device for heat generation plants in accordance with DIN EN 14597. Safety temperature limiter (STB) with EC type test (module B) according to directive 2014/68/EU.

Mechanical temperature control device / rod thermostat **THERM**ASREG® **KTR** with switching output, used for monitoring, controlling or limiting the temperatures of gaseous media as a boiler controller or in heating, air conditioning technology as well as in mechanical and apparatus engineering and in heat generation plants. It is available as one-step or two-step device, as adjustable temperature controller **TR**, temperature monitor **TW**, or as safety temperature limiter **STB**.





TECHNICAL DATA

Switching capacity: (Contact load)	24…250 V AC +10 %, 10 A, cos φ = 1.0 24…250 V AC +10 %, 1.5 A, cos φ = 0.6 at 24 V AC min. 150 mA
Contact:	dust-proof switch block unit as potential-free, single-pole or two-pole changeover contact
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 70 x 73.5 mm (Thor 2)
Cable gland:	M 20 x 1.5; including strain relief
Measuring element:	torsion meter with liquid filling, liquid expansion temperature feeler
Mounting position:	arbitrary
Ambient temperature:	–10…+65 °C at the switch block housing
Tolerance:	T_{min} ± 5 K; T_{max} ± 3 K
Operating medium:	Air
Protective tube:	**metal,** material CuZn37 (2.0321), Ø 14 mm, NL = 205 mm
Inserted length:	approx. 205 mm (with flange); approx. 184 mm (without flange)
Process connection:	by mounting flange (included in the scope of delivery)
Electrical connection:	0.14 - 2.5 mm² via terminal screws
Protection class:	I (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, EMC directive 2014/30/EU, low-voltage directive 2014/35/EU
Tests:	**EC type test (module B) according to directive 2014/68/EU,** certificate No.: IS-TAF-MUC 18 03 2652130 002, DIN EN 14597, register Nos.: **STB 1201, TR/STB 1202**
FUNCTION	**TW, TR:** Contact 2-3 breaks when temperature rises to the preset value. **STB:** Contact 2-1 or 5-4 (two-step) breaks when temperature rises to the preset value. Restart is possible only after cooling off by approx. 15 K - 20 K by pressing the reset button.

Duct temperature controllers, including mounting flange, EC type-tested, TÜV tested, with switching output

Configuration variants:

TW
Temperature monitor
(internal setting)

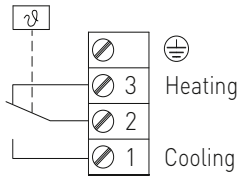
TR
Temperature controller
(external setting)

STB
Safety temperature limiter
(internal setting)

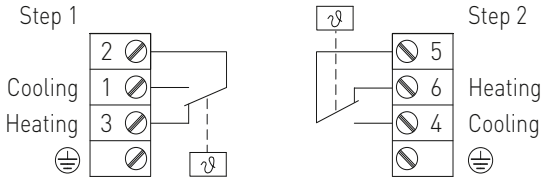
TW+TW
Double temperature monitor
(internal setting)

TR + STB
Temperature controller
(external setting) +
Safety temperature limiter
(internal setting)

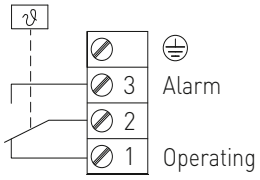
Connecting diagram **KTR**
TW, TR (one-step)



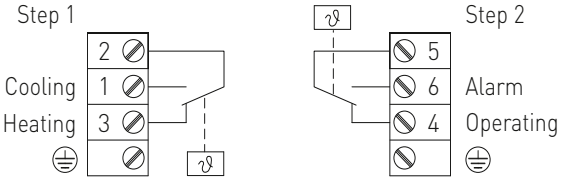
Connecting diagram **KTR**
TW+TW (two-step)



Connecting diagram **KTR**
STB (one-step)



Connecting diagram **KTR**
TR + STB (two-step)





ZERTIFIKAT ◆ CERTIFICATE ◆ 合格证书 ◆ СЕРТИФИКАТ ◆ CERTIFICADO ◆ CERTIFICAT

TÜV SÜD Industrie Service

CERTIFICATE

valid until: 25.02.2028

ZERTIFIKAT

gültig bis: 25.02.2028

EU Type examination (module B) - production type - according to Directive 2014/68/EU

EU-Baumusterprüfung (Modul B) - Baumuster - nach Richtlinie 2014/68/EU

Certificate No.: *Zertifikat-Nr.:*	Z-IS-TAF-MUC-18-03-2652130-002
Name and address of manufacturer: *Name und Anschrift des Herstellers:*	S+S Regeltechnik GmbH Pirnaer Str. 20 90411 Nürnberg

We herewith certify that the type mentioned below meets the requirements of the Directive 2014/68/EU.

Hiermit wird bescheinigt, dass das unten genannte Baumuster die Anforderungen der Richtlinie 2014/68/EU erfüllt.

Evaluation report No.: *Prüfbericht Nr.:*	C-T 1382-01/18 dated 2018-02-26
Scope of examination: *Geltungsbereich:*	Safety temperature limiter as safety accessory type: ETR and KTR (see page 3) basis of examination and details see page 3
Manufacturing plant: *Fertigungsstätte:*	S+S Regeltechnik GmbH Pirnaer Str. 20 90411 Nürnberg

München, 26.02.2018
(Place, date)
(Ort, Datum)

TÜV SÜD Industrie Service GmbH
Certification Body for pressure equipment
Johannes Steiglechner

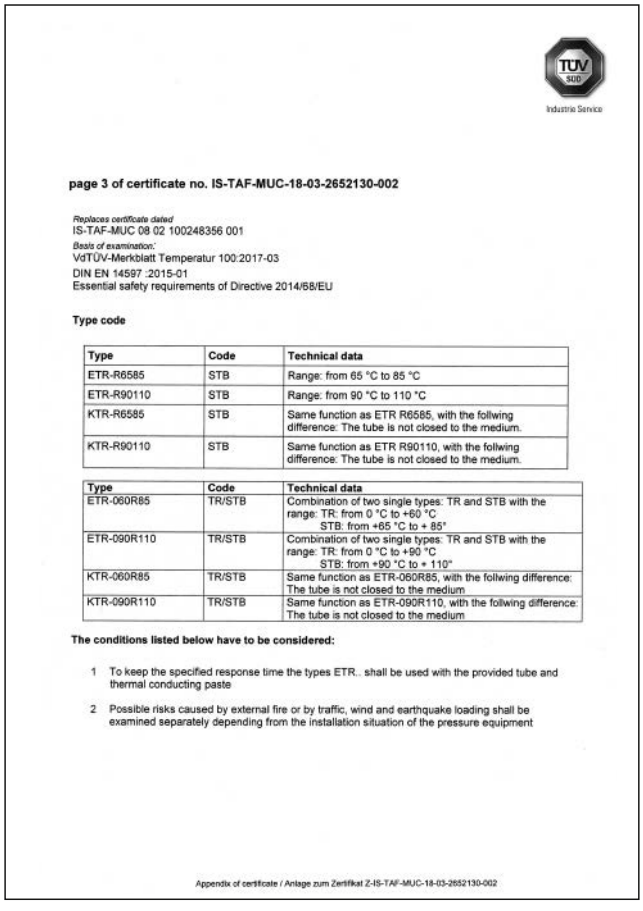
Verification of Certificate by TÜV SÜD App Verify
Echtheitsprüfung durch App TÜV SÜD Verify

089 5190-1027
feuerung@tuev-sued.de

Notified Body, No. 0036
Notifizierte Stelle, Kennnummer 0036
TÜV SÜD Industrie Service GmbH
Westendstr. 199
80686 München
GERMANY

Page 1 of the certificate No. / Seite 1 zum Zertifikat Nr. Z-IS-TAF-MUC-18-03-2652130-002

TÜV®



TÜV SÜD Industrie Service

page 3 of certificate no. IS-TAF-MUC-18-03-2652130-002

Replaces certificate dated
IS-TAF-MUC 08 02 100248356 001
Basis of examination:
VdTÜV-Merkblatt Temperatur 100:2017-03
DIN EN 14597 :2015-01
Essential safety requirements of Directive 2014/68/EU

Type code

Type	Code	Technical data
ETR-R6585	STB	Range: from 65 °C to 85 °C
ETR-R90110	STB	Range: from 90 °C to 110 °C
KTR-R6585	STB	Same function as ETR R6585, with the follwing difference: The tube is not closed to the medium.
KTR-R90110	STB	Same function as ETR R90110, with the follwing difference: The tube is not closed to the medium.

Type	Code	Technical data
ETR-060R85	TR/STB	Combination of two single types: TR and STB with the range: TR: from 0 °C to +60 °C STB: from +65 °C to + 85°
ETR-090R110	TR/STB	Combination of two single types: TR and STB with the range: TR: from 0 °C to +90 °C STB: from +90 °C to + 110°
KTR-060R85	TR/STB	Same function as ETR-060R85, with the follwing difference: The tube is not closed to the medium
KTR-090R110	TR/STB	Same function as ETR-090R110, with the follwing difference: The tube is not closed to the medium

The conditions listed below have to be considered:

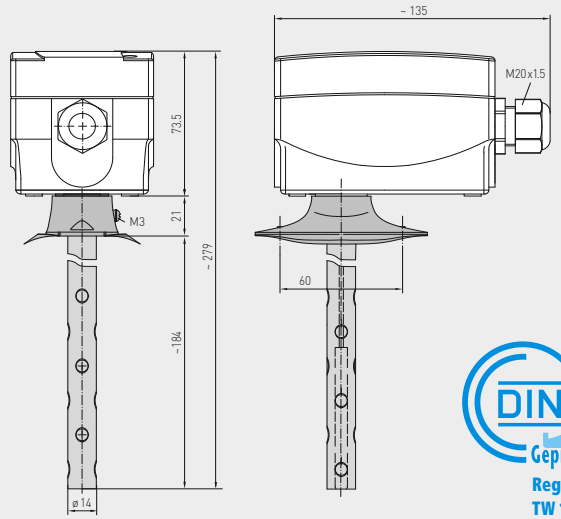
1 To keep the specified response time the types ETR.. shall be used with the provided tube and thermal conducting paste

2 Possible risks caused by external fire or by traffic, wind and earthquake loading shall be examined separately depending from the installation situation of the pressure equipment

Appendix of certificate / Anlage zum Zertifikat Z-IS-TAF-MUC-18-03-2652130-002

Dimensional drawing
Temperature monitor
TW

KTR-xxU
(one-step)



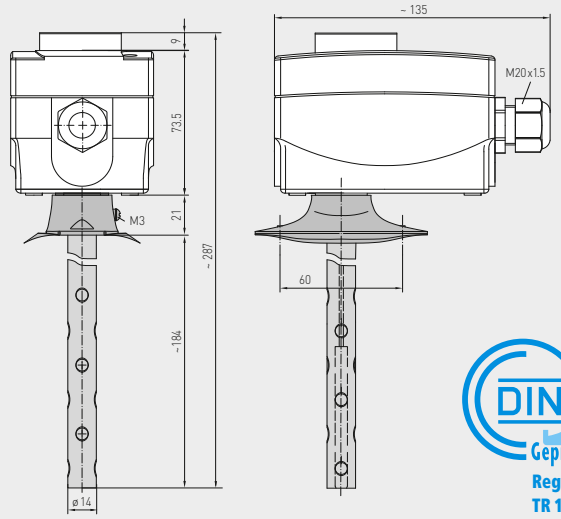
DIN Geprüft
Registernr.:
TW 1200



KTR-060U
KTR-090U
(one-step)
TW

Dimensional drawing
Temperature controller
TR

KTR-xx
(one-step)



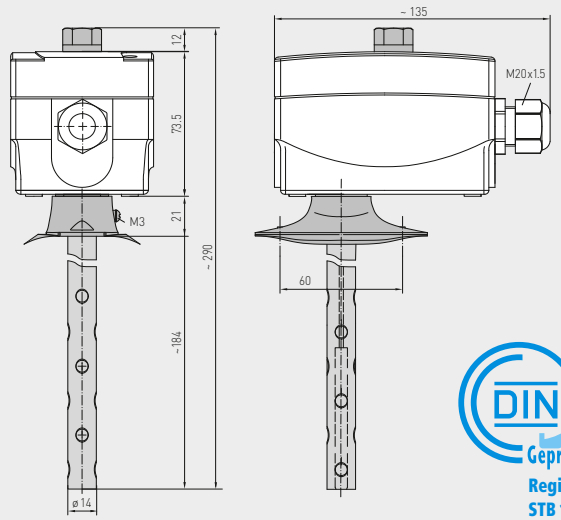
DIN Geprüft
Registernr.:
TR 1199



KTR-1
KTR-060
KTR-090
KTR-0120
KTR-50140
(one-step)
TR

Dimensional drawing
Safety temperature limiter
STB

KTR-Rxx
(one-step)



DIN Geprüft
Registernr.:
STB 1201



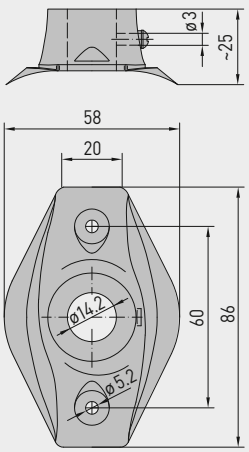
KTR-R6585
KTR-R90110
(one-step)
STB
adjustable

THERMASREG® KTR	Duct temperature controllers, one-step					
Type / WG02	**Ø mm**	**Temperature Ranges (adjustable)**	**Thermal Operating Difference (fixed) approx.**	**Maximum Capillary Temp.**	**Item No.**	**Price**
KTR-060 U / 090 U					**TW**	
KTR-060 U	14	0...+60 °C	3 K	+75 °C	1102-3010-2100-350	**76,50 €**
KTR-090 U	14	0...+90 °C	3 K	+120 °C	1102-3010-2100-450	**76,50 €**
KTR-xx					**TR**	
KTR-1	14	–35...+35 °C	3 K	+75 °C	1102-3010-1100-150	**76,50 €**
KTR-060	14	0...+60 °C	3 K	+75 °C	1102-3010-1100-350	**76,50 €**
KTR-090	14	0...+90 °C	3 K	+120 °C	1102-3010-1100-450	**76,50 €**
KTR-0120	14	0...+120 °C	5 K	+135 °C	1102-3010-1100-550	**76,50 €**
KTR-50140	14	+50...+140 °C	5 K	+150 °C	1102-3010-1100-650	**76,50 €**
KTR-R6585 / R90110					**STB**	
KTR-R6585	14	+65...+85 °C	+0 / –15...20 K	+120 °C	1102-3010-6100-750	**90,70 €**
KTR-R90110	14	+90...+110 °C	+0 / –15...20 K	+120 °C	1102-3010-6100-850	**90,70 €**

Extra charge:	**U** = Internal setting, unless included in a certain type		**9,95 €**
	/2 = 2 steps, unless included in a certain type	on request	
Equipment:	**FT** = Manual reset when temperature drops		
	ST = Manual reset when temperature rises		
	TR = Temperature controller (**external setting**)		
	TB = Temperature limiter (**internal setting**)		
	TW = Temperature monitor (**internal setting**)		
	STB = Safety temperature limiter (**internal setting**), **selectable,** with external switchpoint confirmation and restart interlock, restart by reset button at approx. 15...20 K below switching temperature (+ 0 K / - 15...20 K) **with EC type test (module B) according to directive 2014 / 68 / EU**		

ACCESSORIES			
MF-14-K	**Mounting flange**, plastic	7100-0030-2000-000	**9,56 €**
	For further information see last chapter!		

Dimensional drawing **MF-14-K**



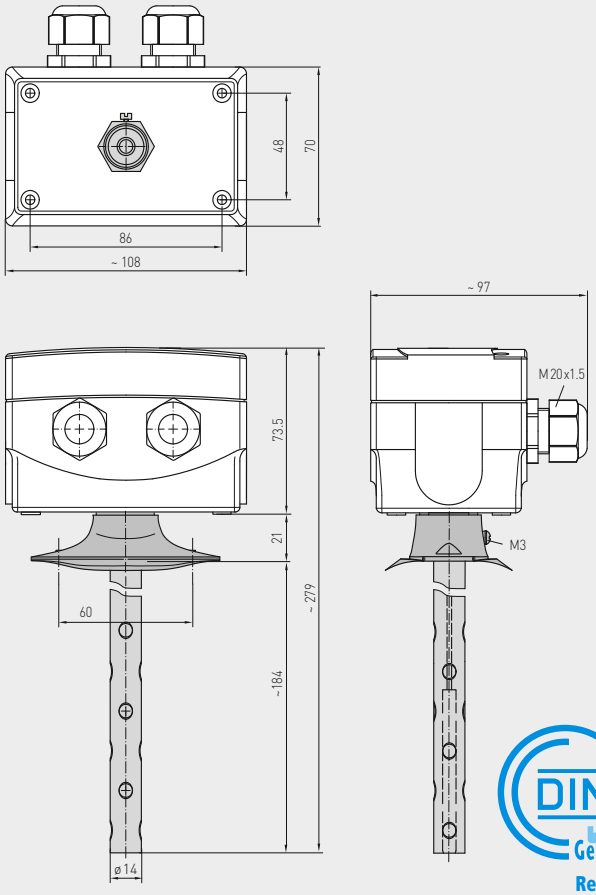
MF-14-K

Mounting flange,
plastic



Dimensional drawing
Double temperature monitor
TW + TW

KTR-xxU
(two-step)



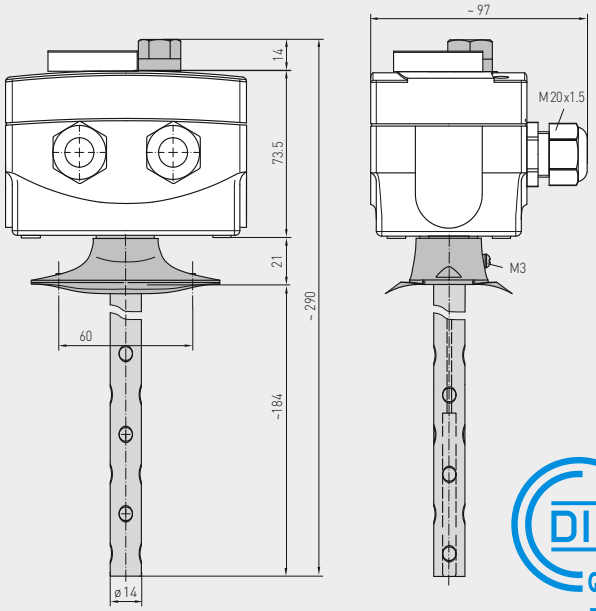
DIN Geprüft
Registernr.:
TW / TW 1241



KTR-090090U
(two-step)
TW + TW

Dimensional drawing
Temperature controller +
safety temperature limiter
TR + STB

KTR-xxRxx
(two-step)



DIN Geprüft
Registernr.:
TR / STB 1202



KTR-060R85
KTR-090R110
(two-step)
TR + STB
adjustable

THERMASREG® KTR Duct temperature controllers, two-step

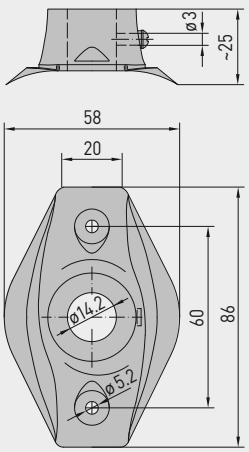
Type / WG02	Ø mm	Temperature Ranges (adjustable) 1.	2.	Thermal Operating Difference (fixed) approx. 1.	2.	Maximum Capillary Temp.	Item No.	Price
KTR-090090 U							**TW + TW**	
KTR-090090 U	14	0...+90 °C	0...+90 °C	3 K	3K	+120 °C	1102-3010-2205-150	**113,75 €**
KTR-060 R 85							**TR + STB**	
KTR-060R85	14	0...+60 °C	+65...+85 °C	3 K	+0 / –15...20 K	+120 °C	1102-3010-7205-250	**113,75 €**
KTR-090 R110							**TR + STB**	
KTR-090R110	14	0...+90 °C	+90...+110 °C	3 K	+0 / –15...20 K	+135 °C	1102-3010-7205-350	**113,75 €**

Extra charge:	**U** = Internal setting, unless included in a certain type		**9,95 €**
	/2 = 2 steps, unless included in a certain type	on request	
Features:	**TR** = Temperature controller (**external setting**)		
	TW = Temperature monitor (**internal setting**)		
	STB = Safety temperature limiter (**internal setting**), **selectable,** with external switchpoint confirmation and restart interlock, restart by reset button at approx. 15...20 K below switching temperature (+ 0 K / - 15...20 K) **with EC type test (module B) according to directive 2014 / 68 / EU**		

ACCESSORIES

MF-14-K	**Mounting flange**, plastic	7100-0030-2000-000	**9,56 €**
	For further information see last chapter!		

Dimensional drawing **MF-14-K**



MF-14-K

Mounting flange,
plastic



THERMASREG® ALTR 060
THERMASREG® ALTR 090

Surface contact temperature controllers, including tension spring

S+S REGELTECHNIK

Mechanical temperature controllers / contact thermostats **THERM**ASREG® **ALTR** with switching output (two-position controller) for monitoring, controlling and limitation of temperatures at pipes or vessels, e.g. in connection with hot-water or floor heating systems. The contact temperature controller ALTR is built as one-step device, as adjustable temperature controller **TR** (with external setting) or as adjustable temperature monitor **TW** (with internal setting).

ALTR 060 / 090



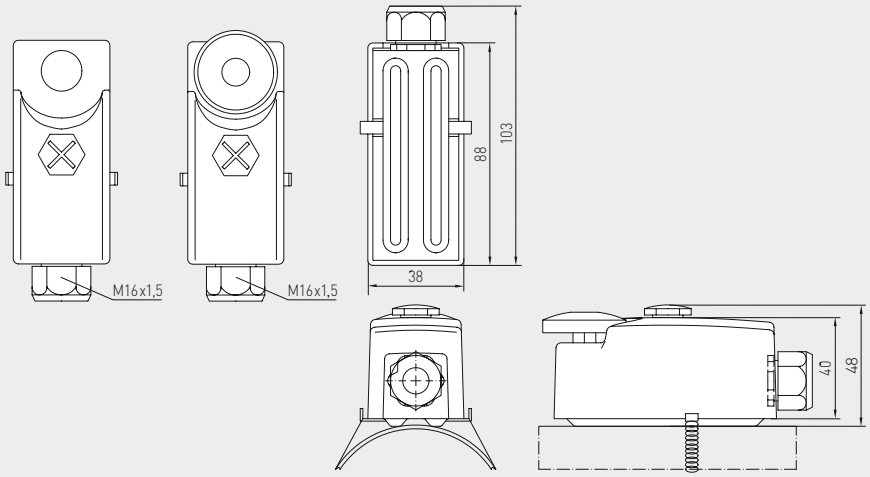
ALTR 060 / 090 U



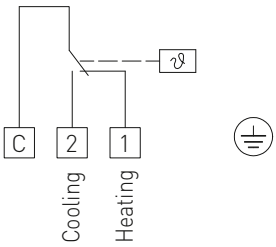
TECHNICAL DATA

Switching capacity: (Contact load)	16 (4) A; 24…250 V AC at 24 V AC min. 150 mA
Max. sensor temperature:	+110 °C
Contact:	dust-proof switch block unit as potential-free single-pole changeover contact
Housing:	ABS (acrylonitrile butadiene styrene), fibre-glass reinforced, base: steel, galvanised, top: grey, M 16 x 1.5
Housing temperature:	–35…+65 °C
Tolerance:	T_{min} ± 5 K; T_{max} ± 5 K
Sensor element:	bi-metal
Housing dimensions:	38 x 48 x 103 mm
Process connection:	by metal tension spring, 220 mm long (included in the scope of delivery)
Electrical connection:	0.14 - 1.5 mm² via terminal screws
Protection class:	I (according to EN 60 730)
Protection type:	**IP 40** (according to EN 60 529)
Standards:	CE conformity, EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU
FUNCTION	**Heating:** wire contacts C - 1 **Cooling:** wire contacts C - 2

Dimensional drawing **ALTR 060 / 090**



Connecting diagram **ALTR 060 / 090**



THERMASREG® ALTR 060 / 090 Surface contact temperature controllers

Type / WG01	Temperature Range	Thermal Operating Difference (fixed) approx.	Max. Capillary Temperature	Item No.	Price
ALTR 060 / 090				**TR** (External setting)	
ALTR-060	0…+60 °C	8 K (± 1 K)	+110 °C	1102-1040-1100-300	**31,84 €**
ALTR-090	0…+90 °C	8 K (± 1 K)	+110 °C	1102-1040-1100-400	**31,84 €**
ALTR 060 / 090 U				**TW** (Internal setting)	
ALTR-060 U	0…+60 °C	8 K (± 1 K)	+110 °C	1102-1040-2100-300	**31,84 €**
ALTR-090 U	0…+90 °C	8 K (± 1 K)	+110 °C	1102-1040-2100-400	**31,84 €**

Mechanical temperature controllers / contact thermostats **THERM**ASREG® **ALTR** with switching output (two-position controller) for monitoring, controlling and limitation of temperatures at pipes or vessels, e.g. in connection with hot-water or floor heating systems. The contact temperature controller ALTR is built as one-step device, as adjustable temperature controller **TR** (with external setting) or as adjustable temperature monitor **TW** (with internal setting).

ALTR 1 / 3 / 5 / 7



ALTR 1 / 3 / 5 / 7 U



TECHNICAL DATA

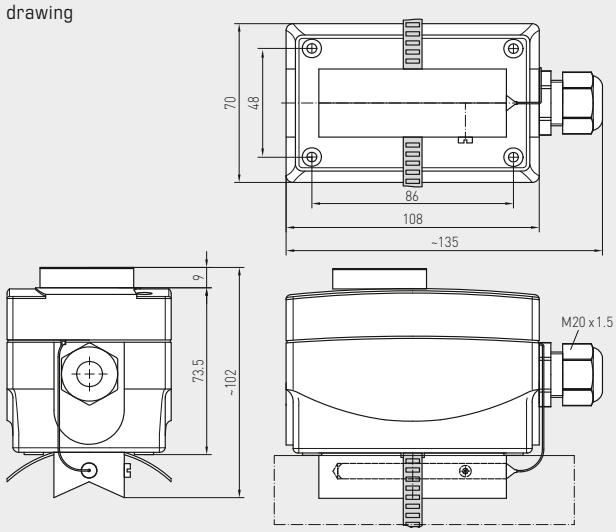
Switching capacity: (Contact load)	24 ... 250 V AC +10 %, 16 A, cos φ = 1.0 24 ... 250 V AC +10 %, 1.5 A, cos φ = 0.6 at 24 V AC min. 150 mA
Contact:	dust-proof switch block unit as potential-free single-pole changeover contact
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 70 x 73.5 mm (Thor 2)
Cable gland:	M 20 x 1.5; including strain relief
Housing temperature:	–35...+65 °C
Tolerance:	T_{min} ± 5 K; T_{max} ± 5 K
Design principle:	torsion meter with liquid filling
Process connection:	endless strap with metal tightener (included in the scope of delivery), Ø = 13 - 92 mm (¼ - 3"), L = 300 mm
Electrical connection:	0.14 - 2.5 mm² via terminal screws
Protection class:	I (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU

FUNCTION

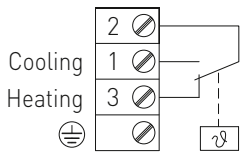
Heating: The preset setpoint (scale value) is equivalent to the switch-off value of the heating.
The switch-on value is lower by the amount of operating difference.
Contact 2 - 3 breaks when temperature rises to the preset value.

Cooling: The preset setpoint (scale value) is equivalent to the switch-on value of the cooling.
The switch-off value is lower by the amount of operating difference.
Contact 1 - 2 closes when temperature rises to the preset value.

Dimensional drawing **ALTR 1 / 3 / 5 / 7**



Connecting diagram **ALTR 1 / 3 / 5 / 7**



THERMASREG® ALTR 1 / 3 / 5 / 7 Surface contact temperature controllers

Type / WG01	Temperature Range	Thermal Operating Difference (fixed) approx.	Max. Capillary Temperature	Item No.	Price
ALTR 1 / 3 / 5 / 7				**TR** (External setting)	
ALTR-1	–35... +35 °C	5 K (± 1 K)	+60 °C	1102-1030-1100-100	**100,68 €**
ALTR-3	0... +60 °C	5 K (± 1 K)	+75 °C	1102-1030-1100-300	**100,68 €**
ALTR-5	0... +90 °C	5 K (± 1 K)	+120 °C	1102-1030-1100-400	**100,68 €**
ALTR-7	0...+120 °C	5 K (± 1 K)	+130 °C	1102-1030-1100-500	**100,68 €**
Extra charge:	**U** = Internal setting (**TW**), e. g. ALTR - 1 U				**9,95 €**

S+S REGELTECHNIK

Frost protection thermostats, mechanical, one-step, with switching output

The mechanical frost protection thermostat / frost monitor **THERM**ASREG® **FST** with switching output, fully-active sensor rod, with automatic reset, or with mechanical locking and manual reset, is available with capillaries in lengths of 0.6 m, 1.8 m, 3 m, 6 m, or 12 m. This frost protection monitor is used for air- and water-side temperature monitoring at heat exchangers, water circulation systems, and heating registers to prevent freezing up and to avoid frost damages, e. g. in ventilation and air conditioning ducts. All devices are self-secure with sensor breakage detection. In case of damage to the capillary tube – membrane system, the relay automatically switches to heating function. **FST-3** can also be used for monitoring liquids. The sensor tube can be installed inside an immersion sleeve. Mounting clamps **MK-05-K** are included in the delivery.

FST-1D / 5D / 7D / 8D



FST-3D

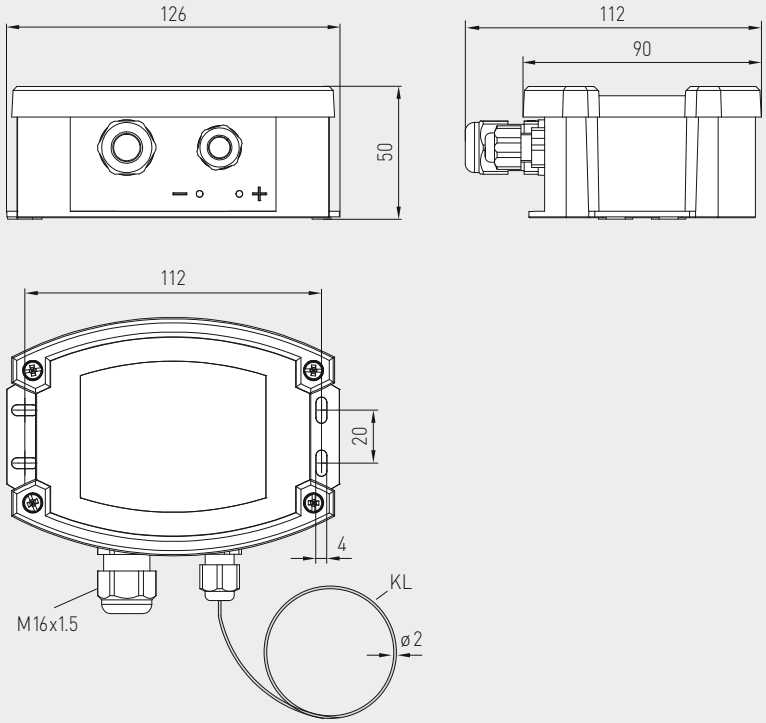


TECHNICAL DATA

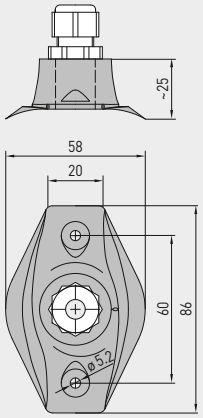
Switching capacity:	10 (2) A, AC 250 V; because of gold-plated switching contacts also switching of signal voltages < 24 V
Setting range:	–10...+15 °C / +14 °F...+59 °F, factory setting to w = +5 °C (+41 °F)
Operating difference:	2 ± 1 K (3.6 ± 1.8 °F)
Reproducibility:	± 0.5 K (± 0.9 °F)
Contact:	dust-proof micro switch as single-pole potential-free changeover contact
Sensor responding length:	approx. 40 cm
Length of capillary tube:	see table of types (0.6...12 m)
Resetting:	**FST-xD** automatic **FST-xD-HR** manual
Permissible medium:	**FST-1D/5D/7D/8D** air **FST-3D** water
Ambient temperatures:	maximum operating temperature: +70 °C (+158 °F) minimum operating temperature: w + min. +2 °C (min. +3.6 °F) storage / transport: –30...+70 °C (–22...+158 °F) capillary: max. +150 °C (+302 °F)
Process connection:	by mounting clamps **MK-05-K** (included in the scope of delivery)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016)
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Cable gland:	M 16 x 1.5; including strain relief
Other materials:	mechanical sheet metal parts: galvanised steel capillary tube: copper capillary tube filling: R 507 switching contacts: Ag / Ni (90% / 10%) gold-plated (3 µm)
Installation length:	arbitrary
Routing:	bending radius > 35mm admissible vibration load ≤ ½g admissible tensile load < 100N
Electrical connection:	0.14 - 2.5 mm²
Protection class:	I (according to EN 60 730-1)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU
FUNCTION	Contact C - 2: danger of frost / sensor breakage Contact C - 3: normal operation

For further information and accessories see next page...

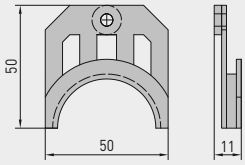
Dimensional drawing **FST-1D / 5D / 7D / 8D**



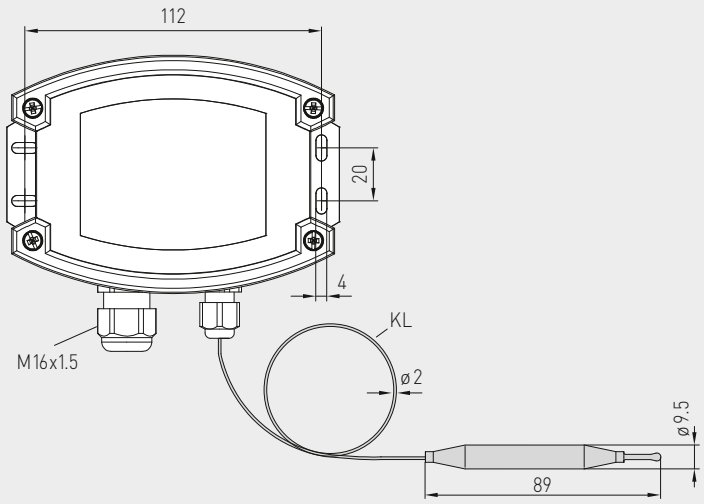
Dimensional drawing **KRD-04**



Dimensional drawing **MK-05-K**



Dimensional drawing **FST-3D**



MK-05-K

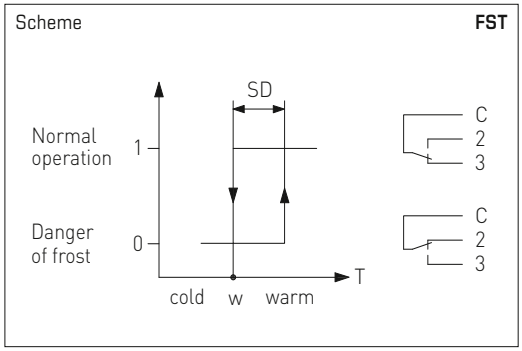


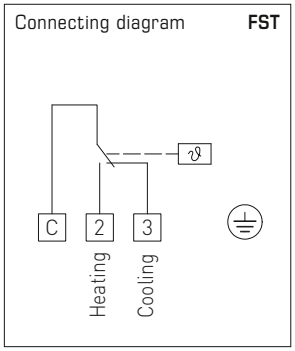
KRD-04



Frost protection thermostats, mechanical, one-step, with switching output

S+S REGELTECHNIK





FST-1D / 5D / 7D / 8D-HR
(manual rest)



FUNCTION

The switch inside frost protection thermostat **FST** responds (closes contact C-2) when temperature falls below the preset temperature setpoint over a capillary tube length of at least 40 cm. Simultaneously contact C-3 breaks and can be used as a signal contact. Resetting (closing contact C-3) happens automatically when temperature rises above the preset setpoint value again (on type **FST-xR** resetting must be done manually by pressing the reset button).

The **FST** is "intrinsically safe", i.e., in the event of damage to the capillary tube-membrane system, it automatically switches to the heating function. Contact C-2 closes and therefore can be used as operating contact. The air temperature is detected over the entire sensor length (capillary tube). The gas-filled (R 507) membrane system and the capillary tube constitute one measuring unit, which is mechanically coupled to the microswitch.

Capillary tube: The capillary tube is laid uniformly at the hot side of the air heater to be protected (in case of air coolers in front of the air cooler) at a distance of approx. 5 cm crosswise to the heat exchanger tubes over the entire area. For test purposes, it is recommended to make a loop of approx. 20 cm directly underneath the housing and before entering the air duct. To avoid damaging the capillary tube, a minimum bending radius of 20 mm must be observed. Installation is facilitated by using the mounting clamps available under accessories.

Frost simulation: The frost situation can be simulated and functioning of the device can be tested by dipping the capillary tube testing loop into a pot filled with ice water.

FST-3D-HR
(manual rest)



WS-03
Weather and sun protection hood
(optional)



FST-xD
TW = temperature monitor
(automatically switching)



FST-xD-HR
TB = temperature limiter
(manual rest)



THERMASREG® FST Frost protection thermostats, mechanical

Type / WG03B	Temperature Range	Thermal Operating Difference (fixed) approx.	Length of Capillary	Permissible Medium	Item No.	Price
FST-xxD					**TW**	
FST-1D *	–10…+15 °C	2 K (± 1 K)	6.0 m	air	1102-1021-0102-000	**87,15 €**
FST-3D *	–10…+15 °C	2 K (± 1 K)	1.8 m	air / water	1102-1023-0102-000	**88,92 €**
FST-5D *	–10…+15 °C	2 K (± 1 K)	3.0 m	air	1102-1022-0102-000	**84,78 €**
FST-7D *	–10…+15 °C	2 K (± 1 K)	12.0 m	air	1102-1025-0102-000	**150,22 €**
FST-8D	–10…+15 °C	2 K (± 1 K)	0.6 m	air	1102-1024-0102-000	**82,50 €**
FST-xxD-HR					**TB**	
FST-1D-HR *	–10…+15 °C	2 K (± 1 K)	6.0 m	air	1102-1021-1102-000	**104,70 €**
FST-3D-HR *	–10…+15 °C	2 K (± 1 K)	1.8 m	air / water	1102-1023-1102-000	**107,30 €**
FST-5D-HR *	–10…+15 °C	2 K (± 1 K)	3.0 m	air	1102-1022-1102-000	**104,33 €**
FST-7D-HR *	–10…+15 °C	2 K (± 1 K)	12.0 m	air	1102-1025-1102-000	**165,50 €**
FST-8D-HR	–10…+15 °C	2 K (± 1 K)	0.6 m	air	1102-1024-1102-000	**97,77 €**
Features:	FST-x**D** FST-x**D-HR**	**TW** = temperature monitor (**automatically switching**) **TB** = temperature limiter (**manual reset**)				

ACCESSORIES

KRD-04	Capillary tube gland bracket	7100-0030-7000-000	**8,91 €**
MK-05-K	Mounting clamps (6 pieces) plastic (*= included in the scope of delivery)	7100-0034-1000-000	**9,88 €**
TH-MS-01	Immersion sleeves, brass, for FST-3	7100-0011-5402-000	**15,55 €**
TH-VA-02	Immersion sleeves, stainless steel **V2A** (1.4301), for FST-3	7100-0012-5402-000	**40,74 €**
WS-03	Weather and sun protection hood, 200 x 180 x 150 mm, stainless steel **V2A** (1.4301)	7100-0040-6000-000	**44,74 €**
	For further information see last chapter!		

THERMASREG® FST-K

**Duct frost protection thermostat,
incl. mounting flange, mechanical, one-step,
with switching output**

S+S REGELTECHNIK

Mechanical frost protection thermostat / frost monitor **THERM**ASREG® **FST-K** with switching output, duct tube monitored across the entire length, with automatic reset or with mechanical locking, with / without optional manual reset.

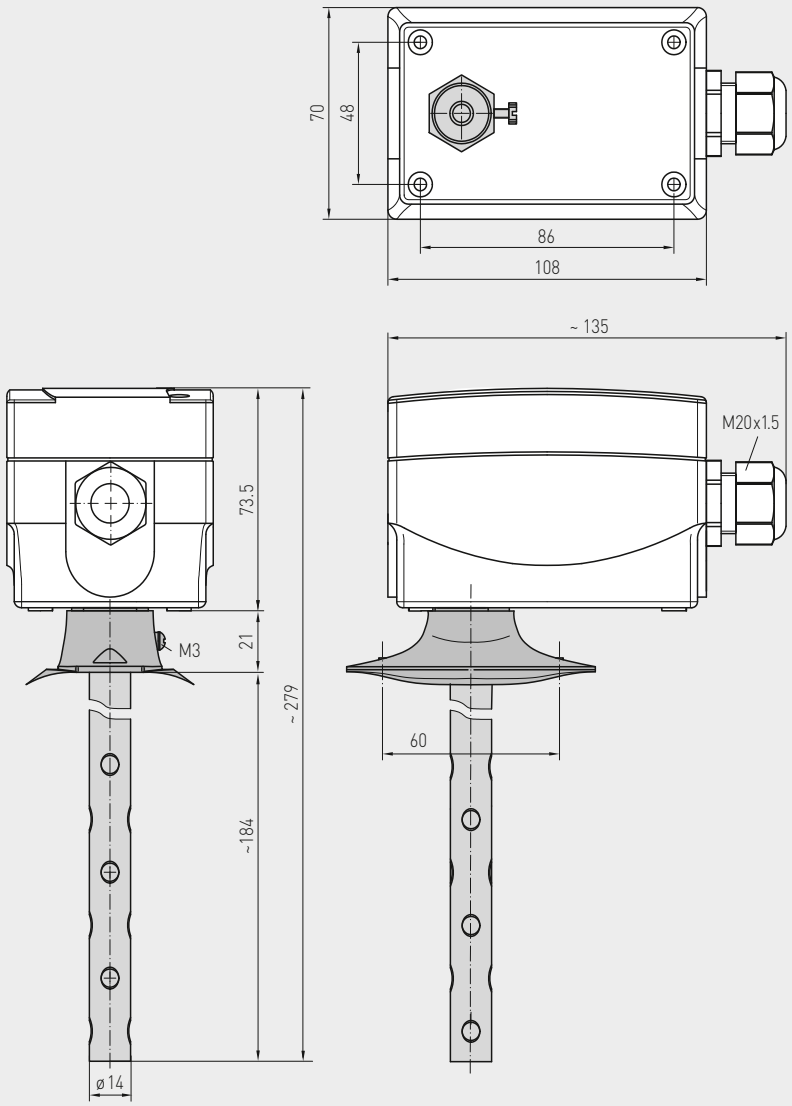
The frost protector is suitable for air side temperature monitoring at heat exchangers and heating registers to prevent freezing up and to avoid frost damage, e.g. in ventilation and air conditioning ducts. The FST-K is intrinsically safe and is equipped with sensor breakage detection. In the event of damage to the capillary membrane system, the frost sensor automatically switches to the heating function. The scope of delivery includes the mounting flange **MF-14-K**.

TECHNICAL DATA

Switching capacity:	10 (2) A, AC 250 V; because of gold-plated switching contacts also switching of signal voltages < 24 V
Setting range:	–10...+15 °C / +14 °F...+59 °F, factory setting to w = +5 °C (+41 °F)
Operating difference:	2 ± 1 K (3.6 ± 1.8 °F)
Reproducibility:	± 0.5 K (± 0.9 °F)
Contact:	dust-proof micro switch as single-pole potential-free changeover contact
Resetting:	**FST-K** automatic **FST-K-HR** manual (by hand)
Permissible medium:	Air
Ambient temperatures:	maximum operating temperature: +70 °C (+158 °F) minimum operating temperature: w + min. +2 °C (min. +3.6 °F) storage / transport: –30...+70 °C (–22...+158 °F)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 70 x 73.5 mm (Thor 2)
Cable gland:	M 20 x 1.5; with strain relief
Process connection:	by mounting flange, plastic (included in the scope of delivery)
Electrical connection:	0.14 - 2.5 mm², via screw terminals
Protective tube:	**metal,** material CuZn37 (2.0321), Ø 14 mm, NL = 205 mm
Other materials:	mechanical sheet metal parts: galvanised steel capillary tube: copper capillary tube filling: R 507 switching contacts: Ag / Ni (90% / 10%) gold-plated (3 µm)
Protection class:	I (according to EN 60 730-1)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, EMC Directive 2014 / 30 / EU, Low Voltage Directive 2014 / 35 / EU
FUNCTION	Contact C - 2: danger of frost / sensor breakage Contact C - 3: normal operation

For further information and accessories see next page...

Dimensional drawing **FST-K**



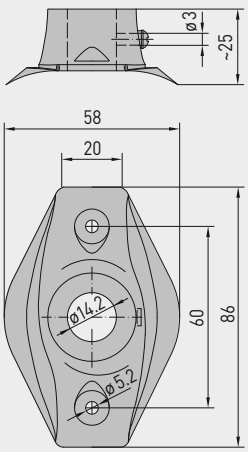
FST-K



FST-K-HR
with manual reset



Dimensional drawing **MF-14-K**

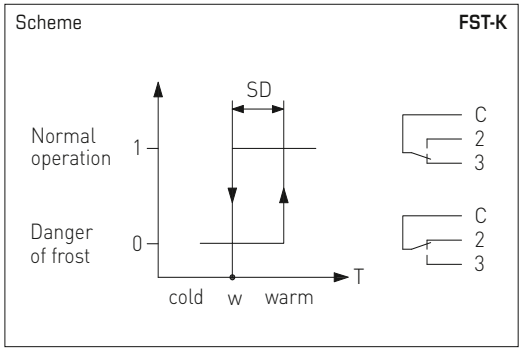


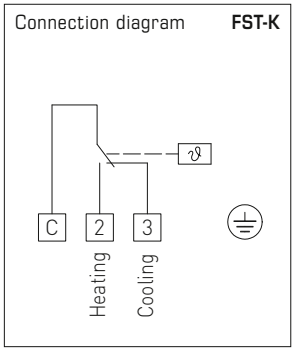
MF-14-K
Mounting flange,
plastic



Duct frost protection thermostat, incl. mounting flange, mechanical, one-step, with switching output

S+S REGELTECHNIK





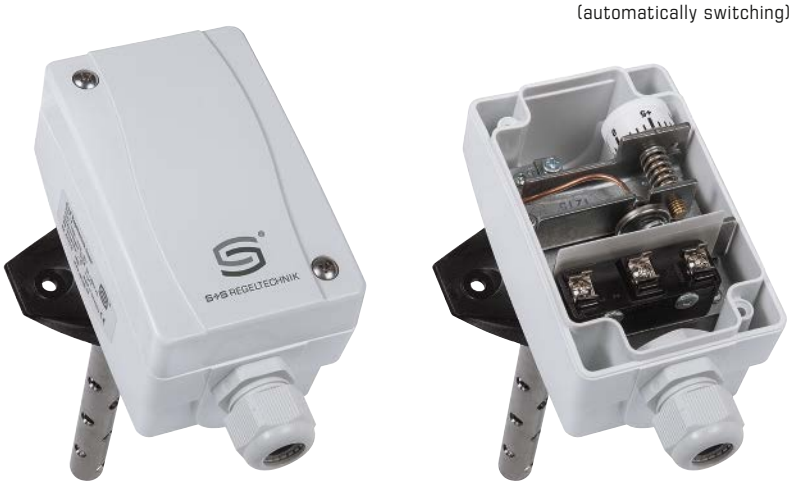
FUNCTION

The switch in the **FST-K** duct frost protection thermostat responds if the temperature across the entire length of the duct tube falls below the preset temperature setpoint (closes contact C - 2). Contact C - 3 opens at the same time and can be used as a signal contact. Resetting occurs automatically (contact closes C - 3) if the temperature rises above the preset setpoint again (on type **FST-K - HR**, resetting must be performed manually using the reset button).

The **FST-K** is "intrinsically safe", i.e., in the event of damage to the capillary tube-membrane system, it automatically switches to the heating function. Contact C - 2 closes and can therefore be used as an operating contact. The air temperature is detected over the entire length of the sensor (capillary tube). The gas-filled (R 507) membrane system and the capillary tube constitute one measuring unit, which is mechanically coupled to the microswitch.

FST-K

TW = temperature monitor
(automatically switching)



FST-K-HR

TB = temperature limiter
(manual rest)



THERMASREG® FST-K Duct frost protection thermostat, mechanical

Type / WG02	Temperature Range	Thermal Operating Difference (fixed) approx.	Function	Permissible Medium	Item No.	Price
FST-K					**TW**	
FST-K	–10…+15 °C	2 K (± 1 K)	TW	air	1102-1064-0100-001	**120,11 €**
FST-K-HR					**TB**	
FST-K HR	–10…+15 °C	2 K (± 1 K)	TB	air	1102-1064-1100-000	**135,40 €**
Equipment:	FST-K FST-K-**HR**	**TW** = temperature monitor (**automatically switching**) **TB** = temperature limiter (**manual reset**)				

ACCESSORIES

MF-14-K	**Mounting flange**, plastic	7100-0030-2000-000	**9,56 €**
	For further information see last chapter!		

THERMASREG® FS-20

**2-phase frost protection thermostat,
with control and cascading input,
with active and switching output**

S+S REGELTECHNIK

Electronic frost protection thermostat / frost monitor **THERM**ASREG® **FS-20** with switching relayoutput, continuous temperature and valve output (summation output 0–10V) and control and cascading output (0–10V), optionally with connection for heating element, in an impact-resistant plastic housing with quick-locking screws, with display by default, with fully active sensorrod made from copper.

The frost monitor is used to monitor air conditioning systems, heat exchangers, heating registers and similar systems, and protects against frost damage and freezing. Falling below the limit value is detected at the coldest measuring point of the capillary tube, the sensor rod is active along its entire length. Uses internal diagnostics to detect capillary breakage, power failure or electric damage to the sensor as an error and the relay automatically switches to frost.

The innovative 2-phase frost protection thermostat enables simple combination of several devices (cascading) for demand-oriented, comprehensive frost monitoring. The delivery scope includes the mounting clamps **MK-05-K** for expert attachment of the sensor rod.

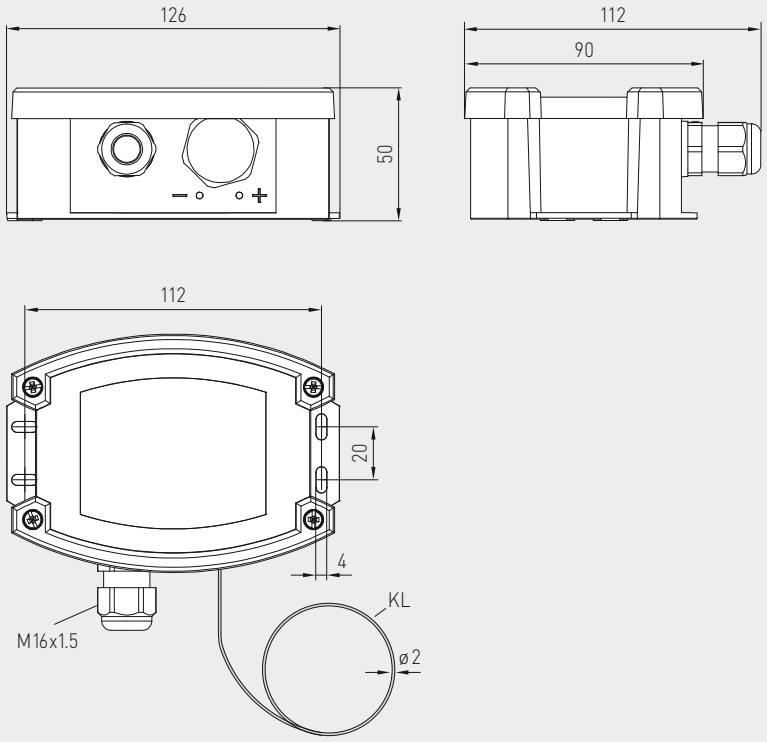
FS-20



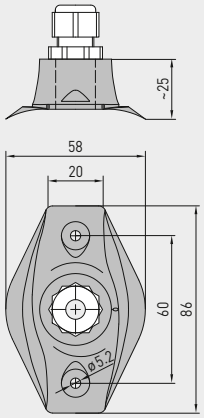
TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %)
Load resistance:	R_L > 50 kOhm
Measuring range:	0...+15 °C
Input:	1 x 0-10 V control input DDC 1 x 0-10 V **ascading input**
Output:	1 x 0-10 V output temperature (corresponding to 0...+15 °C) 1 x 0-10 V output valve (frost signal with control voltage and cascading) 1 x potential-free changeover contact (24 V), range of adjustment 0...+15 °C
Current consumption:	max. 100 mA at 24 V DC (**FS-20** without heating element) max. 200 mA at 24 V DC (**FS-20 xx HE** with heating element)
Accuracy:	typically ± 1 K (at +10 °C)
Hysteresis of the switch step:	2K
Turn-on/run-in time :	< 1 min
Response time:	t_{90} < 5 s
Sensor and capillary tube:	Copper sensor rod, length of 3 m or 6 m, active along the entire sensor length, min. response length of 25 cm
Ambient temperatures:	**Sensor and capillary tube:** –20...+60 °C (capillary tube at a distance of > 20 cm from the housing) **Housing:** –15...+50 °C **Storage / transport:** –30...+70 °C
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Cable gland:	M 16 x 1.5 ; including strain relief, exchangeable, max. inner diameter 10.4 mm
Process connection:	by mounting clamps **MMK-05-K** (included in the scope of delivery)
Electrical connection:	0.14 - 1.5 mm², via screw terminals
Routing:	bending radius > 35mm admissible vibration load ≤ ½g admissible tensile load < 100N
Permitted humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE-conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU
Equipment:	**display with illumination,** three-line, cutout approx. 70 x 40 mm (W x H), for displaying the actual temperature, measuring range overrange/underrange of the set switch point (frost protection temperature), and alarm indicator for "frost" or "error" (capillary breakage, overvoltage/undervoltage)
Internal diagnostics:	**Error 1** in case of cable / capillary breakage **Error 2** in case of undervoltage / overvoltage (relay automatically switches to frost)

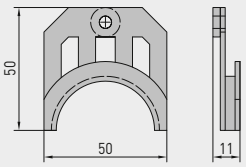
Dimensional drawing **FS-20**



Dimensional drawing **KRD-04**



Dimensional drawing **MK-05-K**



WS-03
Weather and sun protection hood
(optional)



MK-05-K



KRD-04



THERMASREG® FS-20

**2-phase frost protection thermostat,
with control and cascading input,
with active and switching output**

S+S REGELTECHNIK

FUNCTION

The filling used in the copper capillary tube in the frost protection monitor generates a pressure signal that is proportional to the lowest temperature on the entire capillary tube (but min. 200 mm). This is converted into an electrical signal by a sensor and electronically amplified. The standard signal 0-10 V generated as a result corresponding to 0...+15°C is issued. This voltage is available at the "Temp." terminal.

The internal potentiometer can be used to specify a **frost switchpoint** "FS" for the potential-free changeover contact in the range from 0 °C (left limit stop) to +15 °C (right limit stop). If this switchpoint "FS" is undershot, the relay output switches to the "frost protection" position (contact "W" connected to contact "Ö"). If the temperature rises by more than 2 K above the set switchpoint "FS", the device switches back to normal operating mode if "**Reset Auto**" is selected. The relay drops out to the initial position (contact "W" connected to contact "S"). If the "**Reset Hand**" operating mode is selected, the relay output does not automatically switch even if the set switchpoint "FS" +2 K is exceeded, but must be manually reset from the **reset button**.

In addition, a second voltage output "AV", mapped by 0-10 V, is available. At a voltage of 0 V at the control input "SE", the output voltage "AV" is always 0 V if the measured temperature is at least 6 K above the set switchpoint "FS". If the measured temperature falls below the set switchpoint "FS"+6 K, the voltage output "AV" increases in a linear fashion from 0 V to 10 V. The increase here amounts to 1.67 V for every degree Kelvin by which the temperature approaches the preset switchpoint "FS". The output voltage 10 V is therefore issued at "FS" = measured temperature. If you increase "SE", the output voltage "AV" is increased by this amount. The "AV" output therefore represents a summation output for the input variables "SE" and "Frost signal". In this case, the "Frost signal" variable describes the output behaviour of "AV" at "SE" = 0 V. The maximum output voltage is restricted to 10 V.

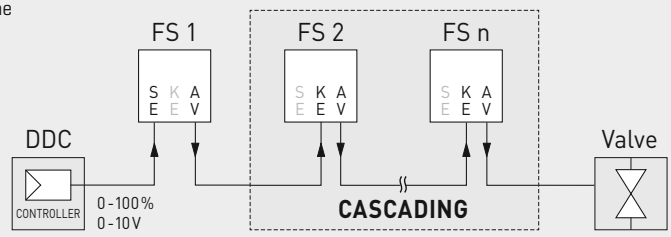
Several frost protection devices can be connected to each other via the **cascading input** "KE" to cover a larger channel cross-section for frost monitoring. The AV output of the first device is connected to the KE input of the second device. The internal device logic decides on the priority frost signal of both devices for controlling the heating register valve.

In the event of capillary breakage, electrical sensor damage (cable breakage), voltage failure, falling short of the permissible voltage level or exceeding it, the relay output is automatically switched to "Frost protection" (contact "W" connected to contact "Ö").

NOTE

The capillary tube must be securely seated in the socked and must not twist.
A redundant setup to protect critical systems is **absolutely necessary.**

Scheme **FS-20**



Display readout **FS-20**



Normal operation
Actual temperature and
set switchpoint temperature



Frost protection alarm
Actual temperature is
below switchpoint temperature



Measuring range exceeded
Actual temperature rises
above +15 °C



Measuring range underranged
Actual temperature falls
below 0 °C

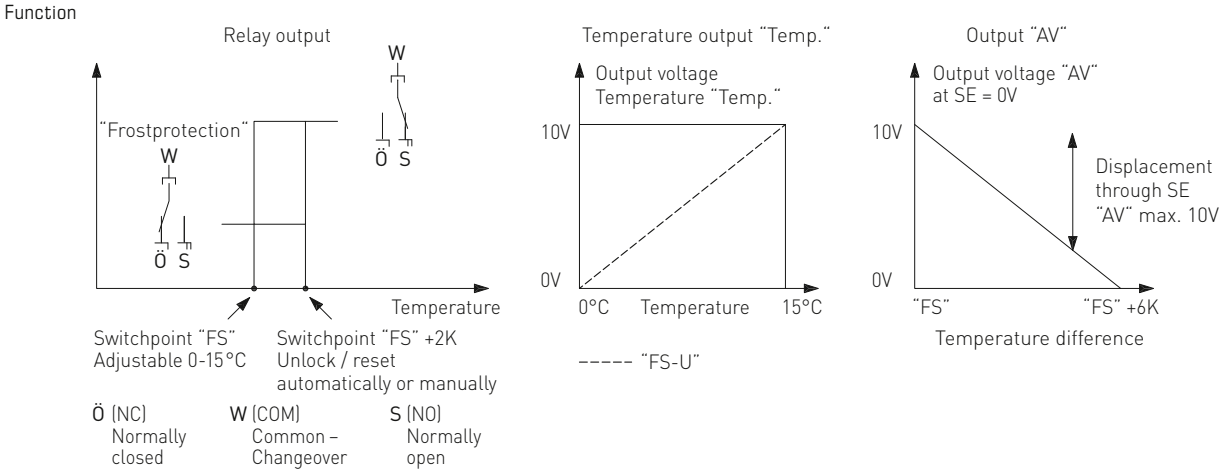


Error message 1
in case of cable/
capillary breakage

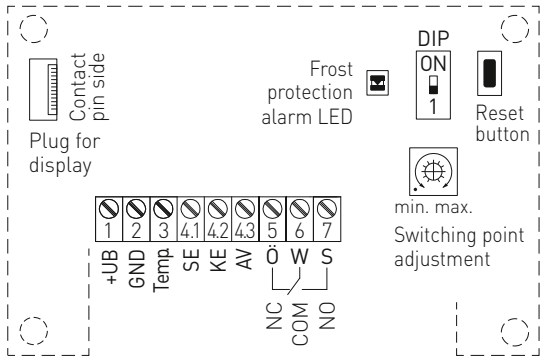


Error message 2
in case of undervoltage/
overvoltage

Function **FS-20**



Connecting diagram **FS-20**



UB+	Operating voltage 24V AC/DC
GND	Operating voltage –UB GND
Temp.	Output temperature 0-10V = 0...+15°C
SE	Control input 0-10V
KE	Cascading input 0-10V
AV	Output valve 0-10V
Ö	(NC) Normally Closed
W	(COM) Common – changeover (24 V)
S	(NO) Normally Open

FS-20



DIP switch	FS-20
Resetting after frost protection (Mode adjustable)	**DIP 1**
Reset Hand (manually) Alarm remains saved	**ON**
Reset Auto (automatically) Alarm is reset automatically (default)	OFF

THERMASREG® FS-20 Two-phase frost protection thermostats

Type / WG02	Measuring Range	Output	Sensor length	Display	Item No.	Price
FS-20						
FS20-UW 3m LCD	0...+15 °C	2 x 0-10 V, 1 x changeover contact	3,0 m	■	1102-1012-2102-030	**256,02 €**
FS20-UW 6m LCD	0...+15 °C	2 x 0-10 V, 1 x changeover contact	6,0 m	■	1102-1011-2102-030	**300,76 €**
FS-20 xx HE					**with heating element**	
FS20-UW-HE 3m LCD	0...+15 °C	2 x 0-10 V, 1 x changeover contact	3,0 m	■	1102-1012-2112-030	**278,63 €**
FS20-UW-HE 6m LCD	0...+15 °C	2 x 0-10 V, 1 x changeover contact	6,0 m	■	1102-1011-2112-030	**324,47 €**

ACCESSORIES			
KRD-04	Capillary tube gland bracket	7100-0030-7000-000	**8,91 €**
MK-05-K	Mounting clamps (6 pieces) plastic (included in the scope of delivery)	7100-0034-1000-000	**9,88 €**
WS-03	Weather and sun protection hood, 200 x 180 x 150 mm, stainless steel **V2A** (1.4301)	7100-0040-6000-000	**44,74 €**
	For further information see last chapter!		

S+S REGELTECHNIK

Temperature controller for top hat rail installation for remote sensor, with multi-range switching and switching output

Electronic top hat rail thermostat / top hat rail temperature controller **THERM**ASREG® **TET** for installation in distributor boxes or control cabinets, with switching output, multi-range switching, and adjustable hysteresis. It is used for electronic control and monitoring of temperatures by remote sensors in the residential sector (e.g. in connection with floor heating systems), in halls and greenhouses and in the industrial sector.
This controller is provided with sensor breakage detection and a switch-off function.

TECHNICAL DATA

Power supply:	24 V DC, +10 % / –15 %; 24 V AC or 230 V AC, +10 % / –15 %, 50 - 60 Hz
Power consumption:	2.5 VA
Control range:	–10...+30 °C; +20...+80 °C; +60...+120 °C, selectable
Input:	Pt1000
Output:	relay as single-pole, potential-free changeover contact (1x)
Switching capacity: (Contact load)	max. 6 A 250 V AC Ue / Ie AC-15, 120 V / 3.5 A, 240 V / 3 A Ue / Ie DC-13, 24 V / 2.5 A EN 60947-5-1, VDE 0435
Operating Difference:	adjustable
Lifetime:	changeover contact mechanical: 5 x 10^6 changeover contact electrical: 1 x 10^5
Ambient conditions:	–20...+60 °C, non-precipitating air
Operating mode indicator:	LED
Housing:	plastic, colour black-grey (similar to RAL 7021) and light grey (similar to RAL 7035), width: 45 mm, 3TE
Electrical connection:	0.14 - 2.5 mm^2 via terminal screws
Mounting:	on DIN top hat rail
Humidity:	< 90 % RH, non-precipitating air
Protection class:	II (according to EN 60 730)
Protection type:	IP 20 at front side (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU

FUNCTION

The range of interpretation is selected at the lower potentiometer.

Three measuring ranges can be chosen: –10...+30 °C; +20...+80 °C; +60...+120 °C.

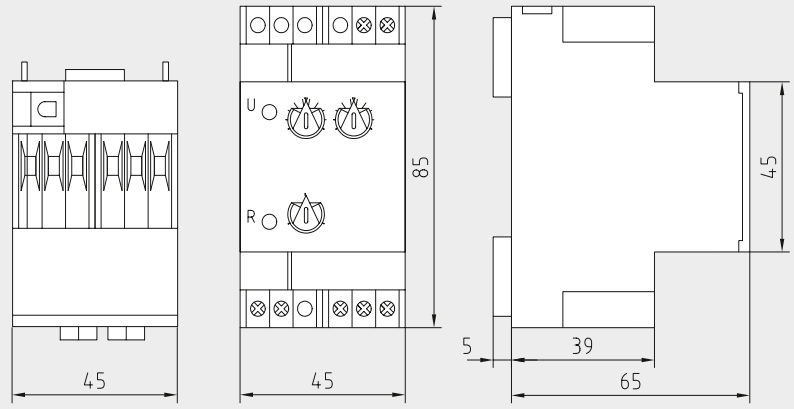
The temperature to be monitored is determined by the potentiometer »Setpoint« and the switchpoints (hysteresis) are defined at the potentiometer »Hyst.«

When temperature at the Pt1000 exceeds the value of »Setpoint + Hyst.«, the output relay switches to rest position (switched off).
When temperature falls below »Setpoint - Hyst.«, the output relay is reactivated.

The following conditions result in a drop of the relay to rest position:
Excess temperature, short circuit, or wire breakage at the Pt 1000 sensor, failure of power supply.

Measuring input and power supply have no electric connection i.e. are galvanically isolated.

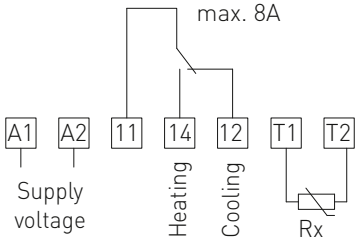
Dimensional drawing **TET**



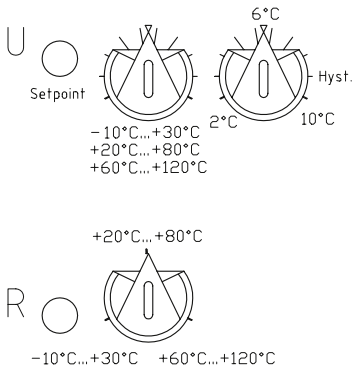
TET



Connecting diagram **TET**



Scheme **TET**



THERMASREG® TET Temperature controller for top hat rail installation

Type / WG01	Supply Voltage	Input Sensor	Output	Item No.	Price
TET					
TET-230VAC	230 V AC, 2,5 VA	Pt1000	1 x changeover contact (potential-free)	1102-6021-0000-000	**201,83 €**
TET-24VAC	24 V AC, 2,5 VA	Pt1000	1 x changeover contact (potential-free)	1102-6022-0000-000	**201,83 €**
TET-24VDC	24 V DC, 2,5 VA	Pt1000	1 x changeover contact (potential-free)	1102-6023-0000-000	**201,83 €**

Humidity

HYGRASGARD® & **HYGR**ASREG®
No chance for mould and corrosion

You can be sure that our humidity transmitters and humidity controllers will never let you down when it comes to preventing mould and rust.

Thanks to an accuracy of up to 2 % RH, you will always be on the safe side. The range of applications extends from standard applications in building automation all the way to demanding cleanroom applications.

Application Areas

- Refrigeration, air conditioning, ventilation and cleanroom technology
- Food and pharmaceutical industry
- Hospitals, museums, office buildings and greenhouses
- Production facilities, laboratories, computer rooms and control cabinets
- Meteorology



S+S REGELTECHNIK



HYGRASGARD® & **HYGR**ASREG®
HUMIDITY SENSORS, CONTROLLERS, HYGROSTATES

Room sensors

RFF/RFTF	Room humidity sensor, on-wall	**373**
FSFM/FSFTM	Room humidity sensor, in-wall	**375**
DFF/DFTF	In-ceiling humidity sensor	**379**
RPFF-SD	Pendulum room humidity sensor	**433**
RPFF/RPFTF	Pendulum room humidity sensor	**437**
RPFF/RPFTF-25	Pendulum room humidity sensor, pluggable	**441**
VFF/VFTF	Showcase humidity sensor	**445**

Duct sensors

KFF/KFTF-SD	Duct humidity sensor	**410**
KFF/KFTF	Duct humidity sensor	**411**
KFF/KFTF-20	Duct humidity sensor	**413**
KFTF-20-VA	Duct humidity sensor (Stainless steel housing Tyr 2E)	**419**
KFTF-35	Duct humidity sensor for high humidity NEW	**423**
KAVTF	Duct humidity sensor	**427**

On-wall sensors

AFF/AFTF-SD	On-wall humidity sensor	**383**
AFF/AFTF	On-wall humidity sensor	**388**
AFF/AFTF-20	On-wall humidity sensor	**391**
AFTF-20-VA	On-wall humidity sensor (Stainless steel housing Tyr 2E)	**396**
AFF/AFTF-25	On-wall humidity sensor, pluggable	**389**
AFTF-35	On-wall humidity sensor for high humidity NEW	**401**
AAVTF	Outdoor humidity sensor	**405**

Screw-in sensors

ESFTF	Screw-in humidity sensor for pressure systems NEW	**431**

Hygrostats

RH-2	Room hygrostat, one-step	**447**
AH-40	On-wall hygrostat, one-step	**453**
KH-10	Duct hygrostat, one-step	**459**
KH-40	Duct hygrostat, one-step	**461**

Hygrothermostats

RHT	Room hygrothermostat, one-step	**446**
RHT-30	Room hygrothermostat, two-step	**451**
AHT-30	On-wall hygrothermostat, two-step	**457**
KHT-30	Duct hygrothermostat, two-step	**465**

Condensation control switch, dew point control switch, leakage sensor

KW-SD	Condensation control switch	**468**
KW	Condensation control switch	**469**
TW	Dew point control switch	**473**
LS	Leakage sensor	**475**

Immersion sleeves and accessories

see chapter Accessories	**644**

Humidity

HYGRASGARD® & **HYGR**ASREG®
Sensor technology for humidity and temperature

Broad Spectrum

All our humidity measuring transducers are designed to be multifunctional. This reduces the diversity of types while expanding their possible applications.

Thanks to microprocessor technology, almost any measuring range can be represented, including custom specifications. Multi-range switching is selectable via DIP switches.

Optimum Precision

These devices are developed and manufactured according to the latest criteria; latest generation digital sensors are installed. All devices are produced at our factory and are calibrated and 100 % checked in our climatic exposure test cabinets. Each sensor is precisely re-adjustable using offset potentiometers. Take advantage of our experience, our development, manufacturing and product know-how and order these products directly from the manufacturer.

Approved Safety

The **HYGR**ASGARD® **3112** with current output (Test No. D8 0910 69871 003) and the **HYGR**ASGARD® **3111** with voltage output (Test No. D8 0910 69871 004) are tested and certified according to DIN EN 61326-1:2006 and EN 61326-2-3:2006 by TÜV SÜD.

DIN tested / certified devices

RoHS conforming materials

ESD compliant manufacturing

CE compliance tested by external laboratories

Certified Quality

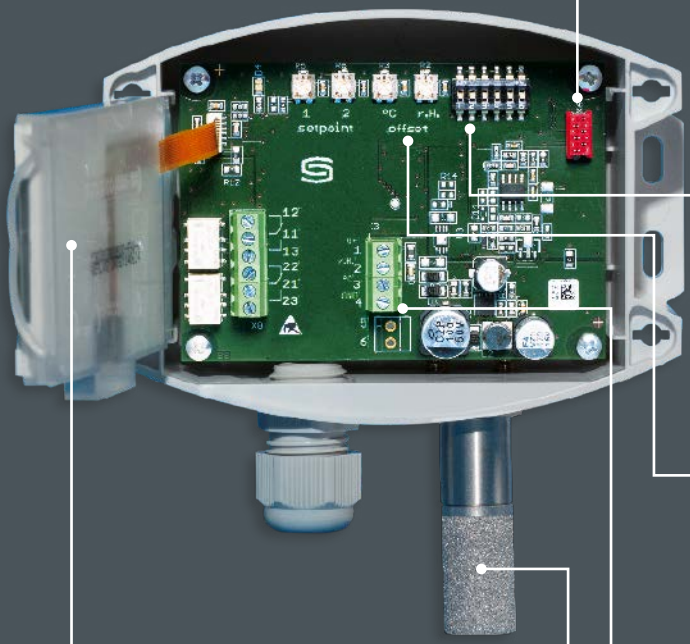
Our development and production in Nuremberg/Germany is certified by TÜV Thüringen according to DIN EN ISO 9001:2015.

GOST certified

EAC certified

MADE IN GERMANY

S+S REGELTECHNIK



2



Quality Assurance

Calibration and balancing are done by means of the bus system in climate cabinets

3



DIP Switches

For multi-range toggling as well as setting of measuring ranges, response times, damping times, units and configuration levels

4



Offset Potentiometer

For fine adjustment (zero point offset) and readjustment upon recalibration

1



Extra-Large Display (70 x 40 mm)

With backlighting as well as display of range violation, sensor breakage, sensor short circuit and physical units

5



Screw Terminals

Active output signals 0-10 V, 4...20 mA or switched output

6

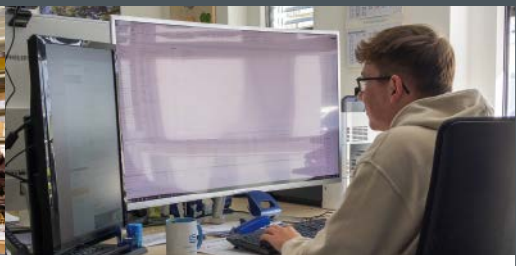


Digital Humity & Temperature Probe

Highly precise, longterm stable and temperature compensated







HYGRASGARD® RFF
HYGRASGARD® RFTF

**Room humidity and temperature sensors (± 2.0 %),
on-wall, calibratable,
with active / passive output**

S+S REGELTECHNIK

The calibratable room humidity and temperature sensor **HYGR**ASGARD® **RFF/RFTF** measures the relative humidity and/or temperature of air. It converts the measurands humidity and temperature into standard signals of 0 -10 V or 4...20 mA and is available with or without an optional display (for displaying actual humidity and actual temperature) in an elegant housing made of plastic, with snap-on lid, base with 4-hole attachment for installation on vertically or horizontally installed in-wall flush boxes, with predetermined breaking point for on-wall cable entry. The relative humidity (in % RH) is the quotient of water vapour partial pressure divided by the saturation vapour pressure at the respective gas temperature.

It is used in non-aggressive dust-free atmospheres in refrigeration, air conditioning, ventilation and clean room technology, in interior rooms such as residential rooms, offices, hotels, technical rooms, meeting rooms and convention centres. These measuring transducers are designed for exact detection of air temperature and humidity. A digital long-term stable sensor is used as a measuring element for humidity and temperature measurement. Fine adjustment by the user is possible.

TECHNICAL DATA

Power supply:	24 V AC (± 20 %) and 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (ohm) = (U_b -14 V) / 0.02 A for I variant
Load resistance:	R_L > 5 kOhm for U variant
Power consumption:	< 1.1 VA / 24 V DC ; < 2.2 VA / 24 V AC
Sensors:	**digital humidity sensor** **with integrated temperature sensor,** small hysteresis, high long-term stability
HUMIDITY	
Measuring range, humidity:	0...100 % RH (output corresponding to 0 -10 V or 4...20 mA)
Operating range, humidity:	0 ... 95 % RH (non-precipitating air)
Deviation, humidity:	typically **± 2.0** % (20...80 % RH) at +25 °C, otherwise ± 3.0 %
Output, humidity:	0 -10 V for U variant 4...20 mA for I variant, working resistance < 800 Ω, see load resistance diagram
TEMPERATURE	
Measuring range, temperature:	0...+ 50 °C (output corresponding to 0 -10 V or 4... 20 mA or Ohm value) others upon request!
Operating range, temperature:	0...+ 50 °C
Deviation, temperature:	typically ± 0.2 K at +25 °C
Output, temperature:	0 -10 V or 4 ... 20 mA or Ohm value
Ambient temperature:	storage –25...+50 °C, operation –5...+55 °C
Electrical connection:	2-, 3- or 4-wire connection (see connecting diagram) 0.14 -1.5 mm² via terminal screws
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010)
Housing dimensions:	85 x 85 x 27 mm (Baldur 1)
Installation:	wall mounting or on in-wall flush box, Ø 55 mm, base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes for cable entry from the back, with predetermined breaking point for on-wall cable entry from top / bottom in case of plain on-wall installation
Long-term stability:	±1 % per year
Protection class:	III (according to EN 60 730)
Protection type:	**IP 30** (according to EN 60 529)
Standards:	CE conformity, according to EMC directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3
Optional:	two-line display with illumination, 36 x 15 mm (W x H), for displaying ACTUAL temperature and / or ACTUAL humidity

The two-line display readout switches between the ACTUAL humidity reading in % RH and the ACTUAL temperature reading in °C.

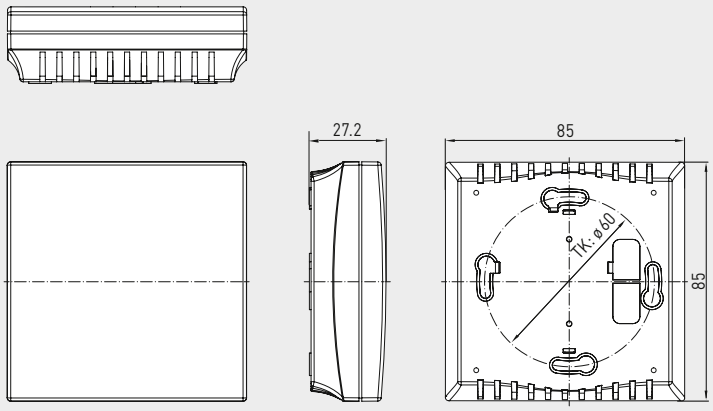
Backlighting is installed for better instrument readability.

Display Readout **RFTF**



Dimensional drawing
(Baldur 1)

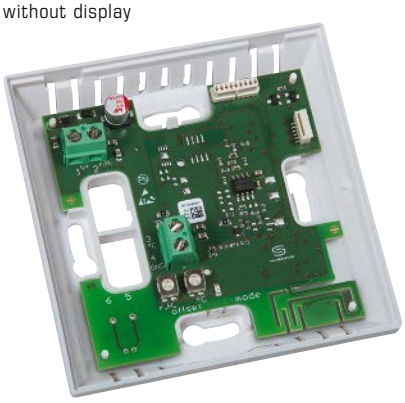
RFF
RFTF



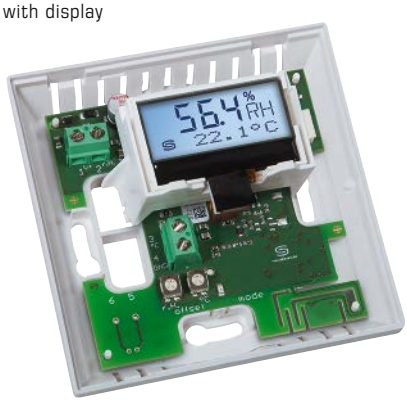
RFF
RFTF



RFF
RFTF
without display



RFF
RFTF
with display



RFF
RFTF
with display



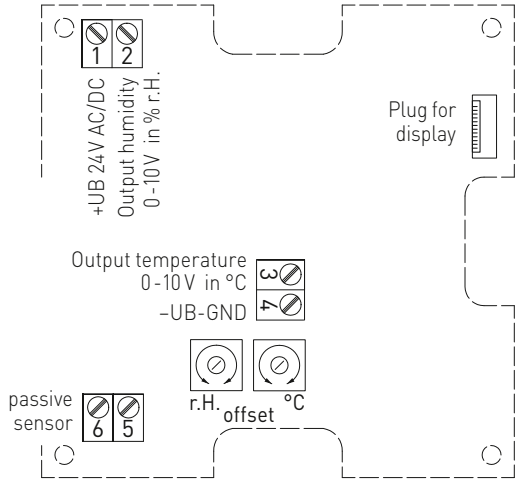
HYGRASGARD® RFF
HYGRASGARD® RFTF

Room humidity and temperature sensors (± 2.0 %), on-wall, calibratable, with active / passive output

S+S REGELTECHNIK

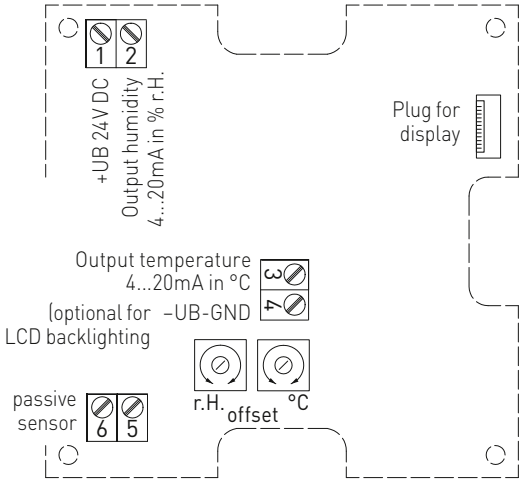
Schematic diagram (Baldur 1)

RFTF-U-x
RFTF-U-x with display



Schematic diagram (Baldur 1)

RFTF-I-x
RFTF-I-x with display



3-wire connection **RFF-U**

1 +UB 24V AC/DC
2 Output humidity in % r.H. 0-10V
3 Free
4 –UB-GND

2- or 3-wire connection * **RFF-I (Transmitter)**

1 +UB 24V DC
2 Output humidity in % r.H. 4...20mA
3 Free
4 –UB-GND (optional for backlighting)

4- or 6-wire connection **RFTF-U (passive temperature sensor)**

1 +UB 24V AC/DC
2 Output humidity in % r.H. 0-10V
3 Output temperature in °C 0-10V
4 –UB-GND
5 Passive element
6 e.g. Pt1000, Ni1000, LMZ235Z

4-wire connection **RFTF-U**
RFTF-U with display

1 +UB 24V AC/DC
2 Output humidity in % r.H. 0-10V
3 Output temperature in °C 0-10V
4 –UB-GND

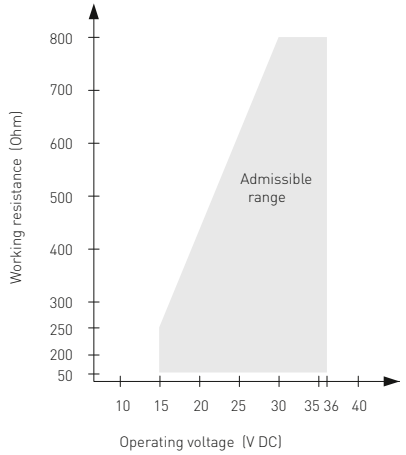
3- or 4-wire connection ** **RFTF-I (Transmitter)**

1 +UB 24V DC
2 Output humidity in % r.H. 4...20mA
3 Output temperature in °C 4...20mA
4 –UB-GND (optional for backlighting)

4- or 6-wire connection **RFTF-I (passive temperature sensor)**

1 +UB 24V DC
2 Output humidity in % r.H. 4...20mA
3 Output temperature in °C 4...20mA
4 –UB-GND (optional for backlighting)
5 Passive element
6 e.g. Pt1000, Ni1000, LMZ235Z

Load resistance diagram 4...20 mA **RFF / RFTF**



Connection*:
2-wire connection for devices with / without display (not illuminated)
3-wire connection for devices with illuminated display

Connection**:
3-wire connection for devices with / without display (not illuminated)
4-wire connection for devices with illuminated display

At the **I variant** the humidity path must be connected!

Humidity table
MR: 0 ...100 % RH

% RH	U_A [V]	I_A [mA]	% RH	U_A [V]	I_A [mA]
0	0	4.0	**50**	5.0	12.0
5	0.5	4.8	**55**	5.5	12.8
10	1.0	5.6	**60**	6.0	13.6
15	1.5	6.4	**65**	6.5	14.4
20	2.0	7.2	**70**	7.0	15.2
25	2.5	8.0	**75**	7.5	16.0
30	3.0	8.8	**80**	8.0	16.8
35	3.5	9.6	**85**	8.5	17.6
40	4.0	10.4	**90**	9.0	18.4
45	4.5	11.2	**95**	9.5	19.2
Continued at the right ...			**100**	10.0	20.0

Temperature table
MR: 0 ...+50 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

HYGRASGARD® RFF Room humidity sensors
HYGRASGARD® RFTF Room humidity and temperature sensors

Type / WG01	Measuring Range / Readout Humidity	Temperature	Output Humidity	Temperature	Display	Item No. (Baldur 1)	Price
RFF						**(active)**	
RFF-I	0...100 % RH	–	4...20 mA	–		1201-41A2-0000-000	**118,91 €**
RFF-I **LCD**	0...100 % RH	–	4...20 mA	–	■	1201-41A2-0200-000	**174,41 €**
RFF-U	0...100 % RH	–	0-10 V	–		1201-41A1-0000-000	**118,91 €**
RFF-U **LCD**	0...100 % RH	–	0-10 V	–	■	1201-41A1-0200-000	**174,41 €**
RFTF						**(active)**	
RFTF-I	0...100 % RH	0...+50 °C	4...20 mA	4...20 mA		1201-41A2-1000-000	**122,61 €**
RFTF-I **LCD**	0...100 % RH	0...+50 °C	4...20 mA	4...20 mA	■	1201-41A2-1200-000	**178,22 €**
RFTF-U	0...100 % RH	0...+50 °C	0-10 V	0-10 V		1201-41A1-1000-000	**122,61 €**
RFTF-U **LCD**	0...100 % RH	0...+50 °C	0-10 V	0-10 V	■	1201-41A1-1200-000	**178,22 €**

HYGRASGARD® RFTF-U xx Room humidity and temperature sensors

Type / WG01	Measuring Range / Readout Humidity	Temperature	Output Humidity	Temperature	Item No. (Baldur 1)	Price
RFTF-U xx	**Pt, Ni, LM235Z**				**(active / passive)**	
RFTF-U Pt100	0...100 % RH	0...+50 °C	0-10 V	0-10 V + Pt100	1201-41A1-2001-000	**163,28 €**
RFTF-U Pt1000	0...100 % RH	0...+50 °C	0-10 V	0-10 V + Pt1000	1201-41A1-2005-000	**166,65 €**
RFTF-U Ni1000	0...100 % RH	0...+50 °C	0-10 V	0-10 V + Ni1000	1201-41A1-2009-000	**167,79 €**
RFTF-U NiTK	0...100 % RH	0...+50 °C	0-10 V	0-10 V + Ni1000TK5000	1201-41A1-2010-000	**168,03 €**
RFTF-U LM235Z	0...100 % RH	0...+50 °C	0-10 V	0-10 V + LM235Z, 10mV / K	1201-41A1-2021-000	**167,40 €**
RFTF-U xx	**NTC**				**(active / passive)**	
RFTF-U NTC1,8K	0...100 % RH	0...+50 °C	0-10 V	0-10 V + NTC 1,8 kOhm	1201-41A1-2012-000	**167,92 €**
RFTF-U NTC10K	0...100 % RH	0...+50 °C	0-10 V	0-10 V + NTC 10 kOhm	1201-41A1-2015-000	**164,27 €**
RFTF-U NTC20K	0...100 % RH	0...+50 °C	0-10 V	0-10 V + NTC 20 kOhm	1201-41A1-2016-000	**164,27 €**
Extra charge:	Two-line **display** with illumination					**49,83 €**

HYGRASGARD® FSFM
HYGRASGARD® FSFTM

Room humidity and temperature sensor or measuring transducer, in-wall in the panel switch programme, with active output

S+S REGELTECHNIK

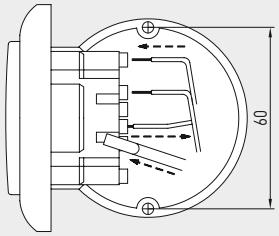
The room sensor **HYGR**ASGARD® **FSFM / FSFTM** in the in-wall housing is used for measuring the relative humidity and temperature of the air. It converts the measured values into a standard signal of 0-10 V.

A digital, long-term stable sensor is used for humidity and temperature measurement. Relative humidity [% RH] is the quotient of water vapour partial pressure divided by the saturation vapour pressure at the respective gas temperature.

The in-wall sensor is mounted in high-quality panel switch programmes, ideally of the brands Gira, Berker, Merten, Jung, Siemens or Busch-Jaeger (using in-wall adapters) either individually or in combination with light switches, socket outlets, etc.

It is used in non-aggressive, dust-free environments, in refrigeration, air conditioning and clean room technology, and in interior rooms, such as living rooms, offices, hotels, etc

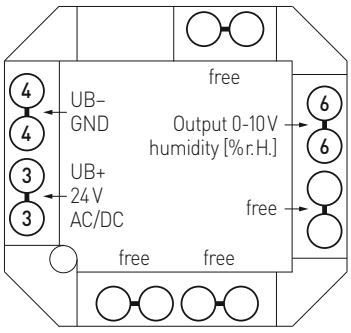
Mounting diagram **in-wall**



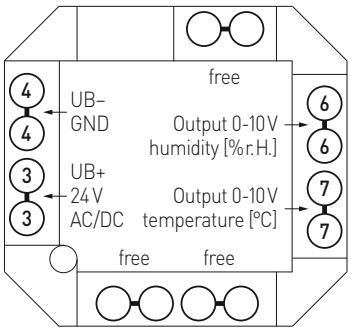
TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %)
Power consumption:	< 1.1 W / 24 V DC; < 2.2 VA / 24 V AC
HUMIDITY	
Sensor:	**digital humidity sensor,** **with integrated temperature sensor,** low hysteresis, high long-term stability
Long-term stability:	± 1 % per year
Measuring range, humidity:	0...100 % RH
Operating range, humidity:	0...95 % RH (non-precipitating air)
Deviation, humidity:	typically ± 3.0 % (20...80 % RH) at +25 °C, otherwise ± 5.0 %
Output, humidity:	0-10 V
TEMPERATURE	
Measuring range:	0...+50 °C
Deviation, temperature:	typically ± 0.8 K at +25 °C
Output, temperature:	0-10 V
Mounting:	in-wall flush box Ø 55 mm
Electrical connection:	1.0 - 2.5 mm², via plug terminals
Ambient temperature:	Storage –35...+85 °C; Operation 0...+50 °C
Permitted humidity:	max. 90 % RH, non-precipitating air
Medium:	clean air and other non-aggressive, non-combustible gases
Protection class:	III (according to EN 60 730)
Protection type:	**IP 20** (according to 60 529)
Standards:	CE-conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU
SWITCH PROGRAMME	
Manufacturer:	GIRA System 55 (other switch programmes, manufacturers, colours as well as prices available upon request)
Housing:	plastic, the standard colour is pure glossy white (similar to RAL 9010) (other colours are available upon request with colour variants depending on the respective light switch programme)

Connection diagram **FSFM**

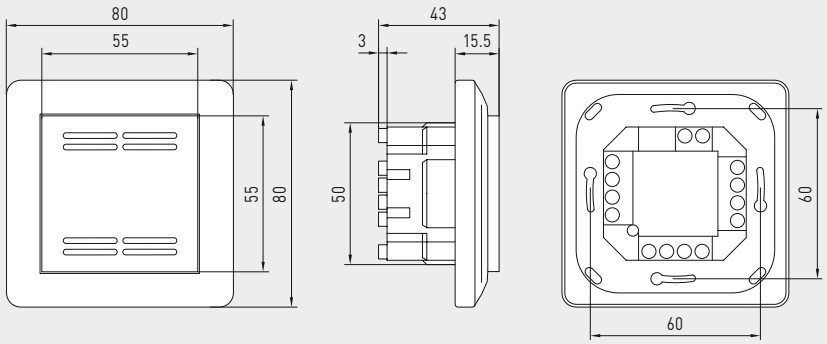


Connection diagram **FSFTM**



Dimensional drawing

FSFM
FSFTM



FSFM
FSFTM



Humidity table
MR: 0...100 % RH

% RH	U_A [V]	% RH	U_A [V]
0	0	**50**	5.0
5	0.5	**55**	5.5
10	1.0	**60**	6.0
15	1.5	**65**	6.5
20	2.0	**70**	7.0
25	2.5	**75**	7.5
30	3.0	**80**	8.0
35	3.5	**85**	8.5
40	4.0	**90**	9.0
45	4.5	**95**	9.5
Continued to the right ...		**100**	10.0

Temperature table
MR: 0...+50 °C

°C	U_A [V]
0	0.0
5	1.0
10	2.0
15	3.0
20	4.0
25	5.0
30	6.0
35	7.0
40	8.0
45	9.0
50	10.0

HYGRASGARD® FSFM Room humidity sensor or measuring transducer, in-wall
HYGRASGARD® FSFTM Room humidity and temperature sensor or measuring transducer, in-wall

Type / WG02	Measuring Range Humidity	Temperature	Output Humidity	Temperature	Item No.	Price
FSFM						
FSFM-U	0...100 % RH	–	0-10 V	–	1201-9121-0000-162	**239,49 €**
FSFTM						
FSFTM-U	0...100 % RH	0...+50 °C	0-10 V	0-10 V	1201-9121-1000-162	**246,60 €**

HYGRASGARD® DFF
HYGRASGARD® DFTF

In-ceiling humidity and temperature sensors (± 2.0 %), calibratable, with multi-range switching and active output

S+S REGELTECHNIK

The calibratable humidity and temperature sensor **HYGR**ASGARD® **DFF / DFTF** measures the relative humidity and temperature of air. It converts the measurands into a standard signal of 0 - 10 V or 4...20 mA, and is available with / without an optional display.

It is equipped with four switchable temperature ranges. Relative humidity (in % RH) is the quotient of water vapour partial pressure divided by the saturation vapour pressure at the respective gas temperature. The measuring transducers are designed for exact detection of temperature and humidity. A digital, long-term stable sensor is used as a measuring element for humidity and temperature measurement. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

The ceiling-installed sensor is used in non-aggressive, dust-free environments and is used for installation in suspended ceilings in corridors, offices, as well as in residential and commercial buildings. The connecting head is pluggable for quick, easy mounting.
The measuring transducer is accommodated in a separate housing.

DFF
DFTF



TECHNICAL DATA

Power supply:	24 V AC (± 20 %) and 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (Ohm) = (U_b -14 V) / 0.02 A for I variant
Load resistance:	R_L > 5 kOhm for U variant
Power consumption:	< 1.1 VA / 24 V DC; < 2.2 VA / 24 V AC
Sensors:	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
HUMIDITY	
Measuring range, humidity:	0...100 % RH (output corresponding to 0 - 10 V or 4...20 mA)
Operating range, humidity:	0..95 % RH (without formation of dew)
Deviation in humidity:	typically **± 2.0** % (20...80 % RH) at +25 °C, otherwise ± 3.0 %
Output, humidity:	0 - 10 V for U variant 4...20 mA for I variant, see load resistance diagram
TEMPERATURE	
Measuring range, temperature:	**multi-range switching with** **4 switchable measuring ranges** (see table) –35...+35 °C; –35...+75 °C; 0...+50 °C; 0...+80 °C (output corresponding to 0 - 10 V or 4...20 mA)
Deviation temperature:	typically ± 0.2 K at +25 °C
Output, temperature:	0 - 10 V or 4...20 mA
Ambient temperature:	storage –5...+60 °C; operation –5...+60 °C
Long-term stability:	± 1 % per year
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	2-, 3- or 4-wire (see connecting diagram), 0.14 - 1.5 mm², via terminal screws
Connecting cable:	PVC, LiYY, 4 x 0.14 mm², cable length (KL) = approx. 2 m
Connecting head:	made of plastic, material polycarbonate (PC), colour white, **pluggable**, Ø = approx. 35 mm, H = approx. 29 mm, with metal sinter filter made of stainless steel **V4A** (1.4404)
Mounting (sensor):	in the suspended ceiling, ceiling cut-out Ø = 30 mm, cover Ø = < 35 mm
Protection class:	III (according to EN 60 730)
Protection type:	**IP 67** (according EN 60 529) Housing tested TÜV SÜD, Report No. 713139052 **IP 30** (according EN 60 529) Sensor in the built-in state
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3
Optional:	two-line **display with illumination**, cutout approx. 36 x 15 mm (W x H), to display the ACTUAL temperature and / or ACTUAL humidity

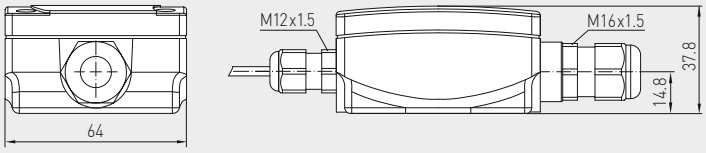
DFF
DFTF
Connecting head, pluggable



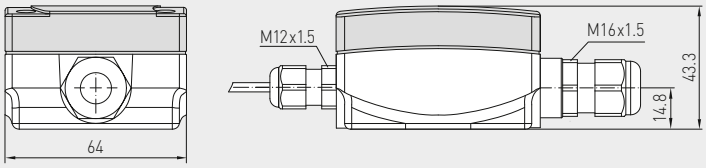
Dimensional drawing

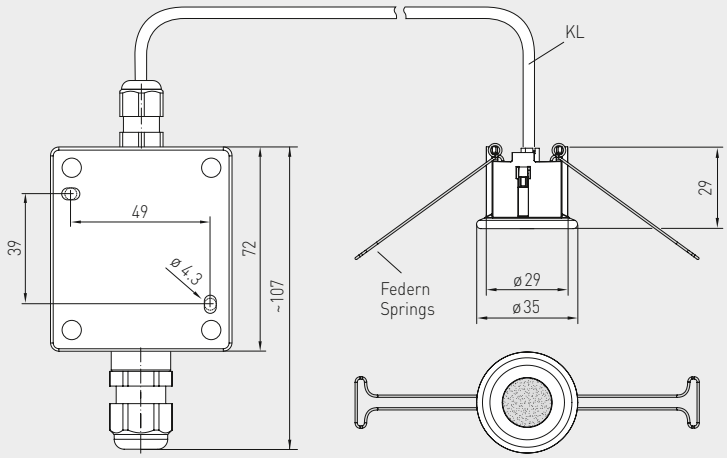
DFF
DFTF

without display



with display





DFF
DFTF
with display





M12 connector
(optional on request)

Temperature table
MR: –35...+75 °C

°C	U_A [V]	I_A [mA]
-35	0.0	4.0
-30	0.5	4.7
-25	0.9	5.5
-20	1.4	6.2
-15	1.8	6.9
-10	2.3	7.6
-5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

Temperature table
MR: –35...+35 °C

°C	U_A [V]	I_A [mA]
-35	0.0	4.0
-30	0.7	5.1
-25	1.4	6.3
-20	2.1	7.4
-15	2.9	8.6
-10	3.6	9.7
-5	4.3	10.9
0	5.0	12.0
5	5.7	13.1
10	6.4	14.3
15	7.1	15.4
20	7.9	16.6
25	8.6	17.7
30	9.3	18.9
35	10.0	20.0

Temperature table
MR: 0...+50 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

Temperature table
MR: 0...+80 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.6	5.0
10	1.3	6.0
15	1.9	7.0
20	2.5	8.0
25	3.1	9.0
30	3.8	10.0
35	4.4	11.0
40	5.0	12.0
45	5.6	13.0
50	6.3	14.0
55	6.9	15.0
60	7.5	16.0
65	8.1	17.0
70	8.8	18.0
75	9.4	19.0
80	10.0	20.0

Humidity table
MR: 0...100 % RH

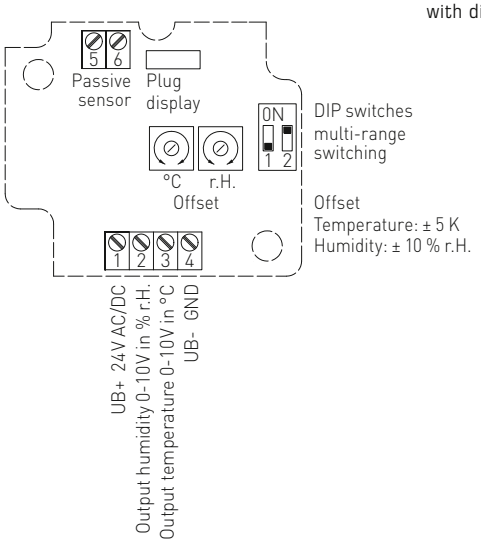
% RH	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

HYGRASGARD® DFF
HYGRASGARD® DFTF

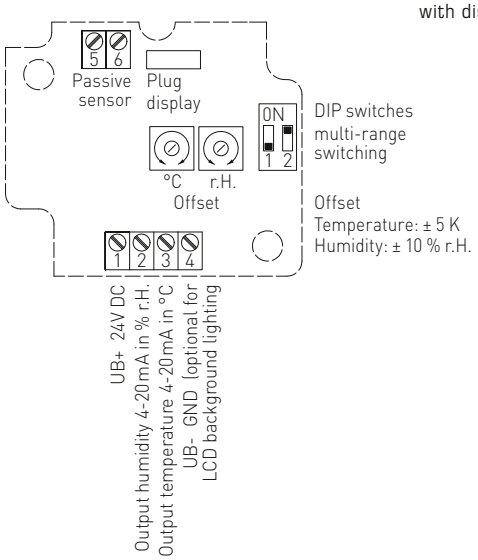
In-ceiling humidity and temperature sensors (± 2.0 %), calibratable, with multi-range switching and active output

S+S REGELTECHNIK

Schematic diagram **DFTF-U** with display



Schematic diagram** **DFTF-I** with display



3-wire connection **DFF-U**

1 +UB 24V AC/DC
2 Output humidity in % r.H. 0-10V
3 Free
4 –UB-GND

2- or 3-wire connection* **DFF-I (Transmitter)**

1 +UB 24V DC
2 Output humidity in % r.H. 4-20mA
3 Free
4 –UB-GND (optional for backlighting)

4-wire connection **DFTF-U**

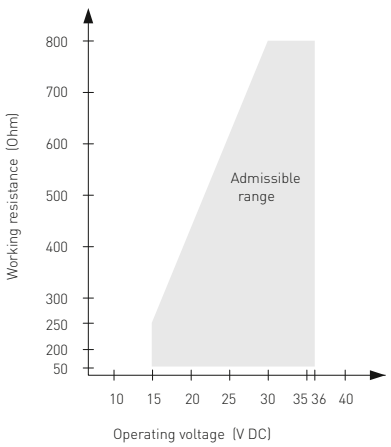
1 +UB 24V AC/DC
2 Output humidity in % r.H. 0-10V
3 Output temperature in °C 0-10V
4 –UB-GND

3- or 4-wire connection** **DFTF-I (Transmitter)**

1 +UB 24V DC
2 Output humidity in % r.H. 4-20mA
3 Output temperature in °C 4-20mA
4 –UB-GND (optional for backlighting)

Temperature measuring ranges (adjustable)	**DIP 1**	**DIP 2**
–35…+75 °C	**ON**	**ON**
–35…+35 °C	OFF	OFF
0…+50 °C (default)	OFF	**ON**
0…+80 °C	**ON**	OFF

Load resistance diagram 4…20 mA **DFF DFTF**



Connection*:

2-wire connection for devices with / without display (not illuminated)

3-wire connection for devices with illuminated display

Connection**:

3-wire connection for devices with / without display (not illuminated)

4-wire connection for devices with illuminated display

For the **I variant** the humidity path must be connected!

HYGRASGARD® DFF
HYGRASGARD® DFTF

In-ceiling humidity and temperature sensors (± 2.0 %), calibratable, with multi-range switching and active output

DFF
DFTF
with display



HYGRASGARD® **DFF**	In-ceiling humidity sensors (± 2.0 %), *Premium*
HYGRASGARD® **DFTF**	In-ceiling humidity and temperature sensors (± 2. 0 %), *Premium*

Type / WG01	Measuring Range / Readout Humidity	Temperature	Output Humidity	Temperature	Display	Item No.	Price
DFF-I						**I-variant**	
DFF-I	0...100 % RH	–	4...20 mA	–		1201-6132-0000-100	**342,64 €**
DFF-I **LCD**	0...100 % RH	–	4...20 mA	–	■	1201-6132-0200-100	**400,73 €**
DFF-U						**U-variant**	
DFF-U	0...100 % RH	–	0-10 V	–		1201-6131-0000-100	**342,64 €**
DFF-U **LCD**	0...100 % RH	–	0-10 V	–	■	1201-6131-0200-100	**400,73 €**
DFTF-I						**I-variant**	
DFTF-I	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA		1201-6132-1000-100	**350,94 €**
DFTF-I **LCD**	0...100 % RH	(4x as above)	4...20 mA	4...20 mA	■	1201-6132-1200-100	**409,04 €**
DFTF-U						**U-variant**	
DFTF-U	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V		1201-6131-1000-100	**350,94 €**
DFTF-U **LCD**	0...100 % RH	(4x as above)	0-10 V	0-10 V	■	1201-6131-1200-100	**409,04 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101					on request	

HYGRASGARD® AFF-SD
HYGRASGARD® AFTF-SD

On-wall humidity and temperature sensors (± 2.0 %), compact form, calibratable, with multi-range switching and active output

S+S REGELTECHNIK

The calibratable outdoor humidity / temperature sensors **HYGR**ASGARD® **AFF-SD / AFTF-SD** measure the relative humidity and / or temperature of air. They convert the measurands into standard signals of 0 -10 V or 4...20 mA and are available with or without an optional display. Terminal box housing made of impact-resistant plastic with housing cover with quick-locking screws. They have four switchable temperature ranges and are applied in non-aggressive dust-free atmospheres in refrigeration, air conditioning, ventilation and clean room technology. Relative humidity (in % RH) is the quotient of water vapour partial pressure divided by the saturation vapour pressure at the respective gas temperature. These measuring transducers are designed for precise detection of humidity. A digital long-term stable sensor is used as a measuring element for humidity measurement. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

AFF-SD
AFTF-SD
compact form



SF-M
Metal sinter filter (optional)



TECHNICAL DATA

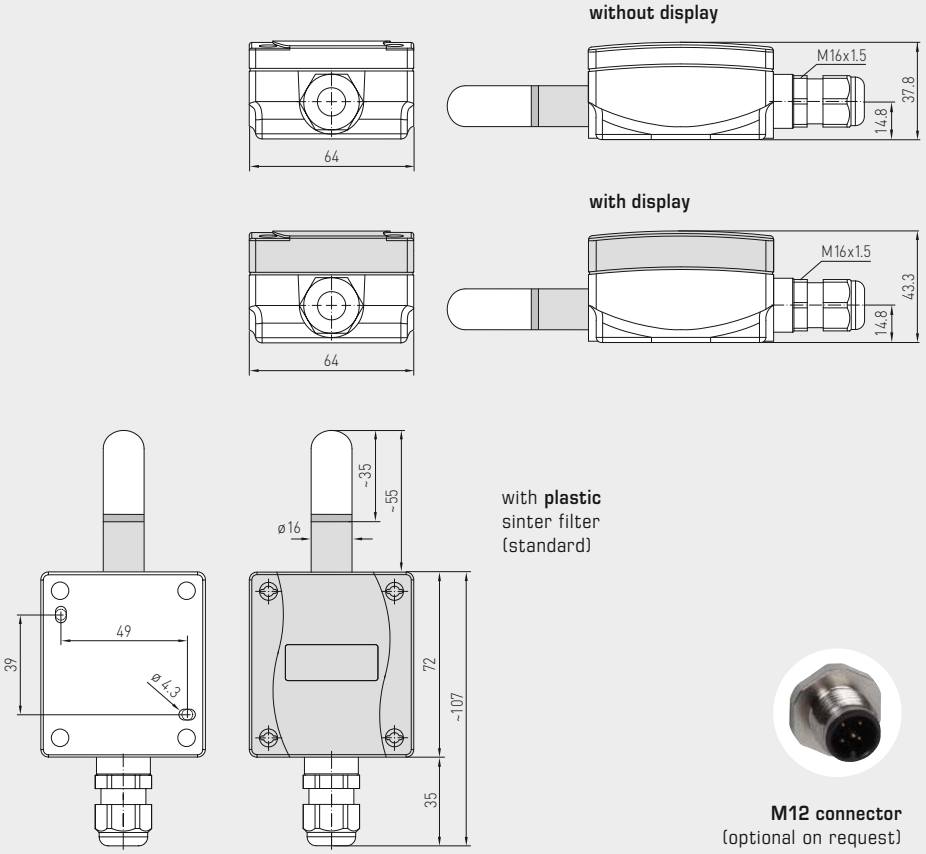
Power supply:	24 V AC (± 20 %); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (ohm) = (U_b -14 V) / 0.02 A for I variant
Load resistance:	R_L > 5 kOhm for U variant
Power consumption:	< 1.1 VA / 24 V DC; < 2.2 VA / 24 V AC
Sensors:	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
Sensor protection:	**plastic** sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional **metal** sinter filter, Ø 16 mm, L = 32 mm)
HUMIDITY	
Measuring range, humidity:	0...100 % RH (output corresponding to 0 -10 V or 4...20 mA)
Operating range, humidity:	0...95 % RH (without dew formation)
Deviation, humidity:	typically **± 2.0** % (20...80 % RH) at +25 °C, otherwise ± 3.0 %
Output, humidity:	0 -10 V for U variant 4...20 mA for I variant, see load resistance diagram
TEMPERATURE	
Measuring range, temperature:	**multi-range switching** (see table) **–35...+35 °C; –35...+75 °C; 0...+50 °C; 0...+80 °C** (output corresponding to 0 -10 V or 4 ... 20 mA)
Deviation, temperature:	typically ± 0.6 K at +25 °C
Output, temperature:	0 -10 V or 4 ... 20 mA or Ohm value
Ambient temperature:	storage –35...+85 °C, operation – 30...+70 °C, non-precipitating
Electrical connection:	2-, 3-, or 4-wire connection (see connecting diagram), 0.14 - 1.5 mm², via terminal screws
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Protective tube:	**stainless steel V2A** (1.4301), Ø = 16 mm, NL = 55 mm
Process connection:	by screws
Long-term stability:	± 1 % per year
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)
Standards:	CE conformity, according to EMC directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3
Optional:	two-line **display with** illumination, cutout approx. 36 x 15 mm (W x H), for displaying ACTUAL temperature and / or ACTUAL humidity
ACCESSORIES	see last chapter

HYGRASGARD® AFF-SD
HYGRASGARD® AFTF-SD

On-wall humidity and temperature sensors (± 2.0 %), compact form, calibratable, with multi-range switching and active output

Dimensional drawing

AFF-SD
AFTF-SD



with **plastic** sinter filter (standard)

M12 connector
(optional on request)

AFF-SD
AFTF-SD
compact form with display



SF-M
Metal sinter filter (optional)



Temperature table
MR: –35...+75 °C

°C	U_A [V]	I_A [mA]
-35	0.0	4.0
-30	0.5	4.7
-25	0.9	5.5
-20	1.4	6.2
-15	1.8	6.9
-10	2.3	7.6
-5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

Temperature table
MR: –35...+35 °C

°C	U_A [V]	I_A [mA]
-35	0.0	4.0
-30	0.7	5.1
-25	1.4	6.3
-20	2.1	7.4
-15	2.9	8.6
-10	3.6	9.7
-5	4.3	10.9
0	5.0	12.0
5	5.7	13.1
10	6.4	14.3
15	7.1	15.4
20	7.9	16.6
25	8.6	17.7
30	9.3	18.9
35	10.0	20.0

Temperature table
MR: 0...+50 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

Temperature table
MR: 0...+80 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.6	5.0
10	1.3	6.0
15	1.9	7.0
20	2.5	8.0
25	3.1	9.0
30	3.8	10.0
35	4.4	11.0
40	5.0	12.0
45	5.6	13.0
50	6.3	14.0
55	6.9	15.0
60	7.5	16.0
65	8.1	17.0
70	8.8	18.0
75	9.4	19.0
80	10.0	20.0

Humidity table
MR: 0...100 % RH

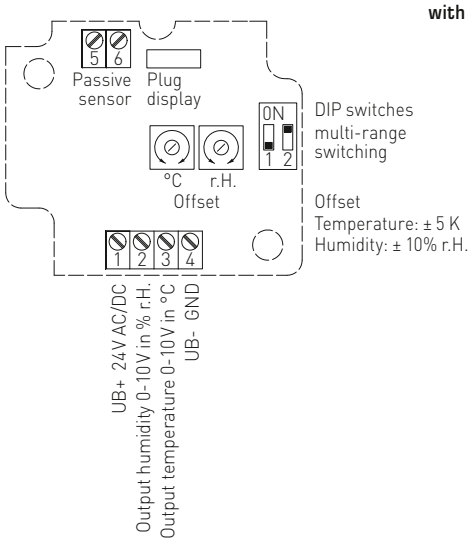
% RH	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

HYGRASGARD® AFF-SD
HYGRASGARD® AFTF-SD

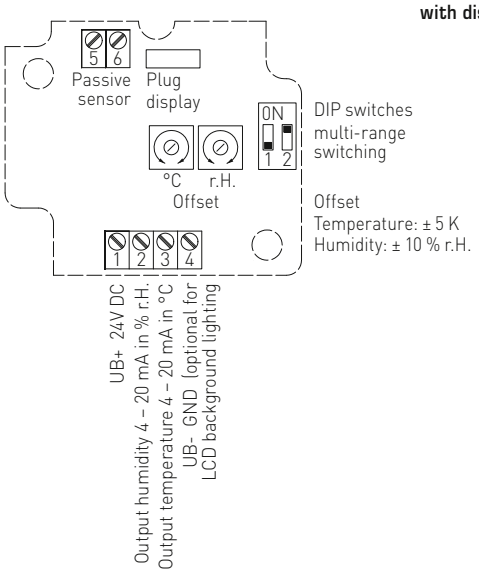
On-wall humidity and temperature sensors (± 2.0 %), compact form, calibratable, with multi-range switching and active output

S+S REGELTECHNIK

Schematic diagram — **AFTF-SD-U with display**



Schematic diagram** — **AFTF-SD-I with display**



3-wire connection — **AFF-SD-U**

1	+UB 24V AC/DC
2	Output humidity in % r.H. 0-10V
3	Free
4	-UB-GND

2- or 3-wire connection* — **AFF-SD-I (Transmitter)**

1	+UB 24V DC
2	Output humidity in % r.H. 4-20mA
3	Free
4	-UB-GND (optional for backlighting)

4-wire connection — **AFTF-SD-U**

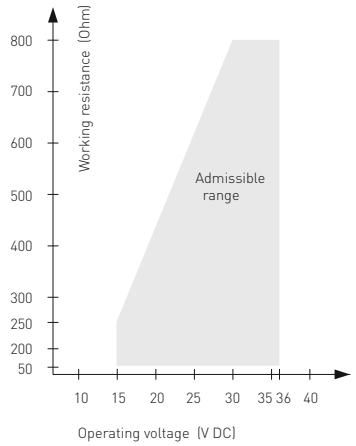
1	+UB 24V AC/DC
2	Output humidity in % r.H. 0-10V
3	Output temperature in °C 0-10V
4	-UB-GND

3- or 4-wire connection** — **AFTF-SD-I (Transmitter)**

1	+UB 24V DC
2	Output humidity in % r.H. 4-20mA
3	Output temperature in °C 4-20mA
4	-UB-GND (optional for backlighting)

Temperature measuring ranges (adjustable)	**DIP 1**	**DIP 2**
–35…+75 °C	**ON**	**ON**
–35…+35 °C	OFF	OFF
0…+50 °C (default)	OFF	**ON**
0…+80 °C	**ON**	OFF

Load resistance diagram — **AFF-SD / AFTF-SD** 4…20 mA



Connection*:
2-wire connection for devices with / without display (not illuminated)
3-wire connection for devices with illuminated display

Connection**:
3-wire connection for devices with / without display (not illuminated)
4-wire connection for devices with illuminated display

For the **I variant** the humidity path must be connected!

HYGRASGARD® AFF-SD
HYGRASGARD® AFTF-SD

On-wall humidity and temperature sensors (± 2.0 %), compact form, calibratable, with multi-range switching and active output

WS-04
Weather and sun protection hood (optional)



AFF-SD
AFTF-SD
compact form with display





HYGRASGARD® **AFF-SD**	On-wall humidity sensors, compact form (± 2.0 %), *Standard*
HYGRASGARD® **AFTF-SD**	On-wall humidity and temperature sensors, compact form (± 2.0 %), *Standard*

Type / WG01B	Measuring Range / Readout Humidity	Temperature	Output Humidity	Temperature	Display	Item No.	Price
AFF-SD-I						**I-variant**	
AFF-SD-I	0...100 % RH	–	4...20 mA	–		1201-1122-0000-100	**180,77 €**
AFF-SD-I **LCD**	0...100 % RH	–	4...20 mA	–	■	1201-1122-0200-000	**231,70 €**
AFF-SD-U						**U-variant**	
AFF-SD-U	0...100 % RH	–	0-10 V	–		1201-1121-0000-100	**180,77 €**
AFF-SD-U **LCD**	0...100 % RH	–	0-10 V	–	■	1201-1121-0200-000	**231,70 €**
AFTF-SD-I						**I-variant**	
AFTF-SD-I	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA		1201-1122-1000-100	**184,59 €**
AFTF-SD-I **LCD**	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA	■	1201-1122-1200-100	**235,50 €**
AFTF-SD-U						**U-variant**	
AFTF-SD-U	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V		1201-1121-1000-100	**184,59 €**
AFTF-SD-U **LCD**	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V	■	1201-1121-1200-100	**235,50 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101					on request	

ACCESSORIES

SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel **V4A** (1.4404)	7000-0050-2200-100	**42,33 €**
WS-01	**Sun and ball-impact protection hood**, 184 x 180 x 80 mm, stainless steel **V2A** (1.4301)	7100-0040-2000-000	**31,77 €**
WS-04	**Weather and sun protection hood**, 130 x 180 x 135 mm, stainless steel **V2A** (1.4301)	7100-0040-7000-000	**37,49 €**
	For further information, see last chapter Accessories!		

HYGRASGARD® AFF-xx
HYGRASGARD® AFTF-xx

On-wall humidity and temperature sensors (± 1.8 % / ± 2.0 %), calibratable, with multi-range switching and active / passive output

S+S REGELTECHNIK

Calibratable outdoor humidity/temperature sensor **HYGR**ASGARD® **AFF/AFTF** (± 2,0 %) and **AFF-20/AFTF-20** (± 1,8 %) with plastic sinter filter (optional metal sinter filter) or **AFF-25/AFTF-25** (± 1,8 %) **with pluggable measuring head** with metal sinter filter; housing made of impact-resistant plastic with quick-locking screws, optionally with / without display, with cable gland (optional M12 connector according to DIN EN 61076-2-101).

It measures the relative humidity and / or temperature of the air and converts the measurand into a standard signal of 0 - 10 V or 4...20 mA. They have four switchable temperature ranges and are applied in non-aggressive, dust-free atmospheres in refrigeration, air conditioning, ventilation and clean room technology. Relative humidity (in % RH) is the quotient of water vapour partial pressure divided by the saturation vapour pressure at the respective gas temperature. These measuring transducers are designed for exact detection of humidity. A digital long-term stable sensor is used as measuring element for humidity measurement. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

Power supply:	24 V AC (± 20 %); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (ohm) = (U_b -14 V) / 0.02 A for I variant, see load resistance diagram
Load resistance:	R_L > 5 kOhm for U variant
Power consumption:	< 1.1 VA / 24 V DC; < 2.2 VA / 24 V AC
Sensors:	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
HUMIDITY	
Measuring range, humidity:	0...100 % RH
Permitted humidity:	< 95 % RH, non-precipitating air
Deviation in humidity:	**AFF / AFTF:** typically **± 2.0** % (20...80 % RH) at +25 °C, otherwise ± 3.0 % **AFF-20 / AFTF-20, AFF-25 / AFTF-25:** typically **± 1.8** % (10...90 % RH) at +25 °C, otherwise ± 2.0 %
Output humidity:	0 - 10 V for U variant; 4...20 mA for I variant
TEMPERATURE	
Measuring range, temperature:	**multi-range switching** (see table) **–35...+35 °C; –35...+75 °C; 0...+50 °C; 0...+80 °C**
Ambient temperature:	storage –35...+85 °C; operation –30...+80 °C, non-precipitating
Deviation, temperature:	**AFF / AFTF:** typically ± 0.4 K at +25 °C **AFF-20 / AFTF-20, AFF-25 / AFTF-25:** typically ± 0.2 K at +25 °C
Output, temperature:	0 - 10 V for U variant; 4...20 mA for I variant; **AFTF-U xx** (passive temperature sensor) see table
Electrical connection:	2-, 3-, or 4-wire connection (see connecting diagram), 0.14 - 1.5 mm², via terminal screws
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016),, housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Typ 2)
Protective tube:	**stainless steel V2A** (1.4301), Ø 16 mm **AFF / AFTF:** NL = 55 mm **AFF-20 / AFTF-20:** NL = 137 mm **AFF-25 / AFTF-25:** NL = 88.5 mm
Sensor protection:	**AFF / AFTF, AFF-20 / AFTF-20:** **plastic** sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional metal sinter filter, Ø 16 mm, L = 32 mm) **AFF-25 / AFTF-25:** **pluggable measuring head** (probe), stainless steel **V2A** (1.4301), with metal sinter filter, Ø 16 mm, L = 88.5 mm, exchangeable
Process connection:	by screws
Long-term stability:	± 1 % per year
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, according to EMC directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3
Optional:	three-line **display with illumination**, cutout 70 x 40 mm (W x H), for displaying ACTUAL temperature and / or ACTUAL humidity
ACCESSORIES	see last chapter

AFF / AFTF (± 2.0 %)
with plastic sinter filter
(standard)



AFF-20 / AFTF-20 (± 1.8 %)
with plastic sinter filter
(standard)

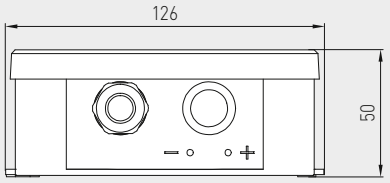


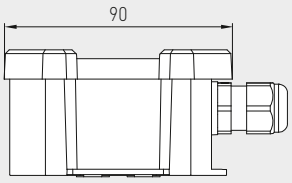
AFF-25 / AFTF-25 (± 1.8 %)
pluggable measuring head
with metal sinter filter



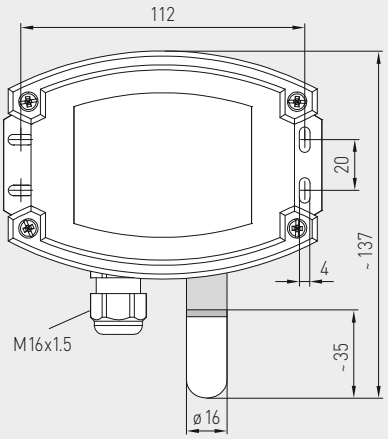
Dimensional drawing

AFF/AFTF
AFF-20/AFTF-20

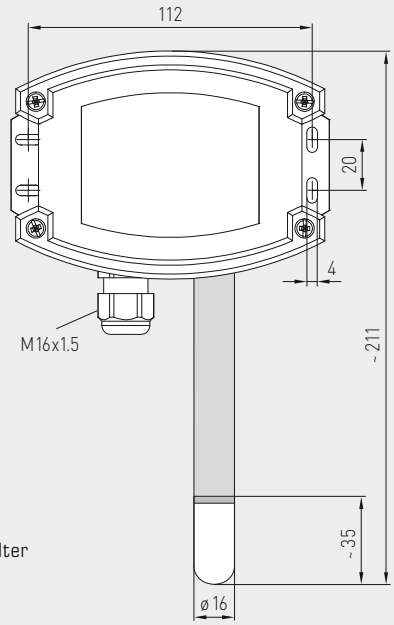




AFF/AFTF



AFF-20/AFTF-20





SF-K
Plastic sinter filter
(standard)



SF-M
Metal sinter filter
(optional)



M12 connector
(optional)

AFF/AFTF (± 2.0 %)
with display and
plastic sinter filter
(standard)

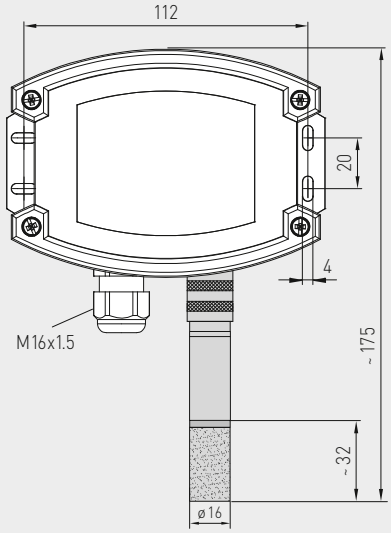


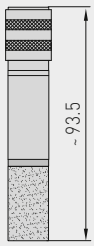
AFF-20/AFTF-20 (± 1.8 %)
with display and
plastic sinter filter
(standard)



Dimensional drawing

AFF-25/AFTF-25





pluggable measuring head
with **metal**
sinter filter

AFF-25/AFTF-25 (± 1.8 %)
pluggable measuring head
with metal sinter filter
and display

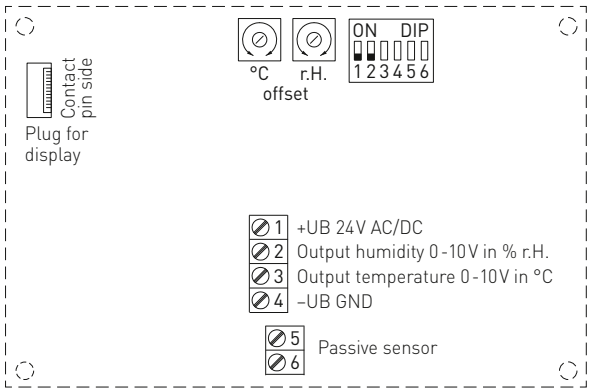


HYGRASGARD® AFF-xx
HYGRASGARD® AFTF-xx

On-wall humidity and temperature sensors (± 1.8 % / ± 2.0 %), calibratable, with multi-range switching and active/passive output

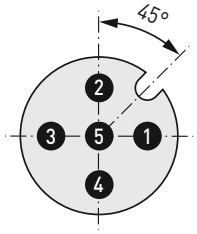
S+S REGELTECHNIK

Schematic diagram **AFTF-xx-U**



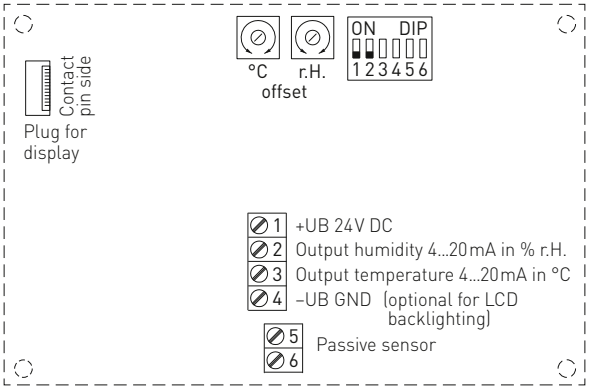
DIP 3, 4, 5, 6 are not assigned!

Pin assignment (M12) **AFTF-xx-U**



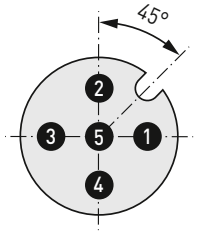
1. +UB 24V AC/DC
2. Output humidity 0-10V [% r.H.]
3. Output temperature 0-10V [°C]
4. –UB GND
5. Shield

Schematic diagram **AFTF-xx-I**



DIP 3, 4, 5, 6 are not assigned!

Pin assignment (M12) **AFTF-xx-I**

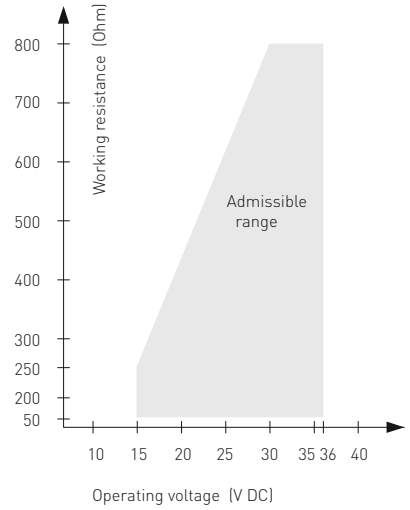


1. +UB 24V DC
2. Output humidity 4...20mA [% r.H.]
3. Output temperature 4...20mA [°C]
4. –UB GND (optional for LCD backlighting)
5. Shield

AFF-xx / AFTF-xx
with display, hinged



Load resistance diagram 4..20mA **AFF-xx-I** **AFTF-xx-I**



HYGRASGARD® AFF-xx
HYGRASGARD® AFTF-xx

On-wall humidity and temperature sensors (± 1.8 % / ± 2.0 %), calibratable, with multi-range switching and active/passive output

3-wire connection **AFF-xx-U**

1	+UB 24V AC/DC
2	Output humidity in % r.H. 0-10V
3	Free
4	–UB-GND

2- or 3-wire connection * **AFF-xx-I (Transmitter)**

1	+UB 24V DC
2	Output humidity in % r.H. 4...20mA
3	Free
4	–UB-GND (optional for backlighting)

4- or 6-wire connection **AFTF-U (passive temperature sensor)**

1	+UB 24V AC/DC
2	Output humidity in % r.H. 0-10V
3	Output temperature in °C 0-10V
4	–UB-GND
5	Passive element
6	e.g. Pt1000, Ni1000, LMZ235Z

4-wire connection **AFTF-xx-U**

1	+UB 24V AC/DC
2	Output humidity in % r.H. 0-10V
3	Output temperature in °C 0-10V
4	–UB-GND

3- or 4-wire connection ** **AFTF-xx-I (Transmitter)**

1	+UB 24V DC
2	Output humidity in % r.H. 4...20mA
3	Output temperature in °C 4...20mA
4	–UB-GND (optional for backlighting)

4- or 6-wire connection **AFTF-I (passive temperature sensor)**

1	+UB 24V DC
2	Output humidity in % r.H. 4...20mA
3	Output temperature in °C 4...20mA
4	–UB-GND (optional for backlighting)
5	Passive element
6	e.g. Pt1000, Ni1000, LMZ235Z

Temperature measuring ranges (adjustable)	**DIP 1**	**DIP 2**
–35...+75 °C	**ON**	**ON**
–35...+35 °C	OFF	OFF
0...+50 °C (default)	OFF	**ON**
0...+80 °C	**ON**	OFF

Connection*:
2-wire connection for devices with/without display (not illuminated)
3-wire connection for devices with illuminated display

Connection**:
3-wire connection for devices with/without display (not illuminated)
4-wire connection for devices with illuminated display

For the **I variant** the humidity path must be connected!

Temperature table
MR: –35...+75 °C

°C	U_A [V]	I_A [mA]
–35	0.0	4.0
–30	0.5	4.7
–25	0.9	5.5
–20	1.4	6.2
–15	1.8	6.9
–10	2.3	7.6
–5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

Temperature table
MR: –35...+35 °C

°C	U_A [V]	I_A [mA]
–35	0.0	4.0
–30	0.7	5.1
–25	1.4	6.3
–20	2.1	7.4
–15	2.9	8.6
–10	3.6	9.7
–5	4.3	10.9
0	5.0	12.0
5	5.7	13.1
10	6.4	14.3
15	7.1	15.4
20	7.9	16.6
25	8.6	17.7
30	9.3	18.9
35	10.0	20.0

Temperature table
MR: 0...+50 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

Temperature table
MR: 0...+80 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.6	5.0
10	1.3	6.0
15	1.9	7.0
20	2.5	8.0
25	3.1	9.0
30	3.8	10.0
35	4.4	11.0
40	5.0	12.0
45	5.6	13.0
50	6.3	14.0
55	6.9	15.0
60	7.5	16.0
65	8.1	17.0
70	8.8	18.0
75	9.4	19.0
80	10.0	20.0

Humidity table
MR: 0...100 % RH

% **RH**	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

HYGRASGARD® AFF
HYGRASGARD® AFTF

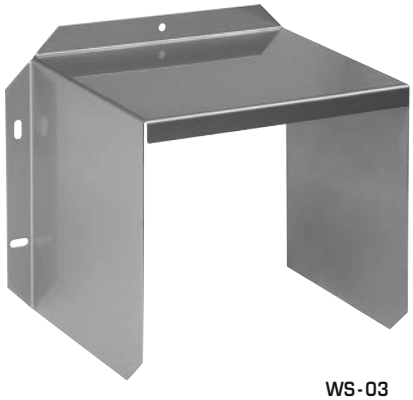
On-wall humidity and temperature sensors (± 2.0 %), calibratable, with multi-range switching and active / passive output

S+S REGELTECHNIK

AFF / AFTF (± 2,0%)
with cable gland







WS-03
Weather and sun protection hood

HYGRASGARD® AFF	On-wall humidity sensors (± 2.0 %), *Standard*
HYGRASGARD® AFTF	On-wall humidity and temperature sensors (± 2.0 %), *Standard*

Type / WG02	**Measuring Range / Readout** Humidity	Temperature	**Output** Humidity	Temperature	**Display**	**Item No.**	**Price**
AFF							
AFF-I	0...100 % RH	–	4...20 mA	–		1201-7112-0000-000	**190,32 €**
AFF-I **LCD**	0...100 % RH	–	4...20 mA	–	■	1201-7112-0400-000	**241,24 €**
AFF-U	0...100 % RH	–	0-10 V	–		1201-7111-0000-000	**190,32 €**
AFF-U **LCD**	0...100 % RH	–	0-10 V	–	■	1201-7111-0400-000	**241,24 €**
AFTF							
AFTF-I	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA		1201-7112-1000-000	**208,78 €**
AFTF-I **LCD**	0...100 % RH	(4x as above)	4...20 mA	4...20 mA	■	1201-7112-1400-000	**259,70 €**
AFTF-U	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V		1201-7111-1000-000	**208,78 €**
AFTF-U **LCD**	0...100 % RH	(4x as above)	0-10 V	0-10 V	■	1201-7111-1400-000	**259,70 €**
Housing variant:	Cable connection **with cable gland** (M12 connector on request)						

HYGRASGARD® AFTF-U xx	On-wall humidity and temperature sensors (± 2.0 %), *Standard* (passive temperature sensor)

Type / WG02	**Measuring Range / Readout** Humidity	Temperature	**Output** Humidity	Temperature	**Item No.**	**Price**
AFTF-U xx	**Pt, Ni, LM235Z, NTC**			(active / **passive**)		
AFTF-U Pt100	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V + **Pt100**	1201-7111-2001-000	**210,05 €**
AFTF-U Pt1000	0...100 % RH	(4x as above)	0-10 V	0-10 V + **Pt1000**	1201-7111-2005-000	**211,32 €**
AFTF-U Ni1000	0...100 % RH	(4x as above)	0-10 V	0-10 V + **Ni1000**	1201-7111-2009-000	**211,96 €**
AFTF-U NiTK	0...100 % RH	(4x as above)	0-10 V	0-10 V + **Ni1000TK5000**	1201-7111-2010-000	**212,59 €**
AFTF-U LM235Z	0...100 % RH	(4x as above)	0-10 V	0-10 V + **LM235Z**, 10mV / K	1201-7111-2021-000	**211,45 €**
AFTF-U NTC1,8K	0...100 % RH	(4x as above)	0-10 V	0-10 V + **NTC 1,8 kOhm**	1201-7111-2012-000	**212,34 €**
AFTF-U NTC10K	0...100 % RH	(4x as above)	0-10 V	0-10 V + **NTC 10 kOhm**	1201-7111-2015-000	**209,42 €**
AFTF-U NTC20K	0...100 % RH	(4x as above)	0-10 V	0-10 V + **NTC 20 kOhm**	1201-7111-2016-000	**209,42 €**
Housing variant:	Cable connection **with cable gland** (M12 connector on request)					

HYGRASGARD® AFF-25
HYGRASGARD® AFTF-25

On-wall humidity sensors and temperature sensors (± 1.8 %), calibratable, with multi-range switching and active output



AFF-25 / AFTF-25 (± 1,8 %)
with cable gland

HYGRASGARD® **AFF-25**	On-wall humidity sensors, **pluggable** (± 1.8 %), *Deluxe*
HYGRASGARD® **AFTF-25**	On-wall humidity and temperature sensors, **pluggable** (± 1.8 %), *Deluxe*

Type / WG02	Measuring Range / Readout Humidity	Temperature	Output Humidity	Temperature	Display	Item No.	Price
AFF-25							
AFF-25-I	0...100 % RH	–	4... 20 mA	–		1201-7132-0000-101	**356,44 €**
AFF-25-I **LCD**	0...100 % RH	–	4... 20 mA	–	■	1201-7132-0400-101	**406,26 €**
AFF-25-U	0...100 % RH	–	0-10 V	–		1201-7131-0000-101	**356,44 €**
AFF-25-U **LCD**	0...100 % RH	–	0-10 V	–	■	1201-7131-0400-101	**406,26 €**
AFTF-25							
AFTF-25-I	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4... 20 mA	4... 20 mA		1201-7132-1000-101	**378,08 €**
AFTF-25-I **LCD**	0...100 % RH	(4x as above)	4... 20 mA	4... 20 mA	■	1201-7132-1400-101	**427,91 €**
AFTF-25-U	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V		1201-7131-1000-101	**378,08 €**
AFTF-25-U **LCD**	0...100 % RH	(4x as above)	0-10 V	0-10 V	■	1201-7131-1400-101	**427,91 €**
Housing variant:	Cable connection **with cable gland** (M12 connector on request)						

ACCESSORIES

SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel **V4A** (1.4404)	7000-0050-2200-100	**42,33 €**
MSK-25	Pluggable **measuring head** (probe) stainless steel **V2A** (1.4301), **Metal** sinter filter, Ø 16 mm, L = 88.5 mm, exchangeable replacement element for **AFF-25 / AFTF-25**	7201-1131-0000-000	**215,15 €**
WS-01	**Sun and ball-impact protection hood**, 184 x 180 x 80 mm, stainless steel **V2A** (1.4301)	7100-0040-2000-000	**31,77 €**
WS-03	**Weather and sun protection hood**, 200 x 180 x 150 mm, stainless steel **V2A** (1.4301)	7100-0040-6000-000	**44,74 €**
	For further information see last chapter!		

HYGRASGARD® AFTF-20-Q

On-wall humidity sensors and temperature sensors (± 1.8 %), calibratable, with multi-range switching and active output

S+S REGELTECHNIK

AFTF-20-Q (± 1,8 %)
with M12 connector



HYGRASGARD® AFTF-20-Q	On-wall humidity sensors and temperature sensors (± 1,8 %), *Premium* (**with M12 connector**)						
Type / WG02	**Measuring Range / Readout** Humidity	Temperature	**Output** Humidity	Temperature	**Display** ● = **Q**	**Item No.**	**Price**
AFTF-20-Q							
AFTF-20-I **Q**	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA	●	2003-6121-2100-001	**306,76 €**
AFTF-20-I **Q LCD**	0...100 % RH	(4x as above)	4...20 mA	4...20 mA	● ■	2003-6122-2100-001	**355,13 €**
AFTF-20-U **Q**	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V	●	2003-6121-1100-001	**306,76 €**
AFTF-20-U **Q LCD**	0...100 % RH	(4x as above)	0-10 V	0-10 V	● ■	2003-6122-1100-001	**355,13 €**
Housing variant "Q":	Cable connection **with M12 connector** (male, **5-pin**, A-code)						

ACCESSORIES			
SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel **V4A** (1.4404)	7000-0050-2200-100	**42,33 €**
	For further information see last chapter!		



AFF-20 / AFTF-20 (± 1,8 %)
with cable gland

HYGRASGARD® **AFF-20**	On-wall humidity sensors (± 1.8 %), *Premium* (**with cable gland**)						
Type / WG02	**Measuring Range / Readout** Humidity	Temperature	**Output** Humidity	Temperature	**Display**	**Item No.**	**Price**
AFF-20							
AFF-20-I	0...100 % RH	–	4... 20 mA	–		1201-7112-0000-201	**241,24 €**
AFF-20-I **LCD**	0...100 % RH	–	4... 20 mA	–	■	1201-7112-0400-201	**292,16 €**
AFF-20-U	0...100 % RH	–	0-10 V	–		1201-7111-0000-201	**241,24 €**
AFF-20-U **LCD**	0...100 % RH	–	0-10 V	–	■	1201-7111-0400-201	**292,16 €**
Housing variant:	Cable connection **with cable gland** (M12 connector on request)						

HYGRASGARD® **AFTF-20**	On-wall humidity and temperature sensors (± 1.8 %), *Premium* (**with cable gland**)						
Type / WG02	**Measuring Range / Readout** Humidity	Temperature	**Output** Humidity	Temperature	**Display**	**Item No.**	**Price**
AFTF-20							
AFTF-20-I	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4... 20 mA	4... 20 mA		1201-7112-1000-201	**264,83 €**
AFTF-20-I **LCD**	0...100 % RH	(4x as above)	4... 20 mA	4... 20 mA	■	1201-7112-1400-201	**313,22 €**
AFTF-20-U	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V		1201-7111-1000-201	**264,83 €**
AFTF-20-U **LCD**	0...100 % RH	(4x as above)	0-10 V	0-10 V	■	1201-7111-1400-201	**313,22 €**
Housing variant:	Cable connection **with cable gland** (M12 connector see **AFTF-20-Q**)						

ACCESSORIES			
SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel **V4A** (1.4404)	7000-0050-2200-100	**42,33 €**
	For further information see last chapter!		

HYGRASGARD® AFTF-20-VA

On-wall humidity sensors and temperature sensors (± 1.8 %), calibratable, with multi-range switching and active output

S+S REGELTECHNIK

Calibratable outdoor humidity and temperature sensor **HYGR**ASGARD® **AFTF-20-VA** (± 1.8 %) with metal sinter filter, rugged housing, **stainless steel V4A**, optionally with / without display, with cable gland or M12 connector according to DIN EN 61076-2-101.

It measures the relative humidity and the temperature of the air and converts the measurand into a standard signal of 0 - 10 V or 4...20 mA. It has four switchable temperature ranges and is applied in non-aggressive dust-free atmospheres in refrigeration, air conditioning, ventilation and clean room technology. These measuring transducers are designed for exact detection of humidity. A digital long-term stable sensor is used as measuring element for humidity measurement. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

AFTF-20-VA
with cable gland



AFTF-20-VAQ
with M12 connector

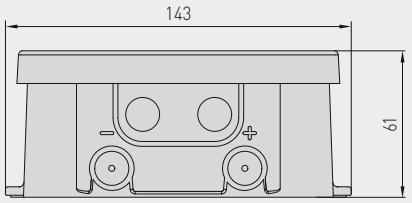


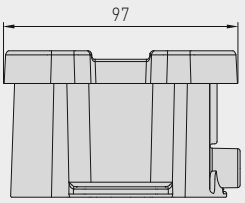
TECHNICAL DATA

Power supply:	24 V AC (± 20 %); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (ohm) = (U_b -14 V) / 0.02 A for I variant, see load resistance diagram
Load resistance:	R_L > 5 kOhm for U variant
Power consumption:	< 1.1 VA / 24 V DC; < 2.2 VA / 24 V AC
Sensors:	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
HUMIDITY	
Measuring range, humidity:	0...100 % RH
Permitted humidity:	< 95 % RH, non-precipitating air
Deviation in humidity:	typically **± 1.8** % (10...90 % RH) at +25 °C, otherwise ± 2.0 %
Output humidity:	0 - 10 V for U variant 4...20 mA for I variant
TEMPERATURE	
Measuring range, temperature:	**multi-range switching** (see table) **–35...+35 °C; –35...+75 °C; 0...+50 °C; 0...+80 °C**
Ambient temperature:	storage –35...+85 °C; operation –30...+80 °C, non-precipitating
Deviation, temperature:	typically ± 0.2 K at +25 °C
Output, temperature:	0 - 10 V for U variant 4...20 mA for I variant
Electrical connection:	2-, 3-, or 4-wire connection (see connecting diagram), 0.14 - 1.5 mm², via terminal screws
Cable connection:	**cable gland, stainless steel V2A** (1.4305) (M 20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) **or** **M12 connector** (male, 5-pin, A-code) according to DIN EN 61076-2-101
Housing:	**stainless steel V4A** (1.4571), with non-distortion cover bolting, impact resistant, high EMI shielding, corrosion, temperature, weather- and UV-resistant
Housing dimensions:	143 x 97 x 61 mm (Tyr 2E)
Protective tube:	made from stainless steel V2A (1.4301), Ø 16 mm, NL = 137 mm
Sensor protection:	**metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable, stainless steel V4A (1.4404)
Process connection:	by screws via the mounting fixture on the housing
Long-term stability:	± 1 % per year
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 7131609608 (Skadi2)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3
Optional:	**display with illumination,** three-line, cutout approx. 70 x 40 mm (W x H), to display the ACTUAL temperature and ACTUAL humidity
ACCESSORIES	(see table)

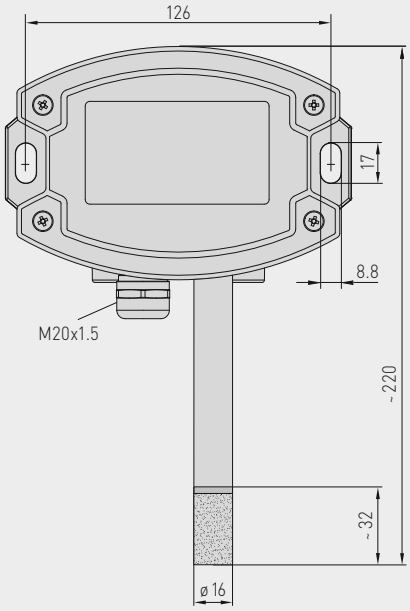
On-wall humidity sensors and temperature sensors (± 1.8 %), calibratable, with multi-range switching and active output

Dimensional drawing **AFTF-20-VA**

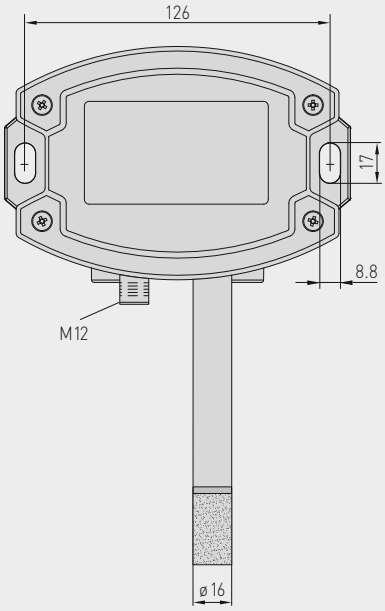




Housing with
cable gland



Housing with
M12 connector





SF-M
Metal sinter filter
(standard)



M12 connector
(male)

AFTF-20-VA
with cable gland
and display



AFTF-20-VAQ
with M12 connector
and display

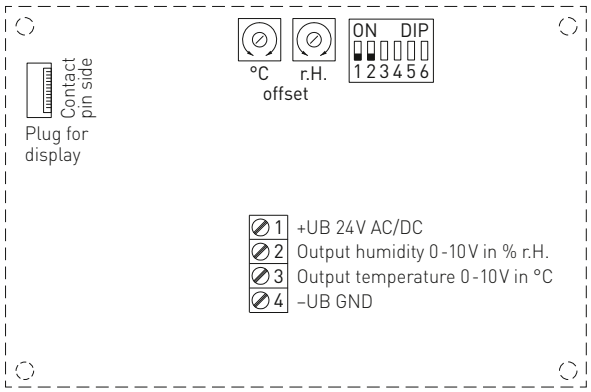


HYGRASGARD® AFTF-20-VA

On-wall humidity sensors and temperature sensors (± 1.8 %), calibratable, with multi-range switching and active output

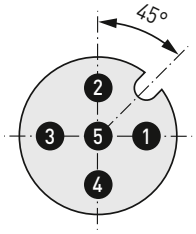
S+S REGELTECHNIK

Schematic diagram — **AFTF-xx-U** with / without display (Tyr 2)



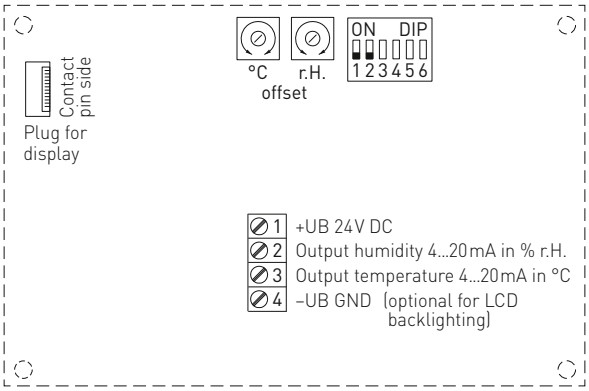
DIP 3, 4, 5, 6 are not assigned!

Pin assignment (M12) — **AFTF-xx-U**



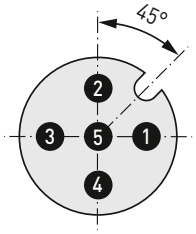
1. +UB 24V AC/DC
2. Output humidity 0-10V [% r.H.]
3. Output temperature 0-10V [°C]
4. –UB GND
5. Shield

Schematic diagram** — **AFTF-xx-I** with / without display (Tyr 2)



DIP 3, 4, 5, 6 are not assigned!

Pin assignment (M12) — **AFTF-xx-I**



1. +UB 24V DC
2. Output humidity 4...20mA [% r.H.]
3. Output temperature 4...20mA [°C]
4. –UB GND (optional for LCD backlighting)
5. Shield

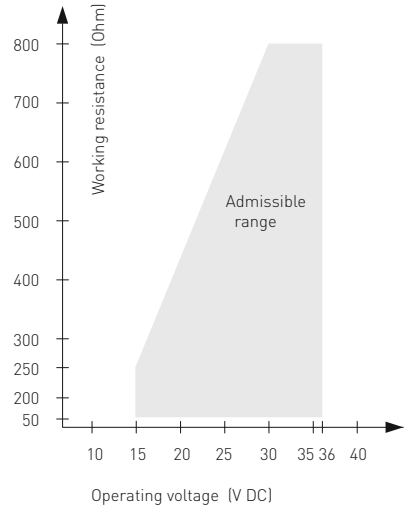
3- or 4-wire connection ** — **AFTF-xx-I (Transmitter)**

1. +UB 24V DC
2. Output humidity in % r.H. 4...20mA
3. Output temperature in °C 4...20mA
4. –UB-GND (optional for backlighting)

4-wire connection — **AFTF-xx-U**

1. +UB 24V AC/DC
2. Output humidity in % r.H. 0-10V
3. Output temperature in °C 0-10V
4. –UB-GND

Load resistance diagram 4..20mA — **AFF-xx-I AFTF-xx-I**



Connection**:
3-wire connection for devices with / without display (not illuminated)
4-wire connection for devices with illuminated display

For the **I variant** the humidity path must be connected!

Temperature measuring ranges (adjustable)	DIP 1	DIP 2
–35...+75 °C	**ON**	**ON**
–35...+35 °C	OFF	OFF
0...+50 °C (default)	OFF	**ON**
0...+80 °C	**ON**	OFF

On-wall humidity sensors and temperature sensors (± 1.8 %), calibratable, with multi-range switching and active output

AFTF-20-VAQ
with display, hinged



Temperature table
MR: –35...+75 °C

°C	U_A [V]	I_A [mA]
-35	0.0	4.0
-30	0.5	4.7
-25	0.9	5.5
-20	1.4	6.2
-15	1.8	6.9
-10	2.3	7.6
-5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

Temperature table
MR: –35...+35 °C

°C	U_A [V]	I_A [mA]
-35	0.0	4.0
-30	0.7	5.1
-25	1.4	6.3
-20	2.1	7.4
-15	2.9	8.6
-10	3.6	9.7
-5	4.3	10.9
0	5.0	12.0
5	5.7	13.1
10	6.4	14.3
15	7.1	15.4
20	7.9	16.6
25	8.6	17.7
30	9.3	18.9
35	10.0	20.0

Temperature table
MR: 0...+50 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

Temperature table
MR: 0...+80 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.6	5.0
10	1.3	6.0
15	1.9	7.0
20	2.5	8.0
25	3.1	9.0
30	3.8	10.0
35	4.4	11.0
40	5.0	12.0
45	5.6	13.0
50	6.3	14.0
55	6.9	15.0
60	7.5	16.0
65	8.1	17.0
70	8.8	18.0
75	9.4	19.0
80	10.0	20.0

Humidity table
MR: 0...100 % RH

% RH	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

HYGRASGARD® AFTF-20-VAQ

On-wall humidity sensors and temperature sensors (± 1.8 %), calibratable, with multi-range switching and active output

S+S REGELTECHNIK

AFTF-20-VAQ
with M12 connector



HYGRASGARD® **AFTF-20-VAQ**	On-wall humidity sensors and temperature sensors (± 1,8 %), *ID* (**with M12 connector**)						
Type / WG02I	**Measuring Range / Readout** Humidity	Temperature	**Output** Humidity	Temperature	**Display** ● = **Q**	**Item No.**	**Price**
AFTF-20-VAQ						**(active)**	
AFTF-20-I VA**Q**	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA	●	2003-6181-2100-001	**662,36 €**
AFTF-20-I VA**Q LCD**	0...100 % RH	(4x as above)	4...20 mA	4...20 mA	● ■	2003-6182-2100-001	**817,76 €**
AFTF-20-U VA**Q**	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V	●	2003-6181-1100-001	**662,36 €**
AFTF-20-U VA**Q LCD**	0...100 % RH	(4x as above)	0-10 V	0-10 V	● ■	2003-6182-1100-001	**817,76 €**
Housing variant "Q":	Cable connection **with M12 connector** (male, **5-pin**, A-code)						

ACCESSORIES			
SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel **V4A** (1.4404)	7000-0050-2200-100	**42,33 €**
	For further information see last chapter!		

On-wall humidity sensors and temperature sensors (± 1.8 %), calibratable, with multi-range switching and active output



AFTF-20-VA
with cable gland

HYGRASGARD® **AFTF-20-VA**	On-wall humidity sensors and temperature sensors (± 1,8 %), *ID* (**with cable gland**)						
Type /WG02I	**Measuring Range / Readout** Humidity	Temperature	**Output** Humidity	Temperature	**Display**	**Item No.**	**Price**
AFTF-20-VA							
AFTF-20-I VA	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4... 20 mA	4... 20 mA		2003-6181-2200-001	**623,83 €**
AFTF-20-I VA **LCD**	0...100 % RH	(4x as above)	4... 20 mA	4... 20 mA	■	2003-6182-2200-001	**779,23 €**
AFTF-20-U VA	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V		2003-6181-1200-001	**623,83 €**
AFTF-20-U VA **LCD**	0...100 % RH	(4x as above)	0-10 V	0-10 V	■	2003-6182-1200-001	**779,23 €**
Housing variant:	Cable connection **with cable gland**						

ACCESSORIES			
SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel **V4A** (1.4404)	7000-0050-2200-100	**42,33 €**
	For further information see last chapter!		

HYGRASREG® AFTF-35

Condensation-protected on-wall humidity and temperature sensor for "high humidity", relative / absolute humidity, mixture ratio, dew point, wet bulb temperature and temperature, calibratable, with multi-range switching, with active and switching output

NEW

S+S REGELTECHNIK

Condensation-protected on-wall sensor **HYGR**ASREG® **AFTF-35** with active and switching output, housing made of impact-resistant plastic with quick-locking screws, cable gland, plastic sinter filter (replaceable), optionally with / without display, for detecting relative humidity (0…100 % RH) and temperature (4 switchable measuring ranges, max. 0…+100 °C) as well as for determining various parameters of humidity measurement technology. The measuring transducer converts the measured variables into a standard signal of 0-10 V or 4…20 mA.

The unit is specially designed for use in the **high humidity range** (95…99 % RH). A long-term stable, **digital humidity and temperature sensor** is used. Overtemperature prevents or hinders dew formation on the humidity sensor. A second, separate temperature measuring element is used to determine the actual relative humidity of the ambient air. The following measured variables are calculated internally from these parameters and are retrievable via output **OUT3**: absolute humidity, mixing ratio, dew point and wet bulb temperature (can be changed via DIP switch).

The sensor is used in medical technology, refrigeration technology, control technology, air conditioning and clean room technology. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA	
Power supply:	24 V AC/DC (± 10 %)
Working resistance:	> 100 kOhm for U variant; 100…500 Ohm for I variant
Power consumption:	typically < 6 W at 24 V DC, peak current 200 mA
Measured variables:	relative humidity [% RH], temperature [°C]
Parameters:	absolute humidity [g/m³], mixture ratio [g/kg], dew point [°C], wet bulb temperature [°C]
Outputs:	3 active outputs (0-10 V or 4…20 mA) 1 changeover contact
Sensor:	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability, with condensation protection through heating function (plus a second, separate temperature measuring element)
Sensor protection:	**plastic** sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional **metal** sinter filter, Ø 16 mm, L = 32 mm)
HUMIDITY	
Measuring range, humidity:	0…100 % RH
Deviation in humidity:	typically ± 3.0 % (30…70 % RH) at +25 °C, otherwise ± 3.5 % (deviations of alternative parameters result from deviations from humidity and temperature.)
Output humidity:	0-10 V for U variant; 4…20 mA for I variant
TEMPERATURE	
Temperature measuring range:	**Multi-range switching with 4 switchable measuring ranges** (see table) 0…+50 °C (default); –20…+50 °C; –20…+80 °C; 0…+100 °C
Deviation in temperature:	typically ± 0.5 K at +25 °C
Temperature output:	0-10 V for U variant; 4…20 mA for I variant
Long-term stability:	± 1 % per year
Response time (t90):	< 60 s
Warm-up time:	< 10 min
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Cable connection:	**Cable gland,** plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm)
Housing:	Plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Typ 2)
Protective tube:	made of stainless steel **V2A** (1.4301), Ø 16 mm, NL = 55 mm (combined humidity and temperature measuring element) **and** of stainless steel **V4A** (1.4571), Ø 6 mm, NL = 65 mm (second, separate temperature measuring element)
Process connection:	via screws
Ambient temperature:	storage –20…+50 °C; operation –20…+50 °C
Permitted humidity:	< 99 % RH, non-precipitating air free of harmful substances
Protection class:	III (as per EN 60 730)
Protection type:	**IP 65** (as per EN 60 529) housing, IP 20 sensor technology
Standards:	CE-conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU
FUNCTION	A constant overtemperature of the humidity sensor makes its dewing considerably more difficult or prevents its formation within the limits of the system. A faster reaction speed is achieved in the case of humidity fluctuations, even in the range above 95 % RH. The sensor (combined humidity and temperature measuring element) is heated approx. 3 K above the ambient temperature. The actual relative humidity is determined from the measured relative humidity at overtemperature, the chip temperature of the sensor and the ambient temperature (via a second, separate temperature measuring element).

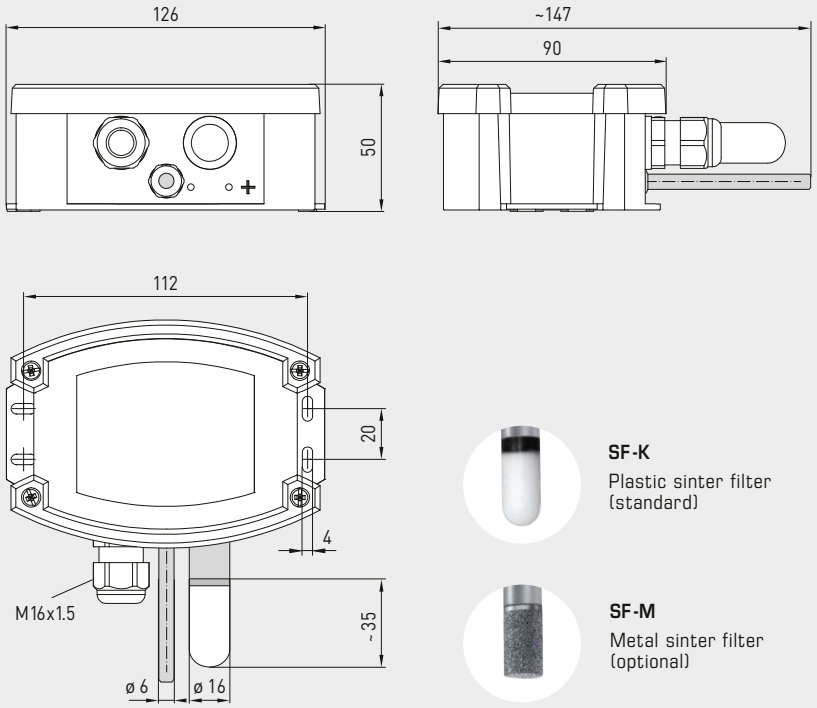
NEW

HYGRASREG® AFTF-35

Condensation-protected on-wall humidity and temperature sensor for "high humidity", relative / absolute humidity, mixture ratio, dew point, wet bulb temperature and temperature, calibratable, with multi-range switching, with active and switching output

Dimensional drawing
[mm]

AFTF-35



SF-K
Plastic sinter filter
(standard)

SF-M
Metal sinter filter
(optional)

AFTF-35
with plastic sinter filter
(standard)



Temperature table
MR: –20...+80 °C

°C	U_A [V]	I_A [mA]
-20	0.0	4.0
-15	0.5	4.8
-10	1.0	5.6
-5	1.5	6.4
0	2.0	7.2
5	2.5	8.0
10	3.0	8.8
15	3.5	9.6
20	4.0	10.4
25	4.5	11.2
30	5.0	12.0
35	5.5	12.8
40	6.0	13.6
45	6.5	14.4
50	7.0	15.2
55	7.5	16.0
60	8.0	16.8
65	8.5	17.6
70	9.0	18.4
75	9.5	19.2
80	10.0	20.0

Temperature table
MR: –20...+50 °C

°C	U_A [V]	I_A [mA]
-20	0.0	4.0
-15	0.7	5.1
-10	1.4	6.3
-5	2.1	7.4
0	2.9	8.6
5	3.6	9.7
10	4.3	10.9
15	5.0	12.0
20	5.7	13.1
25	6.4	14.3
30	7.1	15.4
35	7.9	16.6
40	8.6	17.7
45	9.3	18.9
50	10.0	20.0

Temperature table
MR: 0...+50 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

Temperature table
MR: 0...+100 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

Humidity table
MR: 0...100 % RH

% RH	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

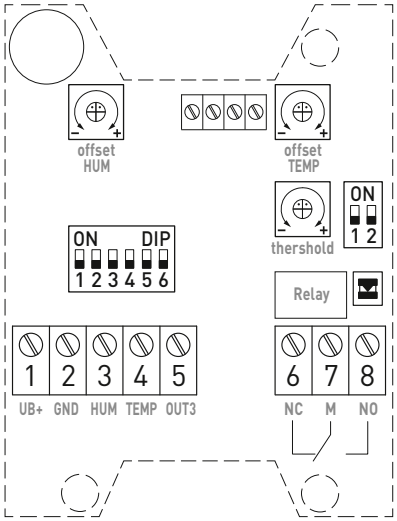
HYGRASREG® AFTF-35

Condensation-protected on-wall humidity and temperature sensor for "high humidity", relative / absolute humidity, mixture ratio, dew point, wet bulb temperature and temperature, calibratable, with multi-range switching, with active and switching output

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Schematic diagram **AFTF-35-xx**

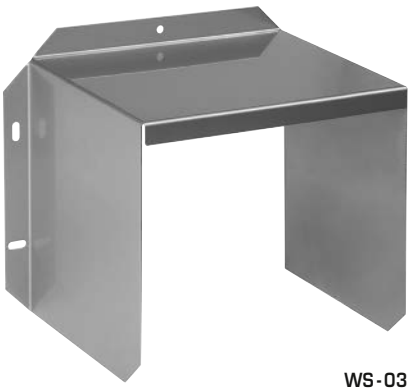


Connecting diagram **AFTF-35-I**

1	+UB 24V AC/DC
2	–UB GND
3	Output Humidity 4...20mA
4	Output Temperature 4...20mA
5	Output altern. parameters 4...20mA
6	NC Normally Closed
7	M Common
8	NO Normally Open

Connecting diagram **AFTF-35-U**

1	+UB 24V AC/DC
2	–UB GND
3	Output Humidity 0-10V
4	Output Temperature 0-10V
5	Output altern. parameters 0-10V
6	NC Normally Closed
7	M Common
8	NO Normally Open



WS-03
Weather and sun protection hood

ON DIP
1 2 3 4 5 6

Measuring ranges temperature	DIP 1	DIP 2
0...+50 °C (default)	OFF	OFF
–20...+50 °C	**ON**	OFF
–20...+80 °C	OFF	**ON**
0...+100 °C	**ON**	**ON**

Measuring ranges alternative parameters	DIP 3	DIP 4	DIP 5
(a.F.) **0...20 g/m³** (default)	OFF	OFF	OFF
(a.F.) 0...25 g/m³	**ON**	OFF	OFF
(MV) 0...20 g/kg	OFF	**ON**	OFF
(MV) 0...25 g/kg	**ON**	**ON**	OFF
(TP) 0...+50 °C	OFF	OFF	**ON**
(TP) –20...+50 °C	**ON**	OFF	**ON**
(FKT) –30...+30 °C	OFF	**ON**	**ON**
(FKT) –20...+50 °C	**ON**	**ON**	**ON**

(a.F.) = absolute humidity [g/m³]
(MV) = mixture ratio [g/kg]
(TP) = dew point [°C]
(FKT) = wet bulb temperature [°C]

Note: For factory service only, it must be set to "OFF" during operation!	DIP 6
Operation (default)	OFF

ON
1 2

Relay function assignment	DIP 1	DIP 2
inactive (default)	OFF	OFF
Humidity	**ON**	OFF
Temperature	OFF	**ON**
alternative parameters	**ON**	**ON**

NEW

HYGRASREG® AFTF-35

Condensation-protected on-wall humidity and temperature sensor for "high humidity", relative / absolute humidity, mixture ratio, dew point, wet bulb temperature and temperature, calibratable, with multi-range switching, with active and switching output



HYGRASREG® **AFTF-35**	Condensation-protected on-wallsensor for high humidity						
Type / WG02	**Measuring Range** Humidity	Temperature	**Output active**	**Output switching**	**Display**	**Item No.**	**Price**
AFTF-35-I						**I variant**	
AFTF-35-I/W	**0...100 %RH** 0...20 g/m³ (a.F.) 0...25 g/m³ (a.F.) 0...20 g/kg (MV) 0...25 g/kg (MV) 0...+50 °C (TP) –20...+50 °C (TP) –30...+30 °C (FKT) –20...+50 °C (FKT)	**0...+50 °C** –20...+50 °C –20...+80 °C 0...+100 °C	3x **4...20 mA**	1x Changeover contact		1201-714B-1000-000	**716,63 €**
AFTF-35-I/W **LCD**	(as above)	(as above)	3x **4...20 mA**	1x Changeover contact	■	1201-714B-1200-000	**819,00 €**
AFTF-35-U						**U variant**	
AFTF-35-U/W	(as above)	(as above)	3x **0-10 V**	1x Changeover contact		1201-714A-1000-000	**716,63 €**
AFTF-35-U/W **LCD**	(as above)	(as above)	3x **0-10 V**	1x Changeover contact	■	1201-714A-1200-000	**819,00 €**
Note	**Alternative parameters** are calculated internally from the measured variables, which are retrievable via the active output **OUT3**: absolute humidity, mixing ratio, dew point and wet bulb temperature (can be changed via DIP switch)						
ACCESSORIES							
SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel **V4A** (1.4404)					7000-0050-2200-100	**42,33 €**
WS-03	**Weather and sun protection hood**, 200 x 180 x 150 mm, stainless steel **V2A** (1.4301)					7100-0040-6000-000	**44,74 €**
	for further information see see chapter Accessories!						

HYGRASGARD® AAVTF

**On-wall outdoor humidity sensors (± 2.0 %),
for mixture ratio, relative / absolute humidity,
dew point, enthalpy (switchable) and temperature,
with multi-range switching, with active output**

S+S REGELTECHNIK

The universal humidity sensors **HYGR**ASGARD® **AAVTF** are used to determine diverse characteristic variables in humidity measurement. The relative humidity and temperature of the ambient air are measured. From these measurands, the different characteristic variables are internally calculated.

For device version x-U, two outputs of 0 - 10 V are available, for Version x-I two outputs of 4...20 mA. Here, the output variables for these outputs can be defined using DIP switches. Selectable for output 1 are relative humidity [% RH], absolute humidity [g / m³], mixture ratio [g / kg], dew point temperature [°C], or enthalpy [kJ / kg] (while neglecting the atmospheric air pressure). At output 2, four different measuring ranges for ambient temperature [°C] are selectable. Ex-factory condition (default) for output 1 is relative humidity 0...100 % RH, for output 2 temperature measuring range 0...+50 °C. Due to the different configuration alternatives provided, numerous measurement and control tasks can be solved by just one device. These devices must be operated in pollutant-free, non-precipitating air, with neither above-atmospheric nor below-atmospheric pressure at the sensors. Application examples include medical technology, refrigeration, air conditioning, and clean room technology. These sensors are suitable for wall mounting.

AAVTF
with plastic sinter filter
(standard)



SF-M
Metal sinter filter
(optional)



TECHNICAL DATA

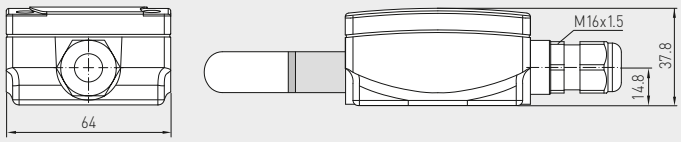
Power supply:	24 V AC (± 20 %); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (ohm) = (U_b -14 V) / 0.02 A for I variant
Load resistance:	R_L > 5 kOhm for U variant
Power consumption:	< 1 W at 24 V DC; < 2 VA at 24 V AC
Sensors:	**digital humidity sensor with integrated temperature sensor**, low hysteresis, high long-term stability
Sensor protection:	**plastic** sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional **metal** sinter filter, Ø 16 mm, L = 32 mm)
HUMIDITY	
Measuring range, humidity:	**multi-range switching with** **8 switchable measuring ranges** (see table) 0...100 % RH (default)
Operating range, humidity:	10...95 % RH, without formation of dew
Deviation, humidity:	typically **± 2.0** % (20...80 % RH) at +25 °C, otherwise ± 3.0 % Deviations of other outputs result from deviations of humidity and temperature.
Output 1, humidity:	0 - 10 V for U variant (see table) 4...20 mA for I variant (see table)
TEMPERATURE	
Measuring range, temperature:	**multi-range switching with** **4 switchable measuring ranges** (see table) 0...+50 °C (default); –20...+80 °C; –35...+75 °C; –35...+35 °C
Operating range, temperature:	–35...+85 °C sensors
Deviation, temperature:	typically ± 0.6 K at +25 °C
Output 2, temperature:	0 - 10 V for U variant (see table) 4...20 mA for I variant (see table)
Ambient temperature:	storage –35...+85 °C; operation –30...+70 °C, non-precipitating
Electrical connection:	4-wire connection for U variant 3-wire connection for I variant (Transmitter) 0.14 - 1.5 mm², via terminal screws
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Protective tube:	**stainless steel V2A** (1.4301), Ø = 16 mm, NL = 55 mm
Process connection:	by screws
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU
Optional:	two-line **display with illumination,** cutout approx. 36 x 15 mm (W x H), for displaying actual temperature and actual humidity, as well as the selectable output variables
ACCESSORIES	see last chapter

On-wall outdoor humidity sensors (± 2.0 %), for mixture ratio, relative / absolute humidity, dew point, enthalpy (switchable) and temperature, with multi-range switching, with active output

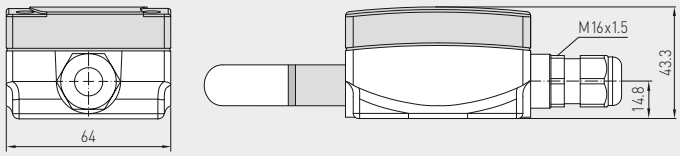
Dimensional drawing

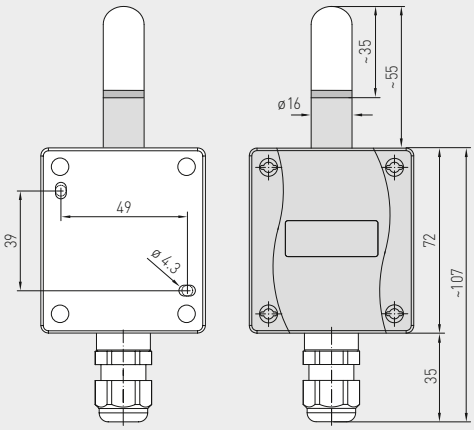
AAVTF

without display



with display





with **plastic** sinter filter (standard)



M12 connector
(optional on request)

AAVTF
with display and plastic sinter filter (standard)



SF-M
Metal sinter filter (optional)



Temperature table
MR: –35...+75 °C

°C	U_A [V]	I_A [mA]
-35	0.0	4.0
-30	0.5	4.7
-25	0.9	5.5
-20	1.4	6.2
-15	1.8	6.9
-10	2.3	7.6
-5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

Temperature table
MR: –35...+35 °C

°C	U_A [V]	I_A [mA]
-35	0.0	4.0
-30	0.7	5.1
-25	1.4	6.3
-20	2.1	7.4
-15	2.9	8.6
-10	3.6	9.7
-5	4.3	10.9
0	5.0	12.0
5	5.7	13.1
10	6.4	14.3
15	7.1	15.4
20	7.9	16.6
25	8.6	17.7
30	9.3	18.9
35	10.0	20.0

Temperature table
MR: 0...+50 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

Temperature table
MR: –20...+80 °C

°C	U_A [V]	I_A [mA]
-20	0.0	4.0
-15	0.5	4.8
-10	1.0	5.6
-5	1.5	6.4
0	2.0	7.2
5	2.5	8.0
10	3.0	8.8
15	3.5	9.6
20	4.0	10.4
25	4.5	11.2
30	5.0	12.0
35	5.5	12.8
40	6.0	13.6
45	6.5	14.4
50	7.0	15.2
55	7.5	16.0
60	8.0	16.8
65	8.5	17.6
70	9.0	18.4
75	9.5	19.2
80	10.0	20.0

Humidity table
MR: 0...100 % RH

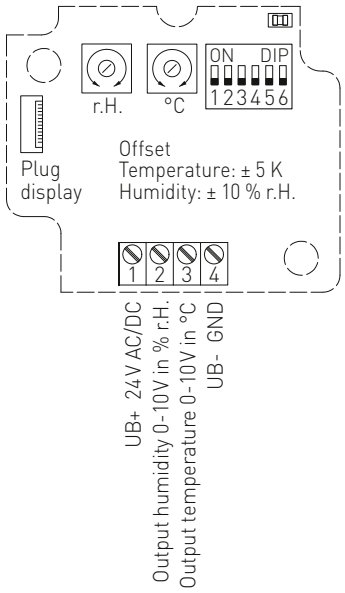
% RH	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

HYGRASGARD® AAVTF

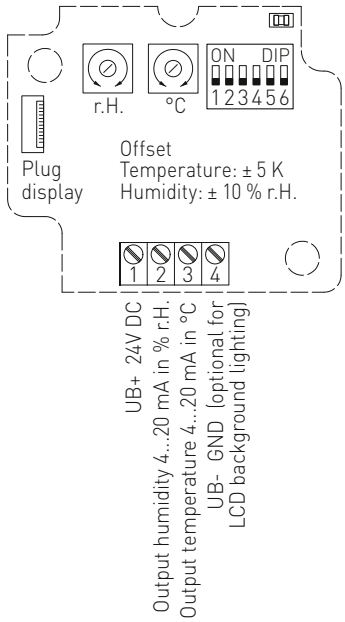
On-wall outdoor humidity sensors (± 2.0 %), for mixture ratio, relative / absolute humidity, dew point, enthalpy (switchable) and temperature, with multi-range switching, with active output

S+S REGELTECHNIK

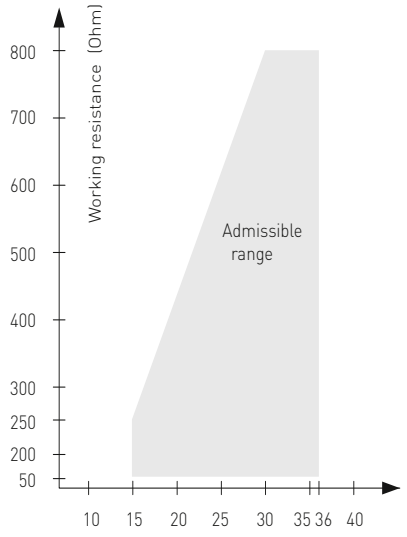
Schematic diagram **AAVTF-U** with display



Schematic diagram **AAVTF-I** with display



Load resistance diagram **AAVTF-I**
4.. 20 mA



Temperature measuring ranges (adjustable)	**DIP 1**	**DIP 2**
0...+50 °C (default)	OFF	OFF
–20...+80 °C	**ON**	OFF
–35...+75 °C	OFF	**ON**
–35...+35 °C	**ON**	**ON**

Switchable measuring ranges (adjustable)	**DIP 3**	**DIP 4**	**DIP 5**
RH: **0...100 %** (default)	OFF	OFF	OFF
MR: 0...50 g / kg	**ON**	OFF	OFF
MR: 0...80 g / kg	OFF	**ON**	OFF
A.H.: 0...50 g / m³	OFF	OFF	**ON**
A.H.: 0...80 g / m³	**ON**	**ON**	OFF
DP: 0...+50 °C	**ON**	OFF	**ON**
DP: –20...+80 °C	OFF	**ON**	**ON**
ENT.: 0...85 kJ / kg	**ON**	**ON**	**ON**

Possible parameters:

(RH) = relative humidity in %
(MR) = mixture ratio in g / kg
(A.H.) = absolute humidity in g / m³
(DP) = dew point in °C
(ENT.) = enthalpy in kJ / kg

Service display / output (adjustable)	**DIP 6**
Display °C and % RH, output of set measurements via DIP 1-5 (service mode for setting °C and % RH)	**ON**
Display and output of set measurements via DIP 1-5	OFF

AAVTF
with display



WS-04
Weather and sun protection hood (optional)



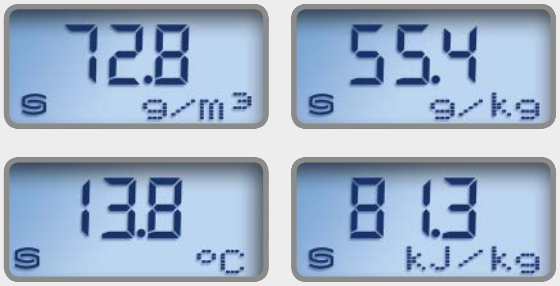
HYGRASGARD® AAVTF

On-wall outdoor humidity sensors (± 2.0 %), for mixture ratio, relative / absolute humidity, dew point, enthalpy (switchable) and temperature, with multi-range switching, with active output

Display Standard **AAVTF Display**



Displays alternative output variables **AAVTF Display**



Displays service mode **AAVTF Display**



By default, the display alternates between the **actual temperature** and the **actual humidity** (relative humidity). In this case, the first line displays the value while the second line displays the corresponding unit:

Temperature in °C
Relative humidity in % RH

For improved legibility, backlighting is provided.

DIP switches can be used to display an **alternative output variable** instead of the standard display:

Absolute humidity in g / m³
Dew point in °C
Mixture ratio in g / kg
Enthalpy in kJ / kg

The **service mode** simultaneously displays (alternately in the first and second lines) the **actual temperature** and the **actual humidity** (relative humidity).

HYGRASGARD® AAVTF On-wall outdoor humidity sensors (± 2.0 %)

Type / WG01	Measuring Range Humidity		Temperature		Output Humidity	Display Temperature		Item No.	Price
AAVTF-I	(switchable)		(switchable)					**I-variant**	
AAVTF-I	0 ...100 % RH	(default)	0...+50 °C	(default)	4...20 mA	4...20 mA		1201-1162-6000-028	**205,58 €**
	0...50 g / kg	(MR)	–20...+80 °C						
	0...80 g / kg	(MR)	–35...+75 °C						
	0...50 g / m³	(A.H.)	–35...+35 °C						
	0...80 g / m³	(A.H.)							
	0...+50 °C	(DP)							
	–20...+80 °C	(DP)							
	0...85 kJ / kg	(ENT.)							
AAVTF-I **LCD**	(8x as above)		(4x as above)		4...20 mA	4...20 mA	■	1201-1162-6200-028	**255,42 €**
AAVTF-U								**U-variant**	
AAVTF-U	(8x as above)		(4x as above)		0-10 V	0-10 V		1201-1161-6000-028	**205,58 €**
AAVTF-U **LCD**	(8x as above)		(4x as above)		0-10 V	0-10 V	■	1201-1161-6200-028	**255,42 €**
Extra charge:	Other non-standard ranges optional								**149,47 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101							on request	

ACCESSORIES

SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel **V4A** (1.4404)	7000-0050-2200-100	**42,33 €**
WS-01	**Sun and ball-impact protection hood**, 184 x 180 x 80 mm, stainless steel **V2A** (1.4301)	7100-0040-2000-000	**31,77 €**
WS-04	**Weather and sun protection hood**, 130 x 180 x 135 mm, stainless steel **V2A** (1.4301)	7100-0040-7000-000	**37,49 €**
	For further information, see last chapter Accessories!		

HYGRASGARD® KFF-xx
HYGRASGARD® KFTF-xx

Duct humidity and temperature sensors (± 1.8 % / ± 2.0 %), including mounting flange, calibratable, with multi-range switching and active / passive output

S+S REGELTECHNIK

Calibratable duct humidity-/temperature sensor **HYGR**ASGARD® **KFF-SD/KFTF-SD** (± 2,0 %), with plastic sinter filter (optional metal sinter filter), housing made from impact-resistant plastic with snap-on lid, with cable gland (optional M12 connector according to DIN EN 61076-2-101).

Calibratable duct humidity-/temperature sensor **HYGR**ASGARD® **KFF/KFTF** (± 2,0 %) or **KFF-20/KFTF-20** (± 1,8 %), with plastic sinter filter (optional metal sinter filter), housing made of impact-resistant plastic with quick-locking screws, optionally with / without display, with cable gland (optional M12 connector according to DIN EN 61076-2-101).

It measures the relative humidity and/or the temperature of the air and converts the measurands into a standard signal of 0 - 10 V or 4...20 mA. It has four switchable temperature ranges and is applied in non-aggressive dust-free atmospheres in refrigeration, air conditioning, ventilation and clean room technology. These measuring transducers are designed for exact detection of humidity. A digital long-term stable sensor is used as measuring element for humidity measurement. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

Power supply:	24 V AC (± 20 %); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (ohm) = (U_b -14 V) / 0.02 A for I variant, see load resistance diagram
Load resistance:	R_L > 5 kOhm for U variant
Power consumption:	< 1.1 VA / 24 V DC; < 2.2 VA / 24 V AC
Sensors:	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
HUMIDITY	
Measuring range, humidity:	0...100 % RH
Permissible air humidity:	< 95 % RH, non-precipitating air
Deviation, humidity:	**KFF / KFTF / KFF-SD / KFTF-SD:** typically **± 2.0** % (20...80 % RH) at +25 °C, otherwise ± 3.0 % **KFF-20 / KFTF-20:** typically **± 1.8** % (10...90 % RH) at +25 °C, otherwise ± 2.0 %
Output, humidity:	0 -10 V for U variant; 4...20 mA for I variant
TEMPERATURE	
Measuring range, temperature:	**multi-range switching with** **4 switchable measuring ranges** (see table) –35...+35 °C; –35...+75 °C; 0...+50 °C; 0...+80 °C
Ambient temperature:	storage –35...+85 °C; operation –30...+75 °C, non-precipitating
Deviation, temperature:	typically ± 0.2 K at +25 °C
Output, temperature:	0 -10 V for U variant; 4...20 mA for I variant; **KFTF-Uxx** (passive temperature sensor) see table
Electrical connection:	2-, 3-, or 4-wire connection (see connecting diagram), 0.14 - 1.5 mm², via terminal screws
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	**KFF-xx / KFTF-xx** (without display): 72 x 64 x 37.8 mm (Typ 1/01) **KFF / KFTF** (with display): 72 x 64 x 43.3 mm (Typ 1) **KFF-20 / KFTF-20** (with display): 26 x 90 x 50 mm (Typ 2)
Protective tube:	**PLEUROFORM**™, material polyamide (PA6), with torsion protection Ø 20 mm, NL = 235 mm (optionally 100 mm), v_{max} = 30 m/s (air) (on request, optional **stainless steel V2A** (1.4301), Ø 16 mm)
Sensor protection:	**plastic** sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional **metal** sinter filter, Ø 16 mm, L = 32 mm)
Process connection:	by mounting flange, plastic (included in the scope of delivery)
Long-term stability:	± 1 % per year
Protection class:	III (according to EN 60 730)
Protection type:	**KFF-SD / KFTF-SD** **IP 54** (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713160960A (Typ 01) **KFF-xx / KFTF-xx** **IP 65** (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Typ 1)
Standards:	CE conformity, according to EMC directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3
Optional:	**display with illumination,** for displaying ACTUAL temperature and / or ACTUAL humidity **KFF / KFTF** (Typ 1)**:** two-line, cutout approx. 36 x 15 mm (W x H) **KFF-20 / KFTF-20** (Typ 2)**:** three-line, cutout approx. 70 x 40 mm (W x H)
ACCESSORIES	see last chapter

SF-K
Plastic sinter filter (standard)



SF-M
Metal sinter filter (optional)



Protective tube stainless steel
(optional on request)

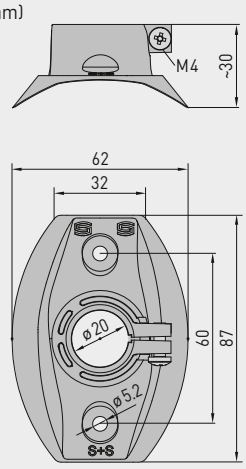


M12 connector
(optional)

MFT-20-K
Mounting flange, plastic



Dimensional drawing (mm) **MFT-20-K**



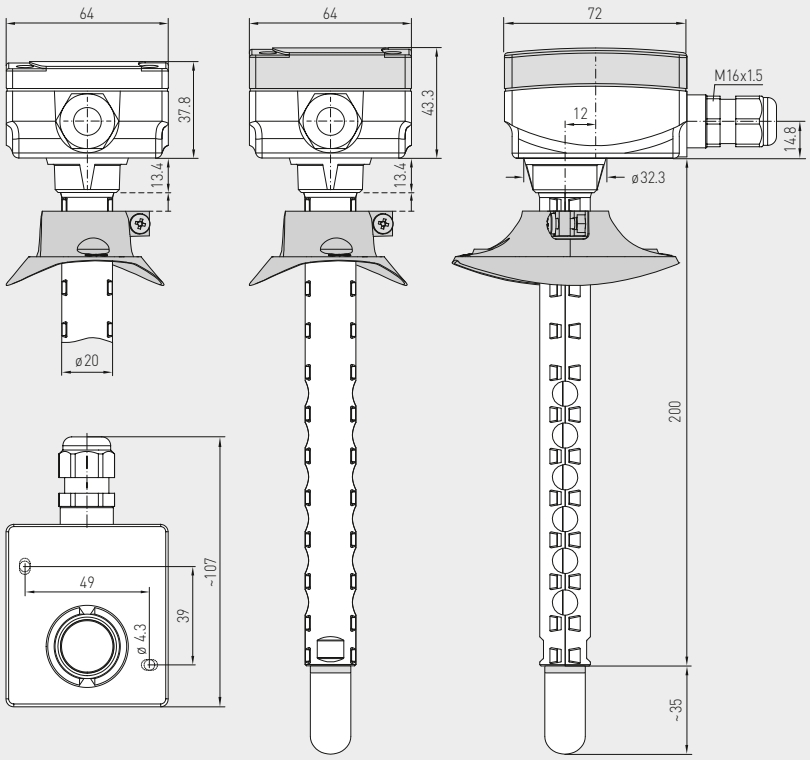
HYGRASGARD® KFF-xx
HYGRASGARD® KFTF-xx

Duct humidity and temperature sensors (± 1.8 % / ± 2.0 %), including mounting flange, calibratable, with multi-range switching and active/passive output

Dimensional drawing
[mm]

KFF/KFTF with/without display
KFF-SD/KFTF-SD without display
KFF-20/KFTF-20 without display

without display **with display**



KFF-SD/KFTF-SD (± 2,0 %)
with snap-on lid
(IP 54)

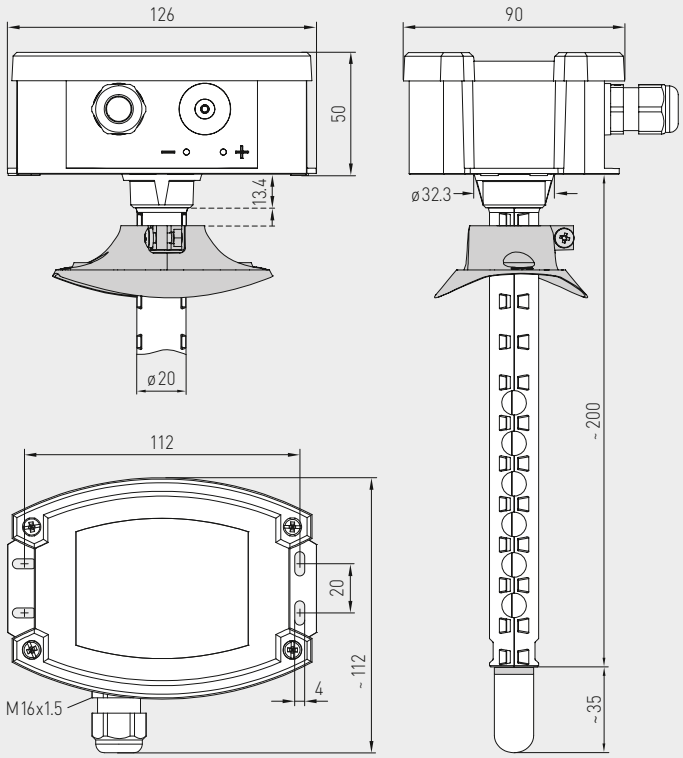


KFF/KFTF (± 2,0 %)
KFF-20/KFTF-20 (± 1,8 %)
without display
(IP 65)



Dimensional drawing
[mm]

KFF-20/KFTF-20 with display



KFF/KFTF (± 2,0 %)
with display
(IP 65)



KFF-20/KFTF-20 (± 1,8 %)
with display
(IP 65)

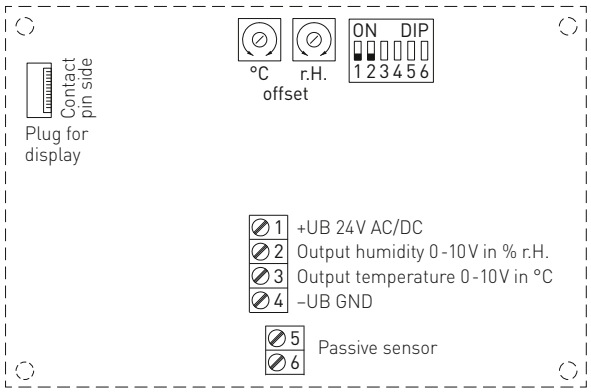


HYGRASGARD® KFF-xx
HYGRASGARD® KFTF-xx

Duct humidity and temperature sensors (± 1.8 % / ± 2.0 %), including mounting flange, calibratable, with multi-range switching and active/passive output

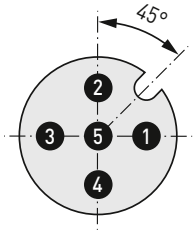
S+S REGELTECHNIK

Schematic diagram **KFTF-20-U** with display (Tyr2)



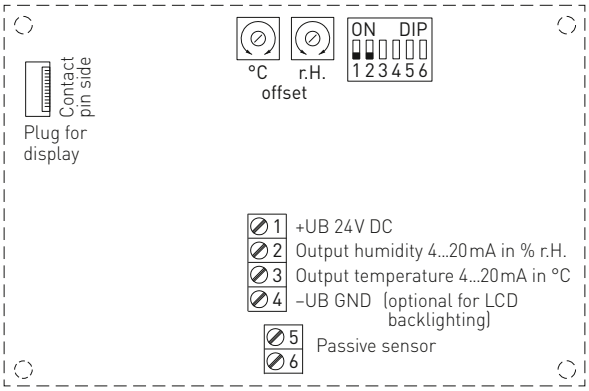
DIP 3, 4, 5, 6 are not assigned!

Pin assignment (M12) **KFTF-xx-U**



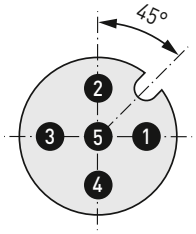
1 +UB 24V AC/DC
2 Output humidity 0-10V [% r.H.]
3 Output temperature 0-10V [°C]
4 –UB GND
5 Shield

Schematic diagram **KFTF-20-I** with display (Tyr2)



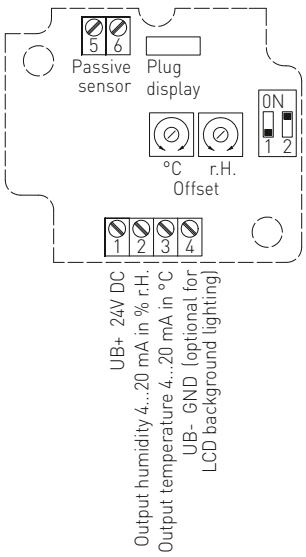
DIP 3, 4, 5, 6 are not assigned!

Pin assignment (M12) **KFTF-xx-I**

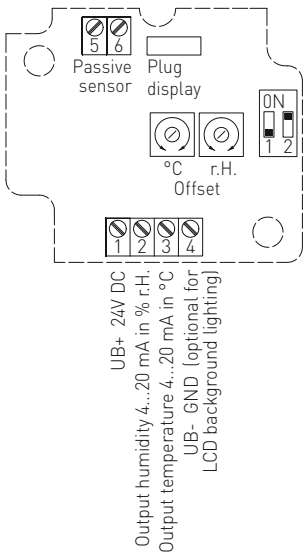


1 +UB 24V DC
2 Output humidity 4...20mA [% r.H.]
3 Output temperature 4...20mA [°C]
4 –UB GND (optional for LCD backlighting)
5 Shield

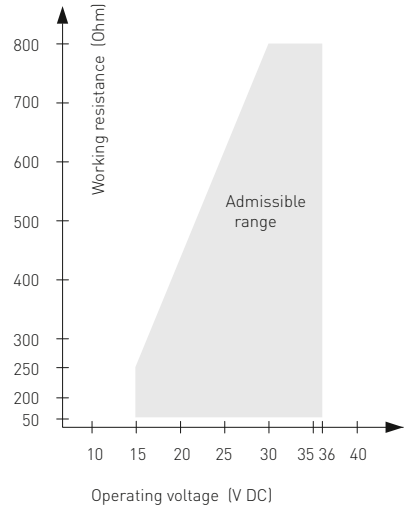
Schematic diagram **KFTF-xx-U** with / without display (Tyr1)



Schematic diagram **KFTF-xx-I** with / without display (Tyr1)



Load resistance diagram 4..20 mA **KFF-xx-I** **KFTF-xx-I**



HYGRASGARD® KFF-xx
HYGRASGARD® KFTF-xx

Duct humidity and temperature sensors (± 1.8 % / ± 2.0 %), including mounting flange, calibratable, with multi-range switching and active/passive output

3-wire connection — **KFF-xx-U**

1	+UB 24V AC/DC
2	Output humidity in % r.H. 0-10V
3	Free
4	–UB-GND

2- or 3-wire connection * — **KFF-xx-I (Transmitter)**

1	+UB 24V DC
2	Output humidity in % r.H. 4...20mA
3	Free
4	–UB-GND (optional for backlighting)

4- or 6-wire connection — **KFTF-U (passive temperature sensor)**

1	+UB 24V AC/DC
2	Output humidity in % r.H. 0-10V
3	Output temperature in °C 0-10V
4	–UB-GND
5	Passive element
6	e.g. Pt1000, Ni1000, LMZ235Z

4-wire connection — **KFTF-xx-U**

1	+UB 24V AC/DC
2	Output humidity in % r.H. 0-10V
3	Output temperature in °C 0-10V
4	–UB-GND

3- or 4-wire connection ** — **KFTF-xx-I (Transmitter)**

1	+UB 24V DC
2	Output humidity in % r.H. 4...20mA
3	Output temperature in °C 4...20mA
4	–UB-GND (optional for backlighting)

4- or 6-wire connection — **KFTF-I (passive temperature sensor)**

1	+UB 24V DC
2	Output humidity in % r.H. 4...20mA
3	Output temperature in °C 4...20mA
4	–UB-GND (optional for backlighting)
5	Passive element
6	e.g. Pt1000, Ni1000, LMZ235Z

Temperature measuring ranges (adjustable)	**DIP 1**	**DIP 2**
–35...+75 °C	**ON**	**ON**
–35...+35 °C	OFF	OFF
0...+50 °C (default)	OFF	**ON**
0...+80 °C	**ON**	OFF

Connection*:
2-wire connection for devices with/without display (not illuminated)
3-wire connection for devices with illuminated display

Connection**:
3-wire connection for devices with/without display (not illuminated)
4-wire connection for devices with illuminated display

For the **I variant** the humidity path must be connected!

Temperature table
MR: –35...+75 °C

°C	U_A [V]	I_A [mA]
–35	0.0	4.0
–30	0.5	4.7
–25	0.9	5.5
–20	1.4	6.2
–15	1.8	6.9
–10	2.3	7.6
–5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

Temperature table
MR: –35...+35 °C

°C	U_A [V]	I_A [mA]
–35	0.0	4.0
–30	0.7	5.1
–25	1.4	6.3
–20	2.1	7.4
–15	2.9	8.6
–10	3.6	9.7
–5	4.3	10.9
0	5.0	12.0
5	5.7	13.1
10	6.4	14.3
15	7.1	15.4
20	7.9	16.6
25	8.6	17.7
30	9.3	18.9
35	10.0	20.0

Temperature table
MR: 0...+50 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

Temperature table
MR: 0...+80 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.6	5.0
10	1.3	6.0
15	1.9	7.0
20	2.5	8.0
25	3.1	9.0
30	3.8	10.0
35	4.4	11.0
40	5.0	12.0
45	5.6	13.0
50	6.3	14.0
55	6.9	15.0
60	7.5	16.0
65	8.1	17.0
70	8.8	18.0
75	9.4	19.0
80	10.0	20.0

Humidity table
MR: 0...100 % RH

% RH	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

HYGRASGARD® KFF-SD
HYGRASGARD® KFTF-SD

Duct humidity and temperature sensors (± 2.0 %), including mounting flange, calibratable, with multi-range switching and active output

S+S REGELTECHNIK

KFF-SD / KFTF-SD
with snap-on lid
(IP 54)



HYGRASGARD® KFF-SD **HYGRASGARD® KFTF-SD**	Duct humidity sensors (± 2.0 %), *Standard* Duct humidity and temperature sensors (± 2.0 %), *Standard*					
Type / WG01B	**Measuring Range / Readout** Humidity	Temperature	**Output** Humidity	Temperature	**Item No.**	**Price**
KFF-SD					**IP 54**	
KFF-SD-I	0...100 % RH	–	4...20 mA	–	1201-3182-0000-029	**162,31 €**
KFF-SD-U	0...100 % RH	–	0-10 V	–	1201-3181-0000-029	**162,31 €**
KFTF-SD					**IP 54**	
KFTF-SD-I	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA	1201-3182-1000-029	**166,76 €**
KFTF-SD-U	0...100 % RH	(4x as above)	0-10 V	0-10 V	1201-3181-1000-029	**166,76 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101 shortened protective tube **PLEUROFORM**™, NL = 100 mm				on request on request	

ACCESSORIES

SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel **V4A** (1.4404)	7000-0050-2200-100	**42,33 €**
	For further information, see chapter Accessories!		

KFF / KFTF
with quick-locking screws
(IP 65)







HYGRASGARD® KFF **HYGRASGARD® KFTF**	Duct humidity sensors (± 2.0 %), *Standard* Duct humidity and temperature sensors (± 2.0 %), *Standard*						
Type / WG01	**Measuring Range / Readout** Humidity	Temperature	**Output** Humidity	Temperature	**Display**	**Item No.**	**Price**
KFF						**IP 65**	
KFF-I	0...100 % RH	–	4...20 mA	–		1201-3112-0000-029	**174,41 €**
KFF-I **LCD**	0...100 % RH	–	4...20 mA	–	■	1201-3112-0200-029	**225,33 €**
KFF-U	0...100 % RH	–	0-10 V	–		1201-3111-0000-029	**174,41 €**
KFF-U **LCD**	0...100 % RH	–	0-10 V	–	■	1201-3111-0200-029	**225,33 €**
KFTF						**IP 65**	
KFTF-I	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA		1201-3112-1000-029	**178,86 €**
KFTF-I **LCD**	0...100 % RH	(4x as above)	4...20 mA	4...20 mA	■	1201-3112-1200-029	**229,79 €**
KFTF-U	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V		1201-3111-1000-029	**178,86 €**
KFTF-U **LCD**	0...100 % RH	(4x as above)	0-10 V	0-10 V	■	1201-3111-1200-029	**229,79 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101 shortened protective tube **PLEUROFORM**™, NL = 100 mm					on request on request	

HYGRASGARD® **KFTF-U xx**	Duct humidity and temperature sensors (± 2.0 %), *Standard* (passive temperature sensor)					
Type / WG01	**Measuring Range / Readout** Humidity	Temperature	**Output** Humidity	Temperature	**Item No.**	**Price**
KFTF-U xx	**Pt, Ni, LM235Z, NTC**			(active / **passive**)	**IP 65**	
KFTF-U Pt100	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V + **Pt100**	1201-3111-2001-029	**185,86 €**
KFTF-U Pt1000	0...100 % RH	(4x as above)	0-10 V	0-10 V + **Pt1000**	1201-3111-2005-029	**186,50 €**
KFTF-U Ni1000	0...100 % RH	(4x as above)	0-10 V	0-10 V + **Ni1000**	1201-3111-2009-029	**187,14 €**
KFTF-U NiTK	0...100 % RH	(4x as above)	0-10 V	0-10 V + **Ni1000TK5000**	1201-3111-2010-029	**188,15 €**
KFTF-U LM235Z	0...100 % RH	(4x as above)	0-10 V	0-10 V + **LM235Z**, 10mV / K	1201-3111-2021-029	**186,88 €**
KFTF-U NTC1,8K	0...100 % RH	(4x as above)	0-10 V	0-10 V + **NTC 1,8 kOhm**	1201-3111-2012-029	**187,14 €**
KFTF-U NTC10K	0...100 % RH	(4x as above)	0-10 V	0-10 V + **NTC 10 kOhm**	1201-3111-2015-029	**185,99 €**
KFTF-U NTC20K	0...100 % RH	(4x as above)	0-10 V	0-10 V + **NTC 20 kOhm**	1201-3111-2016-029	**185,99 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101 shortened protective tube **PLEUROFORM**™, NL = 100 mm				on request on request	

HYGRASGARD® KFTF-20-Q

Duct humidity and temperature sensors (± 1.8 %), incl. mounting flange, calibratable, with multi-range switching and active output

S+S REGELTECHNIK

KFTF-20-Q
with M12 connector,
with display (Tyr2)





KFTF-20-Q
with M12 connector,
without display (Tyr1)



HYGRASGARD® KFTF-20-Q	Duct humidity and temperature sensors (± 1,8 %), *Premium* (**with M12 connector**)						
Type / WG02	**Measuring Range / Readout** Humidity	Temperature	**Output** Humidity	Temperature	**Display** ● = **Q**	**Item No.**	**Price**
KFTF-20-Q						**IP 65**	
KFTF-20-I **Q**	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA	●	2003-4151-2100-001	**306,76 €**
KFTF-20-I **Q LCD**	0...100 % RH	(4x as above)	4...20 mA	4...20 mA	● ■	2003-4172-2100-001	**355,13 €**
KFTF-20-U **Q**	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V	●	2003-4151-1100-001	**306,76 €**
KFTF-20-U **Q LCD**	0...100 % RH	(4x as above)	0-10 V	0-10 V	● ■	2003-4172-1100-001	**355,13 €**
Housing variant "Q":	Cable connection **with M12 connector** (male, **5-pin**, A-code)						

ACCESSORIES			
SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel **V4A** (1.4404)	7000-0050-2200-100	**42,33 €**
	For further information, see chapter Accessories!		

KFF-20 / KFTF-20
with cable gland,
with display (Tyr2)





KFF-20 / KFTF-20
with cable gland,
without display (Tyr1)



HYGRASGARD® **KFF-20**	Duct humidity sensors (± 1,8 %), *Premium* (**with cable gland**)						
Type / WG02	**Measuring Range / Readout** Humidity	Temperature	**Output** Humidity	Temperature	**Display**	**Item No.**	**Price**
KFF-20						**IP 65**	
KFF-20-I	0...100 % RH	–	4... 20 mA	–		1201-3112-0000-030	**241,24 €**
KFF-20-I **LCD**	0...100 % RH	–	4... 20 mA	–	■	1201-8112-0400-030	**292,16 €**
KFF-20-U	0...100 % RH	–	0-10 V	–		1201-3111-0000-030	**241,24 €**
KFF-20-U **LCD**	0...100 % RH	–	0-10 V	–	■	1201-8111-0400-030	**292,16 €**
Housing variant:	Cable connection **with cable gland** (M12 connector on request)						

HYGRASGARD® **KFTF-20**	Duct humidity and temperature sensors (± 1,8 %), *Premium* (**with cable gland**)						
Type / WG02	**Measuring Range / Readout** Humidity	Temperature	**Output** Humidity	Temperature	**Display**	**Item No.**	**Price**
KFTF-20						**IP 65**	
KFTF-20-I	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4... 20 mA	4... 20 mA		1201-3112-1000-030	**264,83 €**
KFTF-20-I **LCD**	0...100 % RH	(4x as above)	4... 20 mA	4... 20 mA	■	1201-8112-1400-030	**313,22 €**
KFTF-20-U	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V		1201-3111-1000-030	**264,83 €**
KFTF-20-U **LCD**	0...100 % RH	(4x as above)	0-10 V	0-10 V	■	1201-8111-1400-030	**313,22 €**
Housing variant:	Cable connection **with cable gland** (M12 connector see **KFTF-20-Q**)						

ACCESSORIES			
SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel **V4A** (1.4404)	7000-0050-2200-100	**42,33 €**
	For further information, see chapter Accessories!		

HYGRASGARD® KFTF-20-VA

Duct humidity and temperature sensors (± 1.8 %), calibratable, with multi-range switching and active output

S+S REGELTECHNIK

Calibratable humidity and temperature sensor **HYGR**ASGARD® **KFTF-20-VA** (± 1.8 %) with metal sinter filter, rugged housing, **stainless steel V4A**, optionally with / without display, with cable gland or M12 connector according to DIN EN 61076-2-101.

It measures the relative humidity and the temperature of the air and converts the measurand into a standard signal of 0 - 10 V or 4...20 mA. It has four switchable temperature ranges and is applied in non-aggressive dust-free atmospheres in refrigeration, air conditioning, ventilation and clean room technology. These measuring transducers are designed for exact detection of humidity. A digital long-term stable sensor is used as measuring element for humidity measurement. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

KFTF-20-VA
with cable gland



KFTF-20-VAQ
with M12 connector

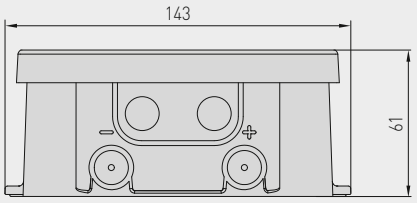


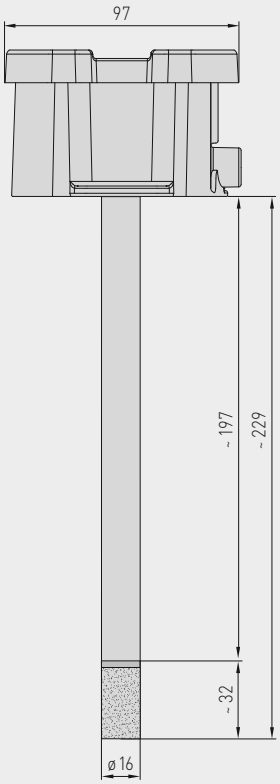
TECHNICAL DATA

Power supply:	24 V AC (± 20 %); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (ohm) = (U_b -14 V) / 0.02 A for I variant, see load resistance diagram
Load resistance:	R_L > 5 kOhm for U variant
Sensors:	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
HUMIDITY	
Measuring range, humidity:	0...100 % RH
Permitted humidity:	< 95 % RH, non-precipitating air
Deviation in humidity:	typically **± 1.8** % (10...90 % RH) at +25 °C, otherwise ± 2.0 %
Output humidity:	0 - 10 V for U variant 4...20 mA for I variant
TEMPERATURE	
Measuring range, temperature:	**multi-range switching** (see table) **–35...+35 °C; –35...+75 °C; 0...+50 °C; 0...+80 °C**
Ambient temperature:	storage –35...+85 °C; operation –30...+80 °C, non-precipitating
Deviation, temperature:	typically ± 0.2 K at +25 °C
Output, temperature:	0 - 10 V for U variant 4...20 mA for I variant
Electrical connection:	2-, 3-, or 4-wire connection (see connection diagram), 0.14 - 1.5 mm², via terminal screws
Cable connection:	**cable gland, stainless steel V2A** (1.4305) (M 20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) **or** **M12 connector** (male, 5-pin, A-code) according to DIN EN 61076-2-101
Housing:	**stainless steel V4A** (1.4571), with non-distortion cover bolting, impact resistant, high EMI shielding, corrosion, temperature, weather- and UV-resistant
Housing dimensions:	143 x 97 x 61 mm (Typ 2E)
Protective tube:	**made from stainless steel V2A** (1.4301), Ø 16 mm, NL = 197 mm
Sensor protection:	**metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable, stainless steel V4A (1.4404)
Process connection:	by screws via the mounting fixture on the housing
Long-term stability:	± 1 % per year
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713160960B (Skadi 2)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3
Optional:	**display with illumination,** three-line, cutout approx. 70 x 40 mm (W x H), to display the ACTUAL temperature and ACTUAL humidity
ACCESSORIES	(see table)

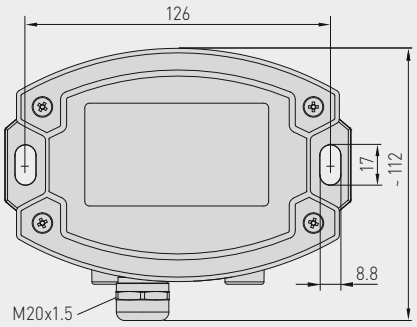
Dimensional drawing
[mm]

KFTF-20-VA

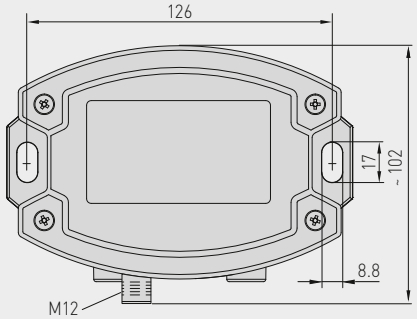




Housing with
cable gland



Housing with
M12 connector





SF-M
Metal sinter filter
(standard)



M12 connector
(male)

KFTF-20-VA
with cable gland
and display



KFTF-20-VAQ
with M12 connector
and display

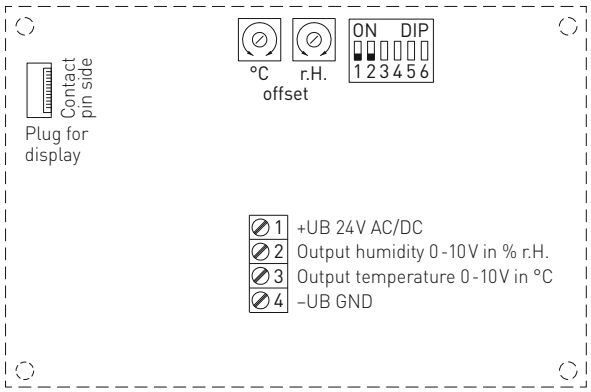


HYGRASGARD® KFTF-20-VA

Duct humidity and temperature sensors (± 1.8 %), calibratable, with multi-range switching and active output

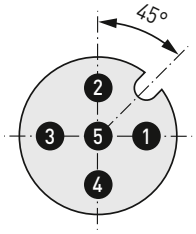
S+S REGELTECHNIK

Schematic diagram **KFTF-xx-U**



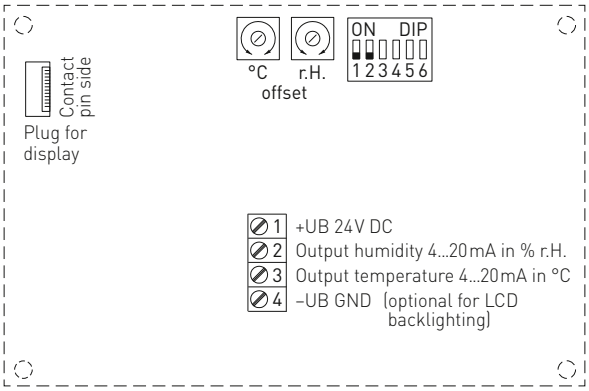
DIP 3, 4, 5, 6 are not assigned!

Pin assignment (M12) **KFTF-xx-U**



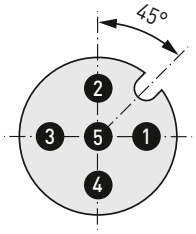
1. +UB 24V AC/DC
2. Output humidity 0-10V [% r.H.]
3. Output temperature 0-10V [°C]
4. –UB GND
5. Shield

Schematic diagram **KFTF-xx-I**



DIP 3, 4, 5, 6 are not assigned!

Pin assignment (M12) **KFTF-xx-I**



1. +UB 24V DC
2. Output humidity 4...20mA [% r.H.]
3. Output temperature 4...20mA [°C]
4. –UB GND (optional for LCD backlighting)
5. Shield

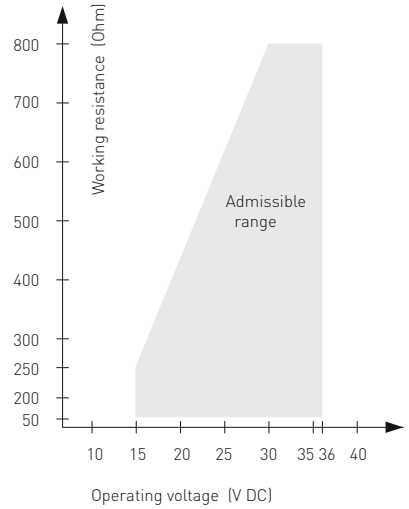
3- or 4-wire connection ** **KFTF-xx-I (Transmitter)**

1. +UB 24V DC
2. Output humidity in % r.H. 4...20mA
3. Output temperature in °C 4...20mA
4. –UB-GND (optional for backlighting)

4-wire connection **KFTF-xx-U**

1. +UB 24V AC/DC
2. Output humidity in % r.H. 0-10V
3. Output temperature in °C 0-10V
4. –UB-GND

Load resistance diagram 4..20mA **KFTF-xx-I**



Connection**:
3-wire connection for devices with/without display (not illuminated)
4-wire connection for devices with illuminated display

For the **I variant** the humidity path must be connected!

Temperature measuring ranges (adjustable)	DIP 1	DIP 2
–35...+75 °C	**ON**	**ON**
–35...+35 °C	OFF	OFF
0...+50 °C (default)	OFF	**ON**
0...+80 °C	**ON**	OFF

Duct humidity and temperature sensors (± 1.8 %), calibratable, with multi-range switching and active output

KFTF-20-VAQ
with display, hinged



Temperature table
MR: –35...+75 °C

°C	U_A [V]	I_A [mA]
-35	0.0	4.0
-30	0.5	4.7
-25	0.9	5.5
-20	1.4	6.2
-15	1.8	6.9
-10	2.3	7.6
-5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

Temperature table
MR: –35...+35 °C

°C	U_A [V]	I_A [mA]
-35	0.0	4.0
-30	0.7	5.1
-25	1.4	6.3
-20	2.1	7.4
-15	2.9	8.6
-10	3.6	9.7
-5	4.3	10.9
0	5.0	12.0
5	5.7	13.1
10	6.4	14.3
15	7.1	15.4
20	7.9	16.6
25	8.6	17.7
30	9.3	18.9
35	10.0	20.0

Temperature table
MR: 0...+50 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

Temperature table
MR: 0...+80 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.6	5.0
10	1.3	6.0
15	1.9	7.0
20	2.5	8.0
25	3.1	9.0
30	3.8	10.0
35	4.4	11.0
40	5.0	12.0
45	5.6	13.0
50	6.3	14.0
55	6.9	15.0
60	7.5	16.0
65	8.1	17.0
70	8.8	18.0
75	9.4	19.0
80	10.0	20.0

Humidity table
MR: 0...100 % RH

% RH	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

HYGRASGARD® KFTF-20-VAQ

Duct humidity and temperature sensors (± 1.8 %), calibratable, with multi-range switching and active output

S+S REGELTECHNIK

KFTF-20-VAQ
with M12 connector



HYGRASGARD® **KFTF-20-VAQ**	Duct humidity and temperature sensors (± 1,8 %), *ID* **(with M12 connector)**						
Type / WG021	**Measuring Range / Readout** Humidity	Temperature	**Output** Humidity	Temperature	**Display** ● = **Q**	**Item No.**	**Price**
KFTF-20-VAQ							
KFTF-20-I VA**Q**	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA	●	2003-4161-2100-001	**662,36 €**
KFTF-20-I VA**Q LCD**	0...100 % RH	(4x as above)	4...20 mA	4...20 mA	● ■	2003-4162-2100-001	**817,76 €**
KFTF-20-U VA**Q**	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V	●	2003-4161-1100-001	**662,36 €**
KFTF-20-U VA**Q LCD**	0...100 % RH	(4x as above)	0-10 V	0-10 V	● ■	2003-4162-1100-001	**817,76 €**
Housing variant "Q":	Cable connection **with M12 connector** (male, **5-pin**, A-code)						

ACCESSORIES			
SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel **V4A** (1.4404)	7000-0050-2200-100	**42,33 €**
	For further information, see chapter Accessories!		

Duct humidity and temperature sensors (± 1.8 %), calibratable, with multi-range switching and active output



KFTF-20-VA
with cable gland

HYGRASGARD® **KFTF-20-VA**	Duct humidity and temperature sensors (± 1,8 %), *ID* (**with cable gland**)						
Type / WG02I	**Measuring Range / Readout** Humidity	Temperature	**Output** Humidity	Temperature	**Display**	**Item No.**	**Price**
KFTF-20-VA							
KFTF-20-I VA	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4... 20 mA	4... 20 mA		2003-4161-2200-001	**623,83 €**
KFTF-20-I VA **LCD**	0...100 % RH	(4x as above)	4... 20 mA	4... 20 mA	■	2003-4162-2200-001	**779,23 €**
KFTF-20-U VA	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V		2003-4161-1200-001	**623,83 €**
KFTF-20-U VA **LCD**	0...100 % RH	(4x as above)	0-10 V	0-10 V	■	2003-4162-1200-001	**779,23 €**
Housing variant:	Cable connection **with cable gland**						

ACCESSORIES			
SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel **V4A** (1.4404)	7000-0050-2200-100	**42,33 €**
	For further information, see chapter Accessories!		

HYGRASREG® KFTF-35

Condensation-protected duct humidity and temperature sensor for "high humidity", relative / absolute humidity, mixture ratio, dew point, wet bulb temperature and temperature, incl. mounting flange, calibratable, with multi-range switching, with active and switching output

NEW

S+S REGELTECHNIK

Condensation-protected ductsensor **HYGR**ASREG® **KFTF-35** with active and switching output, housing made of impact-resistant plastic with quick-locking screws, cable gland, plastic sinter filter (replaceable), optionally with / without display, for detecting relative humidity (0...100 % RH) and temperature (4 switchable measuring ranges, max. 0...+100 °C) as well as for determining various parameters of humidity measurement technology. The measuring transducer converts the measured variables into a standard signal of 0-10 V or 4...20 mA.

The unit is specially designed for use in the **high humidity range** (95...99 % RH). A long-term stable, **digital humidity and temperature sensor** is used. Overtemperature prevents or hinders dew formation on the humidity sensor. A second, separate temperature measuring element is used to determine the actual relative humidity of the ambient air. The following measured variables are calculated internally from these parameters and are retrievable via output **OUT3**: absolute humidity, mixing ratio, dew point and wet bulb temperature (can be changed via DIP switch).

The sensor is used in medical technology, refrigeration technology, control technology, air conditioning and clean room technology. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

SF-K
Plastic sinter filter (standard)



SF-M
Metal sinter filter (optional)

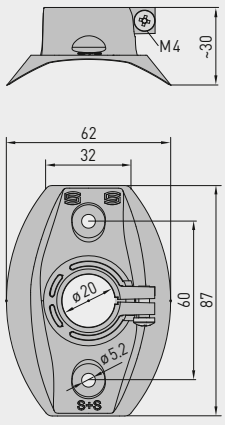


TECHNICAL DATA	
Power supply:	24 V AC/DC (± 10 %)
Working resistance:	> 100 kOhm for U variant; 100...500 Ohm for I variant
Power consumption:	typically < 6 W at 24 V DC, peak current 200 mA
Measured variables:	relative humidity [% RH], temperature [°C]
Parameters:	absolute humidity [g/m³], mixture ratio [g/kg], dew point [°C], wet bulb temperature [°C]
Outputs:	3 active outputs (0-10 V or 4...20 mA) 1 changeover contact
Sensor:	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability, with condensation protection through heating function (plus a second, separate temperature measuring element)
Sensor protection:	**plastic** sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional **metal** sinter filter, Ø 16 mm, L = 32 mm)
HUMIDITY	
Measuring range, humidity:	0...100 % RH
Deviation in humidity:	typically ± 3.0 % (30...70 % RH) at +25 °C, otherwise ± 3.5 % (deviations of alternative parameters result from deviations from humidity and temperature.)
Output humidity:	0-10 V for U variant; 4...20 mA for I variant
TEMPERATURE	
Temperature measuring range:	**multi-range switching with 4 switchable measuring ranges** (see table) 0...+50 °C (default); –20...+50 °C; –20...+80 °C; 0...+100 °C
Deviation in temperature:	typically ± 0.5 K at +25 °C
Temperature output:	0-10 V for U variant; 4...20 mA for I variant
Long-term stability:	± 1 % per year
Response time (t90):	< 60 s
Warm-up time:	< 10 min
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Cable connection:	**cable gland,** plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Typ 2)
Protective tube:	**PLEUROFORM**™, material polyamide (PA6), with torsion protection, Ø 20 mm, NL = 235 mm (optionally 100 mm), v_{max} = 30 m/s (air)
Process connection:	via mounting flange made of plastic (included in the scope of delivery)
Ambient temperature:	storage –20...+50 °C; operation –20...+50 °C
Permitted humidity:	< 99 % RH, non-precipitating air free of harmful substances
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) housing, IP 20 sensor technology
Standards:	CE-conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU
FUNCTION	A constant overtemperature of the humidity sensor makes its dewing considerably more difficult or prevents its formation within the limits of the system. A faster reaction speed is achieved in the case of humidity fluctuations, even in the range above 95 % RH. The sensor (combined humidity and temperature measuring element) is heated approx. 3 K above the ambient temperature. The actual relative humidity is determined from the measured relative humidity at overtemperature, the chip temperature of the sensor and the ambient temperature (via a second, separate temperature measuring element).

MFT-20-K
Mounting flange, plastic



Dimensional drawing [mm] **MFT-20-K**



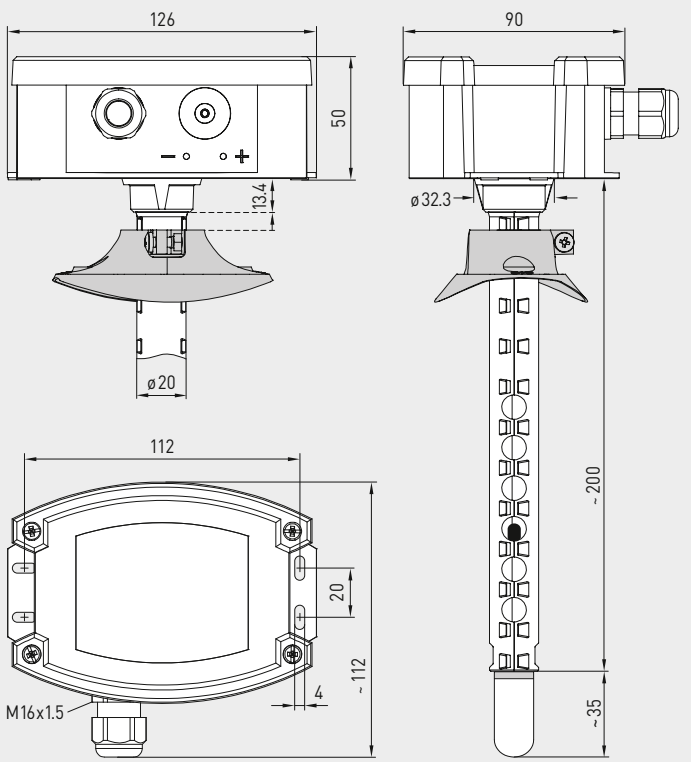
NEW

HYGRASREG® KFTF-35

Condensation-protected duct humidity and temperature sensor for "high humidity", relative / absolute humidity, mixture ratio, dew point, wet bulb temperature and temperature, incl. mounting flange, calibratable, with multi-range switching, with active and switching output

Dimensional drawing
[mm]

KFTF-35



KFTF-35
with plastic sinter filter
(standard)



Temperature table
MR: –20...+80 °C

°C	U_A [V]	I_A [mA]
-20	0.0	4.0
-15	0.5	4.8
-10	1.0	5.6
-5	1.5	6.4
0	2.0	7.2
5	2.5	8.0
10	3.0	8.8
15	3.5	9.6
20	4.0	10.4
25	4.5	11.2
30	5.0	12.0
35	5.5	12.8
40	6.0	13.6
45	6.5	14.4
50	7.0	15.2
55	7.5	16.0
60	8.0	16.8
65	8.5	17.6
70	9.0	18.4
75	9.5	19.2
80	10.0	20.0

Temperature table
MR: –20...+50 °C

°C	U_A [V]	I_A [mA]
-20	0.0	4.0
-15	0.7	5.1
-10	1.4	6.3
-5	2.1	7.4
0	2.9	8.6
5	3.6	9.7
10	4.3	10.9
15	5.0	12.0
20	5.7	13.1
25	6.4	14.3
30	7.1	15.4
35	7.9	16.6
40	8.6	17.7
45	9.3	18.9
50	10.0	20.0

Temperature table
MR: 0...+50 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

Temperature table
MR: 0...+100 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

Humidity table
MR: 0...100 % RH

% RH	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

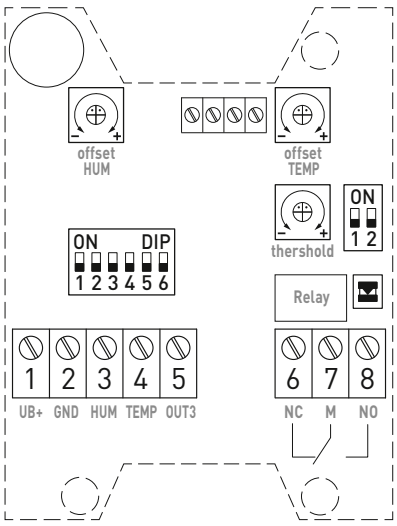
HYGRASREG® KFTF-35

Condensation-protected duct humidity and temperature sensor for "high humidity", relative / absolute humidity, mixture ratio, dew point, wet bulb temperature and temperature, incl. mounting flange, calibratable, with multi-range switching, with active and switching output

NEW

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Schematic diagram **KFTF-35-xx**



Connecting diagram **KFTF-35-I**

1	+UB 24V AC/DC
2	–UB GND
3	Output Humidity 4...20mA
4	Output Temperature 4...20mA
5	Output altern. parameters 4...20mA
6	NC Normally Closed
7	M Common
8	NO Normally Open

Connecting diagram **KFTF-35-U**

1	+UB 24V AC/DC
2	–UB GND
3	Output Humidity 0-10V
4	Output Temperature 0-10V
5	Output altern. parameters 0-10V
6	NC Normally Closed
7	M Common
8	NO Normally Open

ON DIP
1 2 3 4 5 6

Measuring ranges temperature	**DIP 1**	**DIP 2**
0...+50 °C (default)	OFF	OFF
–20...+50 °C	**ON**	OFF
–20...+80 °C	OFF	**ON**
0...+100 °C	**ON**	**ON**

Measuring ranges alternative parameters	**DIP 3**	**DIP 4**	**DIP 5**
(a.F.) **0...20 g/m³** (default)	OFF	OFF	OFF
(a.F.) 0...25 g/m³	**ON**	OFF	OFF
(MV) 0...20 g/kg	OFF	**ON**	OFF
(MV) 0...25 g/kg	**ON**	**ON**	OFF
(TP) 0...+50 °C	OFF	OFF	**ON**
(TP) –20...+50 °C	**ON**	OFF	**ON**
(FKT) –30...+30 °C	OFF	**ON**	**ON**
(FKT) –20...+50 °C	**ON**	**ON**	**ON**

(a.F.) = absolute humidity [g/m³]
(MV) = mixture ratio [g/kg]
(TP) = dew point [°C]
(FKT) = wet bulb temperature [°C]

Note: For factory service only, it must be set to "OFF" during operation!	**DIP 6**
Operation (default)	OFF

ON
1 2

Relay function assignment	**DIP 1**	**DIP 2**
inactive (default)	OFF	OFF
Humidity	**ON**	OFF
Temperature	OFF	**ON**
alternative parameters	**ON**	**ON**

Condensation-protected duct humidity and temperature sensor for "high humidity", relative / absolute humidity, mixture ratio, dew point, wet bulb temperature and temperature, incl. mounting flange, calibratable, with multi-range switching, with active and switching output



HYGRASREG® **KFTF-35**	Condensation-protected duct sensor for high humidity						
Type / WG02	**Measuring Range** Humidity	Temperature	**Output active**	**Output switching**	**Display**	**Item No.**	**Price**
KFTF-35-I						**I variant**	
KFTF-35-I/W	**0...100 % RH** 0...20 g/m³ (a.F.) 0...25 g/m³ (a.F.) 0...20 g/kg (MV) 0...25 g/kg (MV) 0...+50 °C (TP) –20...+50 °C (TP) –30...+30 °C (FKT) –20...+50 °C (FKT)	**0...+50 °C** –20...+50 °C –20...+80 °C 0...+100 °C	3x **4...20 mA**	1x Changeover contact		1201-814B-1000-000	**716,63 €**
KFTF-35-I/W LCD	(as above)	(as above)	3x **4...20 mA**	1x Changeover contact	■	1201-814B-1200-000	**819,00 €**
KFTF-35-U						**U variant**	
KFTF-35-U/W	(as above)	(as above)	3x **0-10 V**	1x Changeover contact		1201-814A-1000-000	**716,63 €**
KFTF-35-U/W LCD	(as above)	(as above)	3x **0-10 V**	1x Changeover contact	■	1201-814A-1200-000	**819,00 €**
Optional:	shortened protection tube **PLEUROFORM**™ NL = 100 mm					on request	
Note	**Alternative parameters** are calculated internally from the measured variables, which are retrievable via the active output **OUT3**: absolute humidity, mixing ratio, dew point and wet bulb temperature (can be changed via DIP switch)						
ACCESSORIES							
SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel **V4A** (1.4404)					7000-0050-2200-100	**42,33 €**
	for further information see see chapter Accessories!						

HYGRASGARD® KAVTF

Duct outdoor humidity sensors (± 2.0 %), including mounting flange, for mixture ratio, relative / absolute humidity, dew point, enthalpy (switchable) and temperature, with multi-range switching, with active output

S+S REGELTECHNIK

The universal humidity sensors **HYGR**ASGARD® **KAVTF** with 6 output sizes are used to determine diverse characteristic variables in humidity measurement. The relative humidity and temperature of the ambient air are measured. From these measurands, the different characteristic variables are internally calculated.

For device version x-U, two outputs of 0 - 10 V are available, for Version x-I two outputs of 4...20 mA. Here, the output variables for these outputs can be defined using DIP switches. Selectable for output 1 are relative humidity [% RH], absolute humidity [g / m³], mixture ratio [g / kg], dew point temperature [°C], or enthalpy [kJ / kg] (while neglecting the atmospheric air pressure). At output 2, four different measuring ranges for ambient temperature [°C] are selectable. Ex-factory condition (default) for output 1 is relative humidity 0...100 % RH, for output 2 temperature measuring range 0...+50 °C.

Due to the different configuration alternatives provided, numerous measurement and control tasks can be solved by just one device. These devices are to be operated in pollutant-free non-precipitating air, with neither above-atmospheric nor below-atmospheric pressure at the sensors. Application examples include medical technology, refrigeration, air conditioning, and clean room technology. These sensors are appropriate for duct installation.

TECHNICAL DATA

Power supply:	24 V AC (± 20 %); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (ohm) = (U_b -14 V) / 0.02 A for I variant
Load resistance:	R_L > 5 kOhm for U variant
Power consumption:	< 1 W at 24 V DC; < 2 VA at 24 V AC
Sensors:	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
Sensor protection:	**plastic** sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional **metal** sinter filter, Ø 16 mm, L = 32 mm)
HUMIDITY	
Measuring range, humidity:	**multi-range switching with** **8 switchable measuring ranges** (see table) 0...100 % RH (default)
Operating range, humidity:	10...95 % RH, without formation of dew
Deviation, humidity:	typically **± 2.0** % (20...80 % RH) at +25 °C, otherwise ± 3.0 % Deviations of other outputs result from deviations of humidity and temperature.
Output 1, humidity:	0 - 10 V for U variant (see table) 4...20 mA for I variant (see table)
TEMPERATURE	
Measuring range, temperature:	**multi-range switching with** **4 switchable measuring ranges** (see table) 0...+50 °C (default); –20...+80 °C; –35...+75 °C; –35...+35 °C
Operating range, temperature:	–35...+85 °C sensors
Deviation, temperature:	typically ± 0.2 K at +25 °C
Output 2, temperature:	0 - 10 V for U variant (see table) 4...20 mA for I variant (see table)
Ambient temperature:	storage –35...+85 °C; operation –30...+70 °C, non-precipitating
Electrical connection:	4-wire connection for U variant 3-wire connection for I variant (Transmitter) 0.14 - 1.5 mm², via terminal screws
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (on request)
Protective tube:	**PLEUROFORM**™, material polyamide (PA6), with torsion protection Ø 20 mm, NL = 235 mm (optionally 100 mm), v_{max} = 30 m/s (air) (on request, optional **stainless steel V2A** (1.4301), Ø 16 mm)
Process connection:	by mounting flange, plastic (included in the scope of delivery)
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) in the built-in state, Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU
Optional:	two-line **display with illumination,** cutout approx. 36 x 15 mm (W x H), for displaying actual temperature and actual humidity, as well as the selectable output variables
ACCESSORIES	see last chapter

SF-K
Plastic sinter filter (standard)



SF-M
Metal sinter filter (optional)



Protective tube stainless steel
(optional on request)

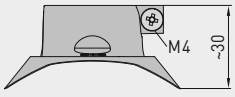


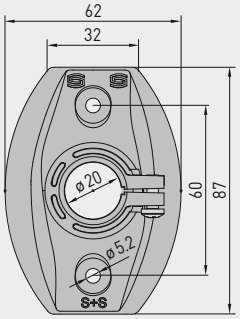
M12 connector
(optional on request)

MFT-20-K
Mounting flange, plastic



Dimensional drawing [mm] **MFT-20-K**



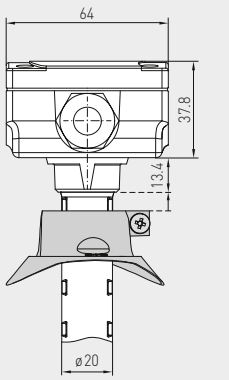


Duct outdoor humidity sensors (± 2.0 %), including mounting flange, for mixture ratio, relative / absolute humidity, dew point, enthalpy (switchable) and temperature, with multi-range switching, with active output

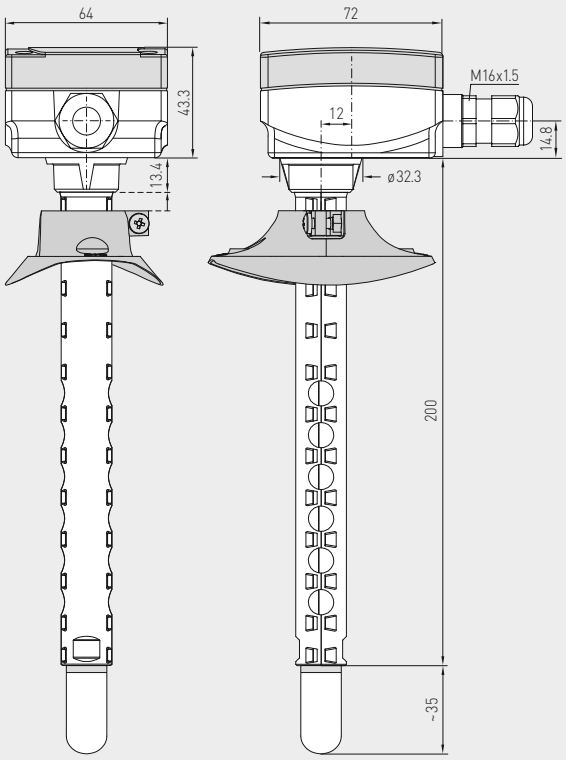
Dimensional drawing
[mm]

KAVTF

without display



with display



KAVTF
with plastic sinter filter
(standard)



Temperature table
MR: –35...+75 °C

°C	U_A [V]	I_A [mA]
-35	0.0	4.0
-30	0.5	4.7
-25	0.9	5.5
-20	1.4	6.2
-15	1.8	6.9
-10	2.3	7.6
-5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

Temperature table
MR: –35...+35 °C

°C	U_A [V]	I_A [mA]
-35	0.0	4.0
-30	0.7	5.1
-25	1.4	6.3
-20	2.1	7.4
-15	2.9	8.6
-10	3.6	9.7
-5	4.3	10.9
0	5.0	12.0
5	5.7	13.1
10	6.4	14.3
15	7.1	15.4
20	7.9	16.6
25	8.6	17.7
30	9.3	18.9
35	10.0	20.0

Temperature table
MR: 0...+50 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

Temperature table
MR: –20...+80 °C

°C	U_A [V]	I_A [mA]
-20	0.0	4.0
-15	0.5	4.8
-10	1.0	5.6
-5	1.5	6.4
0	2.0	7.2
5	2.5	8.0
10	3.0	8.8
15	3.5	9.6
20	4.0	10.4
25	4.5	11.2
30	5.0	12.0
35	5.5	12.8
40	6.0	13.6
45	6.5	14.4
50	7.0	15.2
55	7.5	16.0
60	8.0	16.8
65	8.5	17.6
70	9.0	18.4
75	9.5	19.2
80	10.0	20.0

Humidity table
MR: 0...100 % RH

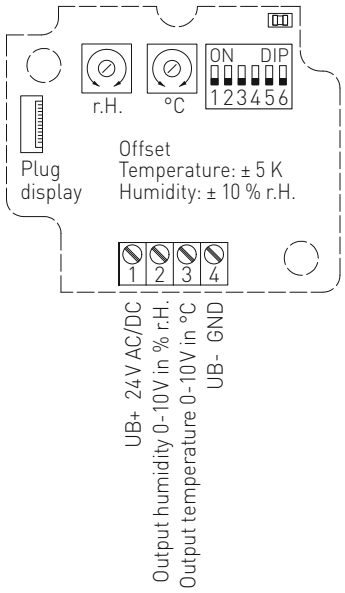
% RH	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

HYGRASGARD® KAVTF

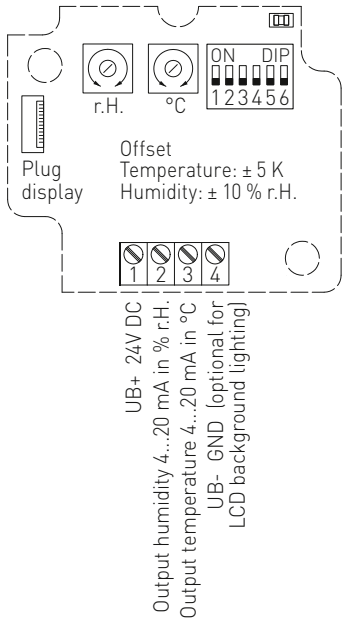
Duct outdoor humidity sensors (± 2.0 %), including mounting flange, for mixture ratio, relative / absolute humidity, dew point, enthalpy (switchable) and temperature, with multi-range switching, with active output

S+S REGELTECHNIK

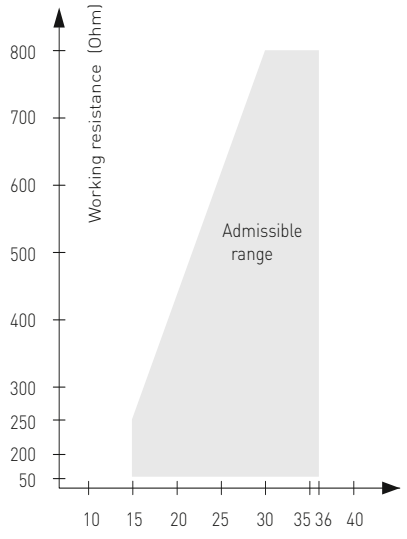
Schematic diagram **KAVTF-U** with display



Schematic diagram **KAVTF-I** with display



Load resistance diagram **KAVTF-I**
4.. 20 mA



Temperature measuring ranges (adjustable)	DIP 1	DIP 2
0...+50 °C (default)	OFF	OFF
–20...+80 °C	**ON**	OFF
–35...+75 °C	OFF	**ON**
–35...+35 °C	**ON**	**ON**

Switchable measuring ranges (adjustable)		DIP 3	DIP 4	DIP 5
RH:	**0...100 %** (default)	OFF	OFF	OFF
MR:	0...50 g / kg	**ON**	OFF	OFF
MR:	0...80 g / kg	OFF	**ON**	OFF
A.H.:	0...50 g / m³	OFF	OFF	**ON**
A.H.:	0...80 g / m³	**ON**	**ON**	OFF
DP:	0...+50 °C	**ON**	OFF	**ON**
DP:	–20...+80 °C	OFF	**ON**	**ON**
ENT.:	0...85 kJ / kg	**ON**	**ON**	**ON**

Possible parameters:

(RH) = relative humidity in %
(MR) = mixture ratio in g / kg
(A.H.) = absolute humidity in g / m³
(DP) = dew point in °C
(ENT.) = enthalpy in kJ / kg

Service display / output (adjustable)	DIP 6
Display °C and % RH, output of set measurements via DIP 1-5 (service mode for setting °C and % RH)	**ON**
Display and output of set measurements via DIP 1-5	OFF

KAVTF
with plastic sinter filter
SF-K (standard)



KAVTF
with metal sinter filter
SF-M (optional)

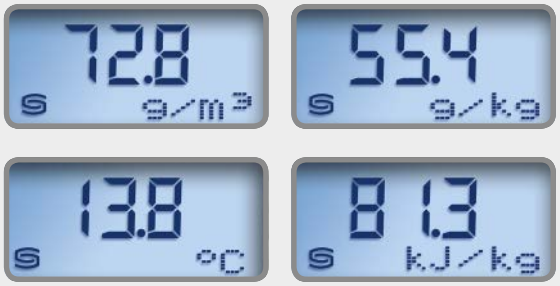


Duct outdoor humidity sensors (± 2.0 %), including mounting flange, for mixture ratio, relative / absolute humidity, dew point, enthalpy (switchable) and temperature, with multi-range switching, with active output

Display Standard — **KAVTF Display**



Displays alternative output variables — **KAVTF Display**



Displays service mode — **KAVTF Display**



By default, the display alternates between the **actual temperature** and the **actual humidity** (relative humidity). In this case, the first line displays the value while the second line displays the corresponding unit:

Temperature in °C
Relative humidity in % RH

For improved legibility, backlighting is provided.

DIP switches can be used to display an **alternative output variable** instead of the standard display:

Absolute humidity in g / m³
Dew point in °C
Mixture ratio in g / kg
Enthalpy in kJ / kg

The **service mode** simultaneously displays (alternately in the first and second lines) the **actual temperature** and the **actual humidity** (relative humidity).



KAVTF
with display

HYGRASGARD® KAVTF Duct outdoor humidity sensors (± 2.0 %)

Type / WG01	Measuring Range Humidity		Temperature		Output Humidity	Display Temperature		Item No.	Price
KAVTF-I	(switchable)		(switchable)					**I-variant**	
KAVTF-I	0 ...100 % RH	(default)	0...+50 °C	(default)	4...20 mA	4...20 mA		1201-3162-6000-029	**187,44 €**
	0...50 g / kg	(MR)	–20...+80 °C						
	0...80 g / kg	(MR)	–35...+75 °C						
	0...50 g / m³	(A.H.)	–35...+35 °C						
	0...80 g / m³	(A.H.)							
	0...+50 °C	(DP)							
	–20...+80 °C	(DP)							
	0...85 kJ / kg	(ENT.)							
KAVTF-I **LCD**	(8x as above)		(4x as above)		4...20 mA	4...20 mA	■	1201-3162-6200-029	**247,92 €**
KAVTF-U								**U-variant**	
KAVTF-U	(8x as above)		(4x as above)		0-10 V	0-10 V		1201-3161-6000-029	**187,44 €**
KAVTF-U **LCD**	(8x as above)		(4x as above)		0-10 V	0-10 V	■	1201-3161-6200-029	**247,92 €**
Extra charge:	Other non-standard ranges optional								**149,47 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101							on request	
	shortened protective tube **PLEUROFORM**™, NL = 100 mm							on request	

ACCESSORIES			
SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel **V4A** (1.4404)	7000-0050-2200-100	**42,33 €**

HYGRASGARD® ESFTF

Screw-in humidity and temperature sensor for pressure systems, mixing ratio, relative / absolute humidity, dew point and temperature, calibratable, with multi-range switching and active output

NEW

S+S REGELTECHNIK

Calibratable screw-in sensor **HYGR**ASGARD® **ESFTF** in a housing made of an impact-resistant plastic with quick-locking screws, with cable gland (optional M12 connector as per DIN EN 61076-2-101), duct tube with thread (G1/2") and metal sinter filter (replaceable).

The sensor is used for detecting the relative humidity (0...100 % RH) and the temperature (4 switchable measuring ranges) in **compressed air lines up to max. 10 bar**. The measuring transducer converts the measured values into a standard signal of 4...20 mA or 0 - 10 V. Further parameters are calculated internally from the measured values, that are retrievable via the humidity output: absolute humidity, mixing ratio and dew point temperature (can be changed via DIP switch).

Furthermore, the unit boasts a **sensor protection function for high humidity** (95...99 % RH).
The measuring element is heated automatically in the critical range and thus protected against condensation.
The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.
It must be installed vertically with the humidity sensor pointing downwards.

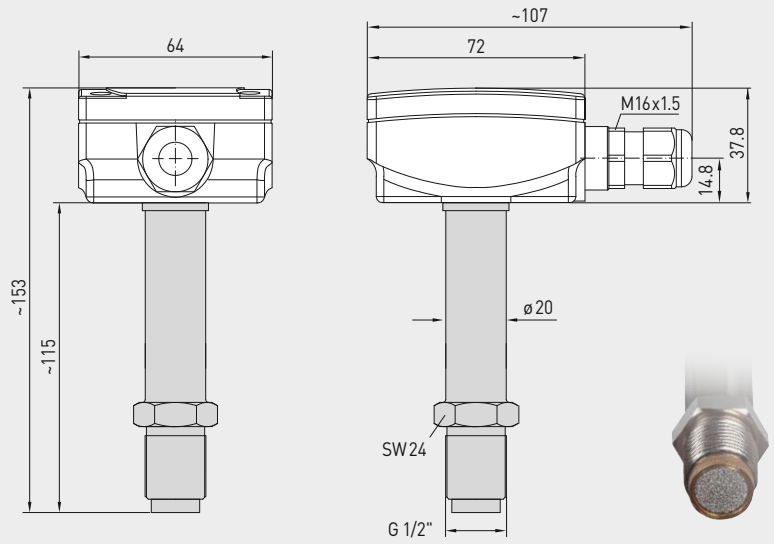
TECHNICAL DATA

Power supply:	24 V AC/DC (± 10 %) for U variant; 15...36 V DC for I variant, depending on working resistance
Working resistance:	RL_{max} = (UB – 15 V) / 0.02 A for I variant, see working resistance diagram
Power consumption:	< 1.1 VA for U variant; < 1.5 W for I variant
Data points:	relative humidity [% RH], absolute humidity [g/m³], mixing ratio [g/kg], dew point [°C], temperature [°C]
HUMIDITY	
Sensor:	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
Sensor protection:	metal sinter filter, Ø 20 mm, replaceable, with condensation protection through heating function
Measuring range, humidity:	0...100 % RH (default)
Deviation in humidity:	typically ± 3.0 % (30...70 % RH) at +25 °C, otherwise ± 3.5 % (deviations of alternative parameters result from deviations from humidity and temperature.)
Long-term stability:	± 1 % per year
Output humidity:	0 - 10 V for U variant; 4...20 mA for I variant
TEMPERATURE	
Temperature measuring range:	**multi-range switching with** **4 switchable measuring ranges** (see table) 0...+50 °C (default); –20...+80 °C; –30...+70 °C; 0...+100 °C
Deviation in temperature:	typically ± 0.5 K at +25 °C
Temperature output:	0 - 10 V for U variant; 4...20 mA for I variant
Response time (t90):	< 60 s
Warm-up time:	< 5 min
Electrical connection:	4-wire for U variant; 3-wire for I variant; 0.14 - 1.5 mm², via terminal screws
Housing:	plastic, UV-resistant, polyamide material, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016)
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1)
Cable connection:	**cable gland** made of plastic (M16 x 1.5; with strain relief, replaceable, max. inner diameter 10.4 mm) **or** **M12 connector** as per DIN EN 61076-2-101 (on request)
Protective tube:	made out of metal, Ø 20 mm, NL = 115 mm, compressive strength p_{max} = 10 bar
Process connection:	thread G1/2", immersion depth 25 mm
Ambient temperature:	storage –20...+50 °C; operation –20...+50 °C
Permitted humidity:	< 99 % RH, non-precipitating air free of harmful substances
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) in the built-in state, sensors IP 30, housing tested, TÜV SÜD, report no. 713139052 (Tyr 1)
Standards:	CE-conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU
FUNCTION	**sensor protection function for high humidity** (95...99 % RH) If the relative humidity exceeds the factory-set threshold of 95 % RH, a temporally restricted heating function is activated and the sensor is protected against condensation. In this operating state, the output signals remain at the previous measured values prior to activating the heating function.

Screw-in humidity and temperature sensor for pressure systems, mixing ratio, relative / absolute humidity, dew point and temperature, calibratable, with multi-range switching and active output

Dimensional drawing
[mm]

ESFTF



Metal sinter filter
(replaceable)

ESFTF



Temperature table
MR: –30...+70 °C

°C	U_A [V]	I_A [mA]
-30	0.0	4.0
-25	0.5	4.8
-20	1.0	5.6
-15	1.5	6.4
-10	2.0	7.2
-5	2.5	8.0
0	3.0	8.8
5	3.5	9.6
10	4.0	10.4
15	4.5	11.2
20	5.0	12.0
25	5.5	12.8
30	6.0	13.6
35	6.5	14.4
40	7.0	15.2
45	7.5	16.0
50	8.0	16.8
55	8.5	17.6
60	9.0	18.4
65	9.5	19.2
70	10.0	20.0

Temperature table
MR: –20...+80 °C

°C	U_A [V]	I_A [mA]
-20	0.0	4.0
-15	0.5	4.8
-10	1.0	5.6
-5	1.5	6.4
0	2.0	7.2
5	2.5	8.0
10	3.0	8.8
15	3.5	9.6
20	4.0	10.4
25	4.5	11.2
30	5.0	12.0
35	5.5	12.8
40	6.0	13.6
45	6.5	14.4
50	7.0	15.2
55	7.5	16.0
60	8.0	16.8
65	8.5	17.6
70	9.0	18.4
75	9.5	19.2
80	10.0	20.0

Temperature table
MR: 0...+50 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

Temperature table
MR: 0...+100 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

Humidity table
MR: 0...100 % RH

% RH	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

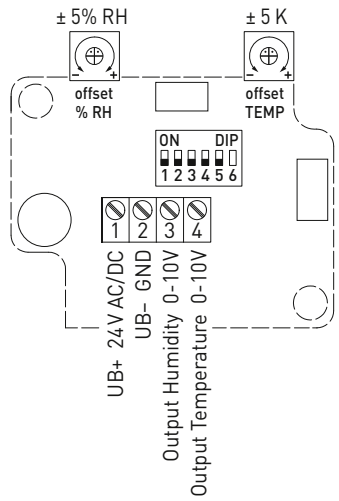
HYGRASGARD® ESFTF

Screw-in humidity and temperature sensor for pressure systems, mixing ratio, relative /absolute humidity, dew point and temperature, calibratable, with multi-range switching and active output

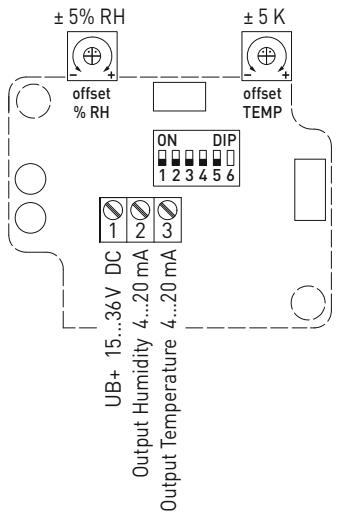
NEW

S+S REGELTECHNIK

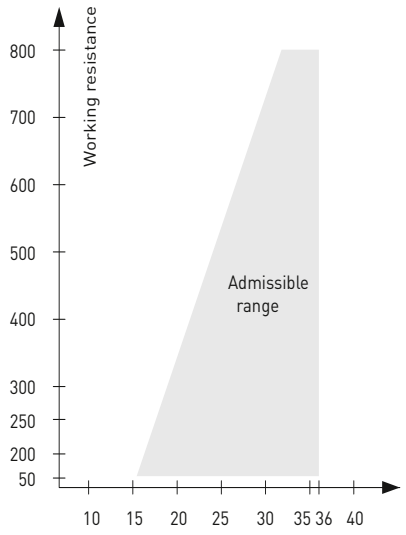
Schematic diagram **ESFTF-U**



Schematic diagram **ESFTF-I**



Load resistance diagram **ESFTF-I**
4.. 20 mA



Connecting diagram **ESFTF-U**

1 UB+ 24 V AC/DC
2 UB– GND
3 Output Humidity 0-10 V
4 Output Temperature 0-10 V

Connecting diagram **ESFTF-I**

1 UB+ 15...36 V DC
2 Output Humidity 4...20 mA
3 Output Temperature 4...20 mA

Temperature measuring ranges (adjustable)	**DIP 1**	**DIP 2**
0...+50 °C (default)	OFF	OFF
–20...+80 °C	**ON**	OFF
–30...+70 °C	OFF	**ON**
0...+100 °C	**ON**	**ON**

Switchable measuring ranges (adjustable)		**DIP 3**	**DIP 4**	**DIP 5**
(RH)	**0...100** % (default)	OFF	OFF	OFF
(a.F.)	0...50 g/m³	**ON**	OFF	OFF
(a.F.)	0...80 g/m³	OFF	**ON**	OFF
(MV)	0...50 g/kg	**ON**	**ON**	OFF
(MV)	0...80 g/kg	OFF	OFF	**ON**
(TP)	0...+50 °C	**ON**	OFF	**ON**
(TP)	–20...+50 °C	OFF	**ON**	**ON**
(TP)	–20...+80 °C	**ON**	**ON**	**ON**

(RH) = Relative Humidity [% RH]
(MV) = Mixing Ratio [g/kg]
(a.F.) = Absolute Humidity [g/m³]
(TP) = Dew Point [°C]

Note: **DIP 6** is not assigned!

Screw-in humidity and temperature sensor for pressure systems, mixing ratio, relative / absolute humidity, dew point and temperature, calibratable, with multi-range switching and active output

ESFTF





HYGRASGARD® **ESFTF**	Screw-in humidity and temperature sensor for pressure systems						
Type / WG02	**Measuring range** Humidity	Temperature	**Output** Humidity	Temperature	**Display**	**Item no.**	**Price**
ESFTF-I	**(switchable)**	**(switchable)**				**I variant**	
ESFTF-I	**0...100 % RH** 0...50 g/m³ (a.F.) 0...80 g/m³ (a.F.) 0...50 g/kg (MV) 0...80 g/kg (MV) 0...+50 °C (TP) –20...+50 °C (TP) –20...+80 °C (TP)	**0...+50 °C** –20...+80 °C –30...+70 °C 0...+100 °C	4...20 mA	4...20 mA		1201-2112-1000-000	**528,94 €**
ESFTF-I **LCD**	(as above)	(as above)	4...20 mA	4...20 mA	■	1201-2112-1200-000	**633,41 €**
ESFTF-U	**(switchable)**	**(switchable)**				**U variant**	
ESFTF-U	**0...100 % RH** 0...50 g/m³ (a.F.) 0...80 g/m³ (a.F.) 0...50 g/kg (MV) 0...80 g/kg (MV) 0...+50 °C (TP) –20...+50 °C (TP) –20...+80 °C (TP)	**0...+50 °C** –20...+80 °C –30...+70 °C 0...+100 °C	0-10 V	0-10 V		1201-2111-1000-000	**528,94 €**
ESFTF-U **LCD**	(as above)	(as above)	0-10 V	0-10 V	■	1201-2111-1200-000	**633,41 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101					on request	

HYGRASGARD® RPFF-SD

Pendulum room humidity sensors (± 2.0 %), calibratable, with active output

S+S REGELTECHNIK

The calibratable pendulum room humidity sensor **HYGR**ASGARD® **RPFF-SD** with plastic sinter filter measures the relative humidity of air. It converts the measurand humidity into a standard signal of 4...20 mA. Relative humidity (in % RH) is the quotient of water vapour partial pressure divided by the saturation vapour pressure at the respective gas temperature.

The sensor applied in non-aggressive dust-free atmospheres in refrigeration, air conditioning, ventilation and clean room technology, hotels, technical rooms, meeting rooms and convention centres. These measuring transducers are designed for precise detection of humidity. A digital long-term stable sensor is used as a measuring element for humidity measurement. This sensor is suitable for duct installation, as a pendulum sensor, or for integration in equipment.

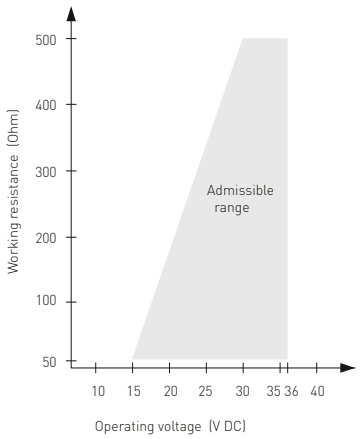
TECHNICAL DATA

Power supply:	15...36 V DC depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (Ohm) = (U_b -14 V) / 0.03 A R_a < 500 Ohm
Power consumption:	< 1.1 VA / 24 V DC
Sensors:	**digital humidity sensor** small hysteresis, high long-term stability
Sensor protection:	**plastic** sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional **metal** sinter filter, Ø 16 mm, L = 32 mm)
Measuring range, humidity:	0...100 % RH (output corresponding to 4...20 mA)
Operating range, humidity:	0...95 % RH (without formation of dew)
Deviation, humidity:	typically **± 2.0** % (20...80 % RH) at +25 °C, otherwise ± 3.0 %
Output, humidity:	4...20 mA, see load resistance diagram
Ambient temperature:	storage –25...+50 °C operation –5...+55 °C
Long-term stability:	± 1 % per year
Electrical connection:	2-wire connection (see connecting diagram), 0.14 - 1.5 mm²
Connection cable:	PVC, LiYY, 2 x 0.25 mm², KL = approx. 1.5 m (other lengths optional)
Protective tube:	**stainless steel V2A** (1.4301), Ø = 16 mm, NL = 142 mm
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, according to EMC directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3
ACCESSORIES	see last chapter

Humidity table
MR: 0 ...100 % RH

% RH	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

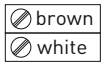
Load resistance diagram **RPFF-SD**
4...20 mA



Circuit board **RPFF-SD**

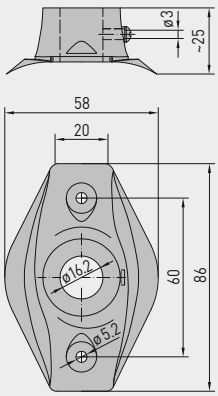


2-wire connection **RPFF-SD-I (Transmitter)**



+UB 24V DC
Output humidity in % r.H. 4-20mA

Dimensional drawing **MF-16-K**

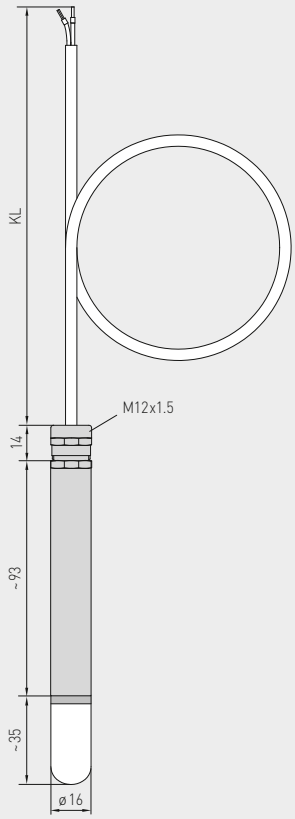


MF-16-K

Mounting flange, plastic (optional)



Dimensional drawing **RPFF-SD**



RPFF-SD

with plastic sinter filter (standard)



SF-M

Metal sinter filter (optional)



HYGRASGARD® RPFF-SD Pendulum room humidity sensors (± 2.0 %), *Standard*				
Type / WG01	**Measuring Range** Humidity (relative)	**Output** Humidity (relative)	**Item No.**	**Price**
RPFF-SD-I			**I- variant**	
RPFF-SD-I	0...100 % RH	4...20 mA	1201-1172-0000-150	**156,12 €**
Extra charge:	**Cable length** (KL) 1.5 m, other lengths optional		on request	
For special orders please specify:	Type, cable length e.g. RPFF-SD-I, 3 m; RPFF-SD-I, 4 m			

ACCESSORIES			
SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel **V4A** (1.4404)	7000-0050-2200-100	**42,33 €**
MF-16-K	Mounting flange, plastic	7100-0030-0000-000	**9,56 €**
	For further information see last chapter!		

HYGRASGARD® RPFF
HYGRASGARD® RPFTF

Pendulum room humidity and temperature sensors (± 2.0 %), calibratable, with multi-range switching and active output

S+S REGELTECHNIK

The calibratable pendulum room humidity and temperature sensor **HYGR**ASGARD® **RPFF / RPFTF** with plastic sinter filter measures the relative humidity and temperature of air. It converts the measurands into standard signals of 0 - 10 V or 4...20 mA and is available with or without an optional display. It has four switchable temperature ranges. The sensor is applied in non-aggressive dust-free atmospheres in refrigeration, air conditioning, ventilation and clean room technology, hotels, technical rooms, meeting rooms and convention centres. These measuring transducers are designed for exact detection of temperature and humidity. A digital long-term stable sensor is used as a measuring element for humidity and temperature measurement. The sensor is appropriate for ceiling and duct installation, or for integrating it into equipment. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

RPFF
RPFTF
with plastic sinter filter
(standard)



TECHNICAL DATA

Power supply:	24 V AC (± 20 %); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (ohm) = (U_b -14 V) / 0.02 A for I variant
Load resistance:	R_L > 5 kOhm for U variant
Power consumption:	< 1.1 VA / 24 V DC; < 2.2 VA / 24 V AC
Sensors:	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
Sensor protection:	**plastic** sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional **metal** sinter filter, Ø 16 mm, L = 32 mm)
HUMIDITY	
Measuring range, humidity:	0...100 % RH (output corresponding to 0 -10 V or 4...20 mA)
Operating range, humidity:	0...95 % RH (without formation of dew)
Deviation, humidity:	typically **± 2.0** % (20...80 % RH) at +25 °C, otherwise ± 3.0 %
Output, humidity:	0 - 10 V for U variant 4...20 mA for I variant, see load resistance diagram
TEMPERATURE	
Measuring range, temperature:	**multi-range switching with** **4 switchable measuring ranges** (see table) –35...+35 °C; –35...+75 °C; 0...+50 °C; 0...+80 °C (output corresponding to 0 -10 V or 4...20 mA)
Operating range, temperature:	–35...+80 °C
Deviation, temperature:	typically ± 0.2 K at +25 °C
Output, temperature:	0 -10 V or 4...20 mA or Ohm value
Ambient temperature:	storage –5...+60 °C operation –5...+60 °C
Long-term stability:	± 1 % per year
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (on request)
Electrical connection:	2-, 3-, or 4-wire connection (see connecting diagram), 0.14 - 1.5 mm² via terminal screws
Connection cable:	PVC, LiYY, 6 x 0.14 mm², KL = approx. 2 m (other lengths optional)
Protective tube:	**stainless steel V2A** (1.4301), Ø = 16 mm, NL = 142 mm
Protection class:	III (according to EN 60 730)
Protection type:	**IP 67** (according to EN 60 529) Housing tested TÜV SÜD, Report No. 713139052 (Tyr 1) **IP 65** (according to EN 60 529) Pendulum with sleeve
Standards:	CE conformity, according to EMC directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3
Optional:	two-line **display with illumination,** cutout approx. 36 x 15 mm (W x H), for displaying ACTUAL temperature and / or ACTUAL humidity
ACCESSORIES	see last chapter



M12 connector
(optional on request)

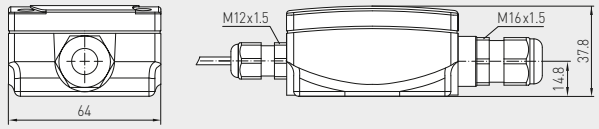
MF-16-K
Mounting flange,
plastic
(optional)



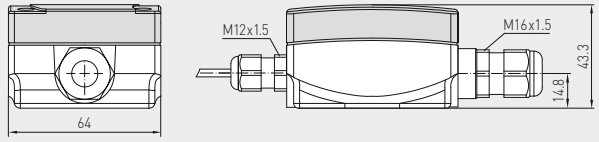
Dimensional drawing

RPFF
RPFTF

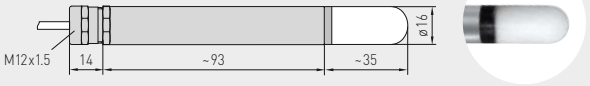
without display



with display



with plastic sinter filter
SF-K (standard)

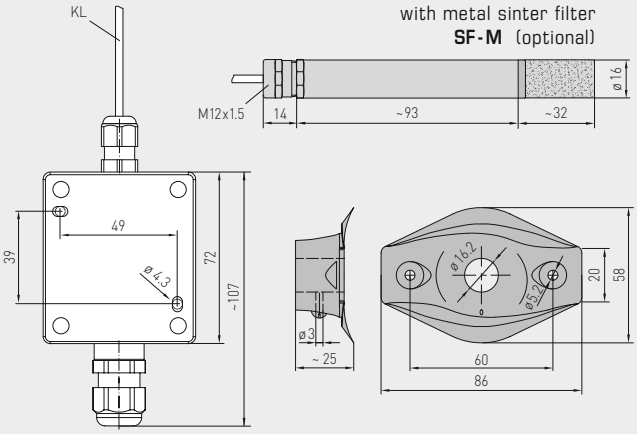




with metal sinter filter
SF-M (optional)







MF-16-K
(optional)

RPFF
RPFTF
with display and plastic sinter filter (standard)



Temperature table
MR: –35...+75 °C

°C	U_A [V]	I_A [mA]
-35	0.0	4.0
-30	0.5	4.7
-25	0.9	5.5
-20	1.4	6.2
-15	1.8	6.9
-10	2.3	7.6
-5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

Temperature table
MR: –35...+35 °C

°C	U_A [V]	I_A [mA]
-35	0.0	4.0
-30	0.7	5.1
-25	1.4	6.3
-20	2.1	7.4
-15	2.9	8.6
-10	3.6	9.7
-5	4.3	10.9
0	5.0	12.0
5	5.7	13.1
10	6.4	14.3
15	7.1	15.4
20	7.9	16.6
25	8.6	17.7
30	9.3	18.9
35	10.0	20.0

Temperature table
MR: 0...+50 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

Temperature table
MR: 0...+80 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.6	5.0
10	1.3	6.0
15	1.9	7.0
20	2.5	8.0
25	3.1	9.0
30	3.8	10.0
35	4.4	11.0
40	5.0	12.0
45	5.6	13.0
50	6.3	14.0
55	6.9	15.0
60	7.5	16.0
65	8.1	17.0
70	8.8	18.0
75	9.4	19.0
80	10.0	20.0

Humidity table
MR: 0...100 % RH

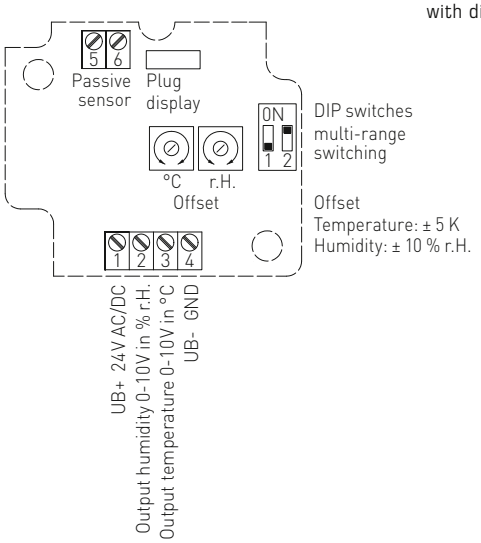
% RH	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

HYGRASGARD® RPFF
HYGRASGARD® RPFTF

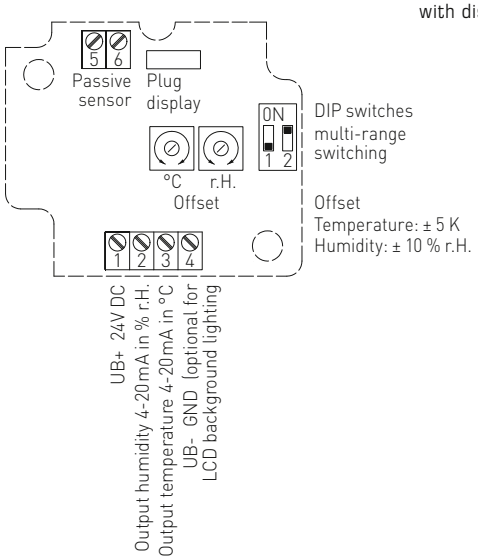
Pendulum room humidity and temperature sensors (± 2.0 %), calibratable, with multi-range switching and active output

S+S REGELTECHNIK

Schematic diagram — **RPFTF-U** with display



Schematic diagram** — **RPFTF-I** with display



3-wire connection — **RPFF-U**

1	+UB 24V AC/DC
2	Output humidity in % r.H. 0-10V
3	Free
4	–UB-GND

2- or 3-wire connection* — **RPFF-I (Transmitter)**

1	+UB 24V DC
2	Output humidity in % r.H. 4-20mA
3	Free
4	–UB-GND (optional for backlighting)

4-wire connection — **RPFTF-U**

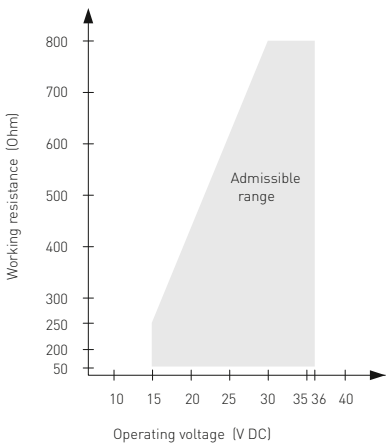
1	+UB 24V AC/DC
2	Output humidity in % r.H. 0-10V
3	Output temperature in °C 0-10V
4	–UB-GND

3- or 4-wire connection** — **RPFTF-I (Transmitter)**

1	+UB 24V DC
2	Output humidity in % r.H. 4-20mA
3	Output temperature in °C 4-20mA
4	–UB-GND (optional for backlighting)

Temperature measuring ranges (adjustable)	**DIP 1**	**DIP 2**
–35…+75 °C	**ON**	**ON**
–35…+35 °C	OFF	OFF
0…+50 °C (default)	OFF	**ON**
0…+80 °C	**ON**	OFF

Load resistance diagram 4…20 mA — **RPFF RPFTF**



Connection*:

2-wire connection for devices with / without display (not illuminated)

3-wire connection for devices with illuminated display

Connection**:

3-wire connection for devices with / without display (not illuminated)

4-wire connection for devices with illuminated display

For the **I variant** the humidity path must be connected!

RPFF
RPFTF
with display



HYGRASGARD® **RPFF**	Pendulum room humidity sensors (± 2.0 %), *Premium*
HYGRASGARD® **RPFTF**	Pendulum room humidity and temperature sensors (± 2.0 %), *Premium*

Type / WG01	**Measuring Range / Readout** Humidity	Temperature	**Output** Humidity	Temperature	**Item No.**	**Price**
RPFF						
RPFF-I	0...100 % RH	–	4...20 mA	–	1201-1172-0000-100	**198,59 €**
RPFF-U	0...100 % RH	–	0-10 V	–	1201-1171-0000-100	**198,59 €**
RPFTF						
RPFTF-I	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA	1201-1172-1000-100	**203,04 €**
RPFTF-U	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V	1201-1171-1000-100	**203,04 €**
Extra charge:	Two-line **display with illumination** **Cable length** (KL = 2 m), other lengths optional up to max. 5 m				on request	**49,83 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101				on request	

ACCESSORIES			
SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel **V4A** (1.4404)	7000-0050-2200-100	**42,33 €**
MF-16-K	**Mounting flange,** plastic	7100-0030-0000-000	**9,56 €**
	For further information see last chapter!		

HYGRASGARD® RPFF-25
HYGRASGARD® RPFTF-25

Pendulum room humidity and temperature sensors (± 1.8 %), calibratable, with multi-range switching and active output

S+S REGELTECHNIK

The calibratable pendulum room humidity and temperature sensor **HYGR**ASGARD® **RPFF-25 / RPFTF-25** with pluggable metal sinter filter, housing made of impact-resistant plastic, with / without optional display.
It measures the relative humidity and/or the temperature of the air and converts the measurands into a standard signal of 0-10 V or 4...20 mA. It is equipped with four switchable temperature ranges. The sensor is applied in non-aggressive dust-free atmospheres in refrigeration, air conditioning, ventilation and clean room technology, hotels, technical rooms, meeting rooms and convention centres. These measuring transducers are designed for exact detection of temperature and humidity. A digital long-term stable sensor is used as measuring element for humidity and temperature measurement. The sensor is appropriate for ceiling and duct installation, or for integrating it into equipment. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

RPFF-25 / RPFTF-25 (± 1.8 %)
pluggable measuring head
with metal sinter filter



TECHNICAL DATA

Power supply:	24 V AC (± 20 %); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (ohm) = (U_b -14 V) / 0.02 A for I variant
Load resistance:	R_L > 5 kOhm for U variant
Power consumption:	< 1.1 VA / 24 V DC; < 2.2 VA / 24 V AC
Sensors:	**digital humidity sensor with integrated temperature sensor,** small hysteresis, high long-term stability, sensor head pluggable
Sensor protection:	**pluggable measuring head** (probe) with **metal** sinter filter, Ø 16 mm, L = 88.5 mm, exchangeable
HUMIDITY	
Measuring range, humidity:	0...100 % RH (output corresponding to 0-10 V or 4...20 mA)
Operating range, humidity:	0...95 % RH (without formation of dew)
Deviation, humidity:	typically **± 1.8** % (10...90 % RH) at +25 °C, otherwise ± 2.0 %
Output, humidity:	0-10 V for U variant 4...20 mA for I variant, see load resistance diagram
TEMPERATURE	
Measuring range, temperature:	**multi-range switching with** **4 switchable measuring ranges** (see table) –35...+35 °C; –35...+75 °C; 0...+50 °C; 0...+80 °C (output corresponding to 0 -10 V or 4...20 mA)
Deviation, temperature:	typically ± 0.2 K at +25 °C
Output, temperature:	0-10 V or 4...20 mA or Ohm value
Ambient temperature:	storage –35...+85 °C operation –30...+70 °C
Long-term stability:	± 1 % per year
Electrical connection:	2-, 3-, or 4-wire connection (see connecting diagram), 0.14 - 1.5 mm² via terminal screws
Connection cable:	KL = 2 m
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (on request)
Protective tube:	**stainless steel V2A** (1.4301), Ø = 18 mm (16 mm), L = 120 mm
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, according to EMC directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3
Optional:	three-line **display with illumination,** cutout approx. 70 x 40 mm (W x H), for displaying ACTUAL temperature and / or ACTUAL humidity
ACCESSORIES	see last chapter



M12 connector
(optional on request)

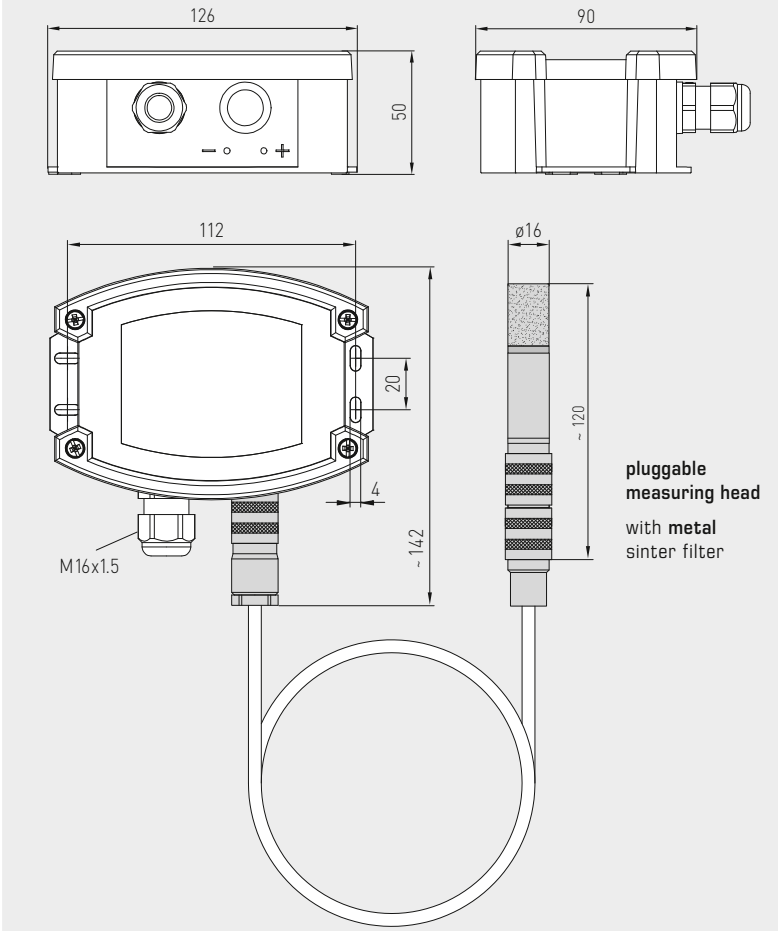
MF-16-K
Mounting flange,
plastic
(optional)



HYGRASGARD® RPFF-25
HYGRASGARD® RPFTF-25

Pendulum room humidity and temperature sensors (± 1.8 %), calibratable, with multi-range switching and active output

Dimensional drawing — **RPFF-25 / RPFTF-25**



RPFF-25 / RPFTF-25 (± 1.8 %)
pluggable measuring head
with metal sinter filter and display



Temperature table
MR: –35...+75 °C

°C	U_A [V]	I_A [mA]
-35	0.0	4.0
-30	0.5	4.7
-25	0.9	5.5
-20	1.4	6.2
-15	1.8	6.9
-10	2.3	7.6
-5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

Temperature table
MR: –35...+35 °C

°C	U_A [V]	I_A [mA]
-35	0.0	4.0
-30	0.7	5.1
-25	1.4	6.3
-20	2.1	7.4
-15	2.9	8.6
-10	3.6	9.7
-5	4.3	10.9
0	5.0	12.0
5	5.7	13.1
10	6.4	14.3
15	7.1	15.4
20	7.9	16.6
25	8.6	17.7
30	9.3	18.9
35	10.0	20.0

Temperature table
MR: 0...+50 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

Temperature table
MR: 0...+80 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.6	5.0
10	1.3	6.0
15	1.9	7.0
20	2.5	8.0
25	3.1	9.0
30	3.8	10.0
35	4.4	11.0
40	5.0	12.0
45	5.6	13.0
50	6.3	14.0
55	6.9	15.0
60	7.5	16.0
65	8.1	17.0
70	8.8	18.0
75	9.4	19.0
80	10.0	20.0

Humidity table
MR: 0...100 % RH

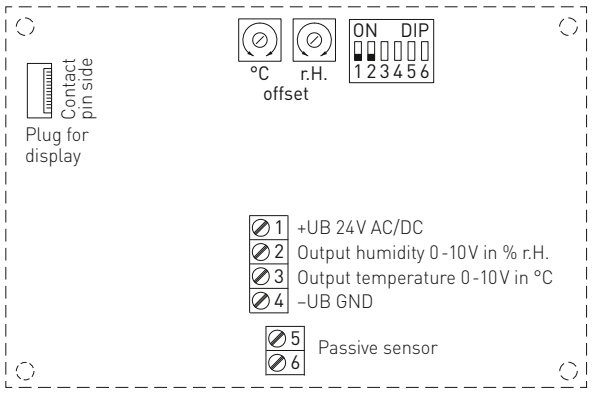
% RH	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

HYGRASGARD® RPFF-25
HYGRASGARD® RPFTF-25

Pendulum room humidity and temperature sensors (± 1.8 %), calibratable, with multi-range switching and active output

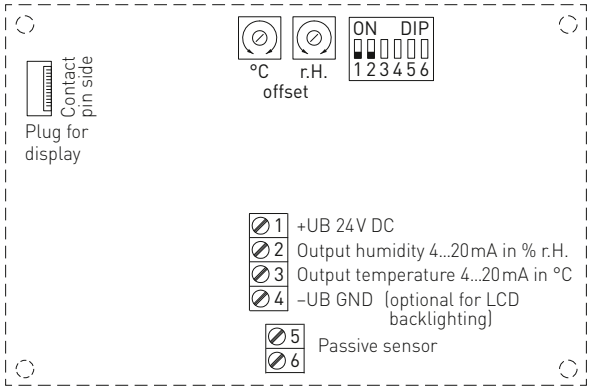
S+S REGELTECHNIK

Schematic diagram — **RPFTF-25-U** with display



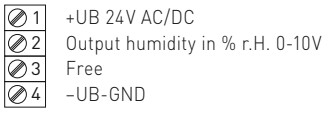
DIP 3, 4, 5, 6 are not assigned!

Schematic diagram** — **RPFTF-25-I** with display

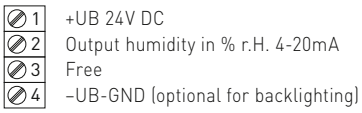


DIP 3, 4, 5, 6 are not assigned!

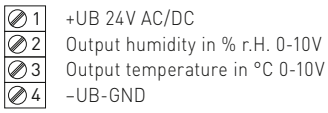
3-wire connection — **RPFF-25-U**



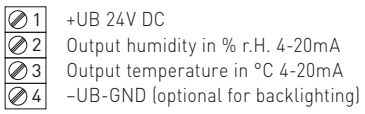
2- or 3-wire connection* — **RPFF-25-I (Transmitter)**



4-wire connection — **RPFTF-25-U**

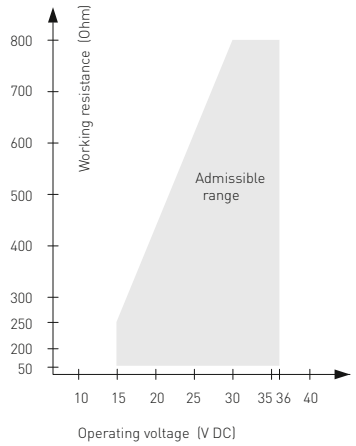


3- or 4-wire connection** — **RPFTF-25-I (Transmitter)**



Temperature measuring ranges (adjustable)	**DIP 1**	**DIP 2**
–35...+75 °C	**ON**	**ON**
–35...+35 °C	OFF	OFF
0...+50 °C (default)	OFF	**ON**
0...+80 °C	**ON**	OFF

Load resistance diagram 4..20 mA — **RPFF-25** **RPFTF-25**



Connection*:

2-wire connection for devices with / without display (not illuminated)

3-wire connection for devices with illuminated display

Connection**:

3-wire connection for devices with / without display (not illuminated)

4-wire connection for devices with illuminated display

For the **I variant** the humidity path must be connected!

HYGRASGARD® RPFF-25
HYGRASGARD® RPFTF-25

Pendulum room humidity and temperature sensors (± 1.8 %), calibratable, with multi-range switching and active output

RPFF-25 / RPFTF-25 (± 1.8 %)
with display



HYGRASGARD® RPFF-25	Pendulum room humidity sensors, pluggable (± 1.8 %), *Deluxe*
HYGRASGARD® RPFTF-25	Pendulum room humidity and temperature sensors, pluggable (± 1.8 %), *Deluxe*

Type / WG02	Measuring Range / Readout Humidity	Temperature	Output Humidity	Temperature	Display	Item No.	Price
RPFF-25-I						**I-variant**	
RPFF-25-I	0...100 % RH	–	4...20 mA	–		1201-7122-0000-100	**413,72 €**
RPFF-25-I **LCD**	0...100 % RH	–	4...20 mA	–	■	1201-7122-0400-100	**463,54 €**
RPFF-25-U						**U-variant**	
RPFF-25-U	0...100 % RH	–	0-10 V	–		1201-7121-0000-100	**413,72 €**
RPFF-25-U **LCD**	0...100 % RH	–	0-10 V	–	■	1201-7121-0400-100	**463,54 €**
RPFTF-25-I						**I-variant**	
RPFTF-25-I	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA		1201-7122-1000-100	**435,37 €**
RPFTF-25-I **LCD**	0...100 % RH	(4x as above)	4...20 mA	4...20 mA	■	1201-7122-1400-100	**485,19 €**
RPFTF-25-U						**U-variant**	
RPFTF-25-U	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V		1201-7121-1000-100	**435,37 €**
RPFTF-25-U **LCD**	0...100 % RH	(4x as above)	0-10 V	0-10 V	■	1201-7121-1400-100	**485,19 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101					on request	

ACCESSORIES			
MSK-25	Pluggable **measuring head** (sensor), stainless steel **V2A** (1.4301), **metal** sinter filter, Ø 16 mm, L = 88.5 mm, exchangeable, as replacement element for **RPFF-25 / RPFTF-25**	7201-1131-0000-000	**215,15 €**
MF-16-K	**Mounting flange,** plastic	7100-0030-0000-000	**9,56 €**
	For further information see last chapter!		

HYGRASGARD® VFF
HYGRASGARD® VFTF

Showcase humidity and temperature sensors (± 2.0 %), calibratable, with multi-range switching and active output

S+S REGELTECHNIK

The calibratable humidity and temperature sensor **HYGR**ASGARD® **VFF / VFTF** measures the relative humidity and temperature of air. It converts the measurands humidity and temperature into a standard signal of 0 - 10 V or 4...20 mA, and is available with / without an optional display.
It is equipped with four switchable temperature ranges. Relative humidity (in % RH) is the quotient of water vapour partial pressure divided by the saturation vapour pressure at the respective gas temperature. The measuring transducers are designed for exact detection of temperature and humidity. A digital, long-term stable sensor is used as a measuring element for humidity and temperature measurement. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

The showcase sensor is used in non-aggressive, dust-free environments and is specifically designed for installation in ceilings, walls, inside showcases or display cabinets in museums, galleries, cinemas or lecture halls or laboratories. The measuring element is contained inside a stainless steel probe and its low height (approx. 2.5 mm) makes it barely noticeable.

VFF
VFTF



TECHNICAL DATA

Power supply:	24 V AC (± 20 %) and 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (Ohm) = (U_b -14 V) / 0.02 A for I variant
Load resistance:	R_L > 5 kOhm for U variant
Power consumption:	< 1.1 VA / 24 V DC; < 2.2 VA / 24 V AC
Sensors:	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
HUMIDITY	
Measuring range, humidity:	0...100 % RH (output corresponding to 0 - 10 V or 4...20 mA)
Operating range, humidity:	0...95 % RH (without formation of dew)
Deviation in humidity:	typically **± 2.0** % (20...80 % RH) at +25 °C, otherwise ± 3.0 %
Output, humidity:	0 - 10 V for U variant 4...20 mA for I variant, see load resistance diagram
TEMPERATURE	
Measuring range, temperature:	**multi-range switching with** **4 switchable measuring ranges** (see table) –35...+35 °C; –35...+75 °C; 0...+50 °C; 0...+80 °C (output corresponding to 0 - 10 V or 4...20 mA)
Deviation, temperature:	typically ± 0.2 K at +25 °CC
Output, temperature:	0 - 10 V or 4...20 mA
Ambient temperature:	storage –5...+60 °C; operation –5...+60 °C
Long-term stability:	± 1 % per year
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	2-, 3-, or 4-wire connection (see connecting diagram), 0.14 - 1.5 mm², via terminal screws
Connecting cable:	PVC, LiYY, 4 x 0.14 mm², cable length (KL) = 2 m
Sensor protection:	**probe** made of stainless steel, **V4A** (1.4571), **pluggable**; sensor head Ø = 17 mm, H = approx. 2.5 mm; protective sleeve Ø = 10 mm, NL = approx. 25 mm, M10 x 1.0; with plastic plug connector Ø = approx. 11 mm, NL = approx. 25 mm,
Mounting (sensor):	cut-out Ø = 11 - 15 mm, inserted length (EL) = approx. 50 mm, lock nut for fixing is included in the scope of delivery.
Protection class:	III (according to EN 60 730)
Protection type:	**IP 67** (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1) **IP 65** (according to EN 60 529) Probe
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3
Optional:	two-line **display with illumination**, cut-out approx. 36 x 15 mm (W x H), for displaying ACTUAL temperature and / or ACTUAL humidity



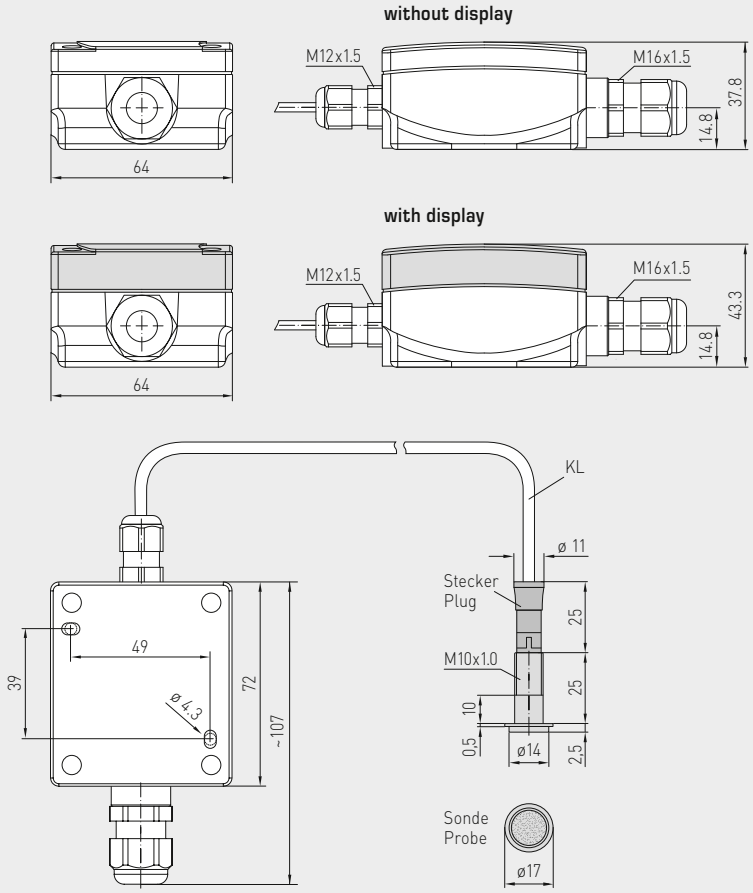
M12 connector
(optional on request)

VFF
VFTF
Probe made of stainless steel, pluggable



Dimensional drawing

VFF
VFTF



VFF
VFTF
with display



Temperature table
MR: –35...+75 °C

°C	U_A [V]	I_A [mA]
-35	0.0	4.0
-30	0.5	4.7
-25	0.9	5.5
-20	1.4	6.2
-15	1.8	6.9
-10	2.3	7.6
-5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

Temperature table
MR: –35...+35 °C

°C	U_A [V]	I_A [mA]
-35	0.0	4.0
-30	0.7	5.1
-25	1.4	6.3
-20	2.1	7.4
-15	2.9	8.6
-10	3.6	9.7
-5	4.3	10.9
0	5.0	12.0
5	5.7	13.1
10	6.4	14.3
15	7.1	15.4
20	7.9	16.6
25	8.6	17.7
30	9.3	18.9
35	10.0	20.0

Temperature table
MR: 0...+50 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

Temperature table
MR: 0...+80 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.6	5.0
10	1.3	6.0
15	1.9	7.0
20	2.5	8.0
25	3.1	9.0
30	3.8	10.0
35	4.4	11.0
40	5.0	12.0
45	5.6	13.0
50	6.3	14.0
55	6.9	15.0
60	7.5	16.0
65	8.1	17.0
70	8.8	18.0
75	9.4	19.0
80	10.0	20.0

Humidity table
MR: 0...100 % RH

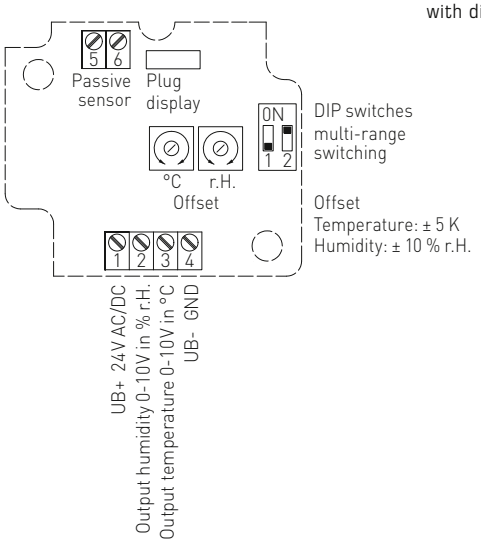
% RH	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

HYGRASGARD® VFF
HYGRASGARD® VFTF

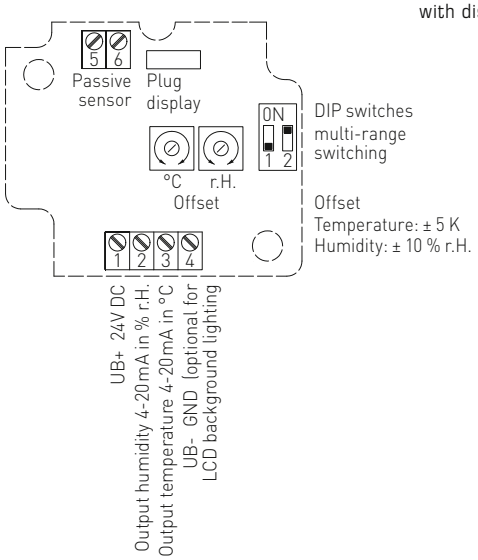
Showcase humidity and temperature sensors (± 2.0 %), calibratable, with multi-range switching and active output

S+S REGELTECHNIK

Schematic diagram **VFTF-U** with display



Schematic diagram** **VFTF-I** with display



3-wire connection **VFF-U**

1	+UB 24V AC/DC
2	Output humidity in % r.H. 0-10V
3	Free
4	–UB-GND

2- or 3-wire connection* **VFF-I (Transmitter)**

1	+UB 24V DC
2	Output humidity in % r.H. 4-20mA
3	Free
4	–UB-GND (optional for backlighting)

4-wire connection **VFTF-U**

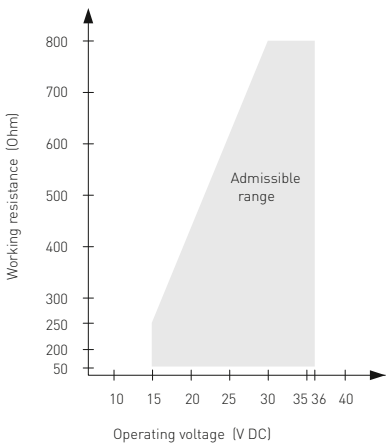
1	+UB 24V AC/DC
2	Output humidity in % r.H. 0-10V
3	Output temperature in °C 0-10V
4	–UB-GND

3- or 4-wire connection** **VFTF-I (Transmitter)**

1	+UB 24V DC
2	Output humidity in % r.H. 4-20mA
3	Output temperature in °C 4-20mA
4	–UB-GND (optional for backlighting)

Temperature measuring ranges (adjustable)	**DIP 1**	**DIP 2**
–35…+75 °C	**ON**	**ON**
–35…+35 °C	OFF	OFF
0…+50 °C (default)	OFF	**ON**
0…+80 °C	**ON**	OFF

Load resistance diagram 4…20 mA **VFF VFTF**



Connection*:

2-wire connection for devices with / without display (not illuminated)

3-wire connection for devices with illuminated display

Connection**:

3-wire connection for devices with / without display (not illuminated)

4-wire connection for devices with illuminated display

For the **I variant** the humidity path must be connected!

HYGRASGARD® VFF
HYGRASGARD® VFTF

Showcase humidity and temperature sensors (± 2.0 %), calibratable, with multi-range switching and active output

VFF
VFTF
with display



HYGRASGARD® VFF Showcase humiditysensor (± 2.0 %), *Premium*
HYGRASGARD® VFTF Showcase humidity- and temperature sensor (± 2.0 %), *Premium*

Type / WG02	Measuring Range / Readout Humidity	Temperature	Output Humidity	Temperature	Display	Item No.	Price
VFF-I						**I-variant**	
VFF-I	0...100 % RH	–	4...20 mA	–		1201-6122-0000-100	**462,39 €**
VFF-I **LCD**	0...100 % RH	–	4...20 mA	–	■	1201-6122-0200-100	**513,38 €**
VFF-U						**U-variant**	
VFF-U	0...100 % RH	–	0-10 V	–		1201-6121-0000-100	**462,39 €**
VFF-U **LCD**	0...100 % RH	–	0-10 V	–	■	1201-6121-0200-100	**513,38 €**
VFTF-I						**I-variant**	
VFTF-I	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA		1201-6122-1000-100	**466,54 €**
VFTF-I **LCD**	0...100 % RH	(4x as above)	4...20 mA	4...20 mA	■	1201-6122-1200-100	**517,86 €**
VFTF-U						**U-variant**	
VFTF-U	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V		1201-6121-1000-100	**466,54 €**
VFTF-U **LCD**	0...100 % RH	(4x as above)	0-10 V	0-10 V	■	1201-6121-1200-100	**517,86 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101					on request	

**Room hygro-thermostat,
mechanical, one-step**

S+S REGELTECHNIK

The mechanical room hygro-thermostat **HYGR**ASREG® **RHT**, a room hygrostat with (bimetal) temperature controller, is used for controlling and monitoring the relative humidity (humidifying and dehumidifying) and the temperature in office and residential rooms, baths, winter gardens, labs, computer rooms, etc. RHT is applied in dust-free, pollutant-free, non-aggressive air.

RHT



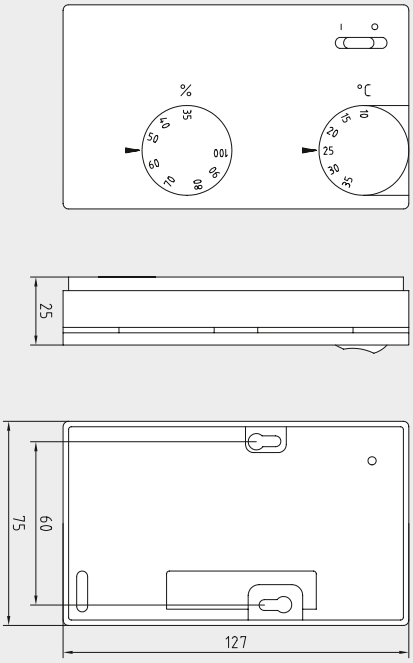
TECHNICAL DATA

	HYGROSTAT
Switching capacity: (Contact load)	24…230 V AC > 24 V in dry rooms only according to VDE 0110 Dehumidifying: 5 (0.2) A, min. 100 mA Humidifying: 3 (0.2) A, min. 100 mA
Setting range:	35…100 % RH
Contact:	2 changeover contact
Sensor element:	plastic fibres
Tolerance:	max. 3 % RH
Operating difference:	approx. 4 % RH
Housing temperature:	0…+60 °C
FUNCTION	Humidifying: wire terminals 5 and 6 Dehumidifying: wire terminals 5 and 7

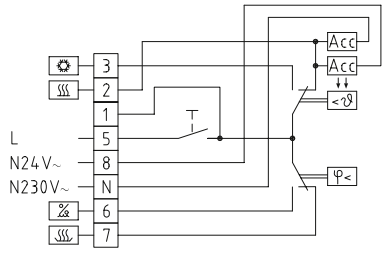
	THERMOSTAT
Switching capacity:	10 (4) A, 24 / 230V AC
Control range:	+10…+35 °C
Contact:	1 changeover contact (potential-free)
Sensor element:	bimetal, with thermal feedback
FUNCTION	Heating: wire terminals 2 and 5 Cooling: wire terminals 3 and 5

Housing:	plastic, material ABS, colour pure white (similar to RAL 9010)
Dimensions:	127.5 x 75 x 28.6 mm
Installation:	wall mounting or on in-wall flush box, Ø 55 mm
Electrical connection:	0.14 - 2.5 mm², via terminal screws
Protection class:	II (according to EN 60 730)
Protection type:	**IP 30** (according to EN 60 529)
Standards:	CE conformity, EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU
ACCESSORIES	When mounting indoor room enclosures on in-wall flush boxes with horizontal fixing holes, adapter frame **ARA 1.7 E** must be included in the order.

Dimensional drawing **RHT**



Connecting diagram **RHT**



HYGRASREG® RHT Room hygro-thermostat

Type / WG02	Setting Range Humidity	Temperature	Steps	Features	Item No.	Price
RHT					**External setting**	
RHT-1	35…100 % RH	+10…+35 °C	one-step	main switch	1202-4010-0000-000	**211,74 €**
ACCESSORIES						
ARA 1,7 E	Adapter frame for in-wall flush boxes				7100-0060-4000-000	**7,06 €**

Mechanical room hygrostat **HYGR**ASREG® **RH-2** with switching output (with single-pole microswitch as two-position controller with humidity sensor) working without external voltage, with humidity measuring element made of stabilized synthetic gauze, optional with setpoint setter for switchpoint adjustment (external or internal setting) in an elegant housing made of plastic, with snap-on lid, base with 4-hole attachment for installation on vertically or horizontally installed in-wall flush boxes, with predetermined breaking point for on-wall cable entry. RH-2 is used for controlling and monitoring the relative humidity in office and residential rooms, baths, labs, control cabinets, computer rooms, etc., as minimum or maximum hygrostat. It is used in dust-free, pollutant-free, non-aggressive air.

RH-2
(with external setting)



RH-2U
(with internal setting)

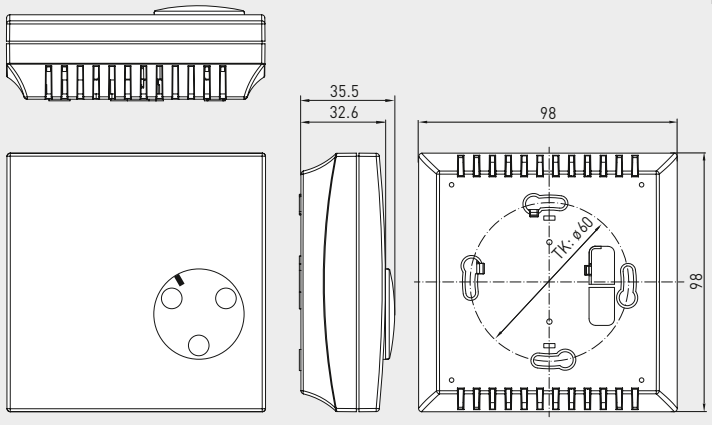


TECHNICAL DATA

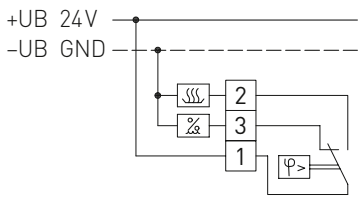
Switching capacity: (Contact load)	24 V AC/DC dehumidifying: 5 (0.2) A, min. 100 mA humidifying: 3 (0.2) A, min. 100 mA
Setting range:	25 ...95 % RH
Contact:	1 changeover contact
Sensor element:	plastic fibres
Operating difference:	approx. 4 % RH
Tolerance:	max. 3 % RH
Housing temperature:	0...+40 °C
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010)
Dimensions:	98 x 98 x 39 mm (Baldur 2, with Potentiometer)
Electrical connection:	0.14 - 2.5 mm², via terminal screws
Installation:	wall mounting or on in-wall flush box Ø 55 mm, base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes for cable entry from the back, with predetermined breaking point for on-wall cable entry from top / bottom in case of plain on-wall installation
Protection class:	III (according to EN 60 730)
Protection type:	**IP 30** (according to EN 60 529)
Standards:	CE conformity, EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU
FUNCTION	humidifying: wire terminals 1 and 3 dehumidifying: wire terminals 1 and 2

Dimensional drawing

Housing **Baldur 2**
RH-2



Connecting diagram **RH-2**



HYGRASREG® RH - 2 Room hygrostat, *Standard*

Type / WG01	Setting Range Humidity	Hysteresis	Output	Steps	Item No.	Price
RH-2					**External setting**	
RH-2	25...95 % RH	approx. 4 % RH	1x Changeover contact	one-step	1202-40C0-0010-000	**83,00 €**
RH-2 U					**Internal setting**	
RH-2 U	25...95 % RH	approx. 4 % RH	1x Changeover contact	one-step	1202-40C0-0020-000	**85,53 €**

HYGRASREG® RHT - 30

Room hygrostats and humidity and temperature sensors (± 2.0 %), electronic, two-step, with continuous / switching outputs

S+S REGELTECHNIK

Electronic room hygrostat and/or room thermostat **HYGR**ASREG® **RHT-30** with one continuous and two switching outputs, adjustable switching thresholds, with / without optional display for indicating ACTUAL humidity and/or ACTUAL temperature (accuracy class ± 2.0 % RH).
The setpoints can be allocated to the relative humidity and/or to the temperature.

It is suitable for regulating and monitoring relative humidity (humidifying and dehumidifying) and/or the temperature (heating and cooling), e.g. in ventilation and air conditioning ducts, laboratories, production facilities, climatic test cabinets, indoor swimming pools, greenhouses, etc., to control humidifying and dehumidifying equipment or heating system control. The measuring transducers are designed for exact humidity/temperature measurement. The RHT-30 uses a digital, long-term stable sensor as a measuring element. It is used in dust-free, unpolluted, non-aggressive air.

TECHNICAL DATA

Power supply:	24 V AC (± 20 %), 15...36 V DC
Load resistance:	R_L > 5 kOhm
Power consumption:	< 1,5 VA / 24 V DC, < 3,5 VA / 24 V AC
Sensor:	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
Setting range:	5...95 % RH (Humidity) +5...+ 45 °C (Temperature) (switch steps 1 and 2 are separately adjustable)
Operating difference:	**Mode 1:** both switch steps are freely adjustable (rel. humidity) **Mode 2:** 5 % between both switch steps (rel. humidity) **Mode 3:** both switch steps freely adjustable (temperature) **Mode 4:** switch step 1 (temperature), switch step 2 (rel. humidity) (adjustable via DiP switches)
Output:	potential-free changeover contacts (2 x changeover contact 24 V, 1A ohmic load, separately adjustable, 1x 0 - 10 V)
Deviation, humidity:	typically **± 2.0** % (20...80 % RH) at +25 °C, otherwise ± 3.0 %
Deviation, temperature:	typically **± 0.2 K** at +25 °C
Ambient temperature:	storage –35...+85 °C; operation –30...+70 °C, non-precipitating
Long-term stability:	± 1 % per year
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010)
Housing dimensions:	98 x 98 x 35 mm (Baldur 2)
Installation:	wall mounting or on in-wall flush box, Ø 55 mm, base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes for cable entry from the back, with predetermined breaking point for on - wall cable entry from top / bottom in case of plain on - wall installation
Protection class:	III (according to EN 60 730)
Protection type:	**IP 30** (according to EN 60 529)
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Standards:	CE conformity, EMC directive 2014 / 30 / EU
Optional:	two-line **display with illumination,** cutout approx. 36 x 15 mm (W x H), for displaying ACTUAL humidity and/or ACTUAL temperature respectively for setpoint adjustment
FUNCTION	
Humidifying/heating:	**1st step:** wire contacts 11 - 12. If actual humidity falls more than 3 % RH / 1 K (hysteresis) below switching threshold S1, the changeover contact switches to 11 - 12. **2. step:** wire contacts 21 - 22. If actual humidity falls more than 3 % RH / 1 K (hysteresis) below switching threshold S2, the changeover contact switches to 21 - 22. Terminal 2: output relative humidity / temperature
Dehumidifying/cooling:	**1st step:** wire contacts 11 - 13. When actual humidity exceeds switching threshold S1, the changeover contact switches to 11 - 13. **2. step:** wire contacts 21 - 23. When actual humidity exceeds switching threshold S 2, the changeover contact switches to 21 - 23. Terminal 2: output relative humidity / temperature

The **1st line** of the display shows the **ACTUAL humidity** in % RH and the **ACTUAL temperature** in °C.
The displays showing the ACTUAL values alternate in a 3-second rhythm.
Resolution: 1/10 % RH or 1/10 °C.

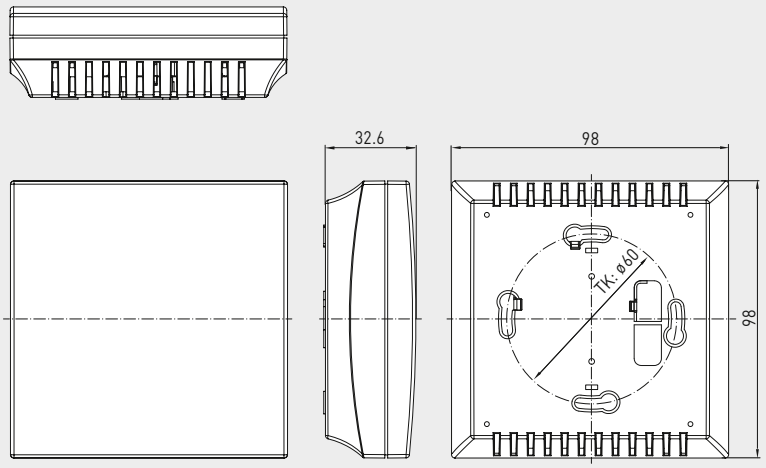
The **2nd line** shows information about the **switching status of the relay** (as a circuit), and indicates the **switching value** in % RH or °C (adjustable via the corresponding set potentiometer). The readouts of the switching thresholds for the first and second relay are displayed alternately at an interval of twenty seconds.

For improved legibility, backlighting is provided.

Display readout **RHT-30**



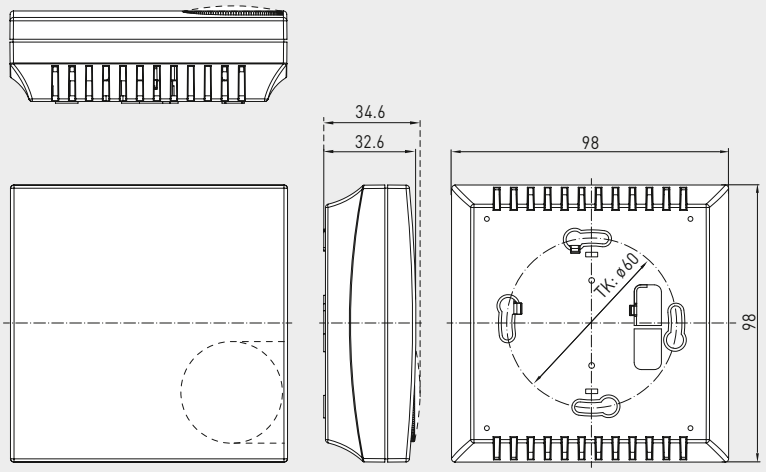
Dimensional drawing **RHT-30U**



RHT-30U
with internal setting



Dimensional drawing **RHT-30**



RHT-30



RHT-30
with display

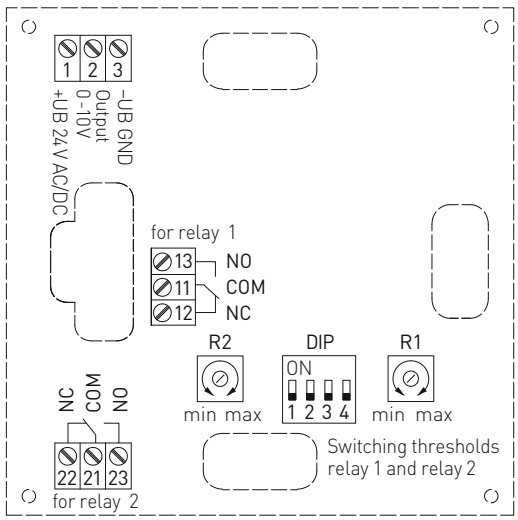


HYGRASREG® RHT-30

Room hygrostats and humidity and temperature sensors (±2.0%), electronic, two-step, with continuous / switching outputs

S+S REGELTECHNIK

Schematic diagram **RHT-30**

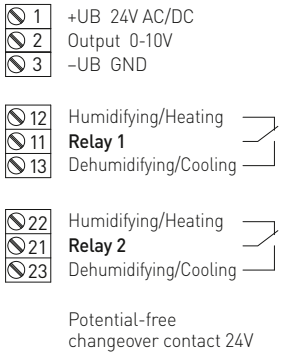


NC = Normally Closed
COM = Common
NO = Normally Open

R1 extended to the outside (adjustment wheel)

DIP switches	RHT-30	
Function mode	**DIP 1**	**DIP 2**
Mode 1 (**2x** 5...95% RH) (default)	OFF	OFF
Mode 2 (5...95% RH **+ 5%** RH)	**ON**	OFF
Mode 3 (**2x** +5...+45 °C)	OFF	**ON**
Mode 4 (5...95% RH / +5...+45 °C)	**ON**	**ON**
Output		**DIP 3**
Temperature		**ON**
Relative humidity (default)		OFF
Backlighting		**DIP 4**
activated		**ON**
deactivated (default)		OFF

Connecting diagram **RHT-30**

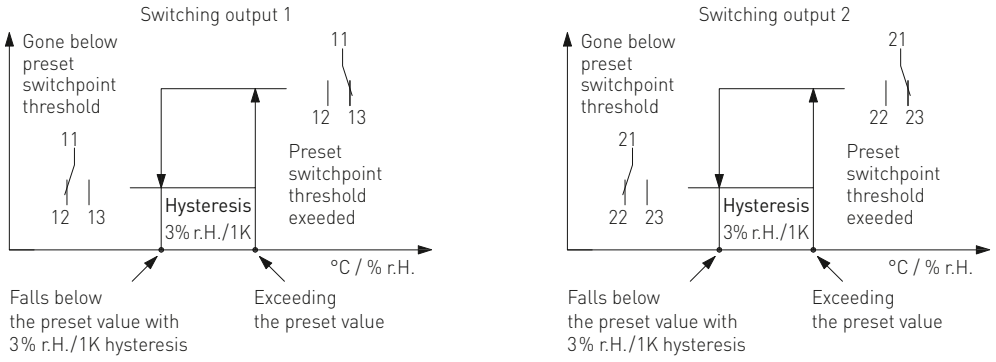


Supply	AC	DC
→ **1**	24 V~	24 V DC
→ **3**	0 V	GND

12	(A1) →	**Relay 1** Breaker contact
11	(W1) →	**Relay 1** Changeover contact
13	(B1) →	**Relay 1** Normally open contact

22	(A2) →	**Relay 2** Breaker contact
21	(W2) →	**Relay 2** Changeover contact
23	(B2) →	**Relay 2** Normally open contact

Switching output **RHT-30**



Mode 1: Independent switchpoints for both relay outputs can be defined in the range of 5...95% RH by the control knobs (setpoint 1 for relay 1, setpoint 2 for relay 2, see schematic diagram). When the respective switchpoint is exceeded, the corresponding relay switches over (changeover contact 1 switches from position 2 to position 3). When the pre-set switchpoint is undershot again by more than 3% RH (hysteresis), the respective switching output switches back to the initial position (changeover contact 1 switches from position 3 to position 2).

Mode 2: In Mode 2, only control knob setpoint 1 is active (setpoint 2 without function)! The switchpoint for the first relay is defined in the range of 5...95% RH by the control knob setpoint 1 (see schematic diagram). The switchpoint for the second relay output is invariably defined in mode 2 as "Switchpoint 1 + 5% RH". Hysteresis of 3% RH is also predefined for each switching output in mode 2.

Mode 3: Independent switchpoints for both relay outputs can be defined in the range of +5...+45 °C RH by the control knobs (setpoint 1 for relay 1, setpoint 2 for relay 2). If the respective switchpoint is exceeded, the corresponding relay switches over. If the pre-set threshold value is undershot again by 1 K (hysteresis), the respective switching output switches back to the initial position. The thresholds of the setting range (temperature) are 5 °C above the minimum or below the maximum range value respectively.

Mode 4: In mode 4, the control knob is allocated to setpoint 1 of the temperature, while control knob is allocated to setpoint 2 of the relative humidity. The switchpoints can be adjusted in the range of +5...+45 °C or 5...95% RH The thresholds of the setting range (temperature) are 5°C above the minimum or below the maximum range value respectively. The control knob for the temperature can be operated from outside, if necessary.

Humidity table
MR: 0 ...100 % RH

% RH	U_A [V]	% RH	U_A [V]
0	0.0	**50**	5.0
5	0.5	**55**	5.5
10	1.0	**60**	6.0
15	1.5	**65**	6.5
20	2.0	**70**	7.0
25	2.5	**75**	7.5
30	3.0	**80**	8.0
35	3.5	**85**	8.5
40	4.0	**90**	9.0
45	4.5	**95**	9.5
Continued at the right ...		**100**	10.0

Temperature table
MR: 0 ...+50 °C

°C	U_A [V]
0	0.0
5	1.0
10	2.0
15	3.0
20	4.0
25	5.0
30	6.0
35	7.0
40	8.0
45	9.0
50	10.0

RHT-30
with display



HYGRASREG® RHT-30 Room hygrostats and humidity and temperature sensors (± 2.0 %)

Type / WG02	Setting Range Humidity	Temperature	Output	Steps	Display	Item No.	Price
RHT-30						**External setting**	
RHT-30W	5...95 % RH	+5...+45 °C	2 x Changeover contact, 1x 0-10 V	two-step		1202-4077-1011-200	**184,72 €**
RHT-30W **LCD**	5...95 % RH	+5...+45 °C	2 x Changeover contact, 1x 0-10 V	two-step	■	1202-4077-1211-200	**198,00 €**
RHT-30-U						**Internal setting**	
RHT-30W U	5...95 % RH	+5...+45 °C	2 x Changeover contact, 1x 0-10 V	two-step		1202-4077-1021-200	**182,05 €**

HYGRASREG® AH - 40

On-wall hygrostats and humidity sensors (± 2.0 %), electronic, one-step, with switching outputs

S+S REGELTECHNIK

Electronic hygrostat and humidity sensor **HYGR**ASREG® **AH - 40** with one switching output, adjustable switching threshold and display for displaying ACTUAL humidity (accuracy class ± 2.0 % RH) and for setting the target humidity.

It is suitable for controlling and monitoring the relative air humidity, e.g. in laboratories, production rooms, climatic exposure test cabinets, swimming pools, greenhouses etc., for controlling humidifying and dehumidifying facilities. The measuring transducers are designed for exact detection of humidity. The AH - 40 uses a digital, long-term stable sensor as a measuring element for measuring humidity. It is used in dust-free, unpolluted, non-aggressive air.

AH-40
with display and metal sinter filter (optional)



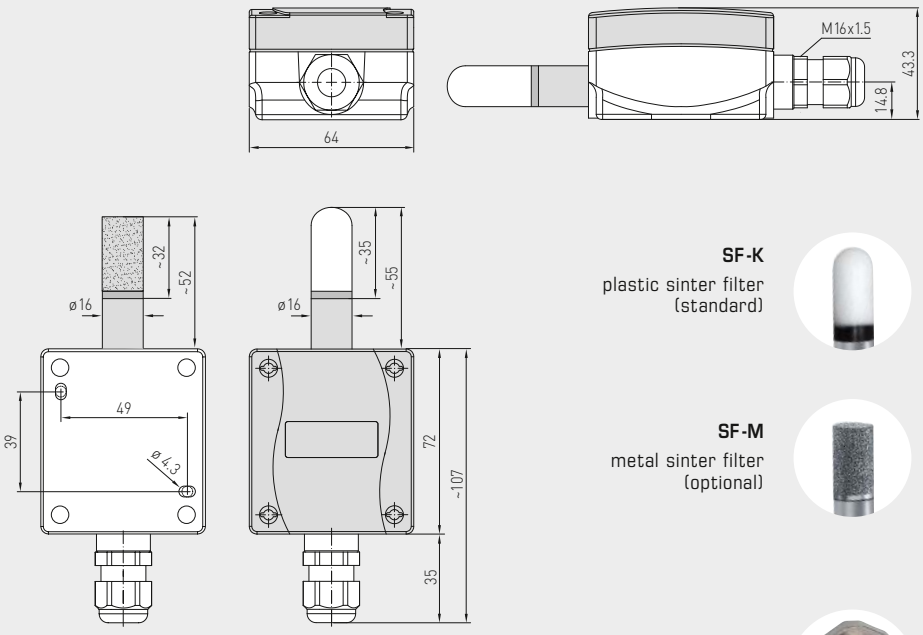
TECHNICAL DATA

Power supply:	24 V AC (± 20 %) 15...36 V DC
Power consumption:	< 1.1 VA / 24 V DC < 2.2 VA / 24 V AC
Sensors:	**digital humidity sensor,** small hysteresis, high long-term stability
Sensor protection:	**plastic** sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional **metal** sinter filter, Ø 16 mm, L = 32 mm)
Setting range:	5...95 % RH
Output:	potential-free changeover contact (24 V), 1 A ohmic load
Deviation, humidity:	typically **± 2.0** % (20...80 % RH) at +25 °C, otherwise ± 3.0 %
Ambient temperature:	storage –35...+85 °C; operation –30...+75 °C, non-precipitating
Long-term stability:	± 1 % per year
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	72 x 64 x 43.3 mm (Tyr 1 with display)
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Protective tube:	**stainless steel V2A** (1.4301), Ø 16 mm, NL = 55 mm
Prozessanschluss:	by screws
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC dire ctive 2014 / 30 / EU
Display:	**two-line display with illumination,** cutout approx. 36 x 15 mm (W x H), for displaying actual humidit and for setting the target humidity
Displaying:	The 1st line of the display shows the **relative humidity.** The 2nd line shows on the left side the information regarding the **switching status of the relay** (as a circuit), as well as the **switching value** readout in % RH on the right side (adjustable using the set potentiometer). ○ **Circuit, empty** = relay in idle state ● **Circuit, full** = relay energised
FUNCTION	**actual humidity < switching value** contact 11-12 closed (LED OFF) **actual humidity > switching value** contact 11-13 closed (LED ON)

Display standard **AH-40**



Dimensional drawing **AH-40**



with **metal** sinter filter (optional)

with **plastic** sinter filter (standard)

SF-K
plastic sinter filter (standard)

SF-M
metal sinter filter (optional)

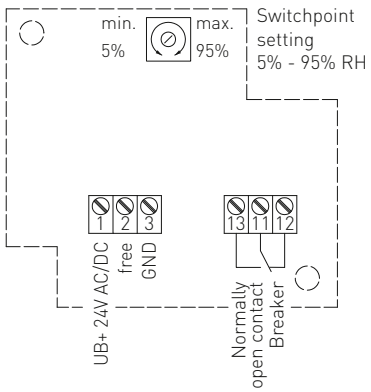
M12 connector (optional on request)



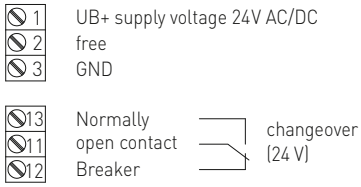
AH-40
with display and plastic sinter filter (standard)



Schematic diagram **AH-40**



Connecting diagram **AH-40**





HYGRASREG® AH-40	On-wall hygrostats and humidity sensors (± 2.0 %), *Premium*					
Type / WG01	**Setting Range** Humidity	**Output**	**Steps**	**Display**	**Item No.**	**Price**
AH-40-U						
AH-40W **LCD**	5...95 % RH	1 x Changeover contact	one-step	■	1202-1065-0221-000	**181,41 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101				on request	

ACCESSORIES			
SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel **V4A** (1.4404)	7000-0050-2200-100	**42,33 €**

HYGRASREG® AHT - 30

On-wall hygrostats and humidity and temperature sensors (± 2.0 %), electronic, two-step, with multi-range switching and continuous / switching output

S+S REGELTECHNIK

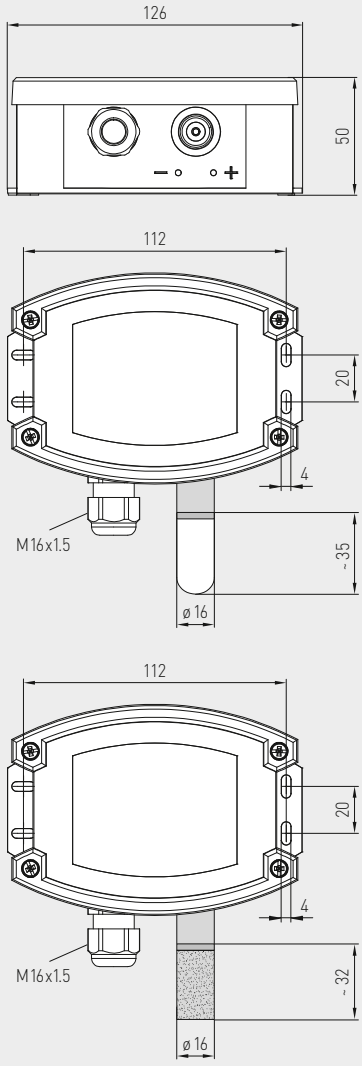
Electronic on-wall hygrostat and/or on-wall thermostat **HYGR**ASREG® **AHT-30** with a continuous and two switching outputs, adjustable switching thresholds and display for indicating ACTUAL humidity and/or ACTUAL temperature (accuracy class ± 2.0 % RH). The setpoints can be allocated to the relative humidity and/or to the temperature.

It is suitable for regulating and monitoring relative humidity (humidifying and dehumidifying) and/or the temperature (heating and cooling), e.g. in laboratories, production facilities, climatic test cabinets, indoor swimming pools, greenhouses, etc., to control humidifying and dehumidifying equipment or heating system control. The measuring transducers are designed for exact humidity/temperature measurement. The AHT-30 uses a digital, long-term stable sensor as a measuring element. It is used in dust-free, unpolluted, non-aggressive air.

TECHNICAL DATA

Power supply:	24 V AC / DC (± 20 %)
Power consumption:	< 1,5 VA / 24 V DC, < 3,5 VA / 24 V AC
Sensor:	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
Sensor protection:	**plastic** sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional **metal** sinter filter, Ø 16 mm, L = 32 mm)
Setting range:	5...95 % RH (humidity) **Multi-range switching with 4 switchable measuring ranges** (see table) –35...+35 °C; –35...+75 °C; 0...+50 °C; 0...+80 °C (temperature) (Switch steps 1 and 2 are separately adjustable)
Operating difference:	**Mode 1:** both switch steps are freely adjustable (rel. humidity) **Mode 2:** 5 % between both switch steps (rel. humidity) **Mode 3:** both switch steps freely adjustable (temperature) **Mode 4:** switch step 1 (temperature), switch step 2 (rel. humidity) (adjustable via DiP switches)
Output:	potential-free changeover contacts (2 x changeover contact 24 V, 1A ohmic load, separately adjustable, 2x 0 - 10 V for U variant or 4...20 mA for I variant)
Deviation, humidity:	typically **± 2.0** % (20...80 % RH) at +25 °C, otherwise ± 3.0 %
Deviation, temperature:	typically ± 0.4 K at +25 °C
Ambient temperature:	storage –35...+85 °C; operation – 30...+75 °C, non-precipitating
Long-term stability:	± 1 % per year
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Protective tube:	**stainless steel V2A** (1.4301), Ø 16 mm, NL = 55 mm (see dimensional drawing)
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Standards:	CE conformity, EMC directive 2014 / 30 / EU
Display:	three-line **display with illumination**, cutout approx. 70 x 40 mm (W x H), for displaying ACTUAL humidity and/or ACTUAL temperature or for setpoint adjustment
FUNCTION	
Humidifying/heating:	**1st step:** wire contacts 11 - 12. If actual humidity falls more than 3 % RH / 1 K (hysteresis) below switching threshold S1, the changeover contact switches to 11 - 12. **2nd step:** wire contacts 21 - 22. If actual humidity falls more than 3 % RH / 1 K (hysteresis) below switching threshold S2, the changeover contact switches to 21 - 22. Terminal 2: output relative humidity / terminal 3: output temperature
Dehumidifying/cooling:	**1st step:** wire contacts 11 - 13. When actual humidity exceeds switching threshold S1, the changeover contact switches to 11 - 13. **2nd step:** wire contacts 21 - 23. When actual humidity exceeds switching threshold S 2, the changeover contact switches to 21 - 23. Terminal 2: output relative humidity / terminal 3: output temperature

Dimensional drawing **AHT-30**





SF-K
plastic sinter filter
(standard)



SF-M
metal sinter filter
(optional)

M12 connector
(optional on request)



AHT-30
with display and
plastic sinter filter
(standard)



AHT-30
with display and
metal sinter filter
(optional)



WS-03
Weather and sun protection hood
(optional)



Display readout

The **1st line** of the display shows the **ACTUAL humidity** in % RH and the **ACTUAL temperature** in °C.
The displays showing the ACTUAL values alternate in a 3-second rhythm.
The resolution is 1/10 % RH or 1/10 °C.

The **3rd line** shows information about the **switching status of relay 1 and 2** (as circuits) on the left, and on the right for the **switching values of relay 1 and 2** in % RH or °C (adjustable via the corresponding set potentiometer).
The reference to respective measured value (relative humidity or temperature) is determined by the mode selected.

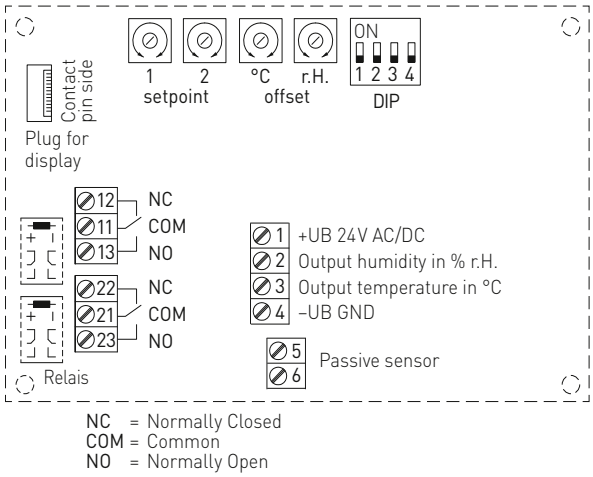
For improved legibility, backlighting is provided.

HYGRASREG® AHT - 30

On-wall hygrostats and humidity and temperature sensors (± 2.0 %), electronic, two-step, with multi-range switching and continuous / switching output

S+S REGELTECHNIK

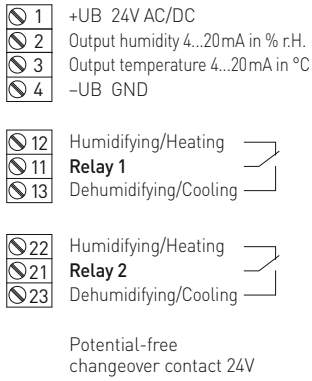
Schematic diagram **AHT-30**



NC = Normally Closed
COM = Common
NO = Normally Open

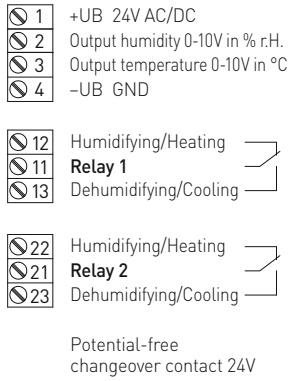
DIP switches	AHT-30	
Function mode	**DIP 1**	**DIP 2**
Mode 1 (**2x** 5...95 % RH) (default)	OFF	OFF
Mode 2 (5...95 % RH **+ 5** % RH)	**ON**	OFF
Mode 3 (**2x** –35...+80 °C)	OFF	**ON**
Mode 4 (5...95 % RH / –35...+80 °C)	**ON**	**ON**
Temperature range	**DIP 3**	**DIP 4**
–35...+35 °C	OFF	OFF
0...+80 °C	**ON**	OFF
0...+50 °C (default)	OFF	**ON**
–35...+75 °C	**ON**	**ON**

Connecting diagram **AHT-30-I**



Potential-free changeover contact 24V

Connecting diagram **AHT-30-U**



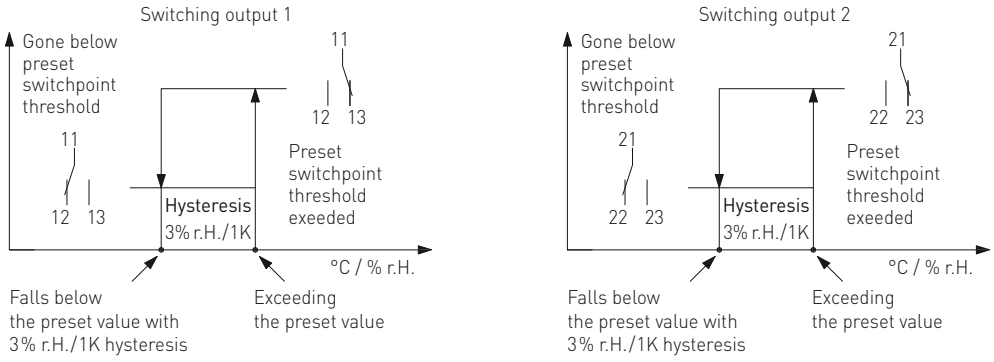
Potential-free changeover contact 24V

Supply	AC	DC
→ **1**	24 V~	24 V DC
→ **4**	0 V	GND

12	(A1) →	**Relay 1** Breaker contact
11	(W1) →	**Relay 1** Changeover contact
13	(B1) →	**Relay 1** Normally open contact

22	(A2) →	**Relay 2** Breaker contact
21	(W2) →	**Relay 2** Changeover contact
23	(B2) →	**Relay 2** Normally open contact

Switching output **AHT-30**



Mode 1: Independent switchpoints for both relay outputs can be defined in the range of 5...95 % RH by the control knobs (setpoint 1 for relay 1, setpoint 2 for relay 2, see schematic diagram). When the respective switchpoint is exceeded, the corresponding relay switches over (changeover contact 1 switches from position 2 to position 3). When the pre-set switchpoint is undershot again by more than 3 % RH (hysteresis), the respective switching output switches back to the initial position (changeover contact 1 switches from position 3 to position 2).

Mode 2: In Mode 2, only control knob setpoint 1 is active (setpoint 2 without function)! The switchpoint for the first relay is defined in the range of 5...95 % RH by the control knob setpoint 1 (see schematic diagram). The switchpoint for the second relay output is invariably defined in mode 2 as "Switchpoint 1 + 5 % RH". Hysteresis of 3 % RH is also predefined for each switching output in mode 2.

Mode 3: Independent switchpoints within the temperature range (selectable via DIP switches) for both relay outputs can be defined by the control knobs (setpoint 1 for relay 1, setpoint 2 for relay 2). If the respective switchpoint is exceeded, the corresponding relay switches over. If the pre-set threshold value is undershot again by 1 K (hysteresis), the respective switching output switches back to the initial position. The thresholds of the setting range (temperature) are 5 °C above the minimum or below the maximum range value respectively.

Mode 4: In mode 4, the control knob is allocated to setpoint 1 of the temperature, while control knob is allocated to setpoint 2 of the relative humidity. The switchpoints can be set within the temperature range (selectable via DIP switches) or from 5...95 % RH (humidity). The thresholds of the setting range (temperature) are 5 °C above the minimum or below the maximum range value respectively.

AHT-30
with display



Temperature table
MR: –35...+75 °C

°C	U_A [V]	I_A [mA]
-35	0.0	4.0
-30	0.5	4.7
-25	0.9	5.5
-20	1.4	6.2
-15	1.8	6.9
-10	2.3	7.6
-5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

Temperature table
MR: –35...+35 °C

°C	U_A [V]	I_A [mA]
-35	0.0	4.0
-30	0.7	5.1
-25	1.4	6.3
-20	2.1	7.4
-15	2.9	8.6
-10	3.6	9.7
-5	4.3	10.9
0	5.0	12.0
5	5.7	13.1
10	6.4	14.3
15	7.1	15.4
20	7.9	16.6
25	8.6	17.7
30	9.3	18.9
35	10.0	20.0

Temperature table
MR: 0...+50 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

Temperature table
MR: 0...+80 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.6	5.0
10	1.3	6.0
15	1.9	7.0
20	2.5	8.0
25	3.1	9.0
30	3.8	10.0
35	4.4	11.0
40	5.0	12.0
45	5.6	13.0
50	6.3	14.0
55	6.9	15.0
60	7.5	16.0
65	8.1	17.0
70	8.8	18.0
75	9.4	19.0
80	10.0	20.0

Humidity table
MR: 0...100% RH

% RH	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

HYGRASREG® AHT-30 On-wall hygrostat and humidity and temperature sensor (±2.0%), *Deluxe*

Type/WG02	Setting Range Humidity	Setting Range Temperature	Output	Steps	Display	Item No.	Price
AHT-30-I						**I-variant**	
AHT-30W-I **LCD**	5...95% RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	2 x changeover contact, 2x 4...20 mA	two-step	■	1202-7127-2421-000	**235,82 €**
AHT-30-U						**U-variant**	
AHT-30W-U **LCD**	5...95% RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	2 x changeover contact, 2x 0-10 V	two-step	■	1202-7127-1421-000	**235,82 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101					on request	
ACCESSORIES							
SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel **V4A** (1.4404)					7000-0050-2200-100	**42,33 €**
WS-03	**Weather and sun protection hood**, 200 x 180 x 150 mm, stainless steel **V2A** (1.4301)					7100-0040-6000-000	**44,74 €**

HYGRASREG® KH - 10

Duct hygrostats including mounting flange, mechanical, one-step, with switching output

S+S REGELTECHNIK

Mechanical duct hygrostat **HYGR**ASREG® **KH-10** with switching output as one-step hygrostat. It works without external voltage and is used for controlling and monitoring the relative humidity in ventilation and air conditioning ducts, laboratories, production facilities, climatic test cabinets, indoor swimming pools, greenhouses, etc. to control humidifying and dehumidifying equipment, as minimum guard, or maximum hygrostat. KH-10 is applied in dust-free, pollutant-free, non-aggressive air.

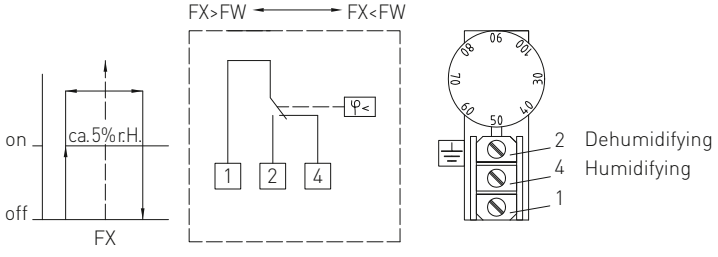
KH-10-U
(with internal setting)



TECHNICAL DATA

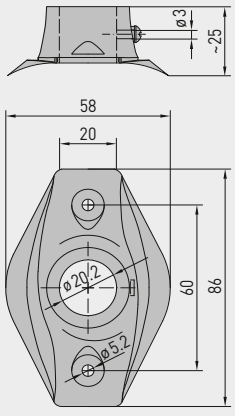
Switching capacity: (Contact load)	15 (2) A; 24...250 V AC, min. 100 mA > 24 V in dry rooms only according to VDE 0110
Setting range:	35...100 % RH
Contact:	dust-proof microswitch as single-pole, potential-free changeover contact (gold-plated optional)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 70 x 73.5 mm (Thor 2)
Cable connection:	**cable gland**, plastic (M 20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm)
Ambient temperature:	0...+ 60 °C
Operating difference:	approx. 3...6 % RH
Measuring accuracy:	typically ± 4 % RH
Controlled medium:	air, unpressurised, non-aggressive
Average temperature coefficient:	0.2 % / K; at +20 °C and 50 % RH
Flow rate:	max. 8 m / s
Sensor sleeve:	made of brass nickel-plated, Ø 20 mm, NL = 223 mm
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Protection class:	I (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU
FUNCTION	
Humidifying:	Wire contacts 1 - 4. Switch points ON / OFF are approx. 2.5 % RH above or below the selected value.
Dehumidifying:	Wire contacts 1 - 2. Switch points ON / OFF are approx. 2.5 % RH above or below the selected value.

Schematic diagram **KH-10**



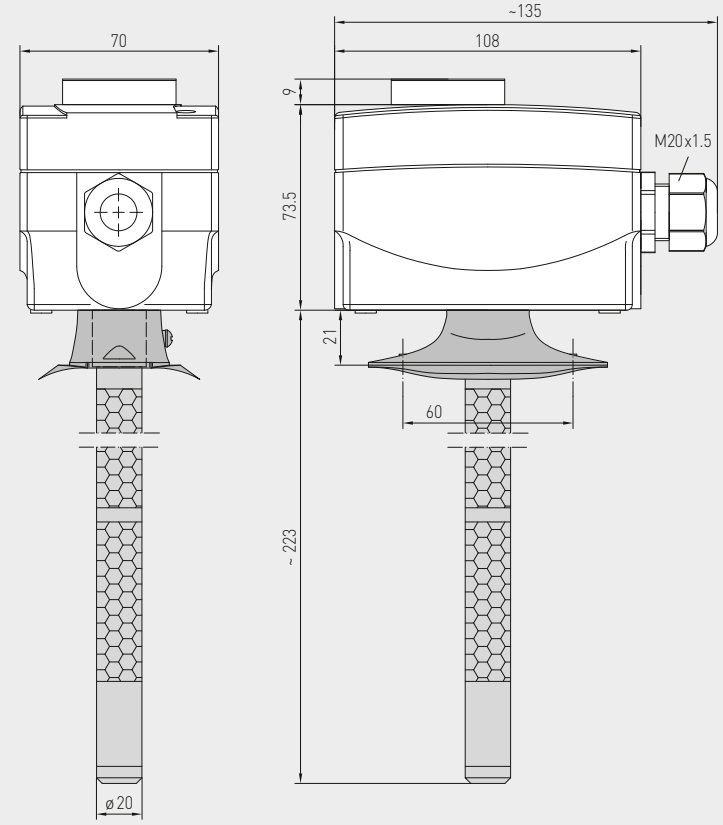
FX = measured relative humidity
FW = Humidity rate preset at the turning knob

Dimensional drawing **MF-20-K**



Dimensional drawing

KH-10



KH-10
(with external setting)



MF-20-K
Mounting flange, plastic



HYGRASREG® KH - 10 Duct hygrostats, mechanical, *Standard*

Type / WG01	Setting Range Humidity	Steps	Features	Item No.	Price
KH-10				**External setting**	
KH-10	35...100 % RH	one-step	–	1202-3012-0010-000	**229,36 €**
KH-10-U				**Internal setting**	
KH-10 U	35...100 % RH	one-step	Setpoint setter concealed	1202-3012-0020-000	**226,93 €**

ACCESSORIES			
MF-20-K	**Mounting flange** for KH, plastic, for duct installation (included in the scope of delivery)	7100-0030-4000-000	**9,56 €**
WH-20	**Wall bracket** for KH for on-wall mounting	1200-0010-4000-000	**12,47 €**
	For further information see last chapter!		

HYGRASREG® KH-40

Duct hygrostats and humidity sensors (± 2.0 %), including mounting flange, electronic, one-step, with switching outputs

S+S REGELTECHNIK

Electronic hygrostat and humidity sensor **HYGR**ASREG® **KH-40** with one switching output, adjustable switching threshold and display for displaying ACTUAL humidity (accuracy class ± 2.0 % RH) and for setting the target humidity. It is suitable for controlling and monitoring the relative air humidity, e.g. in ventilation and air conditioning ducts, laboratories, production rooms, climatic exposure test cabinets, swimming pools, greenhouses etc., for controlling humidifying and dehumidifying facilities. The measuring transducers are designed for exact detection of humidity. The KH-40 uses a digital, long-term stable sensor as a measuring element for measuring humidity. It is used in dust-free, unpolluted, non-aggressive air.

TECHNICAL DATA

Power supply:	24 V AC (± 20 %) and 15...36 V DC
Power consumption:	< 1.1 VA / 24 V DC; < 2.2 VA / 24 V AC
Sensors:	**digital humidity sensor,** small hysteresis, high long-term stability
Sensor protection:	**plastic** sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional **metal** sinter filter, Ø 16 mm, L = 32 mm)
Setting range:	5...95 % RH
Output:	potential-free changeover contact (24 V), 1 A ohmic load
Deviation, humidity:	typically **± 2.0** % (20...80 % RH) at +25 °C, otherwise ± 3.0 %
Ambient temperature:	storage –35...+85 °C; operation –30...+75 °C, non-precipitating
Long-term stability:	± 1 % per year
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (on request)
Protective tube:	**PLEUROFORM**™, material polyamide (PA6), with torsion protection, Ø 20 mm, NL = 235 mm (optionally 100 mm), v_{max} = 30 m/s (air) (on request, optional **stainless steel V2A** (1.4301), Ø 16 mm)
Process connection:	by mounting flange, plastic (included in the scope of delivery)
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) in the built-in state Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU
Display:	two-line **display with illumination,** cutout approx. 36 x 15 mm (W x H), for displaying actual humidit and for setting the target humidity
Displaying:	The 1st line of the display shows the **relative humidity.** The 2nd line shows on the left side the information regarding the **switching status of the relay** (as a circuit), as well as the **switching value** readout in % RH on the right side (adjustable using the set potentiometer). ○ **Circuit, empty** = relay in idle state ● **Circuit, full** = relay energised
FUNCTION	**actual humidity < switching value** contact 11-12 closed (LED OFF) **actual humidity > switching value** contact 11-13 closed (LED ON)

SF-K
Plastic sinter filter (standard)



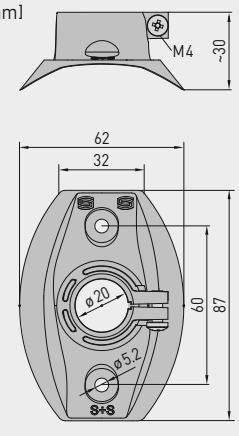
SF-M
Metal sinter filter (optional)



MFT-20-K
Mounting flange, plastic



Dimensional drawing [mm] **MFT-20-K**

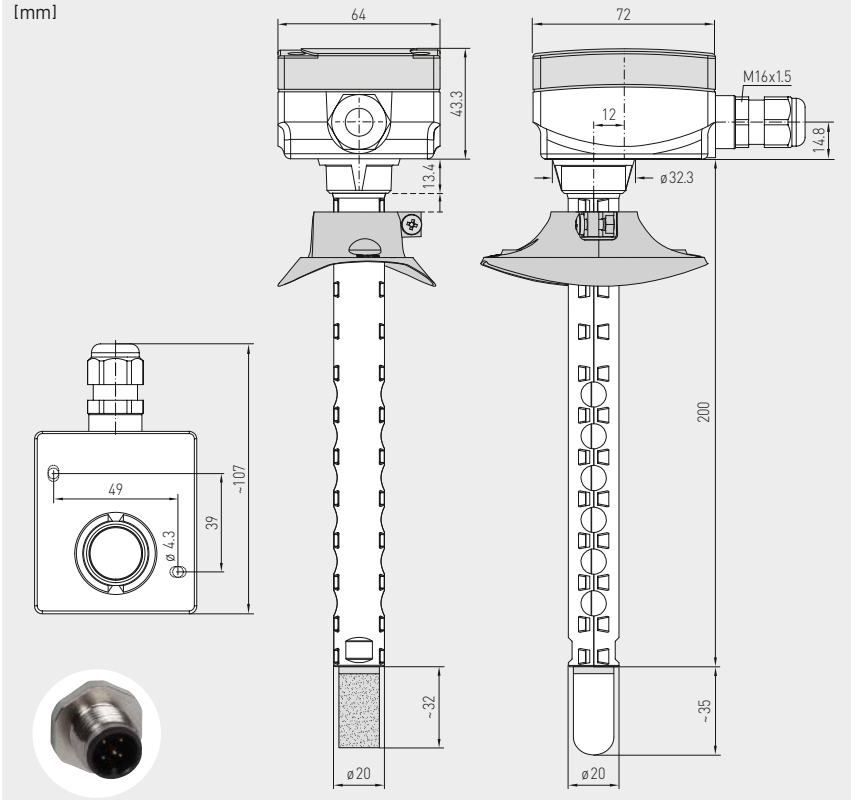


Display standard **KH-40**



Duct hygrostats and humidity sensors (± 2.0 %), including mounting flange, electronic, one-step, with switching outputs

Dimensional drawing [mm] **KH-40**



M12 connector (optional on request)

with **metal** sinter filter (optional)

with **plastic** sinter filter (standard)

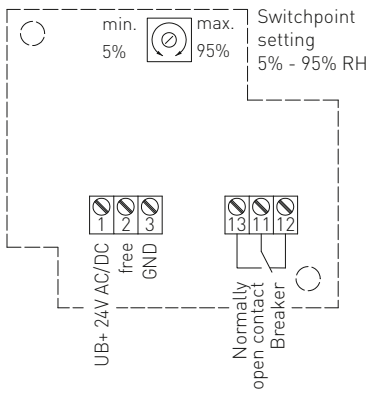
KH-40
with display and plastic sinter filter (standard)



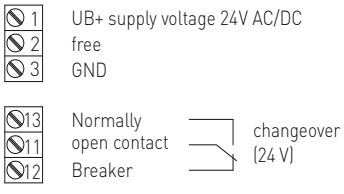




Schematic diagram **KH-40**



Connecting diagram **KH-40**



HYGRASREG® KH-40	Duct hygrostats and humidity sensors (± 2.0 %), *Premium*					
Type / WG01	**Setting Range** Humidity	**Output**	**Steps**	**Display**	**Item No.**	**Price**
KH-40						
KH-40W **LCD**	5...95 % RH	1 x changeover contact	one-step	■	1202-3065-0221-000	**182,61 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101				on request	
	shortened protective tube **PLEUROFORM**™, NL = 100 mm				on request	

ACCESSORIES			
SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable, stainless steel **V4A** (1.4404)	7000-0050-2200-100	**42,33 €**

HYGRASREG® KHT - 30

Duct hygrostats and humidity and temperature sensors (± 2.0 %), incl. mounting flange, electronic, two-step, with multi-range switching and continuous / switching output

S+S REGELTECHNIK

Electronic duct hygrostat and/or duct thermostat **HYGR**ASREG® **KHT-30** with a continuous and two switching outputs, adjustable switching thresholds and display for indicating ACTUAL humidity and/or ACTUAL temperature (accuracy class ± 2.0 % RH). The setpoints can be allocated to the relative humidity and/or to the temperature.

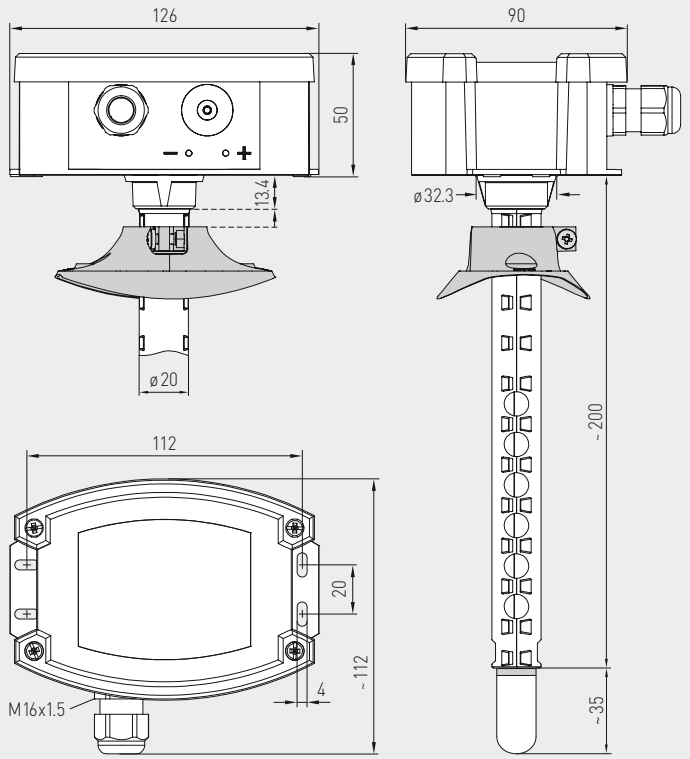
It is suitable for regulating and monitoring relative humidity (humidifying and dehumidifying) and/or the temperature (heating and cooling), e.g. in ventilation and air conditioning ducts, laboratories, production facilities, climatic test cabinets, indoor swimming pools, greenhouses, etc., to control humidifying and dehumidifying equipment or heating system control. The measuring transducers are designed for exact humidity/temperature measurement. The KHT-30 uses a digital, long-term stable sensor as a measuring element. It is used in dust-free, unpolluted, non-aggressive air.

TECHNICAL DATA

Power supply:	24 V AC / DC (± 20 %)
Power consumption:	< 1,5 VA / 24 V DC, < 3,5 VA / 24 V AC
Sensor:	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
Sensor protection:	**plastic** sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional **metal** sinter filter, Ø 16 mm, L = 32 mm)
Setting range:	5...95 % RH (humidity) **Multi-range switching with** **4 switchable measuring ranges** (see table) –35...+35 °C; –35...+75 °C; 0...+50 °C; 0...+80 °C (temperature) (Switch steps 1 and 2 are separately adjustable)
Operating difference:	**Mode 1:** both switch steps are freely adjustable (rel. humidity) **Mode 2:** 5 % between both switch steps (rel. humidity) **Mode 3:** both switch steps freely adjustable (temperature) **Mode 4:** switch step 1 (temperature), switch step 2 (rel. humidity) (adjustable via DiP switches)
Output:	potential-free changeover contacts (2 x changeover contact 24 V, 1A ohmic load, separately adjustable, 2x 0 - 10V for U variant or 4...20mA for I variant)
Deviation, humidity:	typically **± 2.0** % (20...80 % RH) at +25 °C, otherwise ± 3.0 %
Deviation, temperature:	typically **± 0.2 K** at +25 °C
Ambient temperature:	storage –35...+85 °C; operation – 30...+75 °C, non-precipitating
Long-term stability:	± 1 % per year
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Typ 2)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Protective tube:	**PLEUROFORM**™, material polyamide (PA6), with torsion protection, Ø 20 mm, NL = 235 mm (optionally 100 mm), v_{max} = 30 m/s (air) (optional available on request **stainless steel V2A** (1.4301), Ø 16 mm)
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Standards:	CE conformity, EMC directive 2014 / 30 / EU
Display:	three-line **display with illumination**, cutout approx. 70 x 40 mm (W x H), for displaying ACTUAL humidity and/or ACTUAL temperature or for setpoint adjustment
FUNCTION	
Humidifying/heating:	**1st step:** wire contacts 11 - 12. If actual humidity falls more than 3 % RH / 1 K (hysteresis) below switching threshold S1, the changeover contact switches to 11 - 12. **2nd step:** wire contacts 21 - 22. If actual humidity falls more than 3 % RH / 1 K (hysteresis) below switching threshold S2, the changeover contact switches to 21 - 22. Terminal 2: output relative humidity / terminal 3: output temperature
Dehumidifying/cooling:	**1st step:** wire contacts 11 - 13. When actual humidity exceeds switching threshold S1, the changeover contact switches to 11 - 13. **2nd step:** wire contacts 21 - 23. When actual humidity exceeds switching threshold S2, the changeover contact switches to 21 - 23. Terminal 2: output relative humidity / terminal 3: output temperature

Duct hygrostats and humidity and temperature sensors (± 2.0 %), incl. mounting flange, electronic, two-step, with multi-range switching and continuous/switching output

Dimensional drawing [mm] **KHT-30**



SF-K
plastic sinter filter (standard)



SF-M
metal sinter filter (optional)





M12 connector
(optional on request)

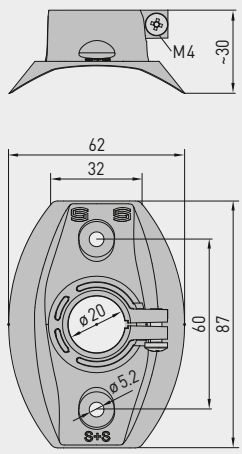
KHT-30
with display and plastic sinter filter (standard)



KHT-30
with display and metal sinter filter (optional)



Dimensional drawing [mm] **MFT-20-K**



MFT-20-K
Mounting flange, plastic



Display readout

The **1st line** of the display shows the **ACTUAL humidity** in % RH and the **ACTUAL temperature** in °C. The displays showing the ACTUAL values alternate in a 3-second rhythm. The resolution is 1/10 % RH or 1/10 °C.

The **3rd line** shows information about the **switching status of relay 1 and 2** (as circuits) on the left, and on the right for the **switching values of relay 1 and 2** in % RH or °C (adjustable via the corresponding set potentiometer). The reference to respective measured value (relative humidity or temperature) is determined by the mode selected.

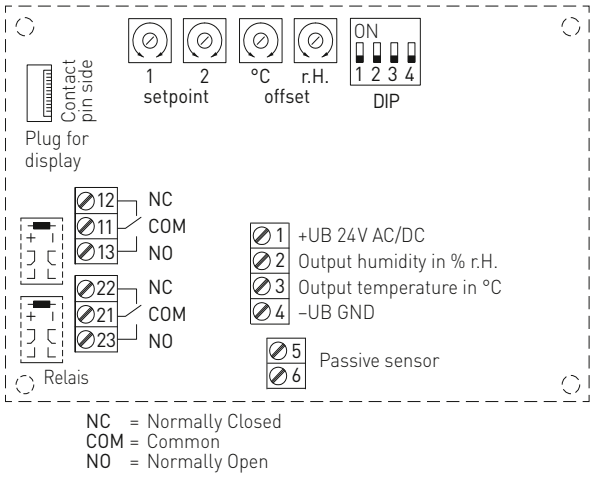
For improved legibility, backlighting is provided.

HYGRASREG® KHT-30

Duct hygrostats and humidity and temperature sensors (± 2.0 %), incl. mounting flange, electronic, two-step, with multi-range switching and continuous/switching output

S+S REGELTECHNIK

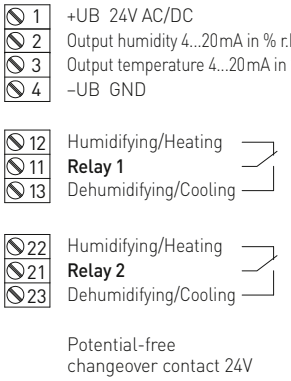
Schematic diagram **KHT-30**



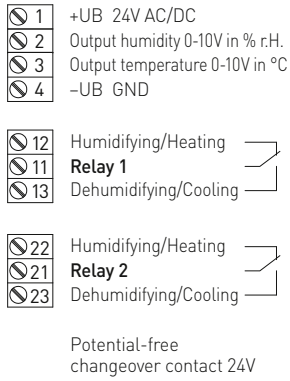
NC = Normally Closed
COM = Common
NO = Normally Open

DIP switches	KHT-30	
Function mode	**DIP 1**	**DIP 2**
Mode 1 (**2x** 5...95 % RH) (default)	OFF	OFF
Mode 2 (5...95 % RH **+ 5** % RH)	**ON**	OFF
Mode 3 (**2x** –35...+80 °C)	OFF	**ON**
Mode 4 (5...95 % RH / –35...+80 °C)	**ON**	**ON**
Temperature range	**DIP 3**	**DIP 4**
–35...+35 °C	OFF	OFF
0...+80 °C	**ON**	OFF
0...+50 °C (default)	OFF	**ON**
–35...+75 °C	**ON**	**ON**

Connecting diagram **KHT-30-I**



Connecting diagram **KHT-30-U**

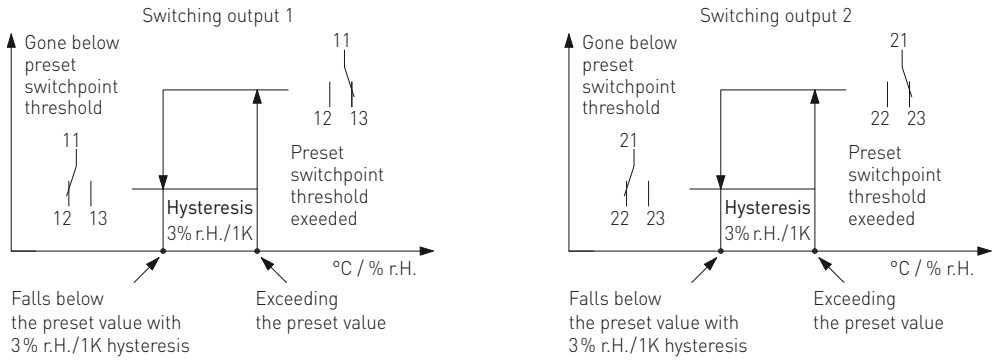


Supply	AC	DC
→ **1**	24 V~	24 V DC
→ **4**	0 V	GND

12	(A1) →	**Relay 1** Breaker contact
11	(W1) →	**Relay 1** Changeover contact
13	(B1) →	**Relay 1** Normally open contact

22	(A2) →	**Relay 2** Breaker contact
21	(W2) →	**Relay 2** Changeover contact
23	(B2) →	**Relay 2** Normally open contact

Switching output **KHT-30**



Mode 1: Independent switchpoints for both relay outputs can be defined in the range of 5...95 % RH by the control knobs (setpoint 1 for relay 1, setpoint 2 for relay 2, see schematic diagram). When the respective switchpoint is exceeded, the corresponding relay switches over (changeover contact 1 switches from position 2 to position 3). When the pre-set switchpoint is undershot again by more than 3 % RH (hysteresis), the respective switching output switches back to the initial position (changeover contact 1 switches from position 3 to position 2).

Mode 2: In Mode 2, only control knob setpoint 1 is active (setpoint 2 without function)! The switchpoint for the first relay is defined in the range of 5...95 % RH by the control knob setpoint 1 (see schematic diagram). The switchpoint for the second relay output is invariably defined in mode 2 as "Switchpoint 1 + 5 % RH". Hysteresis of 3 % RH is also predefined for each switching output in mode 2.

Mode 3: Independent switchpoints within the temperature range (selectable via DIP switches) for both relay outputs can be defined by the control knobs (setpoint 1 for relay 1, setpoint 2 for relay 2). If the respective switchpoint is exceeded, the corresponding relay switches over. If the pre-set threshold value is undershot again by 1 K (hysteresis), the respective switching output switches back to the initial position. The thresholds of the setting range (temperature) are 5 °C above the minimum or below the maximum range value respectively.

Mode 4: In mode 4, the control knob is allocated to setpoint 1 of the temperature, while control knob is allocated to setpoint 2 of the relative humidity. The switchpoints can be set within the temperature range (selectable via DIP switches) or from 5...95 % RH (humidity). The thresholds of the setting range (temperature) are 5 °C above the minimum or below the maximum range value respectively.

HYGRASREG® KHT-30

Duct hygrostats and humidity and temperature sensors (± 2.0 %), incl. mounting flange, electronic, two-step, with multi-range switching and continuous/switching output



KHT-30
with display

Temperature table
MR: –35...+75 °C

°C	U_A [V]	I_A [mA]
-35	0.0	4.0
-30	0.5	4.7
-25	0.9	5.5
-20	1.4	6.2
-15	1.8	6.9
-10	2.3	7.6
-5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

Temperature table
MR: –35...+35 °C

°C	U_A [V]	I_A [mA]
-35	0.0	4.0
-30	0.7	5.1
-25	1.4	6.3
-20	2.1	7.4
-15	2.9	8.6
-10	3.6	9.7
-5	4.3	10.9
0	5.0	12.0
5	5.7	13.1
10	6.4	14.3
15	7.1	15.4
20	7.9	16.6
25	8.6	17.7
30	9.3	18.9
35	10.0	20.0

Temperature table
MR: 0...+50 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

Temperature table
MR: 0...+80 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.6	5.0
10	1.3	6.0
15	1.9	7.0
20	2.5	8.0
25	3.1	9.0
30	3.8	10.0
35	4.4	11.0
40	5.0	12.0
45	5.6	13.0
50	6.3	14.0
55	6.9	15.0
60	7.5	16.0
65	8.1	17.0
70	8.8	18.0
75	9.4	19.0
80	10.0	20.0

Humidity table
MR: 0...100 % RH

% RH	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

HYGRASREG® KHT-30 Duct hygrostat and humidity and temperature sensor (± 2.0 %), *Deluxe*

Type / WG02	Setting Range Humidity	Setting Range Temperature	Output	Steps	Display	Item No.	Price
KHT-30-I						**I-variant**	
KHT-30W-I **LCD**	5...95 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	2 x changeover contact, 2x 4...20 mA	two-step	■	1202-8127-2421-000	**235,82 €**
KHT-30-U						**U-variant**	
KHT-30W-U **LCD**	5...95 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	2 x changeover contact, 2x 0-10 V	two-step	■	1202-8127-1421-000	**235,82 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101 shortened protective tube **PLEUROFORM**™, NL = 100 mm					on request on request	
ACCESSORIES							
SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable, stainless steel **V4A** (1.4404)					7000-0050-2200-100	**42,33 €**

HYGRASREG® KW
HYGRASREG® KW-SD

Condensation control switches including strap / with detached sensor head, with switching output

S+S REGELTECHNIK

Patented quality product
(pro-dynamic cross convection patent no. DE 10 2012 015 726.6)

The condensation control switch **HYGR**ASREG® **KW** with housing made from impact-resistant plastic with quick-locking screws or the cost-effective **HYGR**ASREG® **KW-SD** with snap-on lid is installed on cooling ceilings, on cooling/cold-water piping or on cooled surfaces and is designed to prevent the formation of condensation.

It reliably detects formation of dew by means of its humidity and temperature sensor (no conductivity measurement) and, thanks to its measuring method, **pro-dynamic cross convection**, yields an exact measurement result (with LED status indicator).

Dew point temperature is that temperature at which air reaches the state of saturation and water vapour starts to condensate. The KW condensation control switch can be operated as a monitor on cooling ceilings or pipes so that the switching output is activated when dew builds up on the cooling ceilings of the property to be monitored and e.g. a heating system is started, or other actuators are initiated.

KW-SD
with snap-on lid
(IP 54)



TECHNICAL DATA

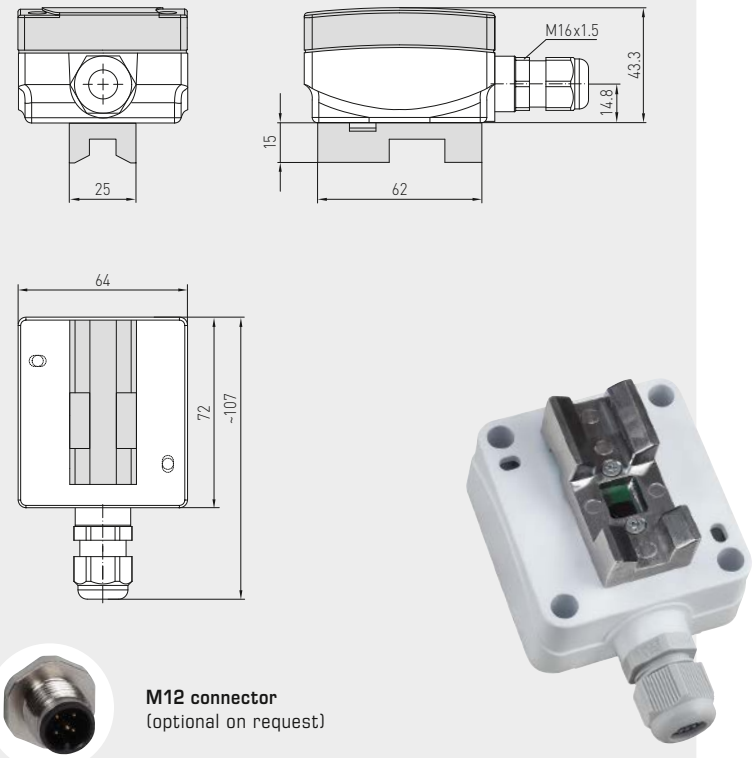
Power supply:	24 V AC (± 20 %) and 15...36 V DC
Power consumption:	< 1.1 VA / 24 V DC; < 2.2 VA / 24 V AC
Switchpoint:	approx. 93 % RH (permanently set)
Output:	potential-free changeover contact (24 V), 1 A ohmic load
Sensor protection:	membrane filter
Medium:	clean air and non-aggressive, non-combustible gases
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016), housing cover is transparent! **KW-xx** **with quick-locking screws** (slotted / Phillips head combination), **KW-xx-SD** **with snap-on lid,**
Housing dimensions:	72 x 64 x 43.3 mm (Tyr 1 / Tyr 01)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Process connection:	**KW / KW-SD** endless strap with metal tightener, 300 mm, for pipes up to 3 " diameter (included in the scope of delivery) **KW / KW-SD -external** cable tie, 200 mm (included in the scope of delivery)
Mounting:	The mounting position should be selected so that no condensate can enter the sensor system in the event that condensation forms! **KW / KW-SD** with strap for direct mounting on pipes or for direct mounting on flat surfaces (e.g. walls, ceilings) **KW-external / KW-SD-external** with detached sensor head (cable length KL = 1.5 m) for mounting on pipes
Protection class:	III (according to EN 60 730)
Protection type:	**KW-xx** **IP 65** (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1) **KW-SD-xx** **IP 54** (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713160960A (Tyr 01)
Standards:	CE-conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU
FUNCTION	The relay output is triggered (contact 13-11 closed) if the **switchpoint (93 % RH)** is not reached and opens (contact 12-11 closed) in the event of a fault (power failure, condensation).
	**LED short pulses =** relay active → switchpoint not reached ACTUAL humidity **< 93 % RH (no condensation)**
	**LED long pulses =** relay inactive → switchpoint exceeded ACTUAL humidity **> 93 % RH (condensation)**

KW-SD-extern
with snap-on lid
(IP 54)



Dimensional drawing

KW
KW-SD





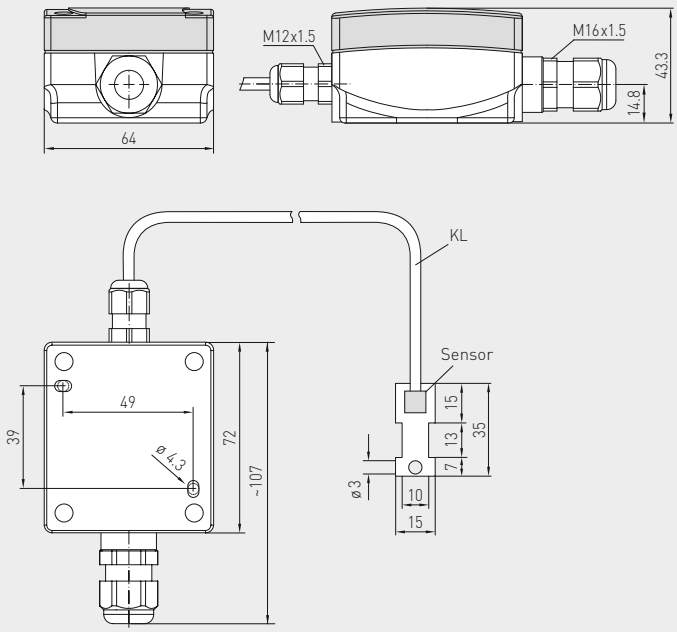
M12 connector
(optional on request)

KW
with quick-locking screws
(IP 65)



Dimensional drawing

KW-external
KW-SD-external





M12 connector
(optional on request)

KW-extern
with quick-locking screws
(IP 65)

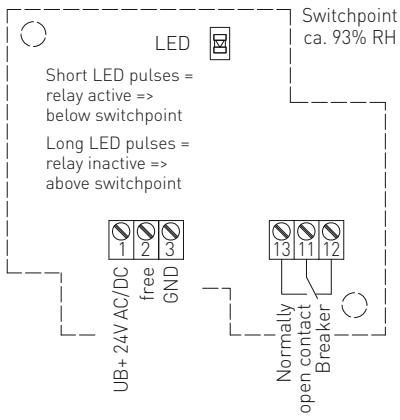


HYGRASREG® KW
HYGRASREG® KW - SD

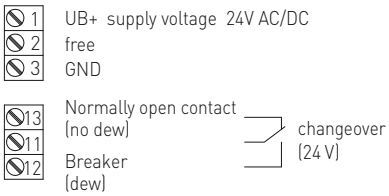
Condensation control switches including strap / with detached sensor head, with switching output

S+S REGELTECHNIK

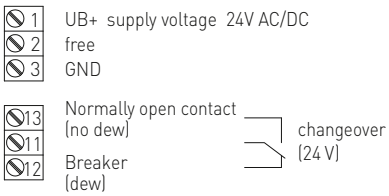
Schematic diagram **KW-W-xx**



Connecting diagram (no condensation) **KW-W-xx**
RH < 93 %



Connecting diagram (condensation) **KW-W-xx**
RH > 93 %



KW
pro-dynamic
cross convection



PATENTED



HYGRASREG® KW-SD	Condensation control switches including strap,, *Standard*
HYGRASREG® KW-SD-external	Condensation control switches with detached sensor head, *Standard*

Type / WG01B	Switchpoint Humidity	Output Humidity	Mounting	Item No.	Price
KW-SD			**Sensor internal**	**IP 54**	
KW-W-SD	ca. 93 % RH	Changeover contact	for direct mounting on pipes, for direct mounting on flat surfaces	1202-1075-0001-020	**105,61 €**
KW-SD-external			**Sensor external**	**IP 54**	
KW-W-SD extern	ca. 93 % RH	Changeover contact	for mounting on pipes	1202-1075-0001-040	**115,63 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101			on request	

KW
KW-external
with quick-locking screws
(IP 65)



KW-SD
KW-SD-external
with snap-on lid
(IP 54)



HYGRASREG® KW	Condensation control switches including strap, *Premium*
HYGRASREG® KW-external	Condensation control switches with detached sensor head, *Premium*

Type / WG01	Switchpoint Humidity	Output Humidity	Mounting	Item No.	Price
KW			**Sensor internal**	**IP 65**	
KW-W	ca. 93 % RH	Changeover contact	for direct mounting on pipes, for direct mounting on flat surfaces	1202-1025-0001-020	**112,92 €**
KW-external			**Sensor external**	**IP 65**	
KW-W-extern	ca. 93 % RH	Changeover contact	for mounting on pipes	1202-1025-0001-040	**137,15 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101			on request	

Dew point control switches including strap / with detached sensor head, with active / switching outputs

S+S REGELTECHNIK

Patented quality product
(pro-dynamic cross convection patent no. DE 10 2012 015 726.6)

The dew point control switch **HYGR**ASREG® **TW** is installed on cooling / cold-water piping or on cooled surfaces. It reliably detects formation of dew by means of its humidity and temperature sensor (no conductivity measurement) and, thanks to its patented measuring method, **pro-dynamic cross convection**, yields an exact measurement result (with LED status display), **with / without display**.

Dew point temperature is that temperature at which air reaches the state of saturation and water vapour starts to condensate. Facilitated by the continuous measuring range from 0...100 % RH of the **TW-U** and the adjustable switchpoint for the **TW-W** of 75...100 % RH, it is possible to operate cooling ceilings, for example, so that the switching output of the dew point control switch, the DDC, is activated and then triggers a heater or other control elements, thereby preventing the formation of dew on pipes or cooling ceilings or on the property to be monitored.

TW
with quick-locking screws



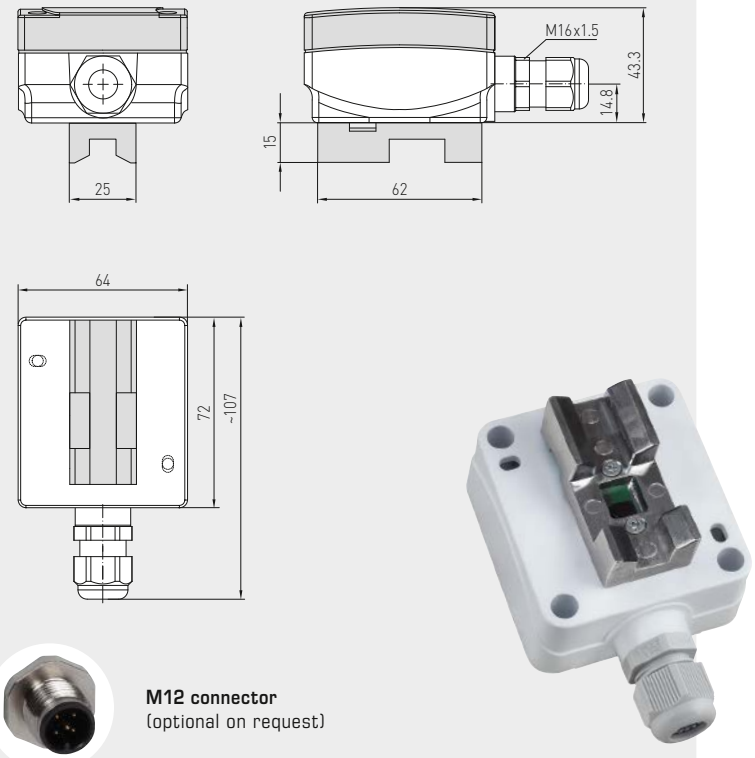
TECHNICAL DATA

Power supply:	24 V AC (± 20 %) and 15...36 V DC
Power consumption:	< 1.1 VA / 24 V DC; < 2.2 VA / 24 V AC
Measuring Range:	formation of dew is detected at 0...100 % RH on the **TW-U**, continuous 75...100 % RH on the **TW-W**, switching (switchpoint adjustable by potentiometer, factory setting 75 % RH)
Output:	0-10 V or potential-free changeover contact (24 V), 1 A ohmic load
Sensors:	**digital humidity sensor with integrated temperature sensor,** small hysteresis, high long-term stability
Sensor protection:	membrane filter
Medium:	clean air and non-aggressive, non-combustible gases
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover is transparent!
Housing dimensions:	72 x 64 x 43.3 mm (Tyr 1)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Process connection:	**TW** endless strap with metal tightener, 300 mm, for pipes up to 3 " diameter (included in the scope of delivery) **TW-external** cable tie, 200 mm (included in the scope of delivery)
Mounting:	**TW** with strap for direct mounting on pipes or for direct mounting on flat surfaces (e.g. walls, ceilings) **TW-external** with detached sensor head (cable length KL = 1.5 m) for mounting on pipes
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU
Optional:	two-line **display with illumination,** cutout approx. 36 x 15 mm (W x H), for displaying actual humidity and the switching status of the relay
FUNCTION	The relay output is triggered (contact 13-11 closed) if the **pre-set switchpoint** (factory setting 75 % RH) is not reached and opens (contact 12-11 closed) in the event of an error (power failure, condensation).
	**LED short pulses =** relay active → switchpoint not reached ACTUAL humidity **< pre-set switchpoint (no condensation)**
	**LED long pulses =** relay inactive → switchpoint exceeded ACTUAL humidity **> pre-set switchpoint (condensation)**

TW-extern
with quick-locking screws



Dimensional drawing **TW**



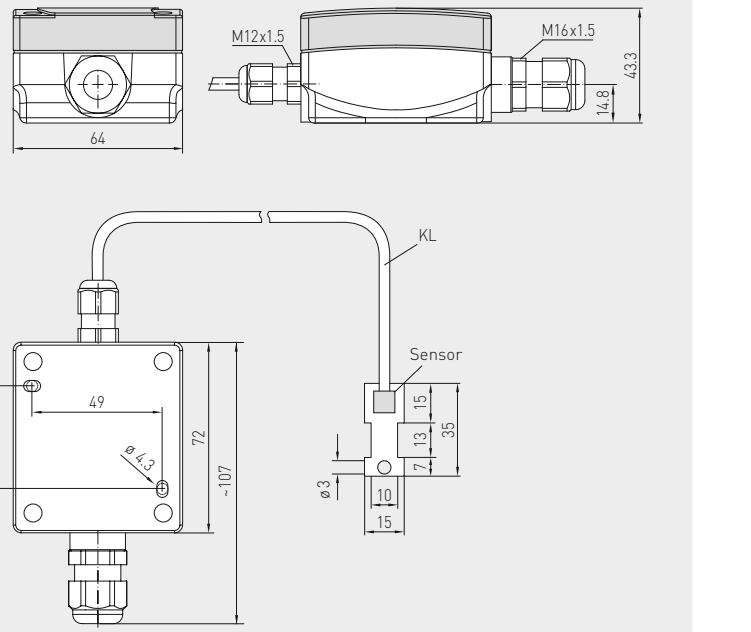


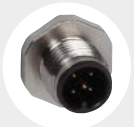
M12 connector
(optional on request)

TW
with display
and quick-locking screws



Dimensional drawing **TW-external**





M12 connector
(optional on request)

TW-extern
with display
and quick-locking screws



HYGRASREG® TW

Dew point control switches
including strap / with detached sensor head,
with active / switching outputs

S+S REGELTECHNIK

Display **standard** — **TW-xx Display**



By default, the first line of the display shows the **relative humidity**.

The second line shows the information about the **switching status of the relay** (as a circuit) on the left, and the respective **switching value** in % RH on the right (switchpoint adjustable by potentiometer, factory setting 75 % RH).

○ **Circuit, empty** = relay in idle state
● **Circuit, full** = relay energised

TW
pro-dynamic
cross convection



PATENTED



Connecting diagram (no condensation) **RH < switchpoint** — **TW-UW**

1 UB+ supply voltage 24V AC/DC
2 Output bedewing 0-10V (continuous)
3 GND
13 / 11 Normally open contact (no dew) — changeover (24 V)
12 Breaker (dew)

Connecting diagram (no condensation) **RH < switchpoint** — **TW-W**

1 UB+ supply voltage 24V AC/DC
2 free
3 GND
13 / 11 Normally open contact (no dew) — changeover (24 V)
12 Breaker (dew)

Connecting diagram (condensation) **RH > switchpoint** — **TW-UW**

1 UB+ supply voltage 24V AC/DC
2 Output bedewing 0-10V (continuous)
3 GND
13 / 11 Normally open contact (no dew) — changeover (24 V)
12 Breaker (dew)

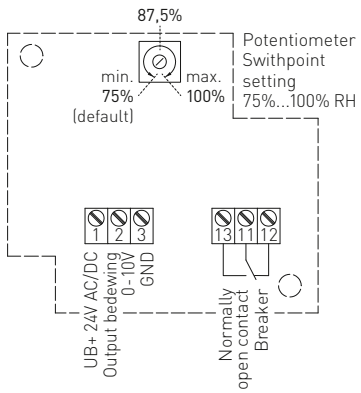
Connecting diagram (condensation) **RH > switchpoint** — **TW-W**

1 UB+ supply voltage 24V AC/DC
2 free
3 GND
13 / 11 Normally open contact (no dew) — changeover (24 V)
12 Breaker (dew)

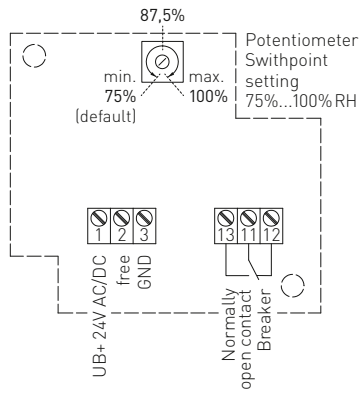
Connecting diagram — **TW-U**

1 UB+ supply voltage 24V AC/DC
2 Output bedewing 0-10V (continuous)
3 GND

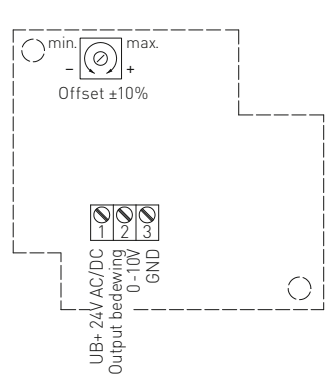
Schematic diagram — **TW-UW**



Schematic diagram — **TW-W**



Schematic diagram — **TW-U**



TW
with display



TW-external
with display



HYGRASREG® **TW**	Dew point control switches including strap (±3%), *Deluxe*
HYGRASREG® **TW-external**	Dew point control switches with detached sensor head (±3%), *Deluxe*

Type / WG01	**Measuring Range** Humidity	**Output** Humidity	**Mounting**	**Display**	**Item No.**	**Price**
TW			**Sensor internal**		**IP 65**	
TW-W	75...100% RH	Changeover contact	for mounting directly on pipes		1202-1015-0001-000	**126,99 €**
TW-W **LCD**	75...100% RH	Changeover contact	for mounting directly on pipes	■	1202-1015-1201-020	**176,81 €**
TW-U	0...100% RH	0-10 V	for mounting directly on pipes		1201-1011-1001-020	**131,82 €**
TW-U/W	0...100% RH	0-10 V + Changeover contact	for mounting directly on pipes		1202-1012-1001-020	**151,16 €**
TW-U/W **LCD**	0...100% RH	0-10 V + Changeover contact	for mounting directly on pipes	■	1202-1012-1201-020	**201,00 €**
TW-external			**Sensor external**		**IP 65**	
TW-W-extern	75...100% RH	Changeover contact	for mounting on pipes		1202-1015-0021-030	**163,25 €**
TW-W-extern **LCD**	75...100% RH	Changeover contact	for mounting on pipes	■	1202-1015-0221-030	**213,07 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101				on request	

S+S REGELTECHNIK

Leakage sensor / water ingress detector with switching output

The leakage sensor / water ingress detector **HYGR**ASREG® **LS** with leakage location is used to detect water ingresses and ingresses of conductive liquids. It is designed for the early detection of water leakages to protect sensitive electrical and electronic equipment in buildings against moisture.
The water ingress detector consists of an electronic monitoring system with LED status indicator, and a matching electrode, which can be extended by the user.

LS-2



LS-4



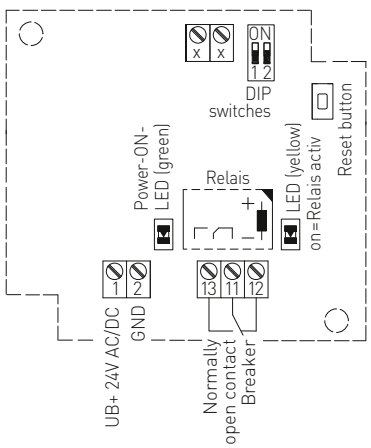




TECHNICAL DATA

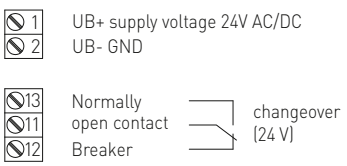
Power supply:	24 V AC (± 20 %) and 15...36 V DC
Power consumption:	< 1.0 VA / 24 V DC; < 2.2 VA / 24 V AC
Operating range electronics module:	10... 95 % RH; 0...+50 °C
Monitoring range:	conductive liquids between the probes
Switching threshold:	conductance between electrodes > threshold
Output:	potential-free changeover contact (24 V), 1 A ohmic load
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover is transparent!
Housing dimensions:	72 x 64 x 43.3 mm (Tyr 1)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.14 - 1.5 mm² via terminal screws
Process connection:	two external probes, laid according to measuring task (on the **LS-2**) or upright on electrodes with insulating plastic caps, which are mounted on the housing underside (on the **LS-4**)
Mounting accessories:	for device type **LS-2** (2 electrodes 10 mm, already permanently mounted) **Electrode extension** 15 mm, 20 mm and 30 mm, 2 pieces each, stainless steel **V2A** (1.4301) (enclosed) **Cable sensor**, L = 1 m (optional)
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU
FUNCTION	The leak sensor can be set using DIP switches so that the relay is energised during normal operation. This means that relay opens in the event of a fault (water damage, cable breakage, power failure). This also enables a break in the cable to the sensor to be detected.

Schematic diagram **LS**

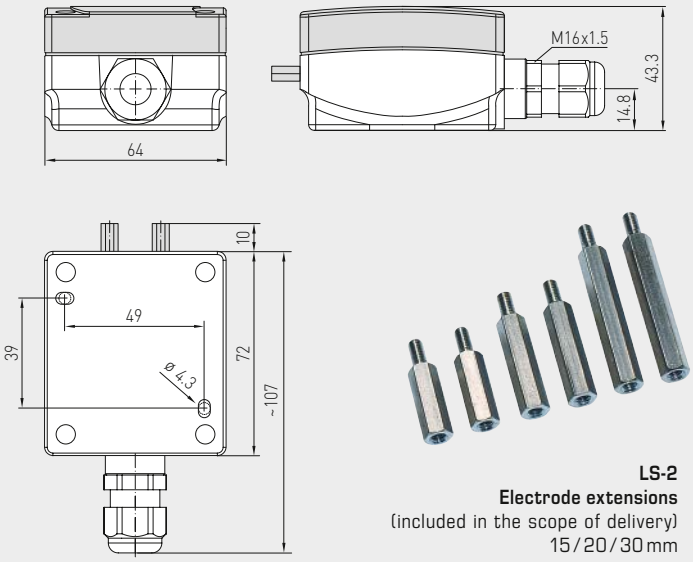


Self-locking (selectable)	**DIP 1**
Self-locking ON	**ON**
Self-locking OFF	OFF
Relay status (selectable)	**DIP 2**
Normally open contact OPEN	**ON**
Normally open contact CLOSED	OFF

Connecting diagram **LS**



Dimensional drawing **LS-2**

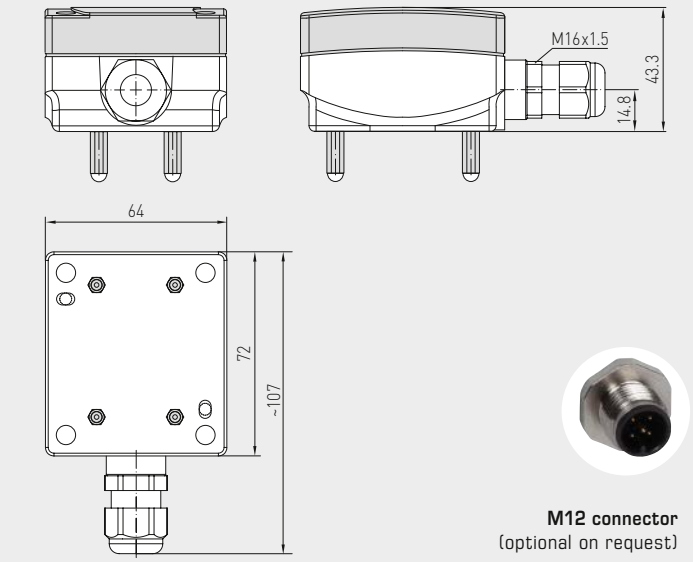


LS-2
Electrode extensions
(included in the scope of delivery)
15 / 20 / 30 mm

LS-2



Dimensional drawing **LS-4**



M12 connector
(optional on request)

LS-4



HYGRASREG® LS	Leakage sensor / water ingress detector			
Type / WG01	**Detection of leakage of conductive liquids**	**Output** Humidity (relative)	**Item No.**	**Price**
LS				
LS-2	Conductance > switching threshold	Changeover contact	1202-1042-0000-000	**104,21 €**
LS-4	Conductance > switching threshold	Changeover contact	1202-1042-0000-100	**117,97 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101		on request	

ACCESSORIES			
LS-Kabelsonde	**Cable sensor**, L = 1 m, for device type **LS-2**	1202-1042-0000-001	**25,47 €**
	For further information, see last chapter Accessories!		

Pressure

PREMASGARD® & **PREM**ASREG®
Atmospheric quality

Whether absolute or relative, whether positive pressure, differential pressure or negative pressure – we can handle pressure and provide the right solutions with our pressure sensors and pressure controllers. The high precision of the piezo-resistive sensors guarantees reliable performance from 25 Pascal to 300 bar.

Application Areas

- Process and mechanical engineering
- Medical and cleanroom engineering
- Large catering facilities
- Heating, ventilation and air conditioning
- Pump control and pressure lines
- Filter monitoring and air pressure deficiency protection
- Rotational speed and limit value control









PREMASGARD® & **PREM**ASREG®
PRESSURE SENSORS, PRESSURE CONTROLLERS

for gaseous media [mbar / Pa]

PREMASGARD® **111x**	Pressure measuring transducer	**491**
PREMASGARD® **112x**	Pressure measuring transducer	**491**
PREMASGARD® **112x-SD**	Pressure measuring transducer	**490**
PREMASGARD® **211x**	Pressure measuring transducer	**485**
PREMASGARD® **212x**	Pressure measuring transducer	**485**
PREMASGARD® **212x-SD**	Pressure measuring transducer	**484**
PREMASGARD® **711x**	Pressure measuring transducer	**497**
PREMASGARD® **711x-VA**	Pressure measuring transducer (Stainless steel housing Tyr 2E)	**503**
PREMASGARD® **722x**	Pressure measuring transducer, dual pressure sensor (2 channels) NEW	**509**
PREMASREG® **711x**	Pressure measuring transducer, pressure controller / pressure switch	**515**
PREMASREG® **711x-VA**	Pressure measuring transducer, pressure controller / pressure switch (Stainless steel housing Tyr 2E)	**521**
ALD	Measuring transducer (mbar) atmospheric pressure	**535**
DS 1 / DS 2	Differential pressure switch	**539**

for volume flow [mbar / Pa]

PREMASREG® **716x**	Volume flow measuring transducer, pressure controller / pressure switch	**527**
PREMASREG® **716x-VA**	Volume flow measuring transducer, pressure controller / pressure switch (Stainless steel housing Tyr 2E)	**533**

for liquid media [bar]

SHD	Pressure measuring transducer	**541**
SHD-SD	Pressure measuring transducer	**541**
SHD 692	Pressure measuring transducer	**543**

Special accessories

see chapter Accessories	**655**



Pressure

PREMASGARD® & **PREM**ASREG®

Precise sensor technology for the correct pressure

Broad Spectrum

Our pressure measuring transducers are designed to be multifunctional. This reduces the diversity of types while expanding their possible applications. Take advantage of our experience, our development, manufacturing and product know-how and order these products direct from the manufacturer S+S Regeltechnik. Thanks to microprocessor technology, almost any measuring range can be represented, including custom specifications. Multi-range switching, reaction times, units, automatic mode, and manual calibration are selectable via DIP switches.

Optimum Precision

The pressure sensors are developed and manufactured according to the latest criteria. They are fitted with the newest generation sensors that are linearised, temperature-compensated, and offer long-term and zeropoint stability.
The devices are produced at our factory and are calibrated and 100 % tested at our test benches and pressure chambers. Each sensor is precisely re-adjustable using offset potentiometers.
Take advantage of our experience, our development, manufacturing, and product know-how, and order these products directly from the manufacturer.

Approved Safety

RoHS conforming materials

ESD compliant manufacturing

CE compliance tested by external laboratories

Certified Quality

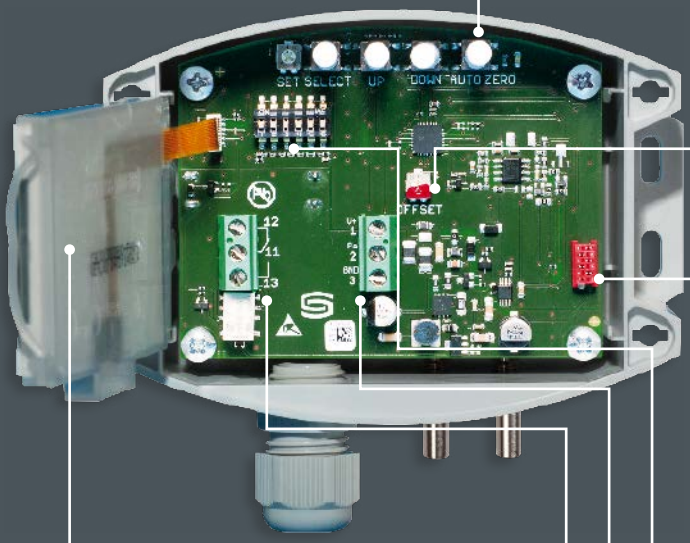
Our development and production in Nuremberg/Germany is certified by TÜV Thüringen according to DIN EN ISO 9001:2015.

GOST certified

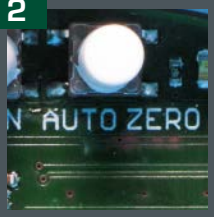
EAC certified

MADE IN GERMANY

S+S REGELTECHNIK



2



Auto-Zero

For zero point correction

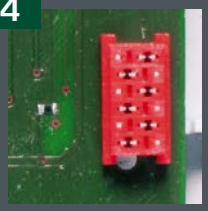
3



Offset Potentiometer

For fine adjustment (zero point offset) and readjustment upon recalibration

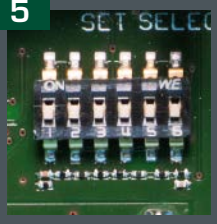
4



Quality Assurance

Calibration and balancing are done by means of the bus system at ther pressure test bench

5



DIP Switches

For multi-range toggling as well as setting of 4 or 8 different measuring ranges, response times, damping times, units and configuration levels

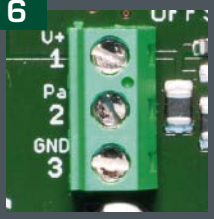
1



Extra-Large Display (70 x 40 mm)

With backlighting as well as display of range violation, sensor breakage, sensor short circuit and physical units

6



Screw Terminals

Active output signals 0-10 V, 4...20 mA or switched output

7

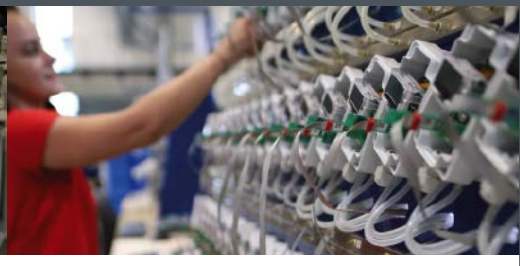


Relais

With optional automatic zero point calibration and valve for zero point correction







PREMASGARD® 211x/212x/212x-SD

Pressure, differential pressure and volume flow measuring transducers, including connection set, compact form, adjustable, calibratable, with multi-range switching and active output

S+S REGELTECHNIK

The calibrateable compact pressure sensors of the **PREM**ASGARD® **211x / 212x / 212x-SD** series are equipped with 8 switchable measuring ranges, 2 switchable output signals (16 devices in one) and with or without optional display and are used for measuring above-atmospheric, below-atmospheric, or differential pressures and Volume flow in air. The piezo-resistive measuring element is temperature-compensated and guarantees a high degree of reliability and accuracy. These pressure transmitters have a pushbutton for manual zero point calibration and an adjustable offset. Applications of these pressure sensors are in clean room, medical and filter technology, in ventilation and air conditioning ducts, in spray booths, in large-scale catering facilities, for monitoring filters, for level measurement or for triggering frequency converters. Media measured with these pressure transducers are air (non-precipitating), or other gaseous non-aggressive, non-combustible media. The differential pressure sensor is supplied including connection set **ASD-06** (2 m connection hose, two pressure connection nipples, screws). You can find further device types under **PREM**ASGARD® **111x / 112x / 112x-SD** (I variant with 2-wire connection).

TECHNICAL DATA

Power supply:	24 V AC/DC (± 10 %)
Working resistance:	R_a (Ohm) = 25 ...450 Ohm for I variant
Load resistance:	R_L > 25 kOhm for U variant
Power consumption:	< 1 W at 24 V DC; < 2 VA at 24 V AC
Current consumption:	< 45 mA
Measuring function:	**Differential pressure, volume flow** (square root output signal)
Measuring ranges:	**multi-range switching** **with 8 switchable measuring ranges** (see table)
Output:	**switchable 0-10 V / 4...20 mA** (via DIP switches)
Electrical connection:	3-wire connection
Media temperature:	–20...+50 °C (temperature-compensated 0...+50 °C)
Pressure connection:	with connection nozzles for pressure hose Ø 6 mm
Type of pressure:	differential pressure
Medium:	clean air and other non-aggressive, non-combustible gases
Accuracy:	**Type 2110 / 2120 / 2120-SD** (100 Pa): typically ± 3 Pa at +25 °C **Type 2111 / 2121 / 2121-SD** (1000 Pa): typically ± 10 Pa at +25 °C **Type 2115 / 2125 / 2125-SD** (5000 Pa): typically ± 35 Pa at +25 °C compared to the calibrated reference device
Zero point offset:	± 10 % of final value
Above- / below-atmospheric pressure:	± 50 kPa
Long-term stability:	± 1 % per year
Signal filtering:	**switchable 1 s / 10 s** (via DIP switches)
Hysteresis:	0.3 % of final value
Media contacting parts:	Brass, Ni, Duroplast, Si, epoxy, RTV, BSG, UV silicone gel
Temperature drift values:	± 0.1 % of final value / °C
Linearity:	< ± 1 % of final value
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016), housing cover for display is transparent! **Type 211x / 212x**: **with quick-locking screws** (slotted/Phillips head combination) **Type 212x-SD**: **with snap-on lid**
Housing dimensions:	72 x 64 x 37.8 mm (Typ 1 / Typ 01 without display) 72 x 64 x 43.3 mm (Typ 1 / Typ 01 with display)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**Type 211x / 212x**: **IP 67** (according to EN 60 529)* Housing tested, TÜV SÜD, Report No. 713139052 (Typ 1) **Type 212x-SD**: **IP 54** (according to EN 60 529)* Housing tested, TÜV SÜD, Report No. 713160960A (Typ 01) * Housing in the built-in state
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU
Features:	two-line **display with illumination**, cutout approx. 36 x 15 mm (W x H), to display ACTUAL pressure
ACCESSORIES	see table

PREMASGARD® **211x**
Pressure connectors **on the top side**, with quick-locking screws (IP 67)



PREMASGARD® **212x**
Pressure connectors **on the bottom side**, with quick-locking screws (IP 67)



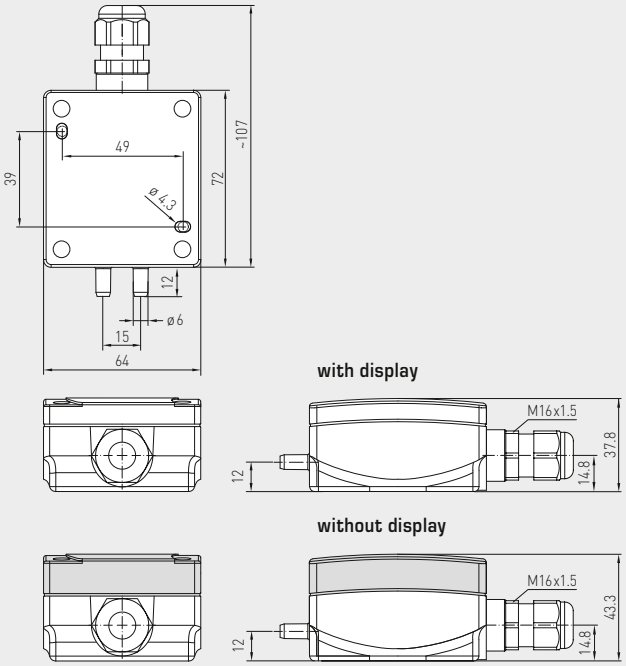
PREMASGARD® **212x-SD**
Pressure connectors **on the bottom side**, with snap-on lid (IP 54)



Pressure, differential pressure and volume flow measuring transducers, including connection set, compact form, adjustable, calibratable, with multi-range switching and active output

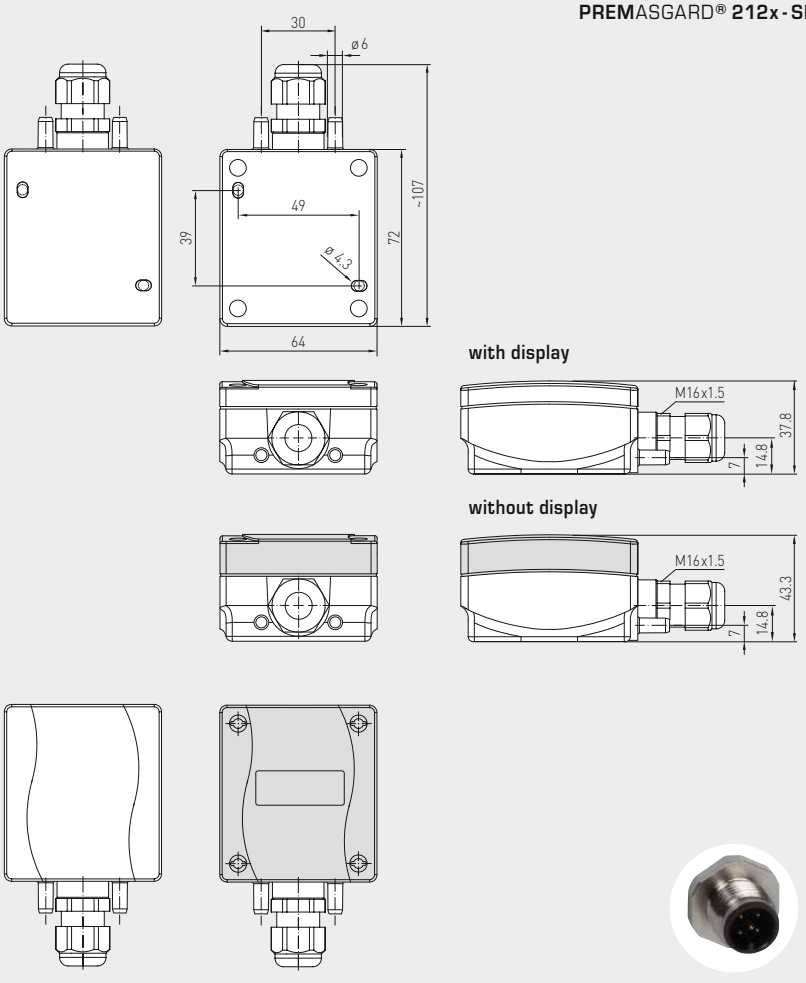
Dimensional drawing

PREMASGARD® 211x



Dimensional drawing

PREMASGARD® 212x
PREMASGARD® 212x-SD



with snap-on lid

with quick-locking screws

M12 connector
(optional on request)

PREMASGARD® 211x
Pressure connectors
on the top side,
with display,
with quick-locking screws
(IP67)



PREMASGARD® 212x
Pressure connectors
on the bottom side,
with display,
with quick-locking screws
(IP67)



PREMASGARD® 212x-SD
Pressure connectors
on the bottom side,
with display,
with snap-on lid
(IP54)

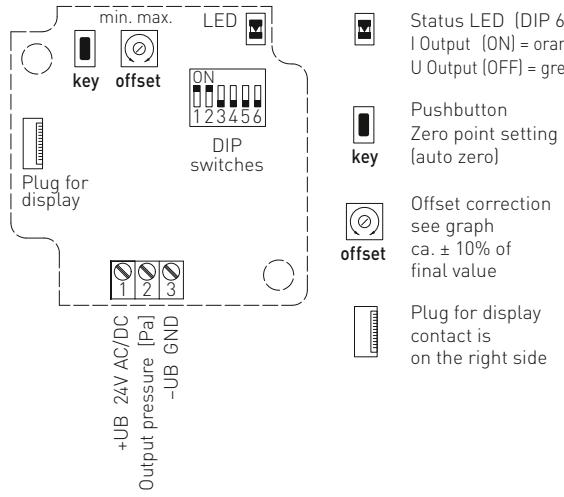


PREMASGARD® 211x/212x/212x-SD

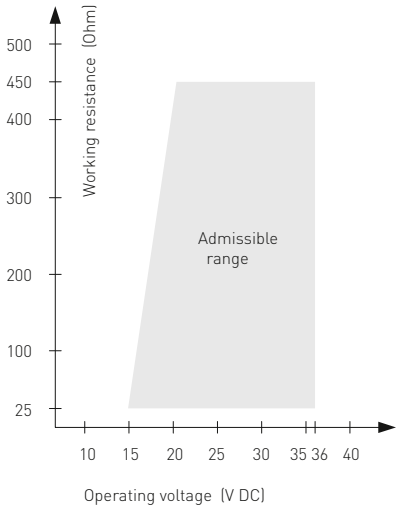
Pressure, differential pressure and volume flow measuring transducers, including connection set, compact form, adjustable, calibratable, with multi-range switching and active output

S+S REGELTECHNIK

Schematic diagram — **PREMASGARD® 211x / PREMASGARD® 212x / PREMASGARD® 212x-SD**



Load resistance diagram 4...20 mA — **PREMASGARD® 211x / PREMASGARD® 212x / PREMASGARD® 212x-SD**



Pressure range (selectable) – max. measuring range (default) is depending to the type of device						**DIP 1**	**DIP 2**
0...50 Pa	0...100 Pa	0...1000 Pa	–50...+50 Pa	–100...+100 Pa	–1000...+1000 Pa	OFF	OFF
–	0...300 Pa	0...2000 Pa	–	–300...+300 Pa	–2000...+2000 Pa	**ON**	OFF
–	0...500 Pa	0...3000 Pa	–	–500...+500 Pa	–3000...+3000 Pa	OFF	**ON**
0...100 Pa	**0...1000 Pa**	**0...5000 Pa**	**–100...+100 Pa**	**–1000...+1000 Pa**	**–5000...+5000 Pa**	**ON**	**ON**

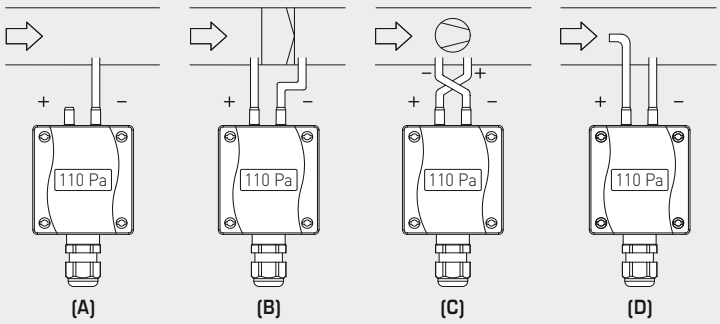
Output characteristic line (Mode selectable)	**DIP 4**
Linear (default) (for pressure detection)	OFF
Square root extracting (to determine the volume flow)	**ON**

Measuring range mode (Mode selectable)	**DIP 3**
Unidirectional (0...+MR) (default)	OFF
Bidirectional (–MR...+MR)	**ON**

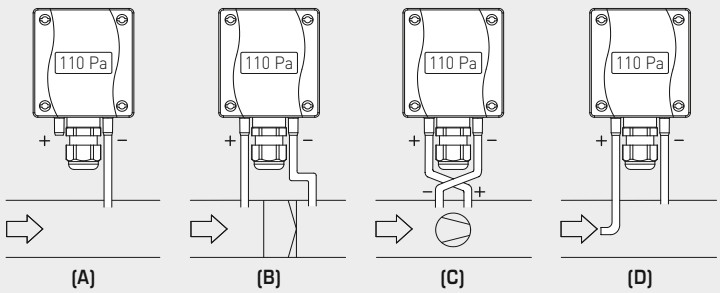
Measurement signal filtering (Time interval selectable)	**DIP 5**
10 s (default)	OFF
1 s	**ON**

Output (selectable)	**DIP 6**
Voltage 0-10 V (default)	OFF
Current 4... 20 mA	**ON**

Mounting diagram — **PREMASGARD® 211x**



Mounting diagram — **PREMASGARD® 212x / 212x-SD**



TYPES OF MONITORING:

Pressure connections at the pressure switch are marked with
P1 (+) for higher pressure and
P2 (–) for lower pressure.

(A) Below-atmospheric pressure
P1 (+) is not connected, but open to the atmosphere
P2 (–) connected to inside of duct

(B) Filter
P1 (+) connected upstream of filter
P2 (–) connected downstream of filter

(C) Ventilator
P1 (+) connected downstream of ventilator
P2 (–) connected upstream of ventilator

(D) Volume flow
P1 (+) dynamic pressure, connected in flow direction
P2 (–) static pressure, connected free of dynamic pressure components

$$V = k \cdot \sqrt{\Delta p}$$

V = Volume flow
k = K factor
Δp = Differential pressure [Pa]

Pressure, differential pressure and volume flow measuring transducers, including connection set, compact form, adjustable, calibratable, with multi-range switching and active output

PREMASGARD® **211x**
Pressure connectors
on the top side,
with display



PREMASGARD® **212x**
Pressure connectors
on the bottom side,
with display



WS-04
Weather and sun protection hood
(optional)



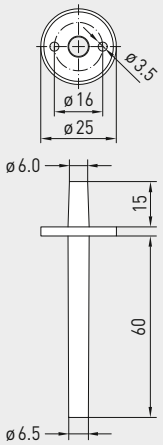
Conversion table for pressure values:

Unit =	bar	mbar	Pa	kPa	mWS
1 Pa	0.00001 bar	0.01 mbar	1 Pa	0.001 kPa	0.000101971 mWS
1 kPa	0.01 bar	10 mbar	1000 Pa	1 kPa	0.101971 mWS
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10.1971 mWS
1 mbar	0.001 bar	1 mbar	100 Pa	0.1 kPa	0.0101971 mWS
1 mWS	0.0980665 bar	98.0665 mbar	9806.65 Pa	9.80665 kPa	1 mWS

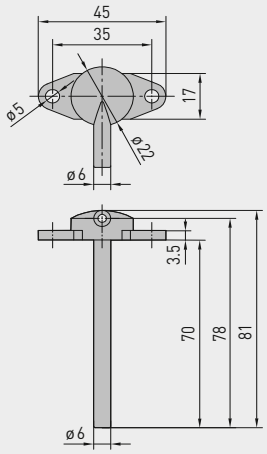
Pressure, differential pressure and volume flow measuring transducers, including connection set, compact form, adjustable, calibratable, with multi-range switching and active output

S+S REGELTECHNIK

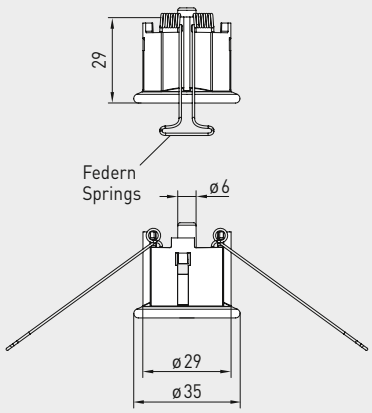
Dimensional drawing **ASD-06**



Dimensional drawing **ASD-07**



Dimensional drawing **DAL-01**



ASD-06
Connection set



ASD-07
Connection nipple



DAL-01
Pressure outlet



ACCESSORIES		Item No.	Price
ASD-06	**Connection set (included in the scope of delivery),** consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose (soft, UV-resistant) and 4 screws	7100-0060-3000-000	**7,64 €**
ASD-07	**2 connection nipples** (at 90 degree angle) made of plastic, ABS	7100-0060-7000-000	**7,64 €**
DAL-01	**Pressure outlet** for ceiling or in-wall installation (e.g. in clean rooms)	7300-0060-3000-001	**35,77 €**
WS-04	**Weather and sun protection hood**, 130 x 180 x 135 mm, stainless steel **V2A** (1.4301)	7100-0040-7000-000	**37,49 €**
	For further information, see last chapter Accessories!		

PREMASGARD® **212x-SD**	Pressure, differential pressure and volume flow measuring transducers, *Standard* (Pressure connectors on the bottom side)				
Pressure range (Ranges adjustable)	**Type / WG01B** (3-wire connection)	**Output** (switchable)	**Display**	**Item No.** (with snap-on lid)	**Price**
max. – 1000...+ 1000 Pa	**PREM**ASGARD® **2121-SD**			**IP 54**	
0... 100 Pa / – 100...+ 100 Pa 0... 300 Pa / – 300...+ 300 Pa 0... 500 Pa / – 500...+ 500 Pa 0...1000 Pa / –1000...+1000 Pa	PREMASGARD 2121-SD	0-10 V / 4...20 mA		1301-11B7-0010-000	**136,49 €**
	PREMASGARD 2121-SD **LCD**	0-10 V / 4...20 mA	■	1301-11B7-2010-000	**185,07 €**
max. – 5000...+ 5000 Pa	**PREM**ASGARD® **2125-SD**			**IP 54**	
0...1000 Pa / – 1000...+ 1000 Pa 0...2000 Pa / – 2000...+ 2000 Pa 0...3000 Pa / – 3000...+ 3000 Pa 0...5000 Pa / – 5000...+ 5000 Pa	PREMASGARD 2125-SD	0-10 V / 4...20 mA		1301-11B7-0050-000	**136,49 €**
	PREMASGARD 2125-SD **LCD**	0-10 V / 4...20 mA	■	1301-11B7-2050-000	**185,07 €**
max. – 100...+ 100 Pa	**PREM**ASGARD® **2120-SD**			**IP 54**	
0... 50 Pa / – 50...+ 50 Pa 0... 100 Pa / – 100...+ 100 Pa	PREMASGARD 2120-SD	0-10 V / 4...20 mA		1301-11B7-0110-000	**136,49 €**
	PREMASGARD 2120-SD **LCD**	0-10 V / 4...20 mA	■	1301-11B7-2110-000	**185,07 €**
Multi-range switching:	The **pressure ranges** depend on the device type and can be set via DIP switches.				
Output:	**0-10 V or 4...20 mA** (selectable via DIP switches)				
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101 (on request)				

Pressure, differential pressure and volume flow measuring transducers, including connection set, compact form, adjustable, calibratable, with multi-range switching and active output

PREMASGARD® **211x**
Pressure connectors **on the top side**, with/without display, with quick-locking screws (IP 67)



PREMASGARD® **212x**
Pressure connectors **on the bottom side**, with/without display, with quick-locking screws (IP 67)



PREMASGARD® **212x-SD**
Pressure connectors **on the bottom side**, with/without display, with snap-on lid (IP 54)



PREMASGARD® **211x**	Pressure, differential pressure and volume flow measuring transducers, *Premium* (Pressure connectors on the top side)				
Pressure range (Ranges adjustable)	**Type / WG01** (3-wire connection)	**Output** (switchable)	**Display**	**Item No.** (with quick-locking screws)	**Price**
max. – 1000...+ 1000 Pa	**PREM**ASGARD® **2111**			**IP 67**	
0... 100 Pa / – 100...+ 100 Pa 0... 300 Pa / – 300...+ 300 Pa 0... 500 Pa / – 500...+ 500 Pa 0... 1000 Pa / – 1000...+ 1000 Pa	PREMASGARD 2111	0-10 V / 4...20 mA		1301-1197-0010-000	**152,11 €**
	PREMASGARD 2111 **LCD**	0-10 V / 4...20 mA	■	1301-1197-2010-000	**202,74 €**
max. – 5000...+ 5000 Pa	**PREM**ASGARD® **2115**			**IP 67**	
0...1000 Pa / – 1000...+ 1000 Pa 0...2000 Pa / – 2000...+ 2000 Pa 0...3000 Pa / – 3000...+ 3000 Pa 0...5000 Pa / – 5000...+ 5000 Pa	PREMASGARD 2115	0-10 V / 4...20 mA		1301-1197-0050-000	**152,11 €**
	PREMASGARD 2115 **LCD**	0-10 V / 4...20 mA	■	1301-1197-2050-000	**202,74 €**
max. – 100...+ 100 Pa	**PREM**ASGARD® **2110**			**IP 67**	
0... 50 Pa / – 50...+ 50 Pa 0... 100 Pa / – 100...+ 100 Pa	PREMASGARD 2110	0-10 V / 4...20 mA		1301-1197-0110-000	**152,11 €**
	PREMASGARD 2110 **LCD**	0-10 V / 4...20 mA	■	1301-1197-2110-000	**202,74 €**
Multi-range switching:	The **pressure ranges** depend on the device type and can be set via DIP switches.				
Output:	**0-10 V or 4...20 mA** (selectable via DIP switches)				
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101 (on request)				

PREMASGARD® **212x**	Pressure, differential pressure and volume flow measuring transducers, *Premium* (Pressure connectors on the bottom side)				
Pressure range (Ranges adjustable)	**Type / WG01** (3-wire connection)	**Output** (switchable)	**Display**	**Item No.** (with quick-locking screws)	**Price**
max. – 1000...+ 1000 Pa	**PREM**ASGARD® **2121**			**IP 67**	
0... 100 Pa / – 100...+ 100 Pa 0... 300 Pa / – 300...+ 300 Pa 0... 500 Pa / – 500...+ 500 Pa 0... 1000 Pa / – 1000...+ 1000 Pa	PREMASGARD 2121	0-10 V / 4...20 mA		1301-11A7-0010-000	**152,11 €**
	PREMASGARD 2121 **LCD**	0-10 V / 4...20 mA	■	1301-11A7-2010-000	**202,74 €**
max. – 5000...+ 5000 Pa	**PREM**ASGARD® **2125**			**IP 67**	
0...1000 Pa / – 1000...+ 1000 Pa 0...2000 Pa / – 2000...+ 2000 Pa 0...3000 Pa / – 3000...+ 3000 Pa 0...5000 Pa / – 5000...+ 5000 Pa	PREMASGARD 2125	0-10 V / 4...20 mA		1301-11A7-0050-000	**152,11 €**
	PREMASGARD 2125 **LCD**	0-10 V / 4...20 mA	■	1301-11A7-2050-000	**202,74 €**
max. – 100...+ 100 Pa	**PREM**ASGARD® **2120**			**IP 67**	
0... 50 Pa / – 50...+ 50 Pa 0... 100 Pa / – 100...+ 100 Pa	PREMASGARD 2120	0-10 V / 4...20 mA		1301-11A7-0110-000	**152,11 €**
	PREMASGARD 2120 **LCD**	0-10 V / 4...20 mA	■	1301-11A7-2110-000	**202,74 €**
Multi-range switching:	The **pressure ranges** depend on the device type and can be set via DIP switches.				
Output:	**0-10 V or 4...20 mA** (selectable via DIP switches)				
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101 (on request)				

PREMASGARD® 111x/112x/112x-SD

Pressure, differential pressure and volume flow measuring transducers, including connection set, compact form, adjustable, calibratable, with multi-range switching and active output

I variant with 2-wire connection

S+S REGELTECHNIK

The calibrateable compact pressure sensors of the **PREM**ASGARD® **111x / 112x / 112x-SD** series are equipped with eight switchable measuring ranges and with or without optional display (eight devices in one) and are used for measuring above-atmospheric, below-atmospheric, or differential pressures and Volume flow in air. The piezo-resistive measuring element is temperature-compensated and guarantees a high degree of reliability and accuracy. These pressure transmitters have a pushbutton for manual zero point calibration and an adjustable offset. Applications of these pressure sensors are in clean room, medical and filter technology, in ventilation and air conditioning ducts, in spray booths, in large-scale catering facilities, for monitoring filters, for level measurement or for triggering frequency converters. Media measured with these pressure transducers are air (non-precipitating), or other gaseous non-aggressive, non-combustible media. The differential pressure sensor is supplied including connection set **ASD-06** (2 m connection hose, two pressure connection nipples, screws). You can find further device types under **PREM**ASGARD® **211x / 212x / 212x-SD** (3-conductor connection) with switchable output (0-10 V / 4...20 mA).

TECHNICAL DATA

Power supply:	24 V AC (±20 %); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ±0.3 V
Working resistance:	R_a (ohm) = (U_b -14 V) / 0.02 A for I variant
Load resistance:	R_L > 5 kOhm for U variant
Power consumption:	< 1 W at 24 V DC; < 2 VA at 24 V AC
Measuring function:	**Differential pressure, volume flow** (square root output signal)
Measuring ranges:	**multi-range switching with 8 switchable measuring ranges** (see table)
Output:	0-10 V or 4...20 mA
Electrical connection:	2- or 3-wire connection
Media temperature:	–20...+50 °C
Pressure connection:	with connection nozzles for pressure hose Ø 6 mm
Type of pressure:	differential pressure
Medium:	clean air and other non-aggressive, non-combustible gases
Accuracy:	**Type 1111 / 1121 / 1121-SD** (1000 Pa): typically ±10 Pa **Type 1115 / 1125 / 1125-SD** (5000 Pa): typically ±50 Pa **Type 1116 / 1126** (10000 Pa): typically ±50 Pa compared to the calibrated reference device
Zero point offset:	±10 % of final value
Above- / below-atmospheric pressure:	max. 5 x measuring range
Long-term stability:	±1 % per year
Signal filtering:	**switchable 1 s / 10 s**
Hysteresis:	0.3 % of final value
Media contacting parts:	ms, Ni, Nylon, PU, Si, PVC with plasticisers
Temperature drift values:	± 0.1 % of final value / °C
Current consumption:	< 20 mA
Linearity:	< ± 1 % of final value
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016), housing cover for display is transparent! **Type 111x / 112x**: **with quick-locking screws** (slotted/Phillips head combination) **Type 112x-SD**: **with snap-on lid**
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 / Tyr 01 without display) 72 x 64 x 43.3 mm (Tyr 1 / Tyr 01 with display)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**Type 111x / 112x**: **IP 67** (according to EN 60 529)* Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1) **Type 112x-SD**: **IP 54** (according to EN 60 529)* Housing tested, TÜV SÜD, Report No. 713160960A (Tyr 01) * Housing in the built-in state
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU
Features:	two-line **display with illumination**, cutout approx. 36 x 15 mm (W x H), to display ACTUAL pressure
ACCESSORIES	see table

PREMASGARD® **111x**
Pressure connectors
on the top side
with quick-locking screws
(IP 67)



PREMASGARD® **112x**
Pressure connectors
on the bottom side
with quick-locking screws
(IP 67)

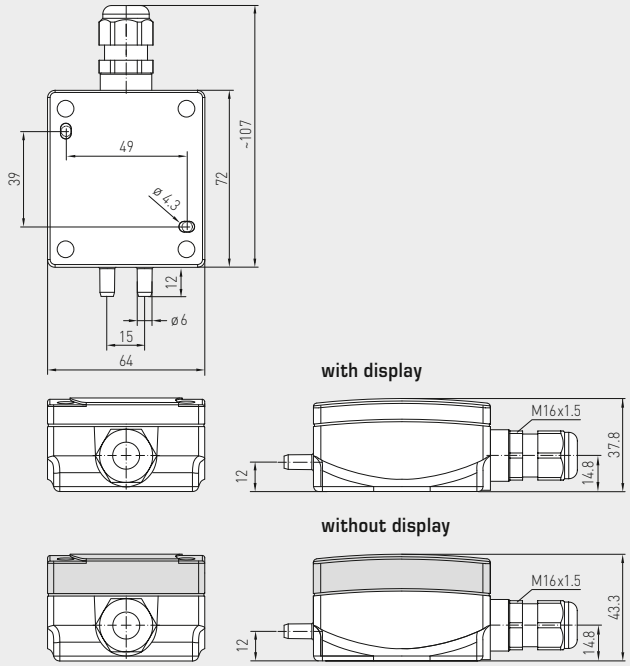


PREMASGARD® **112x-SD**
Pressure connectors
on the bottom side
with snap-on lid
(IP 54)



Dimensional drawing

PREMASGARD® **111x**

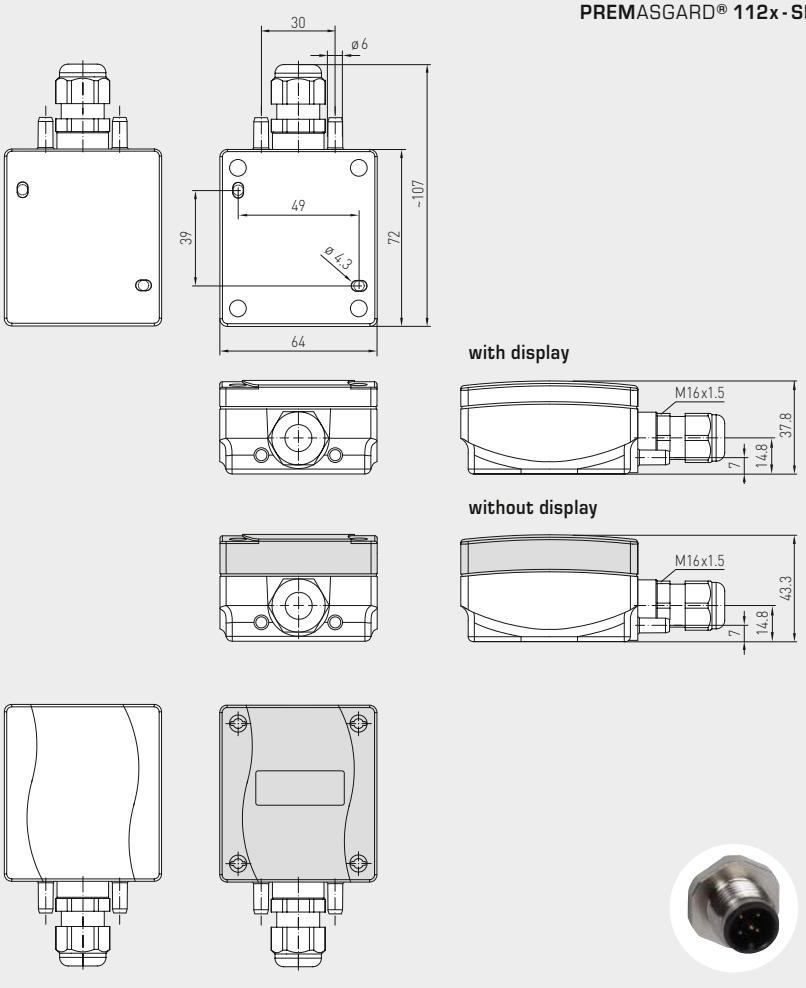


PREMASGARD® **111x**
Pressure connectors **on the top side**, with display, with quick-locking screws (IP 67)



Dimensional drawing

PREMASGARD® **112x**
PREMASGARD® **112x-SD**



PREMASGARD® **112x**
Pressure connectors **on the bottom side**, with display, with quick-locking screws (IP 67)



PREMASGARD® **112x-SD**
Pressure connectors **on the bottom side**, with display, with snap-on lid (IP 54)



PREMASGARD® 111x/112x/112x-SD

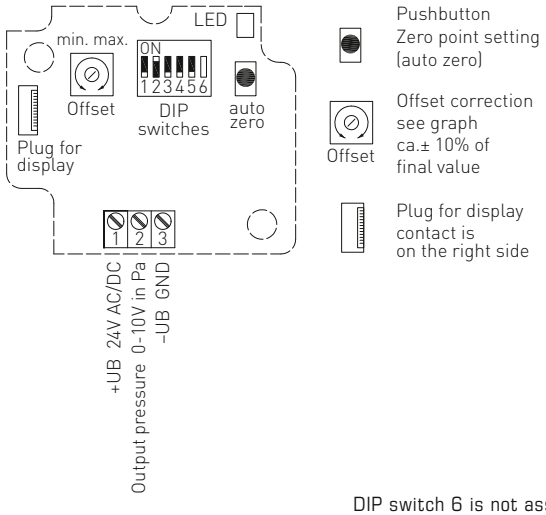
Pressure, differential pressure and volume flow measuring transducers, including connection set, compact form, adjustable, calibratable, with multi-range switching and active output

I variant with 2-wire connection

S+S REGELTECHNIK

Schematic diagram
Output:
0-10 V

PREMASGARD® 111x-U
PREMASGARD® 112x-U
PREMASGARD® 112x-SD-U



Pushbutton
Zero point setting
(auto zero)

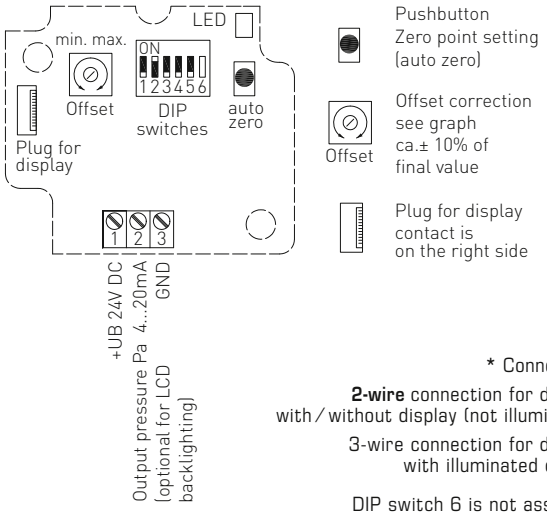
Offset correction
see graph
ca.± 10% of
final value

Plug for display
contact is
on the right side

DIP switch 6 is not assigned!

Schematic diagram *
Output:
4...20 mA

PREMASGARD® 111x-I
PREMASGARD® 112x-I
PREMASGARD® 112x-SD-I



Pushbutton
Zero point setting
(auto zero)

Offset correction
see graph
ca.± 10% of
final value

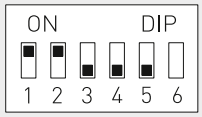
Plug for display
contact is
on the right side

* Connection:
2-wire connection for devices with / without display (not illuminated)
3-wire connection for devices with illuminated display

DIP switch 6 is not assigned!

Pressure range (selectable) – max. measuring range (default) is depending to the type of device						**DIP 1**	**DIP 2**
0...100 Pa	0...1000 Pa	0...4000 Pa	–100...+100 Pa	–1000...+1000 Pa	–4000...+4000 Pa	OFF	OFF
0...300 Pa	0...2000 Pa	0...6000 Pa	–300...+300 Pa	–2000...+2000 Pa	–6000...+6000 Pa	**ON**	OFF
0...500 Pa	0...3000 Pa	0...8000 Pa	–500...+500 Pa	–3000...+3000 Pa	–8000...+8000 Pa	OFF	**ON**
0...1000 Pa	**0...5000 Pa**	**0...10000 Pa**	**-1000...+1000 Pa**	**-5000...+5000 Pa**	**-10000...+10000 Pa**	**ON**	**ON**

PREMASGARD® 11xx



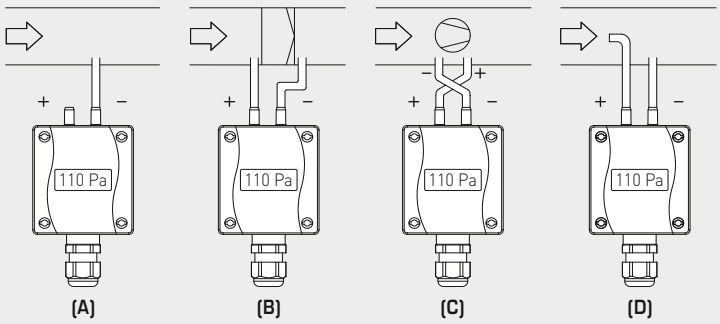
DIP switch 6
is not assigned!

Measuring range mode (Mode selectable)	**DIP 3**
Unidirectional (0...+MR) (default)	OFF
Bidirectional (–MR...+MR)	**ON**

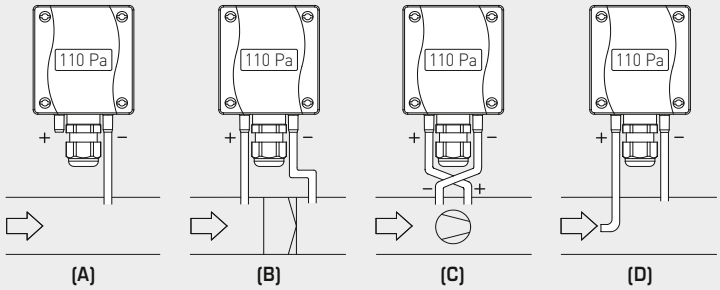
Output characteristic line (Mode selectable)	**DIP 4**
Linear (default) (for pressure detection)	OFF
Square root extracting (to determine the volume flow)	**ON**

Measurement signal filtering (Time interval selectable)	**DIP 5**
10 s (default)	OFF
1 s	**ON**

Mounting diagram **PREMASGARD® 111x**



Mounting diagram **PREMASGARD® 112x / 112x-SD**



TYPES OF MONITORING:
Pressure connections at the pressure switch are marked with
P1 (+) for higher pressure and
P2 (–) for lower pressure.

(A) Below-atmospheric pressure
P1 (+) is not connected, but open to the atmosphere
P2 (–) connected to inside of duct

(B) Filter
P1 (+) connected upstream of filter
P2 (–) connected downstream of filter

(C) Ventilator
P1 (+) connected downstream of ventilator
P2 (–) connected upstream of ventilator

(D) Volume flow
P1 (+) dynamic pressure, connected in flow direction
P2 (–) static pressure, connected free of dynamic pressure components

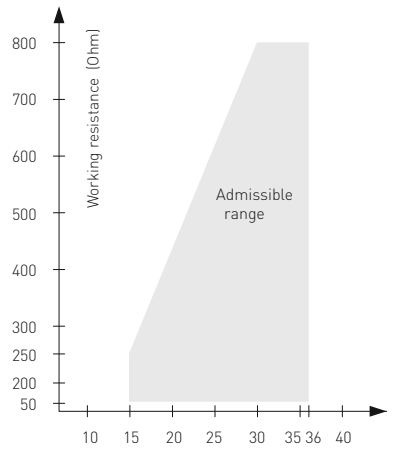
$$V = k \cdot \sqrt{\Delta p}$$

V = Volume flow
k = K factor
Δp = Differential pressure [Pa]

Pressure, differential pressure and volume flow measuring transducers, including connection set, compact form, adjustable, calibratable, with multi-range switching and active output

Load resistance diagram 4...20 mA

PREMASGARD® **111x**
PREMASGARD® **112x**
PREMASGARD® **112x-SD**



PREMASGARD® **111x**
Pressure connectors **on the top side**, with display



PREMASGARD® **112x**
Pressure connectors **on the bottom side**, with display



WS-04
Weather and sun protection hood (optional)



Conversion table for pressure values:

Unit =	bar	mbar	Pa	kPa	mWS
1 Pa	0.00001 bar	0.01 mbar	1 Pa	0.001 kPa	0.000101971 mWS
1 kPa	0.01 bar	10 mbar	1000 Pa	1 kPa	0.101971 mWS
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10.1971 mWS
1 mbar	0.001 bar	1 mbar	100 Pa	0.1 kPa	0.0101971 mWS
1 mWS	0.0980665 bar	98.0665 mbar	9806.65 Pa	9.80665 kPa	1 mWS

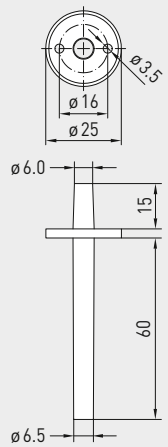
PREMASGARD® 111x/112x/112x-SD

Pressure, differential pressure and volume flow measuring transducers, including connection set, compact form, adjustable, calibratable, with multi-range switching and active output

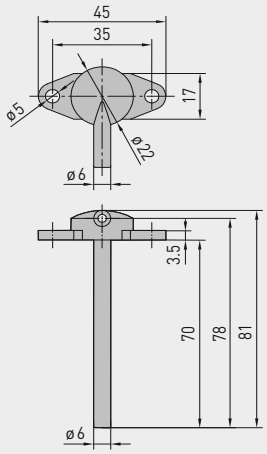
I variant with 2-wire connection

S+S REGELTECHNIK

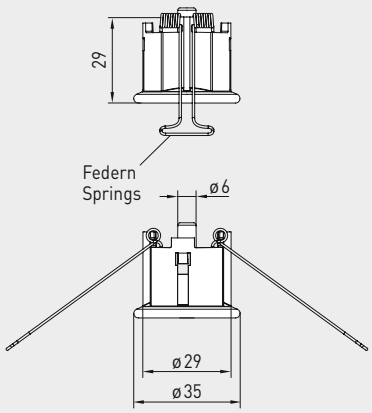
Dimensional drawing **ASD-06**



Dimensional drawing **ASD-07**



Dimensional drawing **DAL-01**



ASD-06
Connection set



ASD-07
Connection nipple



DAL-01
Pressure outlet



ACCESSORIES		Item No.	Price
ASD-06	**Connection set (included in the scope of delivery),** consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose (soft, UV-resistant) and 4 screws	7100-0060-3000-000	**7,64 €**
ASD-07	**2 connection nipples** (at 90 degree angle) made of plastic, ABS	7100-0060-7000-000	**7,64 €**
DAL-01	**Pressure outlet** for ceiling or in-wall installation (e.g. in clean rooms)	7300-0060-3000-001	**35,77 €**
WS-04	**Weather and sun protection hood**, 130 x 180 x 135 mm, stainless steel **V2A** (1.4301)	7100-0040-7000-000	**37,49 €**
	For further information, see last chapter Accessories!		

PREMASGARD® 112x-SD — Pressure, differential pressure and volume flow measuring transducers, *Standard* (Pressure connectors on the bottom side)

Pressure range (Ranges adjustable)	Type / WG01	Connection 2- or 3-wire	Output	Display	Item No (with snap-on lid)	Price
max. – 1000...+ 1000 Pa	**PREMASGARD® 1121-SD**				**IP 54**	
0... 100 Pa / – 100...+ 100 Pa 0... 300 Pa / – 300...+ 300 Pa 0... 500 Pa / – 500...+ 500 Pa 0...1000 Pa / –1000...+1000 Pa	PREMASGARD 1121-SD-I	**2**	4...20 mA		1301-1182-0010-000	**149,97 €**
	PREMASGARD 1121-SD-I **LCD**	**2**/3	4...20 mA	■	1301-1182-2010-000	**193,17 €**
	–	3	0-10 V		see **PREM**ASGARD® **212x-SD**	
max. – 5000...+ 5000 Pa	**PREMASGARD® 1125-SD**				**IP 54**	
0...1000 Pa / –1000...+1000 Pa 0...2000 Pa / –2000...+2000 Pa 0...3000 Pa / –3000...+3000 Pa 0...5000 Pa / –5000...+5000 Pa	PREMASGARD 1125-SD-I	**2**	4...20 mA		1301-1182-0050-000	**149,97 €**
	PREMASGARD 1125-SD-I **LCD**	**2**/3	4...20 mA	■	1301-1182-2050-000	**193,17 €**
	–	3	0-10 V		see **PREM**ASGARD® **212x-SD**	
Multi-range switching:	The **pressure ranges** depend on the device type and can be set via DIP switches.					
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101 (on request)					

I variant with 2-wire connection

Pressure, differential pressure and volume flow measuring transducers, including connection set, compact form, adjustable, calibratable, with multi-range switching and active output

PREMASGARD® **111x**
Pressure connectors **on the top side**, with/without display, with quick-locking screws (IP 67)



PREMASGARD® **112x**
Pressure connectors **on the bottom side**, with/without display, with quick-locking screws (IP 67)



PREMASGARD® **112x-SD**
Pressure connectors **on the bottom side**, with/without display, with snap-on lid (IP 54)



PREMASGARD® **111x** — Pressure, differential pressure and volume flow measuring transducers, *Premium* (Pressure connectors on the top side)

Pressure range (Ranges adjustable)	Type / WG01	Connection 2- or 3-wire	Output	Display	Item No (with quick-locking screws)	Price
max. – 1000...+ 1000 Pa	**PREM**ASGARD® **1111**				**IP 67**	
0... 100 Pa / – 100...+ 100 Pa 0... 300 Pa / – 300...+ 300 Pa 0... 500 Pa / – 500...+ 500 Pa 0... 1000 Pa / – 1000...+ 1000 Pa	PREMASGARD 1111-I	**2**	4...20 mA		1301-1112-0010-000	**152,11 €**
	PREMASGARD 1111-I **LCD**	**2**/3	4...20 mA	■	1301-1112-2010-000	**202,74 €**
	–	3	0-10 V		see **PREM**ASGARD® **211x**	
max. – 5000...+ 5000 Pa	**PREM**ASGARD® **1115**				**IP 67**	
0...1000 Pa / – 1000...+ 1000 Pa 0...2000 Pa / – 2000...+ 2000 Pa 0...3000 Pa / – 3000...+ 3000 Pa 0...5000 Pa / – 5000...+ 5000 Pa	PREMASGARD 1115-I	**2**	4...20 mA		1301-1112-0050-000	**152,11 €**
	PREMASGARD 1115-I **LCD**	**2**/3	4...20 mA	■	1301-1112-2050-000	**202,74 €**
	–	3	0-10 V		see **PREM**ASGARD® **211x**	
max. – 10000...+ 10000 Pa	**PREM**ASGARD® **1116**				**IP 67**	
0... 4000 Pa / – 4000...+ 4000 Pa 0... 6000 Pa / – 6000...+ 6000 Pa 0... 8000 Pa / – 8000...+ 8000 Pa 0...10000 Pa / – 10000...+ 10000 Pa	PREMASGARD 1116-I	**2**	4...20 mA		1301-1112-0060-000	**176,56 €**
	PREMASGARD 1116-I **LCD**	**2**/3	4...20 mA	■	1301-1112-2060-000	**222,79 €**
	PREMASGARD 1116-U	3	0-10 V		1301-1111-0060-000	**176,56 €**
	PREMASGARD 1116-U **LCD**	3	0-10 V	■	1301-1111-2060-000	**222,79 €**
Multi-range switching:	The **pressure ranges** depend on the device type and can be set via DIP switches.					
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101 (on request)					

PREMASGARD® **112x** — Pressure, differential pressure and volume flow measuring transducers, *Premium* (Pressure connectors on the bottom side)

Pressure range (Ranges adjustable)	Type / WG01	Connection 2- or 3-wire	Output	Display	Item No (with quick-locking screws)	Price
max. – 1000...+ 1000 Pa	**PREM**ASGARD® **1121**				**IP 67**	
0... 100 Pa / – 100...+ 100 Pa 0... 300 Pa / – 300...+ 300 Pa 0... 500 Pa / – 500...+ 500 Pa 0... 1000 Pa / – 1000...+ 1000 Pa	PREMASGARD 1121-I	**2**	4...20 mA		1301-1172-0010-000	**152,11 €**
	PREMASGARD 1121-I **LCD**	**2**/3	4...20 mA	■	1301-1172-2010-000	**202,74 €**
	–	3	0-10 V		see **PREM**ASGARD® **212x**	
max. – 5000...+ 5000 Pa	**PREM**ASGARD® **1125**				**IP 67**	
0...1000 Pa / – 1000...+ 1000 Pa 0...2000 Pa / – 2000...+ 2000 Pa 0...3000 Pa / – 3000...+ 3000 Pa 0...5000 Pa / – 5000...+ 5000 Pa	PREMASGARD 1125-I	**2**	4...20 mA		1301-1172-0050-000	**152,11 €**
	PREMASGARD 1125-I **LCD**	**2**/3	4...20 mA	■	1301-1172-2050-000	**202,74 €**
	–	3	0-10 V		see **PREM**ASGARD® **212x**	
max. – 10000...+ 10000 Pa	**PREM**ASGARD® **1126**				**IP 67**	
0... 4000 Pa / – 4000...+ 4000 Pa 0... 6000 Pa / – 6000...+ 6000 Pa 0... 8000 Pa / – 8000...+ 8000 Pa 0...10000 Pa / – 10000...+ 10000 Pa	PREMASGARD 1126-I	**2**	4...20 mA		1301-1172-0060-000	**176,56 €**
	PREMASGARD 1126-I **LCD**	**2**/3	4...20 mA	■	1301-1172-2060-000	**222,79 €**
	PREMASGARD 1126-U	3	0-10 V		1301-1171-0060-000	**176,56 €**
	PREMASGARD 1126-U **LCD**	3	0-10 V	■	1301-1171-2060-000	**222,79 €**
Multi-range switching:	The **pressure ranges** depend on the device type and can be set via DIP switches.					
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101 (on request)					

PREMASGARD® 711x

**Pressure and differential pressure measuring transducers,
including connection set, adjustable, calibratable,
with multi-range switching and active output**

S+S REGELTECHNIK

The calibratable pressure sensors **PREM**ASGARD® **711x** (series) with eight switchable measuring ranges (eight devices in one), housing made from impact-resistant plastic, optionally with/without display, with cable gland or M12 connector according to DIN EN 61076-2-101 and pressure connection nozzles (quick connect optional) are used to measure positive, negative or differential pressures in air. The piezoresistive measuring element is temperature-compensated and guarantees a high degree of reliability and accuracy.

Applications of these pressure sensors are in clean room, medical and filter technology, in ventilation and air conditioning ducts, in spray booths, in large-scale catering facilities, for filter monitoring and level measurement or for triggering frequency converters. Media measured with these pressure transducers are air (non-precipitating), or other gaseous, non-aggressive, non-combustible media.

The pressure sensor has a button for manual zero point calibration (automatic zero point calibration optional/standard for 25 Pa) and an offset potentiometer for final value correction. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible. The delivery includes the connection set **ASD-06** (2 m connection hose, two pressure port nipples, screws).

PREMASGARD® **711x**
with cable gland



PREMASGARD® **711x-Q**
with M12 connector





TECHNICAL DATA

Power supply:	24 V AC (±20 %); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ±0.3 V
Working resistance:	R_a (Ohm) = (U_b -14 V) / 0.02 A for I variant, see working resistance diagram
Load resistance:	R_L > 5 kOhm for U variant
Power consumption:	< 2 VA / 24 V DC, < 3.5 VA / 24 V AC
Measuring ranges:	**multi-range switching** **with 8 switchable measuring ranges** (see table)
Type of pressure:	differential pressure
Pressure connection:	with connection **nozzle** for pressure hose Ø 6 mm, optionally with **quick** connect made from stainless steel for PVC fabric pressure hose Ø 6 mm (external diameter)
Medium:	clean air and non-aggressive, non-combustible gases
Media temperature:	–20...+50 °C
Accuracy:	**Type 7112** (25 Pa): typically ±1 Pa **Type 7110** (100 Pa): typically ±2 Pa **Type 7111** (1000 Pa): typically ±5 Pa **Type 7115** (5000 Pa): typically ±25 Pa compared to the calibrated reference device
Sum of linearity+hysteresis:	< ±1 % of final value ± 2 % of final value for pressure ranges < ±250 Pa
Temp. drift values:	± 0.1 % / °C ± 0.3 % / °C for pressure ranges < 250 Pa
Zero point offset:	< ± 0.7 % of final value ± 1.4 % of final value for pressure ranges < 250 Pa
Positive/negative pressure:	max. ± 100 hPa
Signal filtering:	**switchable 1 s / 10 s** (via DIP switches)
Output:	0 -10 V or 4...20 mA
Connection type:	2- or 3-wire connection
Electrical connection:	0.14 - 1.5 mm², via plug-in screw terminal
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** (male, 5-pin, A-code) according to DIN EN 61076-2-101
Housing:	**plastic**, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Typ 2)
Air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) in the built-in state
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3
Equipment:	**display with illumination,** three-line, cutout approx. 70 x 40 mm (W x H), to display the ACTUAL pressure as well as the automatic zero point calibration
ACCESSORIES	see table

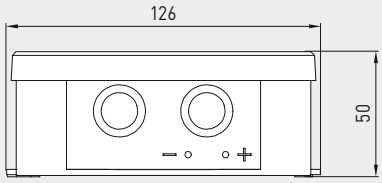
Pressure port
for pressure hose
(as standard)

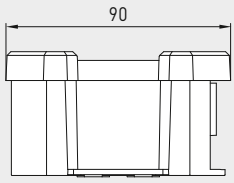


Pressure and differential pressure measuring transducers, including connection set, adjustable, calibratable, with multi-range switching and active output

Dimensional drawing
[mm]

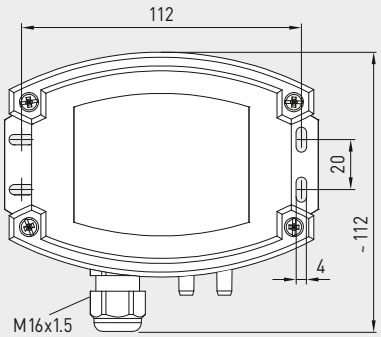
PREMASGARD® 711x

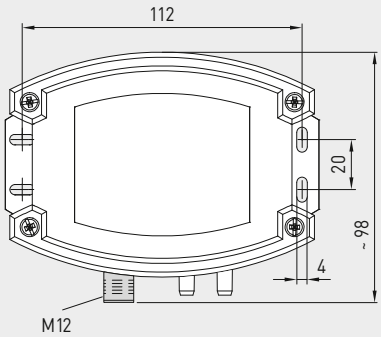


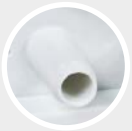


Housing with
cable gland
equipped as standard with
pressure port **nozzles**

Housing with
M12 connector
equipped as standard with
pressure port **nozzles**







Pressure port
for pressure hose
(as standard)



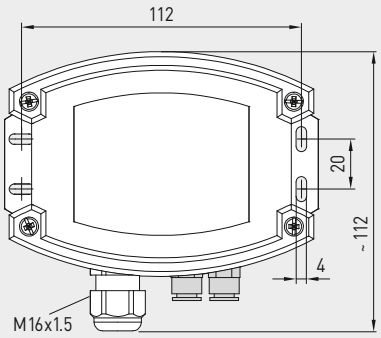
M12 connector
(male)

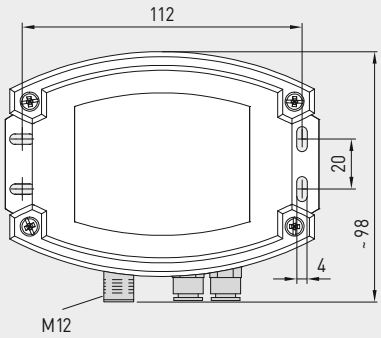
Dimensional drawing
[mm]

PREMASGARD® 711x

Housing with
cable gland
optional on request
with **quick** connect

Housing with
M12 connector
optional on request
with **quick** connect







Pressure port for
PVC/fabric pressure hose
(optional)



M12 connector
(male)

PREMASGARD® 711x
with cable gland
and display



PREMASGARD® 711x-Q
with M12 connector
and display





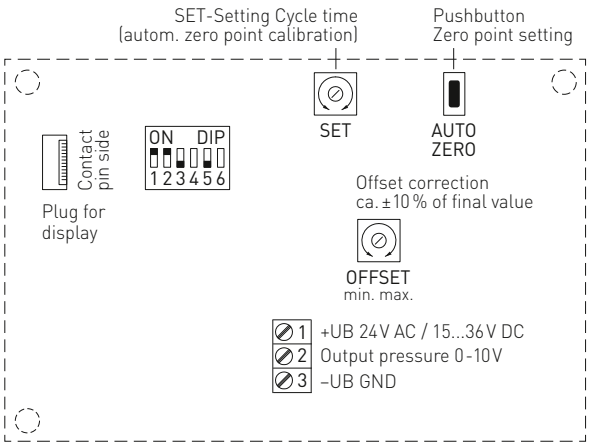
Pressure port for
PVC/fabric pressure hose
(optional)



Pressure and differential pressure measuring transducers, including connection set, adjustable, calibratable, with multi-range switching and active output

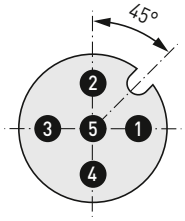
S+S REGELTECHNIK

Schematic diagram **PREMASGARD® 711x-U**



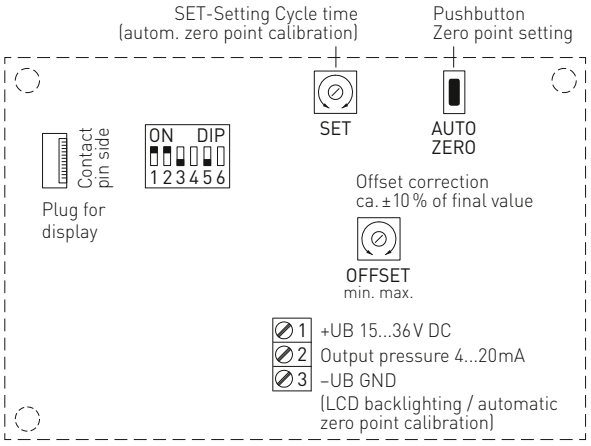
DIP switches 4 and 6 are not assigned!

Pin assignment (M12) **PREMASGARD® 711x-U**



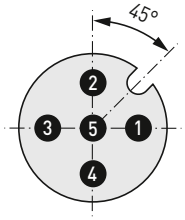
1. +UB 24 V AC / 15...36 V DC
2. Output pressure 0-10 V [Pa]
3. free
4. –UB GND
5. Shield

Schematic diagram **PREMASGARD® 711x-I**



DIP switches 4 and 6 are not assigned!

Pin assignment (M12) **PREMASGARD® 711x-I**



1. +UB 15...36 V DC
2. Output pressure 4...20 mA [Pa]
3. free
4. –UB GND (LCD backlighting / automatic zero point calibration)
5. Shield

Display with option
automatic zero point calibration



Standard
Actual pressure (in Pa)
Calibration interval (arrows)

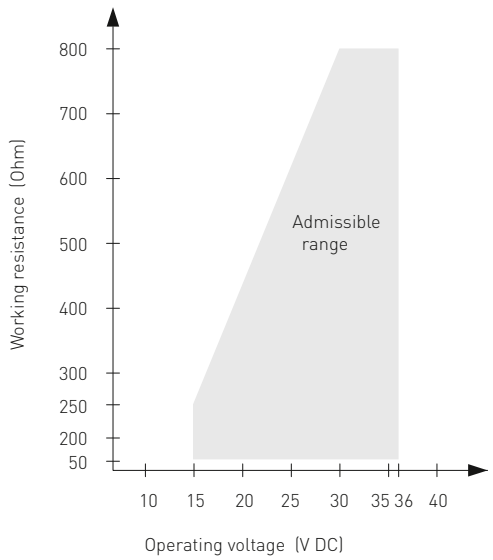


Zero point calibration active
Remaining calibration time (in seconds)



Adjustment of zero point calibration
Cycle time (15 min to 24 hours) adjustable by potentiometer.

Load resistance **PREMASGARD® 711x-I**



Pressure and differential pressure measuring transducers, including connection set, adjustable, calibratable, with multi-range switching and active output

PREMASGARD® **711x-Q**
with display, hinged





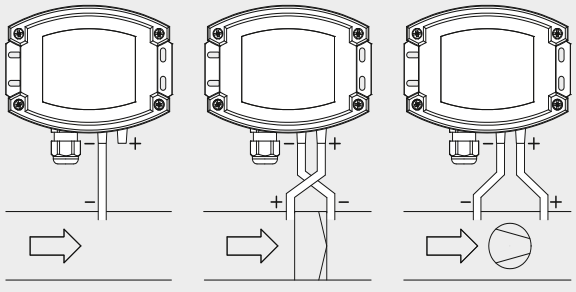


Pressure range (selectable) – max. measuring range (default) is depending to the type of device								**DIP 1**	**DIP 2**
0…25 Pa	0…50 Pa	0…100 Pa	0…1000 Pa	–25…+25 Pa	–50…+50 Pa	–100…+100 Pa	–1000…+1000 Pa	OFF	OFF
–	–	0…300 Pa	0…2000 Pa	–	–	–300…+300 Pa	–2000…+2000 Pa	**ON**	OFF
–	–	0…500 Pa	0…3000 Pa	–	–	–500…+500 Pa	–3000…+3000 Pa	OFF	**ON**
0…25 Pa	**0…100 Pa**	**0…1000 Pa**	**0…5000 Pa**	**–25…+25 Pa**	**–100…+100 Pa**	**–1000…+1000 Pa**	**–5000…+5000 Pa**	**ON**	**ON**

Measuring range mode (Mode selectable)	**DIP 3**
Unidirectional (0…+MR) (default)	OFF
Bidirectional (–MR…+MR)	**ON**

Measurement signal filtering (Time interval selectable)	**DIP 5**
10 s (default)	OFF
1 s	**ON**

Mounting diagram **PREM**ASGARD® **711x**



TYPES OF MONITORING:

(A) Below-atmospheric pressure:
P1 (+) is not connected
but open against atmosphere
P2 (–) connected to inside of duct

(B) Filter:
P1 (+) connected upstream of filter
P2 (–) connected downstream of filter

(C) Ventilator:
P1 (+) connected downstream of ventilator
P2 (–) connected upstream of ventilator

Pressure connections at the pressure switch are marked with P1 (+) for higher pressure and P2 (–) for lower pressure.

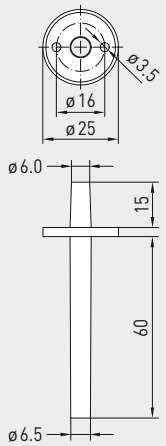
Conversion table for pressure values:

Unit =	bar	mbar	Pa	kPa	mWS
1 Pa	0,00001 bar	0,01 mbar	1 Pa	0,001 kPa	0,000101971 mWS
1 kPa	0,01 bar	10 mbar	1000 Pa	1 kPa	0,101971 mWS
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10,1971 mWS
1 mbar	0,001 bar	1 mbar	100 Pa	0,1 kPa	0,0101971 mWS
1 mWS	0,0980665 bar	98,0665 mbar	9806,65 Pa	9,80665 kPa	1 mWS

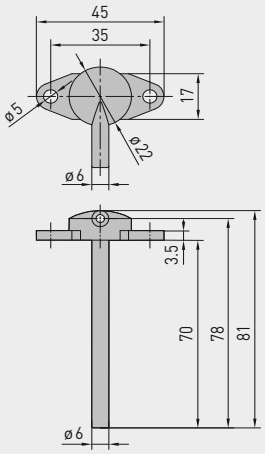
Pressure and differential pressure measuring transducers, including connection set, adjustable, calibratable, with multi-range switching and active output

S+S REGELTECHNIK

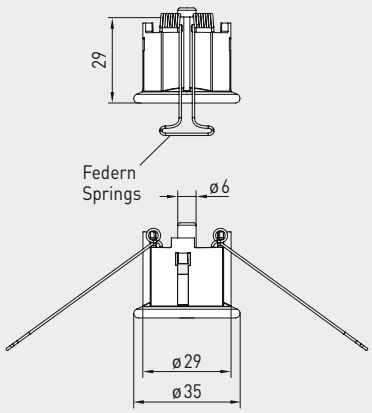
Dimensional drawing [mm] **ASD-06**



Dimensional drawing [mm] **ASD-07**



Dimensional drawing [mm] **DAL-01**



ASD-06
Connection set



ASD-07
Connection nipple



DAL-01
Pressure outlet





WS-03
Weather and sun protection hood (optional)

Pressure port for pressure hose (as standard)



Pressure port for PVC/fabric pressure hose (optional)



ACCESSORIES

ASD-06	**Connection set (included in the scope of delivery),** consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose (soft, UV-resistant) and 4 screws	7100-0060-3000-000	**7,64 €**
ASD-07	**2 connection nipples** (at 90 degree angle) made of plastic, ABS	7100-0060-7000-000	**7,64 €**
DAL-01	**Pressure outlet** for ceiling or in-wall installation (e.g. in clean rooms)	7300-0060-3000-001	**35,77 €**
WS-03	**Weather and sun protection hood**, 200 x 180 x 150 mm, stainless steel **V2A** (1.4301)	7100-0040-6000-000	**44,74 €**
	For further information, see chapter Accessories!		

Pressure and differential pressure measuring transducers, including connection set, adjustable, calibratable, with multi-range switching and active output

PREMASGARD® **711x-Q**
with M12 connector



PREMASGARD® **711x**
with cable gland



PREMASGARD® **711x**	Pressure and differential pressure measuring transducers, *Deluxe*				
Pressure range (adjustable)	**Type / WG02**	**Output**	**Display ● = Q**	**Item No.**	**Price**
max. – 1000...+ 1000 Pa	**Type 7111**				
0... 100 Pa / – 100... + 100 Pa 0... 300 Pa / – 300... + 300 Pa 0... 500 Pa / – 500... + 500 Pa 0...1000 Pa / –1000... +1000 Pa	PREMASGARD 7111-U	0-10 V		1301-7111-0010-200	**168,09 €**
	PREMASGARD 7111-U LCD	0-10 V	■	1301-7111-4010-200	**235,82 €**
	PREMASGARD 7111-I	4...20 mA		1301-7112-0010-100	**168,09 €**
	PREMASGARD 7111-I LCD	4...20 mA	■	1301-7112-4010-100	**235,82 €**
	PREMASGARD 7111-U **Q**	0-10 V	●	2004-6131-1100-001	**210,02 €**
	PREMASGARD 7111-U **Q** LCD	0-10 V	● ■	2004-6132-1100-001	**277,74 €**
	PREMASGARD 7111-I **Q**	4...20 mA	●	2004-6131-2100-001	**210,02 €**
	PREMASGARD 7111-I **Q** LCD	4...20 mA	● ■	2004-6132-2100-001	**277,74 €**
max. – 5000...+ 5000 Pa	**Type 7115**				
0...1000 Pa / – 1000 ... + 1000 Pa 0...2000 Pa / – 2000 ... + 2000 Pa 0...3000 Pa / – 3000 ... + 3000 Pa 0...5000 Pa / – 5000 ... + 5000 Pa	PREMASGARD 7115-U	0-10 V		1301-7111-0050-200	**168,09 €**
	PREMASGARD 7115-U LCD	0-10 V	■	1301-7111-4050-200	**235,82 €**
	PREMASGARD 7115-I	4...20 mA		1301-7112-0050-100	**168,09 €**
	PREMASGARD 7115-I LCD	4...20 mA	■	1301-7112-4050-100	**235,82 €**
	PREMASGARD 7115-U **Q**	0-10 V	●	2004-6131-1100-011	**210,02 €**
	PREMASGARD 7115-U **Q** LCD	0-10 V	● ■	2004-6132-1100-021	**277,74 €**
	PREMASGARD 7115-I **Q**	4...20 mA	●	2004-6131-2100-011	**210,02 €**
	PREMASGARD 7115-I **Q** LCD	4...20 mA	● ■	2004-6132-2100-011	**277,74 €**
max. – 100...+ 100 Pa	**Type 7110**				
0... +50 Pa / –50... +50 Pa 0...+100 Pa / –100...+100 Pa	PREMASGARD 7110-U	0-10 V		1301-7111-0110-200	**211,63 €**
	PREMASGARD 7110-U LCD	0-10 V	■	1301-7111-4110-200	**272,10 €**
	PREMASGARD 7110-I	4...20 mA		1301-7112-0110-100	**211,63 €**
	PREMASGARD 7110-I LCD	4...20 mA	■	1301-7112-4110-100	**272,10 €**
	PREMASGARD 7110-U **Q**	0-10 V	●	2004-6131-1100-021	**253,55 €**
	PREMASGARD 7110-U **Q** LCD	0-10 V	● ■	2004-6132-1100-031	**314,01 €**
	PREMASGARD 7110-I **Q**	4...20 mA	●	2004-6131-2100-021	**253,55 €**
	PREMASGARD 7110-I **Q** LCD	4...20 mA	● ■	2004-6132-2100-021	**314,01 €**
max. – 25...+ 25 Pa	**Type 7112**				
0... +25 Pa / –25... +25 Pa *equipped as standard with automatic zero point calibration (3-wire connection)*	PREMASGARD 7112-U	0-10 V		1301-7111-0370-200	**270,88 €**
	PREMASGARD 7112-U LCD	0-10 V	■	1301-7111-4370-200	**320,72 €**
	PREMASGARD 7112-I	4...20 mA		1301-7112-0370-200	**270,88 €**
	PREMASGARD 7112-I LCD	4...20 mA	■	1301-7112-4370-200	**320,72 €**
	PREMASGARD 7112-U **Q**	0-10 V	●	2004-6131-1100-031	**312,82 €**
	PREMASGARD 7112-U **Q** LCD	0-10 V	● ■	2004-6132-1100-011	**362,64 €**
	PREMASGARD 7112-I **Q**	4...20 mA	●	2004-6131-3100-001	**312,82 €**
	PREMASGARD 7112-I **Q** LCD	4...20 mA	● ■	2004-6132-3100-011	**362,64 €**
Housing variant "Q":	Cable connection with **M12 connector** (male, **5-pin**, A-code)				
Multi-range switching:	The **pressure ranges** depend on the device type and can be set via DIP switches.				
Extra charge:	Other special measuring ranges up to max. 5000 Pa **with optional automatic zero point calibration** **with optional quick connect** for PVC fabric pressure hose Ø 6 mm				**49,83 €** **72,56 €** **41,94 €**

PREMASGARD® 711x-VA

**Pressure and differential pressure measuring transducers,
adjustable, calibratable,
with multi-range switching and active output**

S+S REGELTECHNIK

The calibratable pressure sensors **PREM**ASGARD® **711x-VA** (series) with eight switchable measuring ranges (eight devices in one), **stainless steel V4A** housing, optionally with/without display, with cable gland or M12 connector according to DIN EN 61076-2-101 and pressure port using quick connect (pipe fitting optional) are used to measure positive, negative or differential pressures in air. The piezoresistive measuring element is temperature-compensated and guarantees a high degree of reliability and accuracy.

Applications of these pressure sensors are in clean room, medical and filter technology, in ventilation and air conditioning ducts, in spray booths, in large-scale catering facilities, for filter monitoring and level measurement or for triggering frequency converters. Media measured with these pressure transducers are air (non-precipitating), or other gaseous, non-aggressive, non-combustible media.

The pressure sensor has a button for manual zero point calibration (automatic zero point calibration optional/standard for 25 Pa) and an offset potentiometer for final value correction. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

PREMASGARD® **711x-VA**
with cable gland



TECHNICAL DATA

Power supply:	24 V AC (±20 %); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ±0.3 V
Working resistance:	R_a (Ohm) = (U_b -14 V) / 0.02 A for I variant, see working resistance diagram
Load resistance:	R_L > 5 kOhm for U variant
Power consumption:	< 2 VA / 24 V DC, < 3.5 VA / 24 V AC
Measuring ranges:	**multi-range switching** **with 8 switchable measuring ranges** (see table)
Type of pressure:	differential pressure
Pressure port:	with **quick connect** made from stainless steel for PVC/fabric pressure hose Ø 6 mm (external diameter) optionally with **pipe fitting** made from stainless steel V2A (1.4305) for pressure lines Ø 6 mm
Medium:	clean air and non-aggressive, non-combustible gases
Media temperature:	–20...+50 °C
Accuracy:	**Type 7112** (25 Pa): typically ±1 Pa **Type 7110** (100 Pa): typically ±2 Pa **Type 7111** (1000 Pa): typically ±5 Pa **Type 7115** (5000 Pa): typically ±25 Pa compared to the calibrated reference device
Sum of linearity+hysteresis:	< ±1 % of final value ± 2 % of final value for pressure ranges < ±250 Pa
Temp. drift values:	± 0.1 % / °C ± 0.3 % / °C for pressure ranges < 250 Pa
Zero point offset:	< ± 0.7 % of final value ± 1.4 % of final value for pressure ranges < 250 Pa
Positive /negative pressure:	max. ± 100 hPa
Signal filtering:	**switchable 1 s / 10 s** (via DIP switches)
Output:	0 -10 V or 4...20 mA
Connection type:	2- or 3-wire connection
Electrical connection:	0.14 - 1.5 mm², via plug-in screw terminal
Cable connection:	**cable gland, stainless steel V2A** (1.4305) (M 20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) **or** **M12 connector** (male, 5-pin, A-code) according to DIN EN 61076-2-101
Housing:	**stainless steel V4A** (1.4571), with non-distortion cover bolting, impact-resistant, high EMI shielding, corrosion, temperature, weather- and UV-resistant
Housing dimensions:	143 x 97 x 61 mm (Tyr 2E)
Air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) in the built-in state Housing tested, TÜV SÜD, Report No. 713160960B (Skadi2)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3
Equipment:	**display with illumination,** three-line, cutout approx. 70 x 40 mm (W x H), to display the ACTUAL pressure as well as the automatic zero point calibration
ACCESSORIES	(see table)

PREMASGARD® **711x-VAQ**
with M12 connector

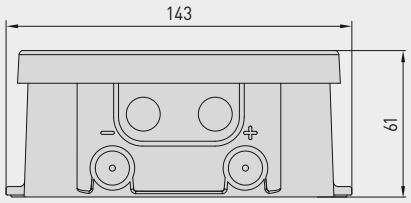


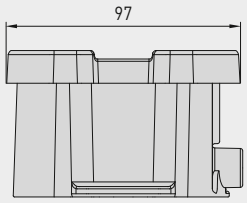
Pressure port for
PVC / fabric pressure hose
(as standard)



Dimensional drawing
[mm]

PREMASGARD® **711x-VA**



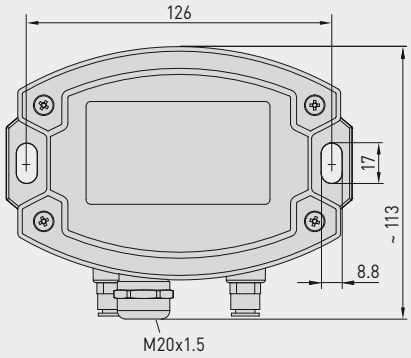


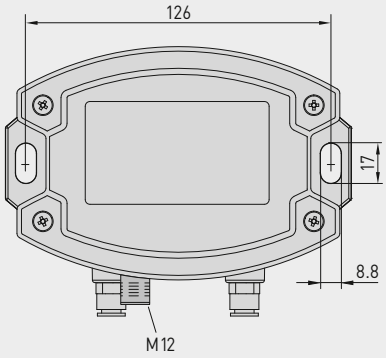
Housing with
cable gland

equipped as standard with
quick connect
for pressure hoses

Housing with
M12 connector

equipped as standard with
quick connect
for pressure hoses







Pressure port for
PVC / fabric pressure hose
(as standard)



M12 connector
(male)

Dimensional drawing
[mm]

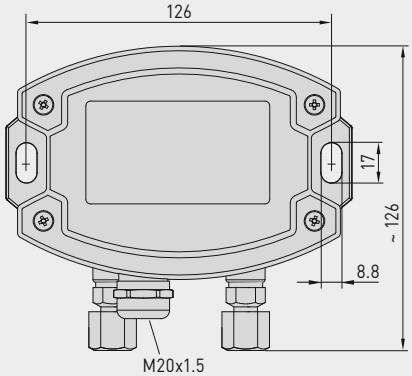
PREMASGARD® **711x-VA**

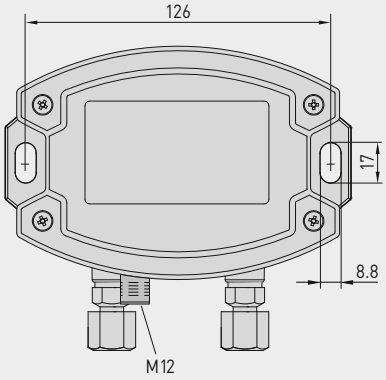
Housing with
cable gland

optional on request
with **pipe fitting**
for pressure lines

Housing with
M12 connector

optional on request
with **pipe fitting**
for pressure lines







Pressure port
for pressure lines / pipes
(optional)



M12 connector
(male)

PREMASGARD® **711x-VA**
with cable gland
and display



PREMASGARD® **711x-VAQ**
with M12 connector
and display





Pressure port
for pressure lines / pipes
(optional)

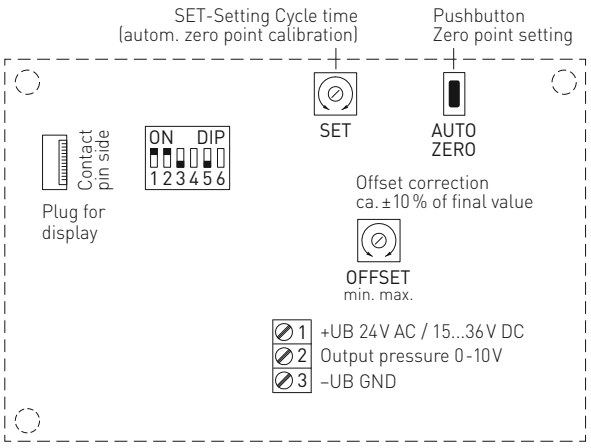


PREMASGARD® 711x-VA

Pressure and differential pressure measuring transducers, adjustable, calibratable, with multi-range switching and active output

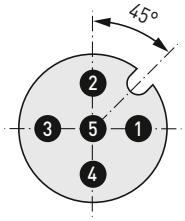
S+S REGELTECHNIK

Schematic diagram **PREMASGARD® 711x-U**



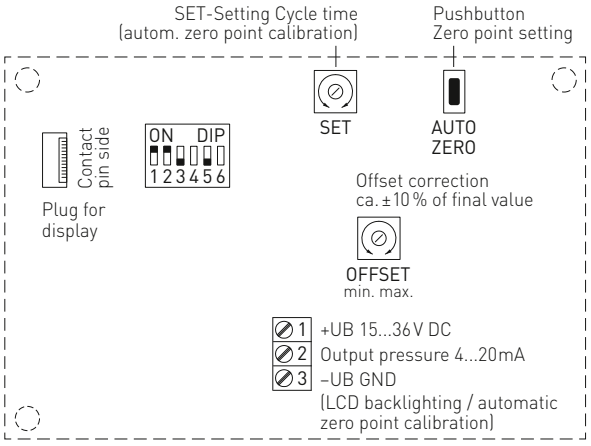
DIP switches 4 and 6 are not assigned!

Pin assignment (M12) **PREMASGARD® 711x-U**



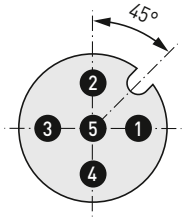
1. +UB 24 V AC / 15...36 V DC
2. Output pressure 0-10 V [Pa]
3. free
4. –UB GND
5. Shield

Schematic diagram **PREMASGARD® 711x-I**



DIP switches 4 and 6 are not assigned!

Pin assignment (M12) **PREMASGARD® 711x-I**



1. +UB 15...36 V DC
2. Output pressure 4...20 mA [Pa]
3. free
4. –UB GND (LCD backlighting / automatic zero point calibration)
5. Shield

Display with option
automatic zero point calibration



Standard
Actual pressure (in Pa)
Calibration interval (arrows)

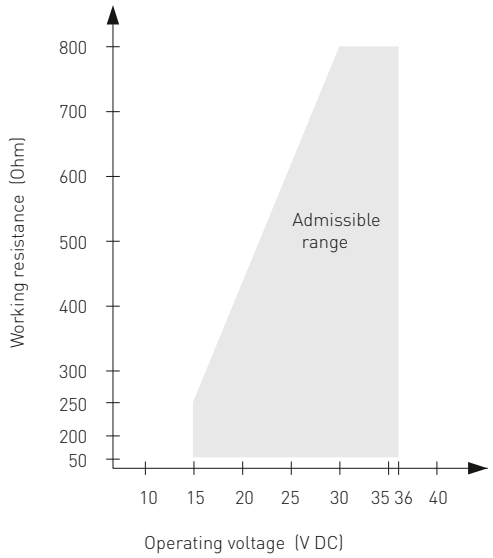


Zero point calibration active
Remaining calibration time (in seconds)



Adjustment of zero point calibration
Cycle time (15 min to 24 hours) adjustable by potentiometer.

Load resistance **PREMASGARD® 711x-I**



Pressure and differential pressure measuring transducers, adjustable, calibratable, with multi-range switching and active output

PREMASGARD® **711x-VAQ**
with display, hinged

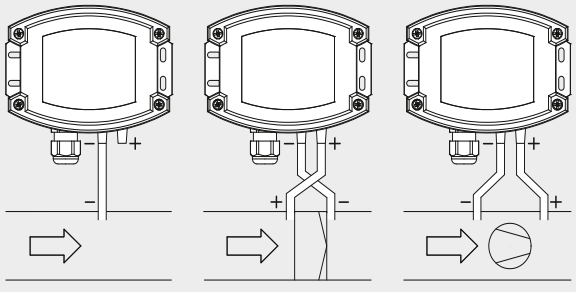


Pressure range (selectable) – max. measuring range (default) is depending to the type of device								**DIP 1**	**DIP 2**
0…25 Pa	0…50 Pa	0…100 Pa	0…1000 Pa	–25…+25 Pa	–50…+50 Pa	–100…+100 Pa	–1000…+1000 Pa	OFF	OFF
–	–	0…300 Pa	0…2000 Pa	–	–	–300…+300 Pa	–2000…+2000 Pa	**ON**	OFF
–	–	0…500 Pa	0…3000 Pa	–	–	–500…+500 Pa	–3000…+3000 Pa	OFF	**ON**
0…25 Pa	**0…100 Pa**	**0…1000 Pa**	**0…5000 Pa**	**–25…+25 Pa**	**–100…+100 Pa**	**–1000…+1000 Pa**	**–5000…+5000 Pa**	**ON**	**ON**

Measuring range mode (Mode selectable)	**DIP 3**
Unidirectional (0…+MR) (default)	OFF
Bidirectional (–MR…+MR)	**ON**

Measurement signal filtering (Time interval selectable)	**DIP 5**
10 s (default)	OFF
1 s	**ON**

Mounting diagram **PREM**ASGARD® **711x**



TYPES OF MONITORING:

(A) Below-atmospheric pressure:
P1 (+) is not connected
but open against atmosphere
P2 (–) connected to inside of duct

(B) Filter:
P1 (+) connected upstream of filter
P2 (–) connected downstream of filter

(C) Ventilator:
P1 (+) connected downstream of ventilator
P2 (–) connected upstream of ventilator

Pressure connections at the pressure switch are marked with P1 (+) for higher pressure and P2 (–) for lower pressure.

Conversion table for pressure values:

Unit =	bar	mbar	Pa	kPa	mWS
1 Pa	0,00001 bar	0,01 mbar	1 Pa	0,001 kPa	0,000101971 mWS
1 kPa	0,01 bar	10 mbar	1000 Pa	1 kPa	0,101971 mWS
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10,1971 mWS
1 mbar	0,001 bar	1 mbar	100 Pa	0,1 kPa	0,0101971 mWS
1 mWS	0,0980665 bar	98,0665 mbar	9806,65 Pa	9,80665 kPa	1 mWS

Pressure and differential pressure measuring transducers, adjustable, calibratable, with multi-range switching and active output

S+S REGELTECHNIK

PREMASGARD® **711x-VAQ**
with M12 connector



PREMASGARD® **711x-VAQ**	Pressure and differential pressure measuring transducer, *ID* Stainless steel housing with M12 connector				
Pressure range (adjustable)	**Type / WG02I**	**Output**	**Display** ● = **Q**	**Item No.**	**Price**
max. – 1000...+ 1000 Pa	**Type 7111**				
0... 100 Pa / – 100... + 100 Pa 0... 300 Pa / – 300... + 300 Pa 0... 500 Pa / – 500... + 500 Pa 0... 1000 Pa / –1000... + 1000 Pa	PREMASGARD 7111-U VA**Q**	0-10 V	●	2004-6191-1100-001	**558,74 €**
	PREMASGARD 7111-U VA**Q** LCD	0-10 V	● ■	2004-6192-1100-001	**740,21 €**
	PREMASGARD 7111-I VA**Q**	4...20 mA	●	2004-6191-2100-001	**558,74 €**
	PREMASGARD 7111-I VA**Q** LCD	4...20 mA	● ■	2004-6192-2100-001	**740,21 €**
max. – 5000...+ 5000 Pa	**Type 7115**				
0...1000 Pa / – 1000 ... + 1000 Pa 0...2000 Pa / – 2000 ... + 2000 Pa 0...3000 Pa / – 3000 ... + 3000 Pa 0...5000 Pa / – 5000 ... + 5000 Pa	PREMASGARD 7115-U VA**Q**	0-10 V	●	2004-6191-1100-011	**558,74 €**
	PREMASGARD 7115-U VA**Q** LCD	0-10 V	● ■	2004-6192-1100-011	**740,21 €**
	PREMASGARD 7115-I VA**Q**	4...20 mA	●	2004-6191-2100-011	**558,74 €**
	PREMASGARD 7115-I VA**Q** LCD	4...20 mA	● ■	2004-6192-2100-011	**740,21 €**
max. – 100...+ 100 Pa	**Type 7110**				
0... +50 Pa / –50... +50 Pa 0...+100 Pa /–100...+100 Pa	PREMASGARD 7110-U VA**Q**	0-10 V	●	2004-6191-1100-021	**621,09 €**
	PREMASGARD 7110-U VA**Q** LCD	0-10 V	● ■	2004-6192-1100-021	**794,63 €**
	PREMASGARD 7110-I VA**Q**	4...20 mA	●	2004-6191-2100-021	**621,09 €**
	PREMASGARD 7110-I VA**Q** LCD	4...20 mA	● ■	2004-6192-2100-021	**794,63 €**
max. – 25...+ 25 Pa	**Type 7112**				
0... +25 Pa / –25... +25 Pa *equipped as standard with automatic zero point calibration (3-wire connection)*	PREMASGARD 7112-U VA**Q**	0-10 V	●	2004-6191-1100-031	**709,97 €**
	PREMASGARD 7112-U VA**Q** LCD	0-10 V	● ■	2004-6192-1100-031	**867,55 €**
	PREMASGARD 7112-I VA**Q**	4...20 mA	●	2004-6191-3100-001	**709,97 €**
	PREMASGARD 7112-I VA**Q** LCD	4...20 mA	● ■	2004-6192-3100-001	**867,55 €**
Housing variant "Q":	Cable connection with **M12 connector** (male, **5-pin**, A-code)				
Multi-range switching:	The **pressure ranges** depend on the device type and can be set via DIP switches.				
Extra charge:	Other special measuring ranges up to max. 5000 Pa **with optional automatic zero point calibration** **with optional pipe fitting** made from stainless steel V2A for pressure lines Ø **6 mm**				**49,83 €** **72,56 €** **41,94 €**

ACCESSORIES

xx-M12	**Special accessories for M12 connector**
	For further information, see chapter Accessories!



PREMASGARD® **711x-VA**
with cable gland

PREMASGARD® **711x-VA**	Pressure and differential pressure measuring transducer, *ID* Stainless steel housing with cable gland				
Pressure range (adjustable)	**Type / WG02I**	**Output**	**Display**	**Item No.**	**Price**
max. – 1000...+ 1000 Pa	**Type 7111**				
0... 100 Pa / – 100... + 100 Pa 0... 300 Pa / – 300... + 300 Pa 0... 500 Pa / – 500... + 500 Pa 0... 1000 Pa / – 1000... + 1000 Pa	PREMASGARD 7111-U VA	0-10 V		2004-6191-1200-001	**523,17 €**
	PREMASGARD 7111-U VA LCD	0-10 V	■	2004-6192-1200-001	**701,67 €**
	PREMASGARD 7111-I VA	4...20 mA		2004-6191-2200-001	**523,17 €**
	PREMASGARD 7111-I VA LCD	4...20 mA	■	2004-6192-2200-001	**701,67 €**
max. – 5000...+ 5000 Pa	**Type 7115**				
0...1000 Pa / – 1000 ... + 1000 Pa 0...2000 Pa / – 2000 ... + 2000 Pa 0...3000 Pa / – 3000 ... + 3000 Pa 0...5000 Pa / – 5000 ... + 5000 Pa	PREMASGARD 7115-U VA	0-10 V		2004-6191-1200-011	**523,17 €**
	PREMASGARD 7115-U VA LCD	0-10 V	■	2004-6192-1200-011	**701,67 €**
	PREMASGARD 7115-I VA	4...20 mA		2004-6191-2200-011	**523,17 €**
	PREMASGARD 7115-I VA LCD	4...20 mA	■	2004-6192-2200-011	**701,67 €**
max. – 100...+ 100 Pa	**Type 7110**				
0... +50 Pa / –50... +50 Pa 0...+100 Pa / –100...+100 Pa	PREMASGARD 7110-U VA	0-10 V		2004-6191-1200-021	**582,54 €**
	PREMASGARD 7110-U VA LCD	0-10 V	■	2004-6192-1200-021	**756,08 €**
	PREMASGARD 7110-I VA	4...20 mA		2004-6191-2200-021	**582,54 €**
	PREMASGARD 7110-I VA LCD	4...20 mA	■	2004-6192-2200-021	**756,08 €**
max. – 25...+ 25 Pa	**Type 7112**				
0... +25 Pa / –25... +25 Pa *equipped as standard with automatic zero point calibration (3-wire connection)*	PREMASGARD 7112-U VA	0-10 V		2004-6191-1200-031	**671,43 €**
	PREMASGARD 7112-U VA LCD	0-10 V	■	2004-6192-1200-031	**829,02 €**
	PREMASGARD 7112-I VA	4...20 mA		2004-6191-3200-001	**671,43 €**
	PREMASGARD 7112-I VA LCD	4...20 mA	■	2004-6192-3200-001	**829,02 €**
Housing variant:	Cable connection with **cable gland** made from stainless steel V2A (1.4305)				
Multi-range switching:	The **pressure ranges** depend on the device type and can be set via DIP switches.				
Extra charge:	Other special measuring ranges up to max. 5000 Pa **with optional automatic zero point calibration** **with optional pipe fitting** made from stainless steel V2A for pressure lines Ø **6 mm**				**49,83 €** **72,56 €** **41,94 €**



Pressure port for
PVC / fabric pressure hose
(as standard)



Pressure port
for pressure lines / pipes
(optional)

PREMASGARD® 722x

Dual pressure sensor (2 measuring channels), pressure and differential pressure measuring transducer, incl. connection set, calibratable, with multi-range switching and active output (Automatic Output Switching)

NEW

S+S REGELTECHNIK

Patented quality product (patent no. DE 10 2015 015 941 B4)

Calibratable dual pressure sensor **PREM**ASGARD® **722x** (series) with 2 x 8 switchable measuring ranges, 2 automated output signals (32 devices in one), housing with pressure connection nozzle from impact-resistant plastic, optionally with/without display, with cable gland or M12 connector acc. to DIN EN 61076-2-101 for measuring overpressure, underpressure or differential pressure of the air. The pressure measuring transducer automatically detects the required output type and converts the measurands into the required standard signal of 0-10 V or 4...20 mA (**Automatic Output Switching**).

It is used in the clean room, medical and filter technology, ventilation and air conditioning ducts, spray booths, large-scale catering facilities, for filter monitoring and level measurement or for triggering frequency converters. Media measured with this pressure measuring transducer are clean air (non-precipitating), or other gaseous, non-aggressive, non-combustible media.

Both pressure sensors with piezoresistive measuring element are temperature-compensated and guarantee a high level of reliability and accuracy. The device has a push-button for manual zero point matching as well as an offset potentiometer for correcting the final value. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible. The delivery includes a connection set **ASD-06** (2 m connection hose, two pressure connection nipples, screws).

TECHNICAL DATA

Power supply:	24 V AC/DC (± 10%)
Working resistance:	R_a (ohms) = 25...450 Ohm (at I output)
Load resistance:	R_L > 15 kOhm (at U output)
Power consumption:	< 2 W / 24 V DC; < 4.4 VA / 24 V AC
Pressure type:	differential pressure **(2 measuring channels)**
Measuring ranges:	**Multi-range switching** **with 2 x 8 switchable measuring ranges** (see table)
Accuracy:	**Type 7229** (500 Pa): typical ± 13 Pa **Type 722x** (7000 Pa): typical ± 105 Pa compared to a calibrated reference device
Pressure connection:	with connection nozzle for pressure hose Ø 6 mm
Medium:	clean air and non-aggressive, non-combustible gases
Media temperature:	–20...+50 °C (temperature-compensated 0...+50 °C)
Temp. drift values:	± 0.1 % / °C final value
Zero point offset:	± 10 % measuring range
Above-/below-pressure:	± 50 kPa
Signal filtering:	**switchable 1 s / 10 s** (via DIP switch)
Output:	**automatically 0-10 V / 4...20 mA** (via **Automatic Output Switching** – the device detects the required output type and automatically switches to U or I output)
Switching type:	3-wire connection
electrical connection:	0.2–1.5 mm², via push-in clamp
Cable connection:	**cable gland** from plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** (male, 5-pin, A-code) according to DIN EN 61076-2-101
Housing:	plastic, UV-resistant, polyamide material, 30 % glass-globe reinforced, with quick-locking screws (slotted / Philips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Typ 2)
Humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Safety class:	**IP 65** (according to EN 60 529) in the built-in state
Standards:	CE conformity, electro-magnetic compatibility according to EN 61326, EMC Directive 2014 / 30 / EU
Features:	**Illuminated display,** 3 lines, cut-out approx. 70 x 40 mm (W x H), to display the ACTUAL pressure of both channels (cyclical)
ACCESSORIES	see table

PREMASGARD® **722x**
with cable gland



PREMASGARD® **722x-Q**
with M12 connector



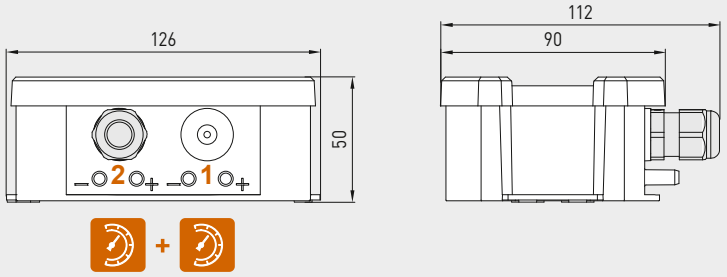


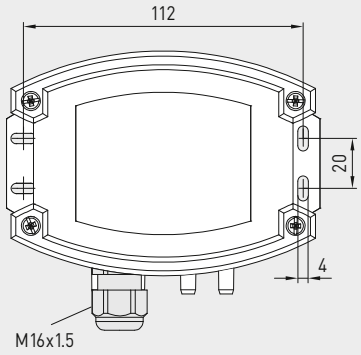
Dual pressure connection
Housing with cable gland



Dimensional drawing
[mm]

PREMASGARD® **722x**





Housing with
dual pressure connection
(2 measuring channels)

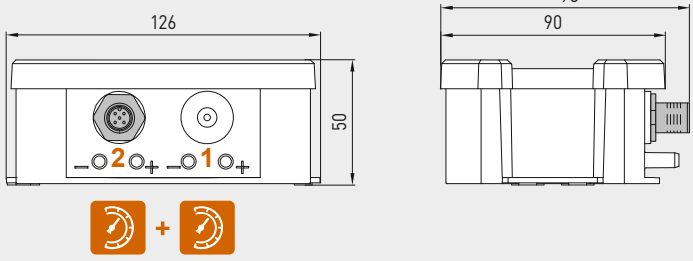
and **cable gland**

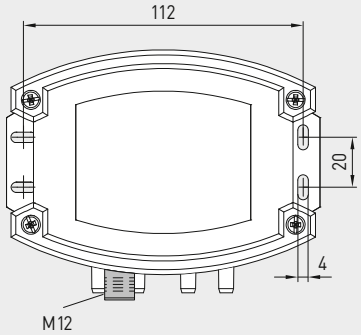
PREMASGARD® **722x**
with cable gland
and display



Dimensional drawing
[mm]

PREMASGARD® **722x-Q**





Housing with
dual pressure connection
(2 measuring channels)

and **M12 connector**
(male)



PREMASGARD® **722x-Q**
with M12 connector
and display





Dual pressure connection
Housing with
M12 connector



Automatic detection and switching
to standard signal 0...10 V or 4...20 mA

AOS-PATENTED
AUTOMATIC OUTPUT SWITCHING

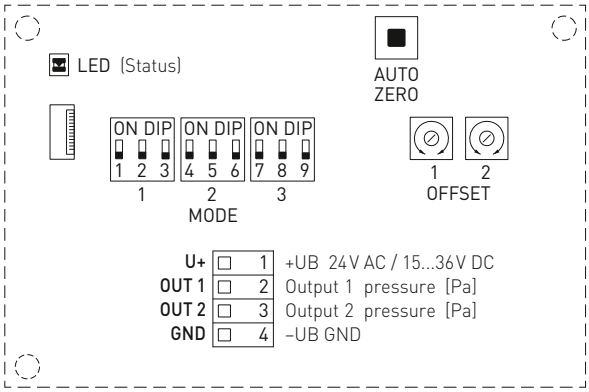
PREMASGARD® 722x

Dual pressure sensor (2 measuring channels), pressure and differential pressure measuring transducer, incl. connection set, calibratable, with multi-range switching and active output (Automatic Output Switching)

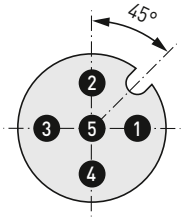
NEW

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Schematic diagram — **PREM**ASGARD® **722x**



Pin assignment (M12) — **PREM**ASGARD® **722x**



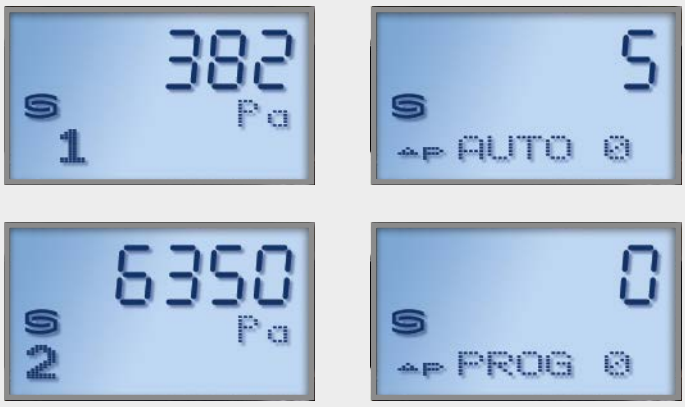
1. +UB 24 V AC / 15...36 V DC
2. Output 1 pressure [Pa]
3. Output 2 pressure [Pa]
4. –UB GND
5. Shield

Measuring channel 1 Pressure range				
Type 7227 adjustable	**Type 7229** adjustable	**DIP 1**	**DIP 2**	**DIP 3**
0...+1000 Pa	0...+100 Pa	OFF	OFF	OFF
0...+3000 Pa	0...+200 Pa	**ON**	OFF	OFF
0...+5000 Pa	0...+300 Pa	OFF	**ON**	OFF
0...+7000 Pa	**0...+500 Pa**	**ON**	**ON**	OFF
–1000...+1000 Pa	–100...+100 Pa	OFF	OFF	**ON**
–3000...+3000 Pa	–200...+200 Pa	**ON**	OFF	**ON**
–5000...+5000 Pa	–300...+300 Pa	OFF	**ON**	**ON**
–7000...+7000 Pa	**–500...+500 Pa**	**ON**	**ON**	**ON**

Measuring channel 2 Pressure range			
Type 722x adjustable	**DIP 4**	**DIP 5**	**DIP 6**
0...+1000 Pa	OFF	OFF	OFF
0...+3000 Pa	**ON**	OFF	OFF
0...+5000 Pa	OFF	**ON**	OFF
0...+7000 Pa	**ON**	**ON**	OFF
–1000...+1000 Pa	OFF	OFF	**ON**
–3000...+3000 Pa	**ON**	OFF	**ON**
–5000...+5000 Pa	OFF	**ON**	**ON**
–7000...+7000 Pa	**ON**	**ON**	**ON**

Mode Measurement signal filtering	
Selectable time interval	**DIP 7**
10 s (default)	OFF
1 s	**ON**
Note: DIP 8 and 9 are not defined!	

Displays — **PREM**ASGARD® **722x**



Default display
Measured value

Actual pressure (Pa) of both channels is shown cyclically (Interval approx. 6 seconds).

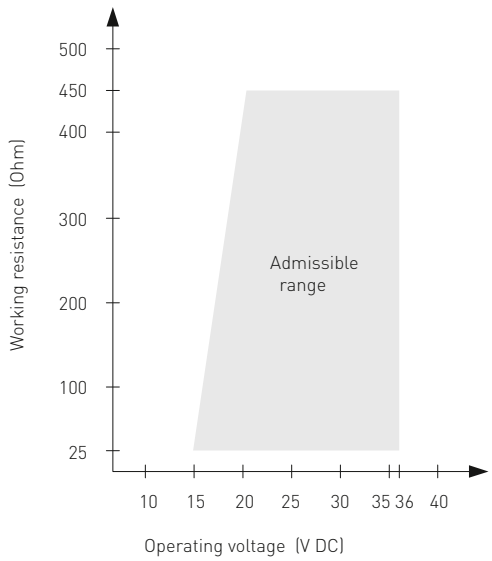
The associated measuring channel is shown on the bottom left.

Status display
zero point calibration

Remaining calibration time is shown (in seconds).

Change from "AUTO 0" to "PROG 0" shows that matching was correct.

Working resistance diagram (4...20 mA) — **PREM**ASGARD® **722x**

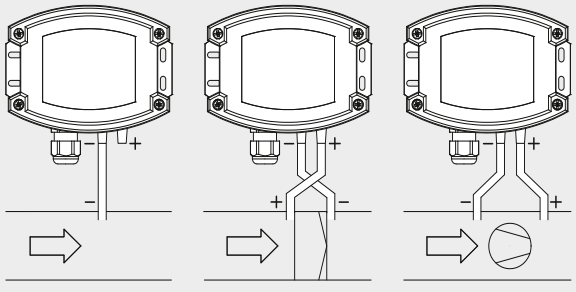


Dual pressure sensor (2 measuring channels), pressure and differential pressure measuring transducer, incl. connection set, calibratable, with multi-range switching and active output (Automatic Output Switching)

PREMASGARD® **722x-Q**
with display, hinged



Mounting diagram **PREM**ASGARD® **722x**



TYPES OF MONITORING:

(A) Below-atmospheric pressure:
P1 (+) is not connected
but open against atmosphere
P2 (–) connected to inside of duct

(B) Filter:
P1 (+) connected upstream of filter
P2 (–) connected downstream of filter

(C) Ventilator:
P1 (+) connected downstream of ventilator
P2 (–) connected upstream of ventilator

Pressure connections at the pressure switch are marked with P1 (+) for higher pressure and P2 (–) for lower pressure.

Conversion table for pressure values:

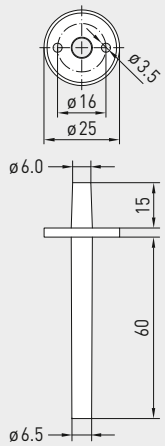
Unit =	bar	mbar	Pa	kPa	mWS
1 Pa	0,00001 bar	0,01 mbar	1 Pa	0,001 kPa	0,000101971 mWS
1 kPa	0,01 bar	10 mbar	1000 Pa	1 kPa	0,101971 mWS
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10,1971 mWS
1 mbar	0,001 bar	1 mbar	100 Pa	0,1 kPa	0,0101971 mWS
1 mWS	0,0980665 bar	98,0665 mbar	9806,65 Pa	9,80665 kPa	1 mWS

Dual pressure sensor (2 measuring channels), pressure and differential pressure measuring transducer, incl. connection set, calibratable, with multi-range switching and active output (Automatic Output Switching)

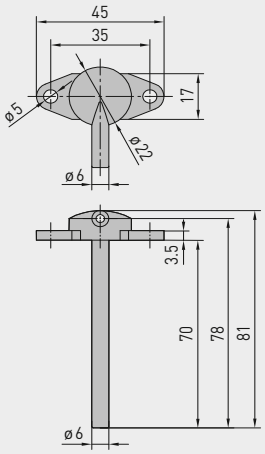
NEW

S+S REGELTECHNIK

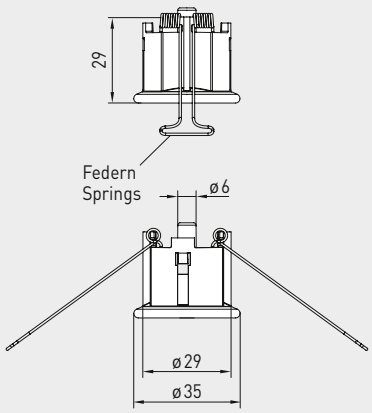
Dimensional drawing [mm] **ASD-06**



Dimensional drawing [mm] **ASD-07**



Dimensional drawing [mm] **DAL-01**



ASD-06
Connection set



ASD-07
Connection nipple



DAL-01
Pressure outlet





WS-03
Weather and sun protection hood (optional)

ACCESSORIES			
ASD-06	**Connection set (included in the scope of delivery),** consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose (soft, UV-resistant) and 4 screws	7100-0060-3000-000	**7,64 €**
ASD-07	**2 connection nipples** (at 90 degree angle) made of plastic, ABS	7100-0060-7000-000	**7,64 €**
DAL-01	**Pressure outlet** for ceiling or in-wall installation (e.g. in clean rooms)	7300-0060-3000-001	**35,77 €**
WS-03	**Weather and sun protection hood**, 200 x 180 x 150 mm, stainless steel **V2A** (1.4301)	7100-0040-6000-000	**44,74 €**
	For further information, see chapter Accessories!		

Dual pressure sensor (2 measuring channels), pressure and differential pressure measuring transducer, incl. connection set, calibratable, with multi-range switching and active output (Automatic Output Switching)

PREMASGARD® **722x-Q**
with M12 connector



PREMASGARD® **722x**
with cable gland



PREMASGARD® **722x**	Dual pressure sensor (2 measuring channels), pressure and differential pressure measuring transducer, *Deluxe*				
Pressure range (adjustable per channel)	**Type / WG02**	**Output** (automatically)	**Display** ● = **Q**	**Item No.**	**Price**
(1) max. – 7000...+ 7000 Pa **(2) max. – 7000...+ 7000 Pa**	**Type 7227**				
Channel (1) and (2): 0 ... 1000 Pa / – 1000 ... + 1000 Pa 0 ... 3000 Pa / – 3000 ... + 3000 Pa 0 ... 5000 Pa / – 5000 ... + 5000 Pa 0 ... 7000 Pa / – 7000 ... + 7000 Pa	PREMASGARD 7227	0-10 V / 4...20 mA		1301-712A-0950-200	**229,07 €**
	PREMASGARD 7227 LCD	0-10 V / 4...20 mA	■	1301-712A-4950-200	**277,83 €**
	PREMASGARD 7227 **Q**	0-10 V / 4...20 mA	●	2004-6331-B100-011	**267,62 €**
	PREMASGARD 7227 **Q** LCD	0-10 V / 4...20 mA	● ■	2004-6332-B100-011	**316,39 €**
(1) max. – 500... + 500 Pa **(2) max. – 7000...+ 7000 Pa**	**Type 7229**				
Channel (1): 0 ... 100 Pa / – 100 ... + 100 Pa 0 ... 200 Pa / – 200 ... + 200 Pa 0 ... 300 Pa / – 300 ... + 300 Pa 0 ... 500 Pa / – 500 ... + 500 Pa Channel (2): see Type 7227	PREMASGARD 7229	0-10 V / 4...20 mA		1301-712A-0930-200	**229,07 €**
	PREMASGARD 7229 LCD	0-10 V / 4...20 mA	■	1301-712A-4930-200	**277,83 €**
	PREMASGARD 7229 **Q**	0-10 V / 4...20 mA	●	2004-6331-B100-001	**267,62 €**
	PREMASGARD 7229 **Q** LCD	0-10 V / 4...20 mA	● ■	2004-6332-B100-001	**316,39 €**
Multi-range switching:	The **pressure ranges** depend on the device type and for each measuring channel, they are separately adjustable via DIP switch.				
Automatic Output Switching:	Patented analogue interface **(patent no. DE 10 2015 015 941 B4)** Device automatically detects the required output type 0–10 V or 4...20 mA.				
Housing variant Q:	Cable connection with **M12 connector** (male, **5 pin**, A-code)				

PREMASREG® 711x

Pressure and differential pressure measuring transducers/switches, incl. connection set, with multi-range switching and adjustable, switching and active output

S+S REGELTECHNIK

The electronic **PREM**ASREG® **711x** pressure sensors and switches are equipped with eight switchable measuring ranges, one switching output, one continuous output, and a display for setting the switch-point and to display the ACTUAL pressure (eight devices in one, plus differential pressure switch / differential pressure monitor, continuous pressure sensor in a single device).

The pressure sensor with a housing made from impact-resistant plastic, with cable gland or M12 connector according to DIN EN 61076-2-101 and pressure connection nozzles (quick connect optional) is used to measure positive, negative or differential pressures in clean air, with limit value switching. The piezoresistive measuring element guarantees a high degree of reliability and accuracy.

Applications of these pressure sensors are in clean room, medical and filter technology, in ventilation and air conditioning ducts, in spray booths, in large-scale catering facilities, for filter monitoring and level measurement or for triggering frequency converters. Media measured with these pressure transducers are air (non-precipitating), or other gaseous, non-aggressive, non-combustible media.

The pressure sensor has a button for manual zero point calibration (automatic zero point calibration optional) and one offset potentiometer for setting the switching point and one for final value correction. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible. The delivery includes the connection set **ASD-06** (2 m connection hose, two pressure port nipples, screws).

TECHNICAL DATA

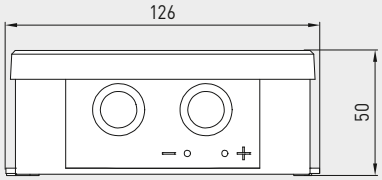
Power supply:	24 V AC / DC (± 20 %)
Load resistance:	R_L > 5 kOhm
Power consumption:	< 1 VA / 24 V DC, < 2.2 VA / 24 V AC
Measuring ranges:	**multi-range switching** **with 8 switchable measuring ranges** (see table)
Type of pressure:	differential pressure
Pressure connection:	with connection **nozzle** for pressure hose Ø 6 mm, optionally with **quick** connect made from stainless steel for PVC fabric pressure hose Ø 6 mm (external diameter)
Medium:	clean air and non-aggressive, non-combustible gases
Media temperature:	–20...+50 °C
Accuracy:	**Type 7111** (1000 Pa): typically ± 5 Pa **Type 7115** (5000 Pa): typically ± 25 Pa compared to the calibrated reference device
Sum of linearity+hysteresis:	< ± 1 % of final value
Temp. drift values:	± 0.1 % / °C
Zero point offset:	< ± 0.7 % of final value
Setting increment Δp:	1 % of pressure range (100 Pa => 1 Pa; 5000 Pa => 50 Pa)
Switching hysteresis:	± 1 % of pressure range (100 Pa => ± 1 Pa; 5000 Pa => ± 50 Pa)
Positive /negative pressure:	max. ± 100 hPa
Signal filtering:	**switchable 1 s / 10 s** (via DIP switches)
Output:	0 -10 V 1 changeover contact (24 V), 1 A ohmic load
Connection type:	3-wire connection
Electrical connection:	0.14 - 1.5 mm², via plug-in screw terminal
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** (male, **12-pin**, A-code) according to DIN EN 61076-2-101
Housing:	**plastic**, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) in the built-in state
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3
Equipment:	**display with illumination,** three-line, cutout approx. 70 x 40 mm (W x H), for displaying ACTUAL pressure and / or SETPOINT pressure as well as automatic zero point calibration
ACCESSORIES	see table

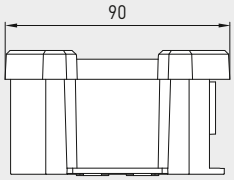
Pressure port
for pressure hose
(as standard)



Dimensional drawing
[mm]

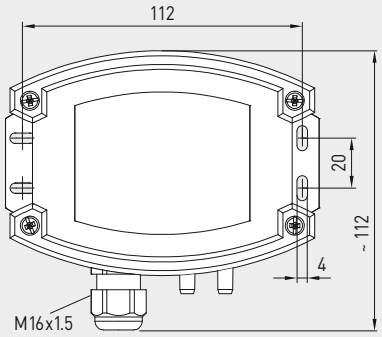
PREMASREG® **711x**

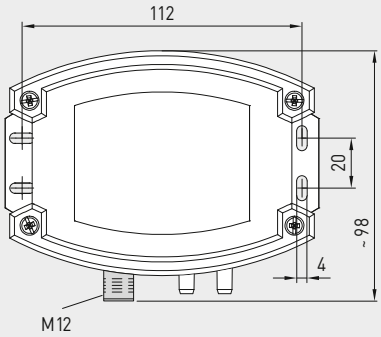


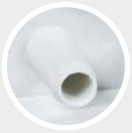


Housing with
cable gland
equipped as standard with
pressure port **nozzles**

Housing with
M12 connector
equipped as standard with
pressure port **nozzles**







Pressure port
for pressure hose
(as standard)



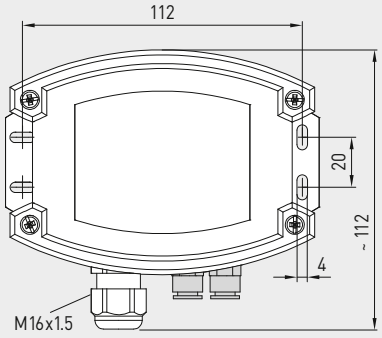
M12 connector
(male)

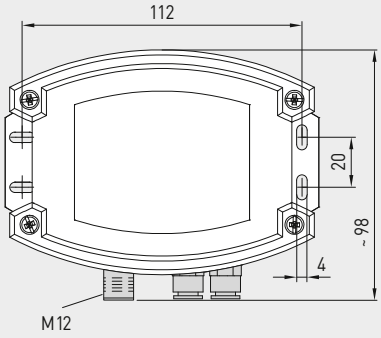
Dimensional drawing
[mm]

PREMASREG® **711x**

Housing with
cable gland
optional on request
with **quick** connect

Housing with
M12 connector
optional on request
with **quick** connect







Pressure port for
PVC/fabric pressure hose
(optional)



M12 connector
(male)

PREMASREG® **711x-Q**
with cable gland
and display



PREMASREG® **711x-Q**
with M12 connector
and display





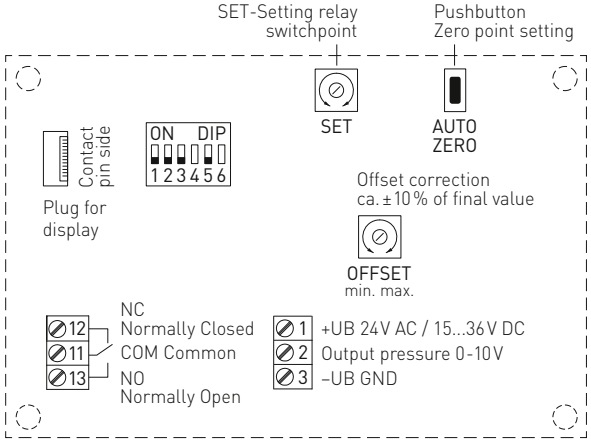
Pressure port for
PVC/fabric pressure hose
(optional)



Pressure and differential pressure measuring transducers/switches, incl. connection set, with multi-range switching and adjustable, switching and active output

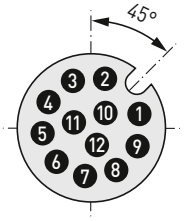
S+S REGELTECHNIK

Schematic diagram — **PREMASREG® 711x-UW**



DIP switches 4 and 6 are not assigned!

Pin assignment (M12) — **PREMASREG® 711x-UW**



1. +UB 24 V AC / 15...36 V DC
2. Output pressure 0-10 V
3. free
4. –UB GND
5. free
6. free
7. COM Common
8. NC Normally Closed
9. NO Normally Open
10. free
11. free
12. free

Pressure range (selectable) – max. measuring range (default) is depending to the type of device				**DIP 1**	**DIP 2**
0...100 Pa	0...1000 Pa	–100...+100 Pa	–1000...+1000 Pa	OFF	OFF
0...300 Pa	0...2000 Pa	–300...+300 Pa	–2000...+2000 Pa	**ON**	OFF
0...500 Pa	0...3000 Pa	–500...+500 Pa	–3000...+3000 Pa	OFF	**ON**
0...1000 Pa	**0...5000 Pa**	**-1000...+1000 Pa**	**-5000...+5000 Pa**	**ON**	**ON**

Measuring range mode (Mode selectable)	**DIP 3**
Unidirectional (0...+MR) (default)	OFF
Bidirectional (–MR...+MR)	**ON**

Measurement signal filtering (Time interval selectable)	**DIP 5**
10 s (default)	OFF
1 s	**ON**

Display with option
automatic zero point calibration



Zero point calibration active
Remaining calibration time (in seconds)

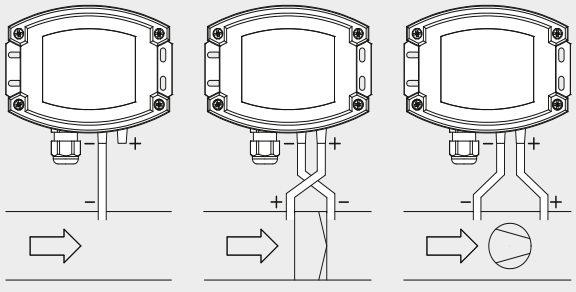
Cycle time (approx. 90 minutes) is fixed in the factory.

Pressure and differential pressure measuring transducers/switches, incl. connection set, with multi-range switching and adjustable, switching and active output

PREMASREG® **711x - Q**
with display,
hinged



Mounting diagram **PREM**ASREG® **711x**



TYPES OF MONITORING:

(A) Below-atmospheric pressure:
P1 (+) is not connected
but open against atmosphere
P2 (–) connected to inside of duct

(B) Filter:
P1 (+) connected upstream of filter
P2 (–) connected downstream of filter

(C) Ventilator:
P1 (+) connected downstream of ventilator
P2 (–) connected upstream of ventilator

Pressure connections at the pressure switch are marked with P1 (+) for higher pressure and P2 (–) for lower pressure.

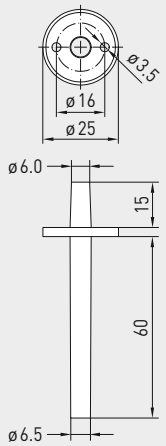
Conversion table for pressure values:

Unit =	bar	mbar	Pa	kPa	mWS
1 Pa	0,00001 bar	0,01 mbar	1 Pa	0,001 kPa	0,000101971 mWS
1 kPa	0,01 bar	10 mbar	1000 Pa	1 kPa	0,101971 mWS
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10,1971 mWS
1 mbar	0,001 bar	1 mbar	100 Pa	0,1 kPa	0,0101971 mWS
1 mWS	0,0980665 bar	98,0665 mbar	9806,65 Pa	9,80665 kPa	1 mWS

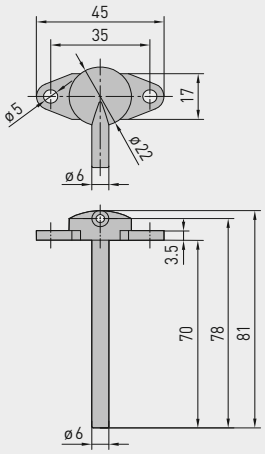
Pressure and differential pressure measuring transducers/switches, incl. connection set, with multi-range switching and adjustable, switching and active output

S+S REGELTECHNIK

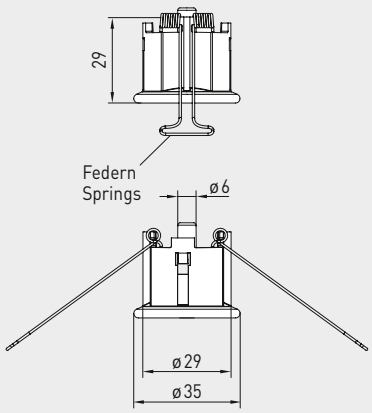
Dimensional drawing [mm] **ASD-06**



Dimensional drawing [mm] **ASD-07**



Dimensional drawing [mm] **DAL-01**



ASD-06
Connection set



ASD-07
Connection nipple



DAL-01
Pressure outlet





WS-03
Weather and sun protection hood (optional)

Pressure port for pressure hose (as standard)



Pressure port for PVC/fabric pressure hose (optional)



ACCESSORIES

ASD-06	**Connection set (included in the scope of delivery),** consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose (soft, UV-resistant) and 4 screws	7100-0060-3000-000	**7,64 €**
ASD-07	**2 connection nipples** (at 90 degree angle) made of plastic, ABS	7100-0060-7000-000	**7,64 €**
DAL-01	**Pressure outlet** for ceiling or in-wall installation (e.g. in clean rooms)	7300-0060-3000-001	**35,77 €**
WS-03	**Weather and sun protection hood**, 200 x 180 x 150 mm, stainless steel **V2A** (1.4301)	7100-0040-6000-000	**44,74 €**
	For further information, see chapter Accessories!		

Pressure and differential pressure measuring transducers/switches, incl. connection set, with multi-range switching and adjustable, switching and active output

PREMASREG® **711x-Q**
with M12 connector



PREMASREG® **711x**
with cable gland



PREMASREG® **711x**	Pressure and differential pressure measuring transducers/switches, *Deluxe* (with cable gland or M12 connector)				
Pressure range (adjustable)	**Type / WG02**	**Output**	**Display ● = Q**	**Item No.**	**Price**
max. – 1000...+ 1000 Pa	**Type 7111**				
0... 100 Pa / – 100... + 100 Pa 0... 300 Pa / – 300... + 300 Pa 0... 500 Pa / – 500... + 500 Pa 0... 1000 Pa / – 1000... + 1000 Pa	PREMASREG 7111-UW LCD	0-10 V 1x Changeover contact	■	1302-7111-4011-200	**240,65 €**
	PREMASREG 7111-UW **Q** LCD	0-10 V 1x Changeover contact	● ■	2004-6132-4100-001	**282,59 €**
max. – 5000...+ 5000 Pa	**Type 7115**				
0...1000 Pa / – 1000 ... + 1000 Pa 0...2000 Pa / – 2000 ... + 2000 Pa 0...3000 Pa / – 3000 ... + 3000 Pa 0...5000 Pa / – 5000 ... + 5000 Pa	PREMASREG 7115-UW LCD	0-10 V 1x Changeover contact	■	1302-7111-4051-200	**240,65 €**
	PREMASREG 7115-UW **Q** LCD	0-10 V 1x Changeover contact	● ■	2004-6132-4100-011	**282,59 €**
Housing variant "Q":	Cable connection with **M12 connector** (male, **12-pin**, A-code)				
Multi-range switching:	The **pressure ranges** depend on the device type and can be set via DIP switches.				
Extra charge:	Other special measuring ranges up to max. 5000 Pa **with optional automatic zero point calibration** **with optional quick connect** for PVC fabric pressure hose Ø 6 mm				**49,83 €** **72,56 €** **41,94 €**

PREMASREG® 711x-VA

**Pressure and differential pressure measuring transducers/switches,
with multi-range switching
and adjustable, switching and active output**

S+S REGELTECHNIK

The electronic **PREM**ASREG® **711x-VA** pressure sensors and switches are equipped with eight switchable measuring ranges, one switching output, one continuous output, and a display for setting the switchpoint and to display the ACTUAL pressure (eight devices in one, plus differential pressure switch / differential pressure monitor, continuous pressure sensor in a single device).

The pressure sensor with a housing made from **stainless steel V4A**, with cable gland or M12 connector according to DIN EN 61076-2-101 and pressure port using quick connect (pipe fitting optional) is used to measure positive, negative or differential pressures in clean air, with limit value switching. The piezoresistive measuring element guarantees a high degree of reliability and accuracy.

Applications of these pressure sensors are in clean room, medical and filter technology, in ventilation and air conditioning ducts, in spray booths, in large-scale catering facilities, for filter monitoring and level measurement or for triggering frequency converters. Media measured with these pressure transducers are air (non-precipitating), or other gaseous, non-aggressive, non-combustible media.

The pressure sensor has a button for manual zero point calibration (automatic zero point calibration optional) as well as one offset potentiometer for setting the switching point and one for final value correction. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

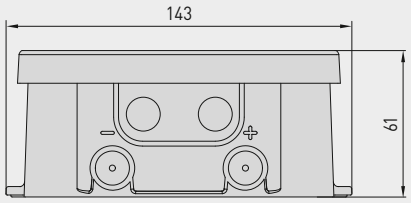
Power supply:	24 V AC / DC (± 20 %)
Load resistance:	R_L > 5 kOhm
Power consumption:	< 1 VA / 24 V DC, < 2.2 VA / 24 V AC
Measuring ranges:	**multi-range switching** **with 8 switchable measuring ranges** (see table)
Type of pressure:	differential pressure
Pressure port:	with **quick connect** made from stainless steel for PVC/fabric pressure hose Ø 6 mm (external diameter) optionally with **pipe fitting** made from stainless steel V2A (1.4305) for pressure lines Ø 6 mm
Medium:	clean air and non-aggressive, non-combustible gases
Media temperature:	–20...+50 °C
Accuracy:	**Type 7111** (1000 Pa): typically ± 5 Pa **Type 7115** (5000 Pa): typically ± 25 Pa compared to the calibrated reference device
Sum of linearity+hysteresis:	< ± 1 % of final value
Temp. drift values:	± 0.1 % / °C
Zero point offset:	< ± 0.7 % of final value
Setting increment Δp:	1 % of pressure range (100 Pa => 1 Pa; 5000 Pa => 50 Pa)
Switching hysteresis:	± 1 % of pressure range (100 Pa => ± 1 Pa; 5000 Pa => ± 50 Pa)
Positive /negative pressure:	max. ± 100 hPa
Signal filtering:	**switchable 1 s / 10 s** (via DIP switches)
Output:	0 -10 V 1 changeover contact (24 V), 1 A ohmic load
Connection type:	3-wire connection
Electrical connection:	0.14 - 1.5 mm², via plug-in screw terminal
Cable connection:	**cable gland, stainless steel V2A** (1.4305) (M 20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) **or** **M12 connector** (male, **12-pin**, A-code) according to DIN EN 61076-2-101
Housing:	**stainless steel V4A** (1.4571), with non-distortion cover bolting, impact-resistant, high EMI shielding, corrosion, temperature, weather- and UV-resistant
Housing dimensions:	143 x 97 x 61 mm (Typ 2E)
Air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) in the built-in state Housing tested, TÜV SÜD, Report No. 713160960B (Skadi2)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3
Equipment:	**display with illumination,** three-line, cutout approx. 70 x 40 mm (W x H), for displaying ACTUAL pressure and / or SETPOINT pressure as well as automatic zero point calibration
ACCESSORIES	(see table)

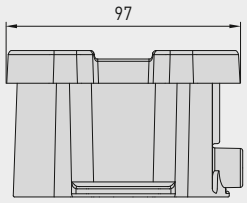
Pressure port for
PVC / fabric pressure hose
(as standard)



Dimensional drawing
[mm]

PREMASREG® **711x-VA**



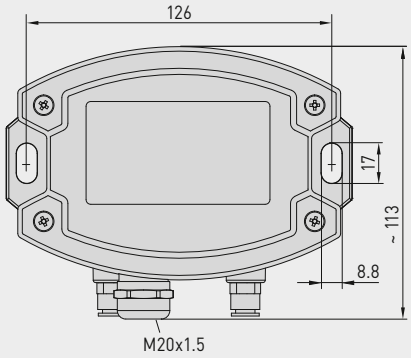


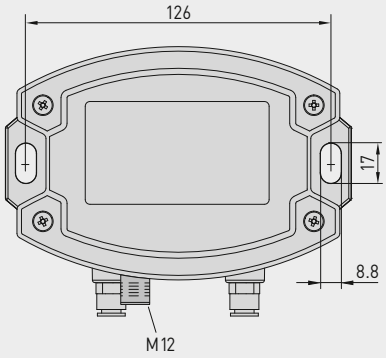
Housing with
cable gland

equipped as standard with
quick connect
for pressure hoses

Housing with
M12 connector

equipped as standard with
quick connect
for pressure hoses







Pressure port for
PVC / fabric pressure hose
(as standard)



M12 connector
(male)

PREMASREG® **711x-VA**
with cable gland
and display



PREMASREG® **711x-VAQ**
with M12 connector
and display





Dimensional drawing
[mm]

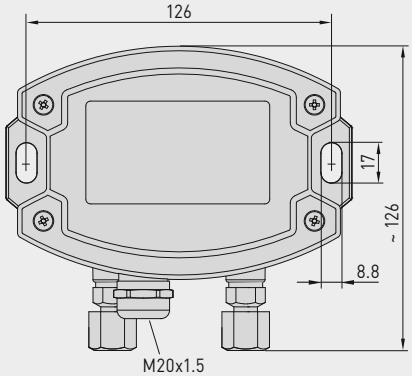
PREMASREG® **711x-VA**

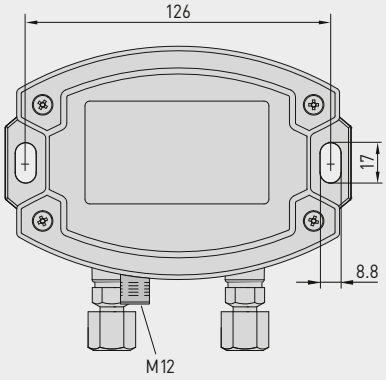
Housing with
cable gland

optional on request
with **pipe fitting**
for pressure lines

Housing with
M12 connector

optional on request
with **pipe fitting**
for pressure lines







Pressure port
for pressure lines / pipes
(optional)



M12 connector
(male)

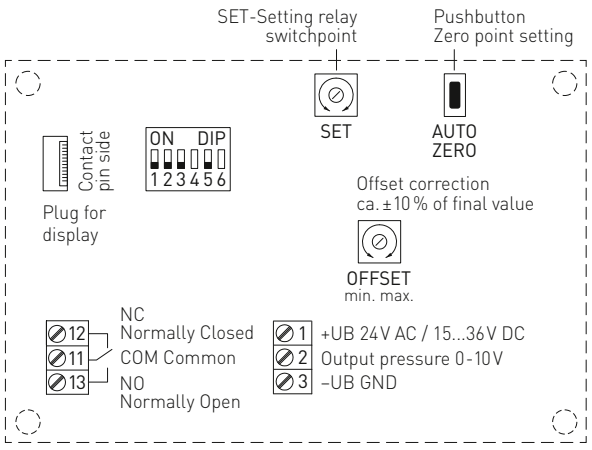
Pressure port
for pressure lines / pipes
(optional)



Pressure and differential pressure measuring transducers/switches, with multi-range switching and adjustable, switching and active output

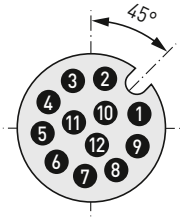
S+S REGELTECHNIK

Schematic diagram **PREMASREG® 711x-UW**



DIP switches 4 and 6 are not assigned!

Pin assignment (M12) **PREMASREG® 711x-UW**



1. +UB 24 V AC / 15...36 V DC
2. Output pressure 0-10 V
3. free
4. –UB GND
5. free
6. free
7. COM Common
8. NC Normally Closed
9. NO Normally Open
10. free
11. free
12. free

Pressure range (selectable) – max. measuring range (default) is depending to the type of device				**DIP 1**	**DIP 2**
0...100 Pa	0...1000 Pa	–100...+100 Pa	–1000...+1000 Pa	OFF	OFF
0...300 Pa	0...2000 Pa	–300...+300 Pa	–2000...+2000 Pa	**ON**	OFF
0...500 Pa	0...3000 Pa	–500...+500 Pa	–3000...+3000 Pa	OFF	**ON**
0...1000 Pa	**0...5000 Pa**	**-1000...+1000 Pa**	**-5000...+5000 Pa**	**ON**	**ON**

Measuring range mode (Mode selectable)	**DIP 3**
Unidirectional (0...+MR) (default)	OFF
Bidirectional (–MR...+MR)	**ON**

Measurement signal filtering (Time interval selectable)	**DIP 5**
10 s (default)	OFF
1 s	**ON**

Display with option **automatic zero point calibration**



Zero point calibration active
Remaining calibration time (in seconds)

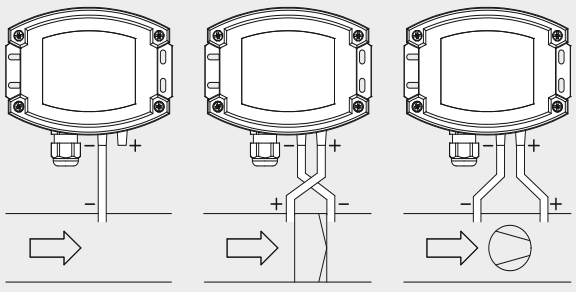
Cycle time (approx. 90 minutes) is fixed in the factory.

Pressure and differential pressure measuring transducers/switches, with multi-range switching and adjustable, switching and active output

PREMASREG® **711x-VAQ**
with display, hinged



Mounting diagram **PREM**ASREG® **711x**



TYPES OF MONITORING:

(A) Below-atmospheric pressure:
P1 (+) is not connected
but open against atmosphere
P2 (–) connected to inside of duct

(B) Filter:
P1 (+) connected upstream of filter
P2 (–) connected downstream of filter

(C) Ventilator:
P1 (+) connected downstream of ventilator
P2 (–) connected upstream of ventilator

Pressure connections at the pressure switch are marked with P1 (+) for higher pressure and P2 (–) for lower pressure.

Conversion table for pressure values:

Unit =	bar	mbar	Pa	kPa	mWS
1 Pa	0,00001 bar	0,01 mbar	1 Pa	0,001 kPa	0,000101971 mWS
1 kPa	0,01 bar	10 mbar	1000 Pa	1 kPa	0,101971 mWS
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10,1971 mWS
1 mbar	0,001 bar	1 mbar	100 Pa	0,1 kPa	0,0101971 mWS
1 mWS	0,0980665 bar	98,0665 mbar	9806,65 Pa	9,80665 kPa	1 mWS

Pressure and differential pressure measuring transducers/switches, with multi-range switching and adjustable, switching and active output

S+S REGELTECHNIK

PREMASREG® **711x-VAQ**
with M12 connector



PREMASREG® **711x-VAQ**	Pressure and differential pressure measuring transducers/switches, *ID* (Stainless steel housing with M12 connector)				
Pressure range (adjustable)	**Type / WG02I**	**Output**	**Display** ● = **Q**	**Item No.**	**Price**
max. – 1000...+ 1000 Pa	**Type 7111**				
0... 100 Pa / – 100... + 100 Pa 0... 300 Pa / – 300... + 300 Pa 0... 500 Pa / – 500... + 500 Pa 0... 1000 Pa / – 1000... + 1000 Pa	PREMASREG 7111-UW VA**Q** LCD	0-10 V 1x Changeover contact	● ■	2004-6192-4100-001	**747,45 €**
max. – 5000...+ 5000 Pa	**Type 7115**				
0... 1000 Pa / – 1000 ... + 1000 Pa 0...2000 Pa / – 2000 ... + 2000 Pa 0...3000 Pa / – 3000 ... + 3000 Pa 0...5000 Pa / – 5000 ... + 5000 Pa	PREMASREG 7115-UW VA**Q** LCD	0-10 V 1x Changeover contact	● ■	2004-6192-4100-011	**747,45 €**
Housing variant "Q":	Cable connection with **M12 connector** (male, **12-pin**, A-code)				
Multi-range switching:	The **pressure ranges** depend on the device type and can be set via DIP switches.				
Extra charge:	Other special measuring ranges up to max. 5000 Pa **with optional automatic zero point calibration** **with optional pipe fitting** made from stainless steel V2A for pressure lines Ø **6 mm**				**49,83 €** **72,56 €** **41,94 €**

ACCESSORIES

xx-M12	**Special accessories for M12 connector**
	For further information, see chapter Accessories!

Pressure and differential pressure measuring transducers/switches, with multi-range switching and adjustable, switching and active output

PREMASREG® **711x-VA**
with cable gland



PREMASREG® **711x-VA**	Pressure and differential pressure measuring transducers/switches, *ID* (Stainless steel housing with cable gland)				
Pressure range (adjustable)	**Type / WG02I**	**Output**	**Display**	**Item No.**	**Price**
max. – 1000...+ 1000 Pa	**Type 7111**				
0... 100 Pa / – 100... + 100 Pa 0... 300 Pa / – 300... + 300 Pa 0... 500 Pa / – 500... + 500 Pa 0... 1000 Pa / – 1000... + 1000 Pa	PREMASREG 7111-UW VA LCD	0-10 V 1x Changeover contact	■	2004-6192-4200-001	**708,93 €**
max. – 5000...+ 5000 Pa	**Type 7115**				
0...1000 Pa / – 1000 ... + 1000 Pa 0...2000 Pa / – 2000 ... + 2000 Pa 0...3000 Pa / – 3000 ... + 3000 Pa 0...5000 Pa / – 5000 ... + 5000 Pa	PREMASREG 7115-UW VA LCD	0-10 V 1x Changeover contact	■	2004-6192-4200-011	**708,93 €**
Housing variant:	Cable connection with **cable gland** made from stainless steel V2A (1.4305)				
Multi-range switching:	The **pressure ranges** depend on the device type and can be set via DIP switches.				
Extra charge:	Other special measuring ranges up to max. 5000 Pa **with optional automatic zero point calibration** **with optional pipe fitting** made from stainless steel V2A for pressure lines Ø **6 mm**				**49,83 €** **72,56 €** **41,94 €**



Pressure port for
PVC / fabric pressure hose
(as standard)



Pressure port for
pressure lines / pipes
(optional)

PREMASREG® 716x

Pressure measuring transducers / switches/monitors for volume flow, differential pressure, filter monitoring and liquid level detection, incl. connection set

S+S REGELTECHNIK

The electronic **PREM**ASREG® **716x** pressure sensor and switch is equipped with measuring functions for volume flow, differential pressure, filter monitoring and liquid level detection based on pressure measurement in clean air. The devices with a housing made from impact-resistant plastic, with cable gland or M12 connector according to DIN EN 61076-2-101 and pressure connection nozzles (quick connect optional) are fitted with one switching output, one continuous output and one backlit display for setting the switching point and displaying the ACTUAL values. The piezoresistive measuring element guarantees a high degree of reliability and accuracy.

This pressure sensor is used in clean room, medical and filter technology, in ventilation and air conditioning ducts, in spray booths, in large-scale catering facilities, for filter monitoring and level measurement or for triggering frequency converters. The medium measured is air (non-precipitating), or other gaseous, non-aggressive, non-combustible media.

It has a manual zero point pushbutton and an offset potentiometer for final value correction. Parameter entry is menu-based and is easy to perform using three buttons with the help of the display. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible. A connection set **ASD-06** (2 m connection hose, two pressure nipples, screws) is included in the scope of supply.

TECHNICAL DATA

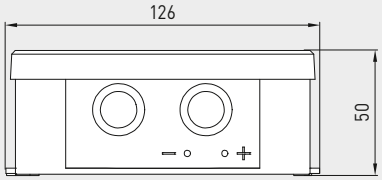
Power supply:	24 V AC / DC (± 10 %) and 15...36 V DC
Load resistance:	R_L > 5 kOhm
Power consumption:	< 1.5 VA / 24 V DC, < 2.8 VA / 24 V AC
Measuring function:	**Volume flow, differential pressure, filter monitoring, fill level** (adjustable)
Measuring ranges:	**10...100%** (adjustable)
Type of pressure:	differential pressure
Pressure connection:	with connection **nozzle** for pressure hose Ø 6 mm, optionally with **quick** connect made from stainless steel for PVC fabric pressure hose Ø 6 mm (external diameter)
Medium:	clean air and non-aggressive, non-combustible gases
Media temperature:	–20...+50 °C
Accuracy:	**Type 7161** (1000 Pa): typically ± 5 Pa **Type 7165** (5000 Pa): typically ± 25 Pa compared to the calibrated reference device
Sum of linearity+hysteresis:	< ± 1 % of final value (pressure)
Temp. drift values:	± 0.1 % / °C
Positive / negative pressure:	max. ± 10000 Pa
Signal hysteresis:	± 1 % of final value (pressure) 10 Pa / 50 Pa
Signal filtering:	**switchable 1 s / 10 s** (via DIP switches) and small value suppression < 1 %
Output:	0-10 V 1 changeover contact (24 V), 1 A ohmic load
Connection type:	3-wire connection
Electrical connection:	0.14 - 1.5 mm², via plug-in screw terminal
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** (male, **12-pin**, A-code) according to DIN EN 61076-2-101
Housing:	**plastic**, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) in the built-in state
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3
Equipment:	**display with illumination,** three-line, cutout approx. 70 x 40 mm (W x H), for displaying the **volume flow, differential pressure, contamination degree** or **level** and for setting the **switchpoint, K factor, measuring range limits** and other settings
K factor:	**1 to 3000** (adjustable)
Units:	**m³/s, m³/min, m³/h, l/s, l/min, l/h, %, cm** (adjustable)
Max. value displayed:	999999
ACCESSORIES	see table

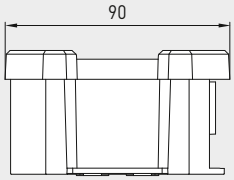
Pressure port for pressure hose (as standard)



Dimensional drawing
[mm]

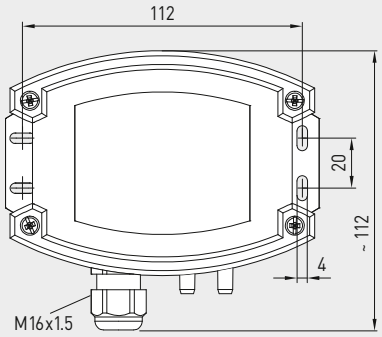
PREMASREG® **716x**

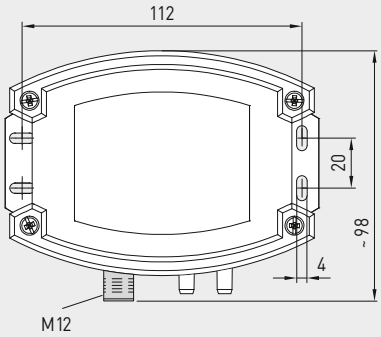


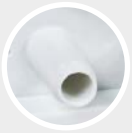


Housing with
cable gland
equipped as standard with
pressure port **nozzles**

Housing with
M12 connector
equipped as standard with
pressure port **nozzles**







Pressure port
for pressure hose
(as standard)



M12 connector
(male)

PREMASREG® **716x**
with cable gland
and display



PREMASREG® **716x-Q**
with M12 connector
and display



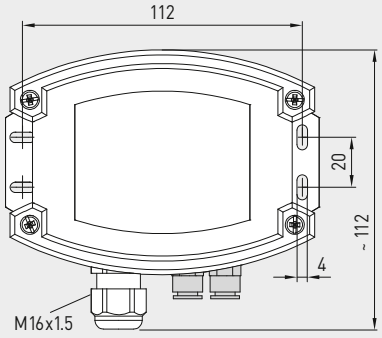


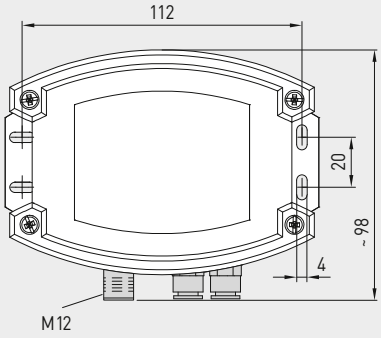
Dimensional drawing
[mm]

PREMASREG® **716x**

Housing with
cable gland
optional on request
with **quick** connect

Housing with
M12 connector
optional on request
with **quick** connect







Pressure port for
PVC/fabric pressure hose
(optional)



M12 connector
(male)

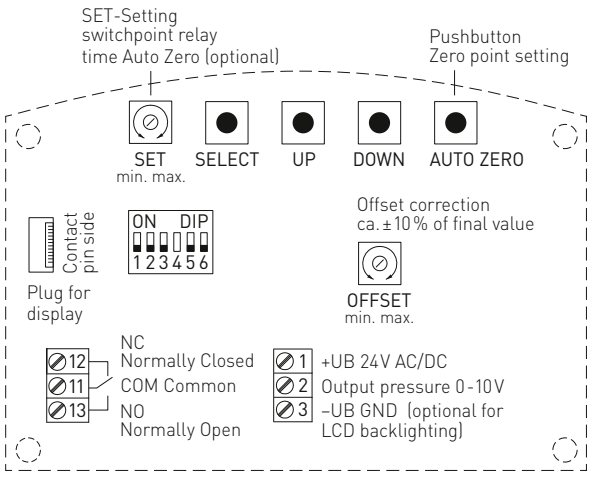
Pressure port for
PVC/fabric pressure hose
(optional)



Pressure measuring transducers / switches/monitors for volume flow, differential pressure, filter monitoring and liquid level detection, incl. connection set

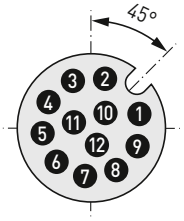
S+S REGELTECHNIK

Schematic diagram — **PREMASREG® 716x-UW**



DIP switch 4 is not assigned!

Pin assignment (M12) — **PREMASREG® 716x-UW**



1. +UB 24V AC / 15...36V DC
2. Output pressure 0-10V
3. free
4. –UB GND
5. free
6. free
7. COM Common
8. NC Normally Closed
9. NO Normally Open
10. free
11. free
12. free

Measuring range mode (Mode selectable)	**DIP 1**
Unidirectional (0...+MR) (default)	OFF
Bidirectional (–MR...+MR)	**ON**

Small value suppression (measured values < 1% of end value (pressure) = 0)	**DIP 2**
Deactivated (default)	OFF
Active	**ON**

Relay (Function adjustable)	**DIP 3**
Deactivated (default)	OFF
Active (display shows switching point)	**ON**

Measurement signal filtering (Time interval selectable)	**DIP 5**
10 s (default)	OFF
1 s	**ON**

Service mode (display adjustable)	**DIP 6**
Standard (according to configuration) (default)	OFF
Service (differential pressure in Pa)	**ON**

PREMASREG® 716x
Function types



Volumolume flow rate

$$V = k \cdot \sqrt{\Delta p}$$

V = Volume flow in m³/h
k = K factor 1...3000
Δp = Differential pressure in Pa



Differential pressure

$$\Delta p = p_+ - p_-$$

Δp = Differential pressure in Pa
p_+ = higher pressure
p_- = lower pressure



Filter contamination

$$S = 100\% \cdot \Delta p \div p_{Filter}$$

S = Contamination degree in %
Δp = Differential pressure in Pa
p_{Filter} = differential pressure filter replacement in Pa



Level display

$$h = \Delta p \div (\rho \cdot g)$$

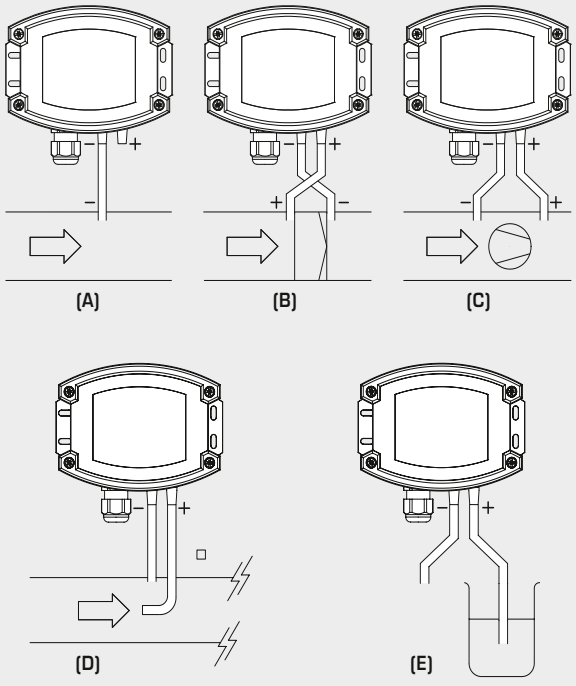
h = Fill level height in cm
Δp = Differential pressure in Pa
ρ = Density 700...1300 in kg/m³
g = 9.81 m/s²

Pressure measuring transducers / switches / monitors for volume flow, differential pressure, filter monitoring and liquid level detection, incl. connection set

PREMASREG® **716x - Q**
with display,
hinged



Mounting diagram **PREM**ASREG® **716x**



TYPES OF MONITORING:

(A) Below-atmospheric pressure:
P1 (+) is not connected,
but open to the atmosphere
P2 (–) connected to inside of duct

(B) Filter:
P1 (+) connected upstream of filter
P2 (–) connected downstream of filter

(C) Ventilator:
P1 (+) connected downstream of ventilator
P2 (–) connected upstream of ventilator

(D) Volume flow:
P1 (+) dynamic pressure,
Connected in flow direction
P2 (–) static pressure,
Connected free of dynamic pressure components

(E) Level:
P1 (+) Connection submerged in medium
P2 (–) Connection is open to the atmosphere

Pressure connections at the pressure switch are marked with
P1 (+) for higher pressure and
P2 (–) for lower pressure.

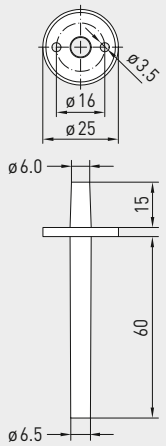
Conversion table for pressure values:

Unit =	bar	mbar	Pa	kPa	mWS
1 Pa	0,00001 bar	0,01 mbar	1 Pa	0,001 kPa	0,000101971 mWS
1 kPa	0,01 bar	10 mbar	1000 Pa	1 kPa	0,101971 mWS
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10,1971 mWS
1 mbar	0,001 bar	1 mbar	100 Pa	0,1 kPa	0,0101971 mWS
1 mWS	0,0980665 bar	98,0665 mbar	9806,65 Pa	9,80665 kPa	1 mWS

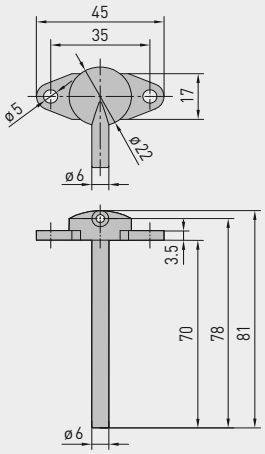
Pressure measuring transducers / switches/monitors for volume flow, differential pressure, filter monitoring and liquid level detection, incl. connection set

S+S REGELTECHNIK

Dimensional drawing [mm] **ASD-06**



Dimensional drawing [mm] **ASD-07**



ASD-06
Connection set



ASD-07
Connection nipple





WS-03
Weather and sun protection hood (optional)

Pressure port for pressure hose (as standard)



Pressure port for PVC/fabric pressure hose (optional)



ACCESSORIES

ASD-06	**Connection set (included in the scope of delivery),** consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose (soft, UV-resistant) and 4 screws	7100-0060-3000-000	**7,64 €**
ASD-07	**2 connection nipples** (at 90 degree angle) made of plastic, ABS	7100-0060-7000-000	**7,64 €**
WS-03	**Weather and sun protection hood**, 200 x 180 x 150 mm, stainless steel **V2A** (1.4301)	7100-0040-6000-000	**44,74 €**
	For further information, see chapter Accessories!		

PREMASREG® **716x-Q**
with M12 connector



PREMASREG® **716x**
with cable gland



PREMASREG® **716x**	Pressure measuring transducers / switches/monitors for volume flow, differential pressure, filter monitoring and liquid level detection, *Deluxe* (with cable gland or M12 connector)					
Measuring Range Pressure / Volume Flow	**Type / WG02**		**Output**	**Display** ● = **Q**	**Item No.**	**Price**
0...1000 Pa	**Type 7161**					
k = 3000 **94800 m³/h**	PREMASREG 7161-UW	LCD	0-10 V 1x Changeover contact	■	1302-7161-4161-200	**278,15 €**
	PREMASREG 7161-UW **Q**	LCD	0-10 V 1x Changeover contact	● ■	2004-6132-4100-021	**320,06 €**
0...5000 Pa	**Type 7165**					
k = 3000 **212100 m³/h**	PREMASREG 7165-UW	LCD	0-10 V 1x Changeover contact	■	1302-7161-4171-200	**278,15 €**
	PREMASREG 7165-UW **Q**	LCD	0-10 V 1x Changeover contact	● ■	2004-6132-4100-031	**320,06 €**
Housing variant "Q":	Cable connection with **M12 connector** (male, **12-pin**, A-code)					
Multi-range switching:	The **pressure ranges** depend on the device type and can be set via DIP switches.					
Extra charge:	**with optional quick connect** for PVC fabric pressure hose Ø 6 mm					**41,94 €**

S+S REGELTECHNIK

Pressure measuring transducers / switches/monitors for volume flow, differential pressure, filter monitoring and liquid level detection

The electronic **PREM**ASREG® **761x-VA** pressure sensor and switch is equipped with measuring functions for volume flow, differential pressure, filter monitoring and liquid level detection based on pressure measurement in clean air. The devices with a housing made from **stainless steel V4A**, with cable gland or M12 connector according to DIN EN 61076-2-101 and pressure port using quick connect (pipe fitting optional) are fitted with one switching output, one continuous output and a backlit display for setting the switching point and displaying the ACTUAL values. The piezoresistive measuring element guarantees a high degree of reliability and accuracy.

This pressure sensor is used in clean room, medical and filter technology, in ventilation and air conditioning ducts, in spray booths, in large-scale catering facilities, for filter monitoring and level measurement or for triggering frequency converters. The medium measured is air (non-precipitating), or other gaseous, non-aggressive, non-combustible media.

It has a manual zero point pushbutton and an offset potentiometer for final value correction. Parameter entry is menu-based and is easy to perform using three buttons with the help of the display. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

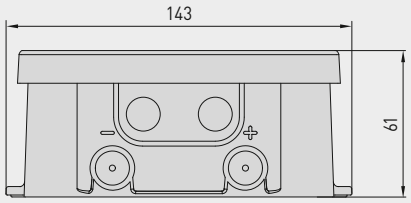
TECHNICAL DATA	
Power supply:	24 V AC / DC (± 10 %) and 15...36 V DC
Load resistance:	R_L > 5 kOhm
Power consumption:	< 1.5 VA / 24 V DC, < 2.8 VA / 24 V AC
Measuring function:	**Volume flow, differential pressure, filter monitoring, fill level** (adjustable)
Measuring ranges:	**10...100%** (adjustable)
Type of pressure:	differential pressure
Pressure port:	with **quick connect** made from stainless steel for PVC / fabric pressure hose Ø 6 mm (external diameter) optionally with **pipe fitting** made from stainless steel V2A (1.4305) for pressure lines Ø 6 mm
Medium:	clean air and non-aggressive, non-combustible gases
Media temperature:	–20...+50 °C
Accuracy:	**Type 7161** (1000 Pa): typically ± 5 Pa **Type 7165** (5000 Pa): typically ± 25 Pa compared to the calibrated reference device
Sum of linearity+hysteresis:	< ± 1 % of final value (pressure)
Temp. drift values:	± 0.1 % / °C
Positive / negative pressure:	max. ± 10000 Pa
Signal hysteresis:	± 1 % of final value (pressure) 10 Pa / 50 Pa
Signal filtering:	**switchable 1 s / 10 s** (via DIP switches) and small value suppression < 1 %
Output:	0-10 V 1 changeover contact (24 V), 1 A ohmic load
Connection type:	3-wire connection
Electrical connection:	0.14-1.5 mm², via plug-in screw terminal
Cable connection:	**cable gland, stainless steel V2A** (1.4305) (M 20 x 1.5; with strain relief, exchangeable, inner diameter 6-12 mm) **or** **M12 connector** (male, **12-pin**, A-code) according to DIN EN 61076-2-101
Housing:	**stainless steel V4A** (1.4571), with non-distortion cover bolting, impact-resistant, high EMI shielding, corrosion, temperature, weather- and UV-resistant
Housing dimensions:	143 x 97 x 61 mm (Typ 2E)
Air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) in the built-in state Housing tested, TÜV SÜD, Report No. 713160960B (Skadi2)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3
Equipment:	**display with illumination,** three-line, cutout approx. 70 x 40 mm (W x H), for displaying the **volume flow, differential pressure, contamination degree** or **level** and for setting the **switchpoint, K factor, measuring range limits** and other settings
K factor:	**1 to 3000** (adjustable)
Units:	**m³/s, m³/min, m³/h, l/s, l/min, l/h, %, cm** (adjustable)
Max. value displayed:	999999
ACCESSORIES	(see table)

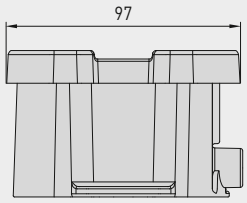
Pressure port for PVC / fabric pressure hose (as standard)



Dimensional drawing
[mm]

PREMASREG® **716x-VA**



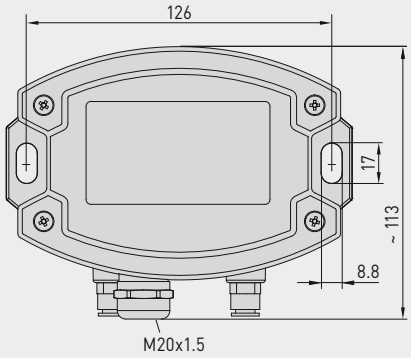


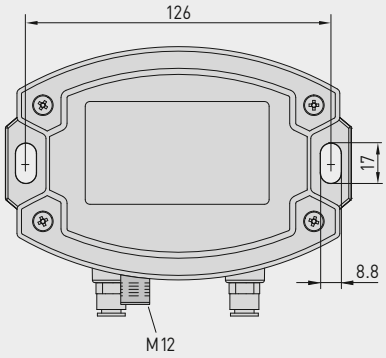
Housing with
cable gland

equipped as standard with
quick connect
for pressure hoses

Housing with
M12 connector

equipped as standard with
quick connect
for pressure hoses







Pressure port for
PVC / fabric pressure hose
(as standard)



M12 connector
(male)

PREMASREG® **716x-VA**
with cable gland
and display



PREMASREG® **716x-VAQ**
with M12 connector
and display





Dimensional drawing
[mm]

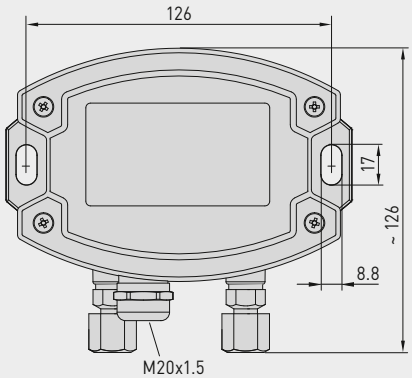
PREMASREG® **716x-VA**

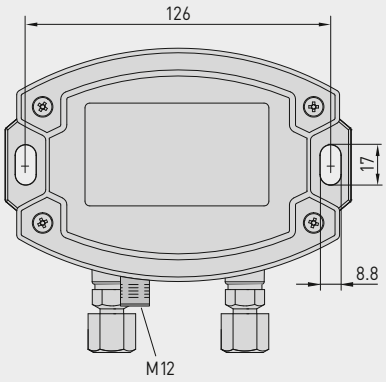
Housing with
cable gland

optional on request
with **pipe fitting**
for pressure lines

Housing with
M12 connector

optional on request
with **pipe fitting**
for pressure lines







Pressure port
for pressure lines / pipes
(optional)



M12 connector
(male)

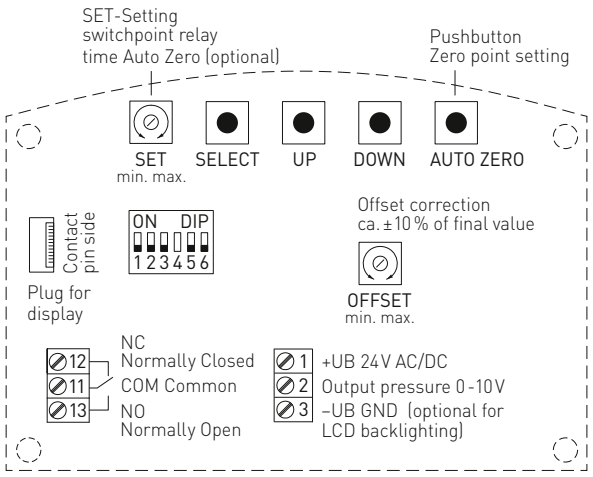
Pressure port
for pressure lines / pipes
(optional)



Pressure measuring transducers / switches/monitors for volume flow, differential pressure, filter monitoring and liquid level detection

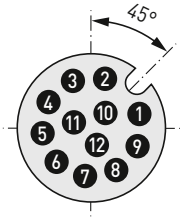
S+S REGELTECHNIK

Schematic diagram — **PREMASREG® 716x-UW**



DIP switch 4 is not assigned!

Pin assignment (M12) — **PREMASREG® 716x-UW**



1. +UB 24 V AC / 15...36 V DC
2. Output pressure 0-10 V
3. free
4. –UB GND
5. free
6. free
7. COM Common
8. NC Normally Closed
9. NO Normally Open
10. free
11. free
12. free

Measuring range mode (Mode selectable)	**DIP 1**
Unidirectional (0...+MR) (default)	OFF
Bidirectional (–MR...+MR)	**ON**

Small value suppression (measured values < 1% of end value (pressure) = 0)	**DIP 2**
Deactivated (default)	OFF
Active	**ON**

Relay (Function adjustable)	**DIP 3**
Deactivated (default)	OFF
Active (display shows switching point)	**ON**

Measurement signal filtering (Time interval selectable)	**DIP 5**
10 s (default)	OFF
1 s	**ON**

Service mode (display adjustable)	**DIP 6**
Standard (according to configuration) (default)	OFF
Service (differential pressure in Pa)	**ON**

PREMASREG® 716x
Function types



Volumolume flow rate

$$V = k \cdot \sqrt{\Delta p}$$

V = Volume flow in m³/h
k = K factor 1...3000
Δp = Differential pressure in Pa



Differential pressure

$$\Delta p = p_+ - p_-$$

Δp = Differential pressure in Pa
p_+ = higher pressure
p_- = lower pressure



Filter contamination

$$S = 100\% \cdot \Delta p \div p_{Filter}$$

S = Contamination degree in %
Δp = Differential pressure in Pa
p_{Filter} = differential pressure filter replacement in Pa



Level display

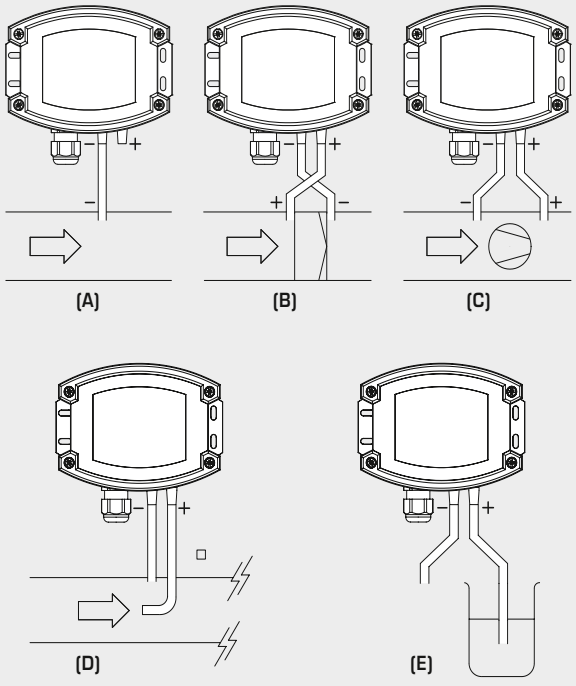
$$h = \Delta p \div (\rho \cdot g)$$

h = Fill level height in cm
Δp = Differential pressure in Pa
ρ = Density 700...1300 in kg/m³
g = 9.81 m/s²

PREMASREG® **716x-VAQ**
with display, hinged



Mounting diagram **PREM**ASREG® **716x**



TYPES OF MONITORING:

(A) Below-atmospheric pressure:
P1 (+) is not connected, but open to the atmosphere
P2 (–) connected to inside of duct

(B) Filter:
P1 (+) connected upstream of filter
P2 (–) connected downstream of filter

(C) Ventilator:
P1 (+) connected downstream of ventilator
P2 (–) connected upstream of ventilator

(D) Volume flow:
P1 (+) dynamic pressure, Connected in flow direction
P2 (–) static pressure, Connected free of dynamic pressure components

(E) Level:
P1 (+) Connection submerged in medium
P2 (–) Connection is open to the atmosphere

Pressure connections at the pressure switch are marked with
P1 (+) for higher pressure and
P2 (–) for lower pressure.

Conversion table for pressure values:

Unit =	bar	mbar	Pa	kPa	mWS
1 Pa	0,00001 bar	0,01 mbar	1 Pa	0,001 kPa	0,000101971 mWS
1 kPa	0,01 bar	10 mbar	1000 Pa	1 kPa	0,101971 mWS
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10,1971 mWS
1 mbar	0,001 bar	1 mbar	100 Pa	0,1 kPa	0,0101971 mWS
1 mWS	0,0980665 bar	98,0665 mbar	9806,65 Pa	9,80665 kPa	1 mWS

Pressure measuring transducers / switches/monitors for volume flow, differential pressure, filter monitoring and liquid level detection

S+S REGELTECHNIK

PREMASREG® **716x-VAQ**
with M12 connector



PREMASREG® **716x-VAQ**	Pressure measuring transducers / switches/monitors for volume flow, differential pressure, filter monitoring and liquid level detection, *ID* Stainless steel housing with M12 connector			
Measuring Range Pressure / Volume Flow	**Type / WG02I**	**Output**	**Display ● = Q**	**Item No.**	**Price**
0...1000 Pa	**Type 7161**				
k = 3000 **94800 m³/h**	PREMASREG 7161-UW VA**Q** LCD	0-10 V 1x Changeover contact	● ■	2004-6192-4100-021	**803,70 €**
0...5000 Pa	**Type 7165**				
k = 3000 **212100 m³/h**	PREMASREG 7165-UW VA**Q** LCD	0-10 V 1x Changeover contact	● ■	2004-6192-4100-031	**803,70 €**
Housing variant "Q":	Cable connection with **M12 connector** (male, **12-pin**, A-code)				
Multi-range switching:	The **pressure ranges** depend on the device type and can be set via DIP switches.				
Extra charge:	**with optional pipe fitting** made from stainless steel V2A for pressure lines Ø **6 mm**				**41,94 €**

ACCESSORIES

xx-M12	**Special accessories for M12 connector**
	For further information, see chapter Accessories!

PREMASREG® **716x-VA**
with cable gland



PREMASREG® **716x-VA**		Pressure measuring transducers / switches/monitors for volume flow, differential pressure, filter monitoring and liquid level detection, *ID* Stainless steel housing with cable gland				
Measuring Range Pressure / Volume Flow		**Type / WG02I**	**Output**	**Display**	**Item No.**	**Price**
0...1000 Pa		**Type 7161**				
k = 3000	**94800 m³ / h**	PREMASREG 7161-UW VA LCD	0-10 V 1x Changeover contact	■	2004-6192-4200-021	**765,16 €**
0...5000 Pa		**Type 7165**				
k = 3000	**212100 m³ / h**	PREMASREG 7165-UW VA LCD	0-10 V 1x Changeover contact	■	2004-6192-4200-031	**765,16 €**
Housing variant:		Cable connection with **cable gland** made from stainless steel V2A (1.4305)				
Multi-range switching:		The **pressure ranges** depend on the device type and can be set via DIP switches.				
Extra charge:		**with optional pipe fitting** made from stainless steel V2A for pressure lines Ø **6 mm**				**41,94 €**



Pressure port for
PVC / fabric pressure hose
(as standard)



Pressure port for
pressure lines / pipes
(optional)

S+S REGELTECHNIK

Barometers /
Measuring transducers for atmospheric pressure, calibratable, with active output

ALD

Calibratable barometer **PREM**ASGARD® **ALD** with active output (U/I switchable) and 4 measuring ranges (max. 600...1100 hPa, switchable), in a compact plastic housing with quick-locking screws, optionally with/without display.

The pressure sensor is used for measuring atmospheric air pressure in clean air (non-precipitating) or other non-aggressive, non-combustible gases. It is used in various applications such as ventilation and air conditioning technology, in meteorological measurement stations and air-pressure-dependent control systems.

The piezoresistive measuring element is temperature-compensated and guarantees a high degree of reliability and accuracy. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.



TECHNICAL DATA	
Power supply:	24 V AC/DC (± 10 %)
Working resistance:	R_a (Ohm) = 25 ...450 Ohm for I-output
Load resistance:	R_L > 25 kOhm for U-output
Power consumption:	< 1 W at 24 V DC; < 2 VA at 24 V AC
Current consumption:	< 45 mA
Measuring ranges:	**multi-range switching with** **4 switchable measuring ranges** (see table)
Output:	**switchable 0-10 V / 4...20 mA** (via DIP switches)
Connection type:	3-wire connection
Ambient temperature:	storage –35...+85 °C; operation – 30...+75 °C, non-precipitating
Type of pressure:	atmospheric air pressure / absolute pressure
Medium:	clean air and non-aggressive, non-combustible gases
Accuracy:	typically ± 0.4 kPa compared to calibrated reference device
Zero point offset:	± 50 hPa
Positive pressure:	200 kPa
Signal filtering:	**switchable 1 s / 10 s** (via DIP switches)
Temperature drift:	± 0.1 % of final value per °C
Housing:	plastic, UV-resistant, polyamide material, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) **or** **M12 plug-in connector** (flush-type connector, 5-pin, A-coding) according to DIN EN 61076-2-101 (optional, available upon request)
Electrical connection:	0.14 - 1.5 mm², via screw terminals
Air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 67** (according to EN 60 529) housing tested, TÜV SÜD, report no. 713139052 (Tyr 1)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU
Equipment:	**display,** one-line, cutout approx. 36 x 15 mm (W x H), for displaying the atmospheric air pressure / absolute pressure
ACCESSOIRES	see chapter Accessories
WS-04	**weather and sun protection hood**, 130 x 180 x 135 mm, stainless steel **V2A** (1.4301)

Pressure range (adjustable)	**DIP 1**	**DIP 2**
600...1100 hPa	OFF	OFF
700...1100 hPa	**ON**	OFF
800...1100 hPa	OFF	**ON**
900...1100 hPa (default)	**ON**	**ON**

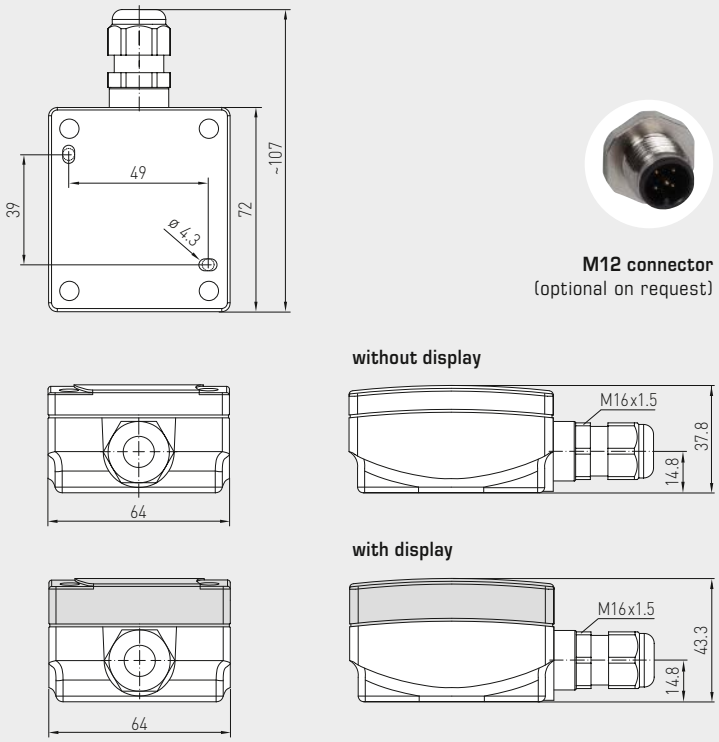
Measurement signal filtering (selectable time interval)	**DIP 5**
10 s (default)	OFF
1 s	**ON**

Output (selectable)	**DIP 6**
Voltage 0-10 V (default)	OFF
Current 4... 20 mA	**ON**

Conversion table for pressure values:

Unit =	bar	mbar	Pa	kPa	mWS
1 Pa	0,00001 bar	0,01 mbar	1 Pa	0,001 kPa	0,000101971 mWS
1 kPa	0,01 bar	10 mbar	1000 Pa	1 kPa	0,101971 mWS
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10,1971 mWS
1 mbar	0,001 bar	1 mbar	100 Pa	0,1 kPa	0,0101971 mWS
1 mWS	0,0980665 bar	98,0665 mbar	9806,65 Pa	9,80665 kPa	1 mWS

Dimensional drawing **ALD**

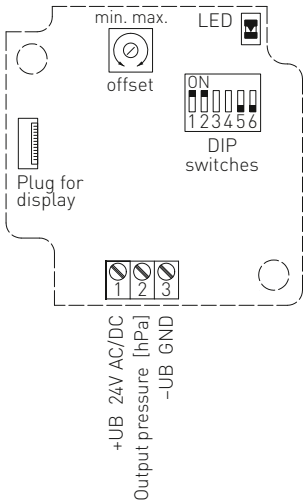


M12 connector
(optional on request)

ALD
with display



Schematic diagram **PREMASGARD® ALD**



Status LED (DIP 6)
I Output (ON) = orange
U Output (OFF) = green

Offset correction

Plug for display
contact is
on the right side

DIP switches 3 and 4 are not assigned!

WS-04
Weather and sun protection hood
(optional)



PREMASGARD® ALD Measuring transducer for atmospheric pressure

Pressure range (adjustable)	Type / WG01	Output (switchable)	Display	Item no.	Price
max. 600...1100 hPa	**ALD**				
600...1100 hPa 700...1100 hPa 800...1100 hPa 900...1100 hPa	ALD	0-10 V / 4...20 mA		1301-1157-0130-200	**167,72 €**
	ALD LCD	0-10 V / 4...20 mA	■	1301-1157-2130-200	**197,79 €**
Multi-range switching:	The **pressure ranges** can be set via DIP switches.				
Output:	**0-10 V or 4...20 mA** (selectable via DIP switches)				
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101 (on request)				

S+S REGELTECHNIK

Differential pressure switches for air, with mounting angle, incl. connection set

The mechanical differential pressure switch / differential pressure monitor **PREM**ASREG® **DS 1** with metal angle is used for monitoring above-atmospheric, differential, and below-atmospheric pressures of air and gaseous, non-aggressive media in air ducts, ventilation intake or exhaust devices, as a flow monitor, as a pressure difference detector or pressure monitor for flow detection at electric heating registers, for monitoring V-belts and filters, as air pressure deficiency protection, for monitoring fans and air dampers, or as a limit value controller. The switchpoint is adjusted using the internal precision scale.

These instruments are factory-calibrated. The differential pressure switch DS 1 is supplied including connection set **ASD-06** (2 m connection hose, two pressure connection nipples, screws) and mounting angle **DS-MW-Z**.

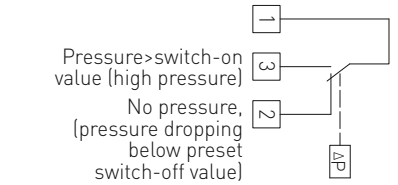
DS 1
with mounting angle



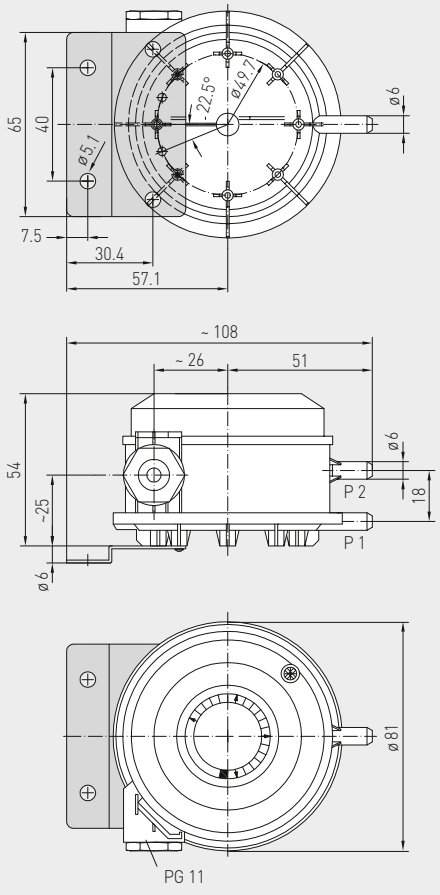
TECHNICAL DATA

Switching capacity: (Contact load)	5 (0.8) A, 250 V AC 4 (0.7) A, 30 V DC
Contact:	single-pole potential-free changeover contact, multi-layer contact, gold-plated (DDC compatible)
Pressure range:	see table, high adjustment accuracy due to individual laser-etched scale for each switch
Housing:	base: material PC (10 % GF), colour light grey (similar to RAL 7035), snap-on lid: material PC, transparent, cable gland PG 11 with strain relief
Temperature of medium:	–30...+85 °C
Membrane:	silicone, LSR (Liquid Silicon Rubber, tempered at +200 °C, non-outgassing, LABS-free, no emission of varnish-adhesion inhibiting substances), long-term stability of switching points due to trapezoidal bead membranes
Humidity:	< 90 % RH, non-precipitating air
Electrical connection:	0.14 - 1.5 mm², via terminal screws with torsion protection
Pressure connection:	with connection nozzles for pressure hose Ø 6 mm
Mounting:	**with metal angle DS-MW-Z** (included in the scope of delivery) (for other optional shapes, see table) Recommended mounting position: vertical (pressure connections downward) – factory setting; horizontal (cap up / down)
Protection class:	II (according to EN 60 730)
Protection type:	**IP 54** (according to EN 60529) with top cover
Standards:	CE conformity, low-voltage directive 2014 / 35 / EU
Tests:	DVGW (according to DIN 1854), VDE 0630, EN 61058, directive on gas devices 2009 / 142 / EU, CE 0085 A P 0918
FUNCTION	Contact 1 - 2 breaks when pressure / differential pressure rises to the preset value. Contact 1 - 3 closes when pressure / differential pressure drops and can be used as signal contact.
ACCESSORIES	
ASD-06	**Connection set** (nipple straight) – (included in the scope of delivery)
DS-MW-Z	**Mounting angle** (included in the scope of delivery)
DS-MW-L	**Mounting angle** (optional)
DS1-MW-U	**Mounting angle** (optional), combination bracket for vertical or horizontal mounting
WS-04	**Weather and sun protection hood**, 130 x 180 x 135 mm, aus stainless steel **V2A** (1.4301)

Dimensional drawing **DS 1**



Dimensional drawing **DS 1**
with mounting angle
DS-MW-Z



Differential pressure switches for air, with mounting ring, including connection set

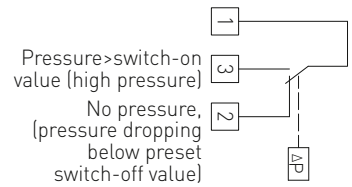
The mechanical differential pressure switch / differential pressure monitor **PREM**ASREG® **DS-2** with 4-hole plastic base ring is used for monitoring above-atmospheric, differential and below-atmospheric pressures of clean air and other gaseous, non-aggressive non-combustible media in air ducts, air intake or exhaust devices, as a pressure difference detector or pressure monitor for flow detection at electric heating registers, for monitoring V-belts and filters, as air pressure deficiency protection, for monitoring fans and air dampers, or as a limit value controller. The switchpoint is adjusted using the internal precision scale.

These instruments are factory-calibrated. The differential pressure switch DS 2 is supplied including connection set **ASD-06** (2 m connection hose, two pressure connection nipples, screws) and mounting ring **DS-MR-K**.

DS 2
with mounting ring



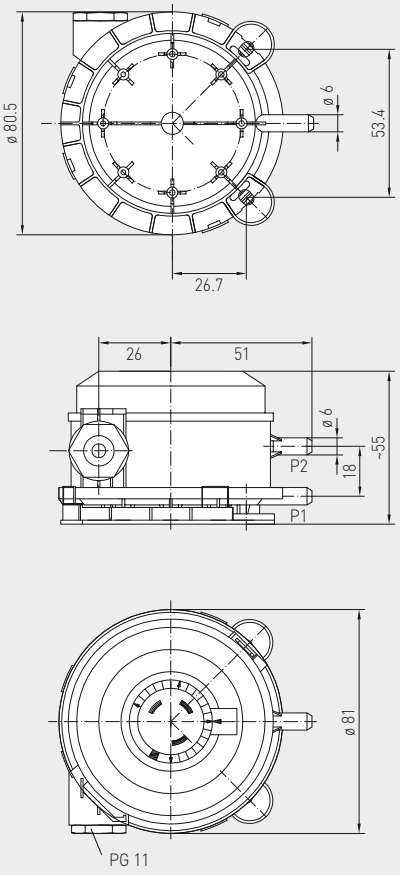
Schematic diagram **DS 2**



TECHNICAL DATA

Switching capacity: (Contact load)	5 (0.8) A, 250 V AC 4 (0.7) A, 30 V DC
Contact:	single-pole potential-free changeover contact, multi-layer contact, gold-plated (DDC compatible)
Pressure range:	see table, high adjustment accuracy due to individual laser-etched scale for each switch
Housing:	base: material PC (10 % GF), colour light grey (similar to RAL 7035), snap-on lid: material PC, transparent, cable gland PG 11 with strain relief
Temperature of medium:	–30...+85 °C
Membrane:	silicone, LSR (Liquid Silicon Rubber, tempered at +200 °C, non-outgassing, LABS-free, no emission of varnish-adhesion inhibiting substances), long-term stability of switching points due to trapezoidal bead membranes
Humidity:	< 90 % RH, non-precipitating air
Electrical connection:	0.14 - 1.5 mm², via terminal screws with torsion protection
Pressure connection:	with connection nozzles for pressure hose Ø 6 mm
Mounting:	**by 4-hole base ring, plastic** (included in the scope of delivery), recommended mounting position: vertical (pressure connections downward) – factory setting, horizontal (cap up / down)
Protection class:	II (according to EN 60 730)
Protection type:	**IP 54** (according to EN 60529) with top cover
Standards:	CE conformity, low-voltage directive 2014 / 35 / EU
Tests:	DVGW (according to DIN 1854), VDE 0630, EN 61058, directive on gas devices 2009 / 142 / EU, CE 0085 A P 0918
FUNCTION	Contact 1 - 2 breaks when pressure / differential pressure rises to the preset value. Contact 1 - 3 closes when pressure / differential pressure drops and can be used as signal contact.
ACCESSORIES	
ASD-06	**Connection set** (nipple straight) – (included in the scope of delivery)
DS-MR-K	**Mounting ring** (included in the scope of delivery)
WS-04	**Weather and sun protection hood**, 130 x 180 x 135 mm, aus stainless steel **V2A** (1.4301)

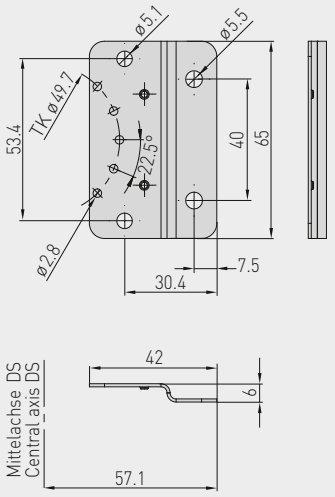
Dimensional drawing **DS 2**
with mounting ring
DS-MR-K



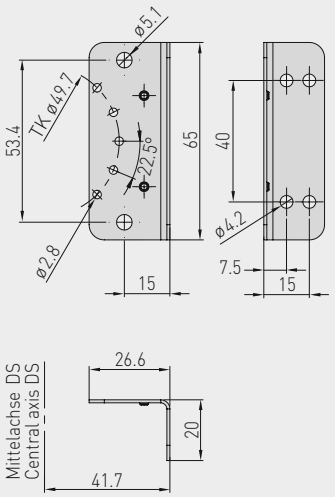
Differential pressure switches for air, including connection set

S+S REGELTECHNIK

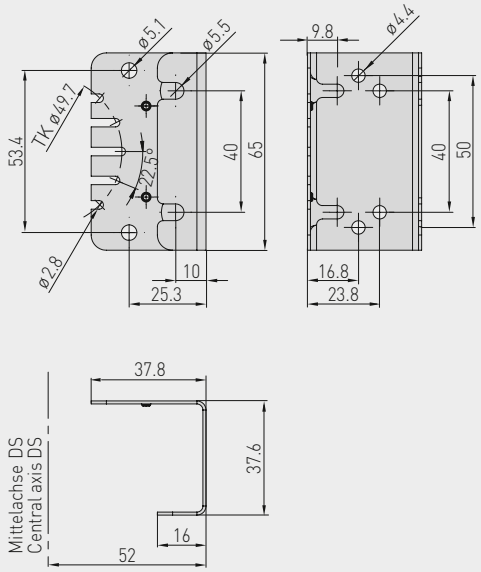
Dimensional drawing **DS - MW-Z**
Mounting angle



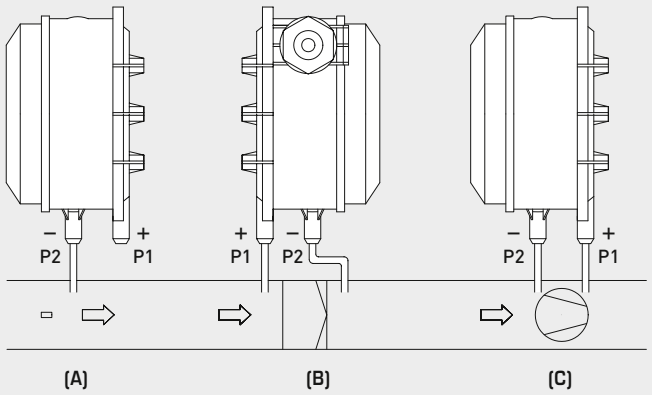
Dimensional drawing **DS - MW-L**
Mounting angle



Dimensional drawing **DS - MW-U**
Mounting angle



Mounting diagram **DS 1 / DS 2**



DS 1 / DS 2
Connection



TYPES OF MONITORING:

(A) Below-atmospheric pressure:
P1 (+) is not connected but open against atmosphere
P2 (–) connected to inside of duct

(B) Filter:
P1 (+) connected upstream of filter
P2 (–) connected downstream of filter

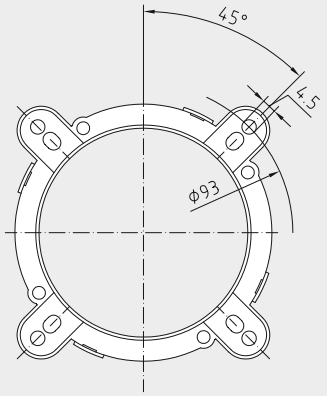
(C) Ventilator:
P1 (+) connected downstream of ventilator
P2 (–) connected upstream of ventilator

Pressure connections at the pressure switch are marked with P1 (+) for higher pressure and P2 (–) for lower pressure.

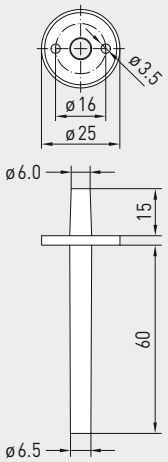
Conversion table for pressure values:

Unit =	bar	mbar	Pa	kPa	mWS
1 Pa	0.00001 bar	0.01 mbar	1 Pa	0.001 kPa	0.000101971 mWS
1 kPa	0.01 bar	10 mbar	1000 Pa	1 kPa	0.101971 mWS
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10.1971 mWS
1 mbar	0.001 bar	1 mbar	100 Pa	0.1 kPa	0.0101971 mWS
1 mWS	0.0980665 bar	98.0665 mbar	9806.65 Pa	9.80665 kPa	1 mWS

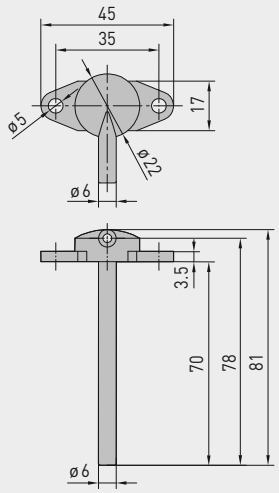
Dimensional drawing **DS-MR-K** Mounting ring



Dimensional drawing **ASD-06** Connection set



Dimensional drawing **ASD-07** Connection nipple



WS-04
Weather and sun protection hood (optional)



ASD-06
Connection set



ASD-07
Connection nipple



PREMASREG® DS 1 Differential pressure switches with mounting angle, *Premium*
PREMASREG® DS 2 Differential pressure switches with mounting ring, *Standard*

Type	Pressure range (adjustable)		Operating Difference approx.	Max. Pressure	Item No.	Price
DS 1 / WG02	*Premium*				**with mounting angle DS-MW-Z**	
DS-106	20… 300 Pa	(0.2…3.0 mbar)	0.1 mbar ± 15 %	5000 Pa (50 mbar)	1302-4011-0000-000	**53,20 €**
DS-106 A	50… 500 Pa	(0.5…5.0 mbar)	0.2 mbar ± 15 %	5000 Pa (50 mbar)	1302-4012-0000-000	**53,20 €**
DS-106 B	100…1000 Pa	(1.0…10.0 mbar)	0.4 mbar ± 15 %	5000 Pa (50 mbar)	1302-4013-0000-000	**53,20 €**
DS-106 C	500…2000 Pa	(5.0…20.0 mbar)	1.0 mbar ± 15 %	5000 Pa (50 mbar)	1302-4014-0000-000	**53,20 €**
DS-106 D	1000…5000 Pa	(10.0…50.0 mbar)	2.5 mbar ± 15 %	7500 Pa (75 mbar)	1302-4015-0000-000	**53,20 €**
DS 2 / WG03B	*Standard*				**with mounting ring DS-MR-K**	
DS-205 F	20… 300 Pa	(0.2…3.0 mbar)	0.1 mbar ± 15 %	5000 Pa (50 mbar)	1302-4026-0000-000	**35,11 €**
DS-205 B	50… 500 Pa	(0.5…5.0 mbar)	0.2 mbar ± 15 %	5000 Pa (50 mbar)	1302-4022-0000-000	**35,11 €**
DS-205 D	100…1000 Pa	(1.0…10.0 mbar)	0.4 mbar ± 15 %	5000 Pa (50 mbar)	1302-4027-0000-000	**35,11 €**
DS-205 E	500…2000 Pa	(5.0…20.0 mbar)	1.0 mbar ± 15 %	5000 Pa (50 mbar)	1302-4028-0000-000	**35,11 €**

ACCESSORIES			
DS-MW-Z	Sheet steel **mounting angle** in **Z**-form **(DS 1: included in the scope of delivery)**	7100-0063-0000-000	**13,36 €**
DS-MW-L	Sheet steel **mounting angle** in **L**-form	7100-0063-1000-000	**13,67 €**
DS-MW-U	Sheet steel **mounting angle** in **U**-form	7100-0060-9000-000	**16,81 €**
ASD-06	**Connection set (included in the scope of delivery),** consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose (soft, UV-resistant) and 4 screws	7100-0060-3000-000	**7,64 €**
ASD-07	**2 connection nipples** (at 90 degree angle) made of plastic, ABS	7100-0060-7000-000	**7,64 €**
WS-04	**Weather and sun protection hood**, 130 x 180 x 135 mm, stainless steel **V2A** (1.4301)	7100-0040-7000-000	**37,49 €**
	For further information, see last chapter Accessories!		

PREMASGARD® SHD-SD
PREMASGARD® SHD

NEW

S+S REGELTECHNIK

Pressure measuring transducers, incl. DIN plug-in connectors, with active output

The pressure sensor **PREM**ASGARD® **SHD-SD** is used for measuring relative pressures (min. 0...6 bar / max. 0...16 bar) in gaseous and liquid media. **Not suitable for ammonia and freon!**

The pressure sensor **PREM**ASGARD® **SHD** is used for measuring relative pressures (min. 0...1 bar / max. 0...40 bar) in gaseous and liquid media. The pressure measuring cell is welded to the pressure sensors without a gasket.

The pressure measuring transducer converts the measurand into a standard signal of 0 - 10 V or 4...20 mA. Process connection is G ½". This pressure transmitter is used in hydraulics, pneumatics, process technology, in mechanical and plant engineering.

SHD xx
with display

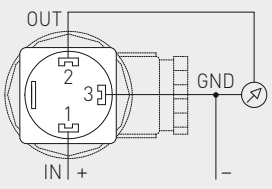


TECHNICAL DATA

Power supply:	24 V AC / DC for output 0-10 V 7 - 33 V DC for output 4...20 mA
Measuring ranges:	see table (other ranges upon request)
Output:	0-10 V, 3-wire, (working resistance > 10 kOhm) or 4... 20 mA, 2-wire, (working resistance < (UB (V) -7 V) / 0,02 A; R_L depending on working resistance
Electrical connection:	0.25 - 1.5 mm², via plug-in connector DIN EN 175301-803-A (included in the scope of delivery)
Pressure connection:	G ½" sealing at the back
Type of pressure:	relative
Medium:	liquid and gaseous
Response time:	2 ms (1 ms typical)
Characteristic line:	± 0.3 %
Mounting:	directly on pressure line
Housing:	stainless steel **V2A** (1.4305)
Connecting head:	plastic, approx. 98 x 50 x 34 mm
SHD-SD	
Measuring principle:	**ceramic measuring cell**
Temperature of medium:	–15...+ 125 °C
Medium contacting parts:	stainless steel **V2A** (1.4305); measuring element ceramic Al_2O_3 (96%); sealing material FPM (Viton)
Load changes:	< 100 Hz
Overload range / Bursting pressure:	< 4 bar: 3 x FS > 4 bar: 2.5 x FS
SHD	
Measuring principle:	**steel measuring cell**
Temperature of medium:	–40...+135 °C
Medium contacting parts:	stainless steel **V2A** (1.4305)
Overload range:	< 6 bar: 5 x of final valu > 6 bar: 3 x of final valu (max. 1500 bar)
Bursting pressure:	< 6 bar: 10 x of final valu > 6 bar: 6 x of final valu (max. 2500 bar)
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU
Tests:	Drinking water approval according to NSF/ANSI 61/372, UL-certified according to ANSI/UL 61010-1
Optional:	with **display module,** made of plastic, polyamide material, black colour, LCD display rotatable and tiltable, for displaying the pressure (in bar, other units available upon request)

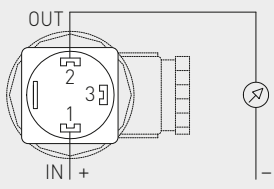
Connecting diagram **SHD xx-U**

2 Output pressure 0-10 V
3 GND
1 Supply voltage UB+ 24 V AC/DC



Connecting diagram **SHD xx-I**

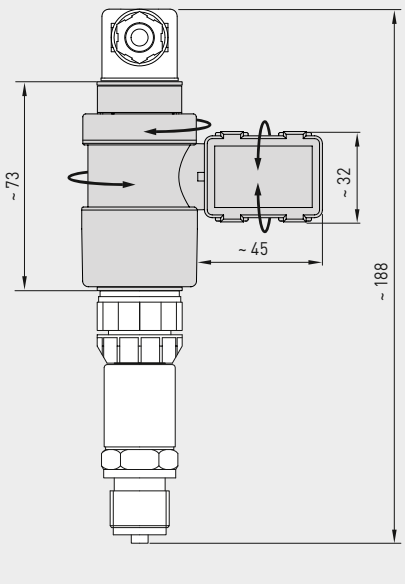
2 Output pressure 4...20 mA
3 Free
1 Supply voltage UB+ 24 V DC

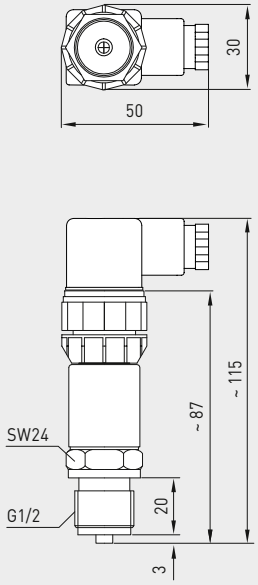


Pressure measuring transducers, incl. DIN plug-in connectors, with active output

Dimensional drawing
[mm]

SHD xx





SHD xx
without display



PREMASGARD® **SHD-SD**	Pressure measuring transducer, *Standard* or gaseous and liquid media				
Measuring Range	**Type / WG01**	**Display**	**Item No.** Output 0-10 V	**Item No.** Output 4...20 mA	**Price**
	SHD-SD-x = U / I		U-variant	I-variant	
0... **6 bar**	SHD-SD-**x** 6		1301-2121-0550-120	1301-2122-0550-000	**129,85 €**
	SHD-SD-**x** 6 LCD	■	1301-2121-1550-120	1301-2122-1550-000	**404,97 €**
0... **10 bar**	SHD-SD-**x** 10		1301-2121-0560-120	1301-2122-0560-000	**129,85 €**
	SHD-SD-**x** 10 LCD	■	1301-2121-1560-120	1301-2122-1560-000	**404,97 €**
0... **16 bar**	SHD-SD-**x** 16		1301-2121-0570-120	1301-2122-0570-000	**129,85 €**
	SHD-SD-**x** 16 LCD	■	1301-2121-1570-120	1301-2122-1570-000	**404,97 €**
Note:	**Not suitable for ammonia and freon!**				

PREMASGARD® **SHD**	Pressure measuring transducer, *Premium* for gaseous and liquid media				
Measuring Range	**Type / WG01**	**Display**	**Item No.** Output 0-10 V	**Item No.** Output 4...20 mA	**Price**
	SHD-x = U / I		U-variant	I-variant	
0... **1 bar**	SHD-**x** 1		1301-2111-0520-220	1301-2112-0520-120	**214,50 €**
	SHD-**x** 1 LCD	■	1301-2111-1520-220	1301-2112-1520-120	**489,63 €**
0...**2,5 bar**	SHD-**x** 2,5		1301-2111-0530-220	1301-2112-0530-120	**214,50 €**
	SHD-**x** 2,5 LCD	■	1301-2111-1530-220	1301-2112-1530-120	**489,63 €**
0... **6 bar**	SHD-**x** 6		1301-2111-0550-220	1301-2112-0550-120	**155,31 €**
	SHD-**x** 6 LCD	■	1301-2111-1550-220	1301-2112-1550-120	**430,43 €**
0... **10 bar**	SHD-**x** 10		1301-2111-0560-220	1301-2112-0560-120	**155,31 €**
	SHD-**x** 10 LCD	■	1301-2111-1560-220	1301-2112-1560-120	**430,43 €**
0... **16 bar**	SHD-**x** 16		1301-2111-0570-220	1301-2112-0570-120	**155,31 €**
	SHD-**x** 16 LCD	■	1301-2111-1570-220	1301-2112-1570-120	**430,43 €**
0... **25 bar**	SHD-**x** 25		1301-2111-0580-220	1301-2112-0580-120	**214,50 €**
	SHD-**x** 25 LCD	■	1301-2111-1580-220	1301-2112-1580-120	**489,63 €**
0... **40 bar**	SHD-**x** 40		1301-2111-0590-220	1301-2112-0590-120	**214,50 €**
	SHD-**x** 40 LCD	■	1301-2111-1590-220	1301-2112-1590-120	**489,63 €**

PREMASGARD® SHD 692

**Pressure measuring transducers,
incl. DIN plug-in connectors and mounting angle,
with active output**

NEW

S+S REGELTECHNIK

The pressure sensor / differential pressure sensor **PREM**ASGARD® **SHD-692** is used for pressure measurement in gaseous and liquid media. It converts the measurand into standard signals of 0-10 V or 4...20 mA. Process connection is 2 x G⅛" - 27 NPT internal thread. SHD-692 differential pressure transmitters are used in piping and hydraulic systems, in mechanical and plant engineering as well as in building automation.
Not applicable for ammonia and Freon!

SHD 692
with display

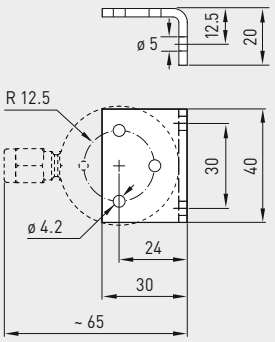


TECHNICAL DATA

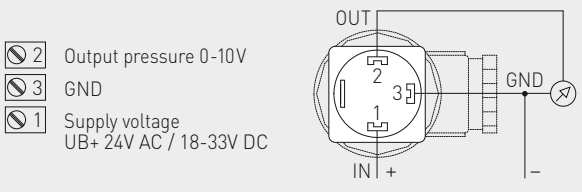
Power supply:	24 V AC (+15 % / –10 %), 18 - 33 V DC for U-variant 24 V DC (± 20 %) for I-variant
Measuring ranges:	see table
Output:	0-10 V (3-wire connection) or 4...20 mA (2-wire connection)
Permissible working resistance: (at nominal voltage)	R_L > 10 kΩ for U-variant R_L < 600 Ω for I-variant
Electrical connection:	0.25 - 1.5 mm², via plug-in connector DIN EN 175301-803-A (included in the scope of delivery)
Pressure connection:	screw pipe connection for 6 mm pipe (G⅛" - 27 NPT internal thread)
Type of pressure:	differential pressure
Measuring principle:	**ceramic measuring cell**
Medium:	liquid or gaseous
Temperature of medium:	–15...+80 °C
Housing:	stainless steel **V2A** (1.4305)
Mounting:	by mounting angle (included in the scope of delivery), installation arbitrary
Medium contacting parts:	INOX (1.4305), ceramics, sealing material EPDM
Response time:	< 5 ms
Class:	0.5 %
Total error:	< 1.3 %
Overload range:	see table (one-sided max. pressure)
System pressure:	max. 25 bar (P1 + P2)
Bursting pressure:	1.5 x system pressure
Insulating resistance:	≥ 100 MOhm, at +20 °C (500 V DC)
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU
Optional:	with **display module,** made of plastic, polyamide material, black colour, LCD display rotatable and tiltable, for displaying the pressure (in bar, other units available upon request)

Dimensional drawing [mm]

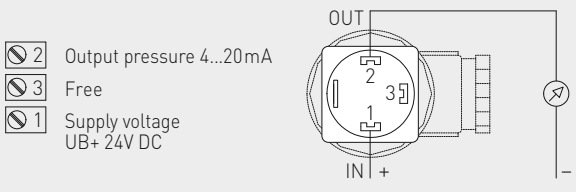
SHD 692
Mounting angle



Connecting diagram **SHD 692-U**



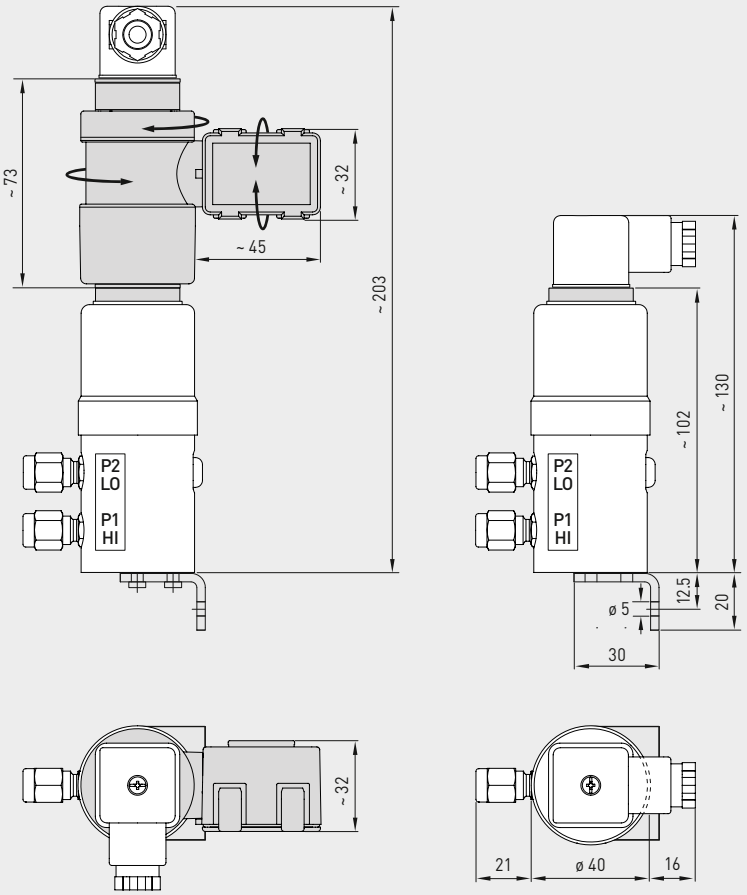
Connecting diagram **SHD 692-I**



**Pressure measuring transducers,
incl. DIN plug-in connectors and mounting angle,
with active output**

Dimensional drawing
[mm]

SHD 692



SHD 692
without display



PREMASGARD® **SHD 692**		Pressure measuring transducers, *Deluxe* or gaseous and liquid media				
Measuring Range	**One-Sideed max. pressure**	**Typd / WG02**	**Display**	**Item No.** Output 0-10 V	**Item No.** Output 4...20 mA	**Price**
		SHD 692-x = U / I		U-variant	I-variant	
0...**0,1 bar**	0,6 bar	SHD 692-**x**-900		1301-4121-0500-000	1301-4122-0500-000	**352,80 €**
		SHD 692-**x**-900-LCD	■	1301-4121-1500-000	1301-4122-1500-000	**627,92 €**
0...**0,5 bar**	3 bar	SHD 692-**x**-907		1301-4121-0510-000	1301-4122-0510-000	**352,80 €**
		SHD 692-**x**-907-LCD	■	1301-4121-1510-000	1301-4122-1510-000	**627,92 €**
0... **1 bar**	5 bar	SHD 692-**x**-912		1301-4121-0520-000	1301-4122-0520-000	**352,80 €**
		SHD 692-**x**-912-LCD	■	1301-4121-1520-000	1301-4122-1520-000	**627,92 €**
0...**2,5 bar**	12 bar	SHD 692-**x**-916		1301-4121-0530-000	1301-4122-0530-000	**352,80 €**
		SHD 692-**x**-916-LCD	■	1301-4121-1530-000	1301-4122-1530-000	**627,92 €**
0... **4 bar**	12 bar	SHD 692-**x**-918		1301-4121-0540-000	1301-4122-0540-000	**352,80 €**
		SHD 692-**x**-918-LCD	■	1301-4121-1540-000	1301-4122-1540-000	**627,92 €**
0... **6 bar**	12 bar	SHD 692-**x**-919		1301-4121-0550-000	1301-4122-0550-000	**352,80 €**
		SHD 692-**x**-919-LCD	■	1301-4121-1550-000	1301-4122-1550-000	**627,92 €**
0... **10 bar**	20 bar	SHD 692-**x**-930		1301-4121-0560-000	1301-4122-0560-000	**352,80 €**
		SHD 692-**x**-930-LCD	■	1301-4121-1560-000	1301-4122-1560-000	**627,92 €**
Note:		**Not suitable for ammonia and freon!**				

Light Intensity & Motion

PHOTASGARD® & **KIN**ASGARD®
Light and shade under control

Our light intensity sensors and motion sensors or presence detectors are the obvious choice when it comes to energy saving and security.

They keep the costs for lighting, shading, heating and cooling within the green range. By the way – our solutions are also ideally suited for presence detection in security zones.

Application Areas

- Heating, ventilation, air conditioning and lighting systems
- Greenhouses, shading and solar protection
- Production facilities and offices in line with occupational health and safety regulations
- Access control, protected areas and security zones
- Parking lots, courtyards and corridors









PHOTASGARD® & **KIN**ASGARD®
LIGHT INTENSITY AND MOTION SENSORS

Light intensity sensors

AHKF	Outdoor light intensity sensor		**553**
FSHKM	in-wall light intensity sensor	NEW	**551**
RHKF	Room light intensity sensor		**552**
DHKF	In-ceiling light intensity sensor		**555**

Motion sensors

ABWF	Outdoor motion sensor		**559**
FSBWF-W	In-wall motion sensor with changeover contact	NEW	**557**
RBWF	Room motion sensor		**558**
DBWF	In-ceiling motion sensor		**561**
DBWF-C	In-ceiling motion sensor		**561**

Light intensity and motion sensors

ABWF/LF	Outdoor motion and light sensor	**565**
RBWF/LF	Room motion and light sensor	**563**
DBWF/LF/FTF	In-ceiling motion and light sensor with humidity and temperature sensor	**567**







Light Intensity & Motion

PHOTASGARD® & **KIN**ASGARD®
Sensor technology for twilight and presence

Broad Spectrum

Our active motion and light intensity sensors are designed to be multi-functional. This reduces the diversity of types and expands their possible applications. Thanks to microprocessor technology, almost any measuring range can be represented, including custom specifications. Multi-range switching is selectable via DIP switches.

Optimum Precision

The devices are tested according to the latest criteria. Each sensor is precisely re-adjustable using offset potentiometers. Take advantage of our experience, our development, manufacturing and product know-how and order these products directly from the manufacturer.

Approved Safety

RoHS conforming materials

ESD compliant manufacturing

CE compliance tested
by external laboratories

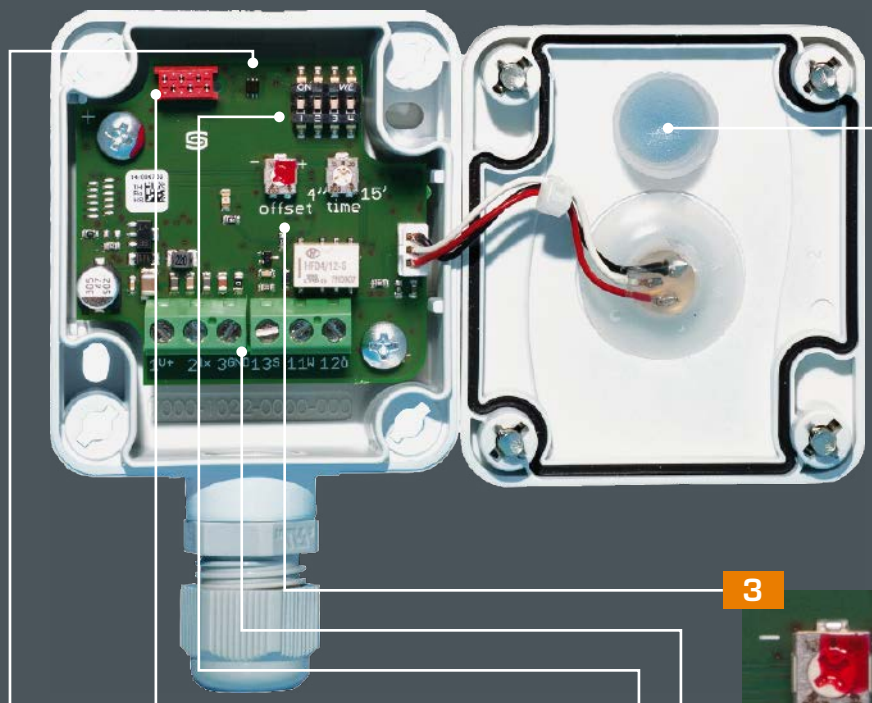
MADE
IN
GERMANY

Certified Quality

Our development and production in Nuremberg/Germany is certified by TÜV Thüringen according to DIN EN ISO 9001:2015.

GOST certified

EAC certified



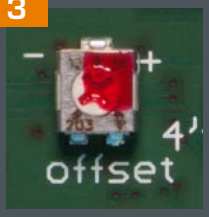
2



Diffusor

With diffusion and absorption rates specially matched to the light intensity sensor, extends the receiving characteristics over a wider angular range

3



Offset Potentiometer

For fine adjustment (zero point offset) and readjustment upon recalibration

4



Screw Terminals

Active output signals 0-10 V, 4...20 mA or switched output

1



Digital Photo Sensor

With high resolution and resistance to ageing, for a wide linear brightness range of 0-120 kLux

- Special measuring ranges possible, e.g. for twilight
- High measuring accuracy with max. < 5 % deviation

5



DIP Switches

For multi-range toggling and setting of 4 measuring ranges:

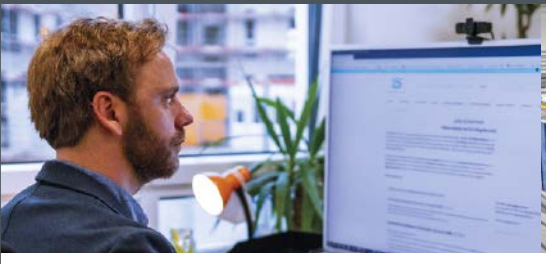
RHKF 0.5 / 1 / 2 / 20 kLux
AHKF 0.5 / 1 / 20 / 60 kLux

6



Quality Assurance

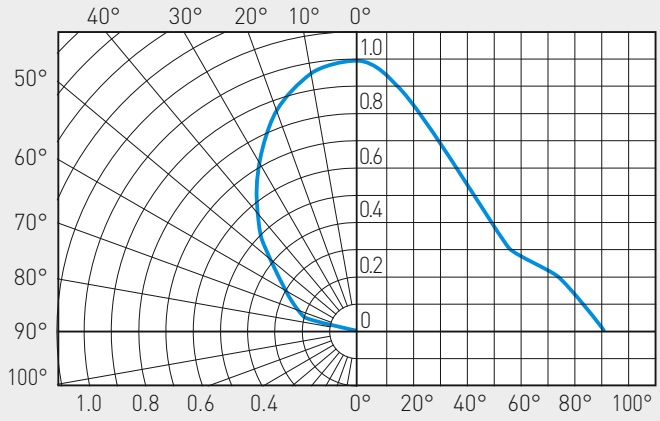
Calibration and balancing are done by means of the bus system





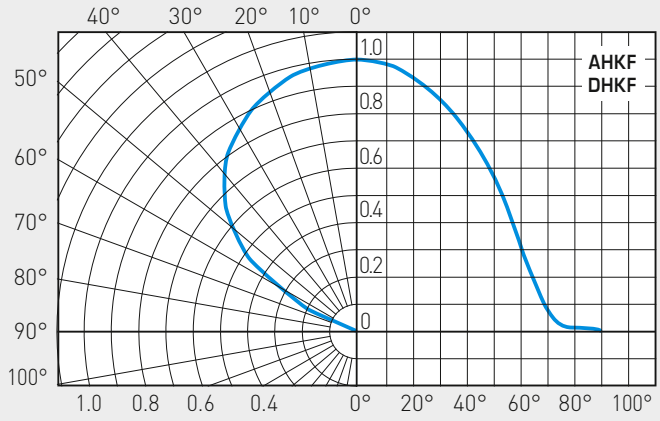


Light sensor (indoor areas) **PHOT**ASGARD®



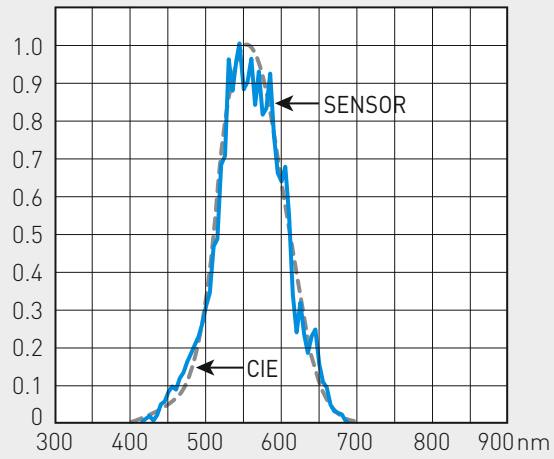
Characteristic curve showing the sensitivity of light sensor (indoor areas) relative to the angle of incidence of light.

Light sensor (outdoor areas) **PHOT**ASGARD®



Characteristic curve showing the sensitivity of light sensor (outdoor areas) relative to the angle of incidence of light.

Light sensor (indoor and outdoor areas) **PHOT**ASGARD®



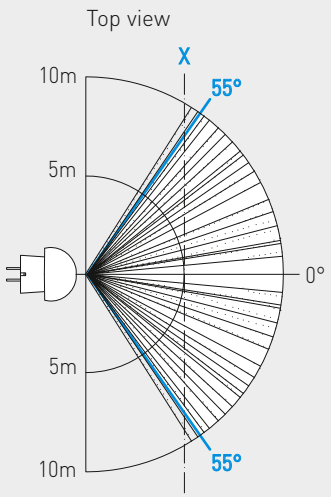
Characteristic curve showing the sensitivity of light sensor on the circuit board in respect of the wavelength of light.

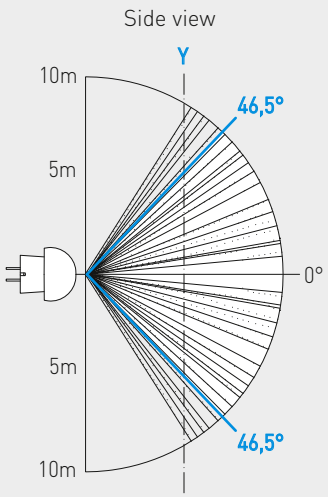
The broken line represents the light perception of the human eye.

The light sensor used in **PHOT**ASGARD® light intensity sensors was specifically adapted to the sensitivity of the human eye. Its greatest sensitivity is in the range of 400 nm to 700 nm.

With its special filter, the sensor is therefore ideally suited for measuring exposure to daylight and/or for measuring artificial light of high colour temperature (similar to sunlight).

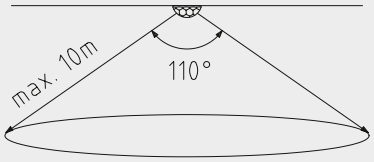
Aperture angle **KIN**ASGARD®



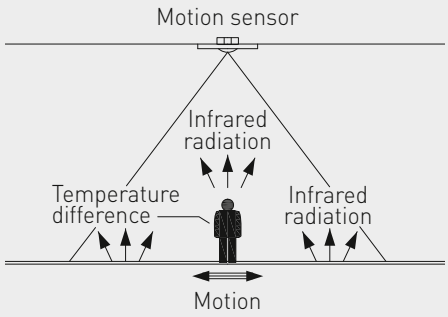


High-end variant infra-red sensor with enlarged aperture angle of 100° or 110° over 360 degrees circumference and 10 m of reach.

Detection range **KIN**ASGARD®



Principle **KIN**ASGARD®



Sensor recognizes the temperature difference resulting from the movement of persons or objects.

In all **KIN**ASGARD® motion sensors and presence detectors, a high-end variant infra-red sensor with enlarged angle of aperture is exclusively used.

The patented lens system with 20 individual lenses results in only very small dark areas that are only a few centimetres wide even at a distance of 10 m, thereby reliably detecting small movements.

The sensor recognizes changes in the infra-red radiation spectrum, meaning heat radiation, resulting from the movement of persons or objects.
Such movements generate a temporary change of the temperature gradient in the field.

Due to the constant presence of body (heat) radiation, this sensor is ideally suitable for detecting persons. The temperature difference between sensor and object must be > 5 K.

PHOTASGARD® FSHKM

**Room light intensity sensor and measuring transducer,
in-wall in the panel switch programme,
with active output**

NEW

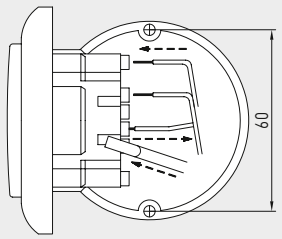
S+S REGELTECHNIK

Maintenance-free light intensity sensor **PHOT**ASGARD® **FSHKM** with active output, in in-wall housing, to determine the illuminance (0…1kLux). The measuring transducer converts the measured variables into a standard signal of 0-10 V. The in-wall sensor is mounted in high-quality panel switch programmes, ideally of the brands Gira, Berker, Merten, Jung, Siemens or Busch-Jaeger (using in-wall adapters) either individually or in combination with light switches, socket outlets, etc.

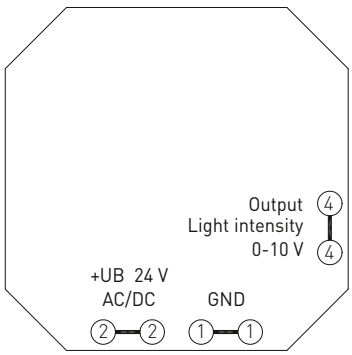
The sensor is used to control luminaires, lighting systems, Venetian blinds and canvas blinds and for monitoring the lighting conditions. It is used indoors at workplaces, in corridors, offices, residential and business premises as well as industrial and storage halls as daylight-dependent constant light control, as brightness or twilight sensor and to control sun protection hoods to avoid unnecessary room heating.

The **light sensor** (**photodiode**) was specifically adapted to the sensitivity of the human eye. It is most sensitive in the range of 350 nm to 820 nm. With its special filter, the sensor is therefore ideally suited to exposure measurement of daylight and / or for measuring artificial light of high colour temperature (similar to sunlight).

Mounting diagram [mm] **In-wall**



Schematic diagram **FSHKM-U**



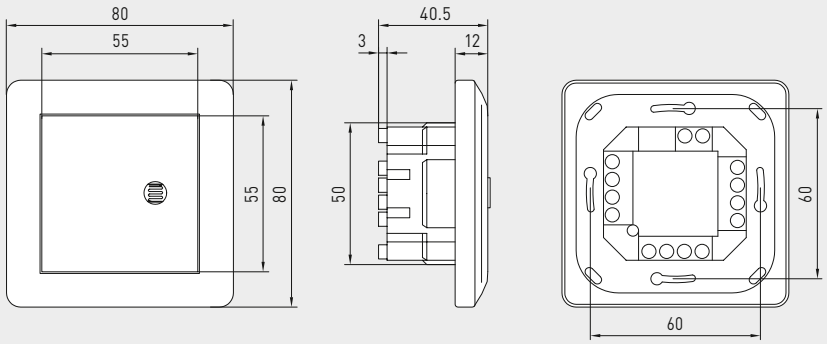
TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %)
Power consumption:	typically < 2.0 VA / 24 V AC; typically < 1.0 W / 24 V DC
BRIGHTNESS	
Sensor:	Light sensor (photo diode) (see beginning of this chapter)
Measuring range:	0…1 kLux (optionally other individual measuring ranges, e. g. 100 kLux)
Measuring accuracy:	typically ± 10 % final value
Output:	0 - 10 V (linearised)
Mounting:	in-wall flush box Ø 55 mm
Electrical connection:	max. 1.5 mm², via push-in terminals
Ambient temperature:	Storage –20…+50 °C; Operation 0…+50 °C
Permitted humidity:	max. 95 % RH, non-condensing air
Protection class:	III (according to EN 60 730)
Protection type:	IP 20 (according to EN 60 529)
Standards:	CE-conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU
SWITCH PROGRAMME	
Manufacturer:	GIRA System 55 (other switch programmes, manufacturers, colours as well as prices available upon request)
Housing:	plastic, the standard colour is pure glossy white (similar to RAL 9010) (other colours are available upon request with colour variants depending on the respective light switch programme)

Room light intensity sensor and measuring transducer, in-wall in the panel switch programme, with active output

Dimensional drawing [mm]

FSHKM



FSHKM



Light Intensity table
MB: 0...1000 lux

Light [lux]	U_A [V]
0	0.0
50	0.5
100	1.0
150	1.5
200	2.0
250	2.5
300	3.0
350	3.5
400	4.0
450	4.5
500	5.0
550	5.5
600	6.0
650	6.5
700	7.0
750	7.5
800	8.0
850	8.5
900	9.0
950	9.5
1000	10.0

PHOTASGARD® FSHKM	Room light intensity sensor or measuring transducer, in-wall			
Type / WG02	**Measuring range** Light Intensity	**Output** Light Intensity	**Item No.**	**Price**
FSHKM				
FSHKM-U 1K	0...1 kLux	0-10 V	1601-5121-7000-162	**245,70 €**
Extra charge:	optionally other individual measuring ranges, e. g. 100 kLux		on request	

Room light intensity sensors with multi-range switching and active output

S+S REGELTECHNIK

The room light intensity sensor **PHOT**ASGARD® **RHKF** with four switchable measuring ranges (four devices in one) measures the luminous intensity with a diffuser and is used to control luminaries, lighting systems, Venetian blinds and canvas blinds, etc., to monitor lighting conditions at workplaces, in storage halls, workshops and corridors, in indoor areas, in industrial halls, in offices as well as in residential and business facilities, for daylight-dependant constant light control, as light intensity or twilight sensor and to control sunshade equipment avoiding unnecessary heating-up of rooms. Therefore it minimizes your variety of types and stock keeping while covering a greater range of universal applications. The sensor used in PHOTASGARD® light intensity sensors was specifically adapted to the sensitivity of the human eye. Its greatest sensitivity is in the range of 400 nm to 700 nm. With its special filter, the sensor is therefore ideally suited for measuring exposure to daylight and / or for measuring artificial light of high colour temperature (similar to sunlight).

RHKF



TECHNICAL DATA

Power supply:	24 V AC (± 20 %); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (ohm) = (U_b -14 V) / 0.02 A for I variant
Load resistance:	R_L > 5 kOhm for U variant
Power consumption:	< 1 W at 24 V DC; < 2 VA at 24 V AC
Sensor:	light sensor with diffuser (see beginning of this chapter)
Measuring ranges:	**multi-range switching** (via DIP switches) **0...500 Lux / 1 kLux / 5 kLux / 20 kLux** (other individual ranges optional, e. g. 100 kLux)
Output:	4...20 mA or 0-10 V (2- or 3-wire connection)
Deviation:	typically < 5 % of final value
Ambient temperature:	0...+50 °C
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010)
Dimensions:	85 x 85 x 27 mm (Baldur 1)
Installation:	wall mounting or on in-wall flush box, Ø 55 mm, base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes for cable entry from the back, with predetermined breaking point for on-wall cable entry from top / bottom in case of plain on-wall installation
Protection class:	III (according to EN 60 730)
Protection type:	**IP 30** (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU

Measuring ranges (selectable)	**DIP 1**	**DIP 2**	**DIP 3**	**DIP 4**
0...500 Lux	**ON**	OFF	OFF	OFF
0... **1 kLux** (default)	OFF	**ON**	OFF	OFF
0... 5 kLux	OFF	OFF	**ON**	OFF
0... 20 kLux	OFF	OFF	OFF	**ON**

Connecting diagram **RHKF-U**



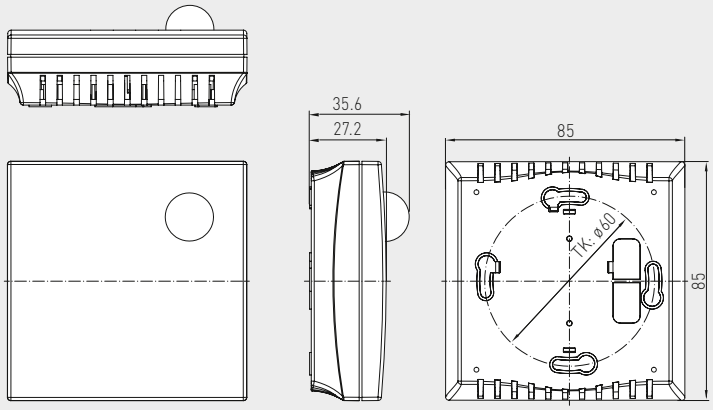
UB+ supply voltage 24V AC/DC
Output light intensity 0-10V
UB– GND

Connecting diagram **RHKF-I**

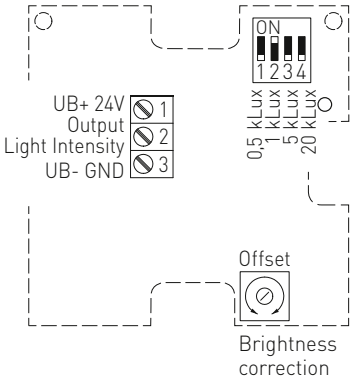


UB+ supply voltage 24V DC
Output light intensity 4...20mA

Dimensional drawing — Housing **Baldur 1** **RHKF**



Schematic diagram **RHKF**



PHOTASGARD® RHKF Room light intensity sensors

Type / WG01	Measuring Range Light Intensity (adjustable)	Output Light Intensity	Item No.	Price
RHKF				
RHKF-I	0...500 Lux / 1 kLux / 5 kLux / 20 kLux	4 ... 20 mA	1601-41A2-2000-000	**100,78 €**
RHKF-U	0...500 Lux / 1 kLux / 5 kLux / 20 kLux	0-10 V	1601-41A1-2000-000	**100,78 €**
Extra charge:	Other individual measuring ranges optional, e. g. 100 kLux		on request	

The light intensity sensor / twilight sensor **PHOT**ASGARD® **AHKF** with six switchable measuring ranges (six devices in one) measures the luminous intensity and is used to control luminaries, lighting systems, Venetian blinds and canvas blinds, etc., to monitor lighting conditions at work-places, in greenhouses, storage halls, workshops, corridors, in outdoor areas, in industrial halls, in offices as well as in residential and business facilities, for daylight-dependant constant light control, as light intensity or twilight sensor and as sun protection control to avoid unnecessary room heating. Therefore it minimizes your variety of types and stock keeping while covering a greater range of universal applications. The sensor used was specifically adapted to the sensitivity of the human eye. Its greatest sensitivity is in the range of 400 nm to 700 nm. With its special filter, the sensor is therefore ideally suited for measuring exposure to daylight and / or for measuring artificial light of high colour temperature (similar to sunlight).

TECHNICAL DATA

Power supply:	24 V AC (± 20 %); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (ohm) = (U_b -14 V) / 0.02 A for I variant
Load resistance:	R_L > 5 kOhm for U variant
Power consumption:	< 1 W at 24 V DC; < 2 VA at 24 V AC
Sensor:	light sensor (see beginning of this chapter)
Measuring ranges:	**multi-range switching** (via DIP switches) **0...500 Lux / 1 kLux / 2 kLux / 5 kLux / 20 kLux / 60 kLux** (other individual ranges optional, e. g. 100 kLux)
Output:	4...20 mA or 0-10 V (2- or 3-wire connection)
Deviation:	typically < 5 % of final value
Ambient temperature:	–30...+70 °C
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), Housing cover is transparent!
Housing dimensions:	72 x 64 x 43.3 mm (Tyr 1)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, nner diameter 10.4 mm) **or** **M12 connector** (optional on request)
Installation:	on-wall
Protection class:	III (according to EN 60 730)
Protection type:	**IP 67** (according to EN 60 529) housing tested, TÜV SÜD, report no. 713139052 (Tyr 1)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU

AHKF



Measuring ranges (selectable)	DIP 1	DIP 2	DIP 3	DIP 4
0...500 Lux	OFF	OFF	OFF	–
0... 1 kLux	**ON**	OFF	OFF	–
0... 2 kLux	OFF	**ON**	OFF	–
0... 5 kLux	**ON**	**ON**	OFF	–
0... **20 kLux** (default)	OFF	OFF	**ON**	–
0... 60 kLux	**ON**	OFF	**ON**	–

Connecting diagram **AHKF-U**



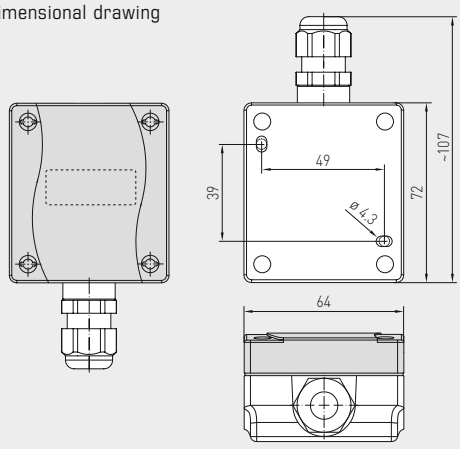
1 UB+ supply voltage 24V AC/DC
2 Output light intensity 0-10V
3 UB– GND

Connecting diagram **AHKF-I**



1 UB+ supply voltage 24V DC
2 Output light intensity 4...20mA

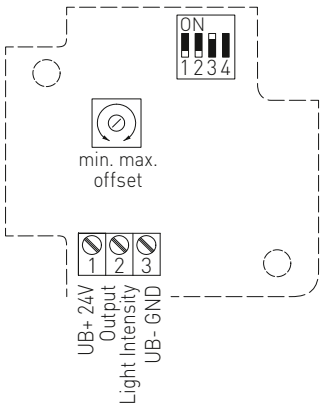
Dimensional drawing **AHKF**





M12 connector
(optional on request)

Schematic diagram **AHKF**



PHOTASGARD® AHKF Outdoor light intensity sensors / twilight sensors

Type / WG01	Measuring Range Light Intensity (adjustable)	Output Light Intensity	Item No.	Price
AHKF				
AHKF-I	0...500 Lux / 1 / 2 / 5 / 20 / 60 kLux	4 ... 20 mA	1601-1112-1000-000	**100,78 €**
AHKF-U	0...500 Lux / 1 / 2 / 5 / 20 / 60 kLux	0-10 V	1601-1111-1000-000	**100,78 €**
Extra charge:	Other individual measuring ranges optional, e. g. 100 kLux		on request	

PHOTASGARD® DHKF

**In-ceiling light intensity sensors,
with multi-range switching
and active output**

S+S REGELTECHNIK

The light-intensity sensor **PHOT**ASGARD® **DHKF** with six switchable measuring ranges (six devices in one) for installation in suspended ceilings. The connecting head is pluggable for quick and easy mounting. The measuring transducer is accommodated in a separate housing.

The sensor used was specifically adapted to the sensitivity of the human eye. Its greatest sensitivity is in the range of 400 nm to 700 nm. With its special filter, the sensor is therefore ideally suited to exposure measurement of daylight and/or for measuring artificial light of high colour temperature (similar to sunlight).

It is used for daylight-dependent constant light control, to control luminaires, lighting systems, Venetian blinds and canvas blinds, and to control light intensity and sun protection hoods to avoid unnecessary heating-up of rooms. It is used in greenhouses, storage halls, industrial halls, workshops, corridors, residential and commercial buildings.

DHKF
Connecting head, pluggable



TECHNICAL DATA

Power supply:	24 V AC (± 20 %); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (ohm) = (U_b -14 V) / 0.02 A for I variant
Load resistance:	R_L > 5 kOhm for U variant
Power consumption:	< 1 W at 24 V DC; < 2 VA at 24 V AC
Sensor:	light sensor (see beginning of this chapter)
Measuring ranges:	**multi-range switching** (via DIP switches) **0...500 Lux / 1 kLux / 2 kLux / 5 kLux / 20 kLux / 60 kLux** (optional other individual measuring ranges, e. g. 100 kLux)
Output:	4...20 mA or 0-10 V
Deviation:	typically < 5 % of final value
Ambient temperature:	–30...+70 °C
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016)
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1)
Electrical connection:	2- or 3-wire (see connecting diagram), 0.14 - 1.5 mm², via terminal screws
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Connecting cable:	PVC, LiYY, 4 x 0.14 mm², cable length (KL) = approx. 2 m
Connecting head:	made of plastic, material polycarbonate (PC), colour white, **pluggable**, Ø = approx. 35 mm, H = approx. 29 mm
Mounting (sensor):	in the suspended ceiling, ceiling cut-out Ø = 30 mm, cover Ø = < 35 mm
Protection type:	**IP 67** (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1) **IP 30** (according to EN 60 529) Sensor in the built-in state
Protection class:	III (according to EN 60 730)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU

Measuring ranges (adjustable)	**DIP 1**	**DIP 2**	**DIP 3**
0...500 Lux	OFF	OFF	OFF
0... 1 kLux	**ON**	OFF	OFF
0... 2 kLux	OFF	**ON**	OFF
0... 5 kLux	**ON**	**ON**	OFF
0... **20 kLux** (default)	OFF	OFF	**ON**
0... 60 kLux	**ON**	OFF	**ON**
Note: **DIP 4, 5, 6** are not assigned!			

Connecting diagram **DHKF-U**



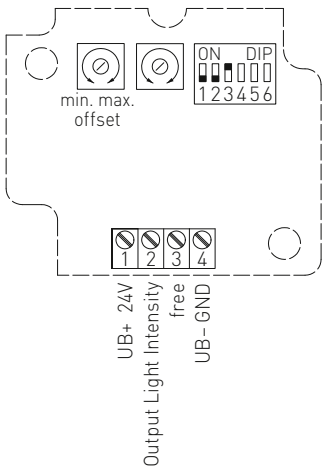
1 UB+ supply voltage 24V AC/DC
2 Output light intensity 0-10V
3 free
4 UB– GND

Connecting diagram **DHKF-I**

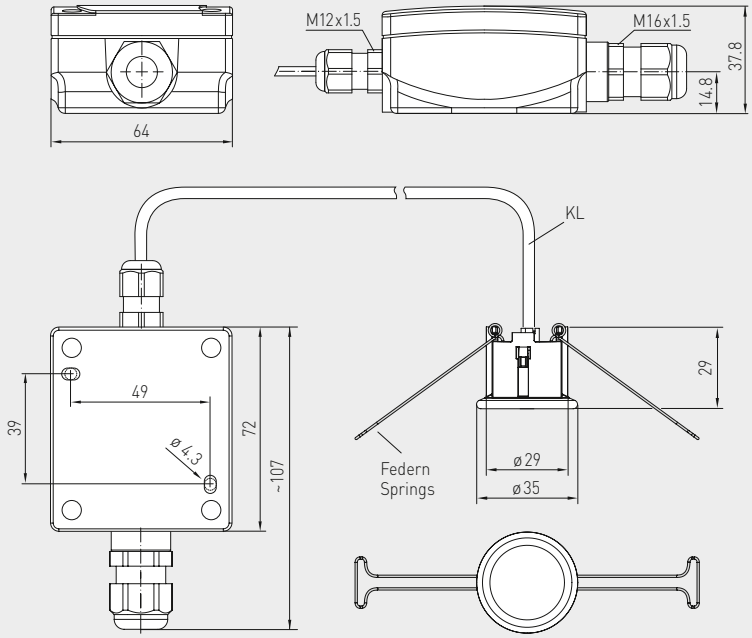


1 UB+ supply voltage 24V DC
2 Output light intensity 4...20mA

Schematic diagram **DHKF**



Dimensional drawing **DHKF**





M12 connector
(optional on request)

DHKF



PHOTASGARD® DHKF In-ceiling light intensity sensors

Type / WG01	Measuring Range Light Intensity (adjustable)	Output Light Intensity	Item No.	Price
DHKF				
DHKF I	0...500 Lux / 1 / 2 / 5 / 20 / 60 kLux	4 ... 20 mA	1601-6122-1000-000	**148,21 €**
DHKF U	0...500 Lux / 1 / 2 / 5 / 20 / 60 kLux	0-10 V	1601-6121-1000-000	**148,21 €**
Extra charge:	Other individual measuring ranges optional, e. g. 100 kLux		on request	
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101		on request	

KINASREG® FSBWF-W

**Room motion sensor or presence detector,
in-wall in the panel switch programme,
with switching output**

NEW

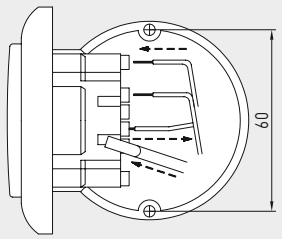
S+S REGELTECHNIK

Maintenance-free motion sensor/presence detector **KIN**ASREG® **FSBWF-W** with switching output, in in-wall housing, to detect the presence of people and movements (360° / approx. 10 m). The in-wall sensor is mounted in high-quality panel switch programmes, ideally of the brands Gira, Berker, Merten, Jung, Siemens or Busch-Jaeger (using in-wall adapters) either individually or in combination with light switches, socket outlets, etc.

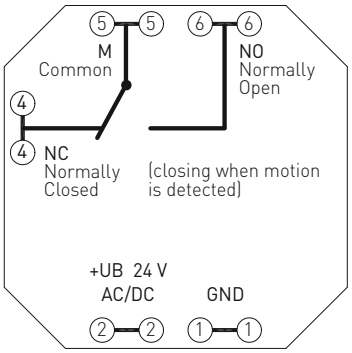
The sensor is used for monitoring and detecting statuses and for motion-dependent control of room functions, e.g. for lowering the temperature of unused rooms. It is used indoors in corridors, offices, residential and business premises as well as industrial and storage halls.

The **infrared motion sensor** detects movement over an aperture angle of 90°/ 110° and a perimeter of 360°. The patented lens system with 20 individual lenses results in very small dark areas that are only a few centimetres wide even at a distance of 10 m, thereby reliably detecting small movements.

Mounting diagram [mm] **In-wall**



Schematic diagram **FSBWF-W**



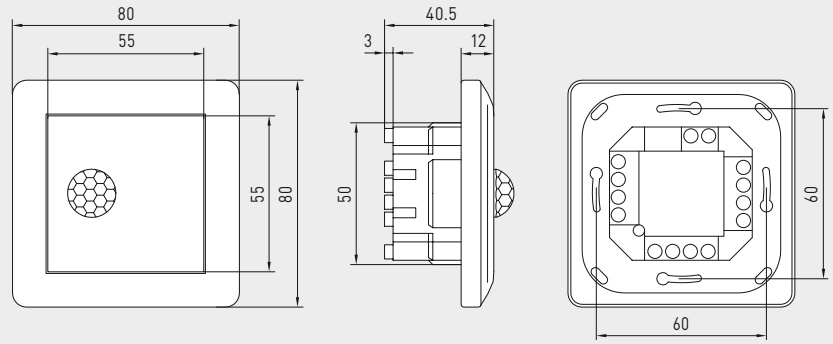
TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %),
Power consumption:	typically < 2.0 VA / 24 V AC; typically < 1.0 W / 24 V DC
MOTION	
Sensor:	infra-red motion sensor (see beginning of this chapter)
Detection range:	360° perimeter, aperture angle 90° / 110°, range approx. 10 m, circular
Motion detection:	of people and objects, necessary temperature difference between subject and surroundings ≥ 5 K
Output:	without / with motion + presence, potential-free changeover contact (24 V), 1 A resistive load
After-running time:	adjustable from approx. 4 seconds to approx. 16 minutes
Mounting:	in-wall flush box Ø 55 mm
Electrical connection:	max. 1.5 mm², via push-in terminals
Ambient temperature:	Storage –20...+50 °C; Operation 0...+50 °C
Permitted humidity:	max. 95 % RH, non-condensing air
Protection class:	III (according to EN 60 730)
Protection type:	IP 20 (according to EN 60 529)
Standards:	CE-conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU
SWITCH PROGRAMME	
Manufacturer:	GIRA System 55 (other switch programmes, manufacturers, colours as well as prices available upon request)
Housing:	plastic, the standard colour is pure glossy white (similar to RAL 9010) (other colours are available upon request with colour variants depending on the respective light switch programme)

Room motion sensor or presence detector, in-wall in the panel switch programme, with switching output

Dimensional drawing
[mm]

FSBWF-W



FSBWF-W



KINASREG® FSBWF-W	Room motion sensor or presence detector, in-wall			
Type / WG02	**Detection of** presence / motion	**Output** presence / motion	**Item No.**	**Price**
FSBWF-W				
FSBWF-W	Yes / No	Changeover contact	1401-5120-3000-162	**245,70 €**

S+S REGELTECHNIK

Room motion sensor with switching output

The motion sensor and presence detector **KIN**ASGARD® **RBWF** detects the presence of persons and motions and has a switching output (changeover contact). The sensor detects motions over an aperture angle of 110° and a perimeter of 360°. The patented lens system with 20 individual lenses results in only very small dark areas that are only a few centimetres wide even at a distance of 10 m, thereby reliably detecting small movements. Elegant housing made of plastic with snap-on lid, base with 4-hole attachment for installation on vertically or horizontally installed in-wall flush boxes, with predetermined breaking point for on-wall cable entry in case of on-wall installation. The room motion sensor is used to monitor and recognise conditions and for the motion-dependent control of room functions, e.g. for lowering temperatures in unused rooms as a motion detector. This residential room motion detector is installed in corridors, in outdoor areas, in industrial halls, in offices, in residential rooms and business facilities.

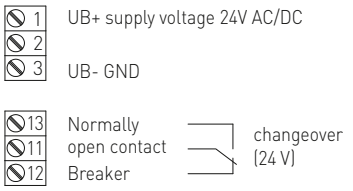
RBWF



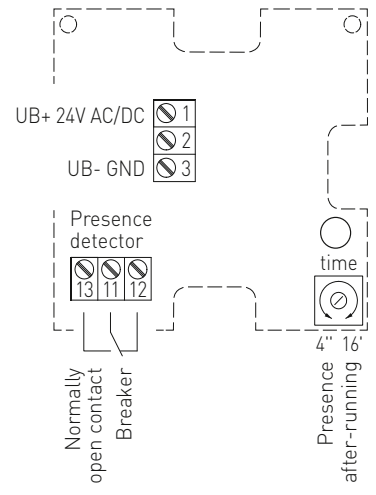
TECHNICAL DATA

Power supply:	24 V AC (± 20 %); 15...36 V DC
Power consumption:	< 1 W at 24 V DC; < 2 VA at 24 V AC
Sensor:	infra-red motion sensor (see beginning of this chapter)
Detection range:	perimeter 360°, aperture angle 90° / 110°, reach approx. 10 m, circular
Motion detection:	of persons and objects, necessary temperature difference between subject and surroundings ≥ 5 K
Output:	without / with motion + presence, potential-free changeover contact (24 V), 1 A ohmic load
After-running time:	adjustable from 4 s to 16 min
Ambient temperature:	0...+50 °C
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010)
Dimensions:	85 x 85 x 27 mm (Baldur 1)
Mounting:	wall mounting or on in-wall flush box, Ø 55 mm, base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes for cable entry from the back, with predetermined breaking point for on-wall cable entry from top / bottom in case of plain on-wall installation
Protection class:	III (according to EN 60 730)
Protection type:	**IP 30** (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU

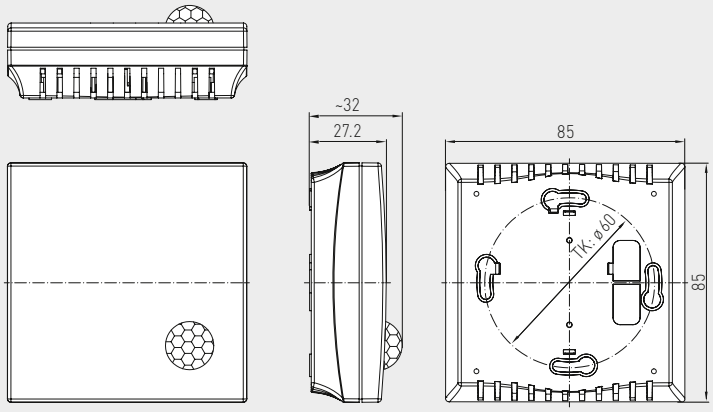
Connecting diagram **RBWF**



Schematic diagram **RBWF**



Dimensional drawing — Housing **Baldur 1** **RBWF**



KINASGARD® **RBWF** Room motion sensor				
Type / WG01	**Detection** Presence + Motion	**Output** Presence + Motion	**Item No.**	**Price**
RBWF				
RBWF-W	Yes / No (relay on / off)	Changeover contact	1401-41A0-4000-000	**108,84 €**

The motion sensor and presence detector **KIN**ASGARD® **ABWF** detects the presence of persons and motions. It is used to observe and recognise conditions and for motion-dependent control of room functions, e.g. as a motion detector to lower temperatures in unused rooms. The motion sensor is used in corridors, in outdoor areas, in industrial halls, in offices, residential rooms and business facilities. The sensor detects motions over an aperture angle of 110° and a perimeter of 360°. The patented lens system with 20 individual lenses results in only very small dark areas that are only a few centimetres wide even at a distance of 10 m, thereby reliably detecting small movements. The sensor recognizes changes in the infra-red radiation spectrum, so in heat radiation, resulting form the movement of persons or objects. Such movements generate a temporary change of the temperature gradient in the field. Due to the constant presence of body (heat) radiation, this sensor is ideally suitable for detecting persons. The temperature difference between sensor and object must be > 5 K.

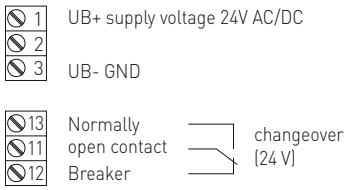
ABWF



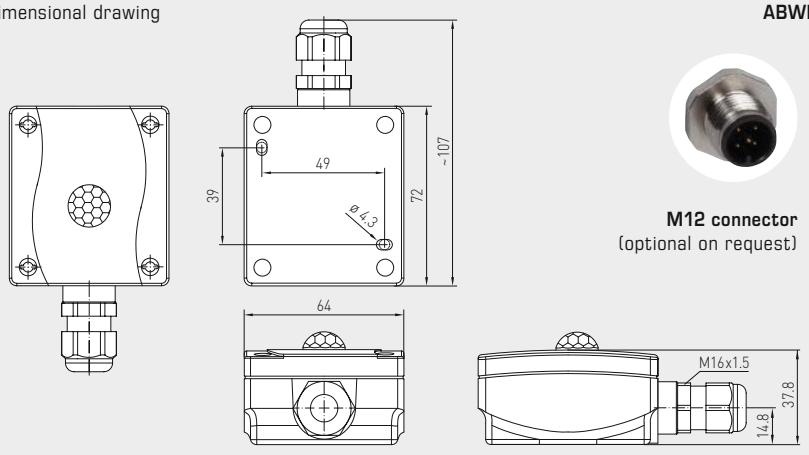
TECHNICAL DATA

Power supply:	24 V AC (± 20 %); 15...36 V DC
Power consumption:	< 1 W at 24 V DC; < 2 VA at 24 V AC
Sensor:	infra-red motion sensor (see beginning of this chapter)
Detection range:	perimeter 360°, aperture angle 90° / 110°, reach approx. 10 m, circular
Motion detection:	of persons and objects, required temperature difference between subject and surroundings ≥ 5 K
Output:	without / with motion + presence, potential-free changeover contact (24 V), 1 A ohmic load
After-running time:	adjustable from 4 s to 16 min
Ambient temperature:	–10...+50 °C
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016)
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) **or** **M12 connector** (optional on request)
Installation:	on-wall
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) housing tested, TÜV SÜD, report no. 713139052 (Tyr 1)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU

Connecting diagram **ABWF**

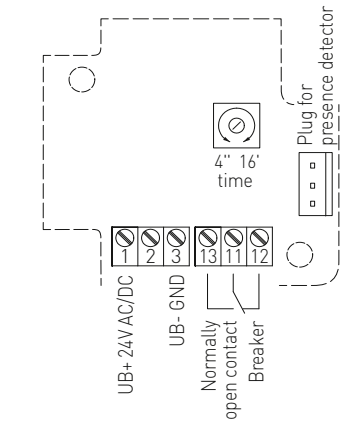


Dimensional drawing **ABWF**



M12 connector
(optional on request)

Schematic diagram **ABWF**



KINASGARD® ABWF Outdoor motion sensor

Type / WG01	Detection Presence + Motion	Output Presence + Motion	Item No.	Price
ABWF				
ABWF-W	Yes / No (relay on / off)	Changeover contact	1401-1110-4000-000	**129,82 €**

KINASGARD® DBWF
KINASGARD® DBWF-C

In-ceiling motion sensor with switching output

S+S REGELTECHNIK

The in-ceiling motion sensor and presence detector **KIN**ASGARD® **DBWF / DBWF-C** detects the presence of persons and movements and has a switching contact as an output. It has been designed for monitoring and detecting statuses and for motion-dependent control of room functions, e.g. for lowering the temperature of unused rooms.
The in-ceiling motion sensor is used for installation in suspended ceilings in corridors, offices, as well as in residential and business facilities. The connecting head is pluggable for quick, easy mounting. The measuring transducer is accommodated in a separate housing.
The sensor detects motions over an aperture angle of 110° and a perimeter of 360°. The patented lens system with 20 individual lenses results in only very small dark areas that are only a few centimetres wide even at a distance of 10 m, thereby reliably detecting small movements.

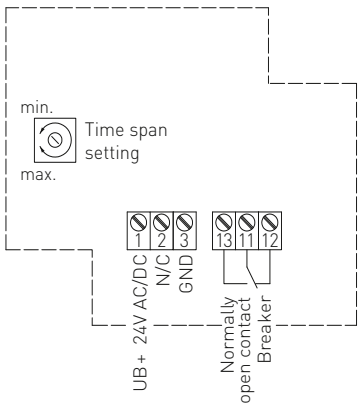
DBWF
DBWF-C
connecting head, pluggable



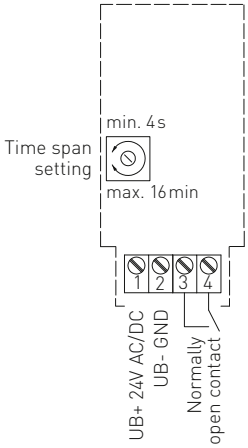
TECHNICAL DATA

Power supply:	24 V AC (± 20 %); 15...36 V DC
Power consumption:	< 1 W at 24 V DC; < 2 VA at 24 V AC
Sensor:	infra-red motion sensor (see beginning of this chapter)
Detection range:	perimeter 360°, aperture angle 90° / 110°, reach approx. 10 m, circular, at an installation height of approx. 3 m the sensor covers a detection radius (r) of approx. 3.4 m
Motion detection:	of persons and objects, necessary temperature difference between subject and surroundings ≥ 5 K
After-running time:	adjustable from 4 seconds to 16 minutes
Ambient temperature:	–10...+50 °C
Connecting head:	plastic, material polycarbonate (PC), colour white, **pluggable**
Connecting cable:	PVC, LiYY, 4 x 0.14 mm², cable length (KL) = approx. 2 m
Electrical connection:	0.14 - 1.5 mm² via terminal screws
Mounting (sensor):	in the suspended ceiling, ceiling cutout Ø = 30 mm, cover Ø = < 35 mm
Protection type (sensor):	**IP 30** (according to EN 60 529) in the built-in state
Protection class (sensor):	III (according to EN 60 730)
Standards:	CE-conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU
DBWF measuring transducer	
Output:	potential-free **changeover contact** (24 V), 1 A ohmic load
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016)
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Protection type (housing):	**IP 67** (according to EN 60 529) housing tested, TÜV SÜD, report no. 713139052 (Tyr 1)
DBWF-C measuring transducer	
Output:	potential-free **normally open contact**, signal relay, max. 24 V / 0.5 A
Housing:	plastic, material PVC, colour black
Housing dimensions:	55 x 20 x 15 mm (compact form)
Protection type (housing):	**IP 20** (according to EN 60 529) (compact form)

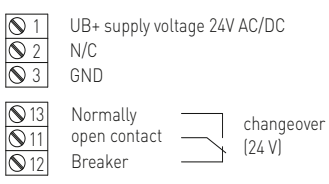
Schematic diagram **DBWF**



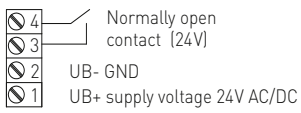
Schematic diagram **DBWF-C**



Connection diagram **DBWF**

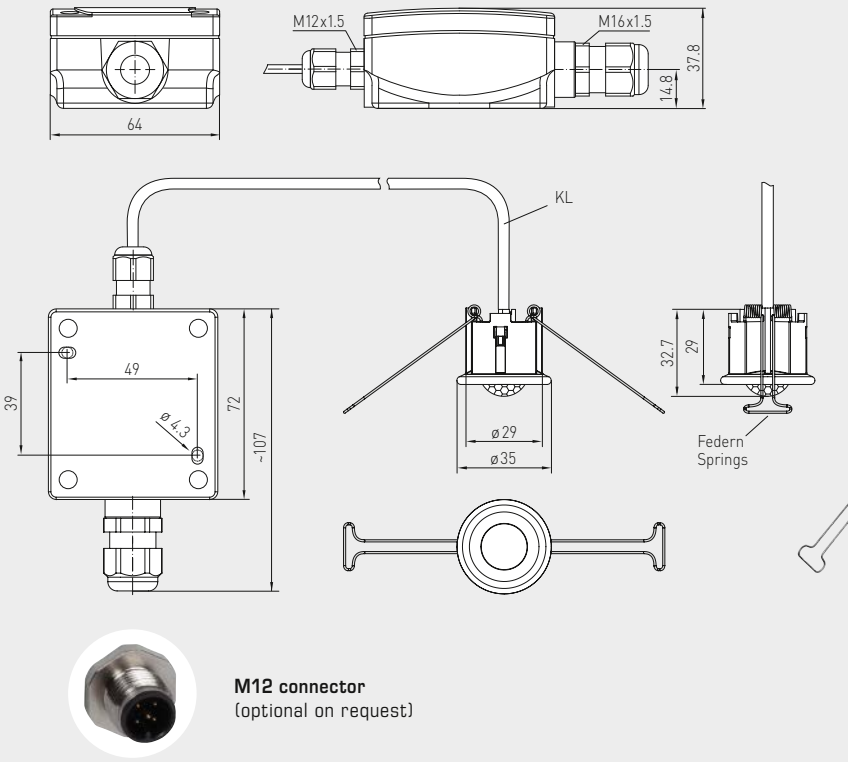


Connection diagram **DBWF-C**



Dimensional drawing

DBWF



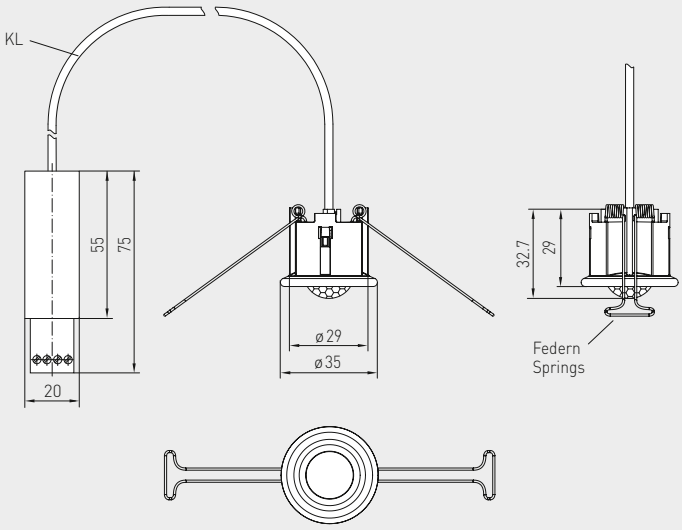
M12 connector
(optional on request)

DBWF



Dimensional drawing

DBWF-C
compact form



DBWF-C
compact form



KINASGARD® DBWF In-ceiling motion sensor **KINASGARD® DBWF-C** In-ceiling motion sensor, compact form				
Type / WG01	**Detection** Presence + Movement	**Output** Presence + Movement	**Item no.**	**Price**
DBWF				
DBWF-W	Yes / No (relay on / off)	Changeover contact	1401-6120-3000-000	**139,06 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101		on request	
DBWF-C				
DBWF-C	Yes / No (relay on / off)	Normally open contact	1401-6130-1000-006	**103,98 €**

**Room motion sensor and light sensor,
multisensors with active and switching output**

S+S REGELTECHNIK

The room motion and light sensor and presence detector **KIN**ASGARD® **RBWF-LF** is a combined instrument that detects motion and light intensity using a diffuser as well as the presence of persons and is used to recognize conditions. RBWF-LF issues a standard signal of 0 - 10 V or 4...20 mA for light intensity and has a switching (normally open contact) output for detecting motion.

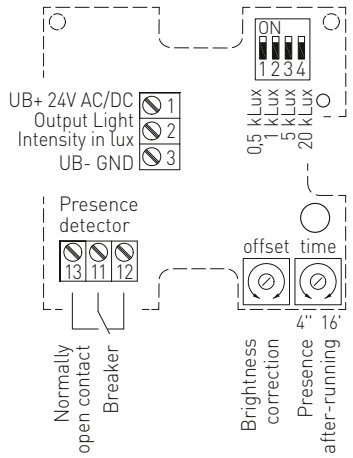
This multi-sensor is used in building automation, in corridors, at workplaces, in industrial halls, in offices and business facilities for the control of lighting as needed, e.g. to control sunshade equipment, for daylight-dependant constant light control, for activating Venetian blinds or luminaries, for automatic energy conservation, and to avoid unnecessary heating-up or cooling of unoccupied rooms.

TECHNICAL DATA

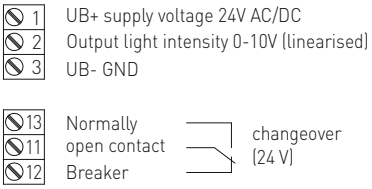
Power supply:	24 V AC (± 20 %); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (ohm) = (U_b -14 V) / 0.02 A for I variant
Load resistance:	R_L > 5 kOhm for U variant
Power consumption:	< 1 W at 24 V DC; < 2 VA at 24 V AC
Sensor:	infra-red motion sensor and light sensor with diffuser (see beginning of this chapter)
Output, motion sensor:	without / with motion + presence, potential-free normally open contact (24 V), 1 A ohmic load
After-running time:	adjustable from 4 s to 16 min
Measuring ranges:	**multi-range switching** (via DIP switches) **0...500 Lux / 1 kLux / 5 kLux / 20 kLux** (other individual ranges optional, e. g. 100 kLux)
Output, light sensor:	0-10 V (linearised, active, 3-wire connection) or 4...20 mA
Deviation, light sensor:	typically < 5 % of final value
Ambient temperature:	0...+50 °C
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010)
Dimensions:	85 x 85 x 27 mm (Baldur 1)
Installation:	wall mounting or on in-wall flush box, Ø 55 mm, base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes for cable entry from the back, with predetermined breaking point for on-wall cable entry from top / bottom in case of plain on-wall installation
Protection class:	III (according to EN 60 730)
Protection type:	**IP 30** (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU

Measuring ranges (selectable)	DIP 1	DIP 2	DIP 3	DIP 4
0...500 Lux	**ON**	OFF	OFF	OFF
0... **1 kLux** (default)	OFF	**ON**	OFF	OFF
0... 5 kLux	OFF	OFF	**ON**	OFF
0... 20 kLux	OFF	OFF	OFF	**ON**

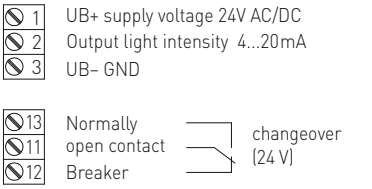
Schematic diagram **RBWF/LF**



Connecting diagram **RBWF/LF-U**

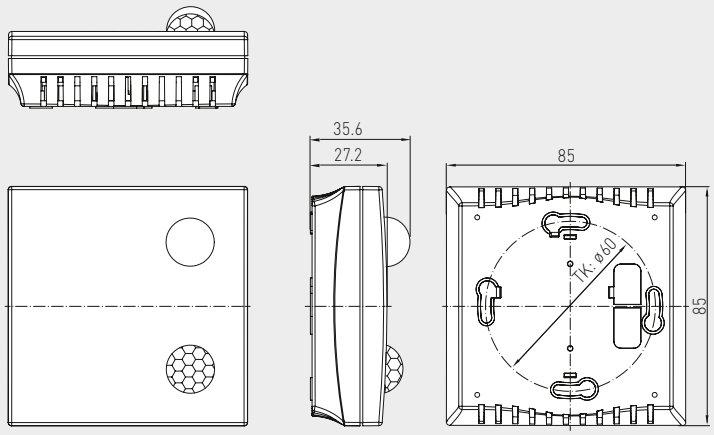


Connecting diagram **RBWF/LF-I**



Dimensional drawing

Housing **Baldur 1**
RBWF/LF



RBWF/LF



KINASGARD® RBWF/LF	Room motion sensor and light sensor			
Type / WG01	**Detection, Measuring Range**	**Output**	**Item No.**	**Price**
RBWF-LF-U				
1. Presence + Motion	Yes / No (relay on / off)	Changeover contact	1401-41A1-1100-000	**165,03 €**
2. Light Intensity	0...500 Lux / 1 kLux / 5 kLux / 20 kLux	0 -10 V (linearised)		
RBWF-LF-I				
1. Presence + Motion	Yes / No (relay on / off)	Changeover contact	1401-41A1-3200-000	**165,03 €**
2. Light Intensity	0...500 Lux / 1 kLux / 5 kLux / 20 kLux	4...20 mA		
Extra charge:	Other individual measuring ranges optional, e. g. 100 kLux		on request	

S+S REGELTECHNIK

Outdoor motion sensor and light sensor, multisensors with active and switching output

The room motion and light sensor and presence detector **KIN**ASGARD® **ABWF / LF** is a combined instrument that detects motions and light intensity as well as the presence of persons and is used to recognize conditions. ABWF / LF issues a standard signal of 0 - 10 V or 4...20 mA for light intensity and has a switching (changeover contact) output for the detection of motions.

The motion sensor / presence detector detects the presence of persons and motions. It is used to monitor and recognise conditions and for motion-dependent control of room functions, e.g. as a motion detector to lower temperatures in unused rooms. The motion sensor is used in corridors, in outdoor areas, in industrial halls, in offices, residential rooms and business facilities.

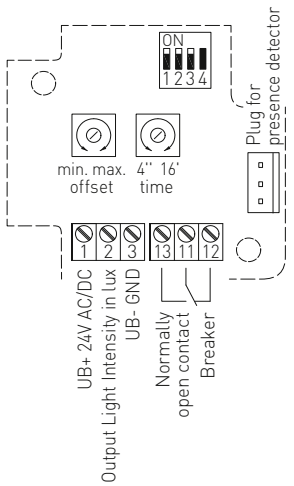
The light intensity sensor / twilight sensor with six switchable measuring ranges (six devices in one) measures the luminous intensity and is used to control luminaries, lighting systems, Venetian blinds and canvas blinds, etc., to monitor lighting conditions at workplaces, in greenhouses, storage halls, workshops, corridors, in outdoor areas, in industrial halls, in offices as well as in residential and business facilities, for daylight-dependant constant light control, as light intensity or twilight sensor and to control sunshade equipment avoiding unnecessary heating-up of rooms.

TECHNICAL DATA

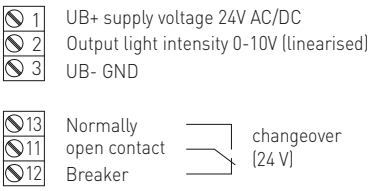
Power supply:	24 V AC (± 20 %); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (ohm) = (U_b -14 V) / 0.02 A for I variant
Load resistance:	R_L > 5 kOhm for U variant
Power consumption:	< 1 W at 24 V DC; < 2 VA at 24 V AC
Sensor:	infra-red motion sensor and light sensor (see beginning of this chapter)
Output, motion sensor:	without / with motion + presence, potential-free normally open contact (24 V), 1 A ohmic load
After-running time:	adjustable from 4 s to 16 min
Measuring ranges:	**multi-range switching** (via DIP switches) **0...500 Lux / 1 kLux / 2 kLux / 5 kLux / 20 kLux / 60 kLux** (other individual ranges optional, e. g. 100 kLux)
Output:	0 - 10 V (linearised, active, 3-wire connection) or 4...20 mA
Deviation, light sensor:	typically < 5 % of final value
Ambient temperature:	–10...+50 °C
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016)
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Installation:	on-wall
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) housing tested, TÜV SÜD, report no. 713139052 (Tyr 1)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU

Measuring ranges (selectable)	DIP 1	DIP 2	DIP 3	DIP 4
0...500 Lux	OFF	OFF	OFF	–
0... 1 kLux	**ON**	OFF	OFF	–
0... 2 kLux	OFF	**ON**	OFF	–
0... 5 kLux	**ON**	**ON**	OFF	–
0... **20 kLux** (default)	OFF	OFF	**ON**	–
0... 60 kLux	**ON**	OFF	**ON**	–

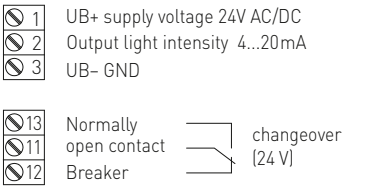
Schematic diagram **ABWF/LF**



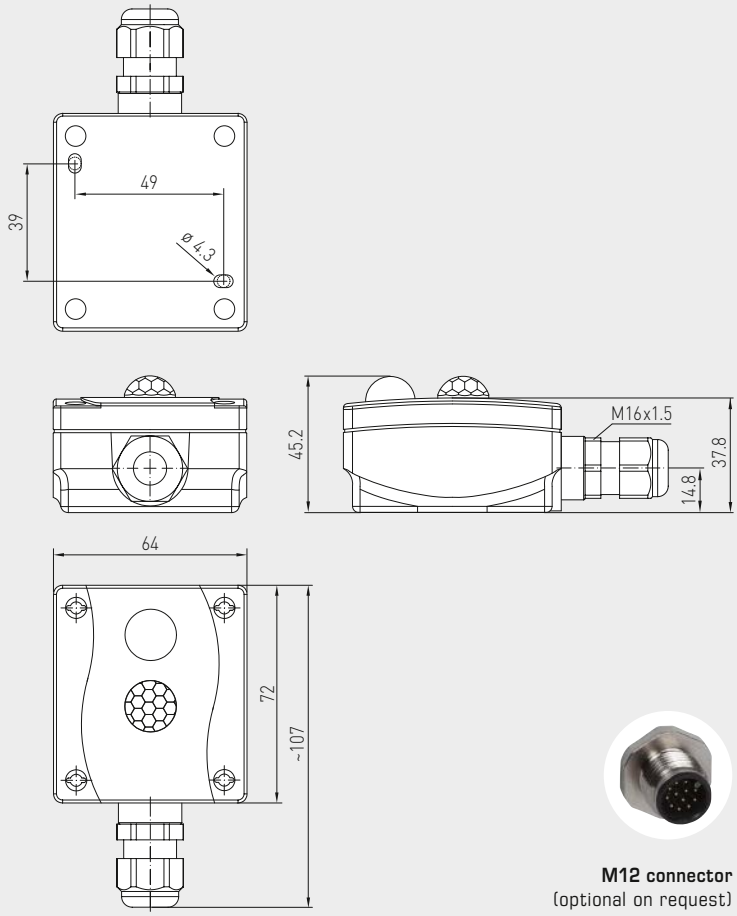
Connecting diagram **ABWF/LF-U**



Connecting diagram **ABWF/LF-I**



Dimensional drawing **ABWF/LF**



M12 connector
(optional on request)

ABWF/LF



KINASGARD® ABWF/LF Outdoor motion sensor and light sensor				
Type / WG01	**Detection, Measuring Range**	**Output**	**Item No.**	**Price**
ABWF-LF-U				
1. Presence + Motion	Yes / No (relay on / off)	Changeover contact	1401-1111-2100-000	**175,35 €**
2. Light Intensity	0…500 Lux / 1 / 2 / 5 / 20 / 60 kLux	**0 – 10 V** (linearised)		
ABWF-LF-I				
1. Presence + Motion	Yes / No (relay on / off)	Changeover contact	1401-1111-3200-000	**175,35 €**
2. Light Intensity	0…500 Lux / 1 / 2 / 5 / 20 / 60 kLux	**4...20 mA** (linearised)		
Extra charge:	Other individual measuring ranges optional, e. g. 100 kLux		on request	
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101		on request	

KINASGARD® DBWF/LF/FTF

In-ceiling motion detector, light, humidity and temperature sensor, multisensors with switching output

S+S REGELTECHNIK

The in-ceiling sensor **KIN**ASGARD® **DBWF/ LF/ FTF** is used to detect persons within a distance of up to 10 meters and to measure luminous intensity or brightness, relative humidity and temperature. It has been designed for installation in suspended ceilings.

The sensor detects **motion** over an aperture angle of 110° and a perimeter of 360°. The patented lens system with 20 individual lenses results in only very small dark areas that are only a few centimetres wide even at a distance of 10 m, thereby reliably detecting small movements. If motion is detected, the potential-free relay output is switched. The hold time of the output, measured from the moment of the last detected movement, can be preset internally in the device via potentiometer within a range of 4 seconds to approx. 17 minutes.

For the **temperature and humidity**, an analogue output 0 - 10 V corresponding to 0...+50 °C or 0...100 % RH is available. Deviations due to the mounting position and location can be compensated internally using one offset regulator respectively.

For **luminous intensity or brightness** of 0...1000 lux or 0...5000 lux (selectable via DIP switches), an analogue output 0 - 10 V is also available. It is also possible to activate the motion output depending on brightness with the help of a jumper.

Fields of application for the DBWF / LF / FTF include residential room monitoring, automatic switching of lights, control technology, alarm technology, and motion-dependent control of room functions, e. g. for lowering the temperature in unused rooms.

TECHNICAL DATA

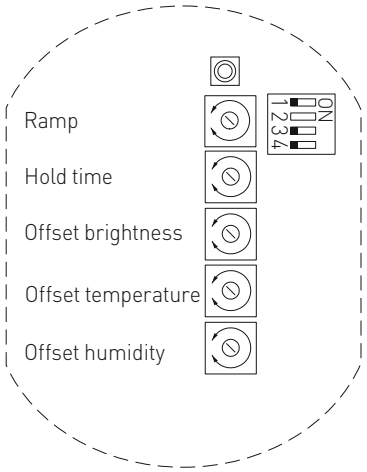
Power supply:	24 V AC / DC (half-wave rectification, read the instructions!)
Power consumption:	< 3.6 VA at 24 V DC
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Outputs:	0-10 V or inverted 10-0 V (selectable via DIP switches)
MOTION	
Sensor:	infra-red motion sensor (see beginning of this chapter)
Detection range:	perimeter 360°, aperture angle 90° / 110°, reach approx. 10 m, circular, at an installation height of approx. 3 m the sensor covers a detection radius (r) of approx. 3.4 m
Motion detection:	of persons and objects, necessary temperature difference between subject and surroundings ≥ 5 K
Output, motion sensor:	potential-free changeover contact, for switching safety extra-low voltage only, up to 1 A
After-running time:	adjustable from 4 s to 17 min
LIGHT INTENSITY	
Sensor:	light sensor with diffusor (see beginning of this chapter)
Measuring range, light sensor:	0...1000 lux / 0...5000 lux (selectable via DIP switches)
Output, light sensor:	0 - 10 V
Deviation, light sensor:	typically < ± 10 % of final value (referred to calibration reference source, approx. 5700 K)
Temperature drift:	< ± 5 % of final value / 10 K at +20 °C
HUMIDITY	
Measuring range, humidity:	0...100 % RH (output corresponding to 0 - 10 V)
Operating range, humidity:	10...95 % RH (non-precipitating air)
Deviation, humidity:	typically **± 3 % RH** (20...80 %); at +20 °C, otherwise ± 5 % RH
Output, humidity:	0-10 V
TEMPERATURE	
Measuring range, temperature:	0...+50 °C (output corresponding to 0 - 10 V) other measuring ranges on request!
Operating range, temperature:	0...+50 °C
Deviation, temperature:	typically ± 0.8 K at +20 °C, under standard conditions
Output, temperature:	0-10 V
Ambient temperature:	0...+50 °C
Storage temperature:	–20...+50 °C
Housing:	steel, white painted
Housing dimensions:	cover: Ø 96 mm, height of housing: 30 mm
Installation dimensions:	ceiling cutout: Ø 80 mm installation depth: < 45 mm (incl. connector system) on-wall protrusion: > 13 mm (motion sensor) > 20 mm (humidity sensor)
Sensor protection:	mounted inside ceiling installation housing
Protection class:	III (according to EN 60 730)
Protection type (housing):	**IP 20** (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU

Function output (direction adjustable)	**DIP 1**
normal (default) 0 % = 0 V 100 % = 10 V	OFF
inverted 0 % = 10 V 100 % = 0 V	**ON**

Brightness (adjustable measuring range)	**DIP 3**
0... **1000 Lux** (default)	OFF
0... 5000 Lux	**ON**

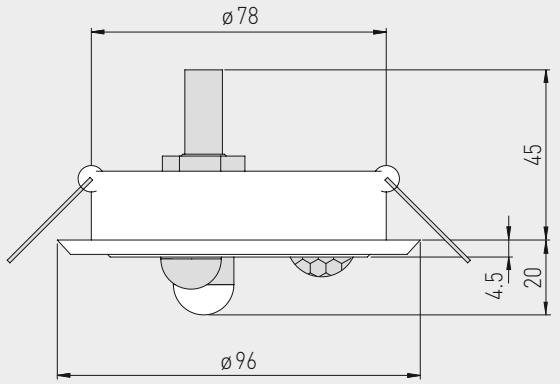
Motion (mode selectable)	**DIP 4**
Motion mode (default) Motion detector is independent of threshold value	OFF
Auto mode If the set threshold value is not reached, the motion detector is active	**ON**

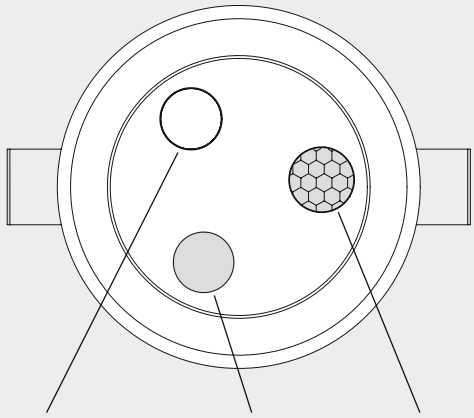
Schematic diagram **DBWF/LF/FTF**
Circuit board



DIP switch 2 is not assigned!

Dimensional drawing **DBWF/LF/FTF**



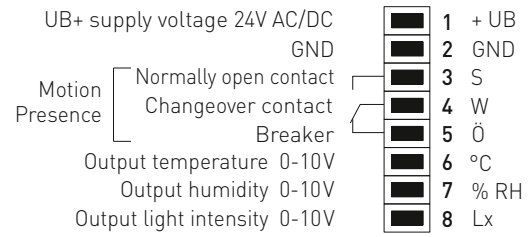


DBWF/LF/FTF





Connecting diagram
Rear side of housing **DBWF/LF/FTF**



KINASGARD® DBWF/LF/FTF In-ceiling motion, light, temperature and humidity sensor				
Type / WG02	**Detection, Measuring Range**	**Output**	**Item No.**	**Price**
DBWF-LF-FTF-W				
1. Presence + Motion	yes / no (relay on / off)	Changeover contact	1401-6114-3100-000	**235,82 €**
2. Light Intensity	0...1000 lux / 0...5000 lux (DIP)	0-10 V (linearised)		
3. Temperature	0 ... 50 °C	0 - 10 V		
4. Humidity	0...100 % RH	0 - 10 V		
Outputs: **0-10 V or inverted 10-0 V** (selectable via DIP switches)				

Air Quality & Flow

AERASGARD®, **RHE**ASGARD® & **RHE**ASREG®
Feel-good climate with energy efficiency

Increased CO2 values, particulate matter or VOC pollution are detrimental with regard to energy costs and well-being. Our air quality and flow sensors allow you to monitor the entire indoor climate in a controlled manner. And our flow monitors and controllers put you firmly in control of lines carrying air, gas or liquid.

Application Areas

- Ventilation and air conditioning
- Ventilator flow monitoring, butterfly valves, heating registers and humidifiers
- Energy management
- Residential, working and conference rooms
- Movie theaters, showrooms and retail stores
- Institutes and laboratories





AERASGARD®, **RHE**ASGARD® & **RHE**ASREG®
AIR QUALITY SENSORS, FLOW SENSORS AND MONITORS

CO2 sensors

FSCO2	In-wall CO2 sensor		**595**
FSTM-CO2	In-wall temperature / CO2 sensor		**595**
RCO2-AS xx	CO2 Room traffic light with signal tone		**581**
RCO2-SD	Room CO2 sensor		**585**
RCO2-W	Room CO2 sensor		**585**
RTM-CO2-SD	Room temperature CO2 sensor		**589**
RFTM-CO2-W	Room humidity / temperature / CO2 sensor		**589**
ACO2-SD	On-wall CO2 sensor		**599**
ACO2-W	On-wall CO2 sensor		**599**
ATM-CO2-SD	On-wall temperature / CO2 sensor		**605**
AFTM-CO2-W	On-wall humidity / temperature / CO2 sensor		**605**
KCO2-SD	Duct CO2 sensor		**615**
KCO2-W	Duct CO2 sensor		**615**
KTM-CO2-SD	Duct temperature / CO2 sensor		**621**
KFTM-CO2-W	Duct humidity / temperature / CO2 sensor		**621**

VOC sensors

FSLQ	In-wall-air quality sensor	NEW	**597**
RLQ-SD	Room air-quality sensor		**577**
RLQ-W	Room air-quality sensor		**577**
KLQ-SD	Duct air-quality sensor		**611**
KLQ-W	Duct air-quality sensor		**611**

Fine dust sensors (PM)

RPS-SD	Room fine dust sensor	NEW	**593**
RFTM-PS-W	Room humidity / temperature / fine dust sensor	NEW	**593**
APS-SD	On-wall fine dust sensor	NEW	**607**

Multifunctional sensors VOC / CO2 / fine dust (PM)

RLQ-CO2-W	Room air-quality / CO2 sensor		**589**
RFTM-LQ-CO2-W	Room humidity / temperature / air-quality / CO2 sensor		**589**
RFTM-PS-CO2-W	Room humidity / temperature / fine dust / CO2 sensor		**593**
ALQ-CO2-W	On-wall air-quality / CO2 sensorr		**605**
AFTM-LQ-CO2-W	On-wall humidity / temperature / air-quality / CO2 sensor		**605**
KLQ-CO2-W	Duct air-quality / CO2 sensor		**621**
KFTM-LQ-CO2-W	Duct humidity / temperature / air-quality / CO2 sensor		**621**

Airflow monitors

KLGF	Duct airflow monitor	NEW	**625**
KLGFVT	Duct sensor for air flow, volume flow and temperature	NEW	**625**
KLSW	Duct airflow monitor	NEW	**625**
SW	Flow monitor		**629**
WFS	Wind vane switch		**627**

Accessories

see chapter Accessories		**652**

Note concerning type designation:
W = with changeover contact

Air Quality & Flow

AERASGARD®, **RHE**ASGARD® & **RHE**ASREG®
Multifunctional sensor technology for air quality and more

Broad Spectrum

Our active devices for measuring and regulating CO2, gas mixtures (VOC), fine dust (PM) and flows are designed to be multifunctional. This reduces the diversity of types and expands their possible applications. Thanks to microprocessor technology, almost any measuring range can be represented, including custom specifications. DIP switches are used to select functions such as multi-range switching, automatic mode, and manual calibration.

Optimum Precision

The devices are tested according to the latest criteria. Take advantage of our experience, our development, manufacturing and product know-how and order these products directly from the manufacturer.

Approved Safety

RoHS conforming materials

ESD compliant manufacturing

CE compliance tested by external laboratories

MADE IN GERMANY

Certified Quality

Our development and production in Nuremberg/Germany is certified by TÜV Thüringen according to DIN EN ISO 9001:2015.

GOST certified

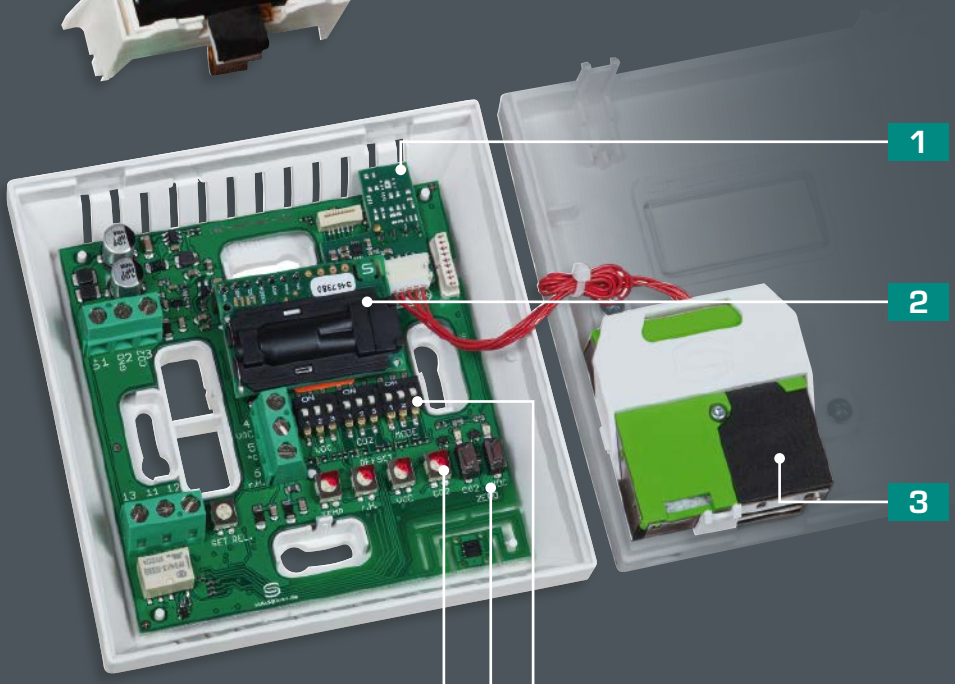
EAC certified

S+S REGELTECHNIK



Optional Display

With backlighting



1

VOC Sensor

For mixed gases and air quality

2

CO2 Sensor

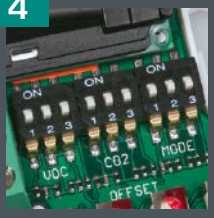
Calibration and balancing is done by means of the bus system in climate cabinets

3

Fine dust sensor (PM)

Optical particle sensor with laser and contamination resistance technology

4



DIP Switches

For individual adjustment of measuring ranges, output, automatic zero point and relay assignment



PLEUROFORM™

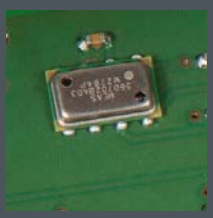
Multi-channel pipe for simultaneous measuring of CO2 and VOC

5



Trigger

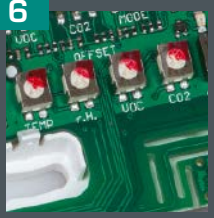
For CO2 or VOC zero point



Air Pressure Compensation

Premium duct sensors with barometric air pressure compensation of CO2 readings

6



Potentiometer

For setting the relay thresholds for CO2 and VOC. For setting the offsets for temperature, humidity, CO2 and VOC



General information
Atmospheric pressure, measurement methods and compensation

Due to the increasing demands for accuracy, low maintenance, and long-term stability, we have further developed and improved our established switchable measuring system. The new generation of devices now includes two-beam measurement technology and atmospheric pressure compensation for CO_2 measurement.

Single-beam measurement method

The single-beam measurement method is particularly suitable for applications where the rooms to be monitored are periodically unoccupied. A prerequisite for reliable measurement results is a regular supply of fresh air – at least three times in seven days. This is the most frequent application.

Dual-beam measurement method

The dual-beam measurement method consists of a reference channel and a measuring channel. In this case, the reference channel operates in a spectrum that is not influenced by the CO_2 concentration of the medium. Ageing, soiling, and drifts affect both channels. With the help of these relationships, the phenomena mentioned can be largely offset without having to rely on a supply of fresh air. The dual-beam measurement method is always used if the application involved unusual circumstances – such as rooms that are in continuous use, 24 hours a day, 7 days a week.

Compensation

In building automation up to now, compensating for the influence of atmospheric pressure was neglected. Due to low- and high-pressure weather conditions and differing altitudes above sea level, barometric pressure variations of up to ± 100 mbar can apply. This can result in measurement errors of up to ± 16 % of the measured value in an uncompensated systems. Our new generation of devices features an integrated atmospheric pressure measurement that compensates CO_2 reading accordingly.

S+S Regeltechnik supplies measuring instruments for CO_2 or VOC measurement in various types of design and, in contrast to other manufacturers, combined devices for CO_2 and VOC measurement with separate sensors for both of these measurands in addition to several switchable measuring ranges.

The most important aspect of ventilation on an as-needed basis is the general room air quality, often also referred to as the "comfort zone". Aside from the generally known and accepted control variables, such as relative humidity and temperature, CO_2 and VOC concentrations in the air are also important parameters to be controlled. Each individual interprets room air and its quality differently.

For that reason, air quality can only be defined in rather general terms. The air must be perceived as pleasant by a majority of people and it must not lead to any discomfort. Air must not contain any hazardous concentrations of pollutants. In this respect, the opinions of persons entering the room are decisive. This is because they soon become accustomed to their surroundings and therefore to the various pollution burdens, which they then no longer notice. An important function of systems for energy-saving ventilation on an as-needed basis is to guarantee good room air quality.

Carbon dioxide

A measuring system based on NDIR (non-dispersive infra-red sensor) technology for CO_2 measurement consists of a light source and a receptor. A certain range of wavelengths of light radiated by the source is damped and absorbed by CO_2 molecules in the measured section. This damping is detected by the receptor.

In building automation applications, detection of the CO_2 content in air is primarily undertaken to control non-smoking rooms occupied by varying numbers of persons, such as conference rooms, break rooms, cinemas, schools, etc. Here, the increased CO_2 content caused by the presence of persons is interpreted as a "deterioration" of the air quality.

Over the last few years, a standard measuring range of 0...2000 ppm (parts per million) has become established for CO_2 measuring instruments. Although this measuring range covers the recommended maximum CO_2 concentrations for working and residential rooms (1000...1500 ppm), in practice however it became apparent that in many applications the measuring range of 2000 ppm does not suffice. Therefore, we have developed and launched a new generation of devices with switchable upper measuring range limits of 2000 ppm, 5000 ppm, and 10000 ppm.

Mixed gas VOC

VOC is the abbreviation for Volatile Organic Compounds. According to the definition by the World Health Organization WHO, VOC are organic substances with a boiling range from +60 to +250°C.

Examples of VOCs include compounds of the substance groups alkanes / alkenes, aromatic compounds, terpenes, halogenated hydrocarbons, esters, aldehydes, and ketones. There is a large number of naturally occurring VOCs, some of which are also released into the atmosphere in substantial quantities, e.g. terpenes and isoprene from forests.

Environmental pollution by VOC caused by human activities increased significantly throughout the last century. The biggest contributor is traffic, followed in second place by the construction sector with construction chemistry products such as coating compounds, adhesives, or sealing compounds. Potential sources of VOC in indoor spaces in addition to construction materials include furnishing objects, cleaning and care products, hobby and do-it-yourself products, office chemicals and, above all, tobacco smoke. An essential carrier of VOC is floor carpeting. Odour problems due to VOC can also be caused be microbes, or metabolic substances from bacteria and fungi.

It is precisely these types of substances mentioned and their increased occurrence that are ascertained. Since the air to be monitored contains a multitude of different substances to which the sensor reacts and since gas mixtures are forming, this sensor does not function selectively but reflects the overall air quality. Also the statement as to what constitutes "good air" or "bad air" cannot be definitively made, as this is an entirely subjective sensation. Ventilation is recommended starting from a value between 60 - 80 % VOC.

The sensor alters its conductivity depending on the concentration, the nature, and the mixture ratio of reducing molecules in ambient air.

CO_2 and / or VOC?

The above explanations demonstrate that there are applications for CO_2 measurement, for VOC measurement, but from our perspective, above all, for a combination of both measurands. The crucial factor in this respect is that both of these measurands are not convertible into each other and derivations to or from one another cannot be made. A NDIR CO_2 measuring instrument measures selectively and cannot detect any VOC, a VOC mixed gas sensor cannot recognize CO_2 molecules.

The new duct sensor featuring the Tyr 2 housing design with **PLEUROFORM**™ multi-channel pipe handles this separation perfectly, can record both CO_2 concentration as well as VOC mixed gas (or gas pressure) and, if necessary, can function as a genuine multifunctional device that delivers humidity and temperature data.

AERASGARD® RLQ-W
AERASGARD® RLQ-SD

Room air quality sensor (VOC) and measuring transducer, self-calibrating, with multi-range switching and active/switching output

S+S REGELTECHNIK

Maintenance-free room sensor **AER**ASGARD® **RLQ-SD** with active output, automatic calibration, in an elegant plastic housing with snap-on lid, for determining the air quality (0…100 % VOC). The measuring transducer converts the measured values into a standard signal of 0-10 V or 4…20 mA (switchable).

Maintenance-free room sensor **AER**ASGARD® **RLQ-W** with active/switching output, automatic calibration in an elegant plastic housing with snap-on lid, optional with traffic light indicator (five coloured LEDs), for determining the air quality (0…100 % VOC). The measuring transducer converts the measured values into a standard signal of 0-10 V or 4…20 mA (switchable).

The sensor is used in offices, hotels, convention centres, apartments, shops, etc. for the purpose of evaluating the indoor climate. This enables energy-saving room ventilation on an as-needed basis, thereby reducing operating costs and improving well-being.

The air quality is detected by a **VOC sensor** (mixed gas sensor for volatile organic substances). This sensor determines the loading of the room air due to contaminated gases such as cigarette smoke, body perspiration, exhaled breathing air, solvent vapours, emissions, etc. With regard to the expected air contamination, low, medium or high VOC sensitivity can be selected. As an alternative, use IAQ categories (from excellent to unhealthy) following the guidelines of the German Federal Environmental Agency to assess the room air.

For more information, see the start of the chapter.

RLQ-W
RLQ-SD

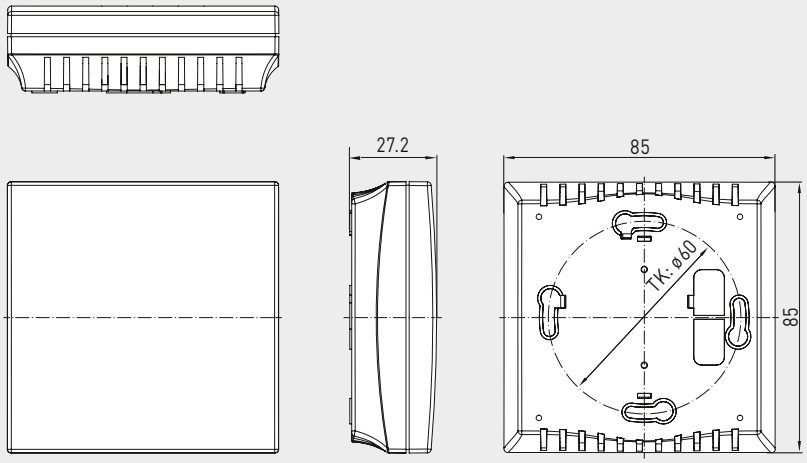


TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %)
Power consumption:	< 1.5 W / 24 V DC typical; < 2.9 VA / 24 V AC typical
Sensor:	VOC sensor (metal oxide) (VOC = volatile organic compounds),, with manual calibration (via zero button), with automatic calibration (permanently active)
Measuring range:	0…100 % air quality; referred to calibrating gas; **multi-range switching** (selectable via DIP switches) VOC sensitivities (low/medium/high) or IAQ category (Indoor Air Quality)
Output:	(0 V = clean air, 10 V = polluted air) **RLQ-SD** 0-10 V (fixed) **RLQ-W** 0-10 V **or** 4…20 mA, working resistance < 800 Ω (selectable via DIP switches), with offset potentiometer (± 10 % of the measuring range)
Relay output:	**RLQ-SD** without changeover contact **RLQ-W** with potential-free **changeover contact** (24 V / 1 A) (switchpoint can be adjusted from 0…100 % of the output signal)
Measuring accuracy:	typically ± 20 % of final value (referred to calibrating gas)
Service life:	> 60 months (under normal load conditions), depending on the type of loading and gas concentration
Gas exchange:	by diffusion
Ambient temperature:	0…+ 50 °C
Warm-up time:	approx. 1 hour
Response time:	approx. 1 minute
Electrical connection:	0.14 - 1.5 mm², via screw terminals
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010), optional stainless steel **V2A** (1.4301)
Dimensions:	85 x 85 x 27 mm (Baldur 1) 100 x 100 x 25 mm (stainless steel)
Installation:	wall mounting or on in-wall flush box, Ø 55 mm, base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes for cable entry from the back, with predetermined breaking point for on-wall cable entry from top / bottom in case of plain on-wall installation
Protection class:	III (according to EN 60 730)
Protection type:	**IP 30** (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU, Low Voltage Directive 2014 / 35 / EU
Optional:	**with traffic light indicator** (five coloured LEDs, see table) for displaying the air quality.

Dimensional drawing

RLQ-W
RLQ-SD

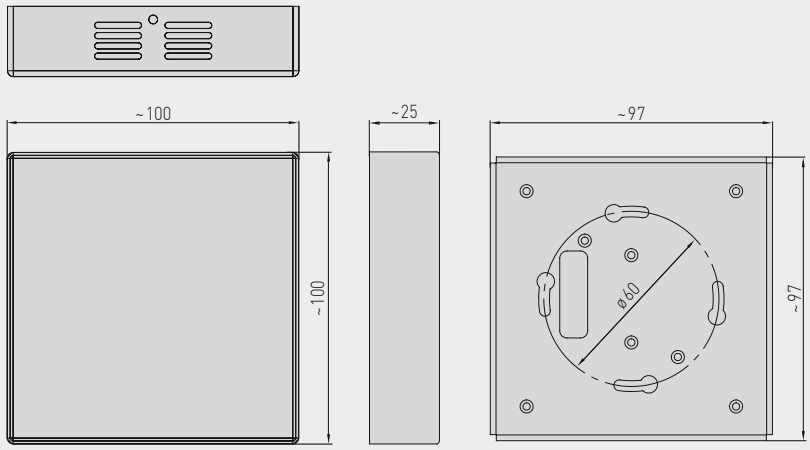


RLQ-W-A
with LEDs



Dimensional drawing

RLQ-W VA



RLQ-W VA
(stainless steel housing)

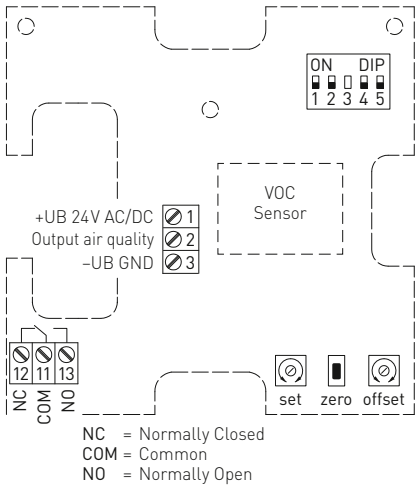


AERASGARD® RLQ-W
AERASGARD® RLQ-SD

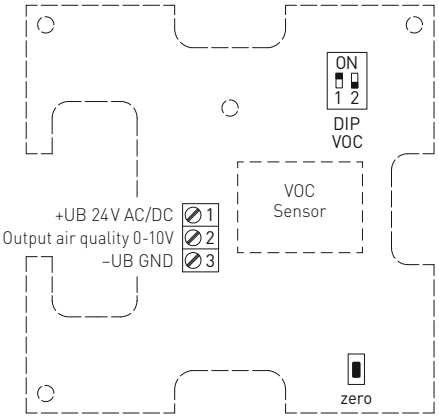
Room air quality sensor (VOC) and measuring transducer, self-calibrating, with multi-range switching and active/switching output

S+S REGELTECHNIK

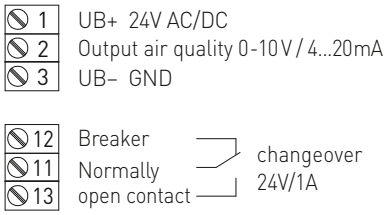
Connecting diagram **RLQ-W**



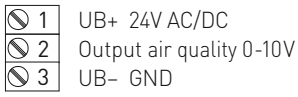
Connecting diagram **RLQ-SD**



Schematic diagram **RLQ-W**



Schematic diagram **RLQ-SD**



DIP switches	RLQ-W	
VOC sensitivity	**DIP 1**	**DIP 2**
LOW	OFF	OFF
MEDIUM (default)	**ON**	OFF
HIGH	OFF	**ON**
IAQ (Indoor Air Quality)	**ON**	**ON**
Output		**DIP 4**
Voltage 0-10 V (default)		OFF
Current 4...20 mA		**ON**
Traffic light (5x LEDs)		**DIP 5**
deactivated		OFF
activated		**ON**
Note: **DIP 3** is not assigned!		

DIP switches	RLQ-SD	
VOC sensitivity	**DIP 1**	**DIP 2**
LOW	OFF	OFF
MEDIUM (default)	**ON**	OFF
HIGH	OFF	**ON**
IAQ (Indoor Air Quality)	**ON**	**ON**

Level	IAQ (Indoor Air Quality)	VOC
1	**excellent** no action required	**0**...**19** %
2	**good** prompt airing recommended	**20**...**39** %
3	**moderate** airing recommended	**40**...**59** %
4	**poor** increased airing required	**60**...**79** %
5	**unhealthy** intense airing necessary	**80**...**100** %

Table according to TVOC guidelines of the German Federal Environmental Agency to assess indoor air contamination *(Bundesgesundheitsbl – Gesundheitsforsch – Gesundheitsschutz 2007, 50: 990–1005)*

Traffic light indicator					RLQ-W-A
VOC content	**LED 1** green	**LED 2** green	**LED 3** yellow	**LED 4** yellow	**LED 5** red
0 %	25 %	–	–	–	–
5 %	50 %	–	–	–	–
10 %	75 %	–	–	–	–
15 %	**100 %**	–	–	–	–
20 %		25 %	–	–	–
25 %		50 %	–	–	–
30 %		75 %	–	–	–
35 %		**100 %**	–	–	–
40 %			25 %	–	–
45 %			50 %	–	–
50 %			75 %	–	–
55 %			**100 %**	–	–
60 %				25 %	–
65 %				50 %	–
70 %				75 %	–
75 %				**100 %**	–
80 %					25 %
85 %					50 %
90 %					75 %
95 %					**100 %**
100 %					

Once the aforementioned values have been reached, the respective LED becomes active (with increasing luminosity of 25 %, 50 %, 75 % and 100 %); LEDs that are already active continue to be illuminated.

RLQ-W-A
with LEDs





AERASGARD® RLQ-SD Room air quality sensor (VOC) and measuring transducer, *Standard*
AERASGARD® RLQ-W Room air quality sensor (VOC) and measuring transducer, *Premium*

Type/WG02	Measuring Range VOC	Output VOC	Equipment	Item No.	Price
RLQ-SD		(fixed)			
RLQ-SD-U	0...100 %	0-10 V	–	1501-61C0-1001-500	**172,35 €**
RLQ-W		(switchable)			
RLQ-W	0...100 %	0-10 V / 4...20 mA	Changeover contact	1501-61C0-7301-500	**180,64 €**
RLQ-W VA	0...100 %	0-10 V / 4...20 mA	Changeover contact, stainless steel housing	1501-61C0-7301-505	**288,87 €**
RLQ-W-A		(switchable)		**with traffic light**	
RLQ-W-A	0...100 %	0-10 V / 4...20 mA	Changeover contact, LEDs	1501-61C0-7331-500	**206,10 €**
	A = with "traffic light" (five coloured LEDs) for displaying the air quality (VOC).				
Note:	This unit **must not** be used as safety-relevant device!				

AERASGARD® RCO2-AS xx

**CO2 traffic light / mobile CO2 sensor,
room CO2 sensor with traffic light indicator and acoustic signal,
self-calibrating**

S+S REGELTECHNIK

Maintenance-free room sensor **AER**ASGARD® **RCO2-AS xx** with traffic-light indicator and acoustic signal, self-calibrating, in an attractive plastic housing, for determining the CO2 content of the room air (0...3000 ppm). The measuring transducer converts the measurand to a standard signal, which is directly presented visually via coloured LEDs (traffic light indicator). An additional signal tone sounds when the warning levels are reached (can be switched off via DIP switch).

Available as a table-top unit**RCO2-AS NT ST** with micro USB power cord and stainless steel stand holder, as well as the device versions **RCO2-AS NT** (with plug-in power supply unit), **RCO2-AS UPNT** (with in-wall power supply unit) and **RCO2-AS** (without power supply unit) for wall mounting.

The room filter with **CO2 traffic light** is used in classrooms, training rooms and convention centres, offices, hotels, apartments, shops, etc. and is used for easy and quick evaluation of the indoor climate. This enables energy-saving demand-based room ventilation, thereby reducing operating costs and improving well-being. One sensor for every 30 m² of room area is recommended

The CO2 measurement is performed using an optical **NDIR sensor** (non-dispersive infra-red technology). You will find more information at the beginning of the chapter.

RCO2-AS
without power supply unit



RCO2-AS UPNT
with in-wall power supply unit





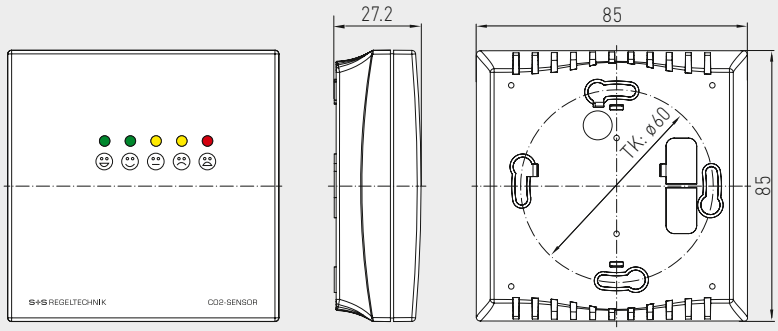
TECHNICAL DATA

Power supply:	**RCO2-AS:**	5...24 V DC
	RCO2-AS UPNT:	5...24 V DC / 230 V AC (power supply unit)*
	RCO2-AS NT:	5...24 V DC / 230 V AC (power supply unit)*
	RCO2-AS NT ST:	5 V DC / 230 V AC (power supply unit)* *(included in the scope of delivery)
electrical connection:	**RCO2-AS:**	terminal screws on circuit board (0.14 - 1.5 mm²), without power supply unit
	RCO2-AS UPNT:	terminal screws on circuit board (0.14 - 1.5 mm²), in-wall power supply unit (open cable ends)
	RCO2-AS NT:	terminal screws on circuit board (0.14 - 1.5 mm²), plug-in power supply unit (open cable ends/Euro plug)
	RCO2-AS NT ST:	Micro-USB socket on circuit board, Micro-USB power supply (micro-USB/Euro plug)
Connection type:		2-wire circuit (no reverse polarity protection!)
Sensor:		optical NDIR sensor (non-dispersive infrared technology), with manual calibration (via zero button) with automatic calibration
Measurement range:		0...3000 ppm
Measuring accuracy:		typically ± 30 ppm ± 3 % of measured value
Temperature dependence:		± 5 ppm / °C or ± 0.5 % of measured value / °C (whichever is greater)
Pressure dependence:		± 0.13 % / mm Hg
Long-term stability:		< 2 % in 15 years
Gas exchange:		by diffusion
Ambient temperature:		0...+ 50 °C
Warm-up time:		approx. 1 hour
Measuring interval:		< 3 seconds
Housing:		plastic, material ABS, colour: pure white (similar to RAL 9010)
Dimensions:		85 x 85 x 27 mm (Baldur 1 housing) 110 x 85 x 100 mm (housing for stand holder)
Mounting:		**RCO2-AS NT ST:** immediately usable free-standing device without mounting (plug-and-play) **RCO2-AS, RCO2-AS NT, RCO2-AS UPNT:** wall mounting or on in-wall flush box, Ø 55 mm, base with 4 holes, for attachment to vertically or horizontally installed in-wall flush boxes for rear cable entry, with predetermined breaking point for top/bottom cable entry for surface-mounted installation
Protection class:		III (according to EN 60 730)
IP rating:		**IP 30** (according to EN 60 529)
Standards:		CE-conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU, low voltage directive 2014 / 35 / EU
Equipment:		**traffic light indicator** (five coloured LEDs), **acoustic signal** (signal can be switched off) for displaying the CO2 concentration Type-specific equipment (see table): **Plug-in power supply unit** (CL = approx. 1.5 m) **In-wall power supply unit** for mounting on in-wall flush boxes **Stand holder** made from stainless steel

**CO2 traffic light / mobile CO2 sensor,
room CO2 sensor with traffic light indicator and acoustic signal,
self-calibrating**

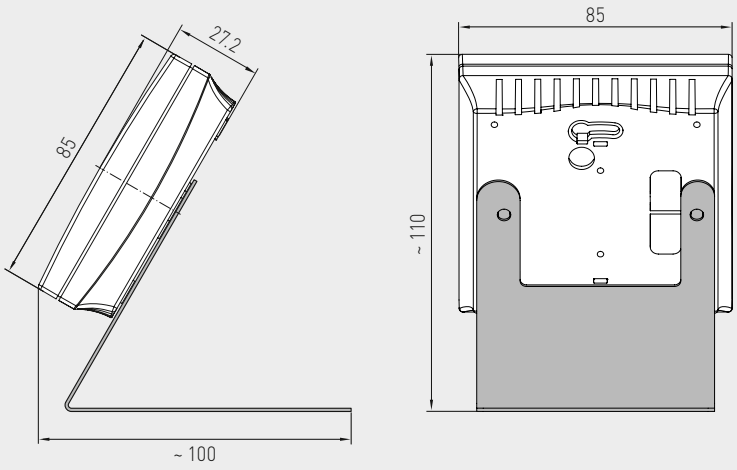
Dimensional drawing
(Baldur 1)

RCO2-AS xx



Dimensional drawing
with stand holder

RCO2-AS NT ST



RCO2-AS NT
with plug-in power supply unit



RCO2-AS NT ST
with Micro-USB power supply unit
and stainless steel
stand holder



**CO2 traffic light / mobile CO2 sensor,
room CO2 sensor with traffic light indicator and acoustic signal,
self-calibrating**

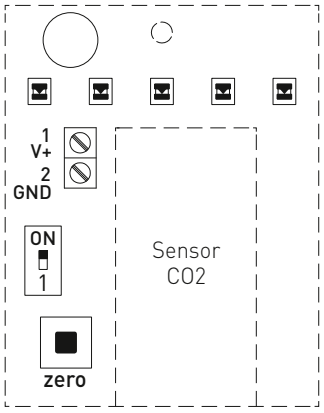
S+S REGELTECHNIK

Indicator						RCO2-AS xx
CO2 content [ppm]	**LED 1** green	**LED 2** green	**LED 3** yellow	**LED 4** yellow	**LED 5** red	**signal tone**
< 400	20 %	–	–	–	–	
401 - 500	40 %	–	–	–	–	
501 - 600	60 %	–	–	–	–	
601 - 700	80 %	–	–	–	–	
701 - 800	**100 %**	–	–	–	–	
801 - 840		20 %	–	–	–	
841 - 880		40 %	–	–	–	
881 - 920		60 %	–	–	–	
921 - 960		80 %	–	–	–	
961 - 1000		**100 %**	–	–	–	
1001 - 1080			20 %	–	–	1x **0.5 s**
1081 - 1160			40 %	–	–	
1161 - 1240			60 %	–	–	
1241 - 1320			80 %	–	–	
1321 - 1400			**100 %**	–	–	
1401 - 1520				20 %	–	2x **0.5 s**
1521 - 1640				40 %	–	
1641 - 1760				60 %	–	
1761 - 1880				80 %	–	
1881 - 2000				**100 %**	–	
2001 - 2200					20 %	3x **0.5 s**
2201 - 2400					40 %	
2401 - 2600					60 %	
2601 - 2800					80 %	
2801 - 3000					**100 %**	1x **1.5 s**

Once the aforementioned values have been reached, the respective LED becomes active (with increasing luminosity of 20 %, 40 %, 60 %, 80 % and 100 %);
LEDs that are already active continue to be illuminated.

Recommendation		RCO2-AS xx
Level	**Traffic light indicator** Actions	**signal tone** (0.5 sec)
1	**green** no action required	
2	**green** prompt airing recommended	
3	**yellow** airing recommended	
4	**yellow** airing required	
5	**red** intensive airing necessary	

Schematic diagram **RCO2-AS xx**



Connecting diagram **RCO2-AS**
RCO2-AS UPNT

1 UB+ 24V AC/DC
2 UB– GND

ATTENTION:
No reverse polarity protection!

DIP switches	RCO2-AS xx
Acoustic signal (can be switched off)	**DIP 1**
active signal tone On (default)	**ON**
deactivated signal tone Off	OFF



CO2 traffic light / mobile CO2 sensor, room CO2 sensor with traffic light indicator and acoustic signal, self-calibrating

RCO2-AS
without power supply unit



RCO2-AS UPNT
with in-wall power supply unit





RCO2-AS NT
with plug-in power supply unit



RCO2-AS NT ST
with Micro-USB power supply unit and stainless steel stand holder



AERASGARD® RCO2-AS xx	Room CO2 sensor with traffic light display and acoustic signal				
Type / WG02	**Measuring ranges** CO2	**Display** CO2	**Equipment**	**Item no.** (Baldur 1)	**Price**
RCO2-AS xx					
RCO2-AS	0...3000 ppm	5 LEDs, signal tone	without power supply unit	1501-61A0-0686-230	**201,73 €**
RCO2-AS NT	0...3000 ppm	5 LEDs, signal tone	Plug-in power supply unit	1501-61A0-0686-232	**206,04 €**
RCO2-AS NT **ST**	0...3000 ppm	5 LEDs, signal tone	Micro-USB power supply unit, **stainless steel stand holder**	1501-61A0-0686-231	**202,85 €**
RCO2-AS UPNT	0...3000 ppm	5 LEDs, signal tone	In-wall power supply unit	1501-61A0-0686-233	**300,74 €**
Note:	This unit must **not** be used as a safety-relevant device!				

AERASGARD® RCO2 - W
AERASGARD® RCO2 - SD

Room CO2 sensor and measuring transducer, self-calibrating, with multi-range switching and active / switching output

S+S REGELTECHNIK

Maintenance-free room sensor **AER**ASGARD® **RCO2 - SD** with active output, automatic calibration (fixed), in an elegant plastic housing with snap-on lid, for determining the CO2 content of the air (0...2000 ppm). The measuring transducer converts the measured values into a standard signal of 0 -10 V.

Maintenance-free room sensor **AER**ASGARD® **RCO2 - W** with active/switching output, automatic calibration (can be deactivated), in an elegant plastic housing with snap-on lid, optional with traffic light indicator (five coloured LEDs), for determining the CO2 content of the air (0...2000 ppm/0...5000 ppm). The measuring transducer converts the measured values into a standard signal of 0 -10 V or 4...20 mA (switchable).

The sensor is used in offices, hotels, convention centres, apartments, shops, etc. for the purpose of evaluating the indoor climate. This enables energy-saving room ventilation on an as-needed basis, thereby reducing operating costs and improving well-being. One sensor for every 30 m² of room area is recommended.

The CO2 measurement is performed using an optical **NDIR sensor** (non-dispersive infra-red technology). The detection range is calibrated for standard applications such as monitoring residential rooms and conference rooms.

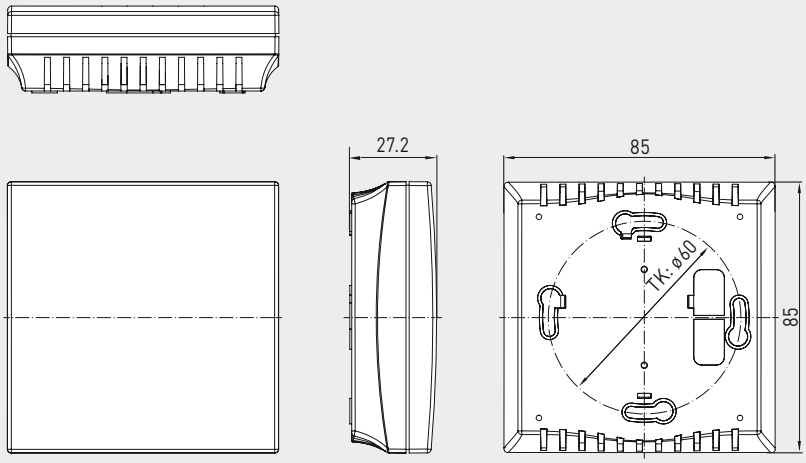
For more information, see the start of the chapter.

TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %)
Power consumption:	< 1.5 W / 24 V DC typical; < 2.9 VA / 24 V AC typical; peak current 200 mA
Sensor:	Optical NDIR sensor (non-dispersive infra-red technology), with manual calibration (via zero button), **RCO2 - SD** with automatic calibration (fixed) **RCO2 - W** with automatic calibration (can be deactivated via DIP switches)
Measuring range:	**RCO2 - SD** 0...2000 ppm (fixed) **RCO2 - W** 0...2000 ppm **or** 0...5000 ppm (selectable via DIP switches)
Output:	**RCO2 - SD** 0 -10 V (fixed) **RCO2 - W** 0 -10 V **or** 4...20 mA, working resistance < 800 Ω (selectable via DIP switches), with offset potentiometer (± 10 % of the measuring range)
Relay output:	**RCO2 - SD** without changeover contact **RCO2 - W** with potential-free **changeover contact** (24 V / 1 A)
Measuring accuracy:	typically ± 30 ppm ± 3 % of measured value
Temperature dependence:	± 5 ppm / °C or ± 0.5 % of measured value / °C (whichever is higher)
Pressure dependence:	± 0.13 % / mm Hg
Long-term stability:	< 2 % in 15 years
Gas exchange:	by diffusion
Ambient temperature:	0...+ 50 °C
Warm up time:	approx. 1 hour
Response time:	< 2 minutes
Electrical connection:	0.14 - 1.5 mm², via screw terminals
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010), stainless steel housing optional **V2A** (1.4301)
Dimensions:	85 x 85 x 27 mm (Baldur 1) 100 x 100 x 25 mm (stainless steel)
Installation:	wall mounting or on in-wall flush box, Ø 55 mm, base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes for cable entry from the back, with predetermined breaking point for on-wall cable entry from top / bottom in case of plain on-wall installation
Protection class:	III (according to EN 60 730)
Protection type:	**IP 30** (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU, Low Voltage Directive 2014 / 35 / EU
Optional:	**with traffic light indicator** (five coloured LEDs, see table) for displaying the CO2 concentration **with display** (see **AER**ASGARD® **RFTM-LQ-CO2**) for displaying the actual CO2 content in ppm

Dimensional drawing

RCO2-W
RCO2-SD

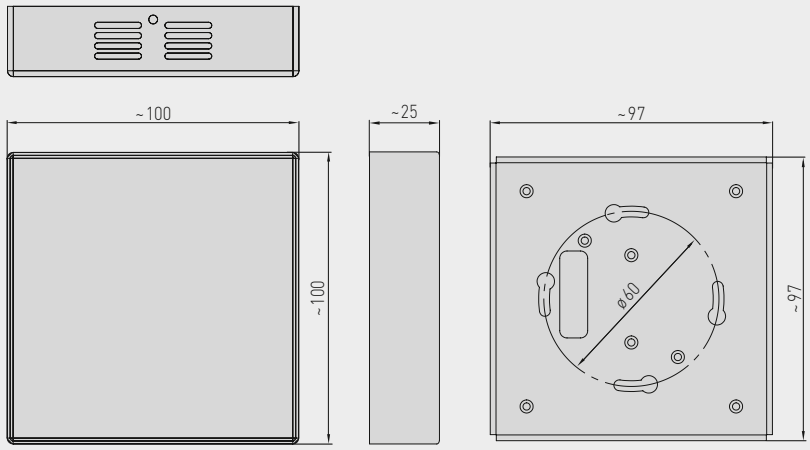


RCO2-W
RCO2-SD



Dimensional drawing

RCO2-W VA



RCO2-W VA
(stainless steel housing)

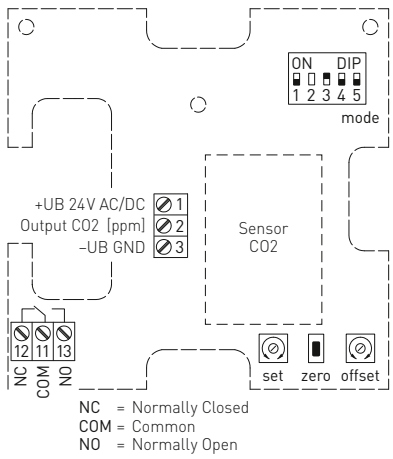


AERASGARD® RCO2-W
AERASGARD® RCO2-SD

Room CO2 sensor and measuring transducer, self-calibrating, with multi-range switching and active/switching output

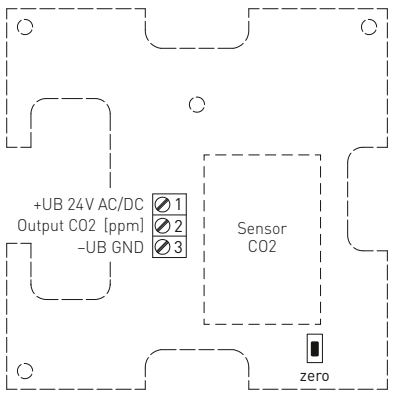
S+S REGELTECHNIK

Connecting diagram **RCO2-W**

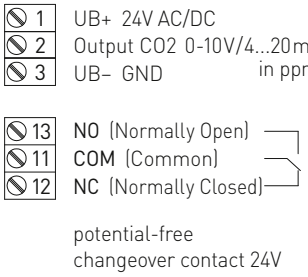


NC = Normally Closed
COM = Common
NO = Normally Open

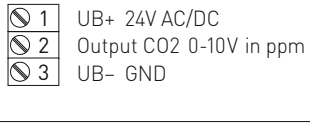
Connecting diagram **RCO2-SD**



Schematic diagram **RCO2-W**



Schematic diagram **RCO2-SD**



DIP switches	RCO2-W
CO2 content	**DIP 1**
0...2000 ppm (default)	OFF
0...5000 ppm	**ON**
CO2 automatic zero point	**DIP 3**
deactivated	OFF
activated (default)	**ON**
Output	**DIP 4**
Voltage 0-10 V (default)	OFF
Current 4...20 mA	**ON**
Traffic light (5x LEDs)	**DIP 5**
deactivated	OFF
activated	**ON**
Note: **DIP 2** is not assigned!	

AERASGARD® RCO2-W
AERASGARD® RCO2-SD

Room CO2 sensor and measuring transducer, self-calibrating, with multi-range switching and active/switching output

Traffic light indicator						RCO2-W-A
CO2 content in ppm 0...2000 ppm	0...5000 ppm	**LED 1** green	**LED 2** green	**LED 3** yellow	**LED 4** yellow	**LED 5** red
350	350	20 %	–	–	–	–
416	536	40 %	–	–	–	–
482	722	60 %	–	–	–	–
548	908	80 %	–	–	–	–
614	**1094**	**100 %**	–	–	–	–
680	1280		20 %	–	–	–
746	1466		40 %	–	–	–
812	1652		60 %	–	–	–
878	1838		80 %	–	–	–
944	**2024**		**100 %**	–	–	–
1010	2210			20 %	–	–
1076	2396			40 %	–	–
1142	2582			60 %	–	–
1208	2768			80 %	–	–
1274	**2954**			**100 %**	–	–
1340	3140				20 %	–
1406	3326				40 %	–
1472	3512				60 %	–
1538	3698				80 %	–
1604	**3884**				**100 %**	–
1670	4070					20 %
1736	4256					40 %
1802	4442					60 %
1868	4628					80 %
1934	**4814**					**100 %**
2000	5000					

Once the aforementioned values have been reached, the respective LED becomes active (with increasing luminosity of 20 %, 40 %, 60 %, 80 % and 100 %);
LEDs that are already active continue to be illuminated.

RCO2-W-A
with LEDs





AERASGARD® RCO2-SD Room CO2 sensor and measuring transducer, *Standard*
AERASGARD® RCO2-W Room CO2 sensor and measuring transducer, *Premium*

Type / WG02	Measuring Range CO2	Output CO2	Equipment	Display	Item No. (Baldur 1)	Price
RCO2-SD	(fixed)	(fixed)				
RCO2-SD-U	0...2000 ppm	0-10 V	–		1501-61A0-1001-200	**209,71 €**
RCO2-W	(switchable)	(switchable)				
RCO2-W	0...2000 ppm / 0...5000 ppm	0-10 V / 4...20 mA	Changeover contact		1501-61A0-7301-200	**248,44 €**
RCO2-W VA	0...2000 ppm / 0...5000 ppm	0-10 V / 4...20 mA	Changeover contact, stainless steel housing		1501-61A0-7301-205	**355,07 €**
RCO2-W LCD	0...2000 ppm / 0...5000 ppm	0-10 V / 4...20 mA	Changeover contact, display	■	see **RFTM-LQ-CO2**	
RCO2-W-A	(switchable)	(switchable)			**with traffic light**	
RCO2-W-A	0...2000 ppm / 0...5000 ppm	0-10 V / 4...20 mA	Changeover contact, LEDs		1501-61A0-7331-200	**291,97 €**
	A = with "traffic light" (five coloured LEDs) for displaying the CO2 concentration.					
Note:	This unit **must not** be used as safety-relevant device!					

AERASGARD® RCO2-W / RLQ-CO2-W
AERASGARD® RFTM-(LQ)-CO2-W / RTM-CO2-SD

Multifunctional room sensors and measuring transducers, for humidity, temperature, air quality (VOC) and CO2 content, calibratable, with active/switching output

S+S REGELTECHNIK

Maintenance-free room sensor **AER**ASGARD® **RTM-CO2-SD** with active output, automatic calibration, in an elegant plastic housing with snap-on lid, for determining the CO2 content of the air (0...2000 ppm) and the temperature (0...+50°C). The measuring transducer converts the measured values into a standard signal of 0-10 V.

Maintenance-free room sensor **AER**ASGARD® **RFTM-LQ-CO2-W** with active/switching output, automatic calibration, in an elegant plastic housing with snap-on lid, optionally with/without display, for determining the CO2 content of the air (0...2000 ppm/0...5000 ppm), the quality in three VOC sensitivity (0...100 % VOC), the temperature (0...+50°C) as well as the relative air humidity (0...100 % RH). The measuring transducer converts the measured values into a standard signal of 0-10 V or 4...20 mA (switchable).

The sensor is used in offices, hotels, convention centres, apartments, shops, etc. for the purpose of evaluating the indoor climate. This enables energy-saving room ventilation on an as-needed basis, thereby reducing operating costs and improving well-being. One sensor for every 30 m² of room area is recommended.

A long-term stable, **digital humidity and temperature sensor** guarantees exact measurement results.

The CO2 measurement is performed using an optical **NDIR sensor** (non-dispersive infra-red technology).
The detection range is calibrated for standard applications such as monitoring residential rooms and conference rooms.

The air quality is detected by a **VOC sensor** (mixed gas sensor for volatile organic substances). This sensor determines the loading of the room air due to contaminated gases such as cigarette smoke, body perspiration, exhaled breathing air, solvent vapours, emissions, etc. As an alternative, use IAQ categories (from excellent to unhealthy) following the guidelines of the German Federal Environmental Agency to assess the room air.

For more information, see the start of the chapter.

TECHNICAL DATA

Voltage supply:	24 V AC / DC (± 10 %)
Power consumption:	**RCO2-W / RTM-CO2-SD:** < 1.5 W / 24 V DC typical; < 2.9 VA / 24 V AC typical; peak current 200 mA **RLQ-CO2-W / RFTM-LQ-CO2-W:** < 4.4 W / 24 V DC typical; < 6.4 VA / 24 V AC typical; peak current 200 mA
Outputs:	**RTM-CO2-SD** 0-10 V (fixed) **Rxx-CO2-W** 0-10 V **or** 4...20 mA, working resistance < 800 Ω (selectable via DIP switches, selected variant applies for all outputs), with offset potentiometer (± 10 % of the measuring range)
Relay output:	**RTM-CO2-SD** without changeover contact **Rxx-CO2-W** with potential-free **changeover contact** (24 V / 1 A) (assignment selectable via DIP switches, switchpoint adjustable)
HUMIDITY	
Sensor (RH / °C):	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
Measuring range (RH):	0...100 % RH
Output (RH):	0-10 V or 4...20 mA (selectable via DIP switches)
Deviation (RH):	typically **± 2.0** % (20...80 % RH) at +25 °C, otherwise ± 3.0 %
TEMPERATURE	
Measuring range (°C):	0...+ 50 °C
Deviation (°C):	typically ± 0.2 K at +25 °C
Output (°C):	**RTM-CO2-SD** 0-10 V (fixed) **Rxx-CO2-W** 0-10 V **or** 4...20 mA (selectable via DIP switches)
AIR QUALITY (VOC)	
Sensor (VOC):	VOC sensor (metal oxide) (VOC = volatile organic compounds), with manual calibration (via zero button) and automatic calibration (permanently active)
Measuring range (VOC):	0...100 % air quality; referred to calibrating gas; **multi-range switching** (selectable via DIP switches) VOC sensitivities (low/medium/high) or IAQ category (Indoor Air Quality)
Output (VOC):	0-10 V (0 V = clean air, 10 V = polluted air) **or** 4...20 mA (selectable via DIP switches, switchpoint can be adjusted from 0...100 % of the output signal)
Measuring accuracy (VOC) :	typically ± 20 % of final value (referred to calibrating gas)
Service life (VOC):	> 60 months (under normal load conditions) depending on the type of loading and gas concentration
CARBON DIOXIDE (CO2)	
Sensor (CO2):	optical NDIR sensor (non-dispersive infra-red technology), with manual calibration (via zero button), **RTM-CO2-SD** with automatic calibration (fixed) **Rxx-CO2-W** with automatic calibration (can be deactivated via DIP switches)
Measuring range (CO2):	**RTM-CO2-SD** 0...2000 ppm (fixed) **Rxx-CO2-W** 0...2000 ppm **or** 0...5000 ppm (selectable via DIP switches)
Output (CO2):	**RTM-CO2-SD** 0-10 V (fixed) **Rxx-CO2-W** 0-10 V **or** 4...20 mA (selectable via DIP switchesr)
Measuring accuracy (CO2):	typically ± 30 ppm (± 3 % of measured value)
Temperature dependence (CO2):	± 5 ppm / °C or ± 0.5 % of measured value / °C (whichever is higher)
Pressure dependence (CO2):	± 0.13 % / mm Hg
Long-term stability (CO2):	< 2 % in 15 years
Gas exchange (CO2):	by diffusion

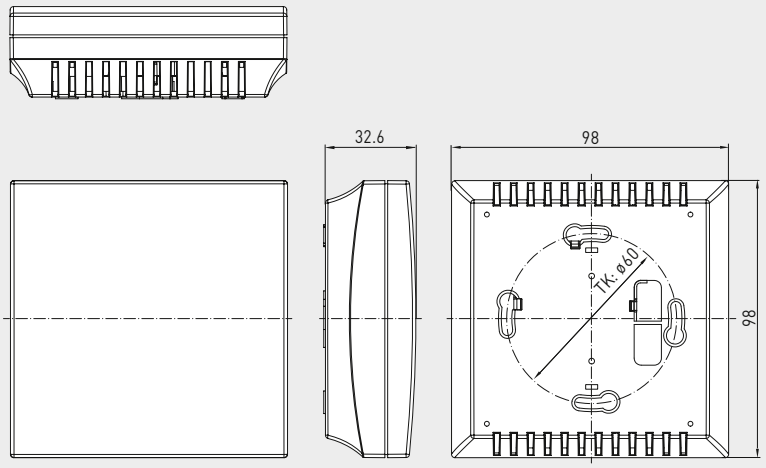
continued on next page!

AERASGARD® RCO2-W / RLQ-CO2-W
AERASGARD® RFTM-(LQ)-CO2-W / RTM-CO2-SD

Multifunctional room sensors and measuring transducers, for humidity, temperature, air quality (VOC) and CO2 content, calibratable, with active/switching output

Dimensional drawing

RCO2-W with display
RLQ-CO2-W
RFTM-LQ-CO2-W
RTM-CO2-SD

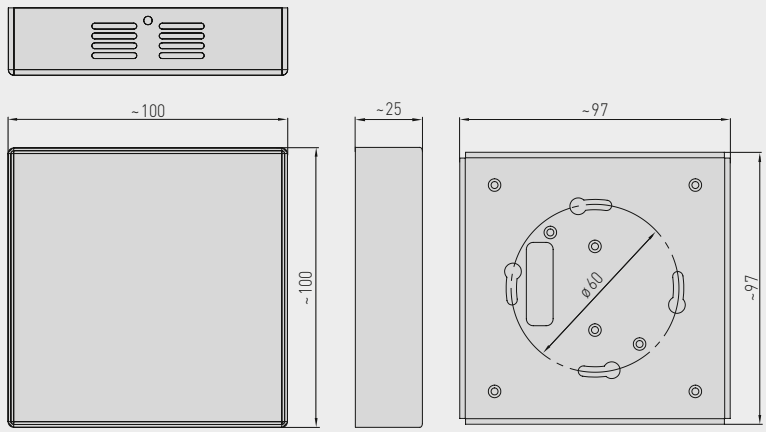


RLQ-CO2-W
RFTM-LQ-CO2-W
RTM-CO2-SD



Dimensional drawing

Stainless steel housing
(See picture on next page)



RCO2-W
RLQ-CO2-W
RFTM-LQ-CO2-W
with display



TECHNICAL DATA (continued)

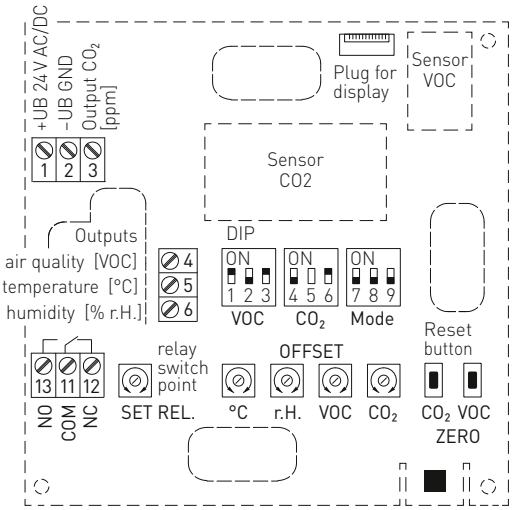
Ambient temperature:	0...+50 °C
Permitted humidity:	0...95 % RH (non-precipitating air)
Warm up time:	approx. 1 hour
Response time:	< 2 minutes
Electrical connection:	0.14 - 1.5 mm², via screw terminals
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010), stainless steel **V2A** (1.4301) housing optional
Dimensions:	98 x 98 x 33 mm (Baldur 2)
Installation:	wall mounting or on in-wall flush box, Ø 55 mm, base with 4 holes, for attachment to vertically or horizontally installed in-wall flush boxes for rear cable entry, with predetermined breaking point for cable entry from top/bottom in case of plain on-wall installation
Protection class:	III (according to EN 60 730)
Protection type:	**IP 30** (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014/30/EU, Low Voltage Directive 2014/35/EU
Optional:	**display with illumination,** two line, cutout approx. 36 x 15 mm (W x H), for displaying actual humidity, actual temperature, air quality and the actual CO2 content

AERASGARD® RCO2-W / RLQ-CO2-W
AERASGARD® RFTM-(LQ)-CO2-W / RTM-CO2-SD

Multifunctional room sensors and measuring transducers, for humidity, temperature, air quality (VOC) and CO2 content, calibratable, with active/switching output

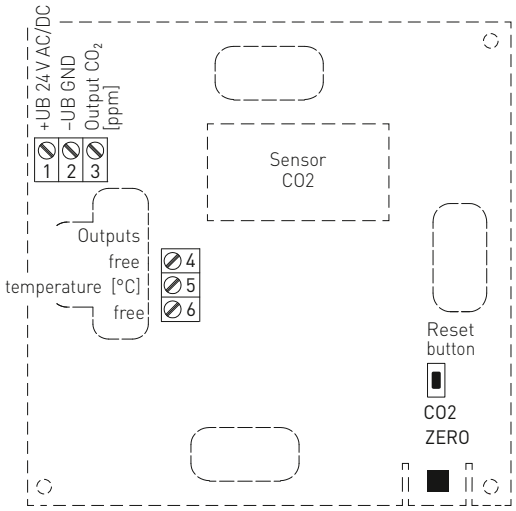
S+S REGELTECHNIK

Schematic diagram **RFTM-LQ-CO2-W**



NC = Normally Closed
COM = Common
NO = Normally Open

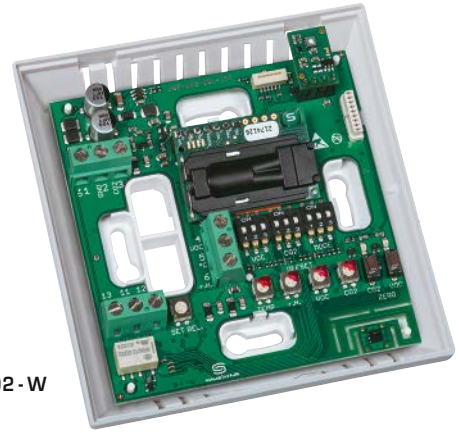
Schematic diagram **RTM-CO2-SD**



DIP switches (Baldur 2)	RFTM-LQ-CO2-W	
VOC sensitivity	**DIP 1**	**DIP 2**
LOW	OFF	OFF
MEDIUM (default)	**ON**	OFF
HIGH	OFF	**ON**
IAQ (Indoor Air Quality)	**ON**	**ON**
CO2 content		**DIP 4**
0...2000 ppm (default)		OFF
0...5000 ppm		**ON**
CO2 automatic zero point		**DIP 6**
deactivated		OFF
activated (default)		**ON**
Relay assignment	**DIP 7**	**DIP 8**
CO2 (default): 600...1900 ppm / 900...4700 ppm	OFF	OFF
VOC: 10...95 %	**ON**	OFF
Temperature: +5...+48 °C	OFF	**ON**
Humidity: 10...95% RH	**ON**	**ON**
Output		**DIP 9**
Voltage 0-10 V (default)		OFF
Current 4...20 mA		**ON**
Note: **DIP 3** and **DIP 5** are not assigned!		

Level	IAQ (Indoor Air Quality)	VOC
1	**excellent** no action required	**0**...**19** %
2	**good** prompt airing recommended	**20**...**39** %
3	**moderate** airing recommended	**40**...**59** %
4	**poor** increased airing required	**60**...**79** %
5	**unhealthy** intense airing necessary	**80**...**100** %

Table according to TVOC guidelines of the German Federal Environmental Agency to assess indoor air contamination
(Bundesgesundheitsbl - Gesundheitsforsch - Gesundheitsschutz 2007, 50: 990–1005)



RFTM-LQ-CO2-W
(Baldur 2)



Stainless steel housing
(optionally available upon request)

AERASGARD® RCO2-W / RLQ-CO2-W
AERASGARD® RFTM-(LQ)-CO2-W / RTM-CO2-SD

Multifunctional room sensors and measuring transducers, for humidity, temperature, air quality (VOC) and CO2 content, calibratable, with active/switching output

Humidity table
MR: 0...100 % RH

% RH	U_A [V]	I_A [mA]
0	0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
Continued at the right ...		

% RH	U_A [V]	I_A [mA]
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

Temperature table
MR: 0...+50 °C

°C	U_A [V]	I_A [mA]
0	0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

AERASGARD® RTM-CO2-SD	Room temperature and CO2 sensor, *Standard*
AERASGARD® RCO2-W	Room CO2 sensor, *Premium*
AERASGARD® RLQ-CO2-W	Room air quality (VOC) and CO2 sensor, *Premium*
AERASGARD® RFTM-CO2-W	Multifunctional room sensor for humidity, temperature and CO2 content, *Deluxe*
AERASGARD® RFTM-LQ-CO2-W	Multifunctional room sensor for humidity, temperature, CO2 content and air quality (VOC), *Deluxe*

Type / WG02	Measuring Range Humidity	Temperature	CO2	VOC	Equipment Display	Item No. (Baldur 2)	Price
RTM-CO2-SD			(fixed)				
RTM-CO2-SD-U	–	0...+50 °C	0...2000 ppm	–	–	1501-61B2-1001-200	**229,60 €**
RCO2-W			(switchable)				
RCO2-W (without display)	–	–	0...2000 / 5000 ppm	–	W	see **RCO2-W / RCO2-SD**	
RCO2-W **LCD**	–	–	0...2000 / 5000 ppm	–	W ■	1501-61B0-7321-200	**298,26 €**
RLQ-CO2-W			(switchable)				
RLQ-CO2-W	–	–	0...2000 / 5000 ppm	0...100 %	W	1501-61B1-7301-500	**375,41 €**
RLQ-CO2-W **LCD**	–	–	0...2000 / 5000 ppm	0...100 %	W ■	1501-61B1-7321-500	**425,24 €**
RFTM-CO2-W			(switchable)				
RFTM-CO2-W	0...100 % RH	0...+50 °C	0...2000 / 5000 ppm	–	W	1501-61B6-7301-200	**350,70 €**
RFTM-CO2-W **LCD**	0...100 % RH	0...+50 °C	0...2000 / 5000 ppm	–	W ■	1501-61B6-7321-200	**388,97 €**
RFTM-LQ-CO2-W			(switchable)				
RFTM-LQ-CO2-W	0...100 % RH	0...+50 °C	0...2000 / 5000 ppm	0...100 %	W	1501-61B8-7301-500	**411,69 €**
RFTM-LQ-CO2-W **LCD**	0...100 % RH	0...+50 °C	0...2000 / 5000 ppm	0...100 %	W ■	1501-61B8-7321-500	**461,52 €**
Outputs:	**0-10 V or 4...20 mA** (selectable via DIP switches, selected variant applies for all outputs) – *Standard* room sensor **RTM-CO2-SD** with fixed output 0-10 V!						
Equipment:	**W = changeover contact** – *Standard* room sensor **RTM-CO2-SD** without changeover contact!						
Note:	This unit **must not** be used as safety-relevant device!						

AERASGARD® RPS-SD
AERASGARD® RFTM-PS-CO2-W

Fine dust sensor/particulate sensor, multifunctional room sensor and measuring transducer for humidity, temperature, fine dust (PM) and CO2 content, calibratable, with active/switching output

S+S REGELTECHNIK

Maintenance-free room sensor **AER**ASGARD® **RPS-SD** with active output, in an elegant plastic housing with snap-on lid, base with 4-hole attachment, for detecting the fine dust content (0...500 µg/m³). The measuring transducer converts the measurand into a standard signal of 0-10 V (fixed).

Maintenance-free, multifunctional room sensor **AER**ASGARD® **RFTM-PS-CO2-W** with active/switching output, automatic calibration, in an elegant plastic housing with snap-on lid, base with 4-hole attachment, optionally with/without display, for detection of measurands air humidity (0...100 % RH), temperature (0...+50°C), fine dust (PM) (0...50/100/300/500 µg/m³) and CO2 content (0...2000/5000 ppm). The measuring transducer converts the measurand into a standard signal of 0-10 V or 4...20 mA (switchable).

Use just one device to monitor and control the entire indoor climate effectively. This enables energy-saving room ventilation on an as-needed basis, thereby reducing operating costs and improving well-being. It is used in offices, hotels, convention centres, apartments, shops, etc. One sensor for every 30 m² of room area is recommended.

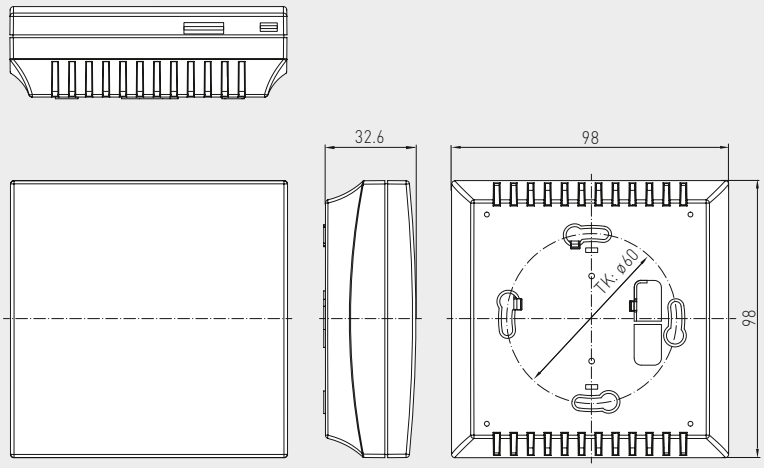
A long-term stable, **digital humidity and temperature sensor** guarantees exact measurement results.
The CO2 content of the air is measured using an optical **NDIR sensor** (non-dispersive infra-red technology).
An optical **fine dust sensor** precisely detects **particulate (PM)** of the size category 0.3 to 10 micrometres.
The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible (except for particulate sensor).

TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %)	
Power consumption:	**RPS-SD**	typically < 1.5 W / 24 V DC; < 2.9 VA / 24 V AC
	RFTM-PS-CO2-W	typically < 4.4 W / 24 V DC; < 6.4 VA / 24 V AC; peak current 200 mA
Output:	**RPS-SD**	0-10 V (fixed)
	RFTM-PS-CO2-W	0-10 V **or** 4...20 mA, working resistance < 800 Ω (selectable via DIP switches, selected version applies **uniformly** to all outputs), with offset potentiometer (± 10 % of measuring range)
Relay output:	**RPS-SD**	without changeover contact
	RFTM-PS-CO2-W	with potential-free **changeover contact** (24 V / 1 A) (assignment selectable via DIP switches, switch point can be set)
HUMIDITY		
Sensor (RH / °C):	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability	
Measuring range (RH):	0...100 % RH	
Output (RH):	0-10 V or 4...20 mA (selectable via DIP switches)	
Deviation (RH):	typically **± 2.0** % (20...80 % RH) at +25 °C, otherwise ± 3.0 %	
TEMPERATURE		
Measuring range (°C):	0...+ 50 °C	
Output (°C):	0-10 V or 4...20 mA (selectable via DIP switches)	
Deviation (°C):	typically ± 0.2 K at +25 °C	
FINE DUST (PM)		
Sensor (PM):	optical **particulate sensor** (**PM** = particulate matter), **fine-dust sensor** with laser- and soiling-resistant technology	
Measuring range (PM):	multi-range switching (selectable via DIP switches) 0...50, 0...100, 0...300 or 0...500 µg/m³	
Output (PM):	**RPS-SD**	0-10 V (fixed)
	RFTM-PS-CO2-W	0-10 V or 4...20 mA (selectable via DIP switches)
Particle size (PM):	**PM 2.5** (0.3...2.5 µm); **PM 10** (0.3...10 µm)	
Measuring accuracy (PM):	typically ± 10 µg/m³ (± 10 % of measured value) at PM 2.5 typically ± 25 µg/m³ (± 25 % of measured value) at PM 10	
Long-term stability (PM):	± 1.25 µg/m³ (± 1.25 % of measured value/year)	
Service life (PM):	> 10 years	
CARBON DIOXIDE (CO2)		
Sensor (CO2):	Optical **NDIR sensor** (non-dispersive infra-red technology), with manual calibration (via zero button), with automatic calibration (can be deactivated via DIP switches)	
Measuring range (CO2):	0...2000 ppm or 0...5000 ppm (selectable via DIP switches)	
Output (CO2):	0-10 V or 4...20 mA (selectable via DIP switches)	
Measuring accuracy (CO2):	typically ± 30 ppm (± 3 % of measured value)	
Temperature dependence (CO2):	± 5 ppm / °C or ± 0.5 % of measured value / °C (whichever is greater)	
Pressure dependence (CO2):	± 0.13 % / mm Hg	
Long-term stability (CO2):	< 2 % in 15 years	
Gas exchange (CO2):	Diffusion	Continued on next page!

Dimensional drawing

RPS-SD
RFTM-PS-CO2-W



RPS-SD
RFTM-PS-CO2-W
without display





RFTM-PS-CO2-W
with display



TECHNICAL DATA (continued)

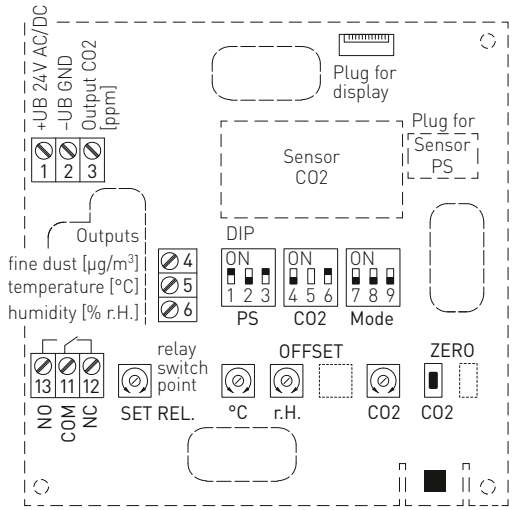
Ambient temperature:	0...+50 °C
Permitted humidity:	0...95 % RH (non-precipitating air)
Warm up time:	approx. 1 hour
Response time:	< 2 minutes
Electrical connection:	0.14 - 1.5 mm², via screw terminals
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010)
Dimensions:	98 x 98 x 33 mm (Baldur 2)
Mounting:	wall mounting or on in-wall flush box, Ø 55 mm, base with 4 holes, for attachment to vertically or horizontally installed in-wall flush boxes for rear cable entry, with predetermined breaking point for top/bottom cable entry for surface-mounted installation
Protection class:	III (according to EN 60 730)
IP rating:	**IP 30** (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU, Low Voltage Directive 2014 / 35 / EU
Optional:	**Display with illumination,** 2-line, cutout approx. 36 x 15 mm (W x H), to display the actual humidity, actual temperature, of the fine-dust and CO2 content as well as for switch point display

AERASGARD® RPS-SD
AERASGARD® RFTM-PS-CO2-W

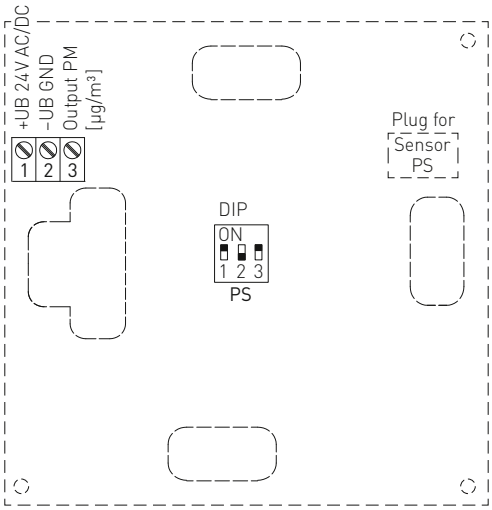
Fine dust sensor/particulate sensor, multifunctional room sensor and measuring transducer for humidity, temperature, fine dust (PM) and CO2 content, calibratable, with active/switching output

S+S REGELTECHNIK

Schematic diagram **RFTM-PS-CO2-W**

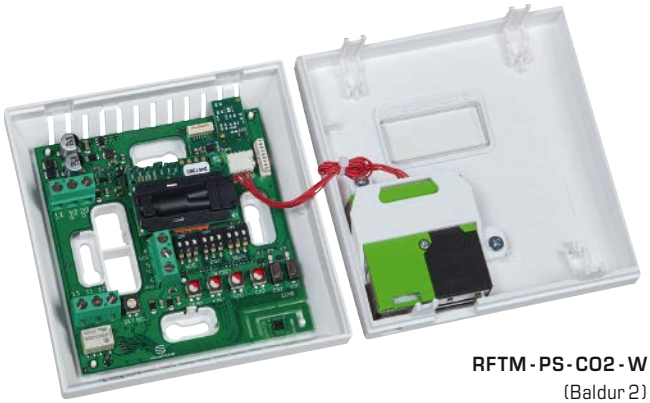


Schematic diagram **RPS-SD**



DIP switch	RFTM-PS-xx	
Fine dust (PM) Measuring range	**DIP 1**	**DIP 2**
0…50 µg/m³	OFF	OFF
0…100 µg/m³ (default)	**ON**	OFF
0…300 µg/m³	OFF	**ON**
0…500 µg/m³	**ON**	**ON**
Fine dust (PM) Particle size		**DIP 3**
PM 2.5 (default)		**ON**
PM 10		OFF
CO2 content		**DIP 4**
0…2000 ppm (default)		OFF
0…5000 ppm		**ON**
CO2 automatic zero point		**DIP 6**
deactivated		OFF
activated (default)		**ON**
Relay assignment	**DIP 7**	**DIP 8**
CO2 (default) 600…1900 ppm / 900…4700 ppm	OFF	OFF
Fine dust 10 %…95 % of measuring range	**ON**	OFF
Temperature +5…+48 °C	OFF	**ON**
Humidity 10…95 % RH	**ON**	**ON**
Output		**DIP 9**
Voltage 0-10 V (default)		OFF
Current 4…20 mA		**ON**
Note: **DIP 5** is not assigned !		

DIP switch	RPS-SD	
Fine dust (PM) Measuring range	**DIP 1**	**DIP 2**
0…50 µg/m³	OFF	OFF
0…100 µg/m³ (default)	**ON**	OFF
0…300 µg/m³	OFF	**ON**
0…500 µg/m³	**ON**	**ON**
Fine dust (PM) Particle size		**DIP 3**
PM 2.5 (default)		**ON**
PM 10		OFF



RFTM-PS-CO2-W
(Baldur 2)

Humidity table
MR: 0...100 % RH

% RH	U_A [V]	I_A [mA]	% RH	U_A [V]	I_A [mA]
0	0	4.0	**50**	5.0	12.0
5	0.5	4.8	**55**	5.5	12.8
10	1.0	5.6	**60**	6.0	13.6
15	1.5	6.4	**65**	6.5	14.4
20	2.0	7.2	**70**	7.0	15.2
25	2.5	8.0	**75**	7.5	16.0
30	3.0	8.8	**80**	8.0	16.8
35	3.5	9.6	**85**	8.5	17.6
40	4.0	10.4	**90**	9.0	18.4
45	4.5	11.2	**95**	9.5	19.2
Continued at the right ...			**100**	10.0	20.0

Temperature table
MR: 0...+50 °C

°C	U_A [V]	I_A [mA]
0	0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

AERASGARD®

RPS-SD Room fine dust sensor / fine dust sensor / particulate sensor (PM), *Standard*

RFTM-PS-W Multifunctional room sensor
for humidity, temperature and fine dust (PM), *Premium*

RFTM-PS-CO2-W Multifunctional room sensor
for humidity, temperature, fine dust (PM) and CO2 content, *Deluxe*

Type / WG02	Measuring Range Humidity	Temperature	PM	CO2	Equipment Display	Item No.	Price
RPS-SD			(switchable)				
RPS-SD	–	–	0... 50 µg/m³ 0...100 µg/m³ 0...300 µg/m³ 0...500 µg/m³	–		1501-2110-1001-000	**307,09 €**
RFTM-PS-W			(switchable)	(switchable)			
RFTM-PS-W	0...100 % RH	0...+50 °C	0... 50 µg/m³ 0...100 µg/m³ 0...300 µg/m³ 0...500 µg/m³	–	W	1501-2116-7301-000	**400,59 €**
RFTM-PS-W **LCD**	0...100 % RH	0...+50 °C	(4x as above)	–	W ■	1501-2116-7321-000	**486,69 €**
RFTM-PS-CO2-W							
RFTM-PS-CO2-W	0...100 % RH	0...+50 °C	0... 50 µg/m³ 0...100 µg/m³ 0...300 µg/m³ 0...500 µg/m³	0...2000 ppm / 0...5000 ppm	W	1501-2113-7301-000	**466,37 €**
RFTM-PS-CO2-W **LCD**	0...100 % RH	0...+50 °C	(4x as above)	0...2000 ppm / 0...5000 ppm	W ■	1501-2113-7321-000	**516,21 €**
Outputs:	**0-10 V or 4...20 mA** (selectable via DIP switches, selected variant applies for all outputs) – *Standard* room sensor **RPS-SD** with fixed output 0-10 V!						
Equipment:	**W = changeover contact** – *Standard* room sensor **RPS-SD** without changeover contact!						
Note:	These units must **not** be used as safety-relevant devices!						

AERASGARD® FSCO2
AERASGARD® FSTM-CO2

Room CO2 and temperature sensor or measuring transducer, in-wall in the panel switch programme, with active output

S+S REGELTECHNIK

The room sensor **AER**ASGARD® **FSCO2 / FSTM-CO2** in the in-wall housing is used for measuring the CO2 content and temperature of the air. It converts the measured values into a standard signal of 0-10 V.

The CO2 content of the air is measured using an optical NDIR sensor (non-dispersive infra-red technology). A digital, long-term stable sensor is used for temperature measurement.

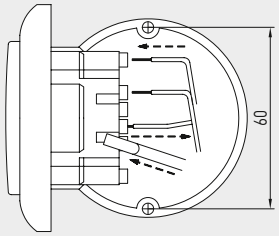
The in-wall sensor is mounted in high-quality panel switch programmes, ideally of the brands Gira, Berker, Merten, Jung, Siemens or Busch-Jaeger (using in-wall adapters) either individually or in combination with light switches, socket outlets, etc.

It is used in non-aggressive, dust-free environments, in refrigeration, air conditioning and clean room technology, and in interior rooms, such as living rooms, offices, hotels, etc.

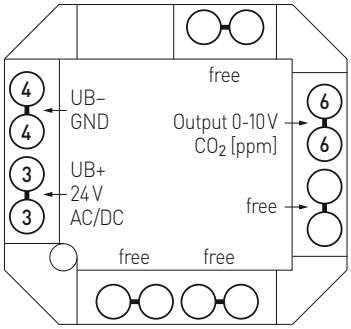
TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %)
Power consumption:	< 1.5 W / 24 V DC; < 2.9 VA / 24 V AC
CARBON DIOXIDE (CO2)	
Sensor, CO2:	**optical NDIR sensor** (non-dispersive infra-red technology), with manual calibration (via zero button) and automatic calibration (fixed)
Long-term stability:	< 2 % in 15 years
Measuring range, CO2:	0...2000 ppm
Output, CO2:	0-10 V
Measuring accuracy, CO2:	typically ± 30 ppm ± 3 % of measured value
Temperature dependence, CO2:	± 5 ppm / °C or ± 0.5 % of measured value / °C (whichever is higher)
Pressure dependence:	± 0.13 % / mm Hg
Gas exchange:	by diffusion
Warm up time:	approx. 1 hour
Response time:	< 2 minutes
TEMPERATURE	
Sensor:	**digital temperature sensor,** low hysteresis, high long-term stability
Long-term stability:	± 1 % per year
Measuring range:	0...+50 °C
Deviation, temperature:	typically ± 0.8 K at +25 °C
Output, temperature:	0-10 V
Mounting:	in-wall flush box Ø 55 mm
Electrical connection:	1.0-2.5 mm², via plug terminals
Ambient temperature:	Storage –35...+85 °C; Operation 0...+50 °C
Permitted humidity:	max. 90 % RH, non-precipitating air
Medium:	clean air and other non-aggressive, non-combustible gases
Protection class:	III (according to EN 60 730)
Protection type:	IP 20 (according to 60 529)
Standards:	CE-conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU
SWITCH PROGRAMME	
Manufacturer:	GIRA System 55 (other switch programmes, manufacturers, colours as well as prices available upon request)
Housing:	plastic, the standard colour is pure glossy white (similar to RAL 9010) (other colours are available upon request with colour variants depending on the respective light switch programme)

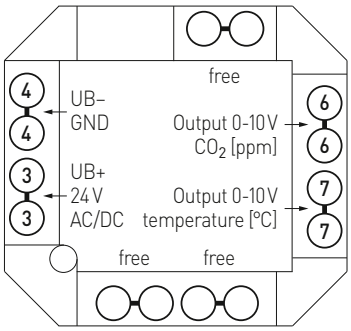
Mounting diagram **in-wall**



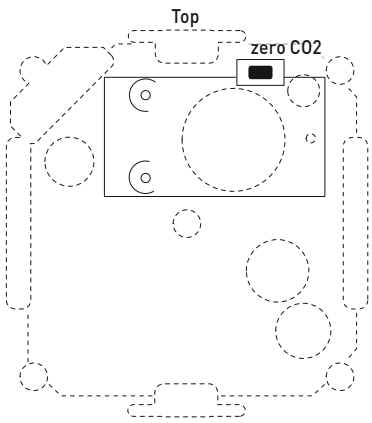
Connection diagram **FSCO2**



Connection diagram **FSTM-CO2**

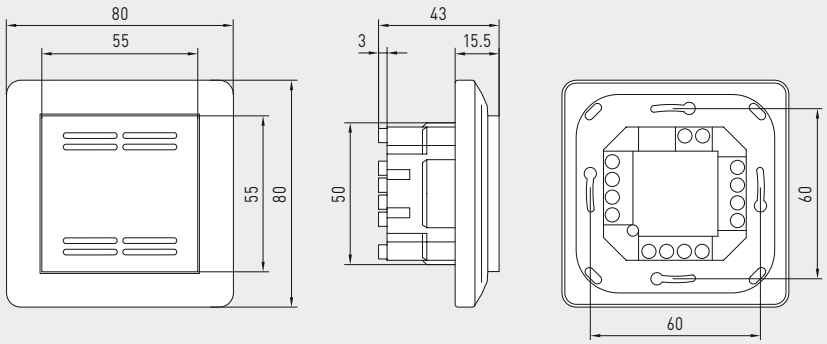


Schematic diagram **FSFTM-CO2**



Dimensional drawing

FSCO2
FSTM-CO2



FSCO2
FSTM-CO2



CO2 content table
MR: 0...2000 ppm

ppm	U_A [V]	ppm	U_A [V]
0	0.00	**1000**	5.0
350	1.75	**1100**	5.5
400	2.00	**1200**	6.0
450	2.25	**1300**	6.5
500	2.50	**1400**	7.0
550	2.75	**1500**	7.5
600	3.00	**1600**	8.0
700	3.50	**1700**	8.5
800	4.00	**1800**	9.0
900	4.50	**1900**	9.5
Continued to the right ...		**2000**	10.0

Temperature table
MR: 0...+50 °C

°C	U_A [V]
0	0.0
5	1.0
10	2.0
15	3.0
20	4.0
25	5.0
30	6.0
35	7.0
40	8.0
45	9.0
50	10.0

AERASGARD® FSCO2 Room CO2 sensor or measuring transducer, in-wall
AERASGARD® FSTM-CO2 Room temperature and CO2 sensor or measuring transducer, in-wall

Type / WG02	Measuring Range CO2	Measuring Range Temperature	Output CO2	Output Temperature	Item No.	Price
FSCO2						
FSCO2-U	0...2000 ppm	–	0-10 V	–	1501-9120-1001-162	**337,90 €**
FSTM-CO2						
FSTM-CO2-U	0...2000 ppm	0...+50 °C	0-10 V	0-10 V	1501-9122-1001-162	**342,64 €**

AERASGARD® FSLQ

Room air-quality sensors (VOC) or measuring transducers, in-wall in the panel switch programme, with active output

NEW

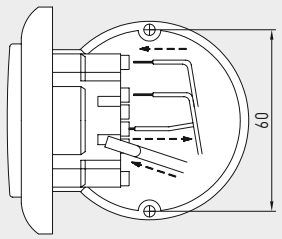
S+S REGELTECHNIK

Maintenance-free air-quality sensor **AER**ASGARD® **FSLQ** with active output, automatic calibration, in the in-wall housing, for determining the air quality (0…100 % VOC). The measuring transducer converts the measured variables into a standard signal of 0-10 V. The in-wall sensor is mounted in high-quality panel switch programmes, ideally of the brands Gira, Berker, Merten, Jung, Siemens or Busch-Jaeger (using in-wall adapters) either individually or in combination with light switches, socket outlets, etc.

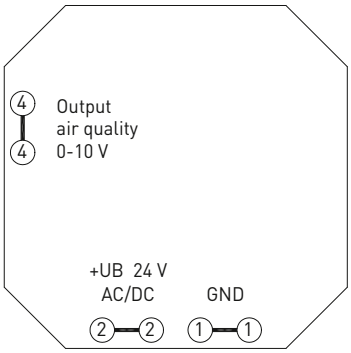
The sensor is used in offices, hotels, convention centres, apartments, shops, etc. and is used for evaluating the indoor climate. This enables energy-saving room ventilation on an as-needed basis, thereby reducing operating costs and improving well-being.

The air quality is detected by a **VOC sensor** (mixed gas sensor for volatile organic substances). This determines the pollutant loading of the room air by contaminated gases such as cigarette smoke, body vapours, breathing air, solvent vapours, emissions, etc.

Mounting diagram [mm] **In-wall**



Schematic diagram **FSLQ-U**



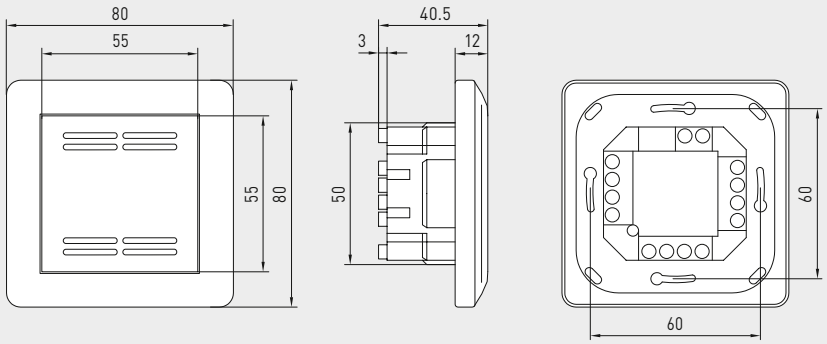
TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %)
Power consumption:	typically < 2.0 VA / 24 V AC; typically < 1.0 W / 24 V DC
AIR QUALITY (VOC)	
Sensor:	VOC sensor (metal oxide) **with automatic calibration** (VOC = volatile organic compounds) Detection of the gases is not selective
Measuring range:	0…100 % air quality (with reference to the calibration gas)
Measuring accuracy:	typically ± 20 % final value (with reference to the calibration gas)
Service life:	> 60 months (under normal load conditions)
Warm-up time:	approx. 1 hour
Response time:	< 60 s
Output:	0 - 10 V (0 V = clean air, 10 V = polluted air) (low to elevated room air pollution load)
Mounting:	in-wall flush box Ø 55 mm
Electrical connection:	max. 1.5 mm², via push-in terminals
Ambient temperature:	Storage –20…+50 °C; Operation 0…+50 °C
Permitted humidity:	max. 95 % RH, non-condensing air
Medium:	clean air and non-aggressive, non-combustible gases
Protection class:	III (according to EN 60 730)
Protection type:	IP 20 (according to EN 60 529)
Standards:	CE-conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU
SWITCH PROGRAMME	
Manufacturer:	GIRA System 55 (other switch programmes, manufacturers, colours as well as prices available upon request)
Housing:	plastic, the standard colour is pure glossy white (similar to RAL 9010) (other colours are available upon request with colour variants depending on the respective light switch programme)

Room air-quality sensors (VOC) or measuring transducers, in-wall in the panel switch programme, with active output

Dimensional drawing
[mm]

FSLQ



FSLQ



Table VOC content
MR: 0...100 %

VOC %	U_A [V]
0	0,0
5	0,5
10	1,0
15	1,5
20	2,0
25	2,5
30	3,0
35	3,5
40	4,0
45	4,5
50	5,0
55	5,5
60	6,0
65	6,5
70	7,0
75	7,5
80	8,0
85	8,5
90	9,0
95	9,5
100	10,0

AERASGARD® FSLQ	Room air quality sensor (VOC) or measuring transducer, in-wall			
Type / WG01	**Measuring range** VOC	**Output** VOC	**Item No.**	**Price**
FSLQ				
FSLQ-U	0...100 %	0-10 V	1501-5120-1000-162	**245,70 €**
Note:	This unit must **not** be used as a safety-relevant device!			

AERASGARD® ACO2-W
AERASGARD® ACO2-SD

On-wall CO2 sensor and measuring transducer, self-calibrating, with multi-range switching and active / switching output

S+S REGELTECHNIK

Maintenance-free on-wall sensor **AER**ASGARD® **ACO2-SD** with active output, automatic calibration (fixed), in an impact-resistant plastic housing with quick-locking screws, for determining the CO2 content of the air (0…2000 ppm/0…5000 ppm). The measuring transducer converts the measured values into a standard signal of 0-10 V.

Maintenance-free on-wall sensor **AER**ASGARD® **ACO2-W** with active/switching output, automatic calibration (can be deactivated), in an impact-resistant plastic housing with quick-locking screws, optionally with/without display, for determining the CO2 content of the air (0…2000 ppm/0…5000 ppm). he measuring transducer converts the measured values into a standard signal of 0-10 V or 4…20 mA (switchable).

The sensor is used in offices, hotels, convention centres, apartments, shops, etc. for the purpose of evaluating the indoor climate. This enables energy-saving room ventilation on an as-needed basis, thereby reducing operating costs and improving well-being. One sensor for every 30 m² of room area is recommended.

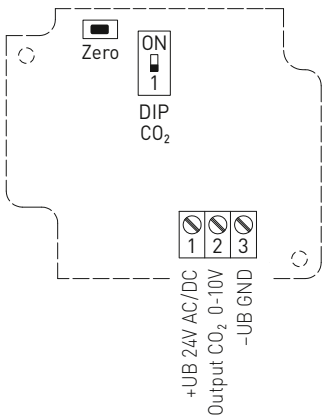
The CO2 measurement is performed using an optical **NDIR sensor** (non-dispersive infra-red technology). The detection range is calibrated for standard applications such as monitoring residential rooms and conference rooms.

For more information, see the start of the chapter.

TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %)
Power consumption:	< 1.5 W / 24 V DC typical; < 2.9 VA / 24 V AC typical; Peak current 200 mA
Sensor:	optical NDIR sensor (non-dispersive infra-red technology), with manual calibration (via zero button), **ACO2-SD** with automatic calibration (fixed) **ACO2-W** with automatic calibration (can be deactivated via DIP switches)
Measuring range:	**Multi-range switching** (selectable via DIP switches) 0…2000 ppm; 0…5000 ppm
Output:	**ACO2-SD** 0-10 V (fixed) **ACO2-W** 0-10 V **or** 4…20 mA, working resistance < 800 Ω (selectable via DIP switches), with offset potentiometer (± 10 % of the measuring range)
Relay output:	**ACO2-SD** without changeover contact **ACO2-W** with potential-free **changeover contact** (24 V / 1 A), switchpoint adjustable
Measuring accuracy:	typically ± 30 ppm ± 3 % of measured value
Temperature dependence:	± 5 ppm / °C or ± 0.5 % of measured value / °C (whichever is higher)
Pressure dependence:	± 0.13 % / mm Hg
Long-term stability:	< 2 % in 15 years
Gas exchange:	by diffusion
Warm up time:	approx. 1 hour
Ambient temperature:	–10…+60 °C
Response time:	approx. 1 minute
Electrical connection:	0.14 - 1.5 mm², via screw terminals
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016)
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Process connection:	by screws
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU
Optional:	**with display** (see **AER**ASGARD® **AFTM-LQ-CO2**) for displaying the actual CO2 content in ppm
ACCESSORIES	see table

Schematic diagram **ACO2-SD**

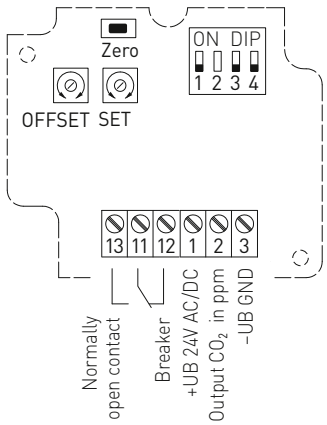


Connecting diagram **ACO2-SD**



UB+ 24V AC/DC
Output CO_2 0-10V in ppm
UB– GND

Schematic diagram **ACO2-W**



Connecting diagram **ACO2-W**



UB+ 24V AC/DC
Output CO_2 0-10V/4…20mA
UB– GND

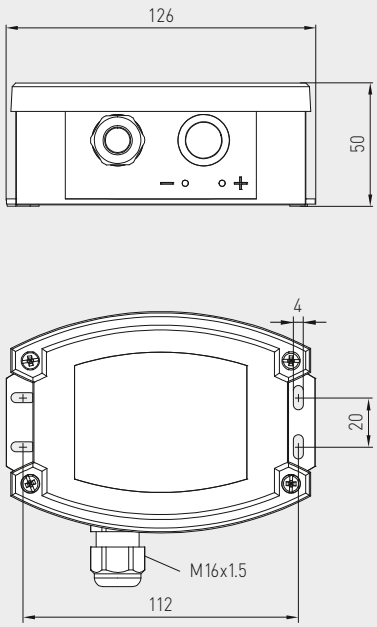
Breaker
Normally open contact
changeover 24V/1A

AERASGARD® ACO2-W
AERASGARD® ACO2-SD

On-wall CO2 sensor and measuring transducer, self-calibrating, with multi-range switching and active/switching output

Dimensional drawing

ACO2-W
ACO2-SD



M12 connector
(optional on request)

ACO2-W
ACO2-SD



WS-03
Weather and sun protection hood
(optional)



DIP switch	ACO2-W
CO2 content	**DIP 1**
0...2000 ppm (default)	OFF
0...5000 ppm	**ON**
CO2 automatic zero point	**DIP 3**
deactivated	OFF
activated (default)	**ON**
Output	**DIP 4**
Voltage 0-10 V (default)	OFF
Current 4...20 mA	**ON**
Note: **DIP 2** is not assigned!	

DIP switch	ACO2-SD
CO2 content	**DIP 1**
0...2000 ppm (default)	OFF
0...5000 ppm	**ON**

AERASGARD® ACO2-SD On-wall CO2 sensor and measuring transducer, *Standard*
AERASGARD® ACO2-W On-wall CO2 sensor and measuring transducer, *Premium*

Type/WG02B	Measuring Range CO2	Output CO2	Equipment	Display	Item No.	Price
ACO2-SD	(switchable)	(fixed)				
ACO2-SD-U	0...2000 ppm / 0...5000 ppm	0-10 V	–		1501-7110-1001-200	**244,81 €**
ACO2-W	(switchable)	(switchable)				
ACO2-W	0...2000 ppm / 0...5000 ppm	0-10 V / 4...20 mA	changeover contact		1501-7110-7301-200	**351,23 €**
ACO2-W LCD	0...2000 ppm / 0...5000 ppm	0-10 V / 4...20 mA	changeover contact, display	■	see **AFTM-LQ-CO2**	
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101 (on request)					
Note:	This unit **must not** be used as safety-relevant device!					

ACCESSORIES			
WS-03	**Weather and sun protection hood**, 200 x 180 x 150 mm, stainless steel **V2A** (1.4301)	7100-0040-6000-000	**44,74 €**
	For further information see last chapter!		

AERASGARD® ACO2-W / ALQ-CO2-W
AERASGARD® AFTM-(LQ)-CO2-W / ATM-CO2-SD

Multifunctional on-wall sensors and measuring transducers, for humidity, temperature, CO2 content and air quality (VOC), calibratable, with active/switching output

S+S REGELTECHNIK

Maintenance-free on-wall sensor **AER**ASGARD® **ATM-CO2-SD** with active output, automatic calibration, in an impact-resistant plastic housing with quick-locking screws, for determining the CO2 content of the air (0...2000 ppm/0...5000 ppm) and the temperature (–35...+80 °C). The measuring transducer converts the measured values into a standard signal of 0-10 V.

Maintenance-free on-wall sensor **AER**ASGARD® **AFTM-LQ-CO2-W** with active/switching output, automatic calibration, in an impact-resistant plastic housing with quick-locking screws, optionally with/without Display, for determining the CO2 content of the air (0...2000 ppm/0...5000 ppm), the quality (0...100 % VOC), the temperature (–35...+80 °C) as well as the relative air humidity (0...100 % RH). The measuring transducer converts the measured values into a standard signal of 0-10 V or 4...20 mA (switchable).

The sensor is used in offices, hotels, convention centres, apartments, shops, etc. for the purpose of evaluating the indoor climate. This enables energy-saving room ventilation on an as-needed basis, thereby reducing operating costs and improving well-being. One sensor for every 30 m² of room area is recommended.

A long-term stable, **digital humidity and temperature sensor** guarantees exact measurement results. The CO2 measurement is performed using an optical **NDIR sensor** (non-dispersive infra-red technology). The detection range is calibrated for standard applications such as monitoring residential rooms and conference rooms. The air quality is detected by a **VOC sensor** (mixed gas sensor for volatile organic substances). This sensor determines the loading of the room air due to contaminated gases such as cigarette smoke, body perspiration, exhaled breathing air, solvent vapours, emissions, etc. With regard to the expected air contamination, low, medium or high VOC sensitivity can be selected. As an alternative, use IAQ categories (from excellent to unhealthy) following the guidelines of the German Federal Environmental Agency to assess the room air.

For more information, see the start of the chapter.

TECHNICAL DATA

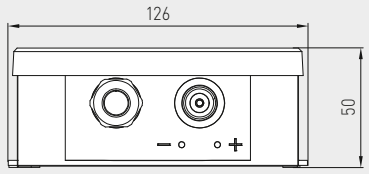
Voltage supply:	24 V AC / DC (± 10 %)
Power consumption:	< 4.8 W / 24 V DC typical; < 6.8 VA / 24 V AC typical; peak current 200 mA
Outputs:	**Axx-SD** 0-10 V (fixed) **Axx-W** 0-10 V **or** 4...20 mA, working resistance < 800 Ω (selectable via DIP switches, selected variant applies for all outputs), with offset potentiometer (± 10 % of the measuring range)
Relay output:	**Axx-SD** without changeover contact **Axx-W** with potential-free **changeover contact** (24 V / 1 A)
HUMIDITY	
Sensors:	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
Sensor protection:	**plastic** sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional **metal** sinter filter, Ø 16 mm, L = 32 mm)
Measuring range, humidity:	0...100 % RH
Operating range, humidity:	0...95 % RH (without dew formation)
Deviation of humidity:	typically **± 2.0** % (20...80 % RH) at +25 °C, otherwise ± 3.0 %
Output, humidity:	0-10 V **or** 4...20 mA (selectable via DIP switches)
TEMPERATURE	
Measuring range, temperature:	–35...+80 °C
Operating range, temperature:	–10...+60 °C
Temperature deviation:	typically ± 0.4 K at 25 °C
Output, temperature:	**Axx-SD** 0-10 V (fixed) **Axx-W** 0-10 V **or** 4...20 mA (selectable via DIP switches)
AIR QUALITY (VOC)	
Sensor, VOC:	VOC sensor (metal oxide) (VOC = volatile organic compounds), with manual calibration (using zero button) and automatic calibration (permanently active)
Measuring range, VOC:	0...100 % air quality; referred to calibrating gas; **multi-range switching** (selectable via DIP switches) VOC sensitivities (low/medium/high) or IAQ category (Indoor Air Quality)
Output, VOC:	0-10 V (0 V = clean air, 10 V = polluted air) **or** 4...20 mA (selectable via DIP switches, switchpoint can be adjusted from 0...100 % of the output signal)
Measuring accuracy, VOC:	typically ± 20 % of final value (referred to calibrating gas)
Service life:	> 60 months (under normal load conditions) depending on the type of loading and gas concentration
CARBON DIOXIDE (CO2)	
Sensor, CO2:	optical NDIR sensor (non-dispersive infra-red technology), with manual calibration (via zero button), **Axx-SD** with automatic calibration (fixed) **Axx-W** with automatic calibration (can be deactivated via DIP switches)
Measuring range, CO2:	0...2000 ppm **or** 0...5000 ppm (selectable via DIP switches)
Output, CO2:	**Axx-SD** 0-10 V (fixed) **Axx-W** 0-10 V **or** 4...20 mA (selectable via DIP switches)
Measuring accuracy, CO2:	typically ± 30 ppm ± 3 % of measured value
Temperature dependence, CO2:	± 5 ppm / °C or ± 0.5 % of measured value / °C (whichever is higher)

continued on next page!

AERASGARD® ACO2-W / ALQ-CO2-W
AERASGARD® AFTM-(LQ)-CO2-W / ATM-CO2-SD

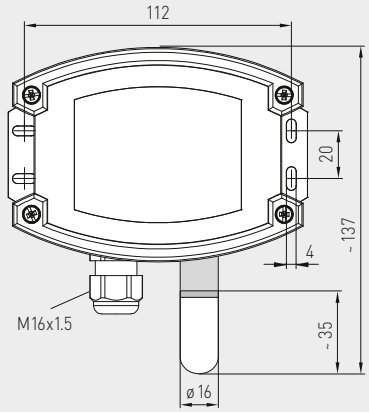
Multifunctional on-wall sensors and measuring transducers, for humidity, temperature, CO2 content and air quality (VOC), calibratable, with active/switching output

Dimensional drawing **AFTM-LQ-CO2-W**



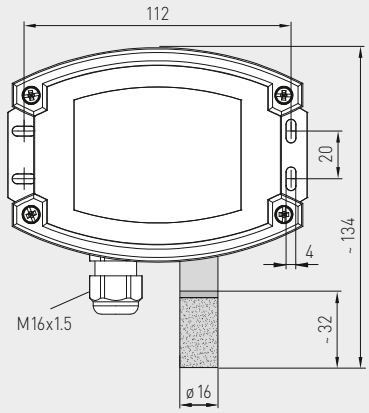
M12 connector
(optional on request)





SF-K
plastic sinter filter
(standard)





SF-M
metal sinter filter
(optional)



AFTM-LQ-CO2-W
with plastic sinter filter
(standard)



AFTM-LQ-CO2-W
with display and
plastic sinter filter
(standard)



TECHNICAL DATA (continued)

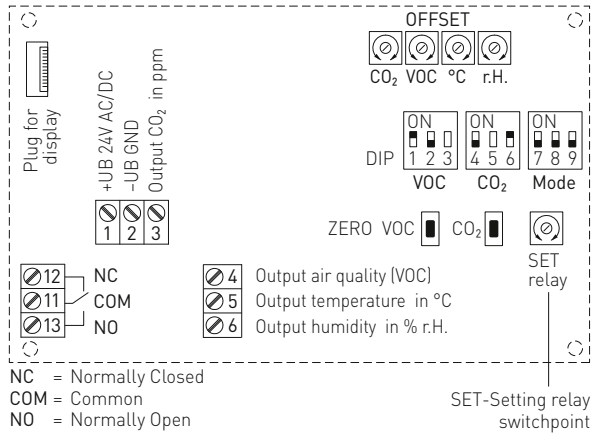
Pressure dependence:	± 0.13 % / mm Hg
Long-term stability:	< 2 % in 15 years
Gas exchange:	by diffusion
Ambient temperature:	–10...+60 °C
Response time:	< 2 minutes
Electrical connection:	0.14 - 1.5 mm², via screw terminals
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Protective tube:	**stainless steel V2A** (1.4301), Ø 16 mm, NL = 55 mm
Process connection:	by screws
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU
Optional:	three-line **display with illumination,** cutout approx. 70 x 40 mm (W x H), for displaying actual humidity, actual temperature, air quality and / or the actual CO2 content

AERASGARD® ACO2-W / ALQ-CO2-W
AERASGARD® AFTM-(LQ)-CO2-W / ATM-CO2-SD

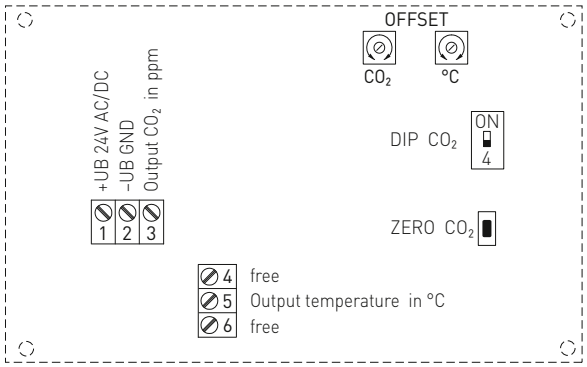
Multifunctional on-wall sensors and measuring transducers, for humidity, temperature, CO2 content and air quality (VOC), calibratable, with active/switching output

S+S REGELTECHNIK

Schematic diagram **AFTM-LQ-CO2-W**



Schematic diagram **ATM-CO2-SD**



DIP switches	AFTM-LQ-CO2-W	
VOC sensitivity	**DIP 1**	**DIP 2**
LOW	OFF	OFF
MEDIUM (default)	**ON**	OFF
HIGH	OFF	**ON**
IAQ (Indoor Air Quality)	**ON**	**ON**
CO2 content		**DIP 4**
0...2000 ppm (default)		OFF
0...5000 ppm		**ON**
CO2 automatic zero point		**DIP 6**
deactivated		OFF
activated (default)		**ON**
Relay assignment	**DIP 7**	**DIP 8**
CO2 (default): 600...1900 ppm / 900...4700 ppm	OFF	OFF
VOC: 10...95 %	**ON**	OFF
Temperature: –23...+74 °C	OFF	**ON**
Humidity: 10...95% RH	**ON**	**ON**
Output		**DIP 9**
Voltage 0-10 V (default)		OFF
Current 4...20 mA		**ON**
Note: **DIP 3** and **DIP 5** are not assigned!		

DIP switches	ATM-CO2-SD
CO2 content	**DIP 4**
0...2000 ppm (default)	OFF
0...5000 ppm	**ON**

Level	IAQ (Indoor Air Quality)	VOC
1	**excellent** no action required	**0...19 %**
2	**good** prompt airing recommended	**20...39 %**
3	**moderate** airing recommended	**40...59 %**
4	**poor** increased airing required	**60...79 %**
5	**unhealthy** intense airing necessary	**80...100 %**

Table according to TVOC guidelines of the German Federal Environmental Agency to assess indoor air contamination
(Bundesgesundheitsbl - Gesundheitsforsch - Gesundheitsschutz 2007, 50: 990–1005)

AERASGARD® ACO2-W / ALQ-CO2-W
AERASGARD® AFTM-(LQ)-CO2-W / ATM-CO2-SD

Multifunctional on-wall sensors and measuring transducers, for humidity, temperature, CO2 content and air quality (VOC), calibratable, with active/switching output

AFTM-LQ-CO2-W
with display



Humidity table
MR: 0...100 % RH

% RH	U_A [V]	I_A [mA]	% RH	U_A [V]	I_A [mA]
0	0	4.0	**60**	6.0	13.6
5	0.5	4.8	**65**	6.5	14.4
10	1.0	5.6	**70**	7.0	15.2
15	1.5	6.4	**75**	7.5	16.0
20	2.0	7.2	**80**	8.0	16.8
25	2.5	8.0	**85**	8.5	17.6
30	3.0	8.8	**90**	9.0	18.4
35	3.5	9.6	**95**	9.5	19.2
40	4.0	10.4	**100**	10.0	20.0
45	4.5	11.2			
50	5.0	12.0			
55	5.5	12.8			

Continued at the right ...

Temperature table
MR: –35...+80 °C

°C	U_A [V]	I_A [mA]	°C	U_A [V]	I_A [mA]
–35	0.0	4.0	**+25**	5.2	12.3
–30	0.4	4.7	**+30**	5.7	13.0
–25	0.9	5.4	**+35**	6.1	13.7
–20	1.3	6.1	**+40**	6.5	14.4
–15	1.7	6.8	**+45**	7.0	15.1
–10	2.2	7.5	**+50**	7.4	15.8
–5	2.6	8.2	**+55**	7.8	16.5
0	3.0	8.9	**+60**	8.3	17.2
+5	3.5	9.6	**+65**	8.7	17.9
+10	3.9	10.3	**+70**	9.1	18.6
+15	4.3	11.0	**+75**	9.6	19.3
+20	4.8	11.7	**+80**	10.0	20.0

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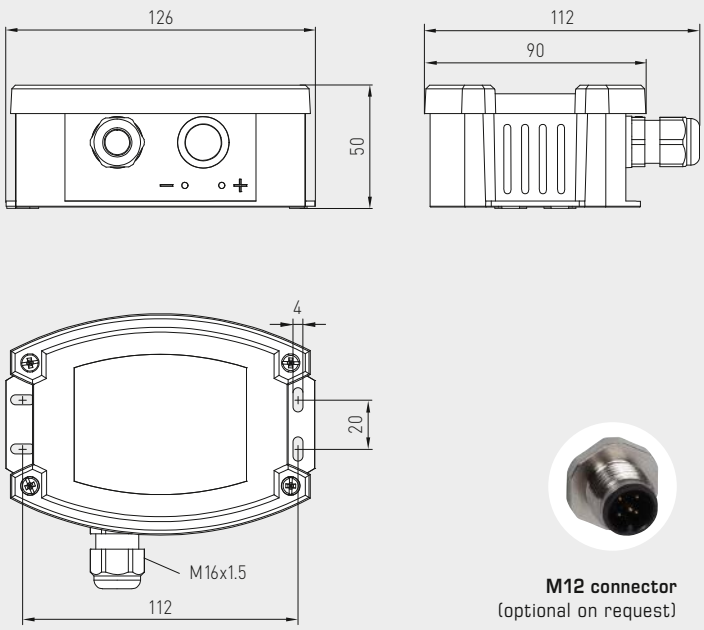
AERASGARD® ACO2-W / ALQ-CO2-W
AERASGARD® AFTM-(LQ)-CO2-W / ATM-CO2-SD

Multifunctional on-wall sensors and measuring transducers, for humidity, temperature, CO2 content and air quality (VOC), calibratable, with active/switching output

S+S REGELTECHNIK

Dimensional drawing

ACO2-W
ALQ-CO2-W



M12 connector
(optional on request)

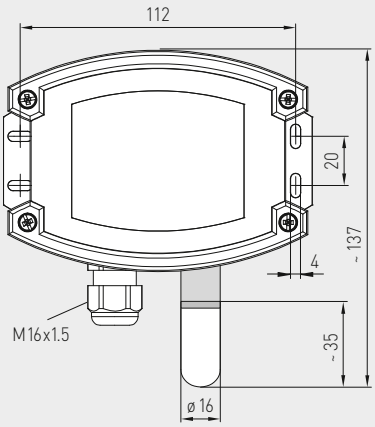
ACO2-W
ALQ-CO2-W





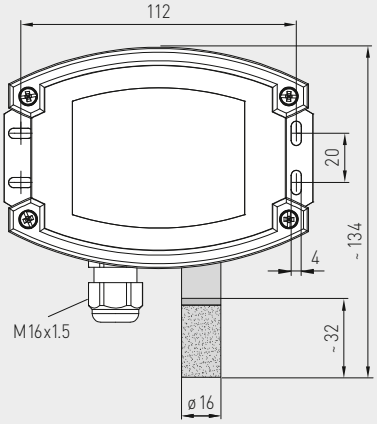
Dimensional drawing

AFTM-CO2-W
AFTM-LQ-CO2-W
ATM-CO2-SD



SF-K
plastic sinter filter
(standard)





SF-M
metal sinter filter
(optional)



AFTM-CO2-W
AFTM-LQ-CO2-W
ATM-CO2-SD
with metal sinter filter
(optional)





AERASGARD® ACO2-W / ALQ-CO2-W
AERASGARD® AFTM-(LQ)-CO2-W / ATM-CO2-SD

Multifunctional on-wall sensors and measuring transducers, for humidity, temperature, CO2 content and air quality (VOC), calibratable, with active/switching output

WS-03
Weather and sun protection hood (optional)



AFTM-CO2-W
AFTM-LQ-CO2-W
ATM-CO2-SD
with plastic sinter filter (standard)



AERASGARD® ATM-CO2-SD	On-wall temperature and CO2 sensor, *Standard*
AERASGARD® ACO2-W	On-wall CO2 sensor, *Premium*
AERASGARD® ALQ-CO2-W	On-wall air quality (VOC) and CO2 sensor, *Premium*
AERASGARD® AFTM-CO2-W	Multifunctional on-wall sensor for humidity, temperature and CO2 content, *Deluxe*
AERASGARD® AFTM-LQ-CO2-W	Multifunctional on-wall sensor for humidity, temperature, CO2 content and air quality (VOC), *Deluxe*

Typ / WG02	Measuring Range Humidity	Temperature	CO2	VOC	Equipment Display	Item No. (Baldur 2)	Price
ATM-CO2-SD			(switchable)				
ATM-CO2-SD-U	–	–35…+80 °C	0…2000 / 5000 ppm	–	–	1501-7112-1001-200	**311,63 €**
ACO2-W			(switchable)				
ACO2-W (without display)	–	–	0…2000 / 5000 ppm	–	W	see **ACO2-W / ACO2-SD**	
ACO2-W **LCD**	–	–	0…2000 / 5000 ppm	–	W ■	1501-7110-7371-200	**411,45 €**
ALQ-CO2-W			(switchable)				
ALQ-CO2-W	–	–	0…2000 / 5000 ppm	0…100 %	W	1501-7111-7301-500	**468,46 €**
ALQ-CO2-W **LCD**	–	–	0…2000 / 5000 ppm	0…100 %	W ■	1501-7111-7371-500	**528,87 €**
AFTM-CO2-W			(switchable)				
AFTM-CO2-W	0…100 % RH	–35…+80 °C	0…2000 / 5000 ppm	–	W	1501-7116-7301-200	**449,91 €**
AFTM-CO2-W **LCD**	0…100 % RH	–35…+80 °C	0…2000 / 5000 ppm	–	W ■	1501-7116-7371-200	**539,89 €**
AFTM-LQ-CO2-W			(switchable)				
AFTM-LQ-CO2-W	0…100 % RH	–35…+80 °C	0…2000 / 5000 ppm	0…100 %	W	1501-7118-7301-500	**589,18 €**
AFTM-LQ-CO2-W **LCD**	0…100 % RH	–35…+80 °C	0…2000 / 5000 ppm	0…100 %	W ■	1501-7118-7371-500	**705,26 €**
Outputs:	**0-10 V or 4…20 mA** (selectable via DIP switches, selected variant applies for all outputs) – *Standard* on-wall sensor **ATM-CO2-SD** with fixed output 0-10 V!						
Equipment:	**W = changeover contact** – *Standard* on-wall sensor **ATM-CO2-SD** without changeover contact!						
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101 (on request)						
Note:	This unit **must not** be used as safety-relevant device!						
ACCESSORIES							
SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel **V4A** (1.4404)					7000-0050-2200-100	**42,33 €**
WS-03	**Weather and sun protection hood**, 200 x 180 x 150 mm, stainless steel **V2A** (1.4301)					7100-0040-6000-000	**44,74 €**
	For further information see last chapter!						

AERASGARD® APS-SD

Fine dust sensor / particulate sensor, on-wall sensor and measuring transducer, with multi-range switching and active output

S+S REGELTECHNIK

Maintenance-free on-wall sensor **AER**ASGARD® **APS-SD** with active output, in an impact-resistant plastic housing with quick-locking screws, for measuring the fine-dust content (0...500 µg /m³).
The measuring transducer converts the measured values into a standard signal of 0-10 V.

The sensor is used in offices, hotels, convention centres, apartments, shops, etc. and is used for evaluation of the indoor climate. This enables energy-saving, demand-based room ventilation, thereby reducing operating costs and improving well-being. One sensor for every 30 m² of room area is recommended.

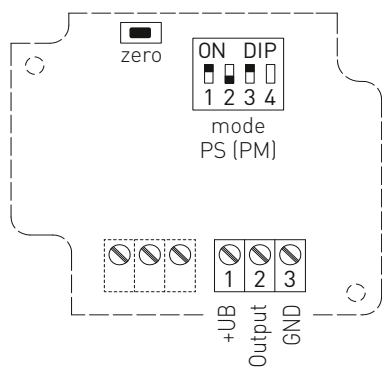
An optical **fine dust sensor** precisely detects **particulate (PM)** of the size category 0.3 to 10 micrometres. The sensor is factory-calibrated.

TECHNICAL DATA

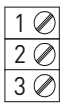
Power supply:	24 V AC / DC (± 10 %)
Power consumption:	typical < 1.5 W / 24 V DC; < 2.9 VA / 24 V AC
Output:	0-10 V (fixed)
FINE DUST (PM)	
Sensor (PM):	optical **particulate sensor** (**PM** = particulate matter), **fine-dust sensor** with laser- and soiling-resistant technology
Measuring range:	multi-range switching (selectable via DIP switches) 0...50, 0...100, 0...300 or 0...500 µg/m³
Particle size:	**PM 2.5** (0.3...2.5 µm); **PM 10** (0.3...10 µm)
Measuring accuracy:	typical ± 10 µg/m³ (± 10% of the measured value) for PM 2.5 typical ± 25 µg/m³ (± 25% of the measured value) for PM 10
Long-term stability:	± 1.25 µg/m³ (± 1.25 % of measured value/year)
Service life:	> 10 years
Response time:	< 2 minutes
Warm-up time:	approx. 1 hour
Ambient temperature:	0...+ 50 °C
Permitted humidity:	0...95 % RH (non-precipitating air)
Housing:	plastic, UV-resistant, polyamide material, 30 % glass-globe reinforced, with quick-locking screws (slotted/Phillips head combination) colour traffic white (similar to RAL 9016)
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Cable connection:	**cable gland** plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.14–1.5 mm², via screw terminals
Process connection:	via screws
Protection class:	III (according to EN 60 730)
Safety class:	**IP 30** (according to EN 60 529)
Standards:	CE-conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU

DIP switch	APS-SD	
Fine dust (PM) Measuring range	**DIP 1**	**DIP 2**
0...50 µg/m³	OFF	OFF
0...100 µg/m³ (default)	**ON**	OFF
0...300 µg/m³	OFF	**ON**
0...500 µg/m³	**ON**	**ON**
Fine dust (PM) Particle size		**DIP 3**
PM 2.5 (default)		**ON**
PM 10		OFF
Note: **DIP 4** is not assigned !		

Schematic diagram **APS-SD**



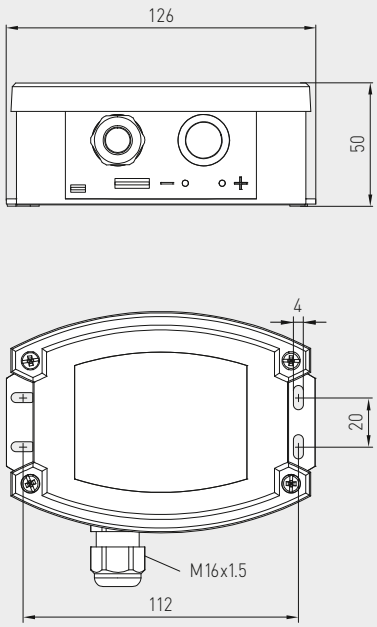
Connecting diagram **APS-SD**



UB+ 24V AC/DC
Output PM [µg/m³]
UB– GND

Fine dust sensor / particulate sensor, on-wall sensor and measuring transducer, with multi-range switching and active output

Dimensional drawing **APS-SD**





M12 connector
(optional on request)

APS-SD





AERASGARD® APS-SD	On-wall fine dust sensor / fine dust sensor / particulate sensor (PM), *Standard*				
Type / WG02	**Measuring Range**	**Particle size**	**Output**	**Item No.**	**Price**
APS-SD	(switchable)	(switchable)			
APS-SD-U	0... 50 µg/m³ 0...100 µg/m³ 0...300 µg/m³ 0...500 µg/m³	PM 2.5 PM 10	0-10 V	1501-7130-1001-000	**413,57 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101 (on request)				
Note:	This unit **must not** be used as safety-relevant device!				

AERASGARD® KLQ-W
AERASGARD® KLQ-SD

Duct air quality sensors (VOC) and measuring transducers, including installation flange, self-calibrating, with multi-range switching and active/switching output

S+S REGELTECHNIK

Patented quality product (patent no. DE 10 2014 010 719.1)

Maintenance-free duct sensor **AER**ASGARD® **KLQ-SD** with active output, automatic calibration, in a compact plastic housing with quick-locking screws, for determining the air quality (0…100 % VOC). The measuring transducer converts the measured values into a standard signal of 0-10 V.

Maintenance-free duct sensor **AER**ASGARD® **KLQ-W** with active/switching output, automatic calibration, in a compact plastic housing with quick-locking screws, for determining the air quality (0…100 % VOC). The measuring transducer converts the measured values into a standard signal of 0-10 V or 4…20 mA (switchable).

The sensor is used in offices, hotels, convention centres, apartments, shops, etc. for the purpose of evaluating the indoor climate. This enables energy-saving room ventilation on an as-needed basis, thereby reducing operating costs and improving well-being.

The air quality is detected by a **VOC sensor** (mixed gas sensor for volatile organic substances). This sensor determines the loading of the room air due to contaminated gases such as cigarette smoke, body perspiration, exhaled breathing air, solvent vapours, emissions etc. With regard to the expected air contamination, low, medium or high VOC sensitivity can be selected. As an alternative, use IAQ categories (from excellent to unhealthy) following the guidelines of the German Federal Environmental Agency to assess the room air.

For more information, see the start of the chapter.



TECHNICAL DATA

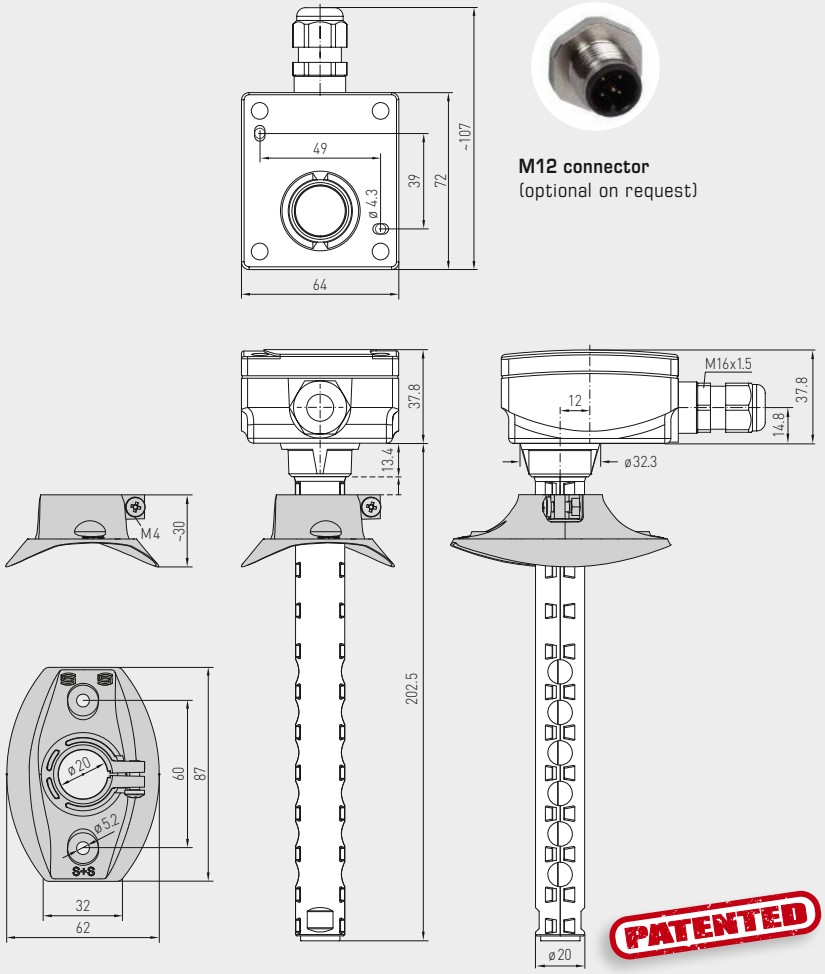
Power supply:	24 V AC / DC (± 10 %)
Power consumption:	< 1.5 W / 24 V DC typical; < 2.9 VA / 24 V AC typical
Sensor:	**VOC sensor** (metal oxide) (VOC = volatile organic compounds), with manual calibration (via zero button), with automatic calibration (permanently active)
Measuring range:	0…100 % air quality; referred to calibrating gas; **multi-range switching** (selectable via DIP switches) VOC sensitivities (low/medium/high) or IAQ category (Indoor Air Quality)
Output:	(0 V = clean air, 10 V = polluted air) **KLQ-SD** 0-10 V (fixed) **KLQ-W** 0-10 V **or** 4…20 mA, working resistance < 800 Ω (selectable via DIP switches), with offset potentiometer (± 10 % of the measuring range)
Relay output:	**KLQ-SD** without changeover contact **KLQ-W** with potential-free **changeover contact** (24 V / 1 A), switchpoint adjustable
Measuring accuracy:	typically ± 20 % of final value (referred to calibrating gas)
Service life:	> 60 months (under normal load conditions), depending on the type of loading and gas concentration
Gas exchange:	by diffusion
Warm-up time:	approx. 1 hour
Response time:	approx. 1 minute, minimum flow rate 0.3 m/s (air)
Ambient temperature:	–10…+60 °C
Electrical connection:	0.14 - 1.5 mm², via terminals
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 without display)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Protective tube:	**PLEUROFORM**™, material polyamide (PA6), with torsion protection, Ø 20 mm, NL = 202.5 mm (optionally 100 mm), v_{max} = 30 m/s (air)
Process connection:	by mounting flange, plastic (included in the scope of delivery)
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)* Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1) * Housing in the built-in state (permeable PLEUROFORM: IP 30)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU
ACCESSORIES	see last chapter

MFT-20-K
Mounting flange, plastic



Dimensional drawing
[mm]

KLQ-W
KLQ-SD



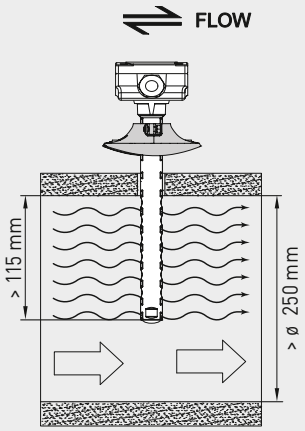
M12 connector
(optional on request)

KLQ-W
KLQ-SD
with quick-locking
screws (IP65)



Mounting diagram

KLQ-W
KLQ-SD

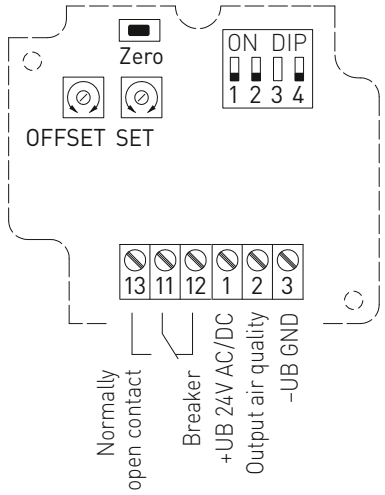


AERASGARD® KLQ-W
AERASGARD® KLQ-SD

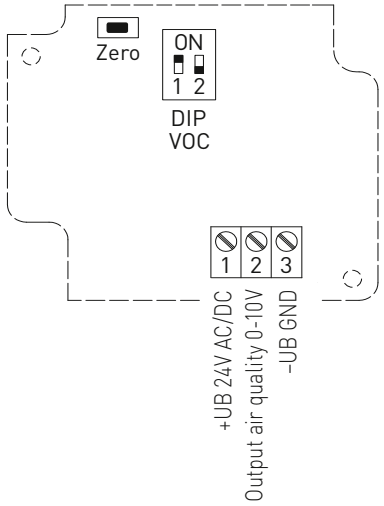
Duct air quality sensors (VOC) and measuring transducers, including installation flange, self-calibrating, with multi-range switching and active/switching output

S+S REGELTECHNIK

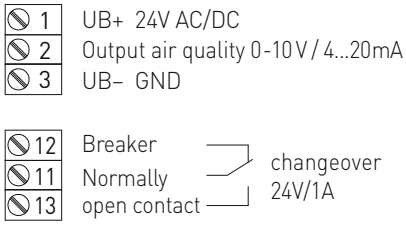
Schematic diagram **KLQ-W**



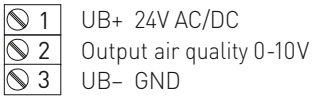
Schematic diagram **KLQ-SD**



Connecting diagram **KLQ-W**



Connecting diagram **KLQ-SD**



DIP switches	KLQ-W	
VOC sensitivity	**DIP 1**	**DIP 2**
LOW	OFF	OFF
MEDIUM (default)	**ON**	OFF
HIGH	OFF	**ON**
IAQ (Indoor Air Quality)	**ON**	**ON**
Output		**DIP 4**
Voltage 0-10 V (default)		OFF
Current 4...20 mA		**ON**
Note: **DIP 3** is not assigned!		

DIP switches	KLQ-SD	
VOC sensitivity	**DIP 1**	**DIP 2**
LOW	OFF	OFF
MEDIUM (default)	**ON**	OFF
HIGH	OFF	**ON**
IAQ (Indoor Air Quality)	**ON**	**ON**

Level	IAQ (Indoor Air Quality)	VOC
1	**excellent** no action required	**0**...**19** %
2	**good** prompt airing recommended	**20**...**39** %
3	**moderate** airing recommended	**40**...**59** %
4	**poor** increased airing required	**60**...**79** %
5	**unhealthy** intense airing necessary	**80**...**100** %

Table according to TVOC guidelines of the German Federal Environmental Agency to assess indoor air contamination
(Bundesgesundheitsbl – Gesundheitsforsch – Gesundheitsschutz 2007, 50: 990–1005)

AERASGARD® KLQ-W
AERASGARD® KLQ-SD

Duct air quality sensors (VOC) and measuring transducers, including installation flange, self-calibrating, with multi-range switching and active/switching output

KLQ-W
Circuit board



AERASGARD® KLQ-SD Duct air quality sensor and measuring transducer, *Standard*
AERASGARD® KLQ-W Duct air quality sensor and measuring transducer, *Premium*

Type / WG02	Measuring Range VOC	Output VOC	Equipment	Item No.	Price
KLQ-SD		(fixed)		**IP 65**	
KLQ-SD-U	0...100 %	0-10 V	–	1501-3170-1001-500	**212,51 €**
KLQ-W		(switchable)		**IP 65**	
KLQ-W	0...100 %	0-10 V / 4...20 mA	changeover contact	1501-3150-7301-500	**221,83 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101 shortened protective tube **PLEUROFORM**™, NL = 100 mm			on request on request	
Note:	This unit **must not** be used as safety-relevant device!				

AERASGARD® KCO2-W
AERASGARD® KCO2-SD

Duct CO2 sensors and measuring transducers, incl. mounting flange, self-calibrating, with multi-range switching and active / switching output

S+S REGELTECHNIK

Patented quality product (patent no. DE 10 2014 010 719.1)

Maintenance-free duct sensor **AER**ASGARD® **KCO2-SD** with active output, automatic calibration (fixed), in a compact plastic housing with quick-locking screws, for determining the CO2 content of the air (0…2000 ppm/0…5000 ppm). The measuring transducer converts the measured values into a standard signal of 0-10 V.

Maintenance-free duct sensor **AER**ASGARD® **KCO2-W** with active/switching output, automatic calibration (can be deactivated), in a compact plastic housing with quick-locking screws, optionally with/without display, for determining the CO2 content of the air (0…2000 ppm/0…5000 ppm). The measuring transducer converts the measured values into a standard signal of 0-10 V or 4…20 mA (switchable).

The CO2 sensor is used in offices, hotels, convention centres, apartments, shops, etc. for the purpose of evaluating the indoor climate. This enables energy-saving room ventilation on an as-needed basis, thereby reducing operating costs and improving well-being. One sensor for every 30 m² of room area is recommended.

The CO2 measurement is performed using an optical **NDIR sensor** (non-dispersive infra-red technology). The detection range is calibrated for standard applications such as monitoring residential rooms and conference rooms.

For more information, see the start of the chapter.

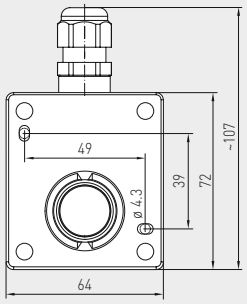
TECHNICAL DATA	
Power supply:	24 V AC / DC (± 10 %)
Power consumption:	< 1.5 W / 24 V DC typical; < 2.9 VA / 24 V AC typical; Peak current 200 mA
Sensor:	optical NDIR sensor (non-dispersive infra-red technology), with manual calibration (via zero button), **KCO2-SD** with automatic calibration (fixed) **KCO2-W** with automatic calibration (can be deactivated via DIP switches)
Measuring range:	**Multi-range switching** (selectable via DIP switches) 0…2000 ppm; 0…5000 ppm
Output:	**KCO2-SD** 0-10 V (fixed) **KCO2-W** 0-10 V **or** 4…20 mA, working resistance < 800 Ω (selectable via DIP switches), with offset potentiometer (± 10 % of the measuring range)
Relay output:	**KCO2-SD** without changeover contact **KCO2-W** with potential-free **changeover contact** (24 V / 1 A), switchpoint adjustable
Measuring accuracy:	typically ± 30 ppm ± 3 % of measured value
Temperature dependence:	± 5 ppm per °C or ± 0.5 % of measured value per °C (whichever is higher)
Pressure dependence:	± 0.13 % per mm Hg
Long-term stability:	< 2 % in 15 years
Gas exchange:	by diffusion
Warm up time:	approx. 1 hour
Ambient temperature:	–10…+60 °C
Response time:	approx. 1 minute, minimum flow rate 0.3 m / s (air)
Electrical connection:	0.14 - 1.5 mm², via screw terminals
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Protective tube:	**PLEUROFORM™**, material polyamide (PA6), with torsion protection, Ø 20 mm, NL = 202.5 mm, (optionally 100 mm), v_{max} = 30 m/s (air)
Process connection:	via flange made of plastic (included in scope of delivery)
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)* Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1) * Housing in the built-in state (permeable PLEUROFORM: IP 30)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU
Optional:	**display with illumination,** two line, cutout approx. 36 x 15 mm (W x H), for displaying the **Actual CO2 content** and for setting the **switchpoint**
ACCESSORIES	see last chapter

MFT-20-K
Mounting flange, plastic



Dimensional drawing
[mm]

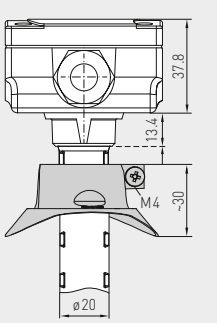
KCO2-W
KCO2-SD

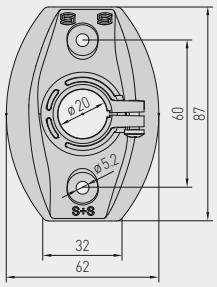




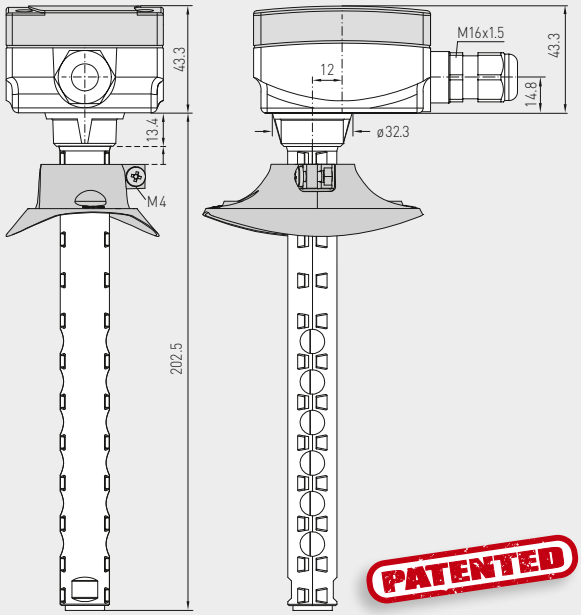
M12 connector
(optional on request)

without display





with display



PATENTED

KCO2-W
KCO2-SD
with quick-locking
screws (IP65)

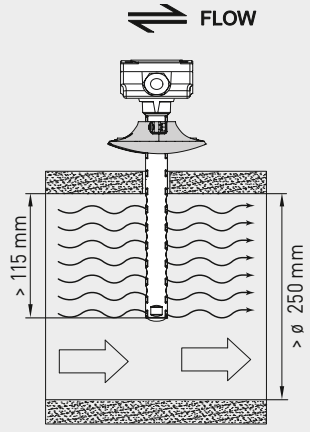


KCO2-W
with quick-locking
screws and
display (IP65)



Mounting diagram

KCO2-W
KCO2-SD

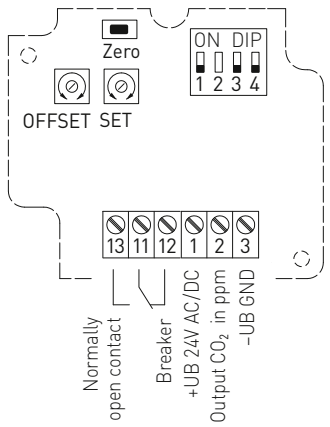


AERASGARD® KCO2-W
AERASGARD® KCO2-SD

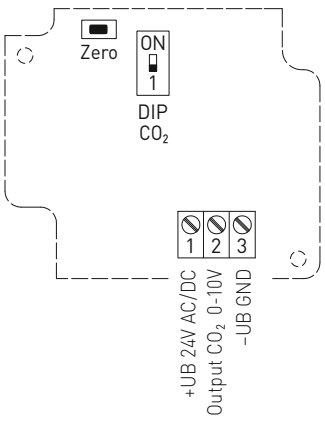
Duct CO2 sensors and measuring transducers, incl. mounting flange, self-calibrating, with multi-range switching and active / switching output

S+S REGELTECHNIK

Schematic diagram **KCO2-W**



Schematic diagram **KCO2-SD**



Connecting diagram **KCO2-W**

1	UB+ 24V AC/DC
2	Output CO_2 0-10V/4...20mA
3	UB– GND

12	Breaker	changeover 24V/1A
11	Normally	
13	open contact	

Connecting diagram **KCO2-SD**

1	UB+ 24V AC/DC
2	Output CO_2 0-10V in ppm
3	UB– GND

DIP switch	KCO2-W
CO2 content	**DIP 1**
0...2000 ppm (default)	OFF
0...5000 ppm	**ON**
CO2 automatic zero point	**DIP 3**
deactivated	OFF
activated (default)	**ON**
Output	**DIP 4**
Voltage 0-10 V (default)	OFF
Current 4...20 mA	**ON**
Note: **DIP 2** is not assigned!	

DIP switch	KCO2-SD
CO2 content	**DIP 1**
0...2000 ppm (default)	OFF
0...5000 ppm	**ON**

AERASGARD® KCO2-W
AERASGARD® KCO2-SD

Duct CO2 sensors and measuring transducers, incl. mounting flange, self-calibrating, with multi-range switching and active / switching output

KCO2-W
with display



AERASGARD® KCO2-SD Duct CO2 sensors and measuring transducers, *Standard*
AERASGARD® KCO2-W Duct CO2 sensors and measuring transducers, *Premium*

Type / WGO2	Measuring Range CO2	Output CO2	Equipment	Display	Item No.	Price
KCO2-SD	(switchable)	(fixed)			**IP 65**	
KCO2-SD-U	0...2000 ppm / 0...5000 ppm	0-10 V	–		1501-3160-1001-200	**239,31 €**
KCO2-W	(switchable)	(switchable)			**IP 65**	
KCO2-W	0...2000 ppm / 0...5000 ppm	0-10 V / 4...20 mA	changeover contact		1501-3140-7301-200	**290,77 €**
KCO2-W **LCD**	0...2000 ppm / 0...5000 ppm	0-10 V / 4...20 mA	changeover contact, display	■	1501-3140-7321-200	**340,95 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101 shortened protective tube **PLEUROFORM**™, NL = 100 mm				on request on request	
Note:	This unit **must not** be used as safety-relevant device!					

AERASGARD® KLQ-CO2-W
AERASGARD® KFTM-(LQ)-CO2-W / KTM-CO2-SD

Multifunctional duct sensors and measuring transducers incl. mounting flange, for humidity, temperature, CO2 content and air quality (VOC), calibratable, with active/switching output

S+S REGELTECHNIK

Patented quality product (patent no. DE 10 2014 010 719.1)

Maintenance-free duct sensor **AER**ASGARD® **KTM-CO2-SD** with active output, automatic calibration, in an impact-resistant plastic housing with quick-locking screws, for determining the CO2 content of the air (0...2000 ppm/0...5000 ppm) and the temperature (–35...+80 °C). The measuring transducer converts the measured values into a standard signal of 0-10 V.

Maintenance-free duct sensor **AER**ASGARD® **KFTM-LQ-CO2-W** with active/switching output, automatic calibration, in an impact-resistant plastic housing with quick-locking screws, optionally with/without Display, for determining the CO2 content of the air (0...2000 ppm/0...5000 ppm), the quality (0...100 % VOC), the temperature (–35...+80 °C) as well as the relative air humidity (0...100 % RH). The measuring transducer converts the measured values into a standard signal of 0-10 V or 4...20 mA (switchable).

The sensor is used in offices, hotels, convention centres, apartments, shops, etc. for the purpose of evaluating the indoor climate. This enables energy-saving room ventilation on an as-needed basis, thereby reducing operating costs and improving well-being. One sensor for every 30 m² of room area is recommended.

A long-term stable, **digital humidity and temperature sensor** guarantees exact measurement results. The CO2 measurement is performed using an optical **NDIR sensor** (non-dispersive infra-red technology). The detection range is calibrated for standard applications such as monitoring residential rooms and conference rooms. The air quality is detected by a **VOC sensor** (mixed gas sensor for volatile organic substances). This sensor determines the loading of the room air due to contaminated gases such as cigarette smoke, body perspiration, exhaled breathing air, solvent vapours, emissions etc. With regard to the expected air contamination, low, medium or high VOC sensitivity can be selected. As an alternative, use IAQ categories (from excellent to unhealthy) following the guidelines of the German Federal Environmental Agency to assess the room air.

TECHNICAL DATA

Voltage supply:	24 V AC / DC (± 10 %)
Power consumption:	< 4.8 W / 24 V DC typical; < 6.8 VA / 24 V AC typical; peak current 200 mA
Outputs:	**KTM-CO2-SD** 0-10 V (fixed) **Kxx-CO2-W** 0-10 V **or** 4...20 mA, working resistance < 800 Ω (selectable via DIP switches, selected variant applies for all outputs), with offset potentiometer (± 10 % of the measuring range)
Relay output:	**KTM-CO2-SD** without changeover contact **Kxx-CO2-W** with potential-free **changeover contact** (24 V / 1 A) (assignment selectable via DIP switches, switchpoint adjustable)
HUMIDITY	
Sensors:	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
Sensor protection:	plastic sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional metal sinter filter, Ø 16 mm, L = 32 mm)
Measuring range, humidity:	0...100 % RH
Operating range, humidity:	0...95 % RH (without dew formation)
Deviation of humidity:	typically **± 2.0** % (20...80 % RH) at +25 °C, otherwise ± 3.0 %
Output, humidity:	0-10 V **or** 4...20 mA (selectable via DIP switches)
TEMPERATURE	
Measuring range, temperature:	–35...+80 °C
Operating range, temperature:	–10...+60 °C
Temperature deviation:	typically ± 0.2 K at +25 °C
Output, temperature:	**KTM-CO2-SD** 0-10 V (fixed) **Kxx-CO2-W** 0-10 V **or** 4...20 mA (selectable via DIP switches)
AIR QUALITY (VOC)	
Sensor, VOC:	VOC sensor (metal oxide) (VOC = volatile organic compounds), with manual calibration (using zero button) and automatic calibration (permanently active)
Measuring range, VOC:	0...100 % air quality; referred to calibrating gas; **multi-range switching** (selectable via DIP switches) VOC sensitivities (low/medium/high) or IAQ category (Indoor Air Quality)
Output, VOC:	0-10 V (0 V = clean air, 10 V = polluted air) **or** 4...20 mA (selectable via DIP switches, switchpoint can be adjusted from 0...100 % of the output signal)
Measuring accuracy, VOC:	typically ± 20 % of final value (referred to calibrating gas)
Service life:	> 60 months (under normal load conditions) depending on the type of loading and gas concentration
CARBON DIOXIDE (CO2)	
Sensor, CO2:	**optical NDIR sensor** (non-dispersive infra-red technology), with manual calibration (via zero button), **KTM-CO2-SD** with automatic calibration (fixed) **Kxx-CO2-W** with automatic calibration (can be deactivated via DIP switches)
Measuring range, CO2:	0...2000 ppm **or** 0...5000 ppm (selectable via DIP switches)
Output, CO2:	**KTM-CO2-SD** 0-10 V (fixed) **Kxx-CO2-W** 0-10 V **or** 4...20 mA (selectable via DIP switches)
Measuring accuracy, CO2:	typically ± 30 ppm ± 3 % of measured value
Temperature dependence, CO2:	± 5 ppm per °C or ± 0.5 % of measured value per °C (whichever is higher)

continued on next page!

SF-K
Plastic sinter filter (standard)



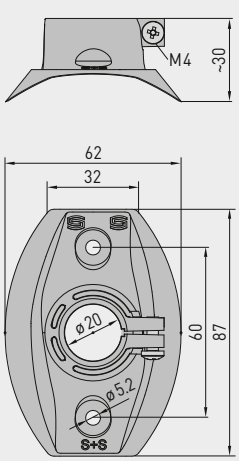
SF-M
Metal sinter filter (optional)



MFT-20-K
Mounting flange, plastic



Dimensional drawing (mm) **MFT-20-K**

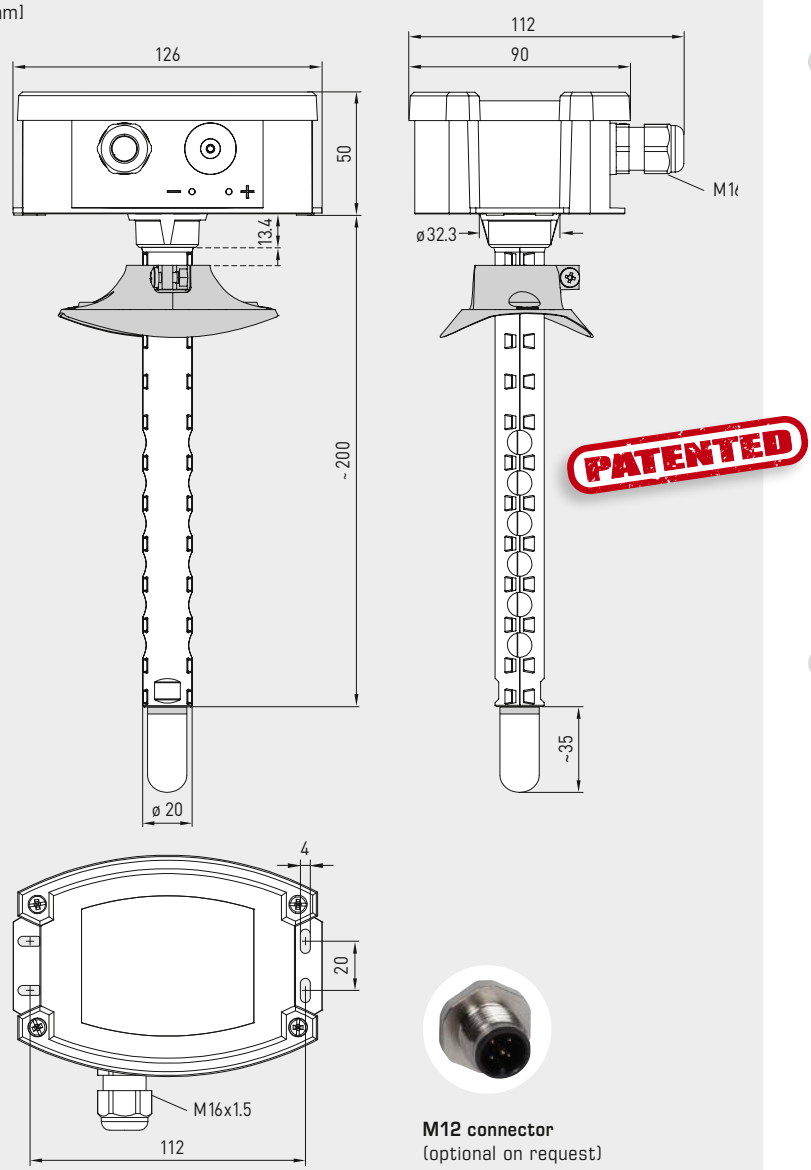


AERASGARD® KLQ-CO2-W
AERASGARD® KFTM-(LQ)-CO2-W / KTM-CO2-SD

Multifunctional duct sensors and measuring transducers incl. mounting flange, for humidity, temperature, CO2 content and air quality (VOC), calibratable, with active/switching output

Dimensional drawing [mm]

KFTM-LQ-CO2-W



M12 connector
(optional on request)

KFTM-LQ-CO2-W
with plastic sinter filter
(standard)



KFTM-LQ-CO2-W
with display and
plastic sinter filter
(standard)



TECHNICAL DATA (continued)

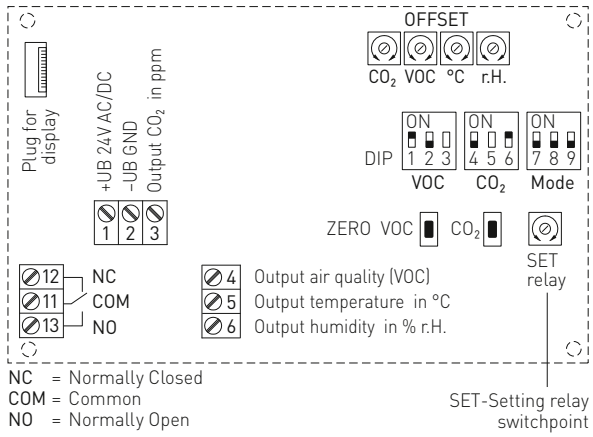
Pressure dependence:	± 0.13 % per mm Hg
Long-term stability:	< 2 % in 15 years
Gas exchange:	by diffusion
Response time:	< 2 minutes, minimum flow rate 0.3 m/s (air)
Ambient temperature:	–10...+60 °C
Electrical connection:	0.14 - 1.5 mm², via screw terminals
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Protective tube:	**PLEUROFORM**™, material polyamide (PA6), with torsion protection, v_{max} = 30 m/s (air) Ø 20 mm, NL = 202.5 mm without filter, NL = 235 mm with plastic filter (optional 100 mm)
Process connection:	via flange made of plastic (included in scope of delivery)
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) Housing in the built-in state (permeable PLEUROFORM: IP 30)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU
Optional:	three-line **display with illumination,** cutout approx. 70 x 40 mm (W x H), for displaying actual humidity, actual temperature, air quality and / or the actual CO2 content

AERASGARD® KLQ-CO2-W
AERASGARD® KFTM-(LQ)-CO2-W / KTM-CO2-SD

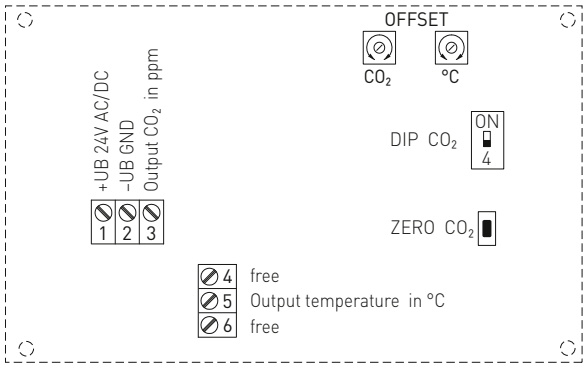
Multifunctional duct sensors and measuring transducers incl. mounting flange, for humidity, temperature, CO2 content and air quality (VOC), calibratable, with active/switching output

S+S REGELTECHNIK

Schematic diagram **KFTM-LQ-CO2-W**



Schematic diagram **KTM-CO2-SD**



DIP switches	KFTM-LQ-CO2-W	
VOC sensitivity	**DIP 1**	**DIP 2**
LOW	OFF	OFF
MEDIUM (default)	**ON**	OFF
HIGH	OFF	**ON**
IAQ (Indoor Air Quality)	**ON**	**ON**
CO2 content		**DIP 4**
0...2000 ppm (default)		OFF
0...5000 ppm		**ON**
CO2 automatic zero point		**DIP 6**
deactivated		OFF
activated (default)		**ON**
Relay assignment	**DIP 7**	**DIP 8**
CO2 (default): 600...1900 ppm / 900...4700 ppm	OFF	OFF
VOC: 10...95 %	**ON**	OFF
Temperature: –23...+74 °C	OFF	**ON**
Humidity: 10...95% RH	**ON**	**ON**
Output		**DIP 9**
Voltage 0-10 V (default)		OFF
Current 4...20 mA		**ON**
Note: **DIP 3** and **DIP 5** are not assigned!		

DIP switches	KTM-CO2-SD
CO2 content	**DIP 4**
0...2000 ppm (default)	OFF
0...5000 ppm	**ON**

Level	IAQ (Indoor Air Quality)	VOC
1	**excellent** no action required	**0**...**19** %
2	**good** prompt airing recommended	**20**...**39** %
3	**moderate** airing recommended	**40**...**59** %
4	**poor** increased airing required	**60**...**79** %
5	**unhealthy** intense airing necessary	**80**...**100** %

Table according to TVOC guidelines of the German Federal Environmental Agency to assess indoor air contamination
(Bundesgesundheitsbl - Gesundheitsforsch - Gesundheitsschutz 2007, 50: 990–1005)

AERASGARD® KLQ-CO2-W
AERASGARD® KFTM-(LQ)-CO2-W / KTM-CO2-SD

Multifunctional duct sensors and measuring transducers incl. mounting flange, for humidity, temperature, CO2 content and air quality (VOC), calibratable, with active/switching output

KFTM-LQ-CO2-W
with display







Humidity table
MR: 0...100 % RH

% RH	U_A [V]	I_A [mA]	% RH	U_A [V]	I_A [mA]
0	0	4.0	**60**	6.0	13.6
5	0.5	4.8	**65**	6.5	14.4
10	1.0	5.6	**70**	7.0	15.2
15	1.5	6.4	**75**	7.5	16.0
20	2.0	7.2	**80**	8.0	16.8
25	2.5	8.0	**85**	8.5	17.6
30	3.0	8.8	**90**	9.0	18.4
35	3.5	9.6	**95**	9.5	19.2
40	4.0	10.4	**100**	10.0	20.0
45	4.5	11.2			
50	5.0	12.0			
55	5.5	12.8			

Continued at the right ...

Temperature table
MR: –35...+80 °C

°C	U_A [V]	I_A [mA]	°C	U_A [V]	I_A [mA]
–35	0.0	4.0	**+25**	5.2	12.3
–30	0.4	4.7	**+30**	5.7	13.0
–25	0.9	5.4	**+35**	6.1	13.7
–20	1.3	6.1	**+40**	6.5	14.4
–15	1.7	6.8	**+45**	7.0	15.1
–10	2.2	7.5	**+50**	7.4	15.8
–5	2.6	8.2	**+55**	7.8	16.5
0	3.0	8.9	**+60**	8.3	17.2
+5	3.5	9.6	**+65**	8.7	17.9
+10	3.9	10.3	**+70**	9.1	18.6
+15	4.3	11.0	**+75**	9.6	19.3
+20	4.8	11.7	**+80**	10.0	20.0

Continued at the right ...

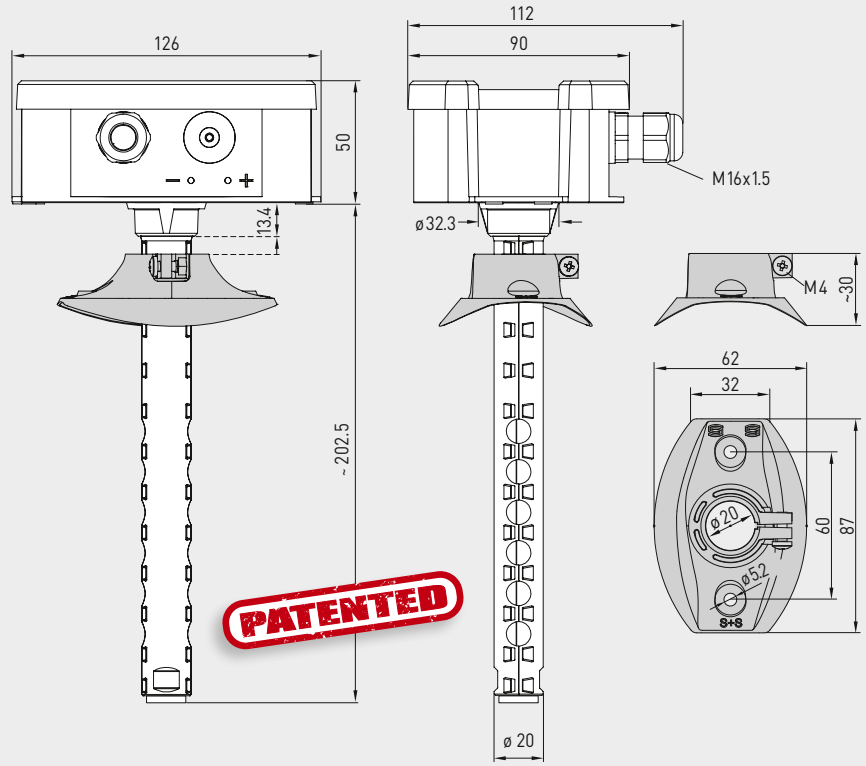
AERASGARD® KLQ-CO2-W
AERASGARD® KFTM-(LQ)-CO2-W / KTM-CO2-SD

Multifunctional duct sensors and measuring transducers incl. mounting flange, for humidity, temperature, CO2 content and air quality (VOC), calibratable, with active/switching output

S+S REGELTECHNIK

Dimensional drawing
[mm]

KLQ-CO2-W

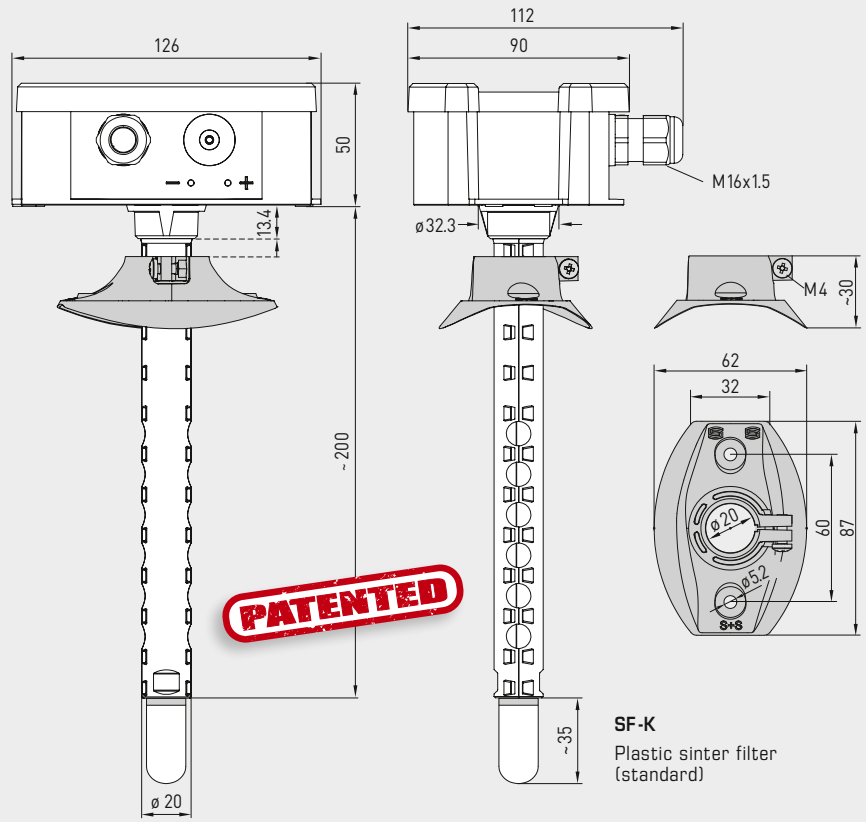


KLQ-CO2-W



Dimensional drawing
[mm]

KFTM-CO2-W
KFTM-LQ-CO2-W
KTM-CO2-SD



SF-K
Plastic sinter filter
(standard)

KFTM-CO2-W
KFTM-LQ-CO2-W
KTM-CO2-SD



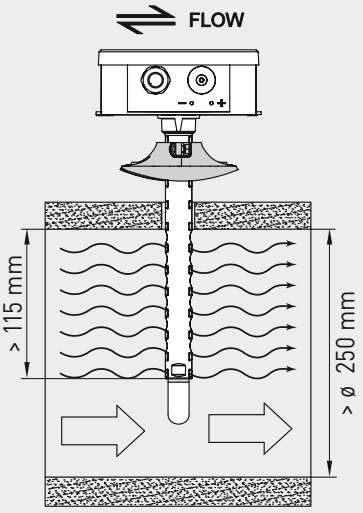
SF-M
Metal sinter filter
(optional)



AERASGARD® KLQ-CO2-W
AERASGARD® KFTM-(LQ)-CO2-W / KTM-CO2-SD

Multifunctional duct sensors and measuring transducers incl. mounting flange, for humidity, temperature, CO2 content and air quality (VOC), calibratable, with active/switching output

Mounting diagram — **KLQ-CO2-W**, **KFTM-LQ-CO2-W**, **KTM-CO2-SD**



AERASGARD® **KTM-CO2-SD**	Duct sensor for temperature and CO2 content, *Standard*
AERASGARD® **KLQ-CO2-W**	Duct sensor for air quality (VOC) and CO2 content, *Premium*
AERASGARD® **KFTM-CO2-W**	Multifunctional duct sensor for humidity, temperature and CO2 content, *Deluxe*
AERASGARD® **KFTM-LQ-CO2-W**	Multifunctional duct sensor for humidity, temperature, air quality (VOC) and CO2 content, *Deluxe*

Type / WG02	Measuring Range Humidity	Temperature	CO2	VOC	Equipment Display	Item No.	Price
KTM-CO2-SD			(switchable)				
KTM-CO2-SD-U	–	–35...+80 °C	0...2000 / 5000 ppm	–	–	1501-8112-1001-200	**304,99 €**
KLQ-CO2-W			(switchable)				
KLQ-CO2-W	–	–	0...2000 / 5000 ppm	0...100 %	W	1501-8111-7301-500	**390,36 €**
KLQ-CO2-W **LCD**	–	–	0...2000 / 5000 ppm	0...100 %	W ■	1501-8111-7371-500	**449,35 €**
KFTM-CO2-W			(switchable)				
KFTM-CO2-W	0...100 % RH	–35...+80 °C	0...2000 / 5000 ppm	–	W	1501-8116-7301-200	**372,99 €**
KFTM-CO2-W **LCD**	0...100 % RH	–35...+80 °C	0...2000 / 5000 ppm	–	W ■	1501-8116-7371-200	**408,85 €**
KFTM-LQ-CO2-W			(switchable)				
KFTM-LQ-CO2-W	0...100 % RH	–35...+80 °C	0...2000 / 5000 ppm	0...100 %	W	1501-8118-7301-500	**467,84 €**
KFTM-LQ-CO2-W **LCD**	0...100 % RH	–35...+80 °C	0...2000 / 5000 ppm	0...100 %	W ■	1501-8118-7371-500	**526,84 €**
Outputs:	**0-10 V or 4...20 mA** (selectable via DIP switches, selected variant applies for all outputs) – *Standard* duct sensor **KTM-CO2-SD** with fixed output 0-10 V!						
Equipment:	**W = changeover contact** – *Standard* duct sensor **KTM-CO2-SD** without changeover contact!						
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101 shortened protective tube **PLEUROFORM**™, NL = 100 mm					on request on request	
Note:	This unit **must not** be used as safety-relevant device!						

ACCESSORIES

SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel **V4A** (1.4404)	7000-0050-2200-100	**42,33 €**

RHEASGARD® KLGF xx
RHEASREG® KLSWxx

**Duct air flow sensors / air flow monitors,
incl. mounting flange, electronic,
with active / switching output**

NEW

S+S REGELTECHNIK

Electronic duct air flow sensor **RHE**ASGARD® **KLGF** with active output,
housing made of impact-resistant plastic with quick-locking screws, with cable gland,
with/without display, to determine the flow velocity (0.1...20 m/s).
The measuring transducer converts the measurement signal into a standard signal of 0 - 10 V.

Electronic duct air flow sensor/monitor **RHE**ASGARD® **KLGFT** (without display) and **KLGFVT** (with display)
with active and switching output, housing made of impact-resistant plastic with quick-locking screws,
with cable gland, to determine the flow velocity (0.1...20 m/s) and temperature (0...+50 °C).
For device type **KLGFVT** , the calculated volume flow parameter can be retrieved as an alternative to the flow
(configurable on the display). The measuring transducer automatically detects the required output type and
converts the measurands into the required standard signal of 0 - 10 V or 4...20 mA (**Automatic Output Switching**).

Electronic duct airflow monitor **RHE**ASREG® **KLSW** with switching output,
housing made of impact-resistant plastic with quick-locking screws, with cable gland,
with/without display, to determine the flow velocity (0.1...20 m/s).

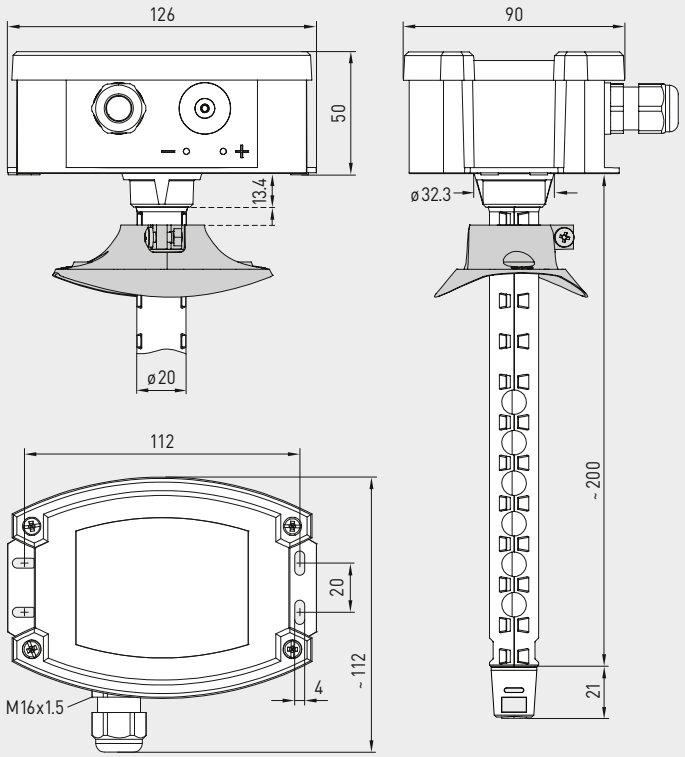
The flow sensors are suitable for monitoring or controlling airflows in ducts, at fans and dampers,
for flow-dependent monitoring of humidifiers and electric heating registers according to DIN 57100, Sect. 420,
or for use in connection with DDC systems.

TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %) (**KLSW-W24, KLGF xx**) 230 V AC, 50 Hz (**KLSW-W230**)	
Current consumption:	approx. 3 VA (**KLGF, KLSW-W24, KLSW-W230**) approx. 4 VA (**KLGFT, KLGFVT**)	
Data points:	flow velocity [m/s], volume flow [m³/h], temperature [°C]	
Outputs:	**KLGF**	**1x** 0 - 10 V (U variant)
	KLGF(V)T	**2x** 0 -10 V / 4...20 mA (via **Automatic Output Switching** – the unit recognises the required output type and automatically switches to U or I output); changeover contact 24 V (max. 5 A, cos φ = 1.0), switching hysteresis 2 % final value, threshold can be adjusted via potentiometer
	KLSW-W24	changeover contact 24 V (max. 5 A, cos φ = 1.0), switching hysteresis 2 % final value, threshold can be adjusted via potentiometer
	KLSW-W230	changeover contact **230 V AC** (max. 5 A, cos φ = 1.0), switching hysteresis 2 % final value, threshold can be adjusted via potentiometer
AIR FLOW		
Sensor:	calorimetric, temperature compensated, sensor breakage protection, with manual zero-point calibration (via button)	
Measuring range:	0.1...20 m/s	
Accuracy:	0.5 m/s + 3 % measured value	
Long-term stability:	± 0.5 % final value per year	
Reproducibility:	± 1.0 % final value	
Warm-up time:	< 2 min	
Response time:	< 60 s	
Start-up override:	0 / 60 s (**KLGF/KLSW** without display), can be activated via DIP switch 0...120 s (**KLGF/KLSW** with display, **KLGFT/KLGFVT**), can be adjusted via potentiometer	
TEMPERATURE	**KLGF(V)T**	
Sensor:	NTC 10k	
Measuring range:	0...+50 °C	
Accuracy:	typical ± 0.5 K at +25 °C	
Protective tube:	**PLEUROFORM**™, material polyamide (PA6), with torsion protection, Ø 20mm, NL = 221 mm, v_{max} = 30 m/s (air), **stainless steel V2A** (1.4301), Ø 16 mm available upon request as an option	
Housing:	plastic, UV-resistant, polyamide material, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!	
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)	
Cable connection:	**cable gland** , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm)	
Electrical connection:	0.2 - 1.5 mm², via push-in terminal	
Process connection:	by means of plastic mounting flange (included in the scope of delivery)	
Ambient temperature:	storage –20...+50 °C; operation 0...+50 °C	
Medium temperature:	0...+70 °C	
Permitted humidity:	< 98 % RH, non-precipitating air free of harmful substances	
Protection class:	II (according to EN 60 730) with UB = 230 V (**KLSW-W230**) III (according to EN 60 730) with UB = 24 V (**KLSW-W24, KLGF xx**)	
Protection type:	**IP 65** (according to EN 60 529) housing; IP 20 sensor technology	
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3	
Optional:	**display with illumination,** three-line, cutout approx. 70 x 40 mm (W x H), to display the flow velocity, volume flow and temperature	

Dimensional drawing
[mm]

KLGF xx
KLSW xx



KLGF xx
KLSW xx
without display

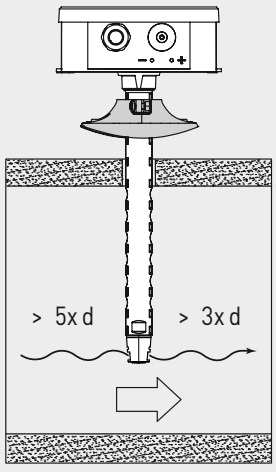


KLSW / KLGF
with display



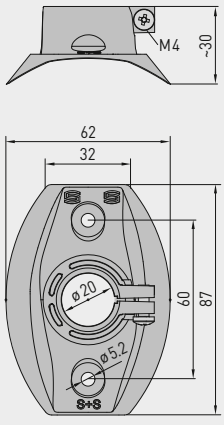
Installation diagram

KLGF xx
KLSW xx



Dimensional drawing
[mm]

MFT-20-K





MFT-20-K
Mounting flange
made of plastic

KLGFVT
with display



Automatic detection and switching
to standard signal 0...10 V or 4...20 mA

AOS-PATENTED
AUTOMATIC OUTPUT SWITCHING

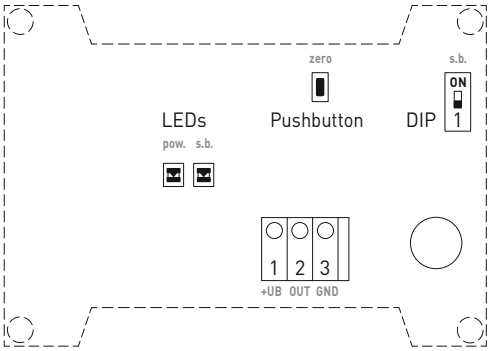
RHEASGARD® KLGF xx
RHEASREG® KLSWxx

Duct air flow sensors / air flow monitors, incl. mounting flange, electronic, with active / switching output

NEW

S+S REGELTECHNIK

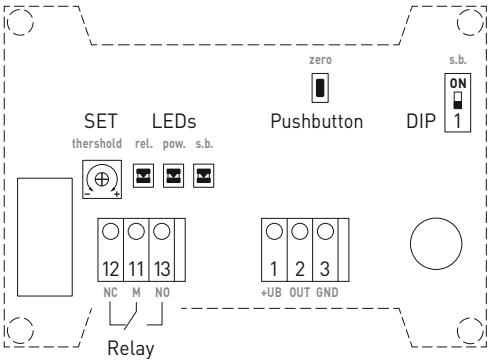
Schematic diagram **KLGF-U**



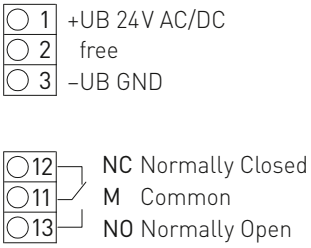
Connecting diagram **KLGF-U** without display



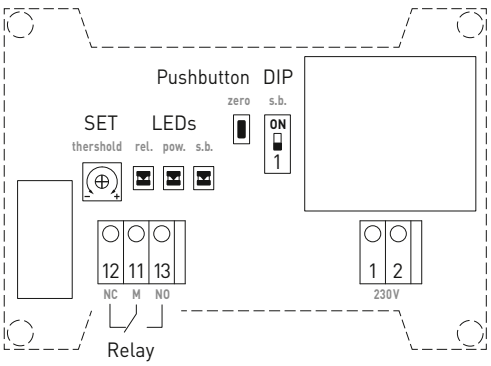
Schematic diagram **KLSW-W24**



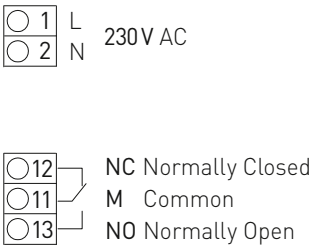
Connecting diagram **KLSW-W24** without display



Schematic diagram **KLSW-W230**



Connecting diagram **KLSW-W230** without display



KLSW-W230
with changeover contact,
UB = 230 V



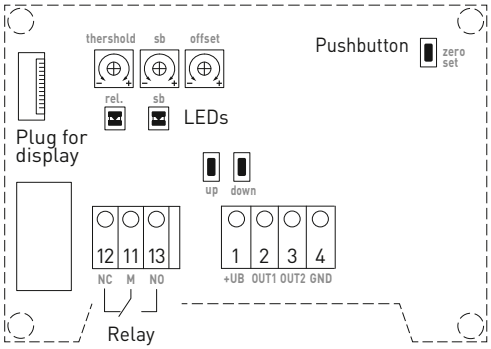
KLSW-W24
with changeover contact,
UB = 24 V



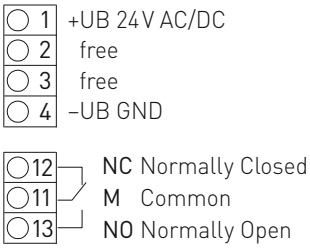
KLGF-U
with output 0-10 V,
UB = 24 V



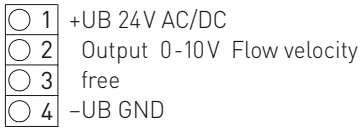
Schematic diagram — **KLGF/KLSW-xx LCD KLGFT-W**



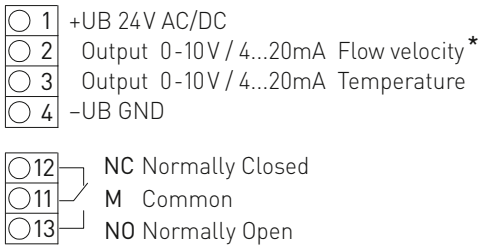
Connecting diagram — **KLSW-W24 LCD**



Connecting diagram — **KLGF-U LCD**



Connecting diagram — **KLGFVT-W LCD KLGFT-W**



* **KLGFVT-W LCD:**
Switching from flow measurand to the alternative **volume flow** parameter is menu-controlled on the display.

RHEASGARD® KLGF Duct air flow sensor, electronic, with active output
RHEASGARD® KLGF(V)T Duct air flow sensor, electronic, with active and switching output
RHEASREG® KLSW Duct air flow monitor, electronic, with switching output

Type / WG01	Power supply	Output active	Output switching	other Parameters	Display	Item no.	Price
KLGF		**U-Variante**					
KLGF-U	24 V AC / DC	**1x** 0-10 V	–	–		1701-4111-0101-000	**236,25 €**
KLGF-U **LCD**	24 V AC / DC	**1x** 0-10 V	–	–	■	1701-4111-1101-000	**297,15 €**
Optional:	Cable connection with **M12 connector** as per DIN EN 61076-2-101					on request	
KLGF(V)T		**AOS**					
KLGFT-W	24 V AC / DC	**2x** 0-10 V / 4...20 mA	1 changeover contact	**T**		1701-4118-0201-001	**299,25 €**
KLGFVT-W LCD	24 V AC / DC	**2x** 0-10 V / 4...20 mA	1 changeover contact	**T | V**	■	1701-4118-1401-001	**368,55 €**
KLSW-W24							
KLSW-W24	24 V AC / DC	–	1 changeover contact	–		1701-4113-0101-001	**206,85 €**
KLSW-W24 **LCD**	24 V AC / DC	–	1 changeover contact	–	■	1701-4113-1101-001	**257,25 €**
KLSW-W230							
KLSW-W**230**	**230 V** AC	–	1 changeover contact	–		1701-4133-0101-001	**208,43 €**

Note:

Changeover contact with automatic reset
(relay opens automatically when value falls below the threshold again)

AOS (**Automatic Output Switching**) = patented analogue interface (patent no. DE 10 2015 015 941 B4), the unit automatically detects the required output type 0 - 10 V or 4...20 mA

T = **temperature** (0...+50 °C) – additional measurand
V = **volume flow** (0...200,000 m³/h) – alternative parameter, can be configured via display!

Vane switch, mechanical, with paddle, with switching output

S+S REGELTECHNIK

Mechanical wind vane switch **RHE**ASREG® **WFS** with switching output, in an impact-resistant plastic housing, with stainless-steel paddle, for flow monitoring of gaseous, non-aggressive media.

The flow sensor is used as a flow controller or air flow monitor in air conditioning ducts, in air intake or exhaust devices of ventilators or electric heating registers (also for contaminated, oily air).

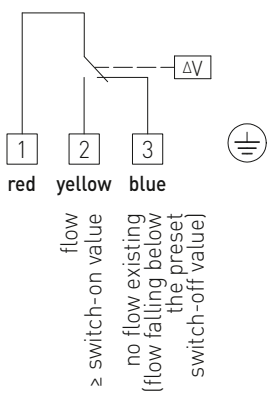
WFS



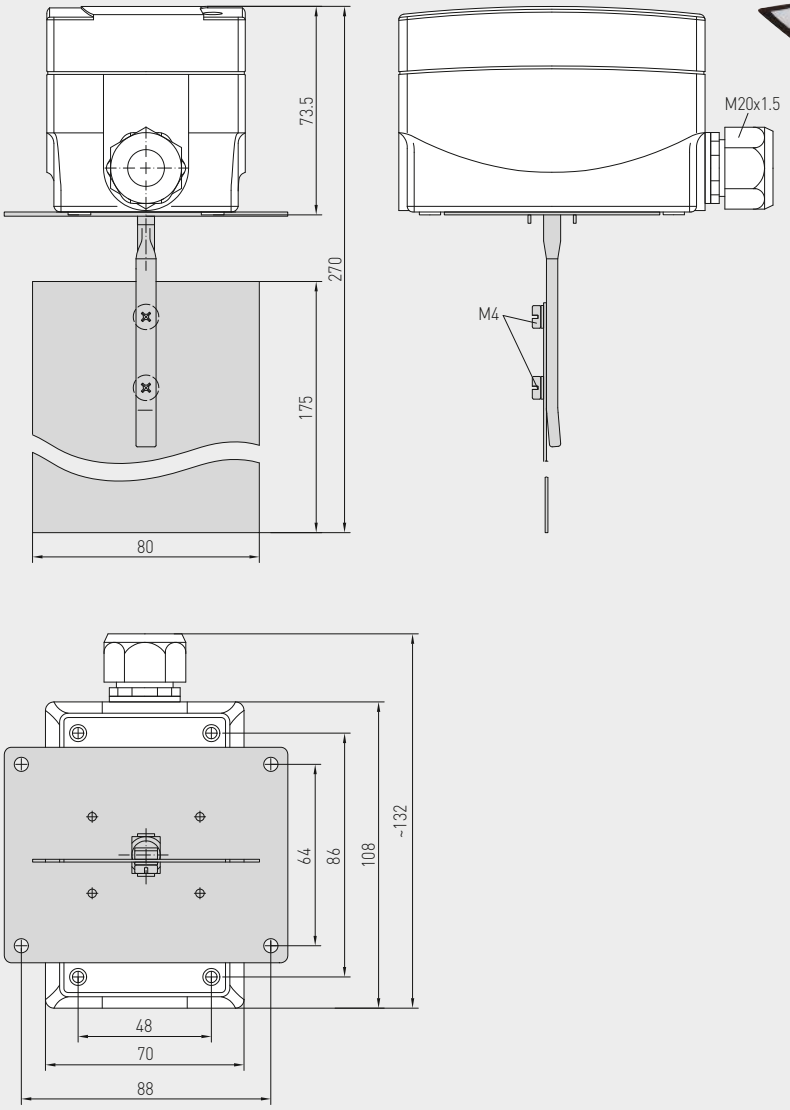
TECHNICAL DATA

Switching capacity: (Contact load)	15 (8) A; 24…250 V AC at 24 V AC min. 150 mA
Contact:	dustproof microswitch as single-pole, potential-free changeover contact
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 70 x 73.5 mm (Thor 2)
Base body:	galvanised steel
Moving arm:	brass
Vane:	stainless steel **V2A** (1.4301)
Cable connection:	**cable gland**, plastic (M 20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm)
Housing temperature:	–40…+85 °C
Operating difference:	≥ 1,5 m / s
Electrical connection:	0.14 - 1.5 mm², via screw terminals
Protection class:	I (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU
FUNCTION	
Monitor:	Contact 1 - 3 breaks when flow rate drops to the preset value. Simultaneously, contact 1 - 2 closes and can be used as signal contact.
Assembly note:	the installation is only possible in **horizontal** air ducts. Make sure that there is a **damping section** (≥ 5 times the pipe diameter) before and after the installation location. For **wind speeds > 5 m/s**, cut the vane/paddle at the marked spots. This will result in an increase of the default values (see table).

Connecting diagram **WFS**



Dimensional drawing **WFS**



WFS



RHEASREG® WFS Vane switch, mechanical, with paddle								
Type / WG01	**Switch-on value [m/s]**			**Switch-off value [m/s]**			**Item No.**	**Price**
	min.		**max.**	**min.**		**max.**		
WFS								
WFS-1E	**2,5**	(4,0)	9,2	**1,0**	(2,5)	8,0	1702-3020-0000-000	**80,62 €**
Note:	Minimum values in brackets apply to wind speeds > 5 m/s							
Spare part								
PWFS-08	Spare paddle for WFS (Stainless steel vane)						7700-0010-2000-000	**18,61 €**

Flow monitors, mechanical, with paddle, with switching output

S+S REGELTECHNIK

Mechanical paddle flow monitor **RHE**ASREG® **SW** with switching output, in an impact-resistant plastic housing, with stainless-steel paddle, for flow monitoring of liquid and gaseous, non-aggressive media in pipes, hydraulic systems of ¾'' through ½'' to 8'' diameter.

The flow sensor is used as a flow controller or low water alarm, e. g. for pumps in oil and cooling circuits, cooling systems, evaporators, compressors and heat exchangers, with brass or stainless-steel bodies.

SW





SW-3E
SW-4E

Incl. attached Tee Fitting according to DIN 2950

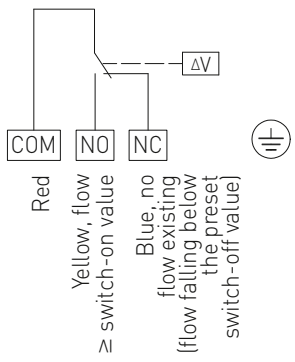
TECHNICAL DATA

Switching capacity:	15 (8) A; 24…250 V AC, at 24 V AC min. 150 mA
Contact:	dustproof microswitch as potential-free single-pole changeover contact
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 70 x 73.5 mm (Thor 2)
Base body:	galvanised steel
Screwed socket:	brass or stainless steel (see table)
Paddle:	stainless steel **V4A** (1.4401)
Cable connection:	**cable gland**, plastic (M 20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm)
Housing temperature:	–40…+85 °C
Max. temperature of medium:	+120 °C
Electrical connection:	0.14 - 1.5 mm², via screw terminals
Protection class:	I (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529)
Standards:	CE conformity, EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU
FUNCTION	
Monitor:	Contact COM – NO (red – yellow) breaks when flow rate drops to the preset value. Simultaneously, contact COM – NC (red - blue) closes and can be used as signal contact. Device is factory-set to the minimum switch-off value, which can be increased by turning the range adjusting screw clockwise.
Installation:	vertical in horizontal pipes, tee R x'' according to DIN 2950, min. smoothing distance = 5 x pipe diameter upstream and downstream of paddle

Table of switching values

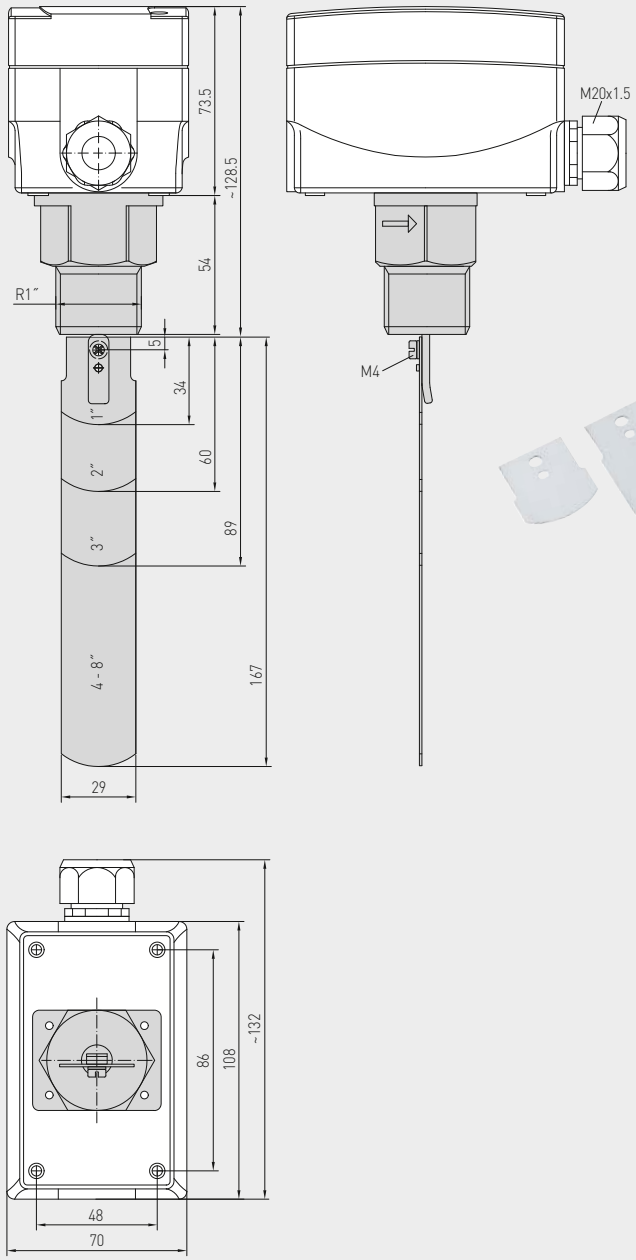
Pipe Ø DN (inches)	Paddle combination PSW-09	Factory Setting OFF / ON (m³/h)	Max. Setting OFF / ON (m³/h)
SW-1 / SW-2			
1"	1	0.6 / 1.0	2.0 / 2.1
1 ¼"	1	0.8 / 1.3	2.8 / 3.0
1 ½"	1	1.1 / 1.7	3.7 / 4.0
2"	1, 2	2.2 / 3.1	5.7 / 6.1
2 ½"	1, 2	2.7 / 4.0	6.5 / 7.0
3"	1, 2, 3	4.3 / 6.2	10.7 / 11.4
4"	1, 2, 3	11.4 / 14.7	27.7 / 29.0
	1, 2, 3, 4	6.1 / 8.0	17.3 / 18.4
5"	1, 2, 3	22.9 / 28.4	53.3 / 55.6
	1, 2, 3, 4	9.3 / 12.9	25.2 / 26.8
6"	1, 2, 3	35.9 / 43.1	81.7 / 85.1
	1, 2, 3, 4	12.3 / 16.8	30.6 / 32.7
8"	1, 2, 3	72.6 / 85.1	165.7 / 172.5
	1, 2, 3, 4	38.6 / 46.5	90.8 / 94.2
SW-3 / SW-4			
½"	–	0.174 / 0.48	0.846 / 0.948
¾"	–	0.138 / 0.408	0.768 / 0.858

Connecting diagram **SW**



Dimensional drawing

SW
PSW-09



SW



PSW-09
Set of stainless steel paddles (Spare part)

Pipe diameters with paddle combinations

Pipe Ø DN (inches)	(mm)	Paddle combination PSW-09	
½"	15 mm	–	(SW-3E incl. Tee Fitting)
¾"	20 mm	–	(SW-4E incl. Tee Fitting)
1"	25 mm	1	
1 ¼"	32 mm	1	
1 ½"	40 mm	1	
2"	50 mm	1, 2	
2 ½"	65 mm	1, 2	
3"	80 mm	1, 2, 3	
4"	100 mm	1, 2, 3 plus 4	(shorten to 92 mm)
5"	125 mm	1, 2, 3 plus 4	(shorten to 117 mm)
6"	150 mm	1, 2, 3 plus 4	(shorten to 143 mm)
8"	200 mm	1, 2, 3 plus 4	(unshortened)

RHEASREG® SW Flow monitors, mechanical, with paddle

Type / WG01	Pipe Ø DN	Max. Operating Pressure PN max	Medium	(Contacting Parts Made of)	Incl. attached Tee Fitting according to DIN 2950	Item No.	Price
SW							
SW-1E	1" - 8"	**11 bar**	**normal**	(brass)	–	1702-3011-0000-000	**116,19 €**
SW-2E	1" - 8"	**30 bar**	**aggressive**	(stainless steel **V4A**)	–	1702-3012-0101-000	**367,54 €**
SW-3E	½"	**11 bar**	**normal**	(brass)	⊥⊥	1702-3013-0031-000	**214,04 €**
SW-4E	¾"	**11 bar**	**normal**	(brass)	⊥⊥	1702-3014-0041-000	**214,04 €**
Spare part							
PSW-09	**Set of stainless steel paddles**, 4 pieces, pipe Ø 1" - 8", for SW-1E and SW-2E (included in the scope of delivery)					7700-0010-1000-000	**19,22 €**

Radio Sensors

KYMASGARD®
Our wireless alternatives

With our radio-capable variants, you can count on a real savings miracle. Without additional energy costs and with minimal wiring effort, these units reduce costs already at installation. The wireless product line combines appealing aesthetics with a variety of application options. A thoroughly smart solution!

Application Areas

- Reconstruction of facilities
- Modernization and extension of offices, hotels and residential buildings
- Listed, historical and sacred buildings under monumental protection
- Schools, museums and hospitals
- Industrial buildings and administration centers









KYMASGARD®
RADIO TRANSMITTER

EnOcean radio transmitter KYMASGARD® 9000

RFTM-xx-FSE	Multifunctional room radio sensor for humidity, temperature, air quality (VOC), and motion/presence	**635**

EnOcean radio transmitters

RTF2-FSE	Room temperature radio sensor	**636**
RFTF2-FSE	Room humidity and temperature radio sensor	**636**
RTF2-FSE-P	Room temperature radio sensor	**637**
RFTF2-FSE-P	Room humidity and temperature radio sensor	**637**
RTF2-FSE-PT	Room temperature radio sensor	**638**
RFTF2-FSE-PT	Room humidity and temperature radio sensor	**638**
RTF2-FSE-PD	Room temperature radio sensor	**639**
RFTF2-FSE-PD	Room humidity and temperature radio sensor	**639**
RTF2-FSE-PDT	Room temperature radio sensor	**640**

EnOcean outside radio transmitters

AFTF-HK-FSE	Multifunctional outside radio sensor for humidity, temperatures and light intensity	**641**

Accessories

see chapter Accessories		**644**



Radio Sensors

KYMASGARD® – Intelligent radio sensor equipment for multifunctional requirements

Broad Spectrum

Our product line for wireless radio installations using EnOcean technology are designed to be multifunctional. This reduces the diversity of types and expands their possible applications. Thanks to microprocessor technology, almost any measuring range can be represented, including custom specifications. The bus addresses are adjustable via DIP switches.

Optimum Precision

All devices are developed, manufactured and tested according to the latest criteria. Each sensor is precisely re-adjustable using offset potentiometers. Take advantage of our experience, our development, manufacturing and product know-how and order these products directly from the manufacturer.

Approved Safety

RoHS conforming materials

ESD compliant manufacturing

CE compliance tested by external laboratories

Certified Quality

Our development and production in Nuremberg/Germany is certified by TÜV Thüringen according to DIN EN ISO 9001:2015.

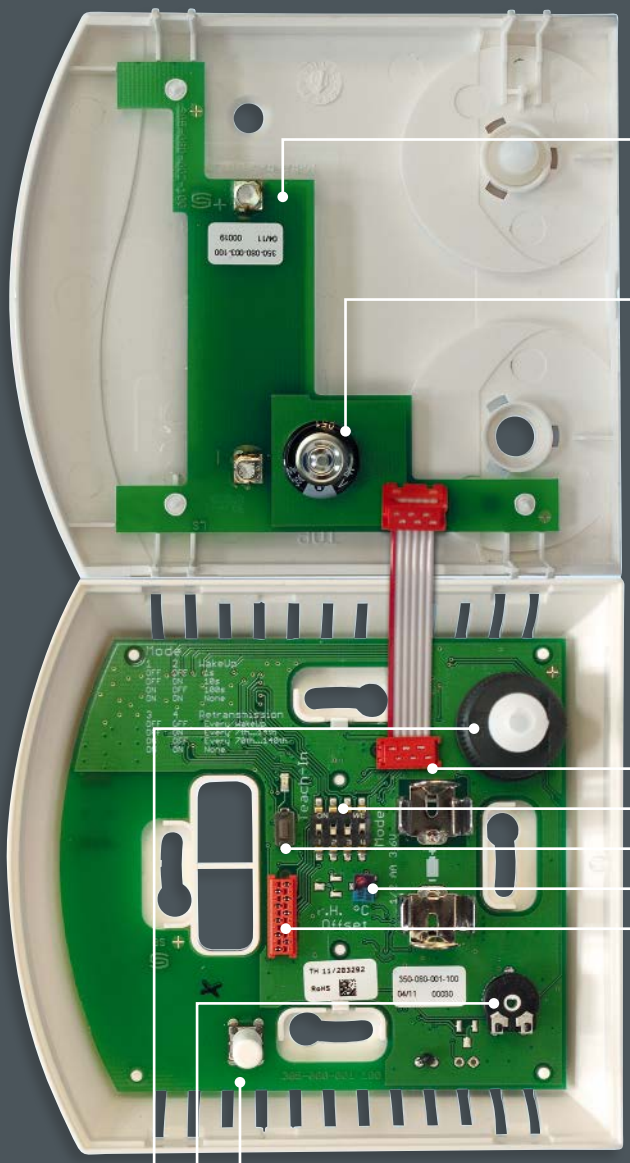
GOST certified

EAC certified

MADE IN GERMANY

enocean®

S+S REGELTECHNIK



Extra-large Solar Cell

With solar generator for energy supply, battery-free, aintenance-free

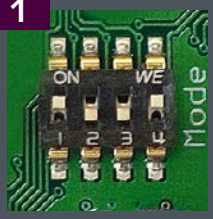
Goldcap

For energy store (internal)

Optional Battery Operation

Change-over to lithium cell based energy supply at times of poor ambient light

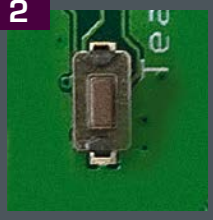
1



DIP Switches

For multi-range switching and setting of measureing and transmission cycle

2



Teach-In

For teaching the sensor and establishing connection between transmitter and receiver

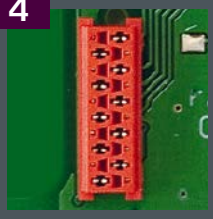
3



Offset Potentiometer

For fine adjustment (zero point offset) and readjustment upon recalibration

4



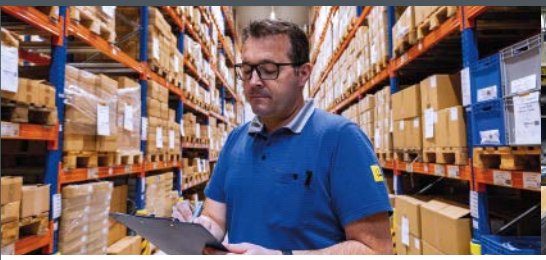
Quality Assurance

Calibration and balancing are done by means of the bus system

Presence Pushbutton

Setpoint Actuator
(Potentiometer)

Control Element
(Rotary Switch)







KYMASGARD® RFTM-xx-FSE

Multi-functional room radio sensors / room control units with solar cell for temperature, humidity, air quality (VOC) and motion / presence

Radio bus system KYMASGARD® 9000

S+S REGELTECHNIK

The room radio sensors of the radio bus system **KYM**ASGARD® **9000** are maintenance-free radio transmitters that operate without batteries (except for **RFTM-LQ-FSE)**. Energy generation is effected by conversion of indoor room light into electric energy by means of a solar generator. If the ambient light is too low for power generation, the sensors can optionally be powered by two AAA batteries (not included).
These sensors are used to detect the indoor climate and the setpoint values, and to transmit the recorded values to radio actuators and radio signal receivers / gateways via radio signals. The following device configurations are available:

The room sensor **KYM**ASGARD® **RFTM-FSE** is used to measure room temperature and room humidity.

The room control unit **KYM**ASGARD® **RFTM-FSE-ST** is used to measure room temperature and humidity, and to display and set the setpoint for temperature.
The setpoint is set directly on site using touch buttons.

The room sensor **KYM**ASGARD® **RFTM-LQ-FSE** is used to measure room temperature, room humidity and air quality (VOC = Volatile Organic Compounds).

The room sensor **KYM**ASGARD® **RFTM-BW-FSE** is used to measure room temperature, room humidity and the movement (or presence) of persons.

Optional accessories include the wall holder **WH-3100** and the stand holder **SH-3110**, which enable them to be used as table-top units.

Room devices
(Ø 90 mm)
with stand holder
(optional)



TECHNICAL DATA

Operation:	Power generated by solar cell, battery-free, (except for **RFTM-LQ-FSE**) maintenance-free (battery operation optional)
Radio technology:	EnOcean protocol, modulation ASK, 868 MHz, transmission power max. 10 mW, telegram type 4BS
Channels:	1 temperature, 1 humidity, 1 setpoint, 1 air quality (VOC), 1 motion/presence
Radio transmitter module:	EnOcean Dolphin
Measurand acquisition:	adjustable, every 1 s / 10 s / 100 s
Transmission interval:	adjustable, typically every 100 seconds, or at any measuring value change, status telegram approximately every 16 minutes
Range of coverage:	indoors typically 30 - 100 m, outdoors up to 300 m
Housing:	plastic, material: ABS, colour: pure white (similar to RAL 9010)
Dimensions:	Ø 88 mm, height 18 mm
Mounting:	Wall-mounted or free-standing using accessories
Ambient temperature:	–5...+55 °C
Storage temperature:	–25...+60 °C
Permitted humidity:	0...90 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 30 (according to EN 60 529)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU and according to R&TTE Directive 2014 / 53 / EU
HUMIDITY	
Operating range, humidity:	0...100 % RH
Deviation in humidity:	typically **± 2.0** % (20...80 % RH) at +25 °C, otherwise ± 3.0 %
TEMPERATURE	
Operating range, temperature:	0...+40 °C
Deviation in temperature:	typically ± 0.2 K at +25 °C
AIR QUALITY (VOC)	
VOC measuring range:	0...8000 ppb (Rotary switch position 0,1); with reference to calibration gas
VOC measuring accuracy:	± 20 % final value (with reference to the calibration gas)
MOTION	
Detection:	yes/no (motion + presence)
SETPOINT / DISPLAY	
Operating elements:	The setpoint for temperature can be set and displayed on a touch panel.

SH-3110
Stand holder
(optional)



WH-3100
Wall holder
(optional)



RFTM-FSE-ST
Room control unit



RFTM-FSE
RFTM-LQ-FSE
Room radio sensors



RFTM-BW-FSE
Room radio sensors



KYMASGARD® RFTM-FSE	Room radio sensor / room control unit for temperature and humidity
KYMASGARD® RFTM-LQ-FSE	Room radio sensor for temperature, humidity and air quality (VOC)
KYMASGARD® RFTM-BW-FSE	Room radio sensor for temperature, humidity and motion / presence detection

Type / WG02	Channels	Measuring ranges / detection Temperature	Humidity	VOC	Movement	Set point	EnOcean-Profile	Item no.	Price
RFTM-FSE									
RFTM-FSE	2	0...+40 °C	0...100 % RH	–	–	–	**EEP A5-04-01**	1801-4280-0000-000	**273,04 €**
RFTM-FSE ST	3	0...+40 °C	0...100 % RH	–	–	●	**EEP A5-10-12**	1801-4280-0869-000	**307,32 €**
RFTM-LQ-FSE									
RFTM-LQ-FSE	4	0...+40 °C	0...100 % RH	0...8000 ppb	–	–		1801-4280-3000-000	**378,80 €**
RFTM-BW-FSE									
RFTM-BW-FSE	3	0...+40 °C	0...100 % RH	–	yes / no	–		1801-4280-4000-000	**365,53 €**
Equipment:		The **setpoint** for temperature can be set via the operating and display elements.							

ACCESSORIES			
SH-3110	**Stand holder** for room radio units (Ø 90 mm)	1801-8490-2000-000	**30,82 €**
WH-3100	**Wall holder** for room radio units (Ø 90 mm and Ø 130 mm)	1801-8490-1000-000	**8,91 €**
Compatibility	For an overview, see the start of the chapter		

KYMASGARD® RTF 2 - FSE
KYMASGARD® RFTF 2 - FSE

Wireless room humidity and temperature radio sensors with solar cell

S+S REGELTECHNIK

The room temperature sensors **KYM**ASGARD® **RTF 2 - FSE** or **RFTF 2 - FSE** are batteryless and maintenance-free radio transmitters. Energy generation is effected by conversion of indoor room light into electric energy by means of a solar generator. These sensors are used to detect the room temperature or room humidity and to transmit the measurands via radio frequency to radio actuators and radio signal receivers / gateways. If ambient light conditions are insufficient for energy generation, they also can be operated on a lithium battery. To do so, insert the lithium cell into the battery holder provided.
The device IDs are marked on a label in the device.

RTF 2 - FSE
RFTF 2 - FSE

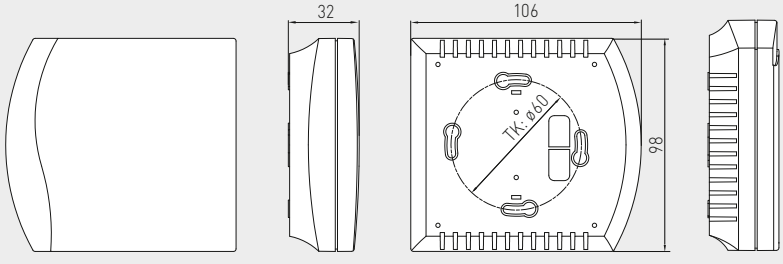


TECHNICAL DATA

Operation:	Energy generation by solar cell, batteryless, maintenance-free (optionally battery-operated)
Radio technology:	EnOcean protocol, modulation ASK, 868 MHz, transmission power max. 10 mW, telegram type 4BS
Channels:	1 temperature, 1 humidity
Radio transmitter module:	EnOcean Dolphin
Measuring range, temperature:	0...+40 °C
Deviation, temperature:	typically ± 0.2 K at +25 °C
Measuring range, humidity:	0...100 % RH
Deviation humidity:	typically ± 3 % RH (30... 80 %) at +20 °C
Measurand acquisition:	adjustable, every 1 s / 10 s / 100 s
Transmission interval:	adjustable, typically every 100 seconds, or at any measuring value change, status telegram approximately every 16 minutes
Range of coverage:	indoors typically 30 - 100 m, outdoors up to 300 m
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010)
Dimensions:	98 x 106 x 32 mm (Frija 2)
Mounting:	wall mounting or on in-wall flush box Ø 55 mm, base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes
Ambient temperature:	–5...+55 °C
Storage temperature:	–25...+60 °C
Humidity:	0...90 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 30 (according to EN 60 529)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU and according to R&TTE directive 2014 / 53 / EU

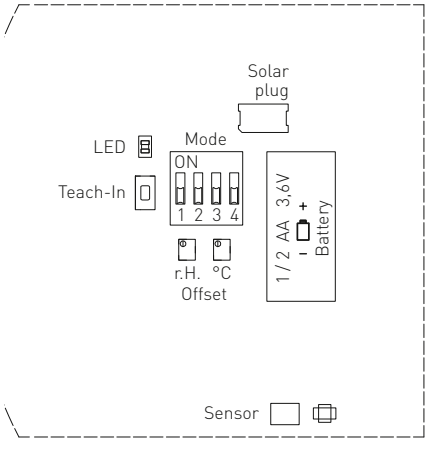
Dimensional drawing

RTF 2 - FSE
RFTF 2 - FSE



Schematic diagram

RTF 2 - FSE
RFTF 2 - FSE



KYMASGARD® **RTF 2 - FSE** Room temperature radio sensors
KYMASGARD® **RFTF 2 - FSE** Wireless room humidity and temperature radio sensors

Type / WG02	Channels	Measuring Range Temperature	Humidity	Energy Generation	Item No.	Price
RTF2-FSE	1	0...+40 °C	–	Solar cell, battery	1801-4451-0040-040	**137,50 €**
RFTF2-FSE	2	0...+40 °C	0...100 % RH	Solar cell, battery	1801-4452-3040-040	**318,26 €**
ACCESSORIES						
ET BATTERIE	**Lithium battery** LS 14250				7000-4000-5000-000	**19,74 €**
Compatibility	For an overview, see the start of the chapter					

Wireless room humidity and temperature radio sensors with solar cell and setpoint setter

The room temperature sensor **KYM**ASGARD® **RTF 2 - FSE - P** or **RFTF 2 - FSE - P** is a batteryless and maintenance-free radio transmitter. Energy generation is effected by conversion of indoor room light into electric energy by means of a solar generator. These sensors are used to detect the room temperature or room humidity as well as for setpoint setting and to transmit the measurands via radio frequency to radio actuators and radio signal receivers / gateways. If ambient light conditions are insufficient for energy generation, they also can be operated on a lithium battery. To do so, insert the lithium cell into the battery holder provided.
The device IDs are marked on a label in the device.

RTF 2 - FSE - P
RFTF 2 - FSE - P

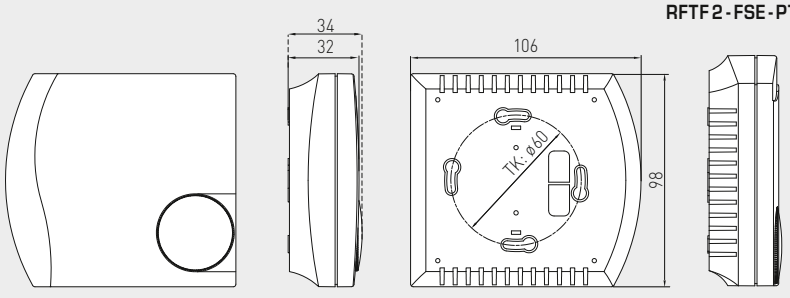


TECHNICAL DATA

Operation:	Energy generation by solar cell, batteryless, maintenance-free (optionally battery-operated)
Radio technology:	EnOcean protocol, modulation ASK, 868 MHz, transmission power max. 10 mW, telegram type 4BS
Channels:	1 temperature, 1 humidity, 1 setpoint
Radio transmitter module:	EnOcean Dolphin
Measuring range, temperature:	0...+40 °C
Deviation, temperature:	typically ± 0.2 K at +25 °C
Measuring range, humidity:	0...100 % RH
Deviation humidity:	typically ± 3 % RH (30... 80 %) at +20 °C
Setpoint capture:	turning angle left 0° = 0 bits turning angle right 220° = 255 bits
Measurand acquisition:	adjustable, every 1 s / 10 s / 100 s
Transmission interval:	adjustable, typically every 100 seconds, or at any measuring value change, or change of turning angle status telegram approximately every 16 minutes
Range of coverage:	indoors typically 30 - 100 m, outdoors up to 300 m
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010)
Dimensions:	98 x 106 x 34 mm (Frija 2)
Mounting:	wall mounting or on in-wall flush box Ø 55 mm, base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes
Ambient temperature:	–5...+55 °C
Storage temperature:	–25...+60 °C
Humidity:	0...90 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 30 (according to EN 60 529)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU and according to R&TTE directive 2014 / 53 / EU

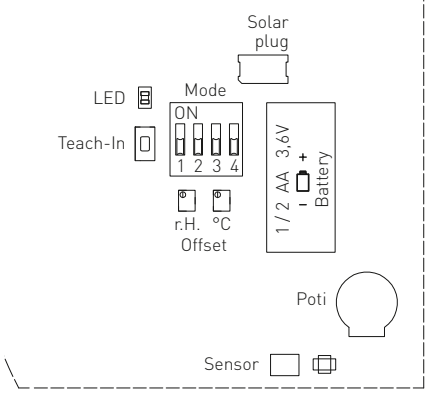
Dimensional drawing

RTF 2 - FSE - PT
RFTF 2 - FSE - PT



Schematic diagram

RTF 2 - FSE - P
RFTF 2 - FSE - P



KYMASGARD® **RTF 2 - FSE - P** Room temperature radio sensors
KYMASGARD® **RFTF 2 - FSE - P** Wireless room humidity and temperature radio sensors

Type / WGO2	Channels	Measuring Range Temperature	Measuring Range Humidity	Energy Generation	Item No.	Price
RTF2-FSE-P	2	0...+40 °C	–	Solar cell, battery	1801-4451-0140-040	**161,69 €**
RFTF2-FSE-P	3	0...+40 °C	0...100 % RH	Solar cell, battery	1801-4452-0140-040	**337,33 €**
ACCESSORIES						
ET BATTERIE	**Lithium battery** LS 14250				7000-4000-5000-000	**19,74 €**
BG KNOPF	**Control knob** (4°C...34°C) for combination with **TA2-FEM**				7000-4030-0008-058	**5,99 €**
Compatibility	For an overview, see the start of the chapter					

KYMASGARD® RTF 2 - FSE - PT
KYMASGARD® RFTF 2 - FSE - PT

Wireless room humidity and temperature radio sensors with solar cell, setpoint setter, and push-button

S+S REGELTECHNIK

The room temperature sensor **KYM**ASGARD® **RTF 2 - FSE - PT** or **RFTF 2 - FSE - PT** is a batteryless and maintenance-free radio transmitter. Energy generation is effected by conversion of indoor room light into electric energy by means of a solar generator. These sensors are used to detect the room temperature or room humidity as well as for setpoint setting and to transmit the measurands via radio frequency to radio actuators and radio signal receivers / gateways. If ambient light conditions are insufficient for energy generation, they also can be operated on a lithium battery. To do so, insert the lithium cell into the battery holder provided. The device IDs are marked on a label in the device.

RTF 2 - FSE - PT
RFTF 2 - FSE - PT

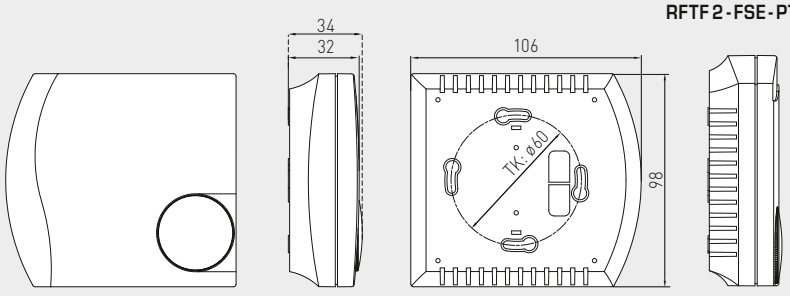


TECHNICAL DATA

Operation:	Energy generation by solar cell, batteryless, maintenance-free (optionally battery-operated)
Radio technology:	EnOcean protocol, modulation ASK, 868 MHz, transmission power max. 10 mW, telegram type 4BS
Channels:	1 temperature, 1 humidity, 1 setpoint, 1 presence pushbutton
Radio transmitter module:	EnOcean Dolphin
Measuring range, temperature:	0...+40 °C
Deviation, temperature:	typically ± 0.2 K at +25 °C
Measuring range, humidity:	0...100 % RH
Deviation humidity:	typically ± 3 % RH (30... 80 %) at +20 °C
Setpoint capture:	turning angle left 0° = 0 bits turning angle right 220° = 255 bits
Measurand acquisition:	adjustable, every 1 s / 10 s / 100 s
Transmission interval:	adjustable, typically every 100 seconds, or at any measuring value change, or change of turning angle status telegram approximately every 16 minutes
Range of coverage:	indoors typically 30 - 100 m, outdoors up to 300 m
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010)
Dimensions:	98 x 106 x 34 mm (Frija 2)
Mounting:	wall mounting or on in-wall flush box Ø 55 mm, base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes
Ambient temperature:	–5...+55 °C
Storage temperature:	–25...+60 °C
Humidity:	0...90 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 30 (according to EN 60 529)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU and according to R&TTE directive 2014 / 53 / EU

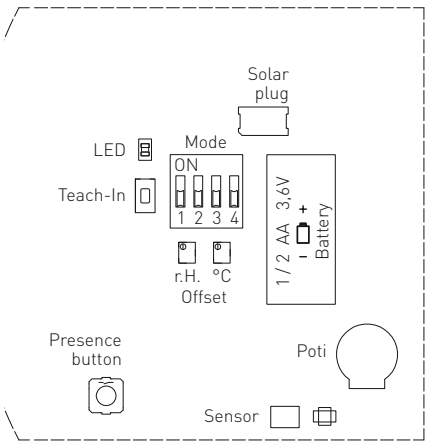
Dimensional drawing

RTF 2 - FSE - PT
RFTF 2 - FSE - PT



Schematic diagram

RTF 2 - FSE - PT
RFTF 2 - FSE - PT



KYMASGARD® **RTF 2 - FSE - PT** Room temperature radio sensors
KYMASGARD® **RFTF 2 - FSE - PT** Wireless room humidity and temperature radio sensors

Type / WG02	Channels	Measuring Range Temperature	Measuring Range Humidity	Energy Generation	Item No.	Price
RTF2-FSE-PT	3	0...+40 °C	–	Solar cell, battery	1801-4451-0440-040	**171,85 €**
RFTF2-FSE-PT	4	0...+40 °C	0...100 % RH	Solar cell, battery	1801-4452-0440-040	**347,54 €**
ACCESSORIES						
ET BATTERIE	**Lithium battery** LS 14250				7000-4000-5000-000	**19,74 €**
Compatibility	For an overview, see the start of the chapter					

KYMASGARD® RTF 2 - FSE - PD
KYMASGARD® RFTF 2 - FSE - PD

Wireless room humidity and temperature radio sensors with solar cell, setpoint setter, and step selection

The room temperature sensor **KYM**ASGARD® **RTF 2 - FSE - PD** or **RFTF 2 - FSE - PD** is a batteryless and maintenance-free radio transmitter. Energy generation is effected by conversion of indoor room light into electric energy by means of a solar generator. These sensors are used to detect the room temperature or room humidity as well as for setpoint setting and to transmit the measurands via radio frequency to radio actuators and radio signal receivers / gateways. If ambient light conditions are insufficient for energy generation, they also can be operated on a lithium battery. To do so, insert the lithium cell into the battery holder provided. The device IDs are marked on a label in the device.

RTF 2 - FSE - PD
RFTF 2 - FSE - PD

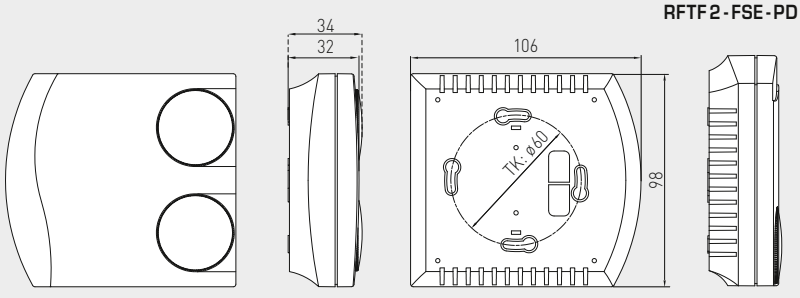


TECHNICAL DATA

Operation:	Energy generation by solar cell, batteryless, maintenance-free (optionally battery-operated)
Radio technology:	EnOcean protocol, modulation ASK, 868 MHz, transmission power max. 10 mW, telegram type 4BS
Channels:	1 temperature, 1 setpoint, 1 step switch
Radio transmitter module:	EnOcean Dolphin
Measuring range, temperature:	0...+40 °C
Deviation, temperature:	typically ± 0.2 K at +25 °C
Measuring range, humidity:	0...100 % RH
Deviation humidity:	typically ± 3 % RH (30... 80 %) at +20 °C
Setpoint capture:	turning angle left 0° = 0 bits turning angle right 220° = 255 bits Step selection: 0 to 255 bits in steps
Measurand acquisition:	adjustable, every 1 s / 10 s / 100 s
Transmission interval:	adjustable, typically every 100 seconds, or at any measuring value change, or change of turning angle status telegram approximately every 16 minutes
Range of coverage:	indoors typically 30 - 100 m, outdoors up to 300 m
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010)
Dimensions:	98 x 106 x 34 mm (Frija 2)
Mounting:	wall mounting or on in-wall flush box Ø 55 mm, base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes
Ambient temperature:	–5...+55 °C
Storage temperature:	–25...+60 °C
Humidity:	0...90 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 30 (according to EN 60 529)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU and according to R&TTE directive 2014 / 53 / EU

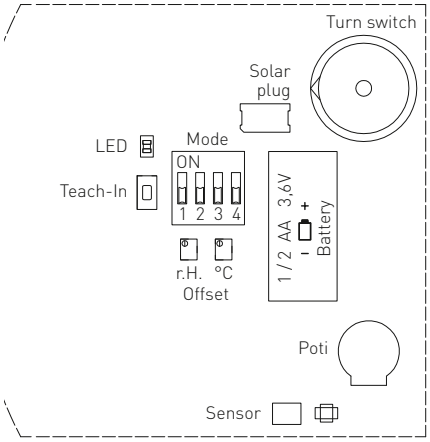
Dimensional drawing

RTF 2 - FSE - PD
RFTF 2 - FSE - PD



Schematic diagram

RTF 2 - FSE - PD
RFTF 2 - FSE - PD



KYMASGARD® **RTF 2 - FSE - PD** Room temperature radio sensors
KYMASGARD® **RFTF 2 - FSE - PD** Wireless room humidity and temperature radio sensors

Type / WGO2	Channels	Measuring Range Temperature	Measuring Range Humidity	Energy Generation	Item No.	Price
RTF2-FSE-PD2	3	0...+40 °C	–	Solar cell, battery	1801-4451-0240-040	**193,49 €**
RTF2-FSE-PD5	3	0...+40 °C	–	Solar cell, battery	1801-4451-0340-040	**193,49 €**
RFTF2-FSE-PD2	4	0...+40 °C	0...100 % RH	Solar cell, battery	1801-4452-0240-040	**362,82 €**
ACCESSORIES						
ET BATTERIE	**Lithium battery** LS 14250				7000-4000-5000-000	**19,74 €**
Compatibility	For an overview, see the start of the chapter					

KYMASGARD® RTF 2 - FSE - PDT

Wireless room temperature radio sensors
with solar cell, setpoint setter, step selection, and push-button

S+S REGELTECHNIK

The room temperature sensor **KYM**ASGARD® **RTF 2 - FSE - PDT** is a battery-less and maintenance-free radio transmitter. Energy generation is effected by conversion of indoor room light into electric energy by means of a solar generator. These sensors are used to detect the room temperature as well as for setpoint setting and to transmit the measurands via radio frequency to radio actuators and radio signal receivers / gateways. If ambient light conditions are insufficient for energy generation, they also can be operated on a lithium battery. To do so, insert the lithium cell into the battery holder provided.
The device IDs are marked on a label in the device.

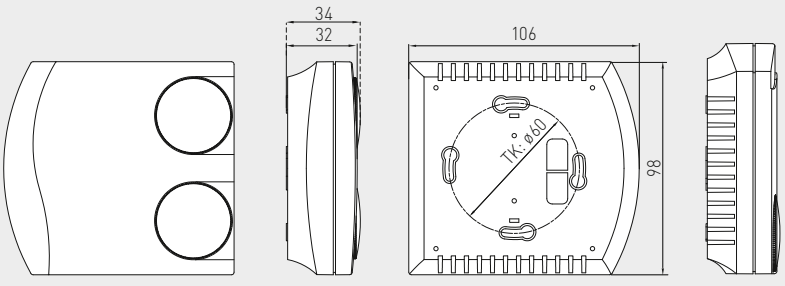
RTF 2 - FSE - PDT



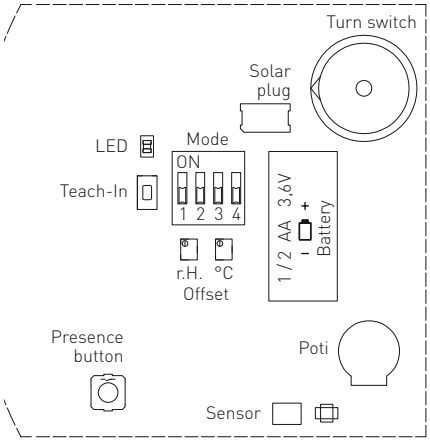
TECHNICAL DATA

Operation:	Energy generation by solar cell, batteryless, maintenance-free (optionally battery-operated)
Radio technology:	EnOcean protocol, modulation ASK, 868 MHz, transmission power max. 10 mW, telegram type 4BS
Channels:	1 temperature, 1 setpoint, 1 step switch, 1 presence pushbutton
Radio transmitter module:	EnOcean Dolphin
Measuring range, temperature:	0...+40 °C
Deviation, temperature:	typically ± 0.2 K at +25 °C
Setpoint capture:	turning angle left 0° = 0 bits turning angle right 220° = 255 bits Step selection: 0 to 255 bits in steps
Measurand acquisition:	adjustable, every 1 s / 10 s / 100 s
Transmission interval:	adjustable, typically every 100 seconds, or at any measuring value change, presence push-button activation, or change of turning angle status telegram approximately every 16 minutes
Range of coverage:	indoors typically 30 - 100 m, outdoors up to 300 m
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010)
Dimensions:	98 x 106 x 34 mm (Frija 2)
Mounting:	wall mounting or on in-wall flush box Ø 55 mm, base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes
Ambient temperature:	–5...+55 °C
Storage temperature:	–25...+60 °C
Humidity:	0...90 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 30 (according to EN 60 529)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU and according to R&TTE directive 2014 / 53 / EU

Dimensional drawing **RTF 2 - FSE - PDT**



Schematic diagram **RTF 2 - FSE - PDT**



KYMASGARD® RTF 2 - FSE - PDT Room temperature radio sensor

Type / WG02	Channels	Measuring Range Temperature	Humidity	Energy Generation	Item No.	Price
RTF2-FSE-PD5T	4	0...+40 °C	–	Solar cell, battery	1801-4451-0540-040	**206,24 €**
ACCESSORIES						
ET BATTERIE	**Lithium battery** LS 14250				7000-4000-5000-000	**19,74 €**
Compatibility	For an overview, see the start of the chapter					

The multifunctional outside sensor **KYM**ASGARD® **AFTF-HK-FSE** is a maintenance-free radio transmitter without battery for on-wall installation. Energy is generated by converting outdoor light into electric energy by means of a solar generator. It is used to detect the outside temperature, outdoor humidity and outdoor light intensity and to transmit the measurands via radio signal to radio actuators and radio receivers/gateways.

AFTF-HK-FSE



TECHNICAL DATA

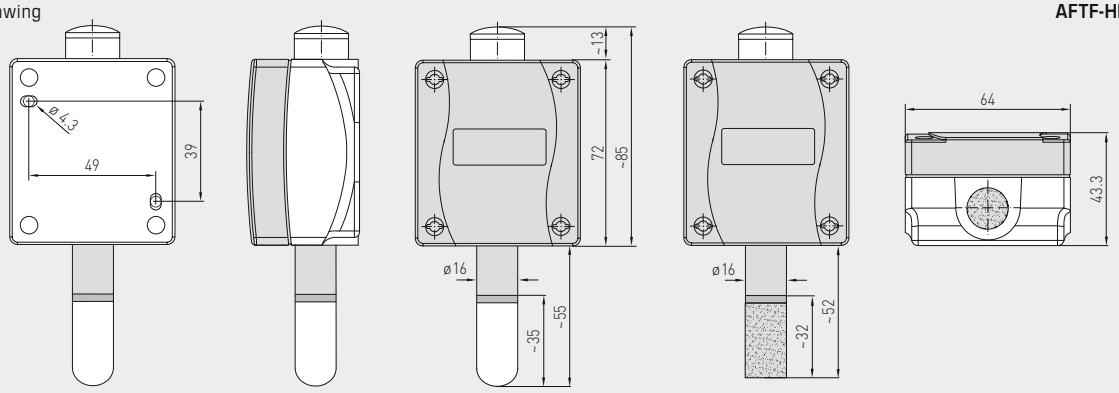
Operation:	Energy generation by solar cell, batteryless, maintenance-free
Radio technology:	EnOcean protocol, modulation ASK, 868 MHz, transmission power max. 10 mW, telegram type 4BS
Channels:	1 temperature, 1 humidity, 1 light intensity
Radio transmitter module:	EnOcean Dolphin
Measurand acquisition:	adjustable, every 1s / 10s / 100s
Transmission interval:	adjustable, typically every 100 seconds, or at any measuring value change, status telegram approximately every 16 minutes
Range of coverage:	Indoors typically 30 - 100 m, outdoors up to 300 m
HUMIDITY	
Operating range, humidity:	0...100 % RH
Deviation in humidity:	typically **± 2.0** % (20...80 % RH) at +25 °C, otherwise ± 3.0 %
TEMPERATURE	
Operating range, temperature:	–20...+60 °C
Deviation in temperature:	typically ± 0.2 K at +25 °C
LIGHT INTENSITY	
Light intensity operating range:	**Multi-range switching** 0...2000 Lux / 0...60 kLux
Deviation in light intensity:	typically < 5 % of final value
Housing:	Plastic, UV-resistant, polyamide material, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), traffic white colour (similar to RAL 9016), housing cover is transparent!
Housing dimensions:	72 x 64 x 43.3 mm (Tyr 1)
Protective tube:	**made of stainless steel V2A** (1.4301), Ø = 16 mm, NL = 55 mm
Sensor protection:	**plastic** sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional **metal** sinter filter, Ø 16 mm, L = 32 mm)
Ambient temperature:	–25...+60 °C
Storage temperature:	–25...+60 °C
Permitted humidity:	0...90 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU and according to R&TTE Directive 2014 / 53 / EU

SF-M
Metal sinter filter
(optional)



Dimensional drawing

AFTF-HK-FSE



KYMASGARD® AFTF-HK-FSE Outside radio sensor for humidity, temperature and light intensity

Type / WGO2	Channels	Measuring ranges Temperature	Humidity	Light intensity	Item no.	Price
AFTF-HK-FSE				(switchable)		
AFTF-HK-FSE	3	–20...+60 °C	0...100 % RH	0...2000 Lux / 0...60 kLux	1801-1140-1000-000	**275,66 €**
Compatibility		For an overview, see the start of the chapter				

Accessories

S+S added value –
smart supplements, always ahead

Take advantage of our comprehensive range of accessories, which can be used together with our entire product portfolio. This keeps you always a step ahead, and best of all: If you buy and stock up, you will also save on the price.

Our standard devices normally differ in type of design and sensors. Depending on the application, you can install S+S accessories directly on site.





IMMERSION SLEEVES & ACCESSORIES

Immersion sleeves

TH 08	Immersion sleeves for temperature sensors	**644**
TH	Immersion sleeves for temperature sensors	**646**
THR	Immersion sleeves for temperature controllers	**648**
THE	Immersion sleeves for sleeve sensors	**650**

Mounting accessories

MFT-20-K	Mounting flange, plastic	**652**
MF-xx-K	Mounting flange, plastic	**652**
MF-xx-M	Mounting flange, metal	**653**
KRD-04	Capillary tube gland bracket, plastic	**652**
MK-xx	Mounting brackets	**653**
ESSH	Welding protection sleeve	**654**
KVSS / KVST	Clamp connections	**654**
TH-Adapter-HW	Immersion sleeve adapter (Honeywell / CentraLine)	**654**

Accessories for differential pressure switches

ASD-06	Connection set	**655**
ASD-07	Connection nipple (90°)	**655**
ASS-UV	Connection hose, UV-resistant	**655**
DAL	Pressure outlet	**655**
DS-MW	Mounting bracket, sheet steel	**655**

Protection hoods

WS-01	Sun and ball-impact protection hood	**656**
WS-03	Weather and sun protection hood (Tyr 2)	**656**
WS-04	Weather and sun protection hood (Tyr 1)	**656**

Spare parts, small parts

SF-xx	Sinter filters, replaceable	**657**
PSW-09	Stainless steel paddle (SW)	**657**
PWFS-08	Stainless steel vane (WFS)	**657**
WH-20	Wall holder (KH)	**657**
HS-Adapter	Universal holder for small housing (top hat rails)	**657**
Modbus-Y	Y-adapter for cable gland	**657**
SPB-1	Strap for surface-contact sensor	**657**
WLP-1	Heat-conductive paste, silicone-free	**657**

Special accessories for plug-in connectors

Connection accessories, A-coded, 5-pin or 12-pin	**658**
Connection accessories, EtherCATP-coded, 4-pin	**659**

Miscellaneous

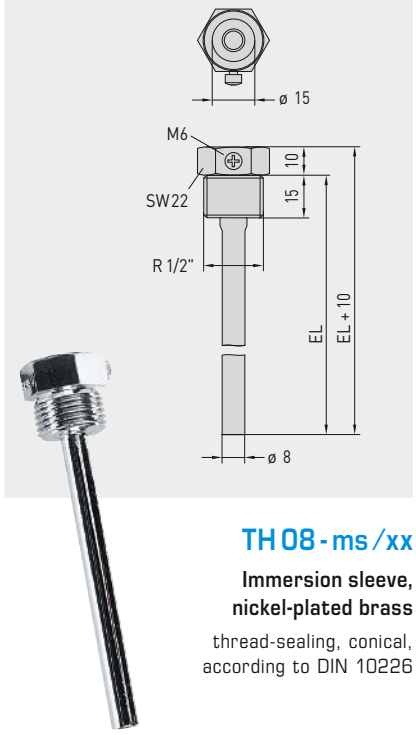
Optional services, single services	**660**
Custom-made products	**661**

THERMASGARD® TH 08

Immersion sleeves made of stainless steel or brass, nickel-plated, for temperature sensors and measuring transducers
TF 43, TM 43, TF 65, TM 65, TM 65-Modbus (Tyr 1))

S+S REGELTECHNIK

Dimensional drawing **TH 08-ms/xx**

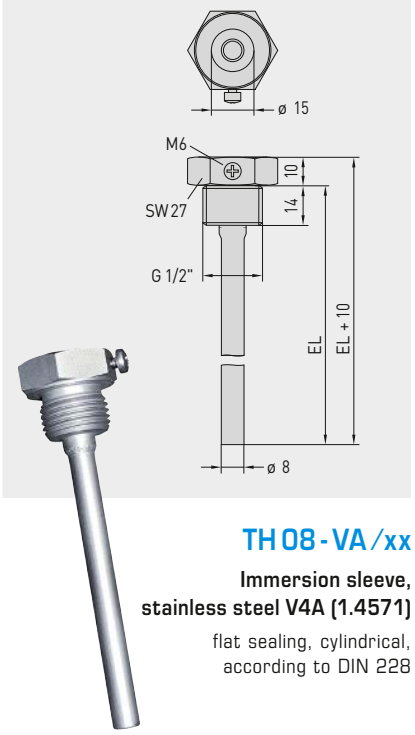


TH 08-ms/xx

Immersion sleeve, nickel-plated brass

thread-sealing, conical, according to DIN 10226

Dimensional drawing **TH 08-VA/xx**

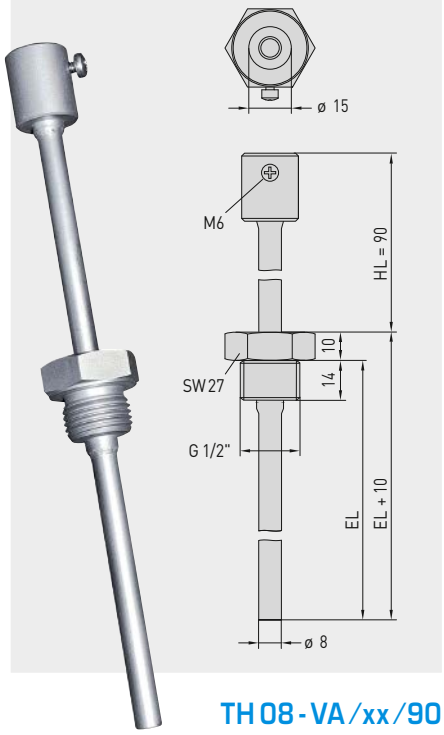


TH 08-VA/xx

Immersion sleeve, stainless steel V4A (1.4571)

flat sealing, cylindrical, according to DIN 228

Dimensional drawing **TH 08-VA/xx/90**



TH 08-VA/xx/90

Immersion sleeve, stainless steel V4A (1.4571) with neck tube

flat sealing, cylindrical, according to DIN 228

THERMASGARD® TH 08 Immersion sleeve Ø 8 mm

Type/WG01	p_{max} (static)	T_{max}	Inserted length (EL)	Item No.	Price
TH 08-ms/xx	**Brass nickel-plated**			**Ø 8** x 0.75 mm	
TH08-MS 50MM	10 bar	+150 °C	**50 mm**	7100-0011-0010-132	**9,31 €**
TH08-MS 100MM	10 bar	+150 °C	**100 mm**	7100-0011-0020-132	**10,61 €**
TH08-MS 150MM	10 bar	+150 °C	**150 mm**	7100-0011-0030-132	**11,20 €**
TH08-MS 200MM	10 bar	+150 °C	**200 mm**	7100-0011-0040-132	**11,56 €**
TH08-MS 250MM	10 bar	+150 °C	**250 mm**	7100-0011-0050-132	**13,39 €**
TH08-MS 300MM	10 bar	+150 °C	**300 mm**	7100-0011-0060-132	**13,76 €**
TH08-MS 350MM	10 bar	+150 °C	**350 mm**	7100-0011-0070-132	**13,87 €**
TH08-MS 400MM	10 bar	+150 °C	**400 mm**	7100-0011-0080-132	**14,00 €**
TH 08-VA/xx	**Stainless steel V4A** (1.4571)			**Ø 8** x 0.75 mm	
TH08-VA 50MM	40 bar	+600 °C	**50 mm**	7100-0012-0010-132	**20,28 €**
TH08-VA 100MM	40 bar	+600 °C	**100 mm**	7100-0012-0020-132	**22,41 €**
TH08-VA 150MM	40 bar	+600 °C	**150 mm**	7100-0012-0030-132	**24,08 €**
TH08-VA 200MM	40 bar	+600 °C	**200 mm**	7100-0012-0040-132	**25,38 €**
TH08-VA 250MM	40 bar	+600 °C	**250 mm**	7100-0012-0050-132	**31,55 €**
TH08-VA 300MM	40 bar	+600 °C	**300 mm**	7100-0012-0060-132	**32,97 €**
TH08-VA 350MM	40 bar	+600 °C	**350 mm**	7100-0012-0070-132	**33,19 €**
TH08-VA 400MM	40 bar	+600 °C	**400 mm**	7100-0012-0080-132	**33,78 €**
TH 08-VA/xx/90	**Stainless steel V4A** (1.4571), with neck tube (90mm)			**Ø 8** x 0.75 mm	
TH08-VA 50/90MM	40 bar	+600 °C	**50 mm**	7100-0012-0012-132	**29,04 €**
TH08-VA 100/90MM	40 bar	+600 °C	**100 mm**	7100-0012-0022-132	**30,35 €**
TH08-VA 150/90MM	40 bar	+600 °C	**150 mm**	7100-0012-0032-132	**31,84 €**
TH08-VA 200/90MM	40 bar	+600 °C	**200 mm**	7100-0012-0042-132	**33,19 €**
TH08-VA 250/90MM	40 bar	+600 °C	**250 mm**	7100-0012-0052-132	**34,79 €**
TH08-VA 300/90MM	40 bar	+600 °C	**300 mm**	7100-0012-0062-132	**37,71 €**
Note:	Inner diameter of socket 15.0 mm				

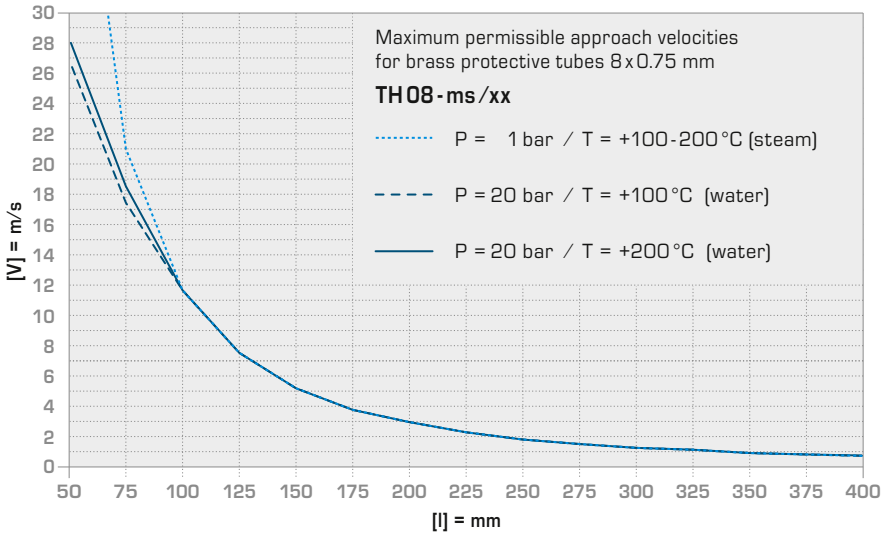
INSTRUCTIONS FOR PLANNING AND INSTALLATION

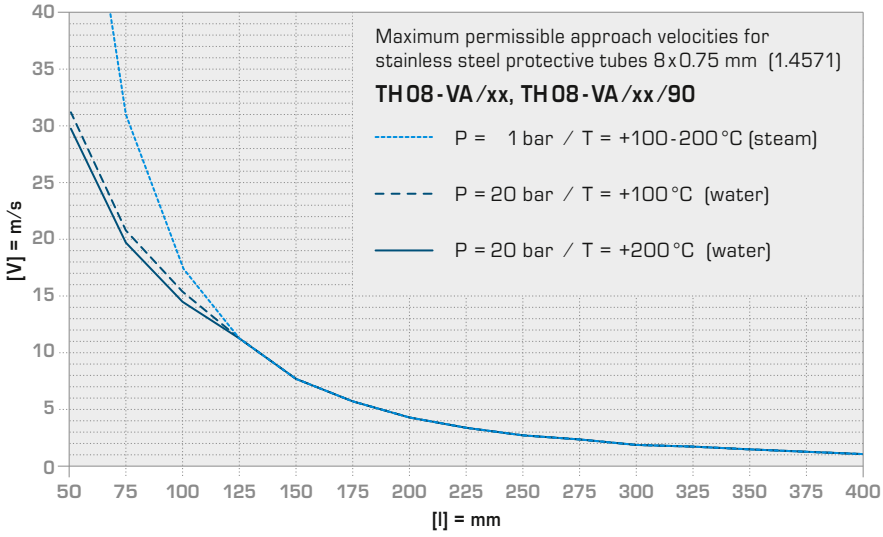
The approaching flow causes the protective tube to vibrate.

If the specified approach velocity is exceeded even by a marginal amount, a negative impact on the protective tube's service life may result (material fatigue).

Please observe permissible approach velocities for stainless steel protective tubes (see graph **TH08-VA**) as well as for brass protective tubes (see graph **TH08-ms**).

Discharge of gases and pressure surges must be avoided as they have a negative influence on the service life and may damage the protective tubes irreparably.

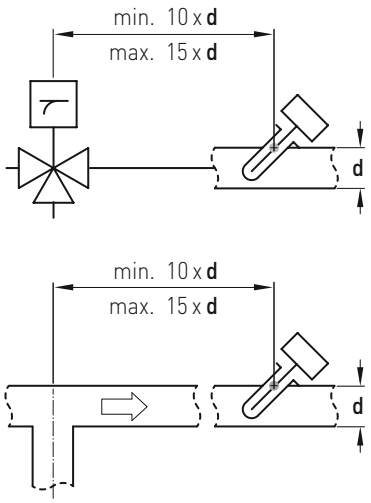




MIXING SECTION

After the mixing of water flows of different temperatures, the issue of temperature stratification means that an adequate distance to the sensor must be observed.

Mixing section **TH08**



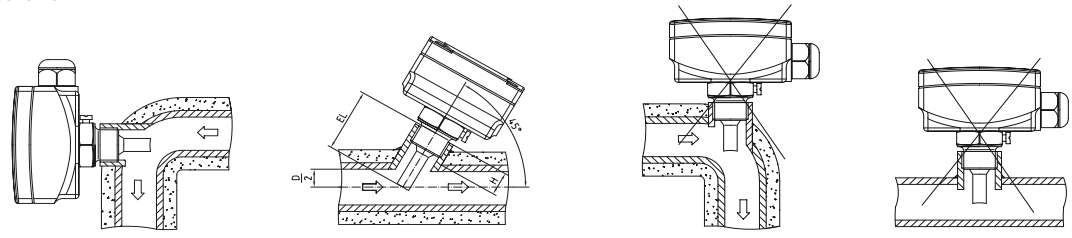
When Copper and Zinc are Not Enough

Uncompromising quality and safety are also paramount in the design of the accessory from S+S. This is why our metal immersion sleeves for duct sensors are made using either nickel plated brass or stainless steel. Brass is an alloy consisting mainly of copper and zinc, which provide good forming and machining properties, mechanical strength, temperature resistance and electrical conductivity.

In contrast to conventional products in the market, however, our brass immersion sleeves feature an additional nickel coating. This ensures their longterm corrosion resistance in minor aggressive media, from air and water to alkaline solutions and diluted acids. At the same time, the nickel layer prevents ingredients in thermally conductive compounds from stripping the copper and causing pitting.

Highest protection against corrosion is provided by immersion sleeves made of stainless steel. Among the available qualities, we chose VA 1.4571 or AISI 316 Ti, a high-grade austenite specialty combining chromium, nickel and molybdenum with an extra titanium content. The alloy has a proven fit particularly in the design of chemical process equipment and technical instruments as well as in waste gas and water treatment. Its corrosion resistance also includes chlorides or salts and more aggressive acids, such as hydrochloric acid (HCl).

Installation scheme **TH08**

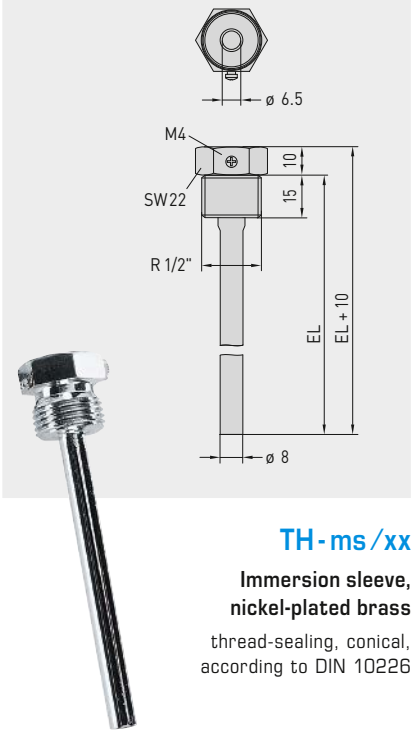


THERMASGARD® TH

**Immersion sleeves made of stainless steel or brass, nickel-plated,
for temperature sensors and measuring transducers TF 54 / TM 54 (form B)**

S+S REGELTECHNIK

Dimensional drawing **TH-ms/xx**

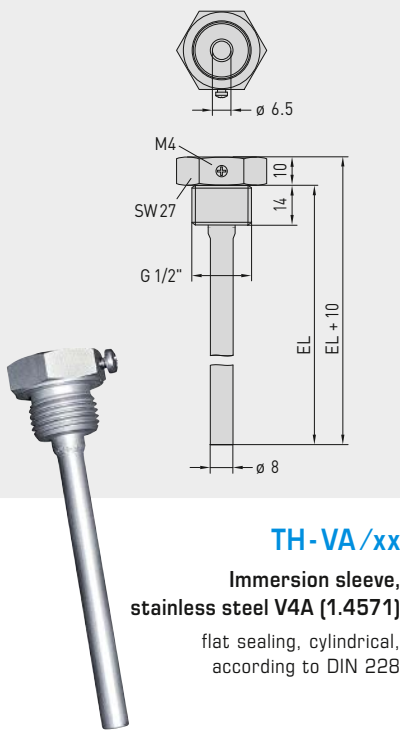


TH-ms/xx

**Immersion sleeve,
nickel-plated brass**

thread-sealing, conical,
according to DIN 10226

Dimensional drawing **TH-VA/xx**

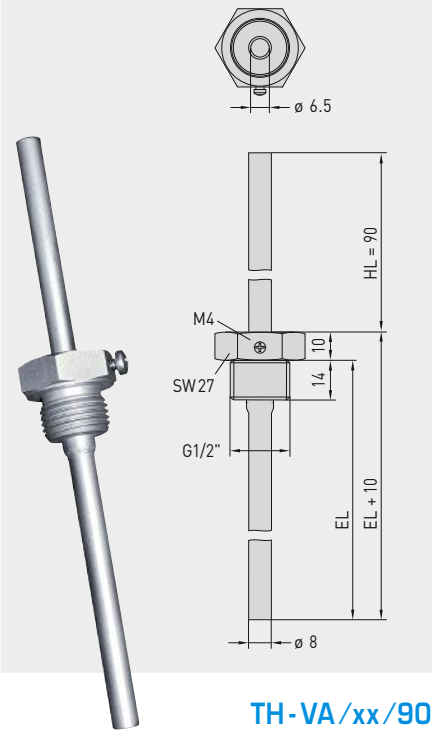


TH-VA/xx

**Immersion sleeve,
stainless steel V4A (1.4571)**

flat sealing, cylindrical,
according to DIN 228

Dimensional drawing **TH-VA/xx/90**



TH-VA/xx/90

**Immersion sleeve,
stainless steel V4A (1.4571)
with neck tube**

flat sealing, cylindrical,
according to DIN 228

THERMASGARD® TH Immersion sleeve Ø 8 mm					
Type / WG01	**p_{max} (static)**	**T_{max}**	**Inserted length (EL)**	**Item No.**	**Price**
TH-ms/xx	**Brass nickel-plated**			**Ø 8** x 0.75 mm	
TH-MS 50MM	10 bar	+150 °C	**50 mm**	7100-0011-0010-001	**9,31 €**
TH-MS 100MM	10 bar	+150 °C	**100 mm**	7100-0011-0020-001	**10,61 €**
TH-MS 150MM	10 bar	+150 °C	**150 mm**	7100-0011-0030-001	**11,20 €**
TH-MS 200MM	10 bar	+150 °C	**200 mm**	7100-0011-0040-001	**11,56 €**
TH-MS 250MM	10 bar	+150 °C	**250 mm**	7100-0011-0050-001	**13,39 €**
TH-MS 300MM	10 bar	+150 °C	**300 mm**	7100-0011-0060-001	**13,76 €**
TH-MS 350MM	10 bar	+150 °C	**350 mm**	7100-0011-0070-001	**13,87 €**
TH-MS 400MM	10 bar	+150 °C	**400 mm**	7100-0011-0080-001	**14,00 €**
TH-VA/xx	**Stainless steel V4A** (1.4571)			**Ø 8** x 0.75 mm	
TH-VA 50MM	40 bar	+600 °C	**50 mm**	7100-0012-0010-001	**20,28 €**
TH-VA 100MM	40 bar	+600 °C	**100 mm**	7100-0012-0020-001	**22,41 €**
TH-VA 150MM	40 bar	+600 °C	**150 mm**	7100-0012-0030-001	**24,08 €**
TH-VA 200MM	40 bar	+600 °C	**200 mm**	7100-0012-0040-001	**25,38 €**
TH-VA 250MM	40 bar	+600 °C	**250 mm**	7100-0012-0050-001	**31,55 €**
TH-VA 300MM	40 bar	+600 °C	**300 mm**	7100-0012-0060-001	**32,97 €**
TH-VA 350MM	40 bar	+600 °C	**350 mm**	7100-0012-0070-001	**33,19 €**
TH-VA 400MM	40 bar	+600 °C	**400 mm**	7100-0012-0080-001	**33,78 €**
TH-VA/xx/90	**Stainless steel V4A** (1.4571), with neck tube (90mm)			**Ø 8** x 0.75 mm	
TH-VA 50/90MM	40 bar	+600 °C	**50 mm**	7100-0012-2010-001	**29,04 €**
TH-VA 100/90MM	40 bar	+600 °C	**100 mm**	7100-0012-2020-001	**30,35 €**
TH-VA 150/90MM	40 bar	+600 °C	**150 mm**	7100-0012-2030-001	**31,84 €**
TH-VA 200/90MM	40 bar	+600 °C	**200 mm**	7100-0012-2040-001	**33,19 €**
TH-VA 250/90MM	40 bar	+600 °C	**250 mm**	7100-0012-2050-001	**34,79 €**
TH-VA 300/90MM	40 bar	+600 °C	**300 mm**	7100-0012-2060-001	**37,71 €**
Note:	Inner diameter of socket 6.5 mm				

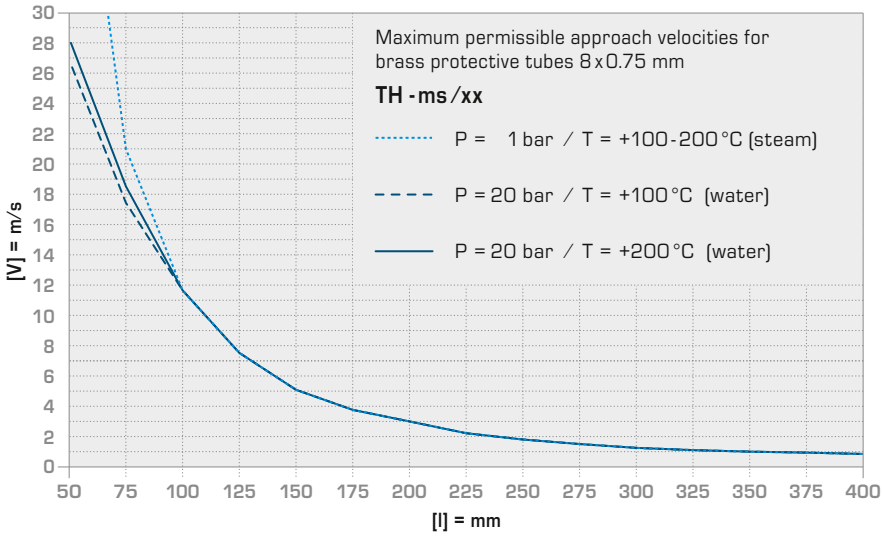
INSTRUCTIONS FOR PLANNING AND INSTALLATION

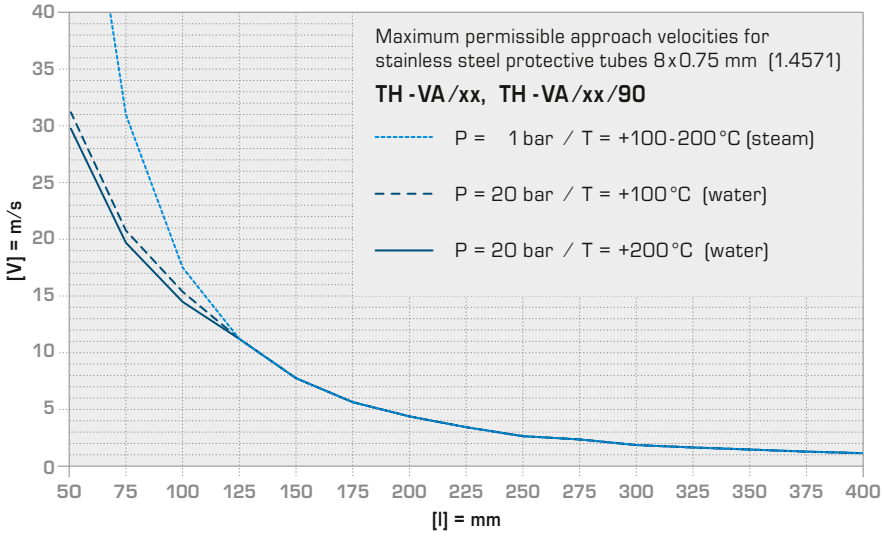
The approaching flow causes the protective tube to vibrate.

If the specified approach velocity is exceeded even by a marginal amount, a negative impact on the protective tube's service life may result (material fatigue).

Please observe permissible approach velocities for stainless steel protective tubes (see graph **TH-VA**) as well as for brass protective tubes (see graph **TH-ms**).

Discharge of gases and pressure surges must be avoided as they have a negative influence on the service life and may damage the protective tubes irreparably.

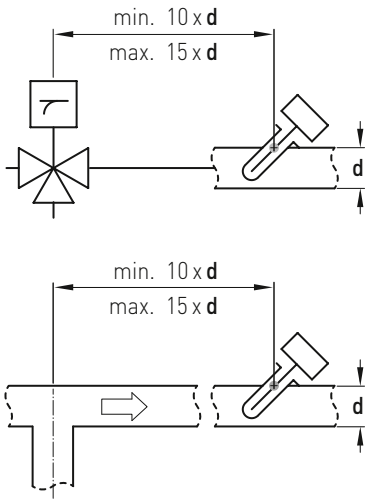




MIXING SECTION

After the mixing of water flows of different temperatures, the issue of temperature stratification means that an adequate distance to the sensor must be observed.

Mixing section **TH**



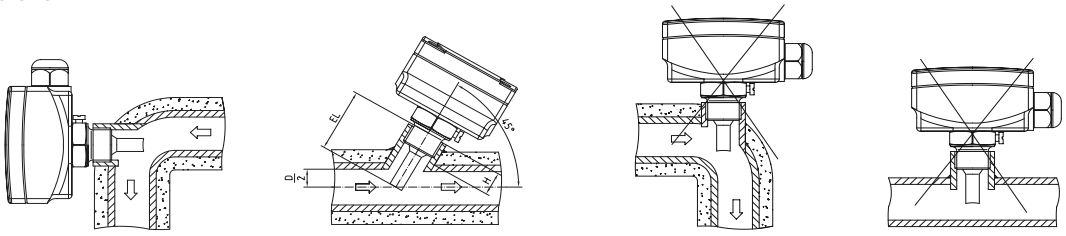
When Copper and Zinc are Not Enough

Uncompromising quality and safety are also paramount in the design of the accessory from S+S. This is why our metal immersion sleeves for duct sensors are made using either nickel plated brass or stainless steel. Brass is an alloy consisting mainly of copper and zinc, which provide good forming and machining properties, mechanical strength, temperature resistance and electrical conductivity.

In contrast to conventional products in the market, however, our brass immersion sleeves feature an additional nickel coating. This ensures their longterm corrosion resistance in minor aggressive media, from air and water to alkaline solutions and diluted acids. At the same time, the nickel layer prevents ingredients in thermally conductive compounds from stripping the copper and causing pitting.

Highest protection against corrosion is provided by immersion sleeves made of stainless steel. Among the available qualities, we chose VA 1.4571 or AISI 316 Ti, a high-grade austenite specialty combining chromium, nickel and molybdenum with an extra titanium content. The alloy has a proven fit particularly in the design of chemical process equipment and technical instruments as well as in waste gas and water treatment. Its corrosion resistance also includes chlorides or salts and more aggressive acids, such as hydrochloric acid (HCl).

Installation scheme **TH**

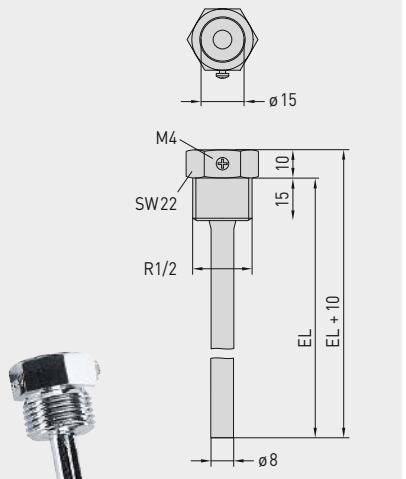


THERMASGARD® THR

Immersion sleeves made of stainless steel or brass, nickel-plated, for temperature controllers ETR (Thor 2)

S+S REGELTECHNIK

Dimensional drawing **THR-ms-08/xx**



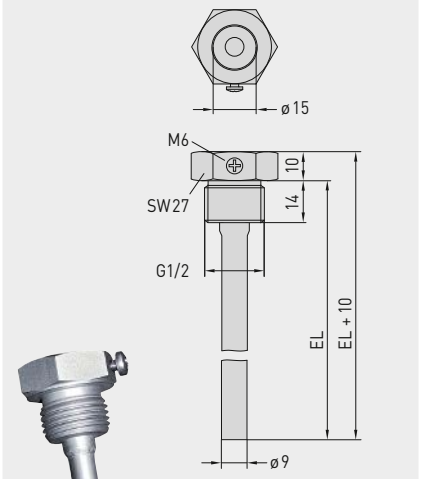


THR-ms-08/xx

Immersion sleeve, nickel-plated brass

thread-sealing, conical, according to DIN 10226

Dimensional drawing **THR-VA-09/xx**



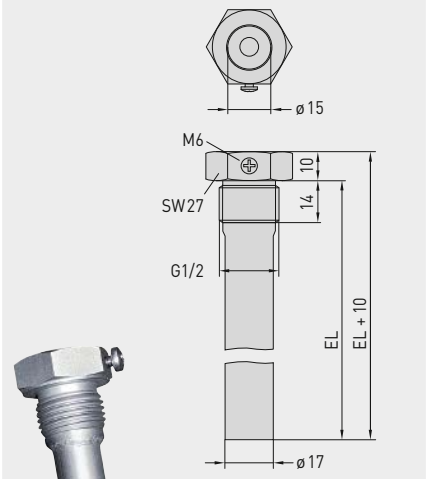


THR-VA-09/xx

Immersion sleeve, stainless steel V4A (1.4571)

flat sealing, cylindrical, according to DIN 228

Dimensional drawing **THR-VA-17/xx**





THR-VA-17/xx

Immersion sleeve, stainless steel V4A (1.4571)

flat sealing, cylindrical, according to DIN 228

When Copper and Zinc are Not Enough

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In contrast to conventional products in the market, however, our brass immersion sleeves feature an additional nickel coating. This ensures their longterm corrosion resistance in minor aggressive media, from air and water to alkaline solutions and diluted acids. At the same time, the nickel layer prevents ingredients in thermally conductive compounds from stripping the copper and causing pitting.

Highest protection against corrosion is provided by immersion sleeves made of stainless steel. Among the available qualities, we chose VA 1.4571 or AISI 316 Ti, a high-grade austenite specialty combining chromium, nickel and molybdenum with an extra titanium content. The alloy has a proven fit particularly in the design of chemical process equipment and technical instruments as well as in waste gas and water treatment. Its corrosion resistance also includes chlorides or salts and more aggressive acids, such as hydrochloric acid (HCl).

THERMASGARD® THR Immersion sleeve Ø 8 / 9 / 17 mm for **THERMASREG® ETR** (Thor 2)

Type / WG01	p_{max} (static)	T_{max}	Time Constant for Medium: Air	Water	Oil	Inserted Length (EL)	Item No. Ø	Price
THR-ms-08/xx	**Brass nickel-plated**						**Ø 8** x 0.5 mm	
THR-MS-08/100	10 bar	+150 °C	106 s	18 s	53 s	**100 mm**	7100-0011-3022-000	**15,42 €**
THR-MS-08/150	10 bar	+150 °C	106 s	18 s	53 s	**150 mm**	7100-0011-3404-000	**15,55 €**
THR-MS-08/200	10 bar	+150 °C	106 s	18 s	53 s	**200 mm**	7100-0011-3403-000	**18,47 €**
THR-VA-09/xx	**Stainless steel V4A** (1.4571)						**Ø 9** x 1.0 mm	
THR-VA-09/100	25 bar	+150 °C	92 s	17 s	41 s	**100 mm**	7100-0012-3022-000	**39,72 €**
THR-VA-09/150	25 bar	+150 °C	92 s	17 s	41 s	**150 mm**	7100-0012-3032-000	**40,99 €**
THR-VA-09/200	25 bar	+150 °C	92 s	17 s	41 s	**200 mm**	7100-0012-3042-000	**43,92 €**
THR-VA-17/xx	**Stainless steel V4A** (1.4571)						**Ø 17** x 1.0 mm	
THR-VA-17/150	25 bar	+150 °C	–	45 s	55 s	**150 mm**	7100-0012-3033-000	**40,99 €**
THR-VA-17/200	25 bar	+150 °C	–	45 s	55 s	**200 mm**	7100-0012-3404-000	**43,92 €**

Ordering example:
THR-ms-08/**100** (Brass immersion sleeve, Ø = 8 mm, **EL = 100** mm)
THR-VA-09/**150** (Stainless steel immersion sleeve, Ø = 9 mm, **EL = 150** mm)
THR-VA-17/**200** (Stainless steel immersion sleeve, Ø = 17 mm, **EL = 200** mm)

Note: inner diameter of socket 15.0 mm

THERMASGARD® THR

Immersion sleeves made of stainless steel or brass, nickel-plated, for temperature controllers ETR (Thor 2)

INSTRUCTIONS FOR PLANNING AND INSTALLATION

The approaching flow causes the protective tube to vibrate.

If the specified approach velocity is exceeded even by a marginal amount, a negative impact on the protective tube's service life may result (material fatigue).

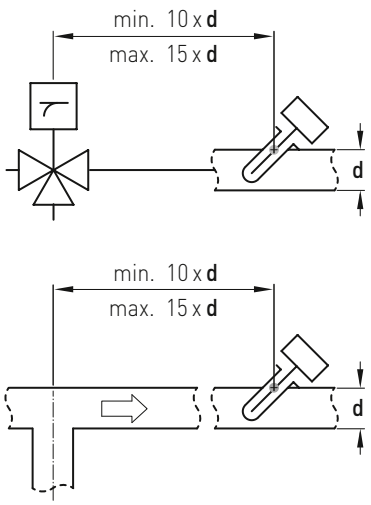
Please observe permissible approach velocities for stainless steel protective tubes (see graph **THR-VA**) as well as for brass protective tubes (see graph **THR-ms**).

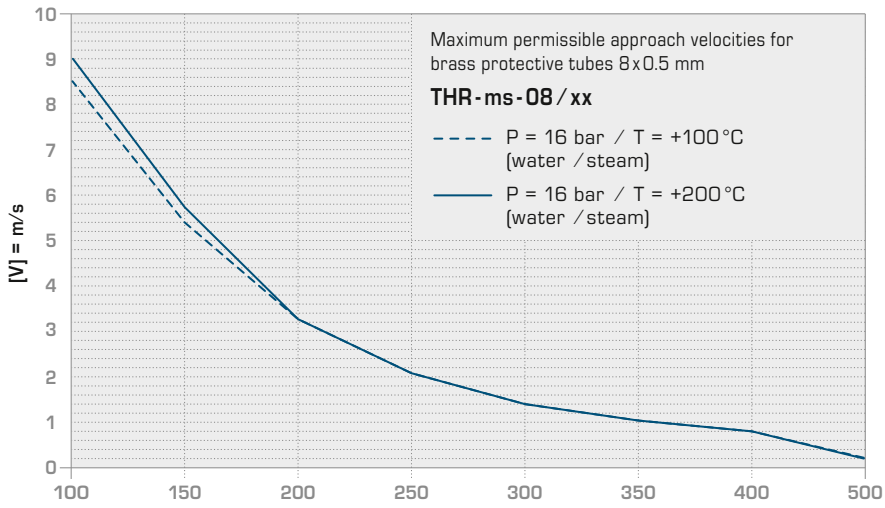
Discharge of gases and pressure surges must be avoided as they have a negative influence on the service life and may damage the protective tubes irreparably.

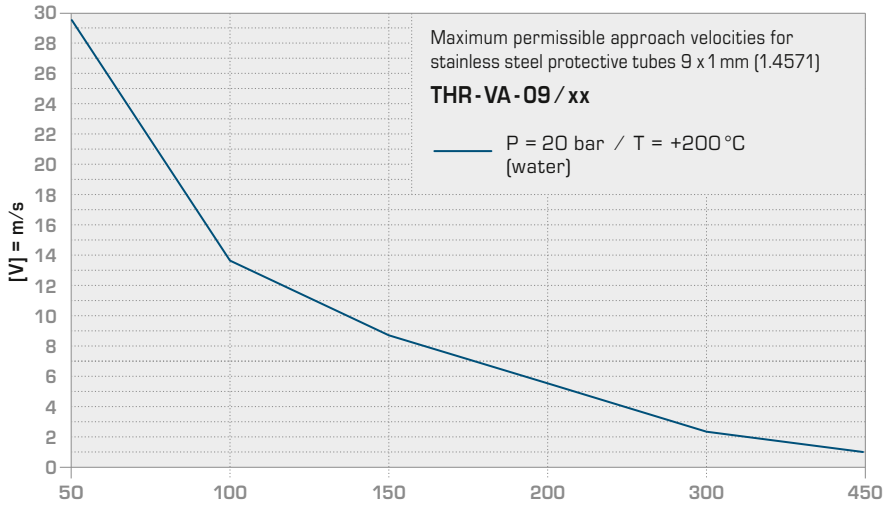
MIXING SECTION

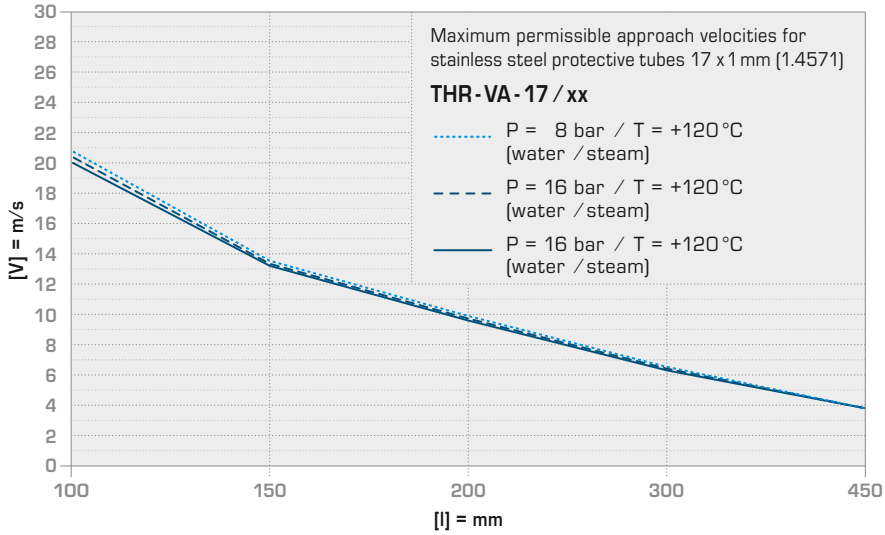
After the mixing of water flows of different temperatures, the issue of temperature stratification means that an adequate distance to the sensor must be observed.

Mixing section **THR**

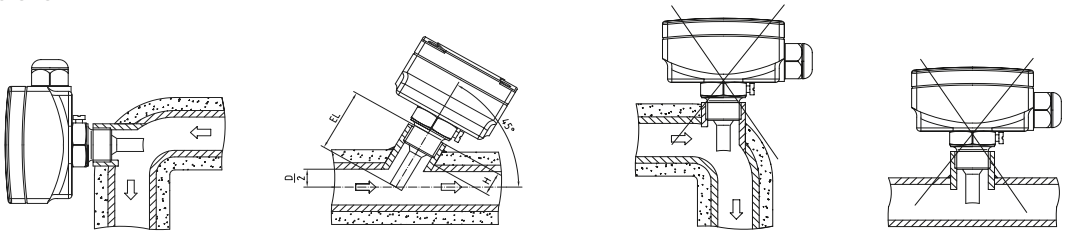








Installation scheme **THR**

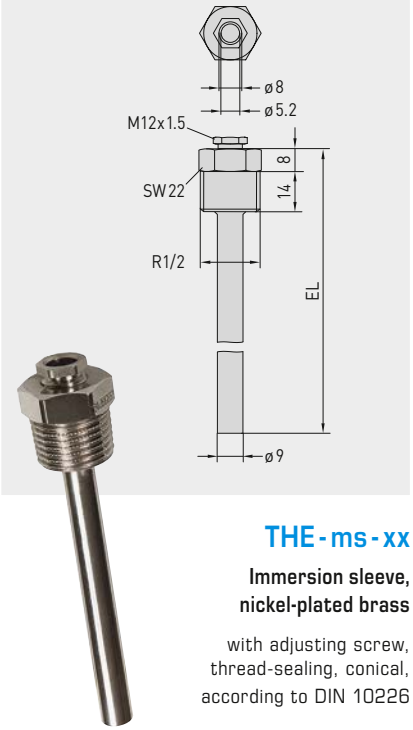


THERMASGARD® THE

Immersion sleeves made of stainless steel or brass, nickel-plated, with adjusting screw, for sleeve sensor HTF / HFTM

S+S REGELTECHNIK

Dimensional drawing **THE - ms - xx**

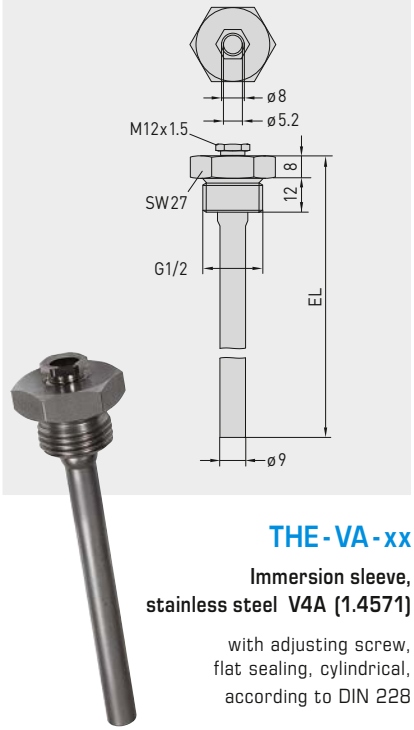


THE - ms - xx

Immersion sleeve, nickel-plated brass

with adjusting screw, thread-sealing, conical, according to DIN 10226

Dimensional drawing **THE - VA - xx**



THE - VA - xx

Immersion sleeve, stainless steel V4A (1.4571)

with adjusting screw, flat sealing, cylindrical, according to DIN 228

When Copper and Zinc are Not Enough

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Highest protection against corrosion is provided by immersion sleeves made of stainless steel. Among the available qualities, we chose VA 1.4571 or AISI 316 Ti, a high-grade austenite specialty combining chromium, nickel and molybdenum with an extra titanium content. The alloy has a proven fit particularly in the design of chemical process equipment and technical instruments as well as in waste gas and water treatment. Its corrosion resistance also includes chlorides or salts and more aggressive acids, such as hydrochloric acid (HCl).

THERMASGARD® THE Immersion sleeve Ø 9 mm for **THERMASGARD® HTF / HFTM**

Type / WG01	p_{max} static	T_{max}	Inserted Length (EL)	Item No.	Price
THE - ms / xx	**Brass nickel-plated**			**Ø 9** x 1,0 mm	
THE-MS 50MM	16 bar	+130 °C	**50 mm**	7100-0011-6010-002	**10,46 €**
THE-MS 100MM	16 bar	+130 °C	**100 mm**	7100-0011-6020-002	**11,30 €**
THE-MS 150MM	16 bar	+130 °C	**150 mm**	7100-0011-6030-002	**11,72 €**
THE-MS 200MM	16 bar	+130 °C	**200 mm**	7100-0011-6040-002	**12,54 €**
THE-MS 250MM	16 bar	+130 °C	**250 mm**	7100-0011-6050-002	**14,05 €**
THE - VA / xx	**Stainless steel V4A** (1.4571)			**Ø 9** x 1,0 mm	
THE-VA 50MM	40 bar	+200 °C	**50 mm**	7100-0012-6010-002	**20,70 €**
THE-VA 100MM	40 bar	+200 °C	**100 mm**	7100-0012-6020-002	**22,86 €**
THE-VA 150MM	40 bar	+200 °C	**150 mm**	7100-0012-6030-002	**24,55 €**
THE-VA 200MM	40 bar	+200 °C	**200 mm**	7100-0012-6040-002	**25,89 €**
THE-VA 250MM	40 bar	+200 °C	**250 mm**	7100-0012-6050-002	**32,18 €**
THE-VA 300MM	40 bar	+200 °C	**300 mm**	7100-0012-6060-002	**33,62 €**
THE-VA 400MM	40 bar	+200 °C	**400 mm**	7100-0012-6080-002	**34,71 €**
Ordering example:	THE - ms - **150** (Brass immersion sleeve, Ø = 9 mm, **EL = 150** mm) THE - VA - **150** (Stainless steel immersion sleeve, Ø = 9 mm, **EL = 150** mm) Other inserted lengths on request				
Note:	inner diameter of socket 5.2 mm, with **adjusting screw** M12 x 1.5				

THERMASGARD® THE

Immersion sleeves made of stainless steel or brass, nickel-plated, with adjusting screw, for sleeve sensor HTF/HFTM

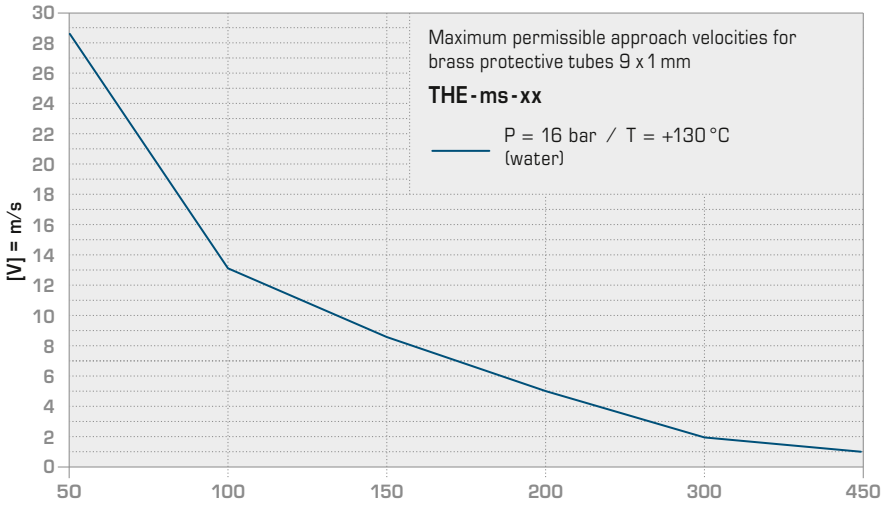
INSTRUCTIONS FOR PLANNING AND INSTALLATION

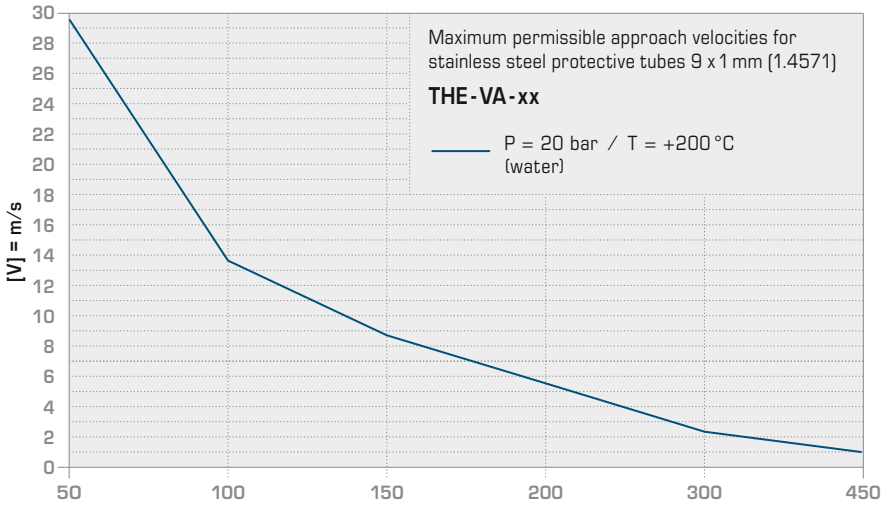
The approaching flow causes the protective tube to vibrate.

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Please observe permissible approach velocities for stainless steel protective tubes (see graph **THE-VA**) as well as for brass protective tubes (see graph **THE-ms**).

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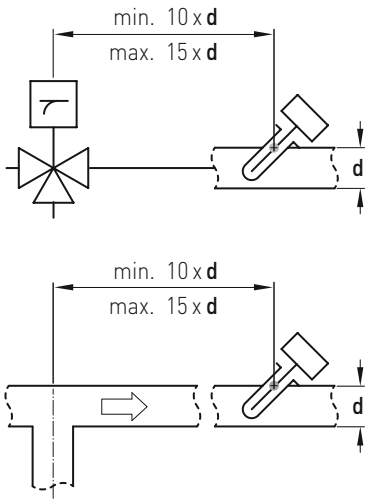




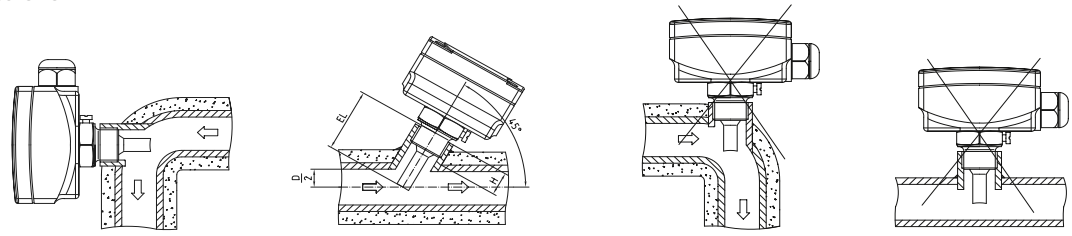
MIXING SECTION

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Mixing section **THE**

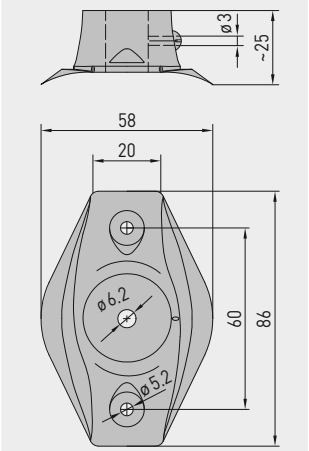


Installation scheme **THE**

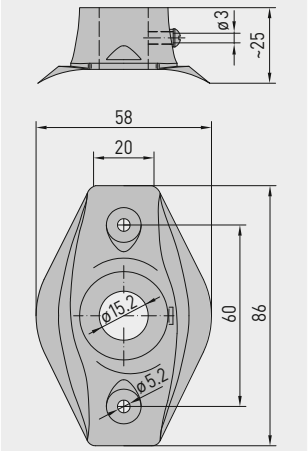


Mounting flange, plastic
Capillary tube gland bracket

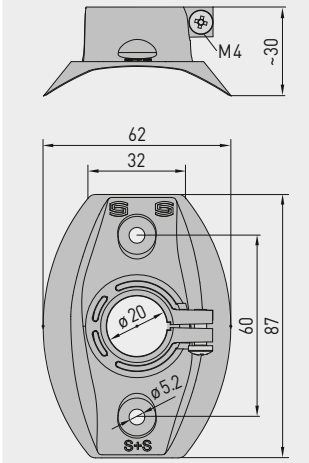
Dimensional drawing **MF-06-K**



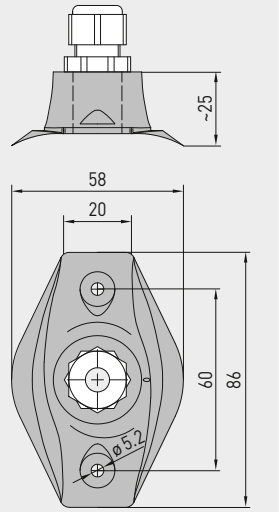
Dimensional drawing **MF-15-K**



Dimensional drawing **MFT-20-K**



Dimensional drawing **KRD-04**



MF-06-K
Mounting flange, plastic

MF-15-K
Mounting flange, plastic

MFT-20-K
Mounting flange, plastic

KRD-04
Capillary tube gland bracket, plastic





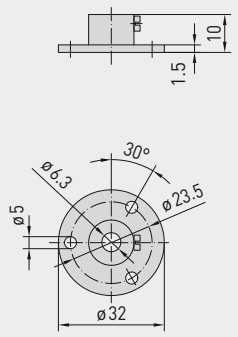




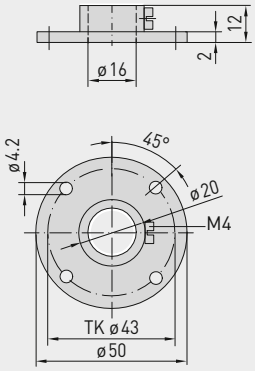
Type / WG01	Mounting flange, plastic	Tube Gland	T_{max}	Item No.	Price
MF-xx-K	for **metal** protective tubes!				
MF-06-K	Mounting flange, plastic, approx. 58 x 86 x 25 mm for rod sensors **MWTF / MWTM**	Ø 6.2 mm	+100 °C	7100-0030-1000-000	**6,12 €**
MF-10-K	Mounting flange, plastic, approx. 58 x 86 x 25 mm for duct air flow monitors **KLGF / KLSW**	Ø 10.2 mm	+100 °C	7100-0031-1000-000	**9,56 €**
MF-14-K	Mounting flange, plastic, approx. 58 x 86 x 25 mm for duct humidity sensors **KFF / KFTF** and pendulum room humidity sensors **RPFF / RPFTF** as well as for duct air flow monitors **KLGF / KLSW**	Ø 14.2 mm	+100 °C	7100-0030-2000-000	**9,56 €**
MF-15-K	Mounting flange, plastic, approx. 58 x 86 x 25 mm for temperature sensors **TF** (series Tyr 1) and temperature measuring transducers **TM** (series Tyr 1)	Ø 15.2 mm	+100 °C	7100-0032-0000-000	**6,12 €**
MF-20-K	Mounting flange, plastic, approx. 58 x 86 x 25 mm for duct sensors **KH**	Ø 20.2 mm	+100 °C	7100-0030-4000-000	**9,56 €**
MFT-20-K	for **PLEUROFORM** multi-channel pipes!				
MFT-20-K	Mounting flange, plastic, approx. 62 x 87 x 30 mm for duct sensors (series Tyr 1 / Tyr 2)	Ø 20 mm	+100 °C	7000-0031-0000-000	**9,56 €**

Type / WG01	Capillary tube gland bracket	Item No.	Price
KRD-04	Capillary tube gland bracket, plastic, approx. 58 x 86 x 25 mm (M 16 x 1.5) for frost protection thermostats (e.g. for air ducts) and rod sensors **MWTF / MWTM**	7100-0030-7000-000	**8,91 €**

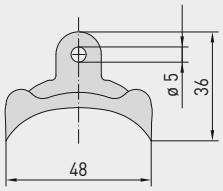
Dimensional drawing **MF-06-M**



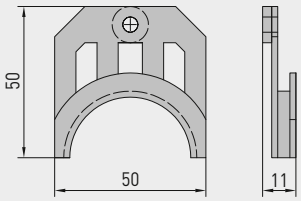
Dimensional drawing **MF-16-M**



Dimensional drawing **MK-05-M**



Dimensional drawing **MK-05-K**



MF-06-M

Mounting flange, metal



MF-16-M

Mounting flange, metal



MK-05-M

Galvanised steel mounting clamps



MK-05-K

Mounting clamps, plastic

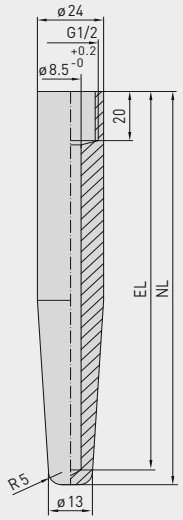


Type / WG01	Mounting flange, metal	Tube Gland	T_{max}	Item No.	Price
MF-xx-M	for **metal** protective tubes!				
MF-06-M	Mounting flange, metal (galvanised steel), Ø 32 mm, for temperature sensors **TF** (form B) temperature measuring transducers **TM** (form B), rod sensors **MWTF / MWTM**	Ø 6.3 mm	+700 °C	7100-0030-5000-100	**9,56 €**
MF-16-M	Mounting flange, metal (galvanised steel), Ø 50 mm, for duct humidity sensors **KFF / KFTF** and pendulum room humidity sensors **RPFF / RPFTF**	Ø 16.0 mm	+700 °C	7100-0030-6020-000	**31,56 €**

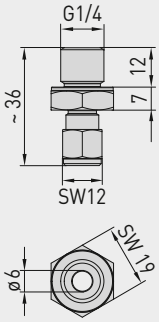
Type / WG01	Mounting clamps	Item No.	Price
MK-05-M	Galvanised steel **mounting clamps** (6 pieces) for rod sensors **MWTF / MWTM**	7100-0034-0000-000	**9,88 €**
MK-05-K	Plastic **mounting clamps** (6 pieces) for frost protection thermostats	7100-0034-1000-000	**9,88 €**

Mounting accessories for Immersion sensor

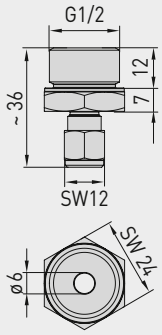
Dimensional drawing **ESSH**



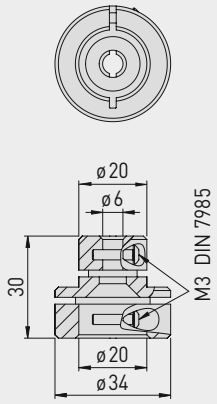
Dimensional drawing **KVSS**



Dimensional drawing **KVST**



Dimensional drawing **TH-ADAPTER-HW**



ESSH

Welding protective sleeve



KVSS

Clamp union with cutting ring



KVST

Clamp union with clamp ring



TH-ADAPTER-HW

Immersion sleeve adapter, metal

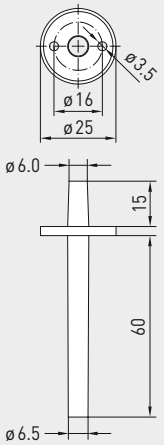


Type / WG01	Welding protective sleeve	Item No.	Price
	Welding protecting sleeves, G ½" straight internal pipe thread, stainless steel **V4A** (1.4571), other materials on request,		
ESSH 100MM	for immersion sleeves (EL) = 100 mm, P_{max} = 100 bar	7100-0052-0020-001	**68,87 €**
ESSH 150MM	for immersion sleeves (EL) = 150 mm, P_{max} = 100 bar	7100-0052-0030-001	**79,07 €**
ESSH 200MM	for immersion sleeves (EL) = 200 mm, P_{max} = 100 bar	7100-0052-0040-001	**89,24 €**

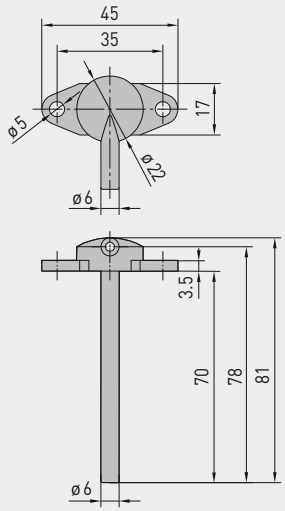
Type / WG01	Clamp union	Item No.	Price
KVST	**Clamp union** with clamp ring PTFE, Ø 6 mm	7100-0032-0110-000	**97,98 €**
KVSS	**Clamp union** with cutting ring VA, Ø 6 mm	7100-0032-1000-000	**63,14 €**

Type / WG01	Immersion sleeve adapter, metal	Item No.	Price
TH-ADAPTER-HW	Metal immersion sleeve adapter (adaptation Ø 20 mm / Ø 6 mm) for mounting S+S temperature sensors from the TF and TM series in immersion sleeves by Honeywell / CentraLine of the types VFFT, VFL, VFNT, VFLN	7100-0037-0001-000	**15,49 €**

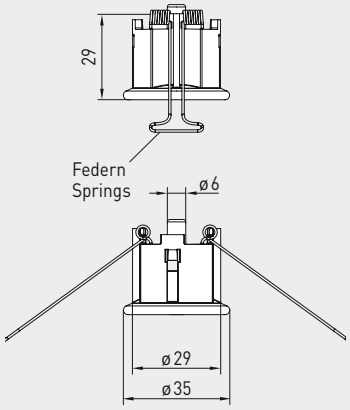
Dimensional drawing **ASD-06**



Dimensional drawing **ASD-07**



Dimensional drawing **DAL**



ASD-06

Connection set
(straight nipples)



ASD-07

Connection nipples
(at 90 degree angle)



DAL

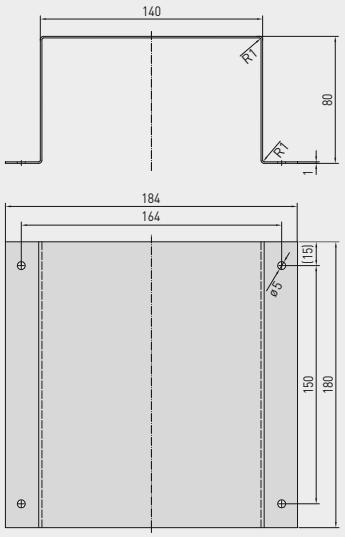
Pressure outlet



Type / WG01	Accessories for differential pressure switches	Item No.	Price
ASD-06	**Connection set** consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose (soft, UV-resistant), 4 Philips head screws (no pre-drilling required)	7100-0060-3000-000	**7,64 €**
ASD-07	**2 connection nipples** (at 90 degree angle) made of ABS	7100-0060-7000-000	**7,64 €**
ASS-UV 100M	**Connecting hose**, UV-resistant, Ø 6 mm, 1 roll (100 m)	7100-0060-3101-000	**1.618,34 €**
DAL-01	**Pressure outlet** for ceiling and in-wall installation as a pressure reference point, Ø 6 mm	7300-0060-3000-001	**35,77 €**
DAL-02	for hose attachment, Ø 6 mm	7300-0060-3000-100	**35,77 €**
DAL-03	as a pressure reference point, with sinter filter made of stainless steel **V4A** (1.4404), Ø 6 mm	7300-0060-3000-200	**66,99 €**

Type / WG01	Accessories for differential pressure switches DS1, DS2	Item No.	Price
DS-MW-Z	Sheet steel **mounting angle** in **Z-Form**	7100-0063-0000-000	**13,36 €**
DS-MW-L	Sheet steel **mounting angle** in **L-Form**	7100-0063-1000-000	**13,67 €**
DS-MW-U	Sheet steel **mounting angle** in **U-Form**	7100-0060-9000-000	**16,81 €**

Dimensional drawing **WS-01**

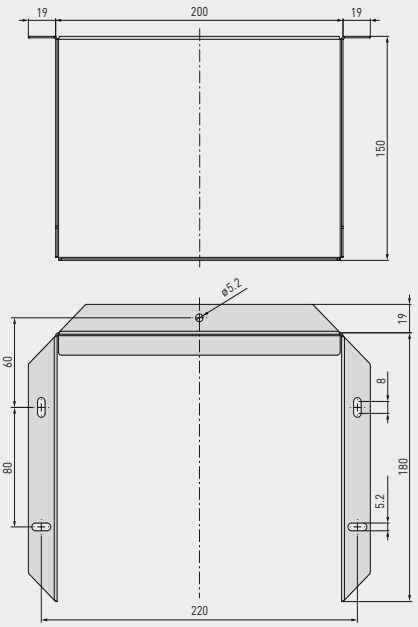


WS-01

Sun and
ball-impact protection hood

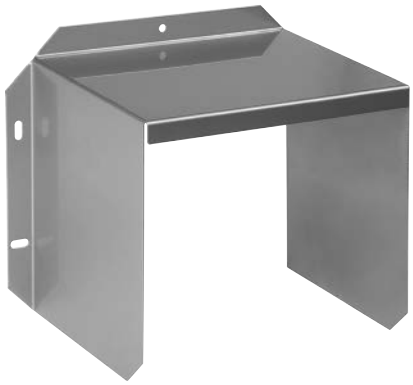


Dimensional drawing **WS-03**

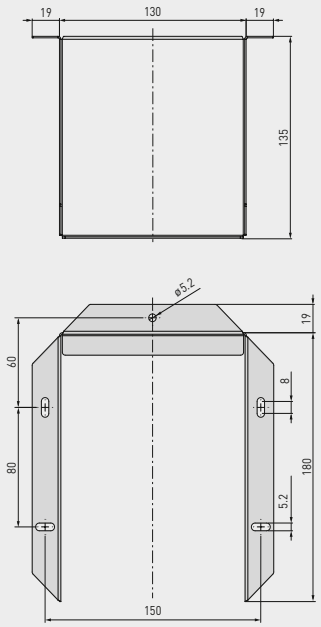


WS-03

Weather and
sun protection hood



Dimensional drawing **WS-04**



WS-04

Weather and
sun protection hood

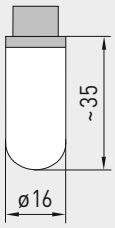


Type / WG01	Protection hoods	Item No.	Price
WS-01	**Sun and ball-impact protection hood,** 184 x 180 x 80 mm, stainless steel **V2A** (1.4301)	7100-0040-2000-000	**31,77 €**
WS-03	**Weather and sun protection hood,** 200 x 180 x 150 mm, stainless steel **V2A** (1.4301)	7100-0040-6000-000	**44,74 €**
WS-04	**Weather and sun protection hood,** 130 x 180 x 135 mm, stainless steel **V2A** (1.4301)	7100-0040-7000-000	**37,49 €**

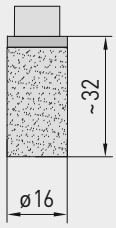
HS-Adapter



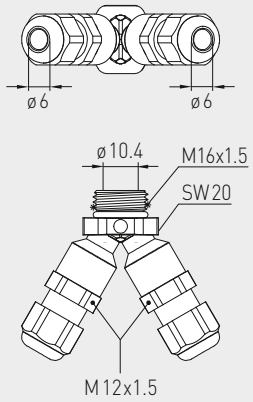
Dimensional drawing **SF-K**



Dimensional drawing **SF-M**



Dimensional drawing **MODBUS-Y**



HS-Adapter

Universal holder
for small housing
on top-hat rails



SF-K

Plastic sinter filter



SF-M

Metal sinter filter



MODBUS-Y

Y-Adapter als Bypass
für Busanschluss



Type / WG01	Spare parts, small parts and special accessories	Item No.	Price
SF-K	**Plastic sinter filter**, Ø 16 mm, L = 35 mm, exchangeable for humidity sensors	7000-0050-2310-000	**12,86 €**
SF-M	**Metal sinter filter**, Ø 16 mm, L = 32 mm, exchangeable, stainless steel **V4A** (1.4404) for humidity sensors	7000-0050-2200-100	**42,33 €**
PSW-09	1 set of **stainless steel paddles** 1-8" (4 pieces), 29 x 34/60/89/157 mm for flow monitors SW	7700-0010-1000-000	**19,22 €**
PWFS-08	**Stainless steel vane** for vane switch WFS	7700-0010-2000-000	**18,61 €**
WH-20	**Wall bracket** for duct hygrostats KH	1200-0010-4000-000	**12,47 €**
HS-ADAPTER	**Universal holder for small housings** made from plastic PA6, black, for installation on 35mm top-hat rails, incl. fixing screws	7100-0038-0000-000	**22,29 €**
SPB1	**Strap** for surface-contact sensors	7100-0035-0000-000	**3,78 €**
WLP-1	**Heat-conductive paste**, silicone-free (2 ml)	7100-0060-1000-000	**3,38 €**
MODBUS-Y	**Y-adapter** for cable gland M16x 1.5 (on 2x M12x 1.5), made of plastic	7000-0005-0002-100	**10,52 €**

Special accessories for M12 connector
5-pin / 12-pin, A coded,
Circular connector with screw-locking according to DIN EN 61076-2-101

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AL xx
Connecting cable
with cable socket



VL xx
Interconnecting cable
with cable socket
and cable connector



KB xx
Cable socket
without cable

5-pin



12-pin



Connecting cable for M12 connector	Type / WG01I	Cable length	Item No.	Price
PVC cable, **5-pin, shielded**, with cable socket (M12, A coded, female), approx. Ø = 15 mm, L = 35 mm, and one open cable end	**ALG xx A5F**		**5-pin, shielded**	
	ALG M12-A5F PVC 2M	**2 m**	2000-9121-0000-031	**27,44 €**
	ALG M12-A5F PVC 5M	**5 m**	2000-9121-0000-041	**35,18 €**
	ALG M12-A5F PVC 10M	**10 m**	2000-9121-0000-051	**48,44 €**
PVC cable, **5-pin,** unshielded, with cable socket (M12, A coded, female), approx. Ø = 15 mm, L = 35 mm, and one open cable end	**AL xx A5F**		**5-pin,** unshielded	
	AL M12-A5F PVC 2M	**2 m**	2000-9121-0000-001	**17,57 €**
	AL M12-A5F PVC 5M	**5 m**	2000-9121-0000-011	**21,74 €**
	AL M12-A5F PVC 10M	**10 m**	2000-9121-0000-021	**28,30 €**
PVC cable, **12-pin,** unshielded, with cable socket (M12, A coded, female), approx. Ø = 15 mm, L = 35 mm, and one open cable end	**AL xx A12F**		**12-pin,** unshielded	
	AL M12-A12F PVC 2M	**2 m**	2000-9122-0000-001	**56,47 €**
	AL M12-A12F PVC 5M	**5 m**	2000-9122-0000-011	**66,80 €**
	AL M12-A12F PVC 10M	**10 m**	2000-9122-0000-021	**84,29 €**

Interconnecting cable for M12 connector	Type / WG01I	Cable length	Item No.	Price
PVC cable, **5-pin, shielded**, with cable socket (M12, A coded, female) and cable connector (M12, A coded, male) approx. Ø = 15 mm, L = 35 mm	**VLG xx A5**		**5-pin, shielded**	
	VLG M12-A5 PVC 2M	**2 m**	2000-9111-0000-031	**59,02 €**
	VLG M12-A5 PVC 5M	**5 m**	2000-9111-0000-041	**66,86 €**
	VLG M12-A5 PVC 10M	**10 m**	2000-9111-0000-051	**80,29 €**
PVC cable, **5-pin,** unshielded, with cable socket (M12, A coded, female) and cable connector (M12, A coded, male) approx. Ø = 15 mm, L = 35 mm	**VL xx A5**		**5-pin,** unshielded	
	VL M12-A5 PVC 2M	**2 m**	2000-9111-0000-001	**31,36 €**
	VL M12-A5 PVC 5M	**5 m**	2000-9111-0000-011	**35,48 €**
	VL M12-A5 PVC 10M	**10 m**	2000-9111-0000-021	**42,51 €**
PVC cable, **12-pin,** unshielded, with cable socket (M12, A coded, female) and cable connector (M12, A coded, male) approx. Ø = 15 mm, L = 35 mm	**VL xx A12**		**12-pin,** unshielded	
	VL M12-A12 PVC 2M	**2 m**	2000-9112-0000-001	**117,93 €**
	VL M12-A12 PVC 5M	**5 m**	2000-9112-0000-011	**129,51 €**
	VL M12-A12 PVC 10M	**10 m**	2000-9112-0000-021	**149,13 €**

Mounting accessories for M12 connector	Type / WG02	Contact	Item No.	Price
Cable socket (M12, A coded, female), approx. Ø = 20 mm, L = 54 mm, unassembled, without cable	**KB xx**		**female**	
	KB M12-A5	**5-pin**	7100-0070-0712-000	**23,12 €**
	KB M12-A12	**12-pin**	7100-0070-0714-000	**68,99 €**
Cable connector (M12, A coded, male), approx. Ø = 20 mm, L = 54 mm, unassembled, without cable	**KS xx**		**male**	
	KS M12-A5	**5-pin**	7100-0070-0716-000	**23,12 €**
	KS M12-A12	**12-pin**	7100-0070-0718-000	**68,99 €**

Special accessories for M8 connector
4-pin, EtherCATP coded,
for industrial EtherCATP applications

ALG ECATP xx

Connecting cable
with one cable connector



VLG ECATP xx

Interconnecting cable
with two cable connectors





Connecting cable for EtherCATP	Type / WG02	Cable length	Item No.	Price
PUR cable, 4-pin, **shielded**, **with one cable connector** (M8, EtherCATP coded) and one open cable end	**ALG ECATP xx**		shielded	
	ALG ECATP 0.5m	**0.5 m**	2000-9131-0000-001	**39,55 €**
	ALG ECATP 1m	**1.0 m**	2000-9131-0000-011	**43,14 €**
	ALG ECATP 2m	**2.0 m**	2000-9131-0000-021	**46,62 €**
	ALG ECATP 5m	**5.0 m**	2000-9131-0000-031	**70,78 €**

Interconnecting cable for EtherCATP	Type / WG02	Cable length	Item No.	Price
PUR cable, 4-pin, **shielded**, **with two cable connectors** (M8, EtherCATP coded)	**VLG ECATP xx**		shielded	
	VLG ECATP 0.5m	**0.5 m**	2000-9131-0000-041	**63,99 €**
	VLG ECATP 1m	**1.0 m**	2000-9131-0000-051	**69,28 €**
	VLG ECATP 2m	**2.0 m**	2000-9131-0000-061	**80,02 €**
	VLG ECATP 5m	**5.0 m**	2000-9131-0000-071	**112,28 €**

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Optional services

Individual components / WG01		Item No.	Price
FET		7100-0022-4000-000	**50,93 €**
KTY 81-210		7100-0022-0000-000	**4,83 €**
LM235Z	(TCR = 10 mV / K; 2.73 V at 0°C), KP10	7100-0022-1000-000	**7,76 €**
NI1000	(according to DIN EN 43760, class B, TKR = 6180 ppm / K)	7100-0020-9000-000	**9,23 €**
NI1000TK5000	(according to DIN EN 43760, class B, TKR = 5000 ppm / K), LG-Ni 1000	7100-0021-0000-000	**12,99 €**
NTC 1,8 KOHM	NTC 1.8 K	7100-0021-2000-000	**11,34 €**
NTC 10 KOHM PRECON	NTC 10 K Precon	7100-0021-9000-000	**5,93 €**
NTC 20 KOHM	NTC 20 K	7100-0021-6000-000	**5,93 €**
NTC 30 KOHM	NTC 30 K	7100-0021-7000-000	**5,93 €**
NTC 50 KOHM	NTC 50 K	7100-0021-8000-000	**5,93 €**
PT100 KLASSE B	(according to DIN EN 60751, class B)	7100-0020-1000-000	**7,13 €**
PT100 1/2 DIN	(according to DIN EN 60751, class B)	7100-0020-2000-000	**9,48 €**
PT100 1/3 DIN	(according to DIN EN 60751, class B)	7100-0020-3000-000	**11,03 €**
PT1000 KLASSE B	(according to DIN EN 60751, class B)	7100-0020-5000-000	**9,62 €**
PT1000 1/2 DIN	(according to DIN EN 60751, class B)	7100-0020-6000-000	**10,89 €**
PT1000 1/3 DIN	(according to DIN EN 60751, class B)	7100-0020-7000-000	**12,67 €**
PT1000 1/10 DIN	(according to DIN EN 60751, class B)	7100-0020-8000-000	**39,67 €**
Note:	Other sensors on request.		

Optional services / WG01		Unit	Price
Double sensor		**plus 50 %** of instrument price	
1 / 2 DIN	(according to DIN EN 60751, class B)	Per piece	**7,36 €**
1 / 3 DIN	(according to DIN EN 60751, class B)	Per piece	**7,36 €**
1 / 10 DIN	(according to DIN EN 60751, class B)	Per piece	**29,40 €**
Connection type	**4-wire connection** with ceramic base, head form B	Per piece	**6,12 €**
	4-wire connection with circuit board, box head	Per piece	**3,68 €**
Protection class	**IP 65** at head form B	Per piece	**9,44 €**
	IP 68 (Sensor sleeve watertight compound-filled) for cable sensors	Per piece	**3,40 €**

Custom-made products (for 25 or more pieces)			Unit	Price
Silicone-free sensor production			Per piece	on request!
Factory test certificate	1-point certificate		One-time cost	on request!
(per device)	2-point certificate		One-time cost	on request!
	3-point certificate		One-time cost	on request!
	Each additional test point		One-time cost	on request!
Custom-made products	Setup costs for custom-made products		One-time cost	on request!
Special paintwork	Set-up costs for special paintwork		one-off (net)	**189,69 €**
	plus costs for special paintwork	**from 25 piece**	per piece	**18,27 €**
		from 50 piece	per piece	**13,28 €**
Special print	Set-up costs incl. stereotype production, **1 colour**		one-off (net)	**189,69 €**
(with stereotype)	Set-up costs incl. stereotype production, **2 colour**		one-off (net)	**290,47 €**
	plus costs for special print	**from 25 piece**	per piece / colour	**11,51 €**
		from 50 piece	per piece / colour	**7,77 €**
		from 100 piece	per piece / colour	**6,24 €**
		from 250 piece	per piece / colour	**4,74 €**
		from 500 piece	per piece / colour	**2,37 €**
Printing customer logo on housing cover	Setup costs for printing on housing cover		One-time cost	on request!
(for 200 covers of one housing series)	Plus printing costs, 2-colour, printing on housing cover		Per piece	on request!
Labelling with customer logo	Setup costs for labelling		One-time cost	on request!
	Plus costs for labelling		Per piece	on request!

BASIC

S+S REGELTECHNIK

Range of preferential items permanently available from stock
in standard design with S+S company logo

THERMASGARD® TF 43

Temperature sensors (basic device)

Type / WG03B	Output	Item No.	Price
TF 43 PT 1000 xx	**passive**	**IP 54**	
TF43 Pt1000 50mm		1101-7010-5011-000	**28,27 €**
TF43 Pt1000 100mm		1101-7010-5021-000	**28,39 €**
TF43 Pt1000 150mm		1101-7010-5031-000	**29,30 €**
TF43 Pt1000 200mm		1101-7010-5041-000	**30,11 €**
TF43 Pt1000 250mm		1101-7010-5051-000	**31,65 €**
TF43 Pt1000 300mm		1101-7010-5061-000	**34,25 €**
TF43 Pt1000 350mm		1101-7010-5071-000	**35,30 €**
TF43 Pt1000 400mm		1101-7010-5081-000	**36,42 €**
TF 43 Ni1000 xx	**passive**	**IP 54**	
TF43 Ni1000 50mm		1101-7010-9011-000	**28,97 €**
TF43 Ni1000 100mm		1101-7010-9021-000	**31,71 €**
TF43 Ni1000 150mm		1101-7010-9031-000	**31,94 €**
TF43 Ni1000 200mm		1101-7010-9041-000	**32,64 €**
TF43 Ni1000 250mm		1101-7010-9051-000	**33,56 €**
TF43 Ni1000 300mm		1101-7010-9061-000	**35,77 €**
TF43 Ni1000 350mm		1101-7010-9071-000	**36,79 €**
TF43 Ni1000 400mm		1101-7010-9081-000	**38,44 €**
TF 43 Ni1000TK xx	**passive**	**IP 54**	
TF43 NiTK 50mm		1101-7011-0011-000	**29,02 €**
TF43 NiTK 100mm		1101-7011-0021-000	**31,77 €**
TF43 NiTK 150mm		1101-7011-0031-000	**32,10 €**
TF43 NiTK 200mm		1101-7011-0041-000	**32,78 €**
TF43 NiTK 250mm		1101-7011-0051-000	**33,67 €**
TF43 NiTK 300mm		1101-7011-0061-000	**35,91 €**
TF43 NiTK 350mm		1101-7011-0071-000	**37,03 €**
TF43 NiTK 400mm		1101-7011-0081-000	**38,58 €**
TF 43 LM235Z xx	**passive**	**IP 54**	
TF43 LM235Z 50mm		1101-7012-1011-000	**29,54 €**
TF43 LM235Z 100mm		1101-7012-1021-000	**29,86 €**
TF43 LM235Z 150mm		1101-7012-1031-000	**30,94 €**
TF43 LM235Z 200mm		1101-7012-1041-000	**31,65 €**
TF43 LM235Z 250mm		1101-7012-1051-000	**32,01 €**
TF43 LM235Z 300mm		1101-7012-1061-000	**34,76 €**
TF43 LM235Z 350mm		1101-7012-1071-000	**35,18 €**
TF43 LM235Z 400mm		1101-7012-1081-000	**37,38 €**
TF 43 NTC 1,8 K xx	**passive**	**IP 54**	
TF43 NTC1,8K 50mm		1101-7011-2011-000	**28,27 €**
TF43 NTC1,8K 100mm		1101-7011-2021-000	**29,80 €**
TF43 NTC1,8K 150mm		1101-7011-2031-000	**30,56 €**
TF43 NTC1,8K 200mm		1101-7011-2041-000	**31,27 €**
TF43 NTC1,8K 250mm		1101-7011-2051-000	**32,78 €**
TF43 NTC1,8K 300mm		1101-7011-2061-000	**33,86 €**
TF43 NTC1,8K 350mm		1101-7011-2071-000	**35,01 €**
TF43 NTC1,8K 400mm		1101-7011-2081-000	**35,91 €**
TF 43 NTC10K xx	**passive**	**IP 54**	
TF43 NTC10K 50mm		1101-7011-5011-000	**28,27 €**
TF43 NTC10K 100mm		1101-7011-5021-000	**29,80 €**
TF43 NTC10K 150mm		1101-7011-5031-000	**30,56 €**
TF43 NTC10K 200mm		1101-7011-5041-000	**31,27 €**
TF43 NTC10K 250mm		1101-7011-5051-000	**32,78 €**
TF43 NTC10K 300mm		1101-7011-5061-000	**33,86 €**
TF43 NTC10K 350mm		1101-7011-5071-000	**35,01 €**
TF43 NTC10K 400mm		1101-7011-5081-000	**35,91 €**
TF 43 NTC20K xx	**passive**	**IP 54**	
TF43 NTC20K 50mm		1101-7011-6011-000	**28,27 €**
TF43 NTC20K 100mm		1101-7011-6021-000	**29,80 €**
TF43 NTC20K 150mm		1101-7011-6031-000	**30,56 €**
TF43 NTC20K 200mm		1101-7011-6041-000	**31,27 €**
TF43 NTC20K 250mm		1101-7011-6051-000	**32,78 €**
TF43 NTC20K 300mm		1101-7011-6061-000	**33,86 €**
TF43 NTC20K 350mm		1101-7011-6071-000	**35,01 €**
TF43 NTC20K 400mm		1101-7011-6081-000	**35,91 €**









Basic device
(without accessories)



Immersion / screw-in
temperature sensor
with immersion sleeve
(accessories)



Duct temperature sensor
with mounting flange
(accessories)

THERMASGARD® TM 43

Temperature measuring transducer (basic device),
calibratable, with multi-range switching

Type / WG01B	Output	Item No.	Price
TM 43-U xx	**active**	**IP 54**	
TM43-U 50mm	0 -10 V	1101-7111-0019-900	**72,29 €**
TM43-U 100mm	0 -10 V	1101-7111-0029-900	**73,48 €**
TM43-U 150mm	0 -10 V	1101-7111-0039-900	**74,55 €**
TM43-U 200mm	0 -10 V	1101-7111-0049-900	**74,91 €**
TM43-U 250mm	0 -10 V	1101-7111-0059-900	**76,16 €**
TM43-U 300mm	0 -10 V	1101-7111-0069-900	**77,40 €**
TM 43-I xx	**active**	**IP 54**	
TM43-I 50mm	4...20 mA	1101-7112-0019-900	**72,29 €**
TM43-I 100mm	4...20 mA	1101-7112-0029-900	**73,48 €**
TM43-I 150mm	4...20 mA	1101-7112-0039-900	**74,55 €**
TM43-I 200mm	4...20 mA	1101-7112-0049-900	**74,91 €**
TM43-I 250mm	4...20 mA	1101-7112-0059-900	**76,16 €**
TM43-I 300mm	4...20 mA	1101-7112-0069-900	**77,40 €**

Accessories
for basic device
TF 43 / TM 43



Type / WG01B	Item No.	Price
Immersion sleeves		
TH 08-ms / xx (T_{max} +150 °C)	Brass nickel-plated	
TH08-MS 50MM	7100-0011-0010-132	**9,31 €**
TH08-MS 100MM	7100-0011-0020-132	**10,61 €**
TH08-MS 150MM	7100-0011-0030-132	**11,20 €**
TH08-MS 200MM	7100-0011-0040-132	**11,56 €**
TH08-MS 250MM	7100-0011-0050-132	**13,39 €**
TH08-MS 300MM	7100-0011-0060-132	**13,76 €**
TH08-MS 350MM	7100-0011-0070-132	**13,87 €**
TH08-MS 400MM	7100-0011-0080-132	**14,00 €**
TH 08-VA / xx (T_{max} +600 °C)	Stainless steel V4A (1.4571)	
TH08-VA 50MM	7100-0012-0010-132	**20,28 €**
TH08-VA 100MM	7100-0012-0020-132	**22,41 €**
TH08-VA 150MM	7100-0012-0030-132	**24,08 €**
TH08-VA 200MM	7100-0012-0040-132	**25,38 €**
TH08-VA 250MM	7100-0012-0050-132	**31,55 €**
TH08-VA 300MM	7100-0012-0060-132	**32,97 €**
TH08-VA 350MM	7100-0012-0070-132	**33,19 €**
TH08-VA 400MM	7100-0012-0080-132	**33,78 €**
Mounting flanges	Plastic	
MF-15-K Ø 15.2 mm (T_{max} +100 °C)	7100-0032-0000-000	**6,12 €**

BASIC

S+S REGELTECHNIK

Range of preferential items permanently available from stock
in standard design with S+S company logo

THERMASGARD® ATF 01

Outside temperature sensors / wet room temperature sensors

Type / WG03B	Output	Item No.	Price
ATF 01 xx	**passive**	**IP 54**	
ATF01 Pt1000		1101-1030-5001-000	**17,90 €**
ATF01 Ni1000		1101-1030-9001-000	**18,70 €**
ATF01 NiTK		1101-1031-0001-000	**21,70 €**
ATF01 LM235Z		1101-1032-1001-000	**15,76 €**
ATF01 NTC1,8K		1101-1031-2001-000	**14,52 €**
ATF01 NTC10K		1101-1031-5001-000	**14,52 €**
ATF01 NTC20K		1101-1031-6001-000	**14,52 €**



THERMASGARD® ATM 2-SD

Outside temperature / wet room temperature measuring transducers
calibratable, with multi-range switching

Type / WG01B	Output	Item No.	Price
ATM 2-SD	**active**	**IP 54**	
ATM2-SD-U	0 -10 V	1101-1191-0009-900	**85,60 €**
ATM2-SD-I	4...20 mA	1101-1192-0009-900	**85,60 €**



THERMASGARD® ALTF 02

Surface contact temperature sensors / tube contact temperature sensors,
compact variant

Type / WG03B	Output	Item No.	Price
ALTF 02 xx	**passive**	**IP 54**	
ALTF02 Pt1000		1101-1010-5001-000	**21,65 €**
ALTF02 Ni1000		1101-1010-9001-000	**22,02 €**
ALTF02 NiTK		1101-1011-0001-000	**25,21 €**
ALTF02 LM235Z		1101-1012-1001-000	**22,28 €**
ALTF02 NTC1,8K		1101-1011-2001-000	**21,00 €**
ALTF02 NTC10K		1101-1011-5001-000	**21,00 €**
ALTF02 NTC20K		1101-1011-6001-000	**21,00 €**



THERMASGARD® ALTM 1-SD

Surface contact / tube contact temperature measuring transducers,
compact variant,
calibratable, with multi-range switching

Type / WG01B	Output	Item No.	Price
ALTM1-SD	**active**	**IP 54**	
ALTM1-SD-U	0 -10 V	1101-6141-0219-920	**84,19 €**
ALTM1-SD-I	4...20 mA	1101-6142-0219-920	**84,19 €**





THERMASGARD® ALTF 1

Surface contact temperature sensors / tube contact temperature sensors,
with detached sensor head,
(L = 50 mm, cable material: PVC, cable length: 1.5 m, without housing)

Type / WG03B	Output	Item No.	Price
ALTF 1 xx	**passive**	**IP 65**	
ALTF1 Pt1000 PVC 1,5M		1101-6020-5211-110	**20,25 €**
ALTF1 Ni1000 PVC 1,5M		1101-6020-9211-110	**21,00 €**
ALTF1 NiTK PVC 1,5M		1101-6021-0211-110	**21,78 €**
ALTF1 LM235Z PVC 1,5M		1101-6022-1211-110	**21,39 €**
ALTF1 NTC1,8K PVC 1,5M		1101-6021-2211-110	**20,76 €**
ALTF1 NTC10K PVC 1,5M		1101-6021-5211-110	**20,76 €**
ALTF1 NTC20K PVC 1,5M		1101-6021-6211-110	**20,76 €**

THERMASGARD® ALTM2-SD

Surface contact / tube contact temperature measuring transducers,
with detached sensor head,
calibratable, with multi-range switching
(L = 50 mm, cable material: silicone, cable length: 1.5 m, with housing)

Type / WG01B	Output	Item No.	Price
ALTM2-SD	**active**	**IP 54**	
ALTM2-SD-U	0 -10 V	1101-6151-0219-920	**83,35 €**
ALTM2-SD-I	4...20 mA	1101-6152-0219-920	**83,35 €**



THERMASGARD® HTF 50

Sleeve temperature sensors / cable temperature sensors
(L = 50 mm, cable material: PVC, cable length: 1.5 m, without housing)

Type / WG03B	Output	Item No.	Price
HTF 50 xx	**passive**	**IP 65**	
HTF50 Pt1000 PVC 1,5M		1101-6030-5211-110	**16,12 €**
HTF50 Ni1000 PVC 1,5M		1101-6030-9211-110	**15,66 €**
HTF50 NiTK PVC 1,5M		1101-6031-0211-110	**19,74 €**
HTF50 LM235Z PVC 1,5M		1101-6032-1211-110	**14,02 €**
HTF50 NTC1,8K PVC 1,5M		1101-6031-2211-110	**13,24 €**
HTF50 NTC10K PVC 1,5M		1101-6031-5211-110	**13,24 €**
HTF50 NTC20K PVC 1,5M		1101-6031-6211-110	**13,24 €**

THERMASGARD® HFTM-SD

Sleeve sensors with temperature measuring transducer,
calibratable, with multi-range switching
(L = 50 mm, cable material: PVC, cable length: 1.5 m, with housing)

Type / WG01B	Output	Item No.	Price
HFTM-SD	**active**	**IP 54**	
HFTM-SD-U	0 -10 V	1101-6161-0219-920	**80,86 €**
HFTM-SD-I	4...20 mA	1101-6162-0219-920	**80,86 €**

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THERMASGARD® RTF1-SD

Room temperature sensors without operating elements

Type / WG03B	Output	Item No.	Price
RTF1-SD xx	**passive**	**IP30**	
RTF1-SD Pt1000		1101-40D0-5000-000	**19,45 €**
RTF1-SD Ni1000		1101-40D0-9000-000	**19,09 €**
RTF1-SD NiTK		1101-40D1-0000-000	**22,11 €**
RTF1-SD LM235Z		1101-40D2-1000-000	**17,90 €**
RTF1-SD NTC1,8K		1101-40D1-2000-000	**16,30 €**
RTF1-SD NTC10K		1101-40D1-5000-000	**16,30 €**
RTF1-SD NTC10K (B=3695K)		1101-40D1-9000-000	**16,30 €**
RTF1-SD NTC20K		1101-40D1-6000-000	**16,30 €**



THERMASGARD® RTM1-SD

Room temperature measuring transducers without operating elements

Type / WG01B	Output	Item No.	Price
RTM1-SD	**active**	**IP30**	
RTM1-SD-U	0 -10 V	1101-41D1-0000-200	**73,10 €**
RTM1-SD-I	4...20 mA	1101-41D2-0000-200	**73,10 €**

THERMASGARD® MWTF-SD

Mean value / rod / duct temperature sensor
including mounting flange
(Measuring rod: reinforced thermoplastic tube, NL = 3m / 6m)

Type / WG03B	Output	Item No.	Price
MWTF-SD xx	**passive**	**IP54**	
MWTF-SD Pt1000 3m		1101-3050-5231-200	**94,63 €**
MWTF-SD Pt1000 6m		1101-3050-5261-200	**105,28 €**



THERMASGARD® MWTM-SD

Mean value / rod / duct temperature measuring transducer,
including mounting flange, calibratable, with multi-range switching
(Measuring rod: reinforced thermoplastic tube, NL = 3m / 6m)

Type / WG01B	Output	Item No.	Price
MWTM-SD-U	**active**	**IP54**	
MWTM-SD-U 3m	0 -10 V	1101-3131-0239-90K	**157,09 €**
MWTM-SD-U 6m	0 -10 V	1101-3131-0269-90K	**166,57 €**
MWTM-SD-I	**active**	**IP54**	
MWTM-SD-I 3m	4...20 mA	1101-3132-0239-90K	**160,46 €**
MWTM-SD-I 6m	4...20 mA	1101-3132-0269-90K	**170,39 €**

THERMASREG® FST

Frost protection thermostats, mechanical, one-step,
with switching output
(length of capillary 3m / 6m, incl. mounting clamps)

Type / WG03B	Output	Item No.	Price
FST-xxD	**switching**	**IP65**	
FST-1D 6m		1102-1021-0102-000	**87,15 €**
FST-5D 3m		1102-1022-0102-000	**84,78 €**





HYGRASGARD® RFTF-SD

Room humidity and temperature sensors (±2%), calibratable

Type/WG01B	Output	Item No.	Price
RFTF-SD	**active (2x)**	**IP30**	
RFTF-SD-U	0 -10 V	1201-41D1-1000-000	**114,73 €**
RFTF-SD-I	4...20 mA	1201-41D2-1000-000	**114,73 €**



HYGRASGARD® KFF-SD
HYGRASGARD® KFTF-SD

Duct humidity and temperature sensors (±2%), including mounting flange, calibratable, with multi-range switching

Type/WG01B	Output	Item No.	Price
KFF-SD	**active**	**IP54**	
KFF-SD-U	0 -10 V	1201-3181-0000-029	**162,31 €**
KFF-SD-I	4...20 mA	1201-3182-0000-029	**162,31 €**
KFTF-SD	**active (2x)**	**IP54**	
KFTF-SD-U	0 -10 V	1201-3181-1000-029	**166,76 €**
KFTF-SD-I	4...20 mA	1201-3182-1000-029	**166,76 €**



HYGRASGARD® AFF-SD
HYGRASGARD® AFTF-SD

On-wall humidity and temperature sensors (±2%), calibratable, with multi-range switching

Type/WG01B	Output	Item No.	Price
AFF-SD	**active**	**IP54**	
AFF-SD-U	0 -10 V	1201-1121-0000-100	**180,77 €**
AFF-SD-I	4...20 mA	1201-1122-0000-100	**180,77 €**
AFTF-SD	**active (2x)**	**IP54**	
AFTF-SD-U	0 -10 V	1201-1121-1000-100	**184,59 €**
AFTF-SD-I	4...20 mA	1201-1122-1000-100	**184,59 €**



HYGRASREG® KW-SD

Condensation control switches including strap

Type/WG01B	Output	Item No.	Price
KW-SD	**switching**	**IP54**	
KW-W-SD	Changeover contact	1202-1075-0001-020	**105,61 €**

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Range of preferential items permanently available from stock
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PREMASGARD® 212x-SD

Pressure, differential pressure and volume flow measuring transducers,
with / without display, including connection set,
adjustable, calibratable, with multi-range switching

Type / WG01B	Output	Item No.	Price
max. – 1000...+ 1000 Pa	**active**	**IP 54**	
PREMASGARD **2121**-SD	0-10 V / 4...20 mA	1301-11B7-0010-000	**136,49 €**
PREMASGARD **2121**-SD **LCD** (Display)	0-10 V / 4...20 mA	1301-11B7-2010-000	**185,07 €**
max. – 5000...+ 5000 Pa	**active**	**IP 54**	
PREMASGARD **2125**-SD	0-10 V / 4...20 mA	1301-11B7-0050-000	**136,49 €**
PREMASGARD **2125**-SD **LCD** (Display)	0-10 V / 4...20 mA	1301-11B7-2050-000	**185,07 €**
max. – 100...+ 100 Pa	**active**	**IP 54**	
PREMASGARD **2120**-SD	0-10 V / 4...20 mA	1301-11B7-0110-000	**136,49 €**
PREMASGARD **2120**-SD **LCD** (Display)	0-10 V / 4...20 mA	1301-11B7-2110-000	**185,07 €**





PREMASREG® DS 2

Mechanical differential pressure switches for air,
with / without connection set

Type / WG03B	Pressure range	Item No.	Price
DS2 incl. connection set		**IP 54**	
DS-205 F	20 ... 300 Pa	1302-4026-0000-000	**35,11 €**
DS-205 B	50 ... 500 Pa	1302-4022-0000-000	**35,11 €**
DS-205 D	100 ... 1000 Pa	1302-4027-0000-000	**35,11 €**
DS-205 E	500 ... 2000 Pa	1302-4028-0000-000	**35,11 €**
DS2 without connection set		**IP 54**	Multipack
DS-205 F	20 ... 300 Pa	1302-4026-1000-**M40**	**23,81 €**
DS-205 B	50 ... 500 Pa	1302-4022-1000-**M40**	**23,81 €**
DS-205 D	100 ... 1000 Pa	1302-4027-1000-**M40**	**23,81 €**
DS-205 E	500 ... 2000 Pa	1302-4028-1000-**M40**	**23,81 €**
M40 = Special price per piece in the multi-pack (40 pieces)			



AERASGARD® KCO2-SD

Duct CO2 sensors,
including mounting flange

Type / WG02B	Output	Item No.	Price
KCO2 - SD	**active**	**IP 65**	
KCO2-SD-U	0-10 V	1501-3160-1001-200	**239,31 €**



AERASGARD® RCO2-SD

Room CO2 sensors,
self-calibrating

Type / WG02B	Output	Item No.	Price
RCO2 - SD	**active**	**IP 30**	
RCO2-SD-U	0-10 V	1501-61A0-1001-200	**209,71 €**



NOTE

All devices supplied display the company logo of S + S Regeltechnik GmbH as standard!
Neutral versions without the logo printed are available on request!

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Orders can be placed in writing, by phone, by fax, or by e-mail. In doing so, the requested items shall be identified by denomination and quantities ordered and also the requested delivery date shall be stated. Special orders must generally be placed in writing, precisely specifying all requested special features. Or order directly ONLINE at **www.SplusS.de**!

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The catalogue items are available from stock in partial quantities – subject to prior sale.
Delivery dates for large and special orders are determined after receipt of order / release order and mutual agreement.
We reserve the right to make partial deliveries. Events of force majeure such as difficulties in procurement of materials, strikes, etc. entitle us to withdraw from the contract.

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Editor: S + S Regeltechnik GmbH, Mr. Tino Schulze and Mr. Heiko Linke, managing directors

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S+S Regeltechnik GmbH
General Terms and Conditions of Sale and Delivery
valid as of May 2021

S+S REGELTECHNIK

1. Scope

(1) Any and all quotations, services and agreements are solely made or performed on the basis of these General Terms and Conditions of Sale and Delivery of S+S Regeltechnik GmbH (S+S) in their respective valid version. These General Terms and Conditions of Sale and Delivery apply solely to companies as defined by the BGB (German Civil Code).

(2) Customers' terms and conditions conflicting with or deviating from these General Terms and Conditions of Sale and Delivery will be acknowledged by S+S only if S+S has expressly consented to the validity of such terms in writing. The General Terms and Conditions of Sale and Delivery of S+S shall also apply if services have been provided to the customer without reservation in the knowledge of conflicting or deviating terms of that customer.

(3) These General Terms and Conditions of Sale and Delivery of S+S shall be acknowledged by the customer's order placement or acceptance of services provided for the duration of the entire business relationship, even if these terms are not explicitly restated.

2. Quotation / contract conclusion / termination of contract

(1) The quotations made by S+S are non-binding. A contract is concluded by the written order confirmation or the delivery of goods ordered insofar as S+S does not indicate via other circumstances that the order has been accepted. Insofar as the customer communicates change requests following receipt of the order confirmation, S+S is entitled to charge the additional costs resulting from this if it accepts such changes.

(2) Illustrations, drawings and other specifications are only binding if agreed upon in writing. The same applies to advisory or informative discussions between S+S and the customer, in particular regarding the possible uses of goods ordered.

3. Services / dates

(1) Delivery deadlines are only binding (fixed date transaction), if S+S has expressly confirmed this in writing.

(2) The adherence to binding delivery deadlines presupposes the clarification of all technical and other issues as well as the timely and proper performance of any obligations by the customer.

(3) S+S shall not be held responsible for delays in delivery for reasons beyond the control of S+S, specifically unforeseeable events that prevent or impede timely delivery. In such cases, the delivery deadline shall be extended accordingly. In the event of a delay of performance, the customer is entitled to withdraw from the non-performed part of the contract insofar as such impediment to performance continues for more than 6 weeks and a reasonable grace period for delivery has been granted. The customer's claims for damages due to the extension of the delivery deadline or if S+S is exempted from its duty to perform are excluded, insofar as the customer was notified without delay of such impediment to performance.

(4) Insofar as S+S is responsible for the non-compliance with binding delivery dates, the liability of S+S shall be limited to 0.5 % of the order value for each full week of delay, but up to a maximum of 5 % of the order value of the delivery affected. The customer can only assert further claims for damages insofar as the customer has granted S+S a reasonable grace period in writing and such delay in delivery is attributable to gross negligence or intent on part of S+S.

(5) S+S is exempt from its delivery obligation if circumstances come to light during the contractual relationship that give just cause to doubt the solvency of the customer. In this case, S+S will perform the delivery insofar as the customer makes an advance payment in respect of the purchase price, or provides appropriate sureties.

(6) Insofar as the customer orders goods on call (in particular, pre-order), the full acceptance of the purchase or the full release order respectively shall be completed within 12 months of the date of contract conclusion or order respectively. Otherwise, the customer is obligated to accept the goods within 10 working days insofar as S+S requests this in writing.

(7) The failure to comply with the time limit mentioned in number (6) will trigger the legal consequences of default of acceptance as defined in the BGB.

(8) There is no general right to return goods no longer required by the purchaser or for the purpose of stock reduction.

4. Delivery

(1) Shipment of goods is effected ex principal office of S+S at the customer's risk and expense (Incoterms 2010: EXW). S+S shall only take out transport, breakage, theft, or other insurance at the written request of the customer. The resulting costs shall be charged to the customer's account.

(2) Insofar as delivery of the goods is to be carried out at a later date than the possible date of shipment at the customer's request, S+S is entitled to charge the costs of storage to the customer's account, starting one month after the notification of readiness for delivery at a flat rate at 0.5 % of the order value for each month, subject to the provision of other evidence. One month after notification of readiness for delivery, S+S is alternatively entitled to request the customer to accept the goods and, in case of non-acceptance, to dispose of the goods in another manner. The customer is then to be supplied within a reasonably extended deadline.

(3) Partial performances are permissible insofar as this is not unreasonable to the customer.

5. Prices / payment terms

(1) The prices of S+S are subject to the statutory value added tax at the respective rate in effect, ex principal office of S+S and plus transport/shipping and packaging costs to be separately charged. For orders of less than EUR 75.00 in value, we reserve the right to charge a low-quantity surcharge in the amount of EUR 15.00. For custom-made items, we charge setup expenditure at cost.

Existing customers whose previous payment was received more than 12 months ago as well as new customers from Germany are supplied two times subject to prepayment and then, after a positive creditworthiness check by our Euler Hermes trade credit default insurance, by payment on account. Deliveries to customers outside Germany are subject to prepayment.

(2) S+S is entitled to issue partial invoices in accordance with the progress of the order.

(3) The invoice amount is due for payment on receipt of the invoice. Insofar as payment is not effected within 14 working days of the date of performance of goods and receipt of the invoice, the customer shall be deemed to be in default. All payments must be made in EUR. Notwithstanding evidence of further damages, the customer in the case of payment default shall pay interest on arrears at a rate of 8 percentage points above the respective base rate.

(4) Bills of exchange and checks are only accepted as conditional payment and take fulfilling effect only after being unconditionally credited. Possible ancillary costs arising due to payment by bills of exchange or check shall be charged to the customer.

6. Warranty entitlements of the purchaser

(1) The rights of the purchaser regarding material defects and defects of title (including incorrect and under-delivery as well as improper assembly or incorrect assembly instructions) shall be based on the statutory provisions, unless otherwise agreed below. The special statutory provisions for final delivery of the unprocessed goods to a consumer, even if this consumer has further processed these goods, shall remain unaffected in all cases (supplier regress according to §§ 478 BGB). Claims arising from the supplier regress are excluded if the defective goods were subject to further processing, e.g. by installation in another product, by the customer or another company.

(2) Our liability for defects is based primarily on the agreement reached concerning the quality of the goods. All product descriptions and manufacturer's specifications that form part of an individual contract or that were published by us (specifically in catalogues or on our website) at the time of contract conclusion are deemed to be agreements concerning the quality of the goods.

(3) Insofar as the quality was not agreed, the existence of a defect shall be evaluated according to the statutory provision (§ 434 par. 1 p. 2 and 3 BGB). However, we accept no liability for public statements by third parties (e.g., advertising statements) to which the customer has not drawn our attention as having influenced his/her purchasing decision.

(4) In principle, we accept no liability for defects that the customer is aware of, or unaware of due to gross negligence, at the time of conclusion of the contract (§ 442 BGB). Furthermore, the customer's claims for defects require that the customer has fulfilled his/her statutory examination and reporting obligations (§§ 377, 381 German Commercial Code (HGB)). In the case of goods intended for installation or other further processing, an investigation must be carried out in all cases immediately prior to processing. If a defect is discovered during the delivery, the investigation or at any subsequent time, we must be notified of this in writing immediately. In all cases, obvious defects must be reported in writing within 5 working days of delivery and non-visible defects undiscovered during the investigation must be reported in writing within the same period following discovery. If the customer fails to carry out a proper investigation and/or report defects, our liability for defects that are not reported, not reported in time or not reported properly shall be excluded in accordance with the statutory provisions.

(5) If the item delivered is defective, we can initially choose whether to provide subsequent performance by eliminating the defect (rectification) or by delivering a defect-free item (replacement delivery). This does not affect our right to refuse subsequent performance in accordance with statutory requirements.

(6) S+S is entitled to refuse subsequent performance if this is only possible at disproportionate costs. Disproportionate costs are deemed to apply if the costs of subsequent performance, including the cost of removing the defective item and installing a defect-free item, exceed the value of the goods in their defect-free condition by 200 %.

(7) S+S is entitled to make the subsequent performance owed dependent on the purchaser paying the purchase price due. However, the purchaser is entitled to withhold a portion of the purchase price that is commensurate with the defect.

(8) The purchaser must provide us with the necessary time and opportunity to carry out the subsequent performance owed and, in particular, must hand over the rejected goods to us. In the event of a replacement delivery, the purchaser must return the defective item to us in accordance with the statutory provisions.

(9) In the case of subsequent performance, S+S itself shall remove the defective item and install the defect-free item. The customer is only entitled to remove the defective item and to install a defect-free item with the prior consent of S+S or following the expiry of an appropriate deadline set by the customer. Insofar as a defect actually exists, we will bear or reimburse in accordance with statutory provisions the expenditure incurred for the purpose of inspection and subsequent performance, in particular, transport, travel, labour and material costs as well as any applicable removal and installation costs. Otherwise, we are entitled to demand reimbursement from the customer for the costs incurred due to the unwarranted request for defect rectification (in particular, inspection and transport costs), unless the purchaser was unable to ascertain the freedom from defects.

(10) If the subsequent performance has failed or if an appropriate deadline to be set by the customer for the subsequent performance has expired without success or is dispensable in accordance with the statutory provisions, the purchaser is entitled to withdraw from the contract or reduce the purchase price. However, the right of withdrawal does not apply for insignificant defects.

(11) Claims by the purchaser for damages or compensation for wasted expenditure apply even for defects only in accordance with § 8 and are excluded in all other cases.

7. Warranty

(1) S+S grants a warranty for products that the customer has purchased on or after 1 January 2021 subject to the following provisions. This warranty is provided to customers in addition to and independently of their statutory entitlements in the event of defects.

(2) S+S will rectify any faults in the design, material or workmanship by repair or replacement delivery within 5 years of delivery. The usual signs of wear, especially due to corrosion, ageing as well as ambient and environmental influences, are excluded from the warranty.

(3) The warranty only covers the repair or replacement delivery at the discretion of S+S. The warranty does not cover the removal of the defective item and installation of the new defect-free item.

(4) The assertion of warranty claims requires that the product be purchased on or after 1 January 2021 and was installed and maintained by a qualified technician in compliance with the mounting and operation handouts of S+S.

(5) The warranty shall expire if the fault is caused by improper installation, operating, usage or handling, or if the product was subject to structural modifications after it was purchased or was repaired or modified using third-party components.

(6) When a warranty claim is submitted, the product must be sent, securely packaged, accompanied by a complaint number that must be requested from S+S by telephone or by e-mail to "S+S Regeltechnik GmbH, Reklamationsabteilung, Thurn-und-Taxis-Str. 22, D-90411 Nürnberg, Germany". The customer bears all shipping costs. The copy of the invoice with purchase date and the completed "Form for Returns", which can be downloaded at https://spluss.de/en/downloads/, must be enclosed with the shipment.

8. Liability

(1) Unless otherwise specified in these General Terms and Conditions of Sale and Delivery including the following previsions, S+S shall be liable for breaches of contractual and non-contractual obligations in accordance with the statutory provisions.

(2) S+S is liable for damages – irrespective of the legal grounds – in the case of fault-based liability arising from intent and gross negligence. In the case of simple negligence, S+S shall be liable based on a more lenient liability standard in accordance with statutory provisions (e.g., for care and attention regarding internal matters) only

a) for damage arising from the injuries to life and limb or to health;

b) for damage arising from the violation of a material contractual obligation, the fulfilment of which enables the proper execution of the contract in the first place and on whose fulfilment the customer can normally rely on and is entitled to rely on; in this case, however, liability is limited to compensation of the typically foreseeable level of damage.

(3) The liability limitations arising from number 8 (2) also apply for breaches of duty by or in favour of persons for whose fault S+S is responsible in accordance with statutory provisions. They shall not apply insofar as S+S has maliciously concealed a defect or has assumed a warranty for the quality of the goods and for claims by the customer in accordance with the German Product Liability Act.

(4) S+S can only be held liable for deliberate breach of duty and not for any consequential damage caused by further processing of unsuitable or defective goods.

9. Limitation period

(1) Contrary to § 438 par. 1 no. 3 BGB, the general limitation period for claims arising from material defects and defects of title is one year after delivery.

(2) However, if the good in question is a building or an item that has been used in accordance with its customary purpose for a building and has caused it to be defective (building material), the limitation period according to the statutory provision is 5 years of delivery (§ 438 par. 1 no. 2 BGB). Additional statutory special regulations regarding the limitation period, especially in accordance with § 438 par. 1 no. 1 BGB, also remain unaffected if S+S has maliciously concealed the defect or assumed a warranty for the quality of the goods (§ 438 par. 3, § 444 BGB) or in the case of supplier regress in the sale of consumer goods in accordance with §§ 478, 479 BGB.

(3) The above limitation periods specified in legislation covering the sale of goods also apply for contractual and non-contractual claims for compensation by the customer that are based on a defect of the goods, unless application of the normal statutory limitation period (§§ 195, 199 BGB) would in this particular case result in a shorter limitation period. Claims for compensation by the customer in accordance with number 8 (2) clause 1 and clause 2 (a) and in accordance with the product liability law shall come under the statute of limitations exclusively in accordance with the statutory limitation periods.

10. Retention of title

(1) The goods delivered shall remain the property of S+S until the complete settlement of any and all claims by the customer. If the customer sells reserved goods without receiving the purchase price from its buyers on a payment-on-delivery basis or in advance, the customer shall agree the reservation of title with its buyers in accordance with these provisions.

(2) The customer is not entitled to pledge the reserved goods or to transfer them as collateral. In the event of seizures or other interventions by third parties, the customer shall notify S+S in writing without delay.

(3) The customer is entitled to resell reserved goods during the course of its regular business operations. The customer now already assigns to S+S all receivables in the amount of the total invoice amount (including VAT) of the claim that are accruing to the customer from its buyers from the resale, irrespective of whether such goods are sold either without or after processing. The customer is also still entitled to collect the receivable after assignment, although this does not affect the entitlement of S+S to collect the outstanding amount itself. However, S+S undertakes to the customer not to collect the outstanding amount as longas the customer does not fall behind with payments, or an application to initiate a judicial settlement or insolvency proceedings has not been filed. If this is the case, the customer is obligated at the request of S+S to disclose the assigned receivables and their debtors, to provide the necessary records, and to notify the debtors of the assignment.

11. Operating and mounting instructions

The customer undertakes to adhere to any operating and mounting instructions delivered with goods, and to make any third-party buyers aware of same. The complete or partial non-observance of such instructions may result in a complete loss of buyers' rights. This does not apply to possible claims for damages according to § 7.

12. Copyright

The customer is not entitled to reproduce or copy any of the content of S+S catalogues, specifically technical drawings and photographs, for his/her own advertising or other purposes without the express written approval of S+S. The customer is not permitted to make quotations or other commercial documents available to third parties.

13. Miscellaneous

(1) For any disputes arising from or in connection with the contractual relationship, Nuremberg/Germany is agreed as the place of jurisdiction. The place of performance is Nuremberg.

(2) The customer can only offset against claims that are undisputed or have been legally established as final and absolute. The customer is entitled to a right of retention only if its counter-claims originate from the very same contractual relationship, or if such claims are undisputed or have been legally established as final and absolute.

(3) Modifications of the contract must be made in writing. This also applies to the alteration of this written-form requirement clause.

(4) Should one or several provisions of these General Terms and Conditions of Sale and Delivery be ineffective or not have been properly incorporated into the contract, the remaining provisions of these General Terms and Conditions of Sale and Delivery shall remain effective.

(5) Solely the laws of the Federal Republic of Germany shall apply to the exclusion of the law regarding the United Nations Convention on Contracts for the International Sale of Goods (CISG) – also if the customer has its registered office outside Germany.

These General Terms and Conditions of Sale and Delivery are protected by copyright. Copyright infringements will be legally prosecuted.

Certificate

You can rely on S+S –
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When it comes to quality, we leave nothing to chance. We make sure of this with systematic quality management and uncompromising checks at our in-house testing centre.

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Scope

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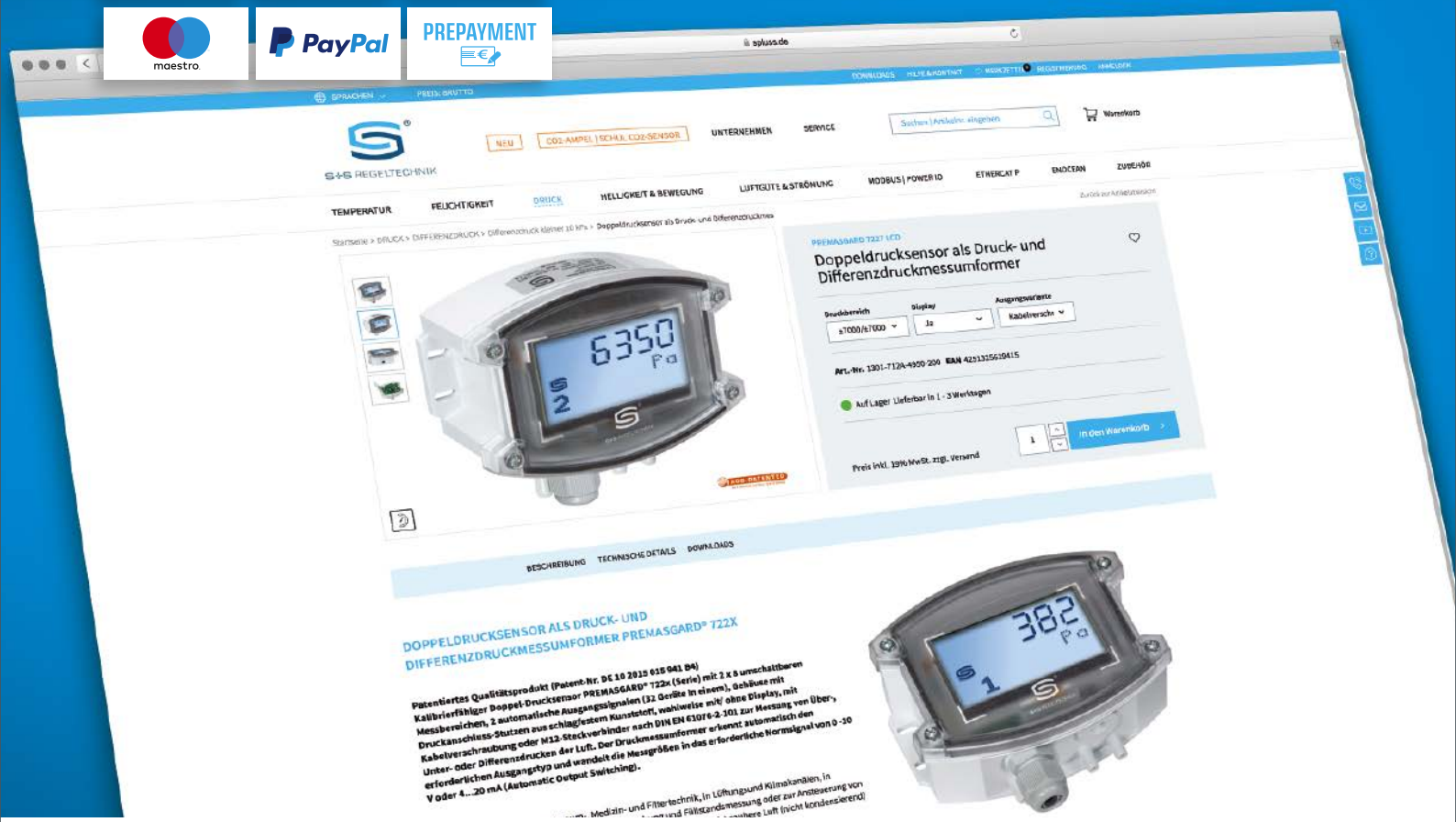
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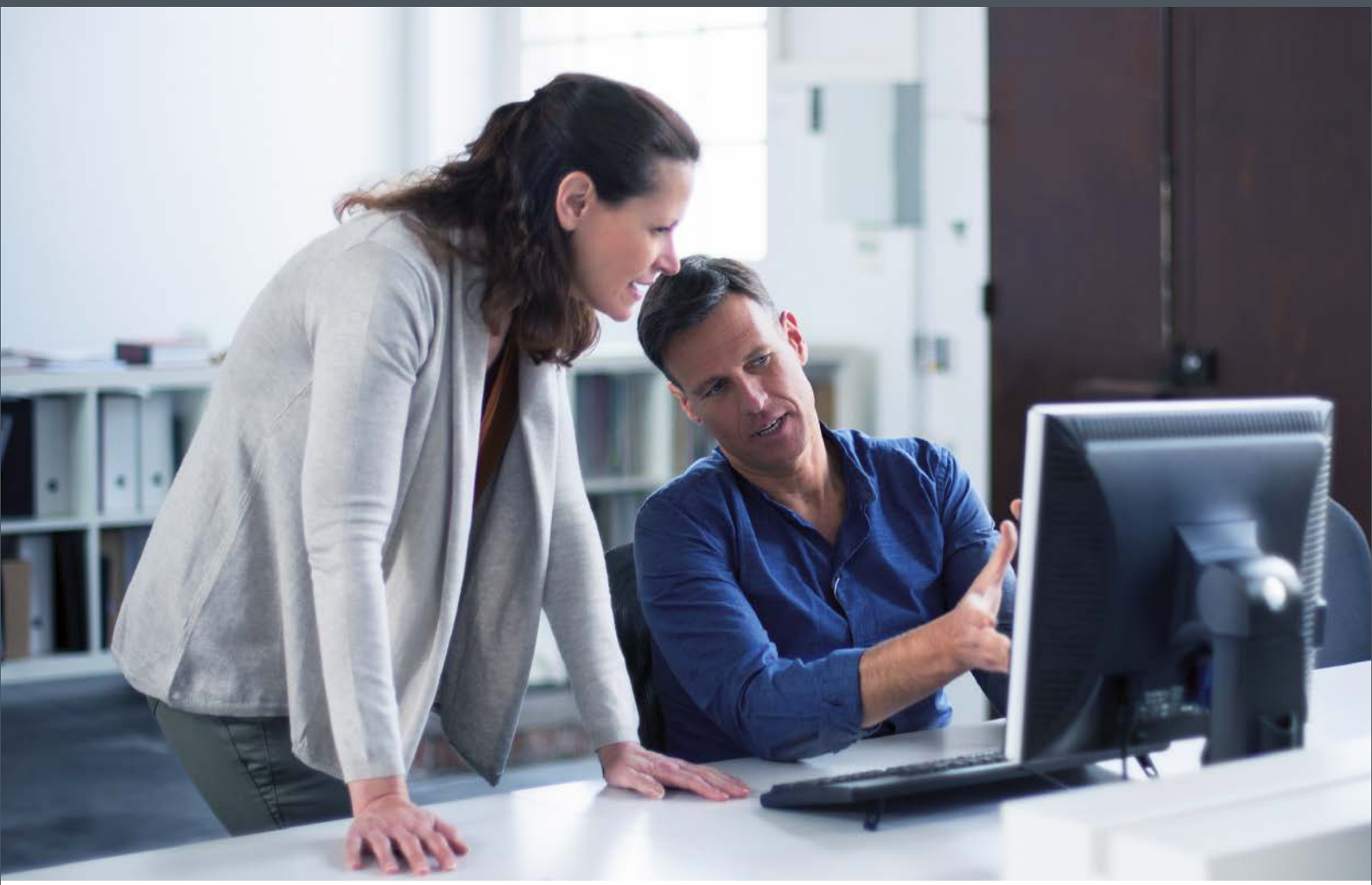
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