



safe.inspiring.green.

GEOS 

GEOS Industrial and Outdoor Enclosures
Tough. Flexible. Safe.



High quality materials and an innovative design make the new GEOS series a universal solution and longlasting enclosure for indoor and outdoor applications.

The UV and weather resistance of the high-quality polycarbonate and the new and innovative „Drain Protect“ seal system guarantee optimal protection against most environmental influences, as well as rain, cold and heat.

Even in tough conditions caused by aggressive atmospheres, oils, greases or mechanical stresses, you can rely on the GEOS enclosures and cabinets. Certifications for the most varied applications give the user confidence at all times.

► GEOS | EMPTY ENCLOSURES + CABINETS

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► GEOS | CABINETS **NEW!**

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TOUGH

UV and weather resistant

Corrosion resistant

Temperature resistant

Rugged

High impact resistance - IK 09

FLEXIBLE

Enclosure variety

Variable internal fit-out

Easy processing

SAFE

Drain protect seal system

Protection against dust, rain,
snow, sprayed water

Air ventilation elements

Insulated protection

High protection rating IP66 / IP67



GEOS Variety

- 32 variants
- 3 base sizes
- 2 enclosure heights
- Cover and doors
grey or transparent
- Different cover closure systems

GEOS Applications

- Water and utility water management
- Renewable energies
- Monitoring and access technology
- Agricultural operating facilities
- Traffic engineering
- Construction of control systems
- Electric mobility / infrastructure

NEW!

GEOS | **Empty Enclosures + Cabinets** Properties

Now DNV-GL tested!



(except GEOS with swivel lever)



IP66
IP67

UL
TYPE 4X

IK09



1000V
AC

1500V
DC

cULus

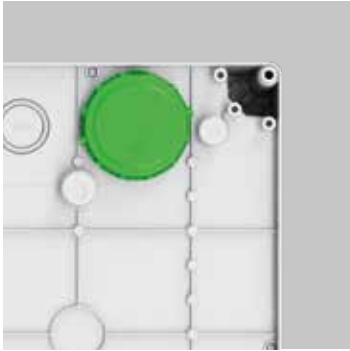


els spelsberg



ALL-ROUND PROTECTION THROUGH „DRAIN PROTECT“

- ✚ Lasting protection against moisture
- ✚ High protection class IP 66 / IP 67



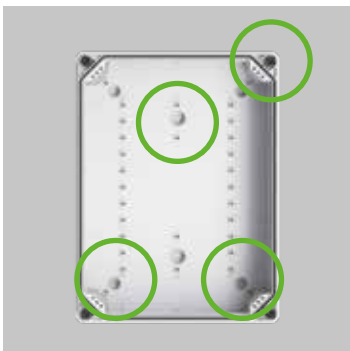
PROTECTION AGAINST CONDENSATE WATER

- ✚ Preparation for BEL Air M40 ventilation elements
- ✚ Protection class IP 65



SOLID PLASTIC ENCLOSURE

- ✚ Fast and easy machining with low weight
- ✚ Extremely durable: No corrosion after mechanical processing
- ✚ Always protection class II
- ✚ High impact resistance - IK 09



SEVERAL MOUNTING OPTIONS

- ✚ Easy installation via keyhole mounting
- ✚ Mounting outside the sealing area
- ✚ UL-compliant installation
- ✚ Installation of preassembled enclosure



OPTIONAL EXTERNAL FASTENING

- ✚ Installation of assembled enclosures
- ✚ Available in 2 heights (10 mm or 40 mm)
- ✚ Distance from wall for optimum laying of cables
- ✚ Mast clamp mounting





GEOS VARIANTS

- + Covers and doors
- grey or transparent



DIFFERENT CLOSURE SYSTEMS

- + Choice between screw closure and quick-release closure or triangle-head screws
- + Doors with cam lock and pivoted lever



EXTREMELY FLEXIBLE

- + Flexible use of the components
- + Modular installation system
- + Toolfree and fast assembly



OPTIMISED BOX DIMENSIONS

- + Flexible assembly of the enclosures with flange plates and heavy-duty industrial plug-in connectors
- + For universal use in different applications



CUSTOMISED SOLUTIONS

- + Drilling and milling
- + Customised printing
- + Wiring
- + Testing
- + Customised packaging

TOUGH



For the use in
harsh environments



Internal fittings are
safely protected



Material Polycarbonate

- Can be customised easily and cleanly
- UV-resistant
- Weather resistant
- Corrosion resistant
- High impact resistance

IK09

-35°C
-
+80°C

GEOS | Empty Enclosures + Cabinets



■ Easy to modify by
CNC machining

Robust enclosure design

- Solid design of box and cover / door
- High impact resistance (IK 09) despite the low enclosure weight



■ Robust design of enclosure



■ Solid design

FLEXIBLE



Modular design system

- **No machining required for the installation of windows**
- Standard-type design
- Variants of doors and covers in grey or transparent
- **Flexible use of components**
- **Small stock keeping capacity required**
- **Can be extended easily**
- Standardised external dimensions
- Identical approvals
- Universal use in various applications
- **Installation system**
Tool-free and fast installation within the 25 mm grid
- **Mounting domes enable assembly flexibility**
in box, cover, door
- **Quick-release closure - thread inserts**
 - ¼-rotation with defined end position
 - Can be replaced easily



EMPTY ENCLOSURE

with grey or transparent cover



CABINET

with grey or transparent door



CABINET

with grey or transparent door



CABINET (horizontal)

with grey or transparent door



Standard-type
overall image



Can easily be replaced
at any time



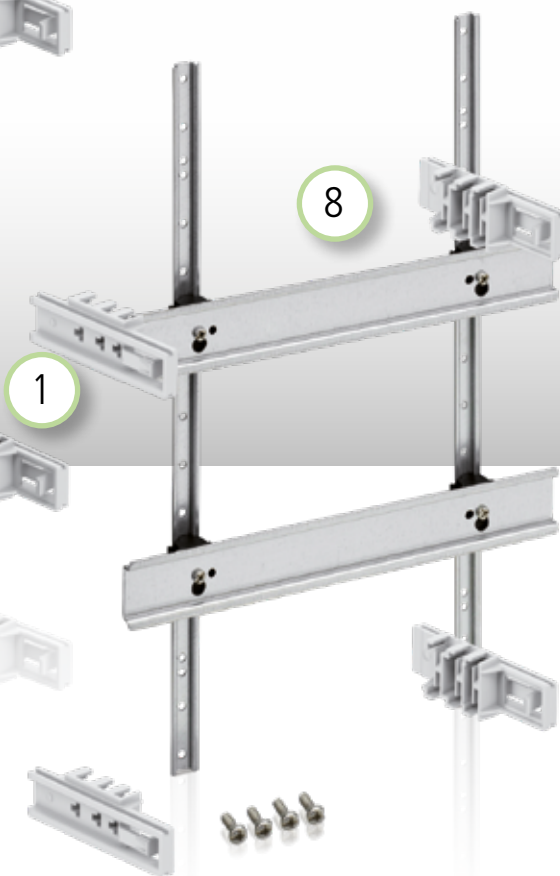
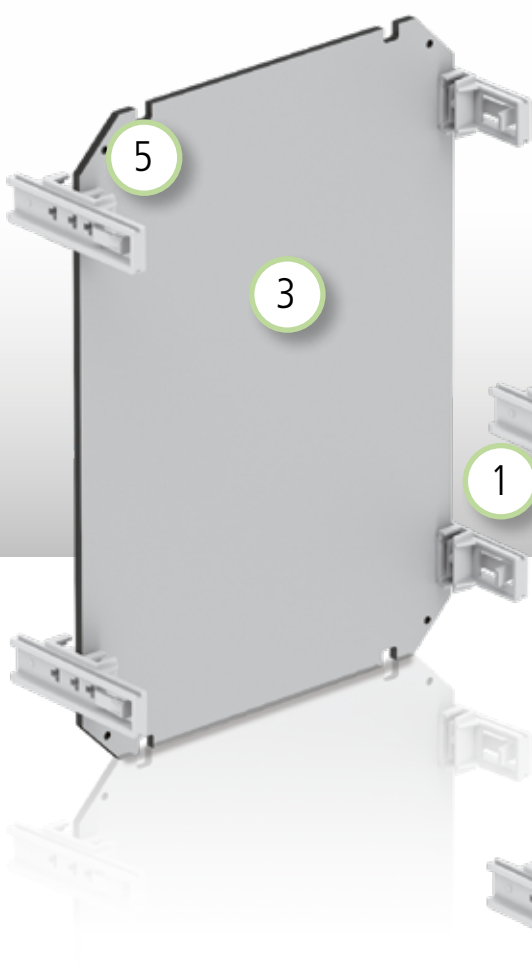
Without any restriction
of technical
properties

FLEXIBLE



Installation system

- Functional installation system with mountingholder (1)
- Tool-free installation of mounting holder (2)
- Universally usable for assembly plates (3), standard rails (4) and carrying frame (8)
- Different installation heights possible in the mounting holder (5)
- Subsequent insertion of pre-assembled assembly plates or devices (6)
- Slide-in partition walls (7)
- Protective cover (9)



Flexible use
of components



Can be extended easily



SAFE

Now DNV-GL tested!



(except GEOS with swivel lever)



IP66
IP67

UL
TYPE 4X

UL
US

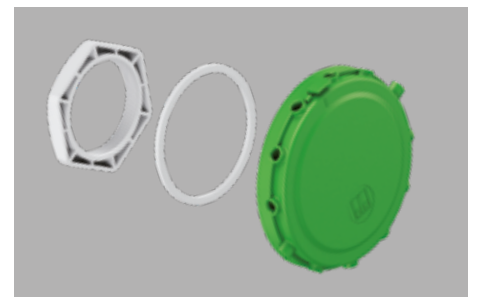
DLG

TYPE APPROVED PRODUCT
DNV-GL
DNVGL.COM/AF

iQ

GEOS Safety

- Empty enclosures tested according to IEC 61439 with comprehensive certifications according to IEC 62208
 - UL 50
 - UL 50E
 - CSA 22.2
- DNV-GL checked (except GEOS with swivel lever)
- UV and corrosion resistant
- High impact resistance
- Protection against condensate water due to BEL Air M40 ventilation elements





GEOS "Drain protect" sealing principle

- Unique enclosure design with lasting protection against moisture ingress
- Diverts moisture, e.g. rain or snow, to the back of the enclosure
- Overlapping cover
- Drainage channels along the sides of the enclosure
- Elastomer seal
- Optimum protection of the seal against environmental influences
- Unrestricted use in the most varied environments
- Optimised for challenging outdoor applications



Fast and easy
access to the box



Components are easy
to operate



Cover cannot
drop down



Switch cabinet
closes safely



Solid design
for a long
operating life



NEW!

GEOS | **Cabinets** New types



Now DNV-GL tested!



(except GEOS with swivel lever)

GEOS Cabinets

- Access to the interior space with standard locking system (3 mm - two-bit key)
- Optional alternative locking inserts available as accessories
- Doors are guided by frames to be solid
- Doors with wide opening angle > 180°
- Doors are rigidly mounted on the box
- No restrictions for the assembly of internal fittings
- Suitable for indoor and outdoor installation
- Optimised for rough outdoor applications

GEOS Variety

- 22 variants
- Horizontally or vertically format
- Transparent and grey doors
- 3 base sizes
- Up to 2 enclosure heights
- Locking system - cam lock or pivoted lever
- Cabinets tested according to IEC 61439

GEOS Safety

- Comprehensive certifications as per IEC 62208
UL 50*
UL 50E*
CSA 22.2*
(*Excluding SH types)
- DNV-GL checked
(except GEOS with swivel lever)

IP66
IP67



IK09



1000V
AC

1500V
DC



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FLEXIBLE



Built-in modules protected against contact

- Can be processed easily and quickly
- Secured against tampering
- Option to modify to small-scale distributors
- Modular design possible
- Tool-free installation

Assembly frame + door

- Can easily be changed at any time
- Can be extended easily
- Easy mounting and dismantling – also after installation
- Easy change of door fixation right/left by turning of the frame incl. door
- Easy dismantling of the door



NEW!

GEOS | **Cabinets** Internal fit-out



Easy adjustment
of enclosures



Flexible use
of enclosures



Easy to mount

Frame as basis for accessories

- Flexible use of enclosures
- Isolation of electrical equipment and user interface with protection against accidental contact

- Individual internal fit-out, e.g. with mounting plates, modules protected against contact, internal doors
- Installation of serial mounting devices, instruction and detection devices, measuring devices, displays, etc.

Frames for individual customisation

- No restriction due to accessories
- Flexible use of enclosures
- Application-optimised equipment of cabinets, e.g. with door retaining device, door contact, internal lighting, cable clips
- Easy and fast assembly
- No restrictions for the installation room



FLEXIBLE



Cabinet door step

- It prevents the door from accidental slamming
- Fixation of the open door in two optional positions
- Can easily be mounted at any time

Door contact switch

- Integrated in the frame
- It does not require any space in the installation room
- Remote enquiry of opening state in sensitive installation environments

Internal lighting (LED)

- Integrated in the frame
- Easy to mount, pre-fabricated
- Shadow-free lighting of work area

NEW!

GEOS | **Cabinets** with internal valves



Doors with wide
opening angle $> 180^\circ$



Solid design for
long operating life



Advantages - doors

- Can be opened quickly and easily and closed safely
- Good operability of components
- No restrictions for the assembly of internal fittings
- Doors with wide opening angle $> 180^\circ$
- Access to the interior space with stand and locking system (3 mm - two-bit key)
- Alternative locking inserts available as accessories
- Doors are guided by frames to be solid



GEOS | **Empty Enclosures** Perfectly conceived



(except GEOS with swivel lever)



GEOS Empty Enclosures

- Tested according to IEC 61439
- Extensive certifications according to IEC 62208
 - UL 50
 - UL 50E
 - CSA 22.2

GEOS Variety

- 10 variants
- 3 base sizes
- 2 enclosure heights
- Grey or transparent cover
- Different cover closure systems



Cabinets



Width: 300 mm
Height: 180 mm

Width: 300 mm
Height: 226 mm

Width: 300 mm
Height: 180 mm

Width: 300 mm
Height: 226 mm

Width: 400 mm
Height: 226 mm

Type:	GEOS-S 3030-18-to	GEOS-S 3030-22-to	GEOS-S 3040-18-to	GEOS-S 3040-22-to/SH	GEOS-S 4050-22-to
Order-No.:	711 433 01	711 733 01	711 434 01	721 734 01	711 745 01



Width: 300 mm
Höhe: 180 mm

Width: 300 mm
Height: 226 mm

Width: 300 mm
Height: 180 mm

Width: 300 mm
Height: 226 mm

Width: 400 mm
Height: 226 mm

Type:	GEOS-S 3030-18-o	GEOS-S 3030-22-o	GEOS-S 3040-18-o	GEOS-S 3040-22-o/SH	GEOS-S 4050-22-o
Order-No.:	710 433 01	710 733 01	710 434 01	720 734 01	710 745 01

GEOS 3030

- Outside dimensions:
300 x 300 x 180 / 226 mm
- Installation height - Interior:
152 / 198 mm
- Functional surface - Cover:
234 x 234 mm
- Functional surface - Side:
212 x 102 / 148 mm

GEOS 3040

- Outside dimensions:
300 x 400 x 180 / 226 mm
- Installation height - Interior:
152 / 198 mm
- Functional surface - Cover:
234 x 334 mm
- Functional surface - Side:
212 x 102 / 148 mm
312 x 102 / 148 mm

GEOS 4050

- Outside dimensions:
400 x 500 x 226 mm
- Installation height - Interior:
198 mm
- Functional surface - Cover:
334 x 434 mm
- Functional surface - Side:
312 x 148 mm
2 surfaces, each
181 x 148 mm

Empty Enclosures



Width: 300 mm
Height: 180 mm

Width: 300 mm
Height: 226 mm

Width: 300 mm
Height: 180 mm

Width: 300 mm
Height: 226 mm

Width: 400 mm
Height: 226 mm

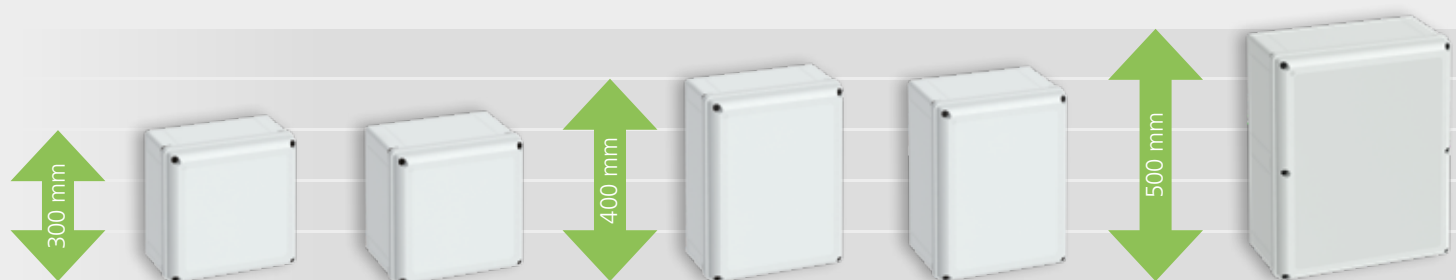
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Order-No.: 701 433 01

Type: **GEOS-L 3030-22-to**
Order-No.: 701 733 01

Type: **GEOS-L 3040-18-to**
Order-No.: 701 434 01

Type: **GEOS-L 3040-22-to**
Order-No.: 701 734 01

Type: **GEOS-L 4050-22-to**
Order-No.: 701 745 01



Width: 300 mm
Height: 180 mm

Width: 300 mm
Height: 226 mm

Width: 300 mm
Height: 180 mm

Width: 300 mm
Height: 226 mm

Width: 400 mm
Height: 226 mm

Type: **GEOS-L 3030-18-o**
Order-No.: 700 433 01

Type: **GEOS-L 3030-22-o**
Order-No.: 700 733 01

Type: **GEOS-L 3040-18-o**
Order-No.: 700 434 01

Type: **GEOS-L 3040-22-o**
Order-No.: 700 734 01

Type: **GEOS-L 4050-22-o**
Order-No.: 700 745 01

Enclosure height

- Flexible assembly of the side walls with sealing elements for cable entry
- Optimised for installation of flange plate and heavy plug-in connectors
- Suitable for installing the BEL Air M40 ventilation elements to prevent condensate water



Certifications

For certifications Spelsberg operates an in-house testing laboratory at its headquarters in Schalksmühle, Germany.

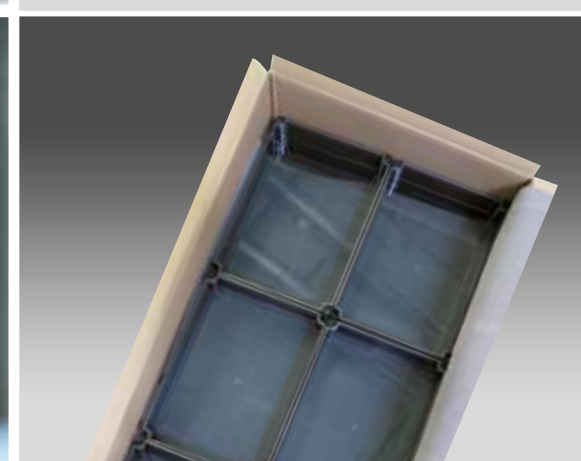
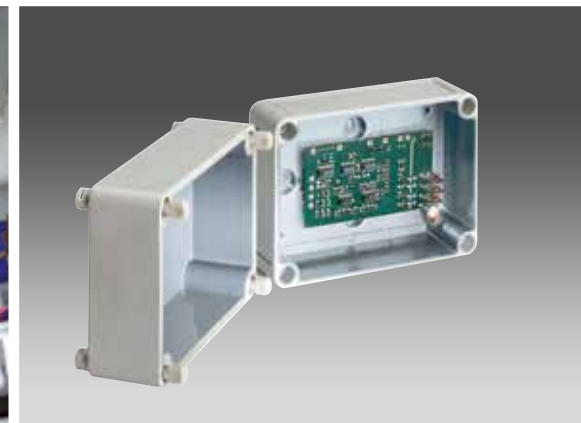
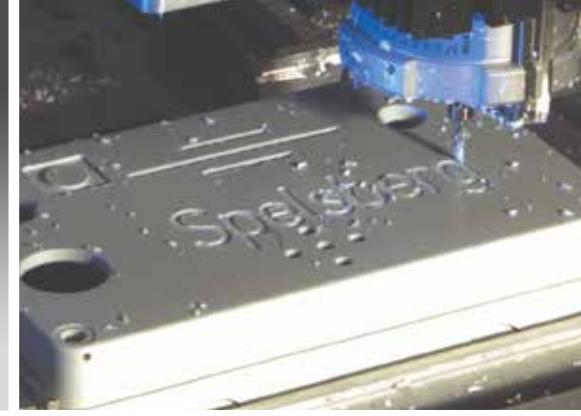
The laboratory and devices are not just VDE-certified, they are also UL-certified, thus enabling the necessary inspections for the international use of series products and special solutions to be conducted in-house.

Such a facility is especially important when developing customised solutions together with our customers. The aim is to help our customers make their products market ready as fast as possible.

The testing laboratory has state-of-the-art equipment and is continuously developed further.

UL and VDE conduct an annual audit as part of the Client Test Data Program to assure that work continues to be carried out at a consistently high standard.

- Impact testing UL Impact
- Impact testing IK Level
- Climatic chambers
- Dust protection testing
- Protection against water - sprayed water testing
- UL and VDE certified
- Cover tensile testing



Services

We are happy to develop individual solutions with our customers and offer a customisation service. That's how we create special, unique enclosures that stand out from the crowd.

Expressive designs, drilling and milling, wiring or packing. A plain, standard enclosure thus transforms into a distinctive one as required.

Customisation service

- Individual fastening points (ultrasonic welding)
- Through openings
- Thread drilling
- Engraving
- EMC coatings

Print Service

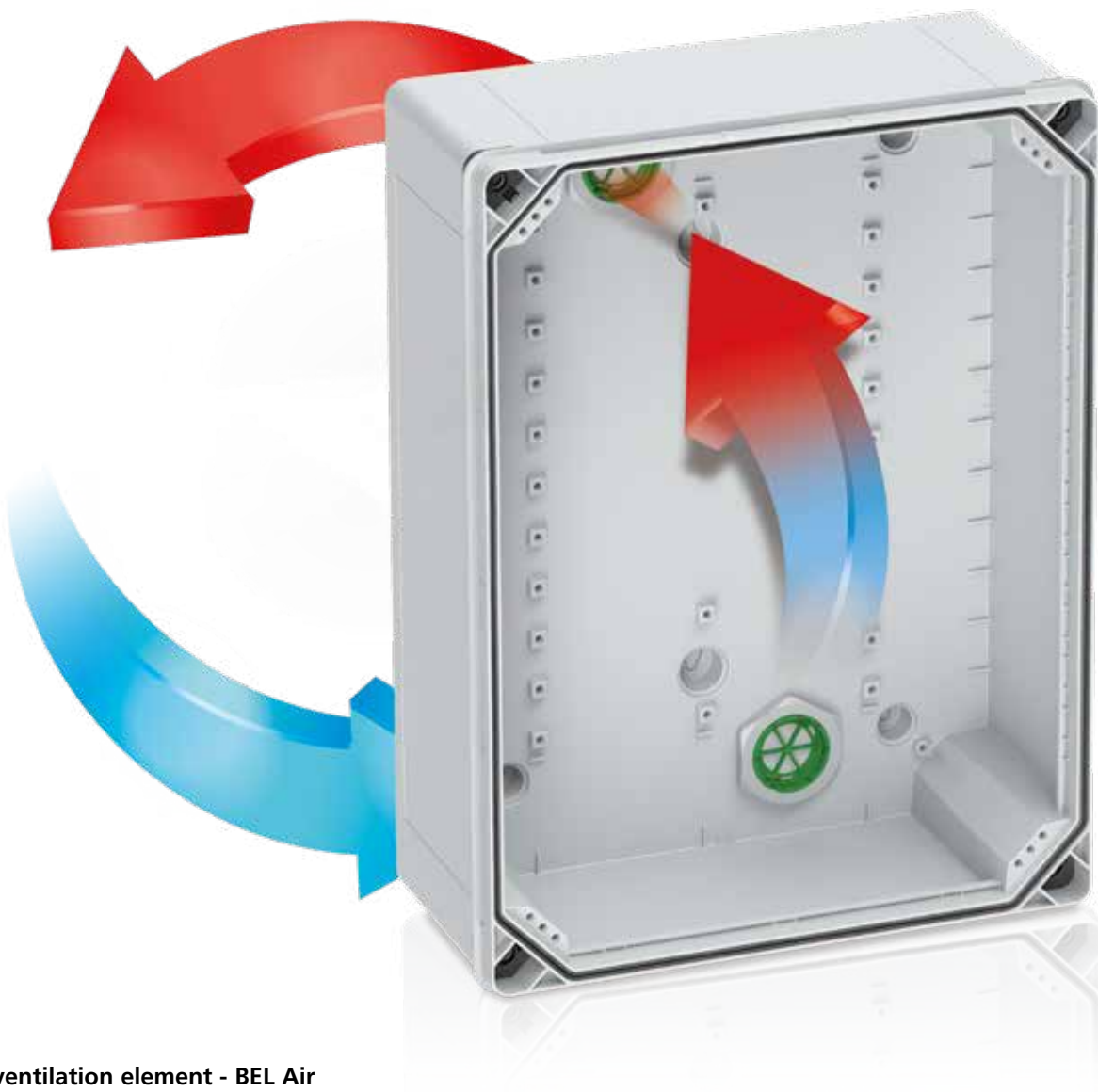
- Hot embossing
- Screen, pad, digital printing and laser marking
- Patterned films
- Membrane keyboards

Assembly service

- Assembly
- Wiring
- Testing

Packing service

- **production-oriented**
 - loosely and separately packed
- **ready-to-ship**
 - assembled goods
 - shrink-wrapped and customer-specific labelling



The ventilation element - BEL Air

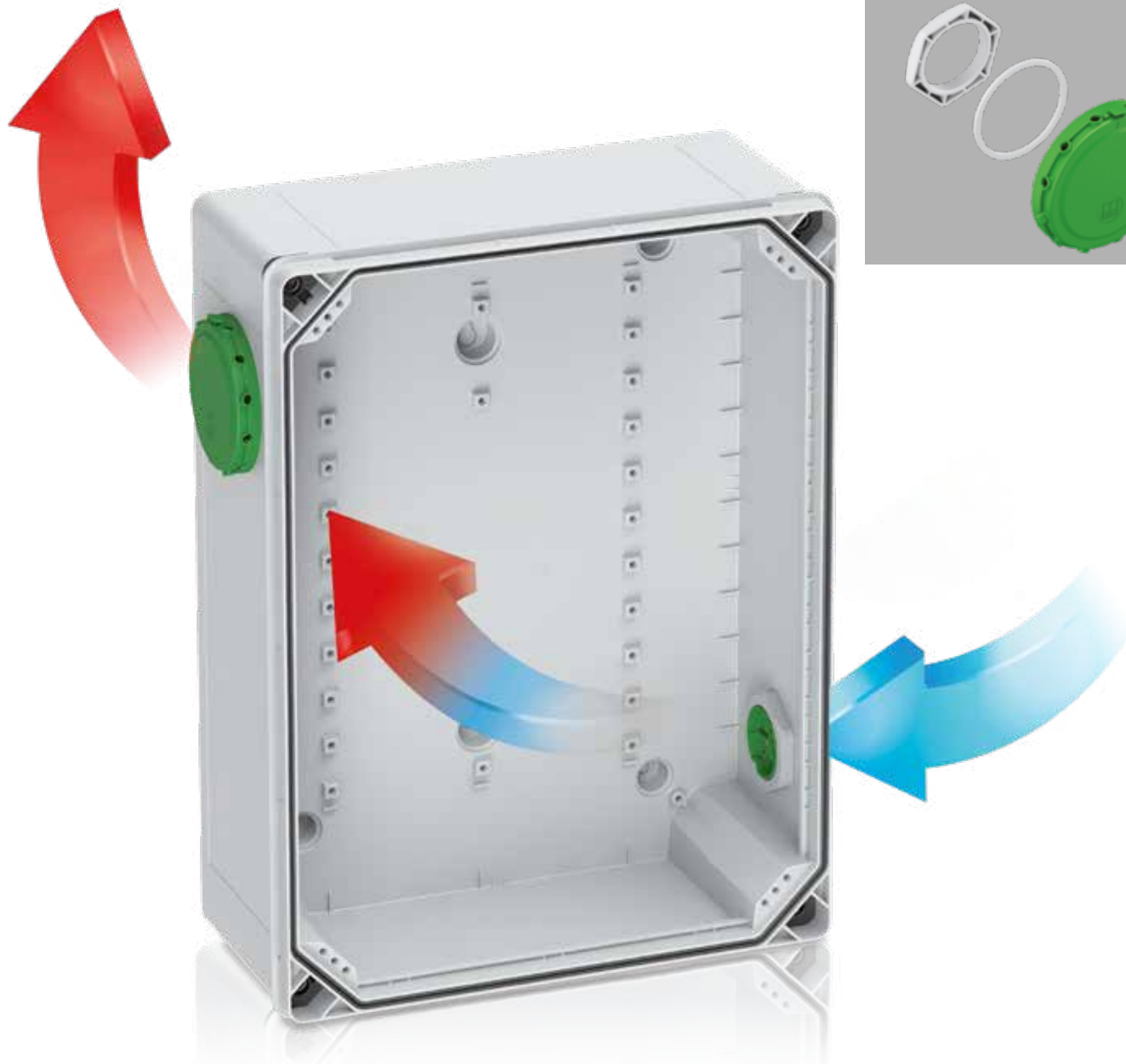
The BEL Air ventilation elements prevents condensation, while maintaining the high IP65 protection rating.

Any condensate occurring is transported out of the enclosure immediately via air exchange.

The continuous and high rate of air exchange allows the interior air to mix constantly with the environmental air and transports the moisture outwards.

Air exchange also takes place in environments with almost constant air humidity and temperature, as the air in the interior of the enclosure heats up, due to the components.

Due to the permanent pressure equalisation, all the enclosure parts, such as the seal, are relieved of pressure permanently. More information on the formation of condensate water on page 68 in this leaflet.



Mounting options BEL Air 40

- M32/40 knockouts in the enclosure bottom
- The wall clearance is suitable for installing BEL Air M40 ventilation elements
- Optional of mounting on the sidewalls of the enclosure

Advantages

- Prevention of condensation while maintaining the high IP 65 protection rating
- High air exchange rate
- 100% pressure equalisation
- 100% protection against foreign particles
- Maintenance-free

BEL Air M40

Recommended quantity of ventilation elements

- GEOS 3030 1 Set = 2 pieces
- GEOS 3040 1 Set = 2 pieces
- GEOS 4050 2 Sets = 4 pieces

NEW!

CABINET
with grey door



NEW!

CABINET
with transparent door



Industrial- and Outdoor Enclosures GEOS

Cabinets

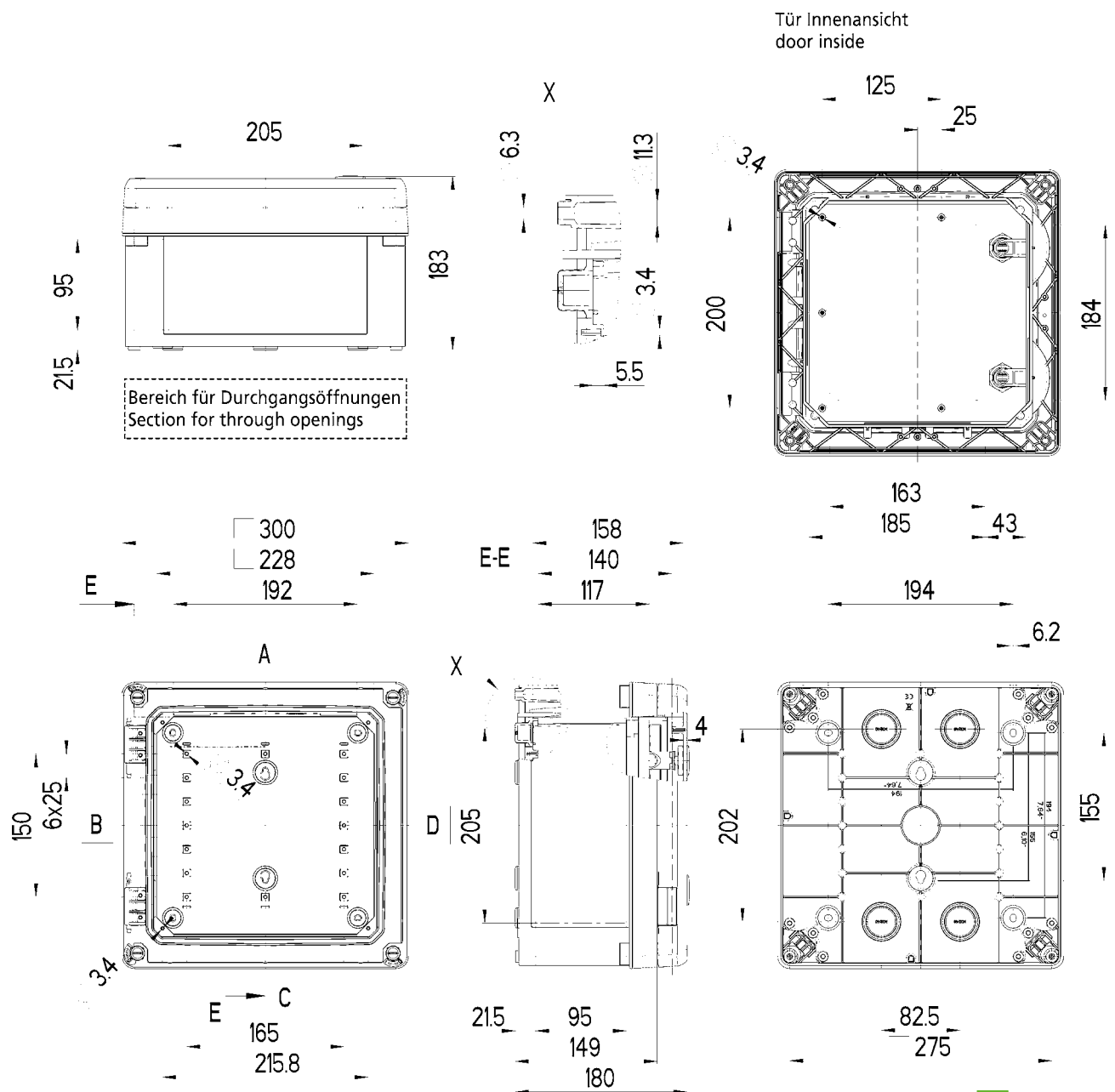
GEOS-S 3030-18

300 x 300 mm



Cabinet - Industrial Quality, suitable for installation in harsh environments and in exposed outside areas, box and frame: glass-fibre reinforced polycarbonate, grey, similar to RAL 7035, door: Polycarbonate. Door latch: sash fastener with 3mm double-bit insert (interchangeable) in accordance to DIN 43668

Description	Design	Height/mm	Order no.
GEOS-S 3030-18-o NEW	Door, grey	180	71043301
GEOS-S 3030-18-to NEW	Door, transparent	180	71143301



Industrial- and Outdoor Enclosures GEOS

Cabinets

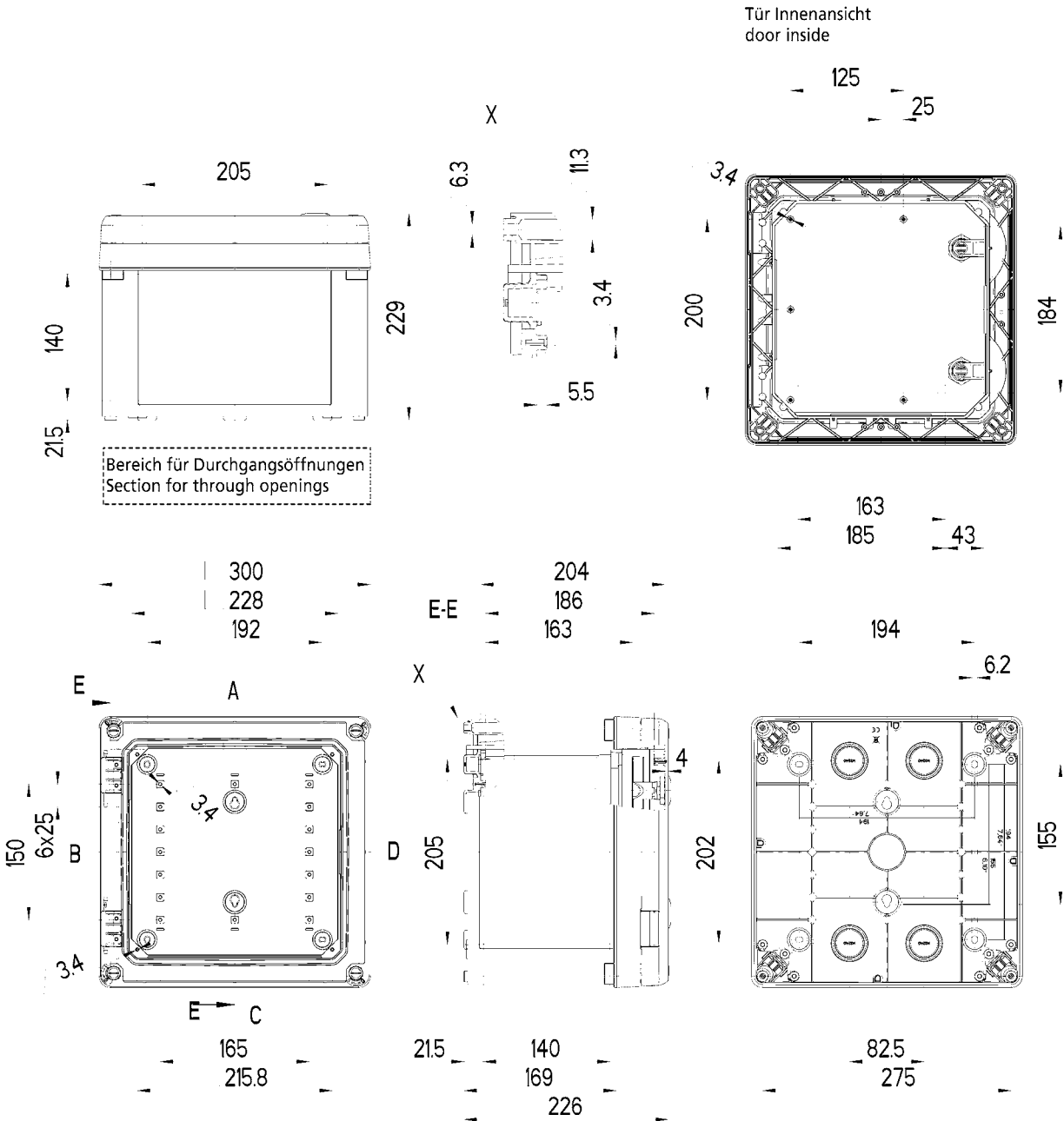
GEOS-S 3030-22

300 x 300 mm



Cabinet - Industrial Quality, suitable for installation in harsh environments and in exposed outside areas, box and frame: glass-fibre reinforced polycarbonate, grey, similar to RAL 7035, door: Polycarbonate.
Twist lock with 3mm double-bit insert (interchangeable) in accordance to DIN 43668

Description	Design	Height/mm	Order no.
GEOS-S 3030-22-o NEW	Door, grey	226	71073301
GEOS-S 3030-22-to NEW	Door, transparent	226	71173301



Industrial- and Outdoor Enclosures GEOS

Cabinets

GEOS-S 3040-18

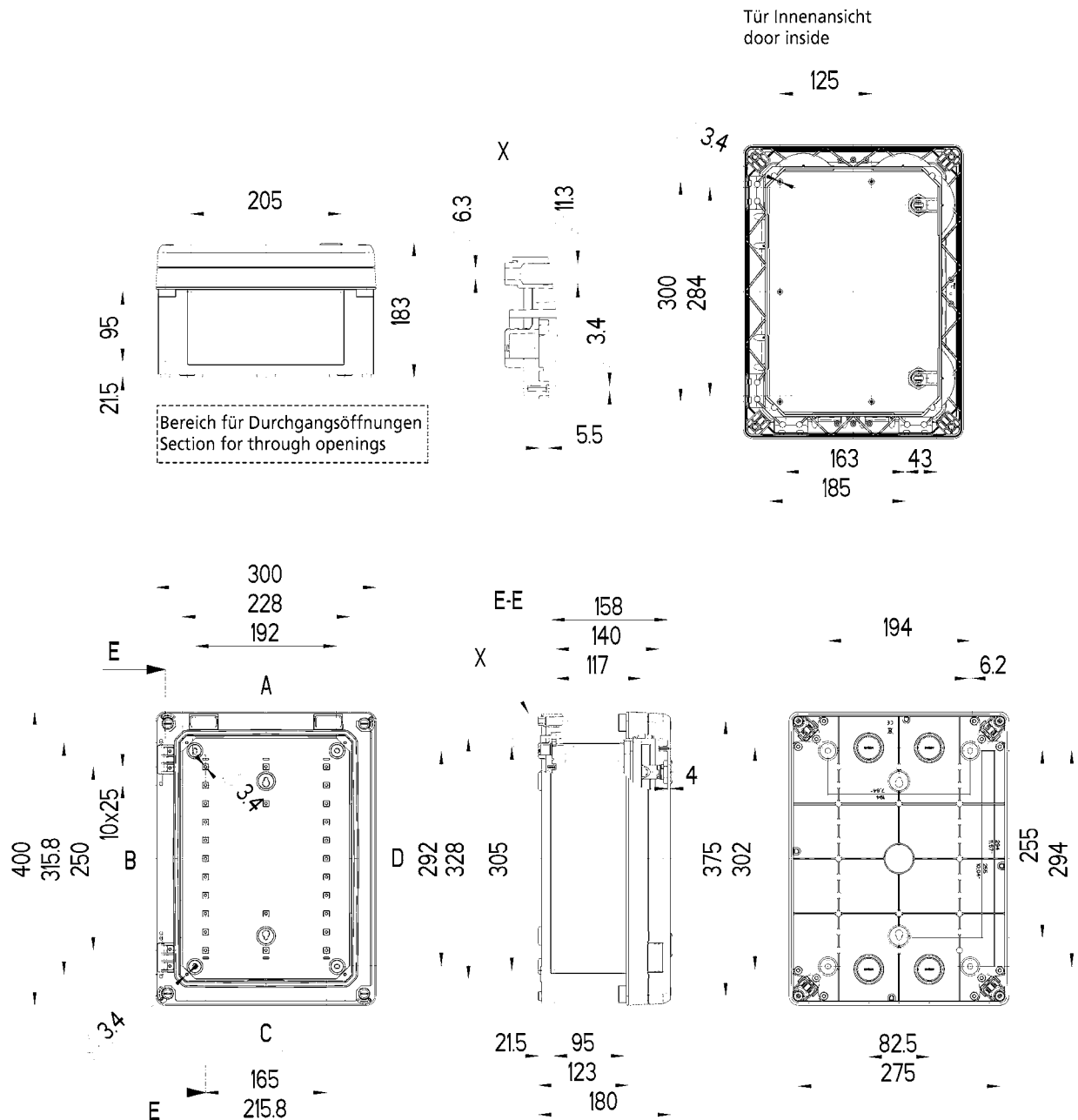
300 x 400 mm



Cabinet - Industrial Quality, suitable for installation in harsh environments and in exposed outside areas, box and frame: glass-fibre reinforced polycarbonate, grey, similar to RAL 7035, door: Polycarbonate.

Twist lock with 3mm double-bit insert (interchangeable) in accordance to DIN 43668

Description	Design	Height/mm	Order no.
GEOS-S 3040-18-o NEW	Door, grey	180	71043401
GEOS-S 3040-18-to NEW	Door, transparent	180	71143401



Industrial- and Outdoor Enclosures GEOS

Cabinets

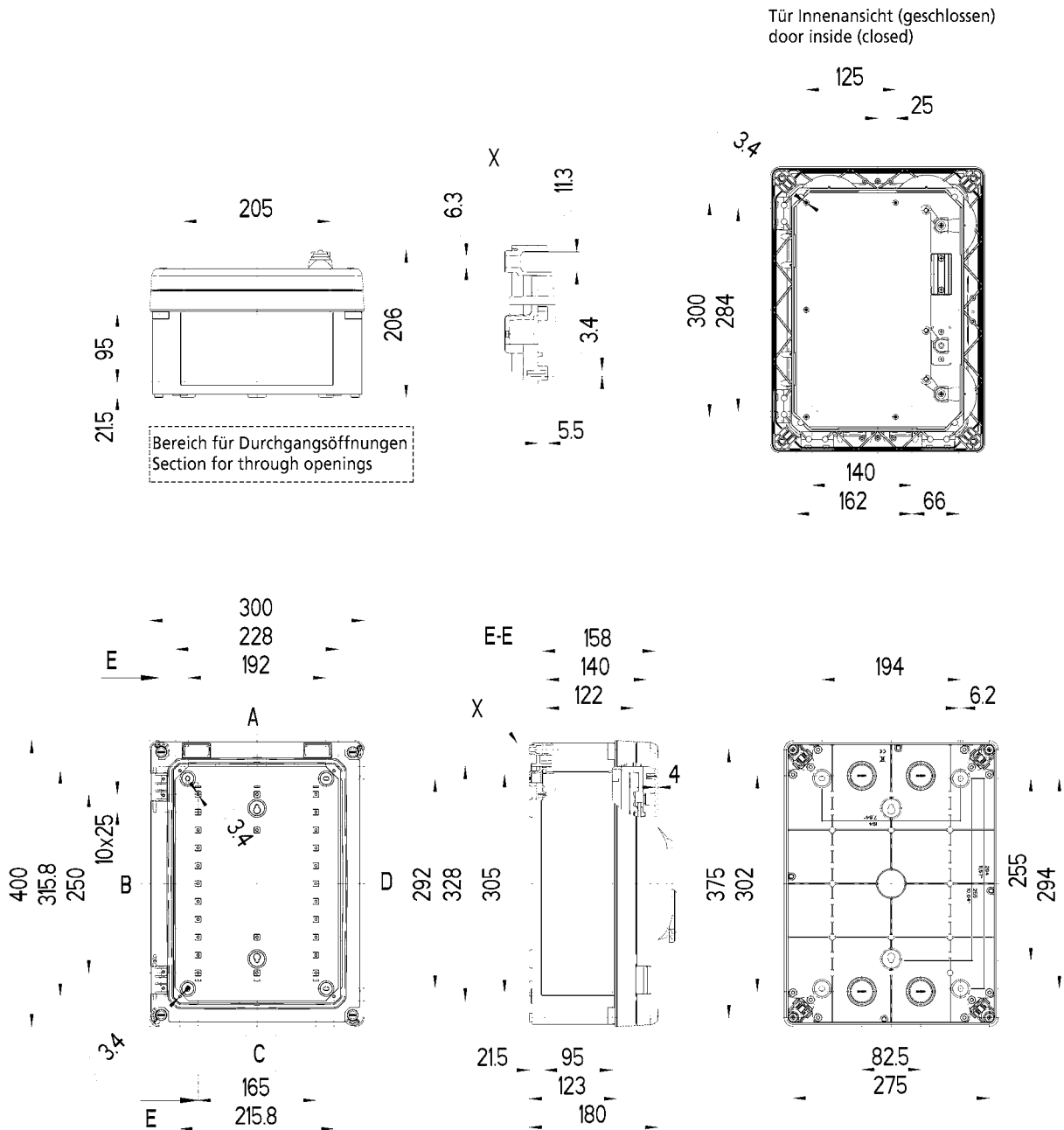
GEOS-S 3040-18/SH

300 x 400 mm



Cabinet - Industrial Quality, suitable for installation in harsh environments and in exposed outside areas, box and frame: glass-fibre reinforced polycarbonate, grey, similar to RAL 7035, door: Polycarbonate.
Swivel lever for inserting profile-cylinders in accordance to DIN 18252

Description	Design	Height/mm	Order no.
GEOS-S 3040-18-o/SH NEW	Door, grey	180	72043401
GEOS-S 3040-18-to/SH NEW	Door, transparent	180	72143401



Industrial- and Outdoor Enclosures GEOS

Cabinets

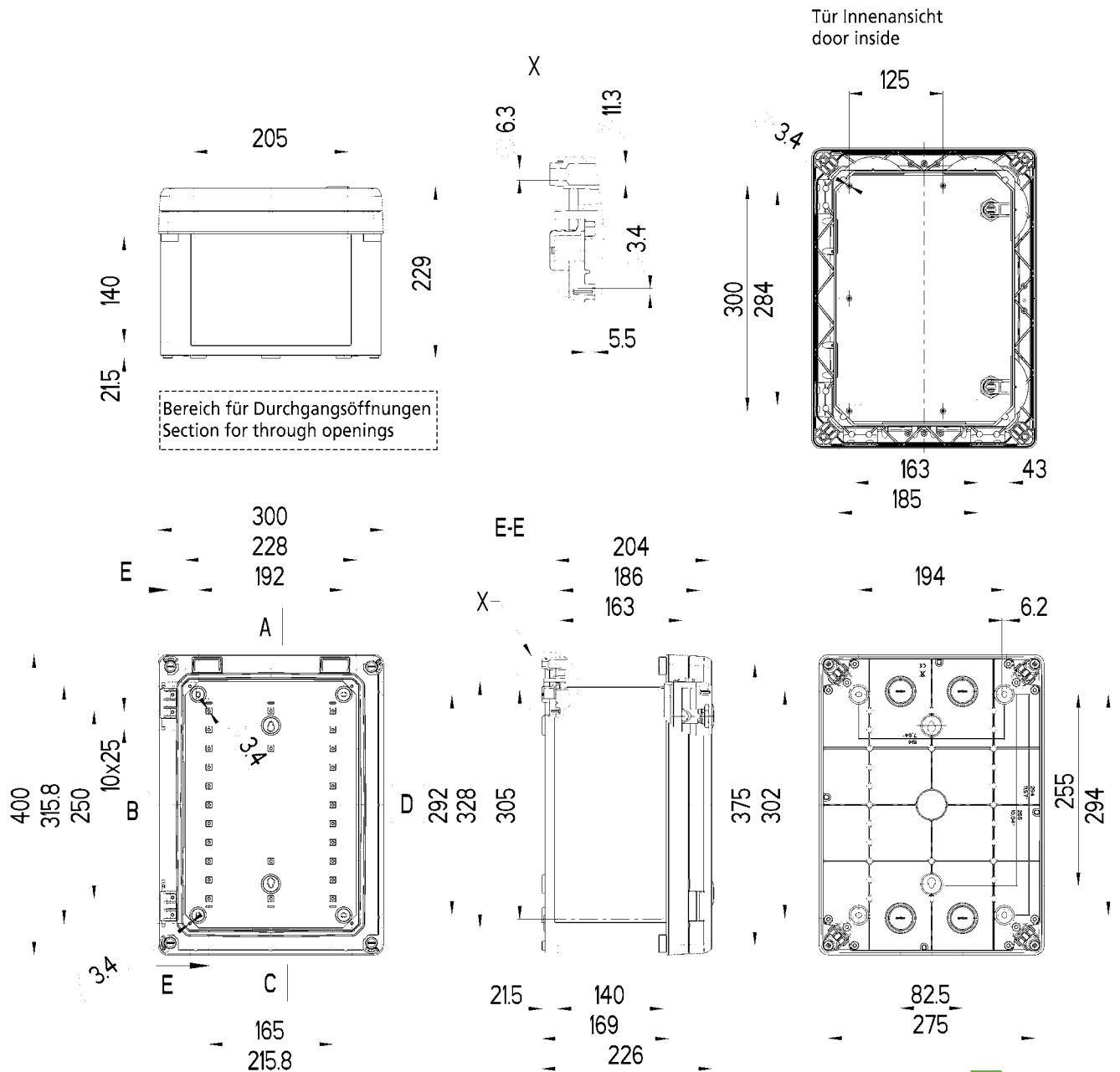
GEOS-S 3040-22

300 x 400 mm



Cabinet - Industrial Quality, suitable for installation in harsh environments and in exposed outside areas, box and frame: glass-fibre reinforced polycarbonate, grey, similar to RAL 7035, door: Polycarbonate.
Twist lock with 3mm double-bit insert (interchangeable) in accordance to DIN 43668

Description	Design	Height/mm	Order no.
GEOS-S 3040-22-o NEW	Door, grey	226	71073401
GEOS-S 3040-22-to NEW	Door, transparent	226	71173401



Industrial- and Outdoor Enclosures GEOS

Cabinets

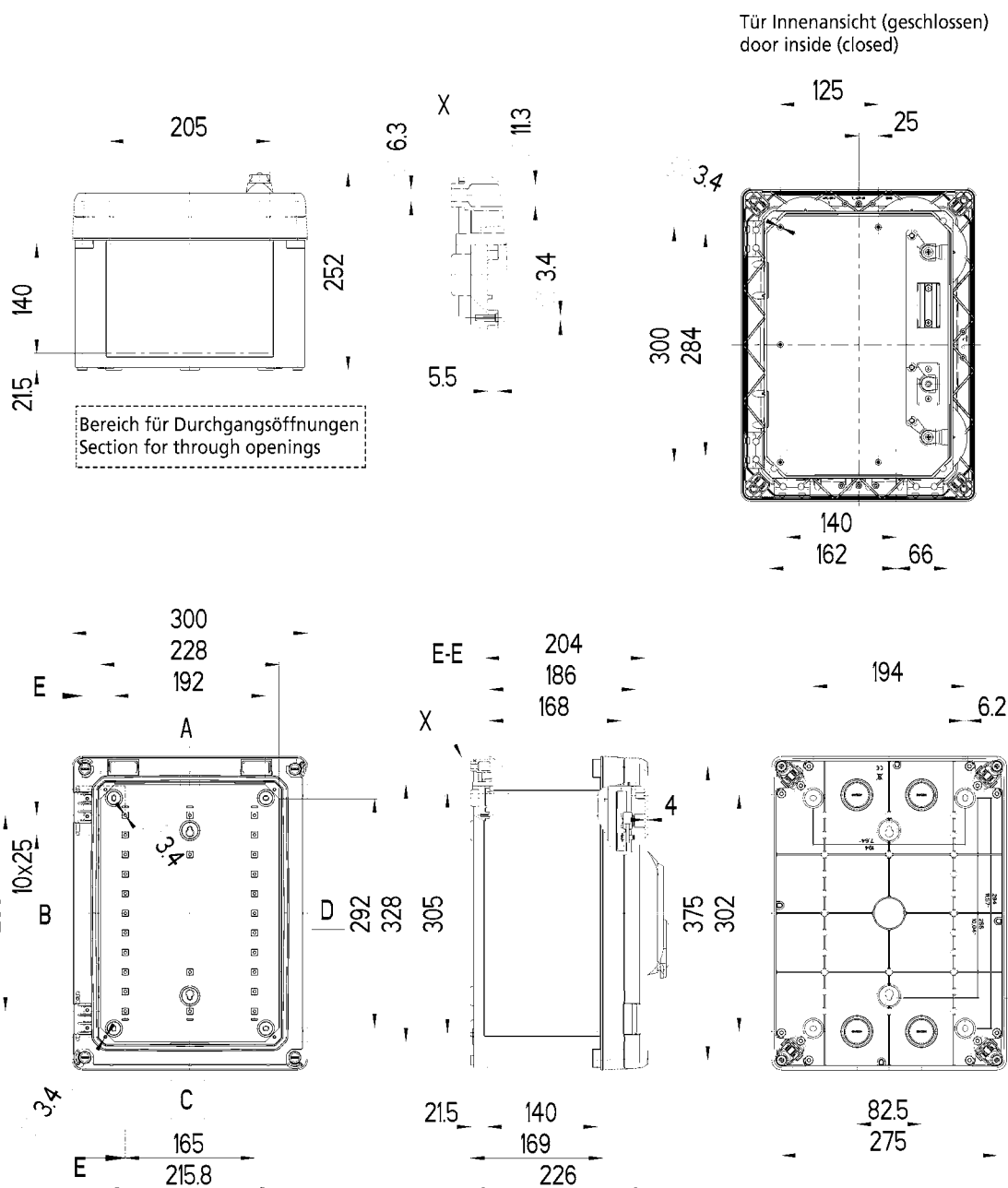
GEOS-S 3040-22/SH

300 x 400 mm



Cabinet - Industrial Quality, suitable for installation in harsh environments and in exposed outside areas, box and frame: glass-fibre reinforced polycarbonate, grey, similar to RAL 7035, door: Polycarbonate.
Swivel lever for inserting profile-cylinders in accordance to DIN 18252

Description	Design	Height/mm	Order no.
GEOS-S 3040-22-o/SH NEW	Door, grey	226	72073401
GEOS-S 3040-22-to/SH NEW	Door, transparent	226	72173401



Industrial- and Outdoor Enclosures GEOS

Cabinets

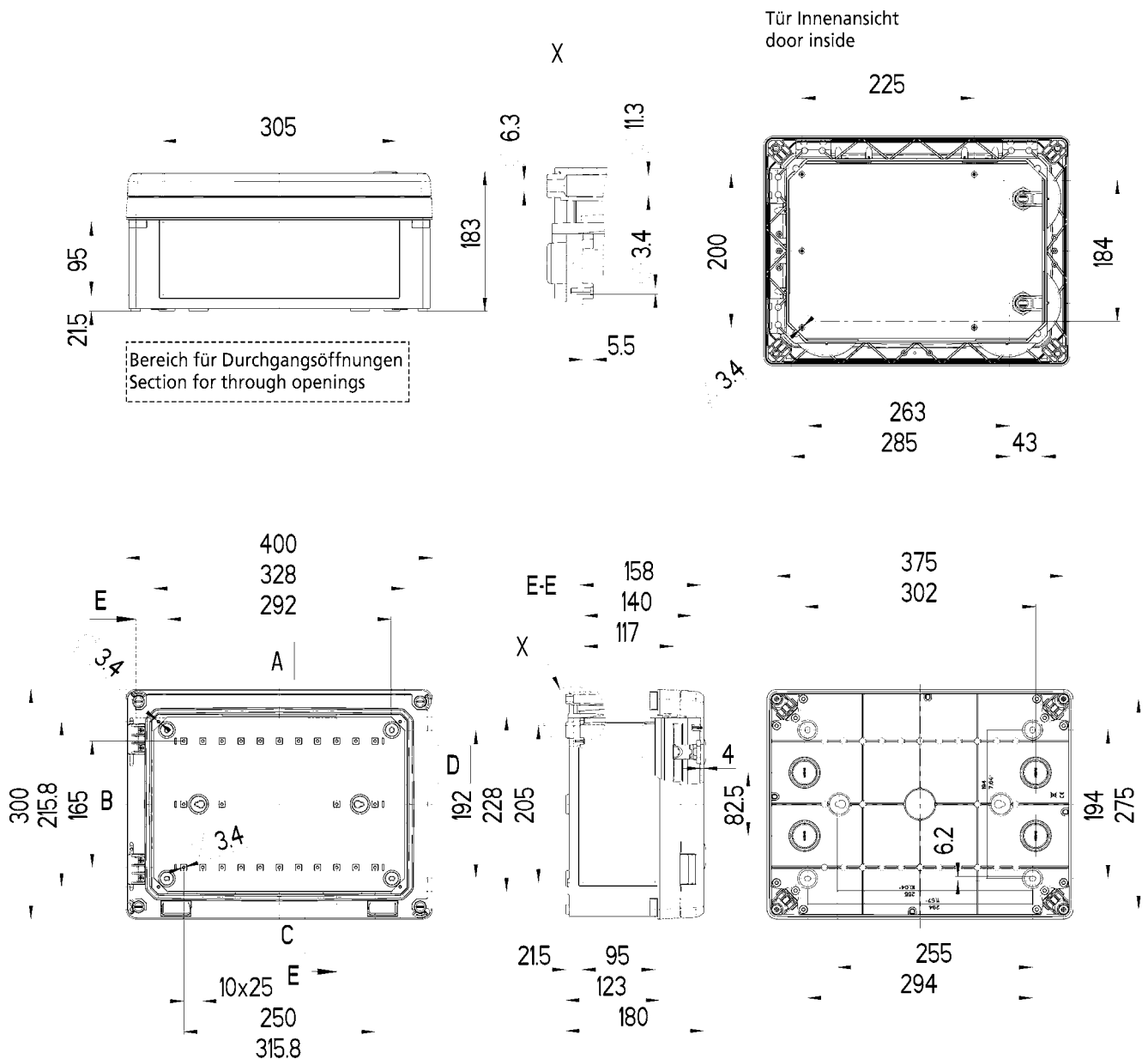
GEOS-S 4030-18

400 x 300 mm



Cabinet - Industrial Quality, suitable for installation in harsh environments and in exposed outside areas, box and frame: glass-fibre reinforced polycarbonate, grey, similar to RAL 7035, door: Polycarbonate.
Twist lock with 3mm double-bit insert (interchangeable) in accordance to DIN 43668

Description	Design	Height/mm	Order no.
GEOS-S 4030-18-o NEW	Door, grey	180	71044301
GEOS-S 4030-18-to NEW	Door, transparent	180	71144301



Industrial- and Outdoor Enclosures GEOS

Cabinets

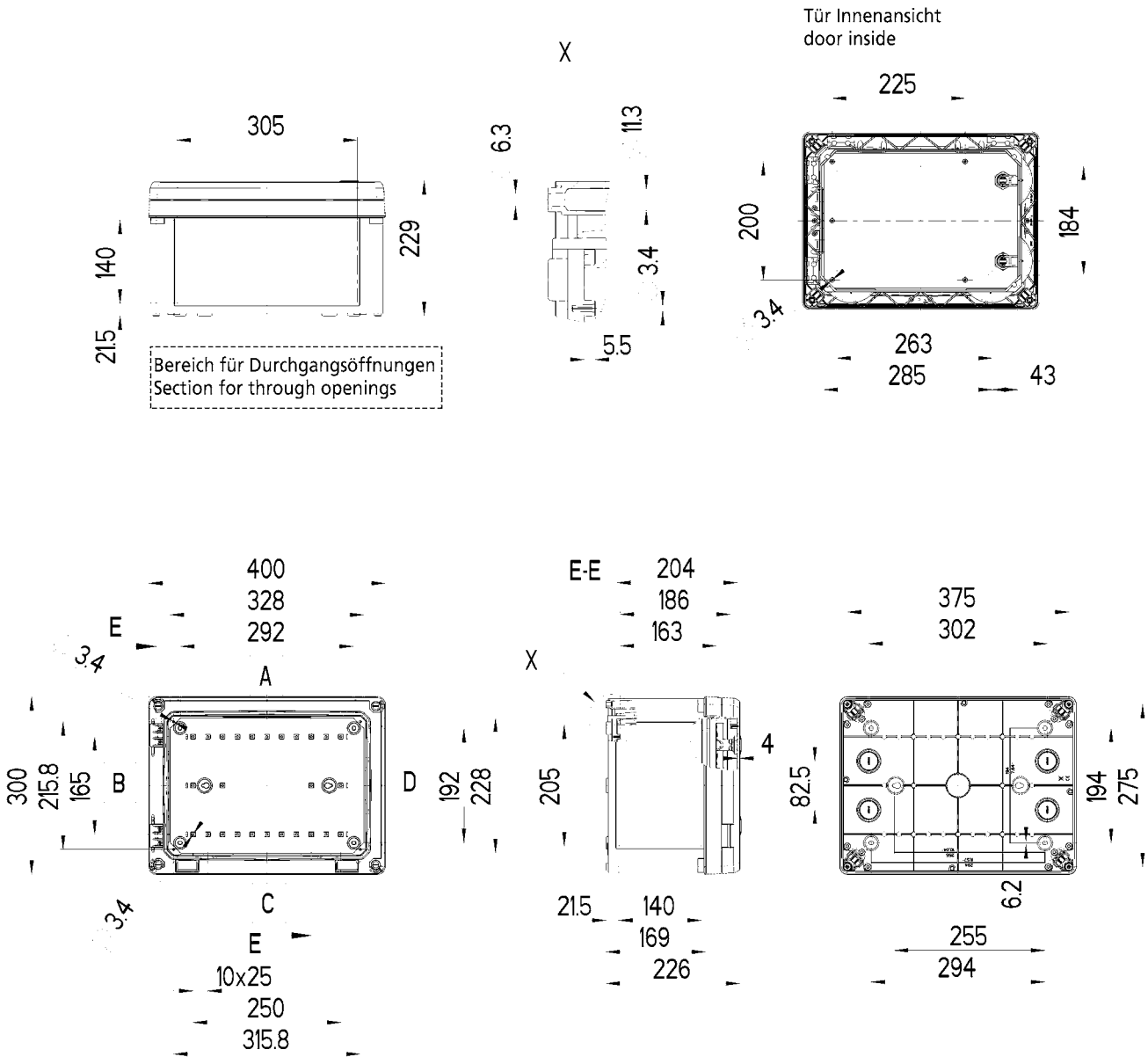
GEOS-S 4030-22

400 x 300 mm



Cabinet - Industrial Quality, suitable for installation in harsh environments and in exposed outside areas, box and frame: glass-fibre reinforced polycarbonate, grey, similar to RAL 7035, door: Polycarbonate.
Twist lock with 3mm double-bit insert (interchangeable) in accordance to DIN 43668

Description	Design	Height/mm	Order no.
GEOS-S 4030-22-o NEW	Door, grey	226	71074301
GEOS-S 4030-22-to NEW	Door, transparent	226	71174301



Industrial- and Outdoor Enclosures GEOS

Cabinets

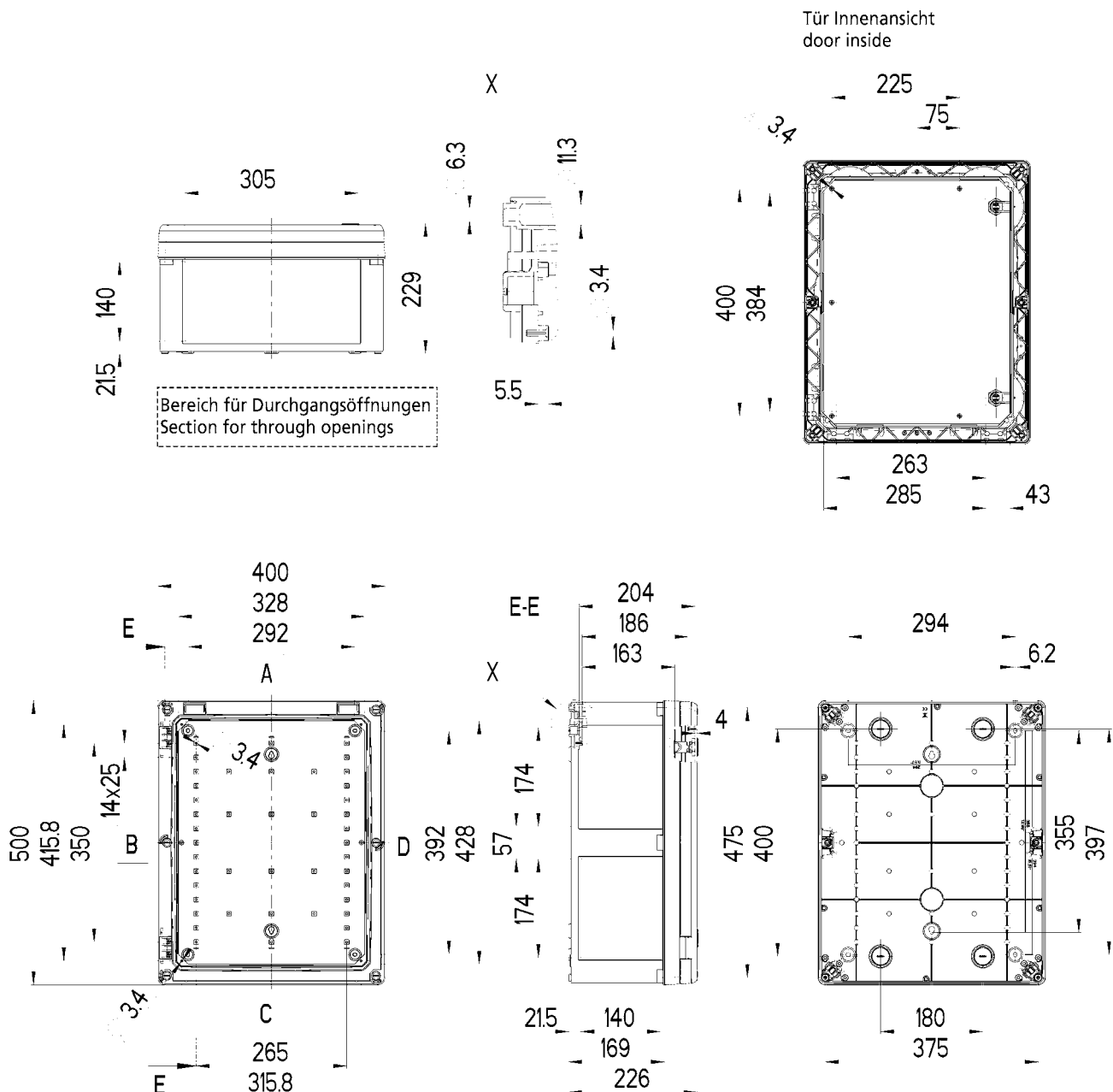
GEOS-S 4050-22

400 x 500 mm



Cabinet - Industrial Quality, suitable for installation in harsh environments and in exposed outside areas, box and frame: glass-fibre reinforced polycarbonate, grey, similar to RAL 7035, door: Polycarbonate.
Twist lock with 3mm double-bit insert (interchangeable) in accordance to DIN 43668

Description	Design	Height/mm	Order no.
GEOS-S 4050-22-o NEW	Door, grey	226	71074501
GEOS-S 4050-22-to NEW	Door, transparent	226	71174501



Industrial- and Outdoor Enclosures GEOS

Cabinets

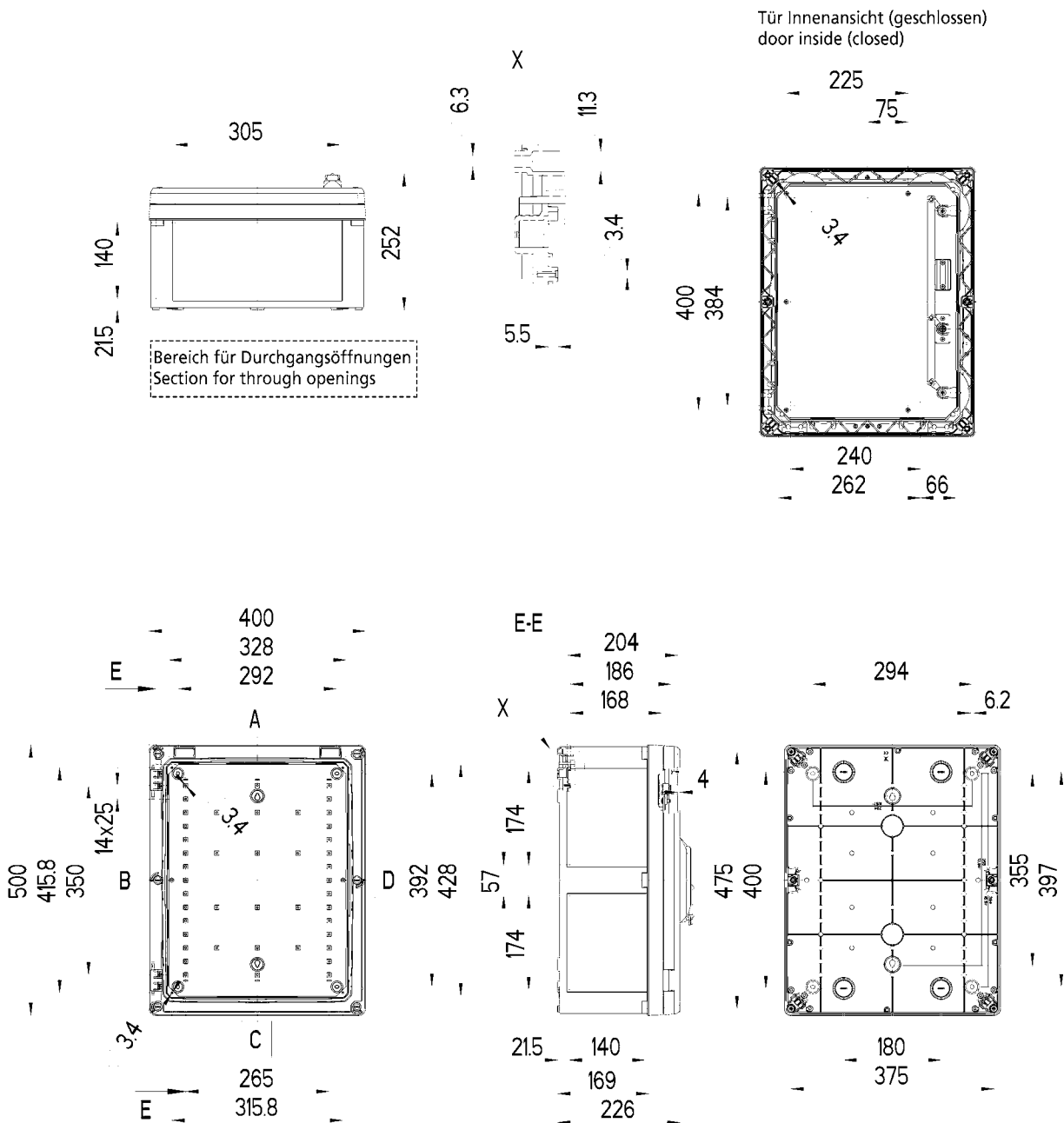
GEOS-S 4050-22/SH

400 x 500 mm



Cabinet - Industrial Quality, suitable for installation in harsh environments and in exposed outside areas, box and frame: glass-fibre reinforced polycarbonate, grey, similar to RAL 7035, door: Polycarbonate.
Swivel lever for holding profile-cylinders in accordance to DIN 18252

Description	Design	Height/mm	Order no.
GEOS-S 4050-22-o/SH NEW	Door, grey	226	72074501
GEOS-S 4050-22-to/SH NEW	Door, transparent	226	72174501



Industrial- and Outdoor Enclosures GEOS

Cabinets

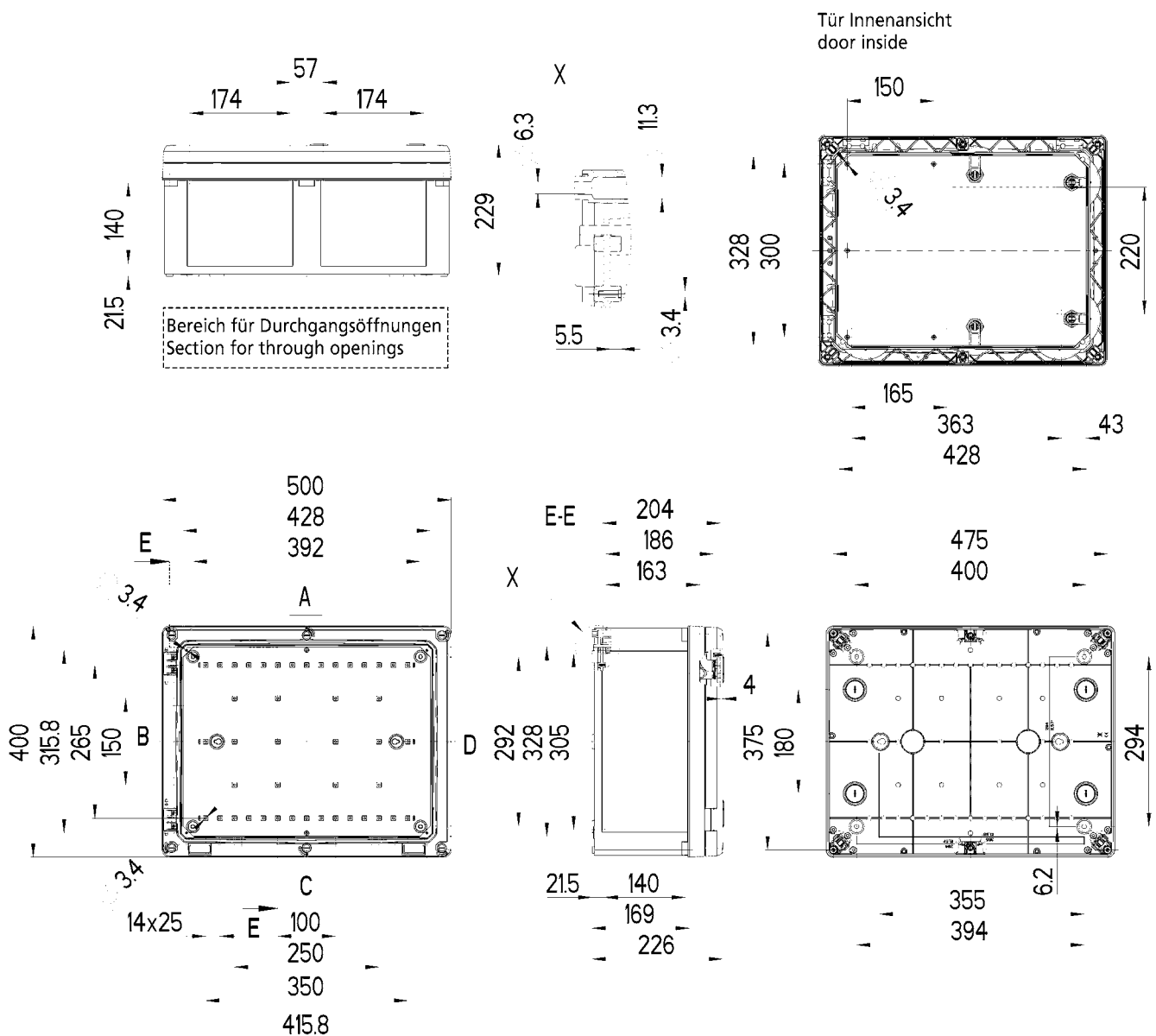
GEOS-S 5040-22

500 x 400 mm



Cabinet - Industrial Quality, suitable for installation in harsh environments and in exposed outside areas, box and frame: glass-fibre reinforced polycarbonate, grey, similar to RAL 7035, door: Polycarbonate.
Twist lock with 3mm double-bit insert (interchangeable) in accordance to DIN 43668

Description	Design	Height/mm	Order no.
GEOS-S 5040-22-o NEW	Door, grey	226	71075401
GEOS-S 5040-22-to NEW	Door, transparent	226	71175401



EMPTY ENCLOSURE

with grey cover



EMPTY ENCLOSURE

with transparent cover



Industrial- and Outdoor Enclosures GEOS

Empty Enclosures

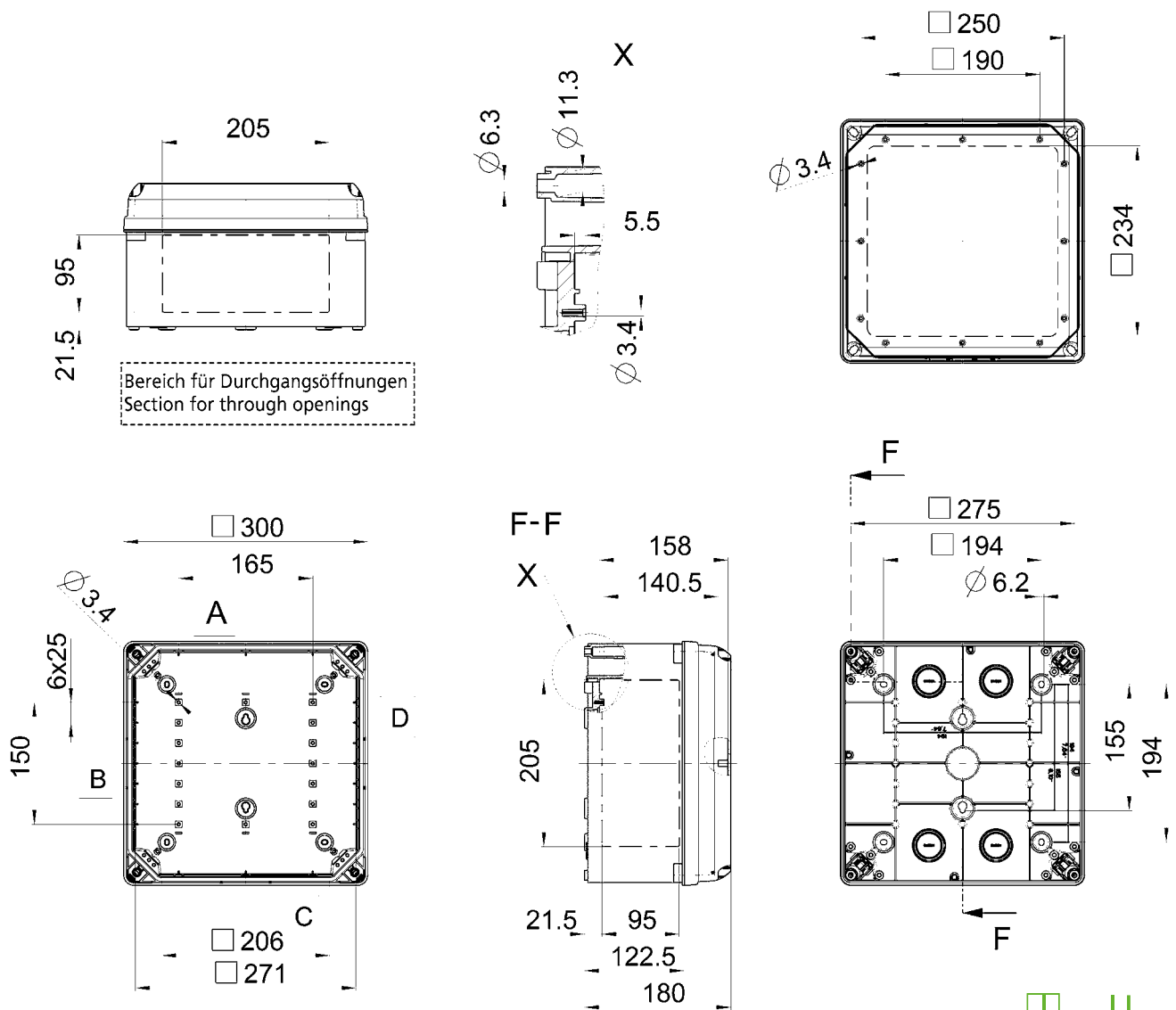
GEOS-L 3030-18

300 x 300 mm



Empty enclosure - Industrial Quality -, suitable for installation in harsh environments and exposed outside areas, base: glass fibre reinforced polycarbonate, grey, similar to RAL 7035, cover: Polycarbonate

Description	Design	Height/mm	Order no.
GEOS-L 3030-18-o	Cover, grey	180	70043301
GEOS-L 3030-18-to	Cover, transparent	180	70143301



Industrial- and Outdoor Enclosures GEOS

Empty Enclosures

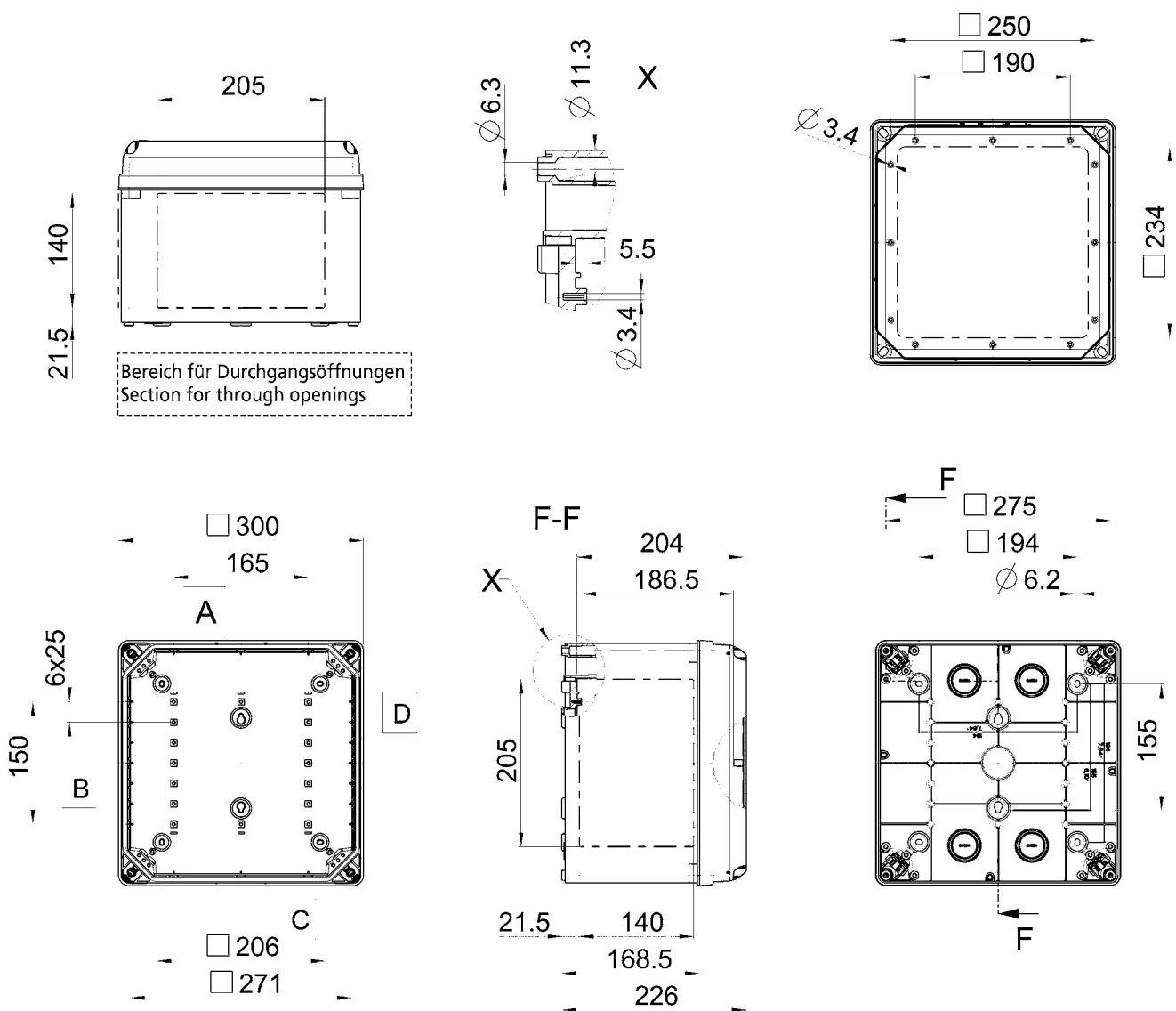
GEOS-L 3030-22

300 x 300 mm



Empty enclosure - Industrial Quality -, suitable for installation in harsh environments and exposed outside areas, base: glass fibre reinforced polycarbonate, grey, similar to RAL 7035, cover: Polycarbonate

Description	Design	Height/mm	Order no.
GEOS-L 3030-22-o	Cover, grey	226	70073301
GEOS-L 3030-22-to	Cover, transparent	226	70173301



Industrial- and Outdoor Enclosures GEOS

Empty Enclosures

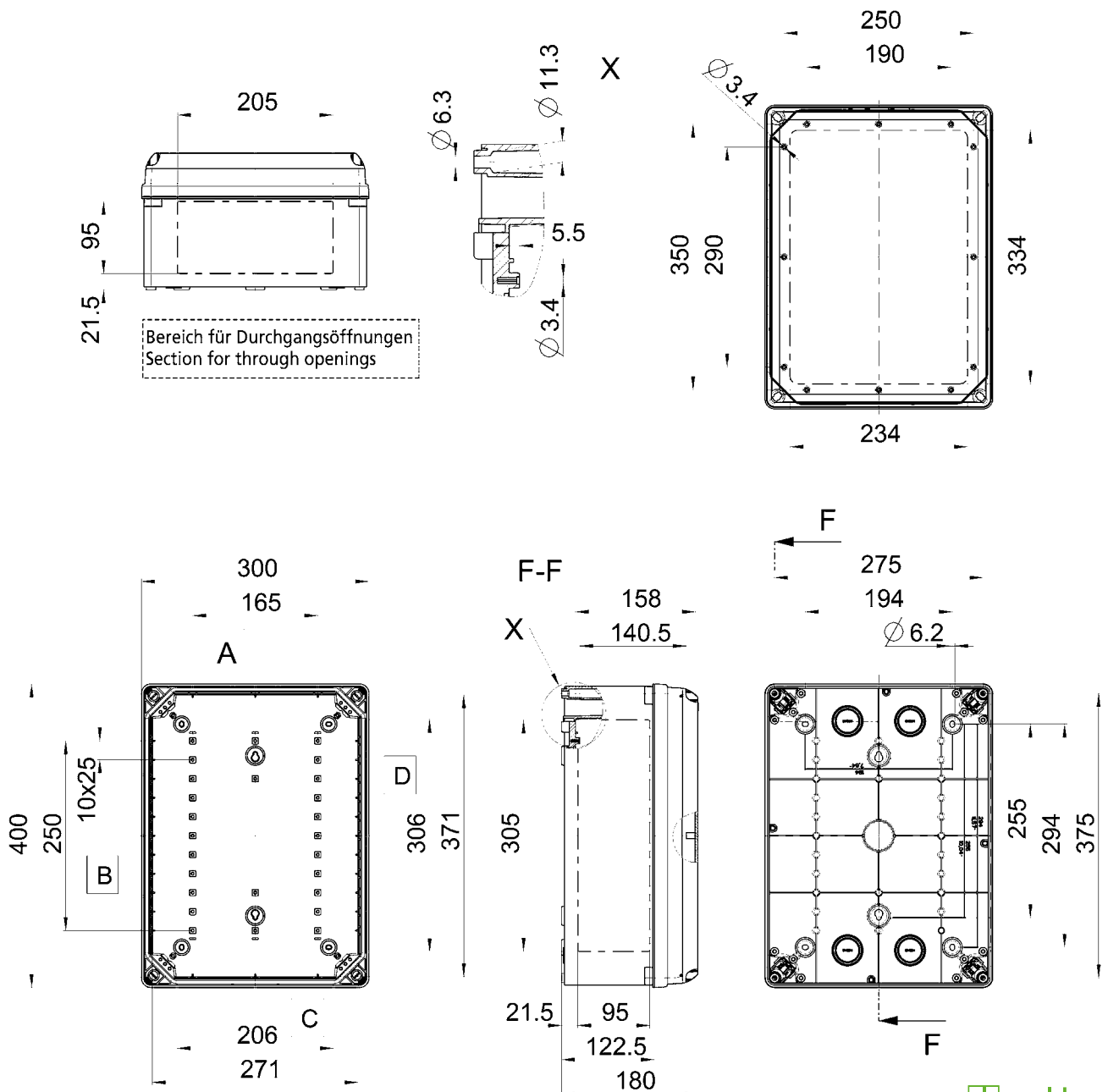
GEOS-L 3040-18

300 x 400 mm



Empty enclosure - Industrial Quality -, suitable for installation in harsh environments and exposed outside areas, base: glass fibre reinforced polycarbonate, grey, similar to RAL 7035, cover: Polycarbonate

Description	Design	Height/mm	Order no.
GEOS-L 3040-18-o	Cover, grey	180	70043401
GEOS-L 3040-18-to	Cover, transparent	180	70143401



Industrial- and Outdoor Enclosures GEOS

Empty Enclosures

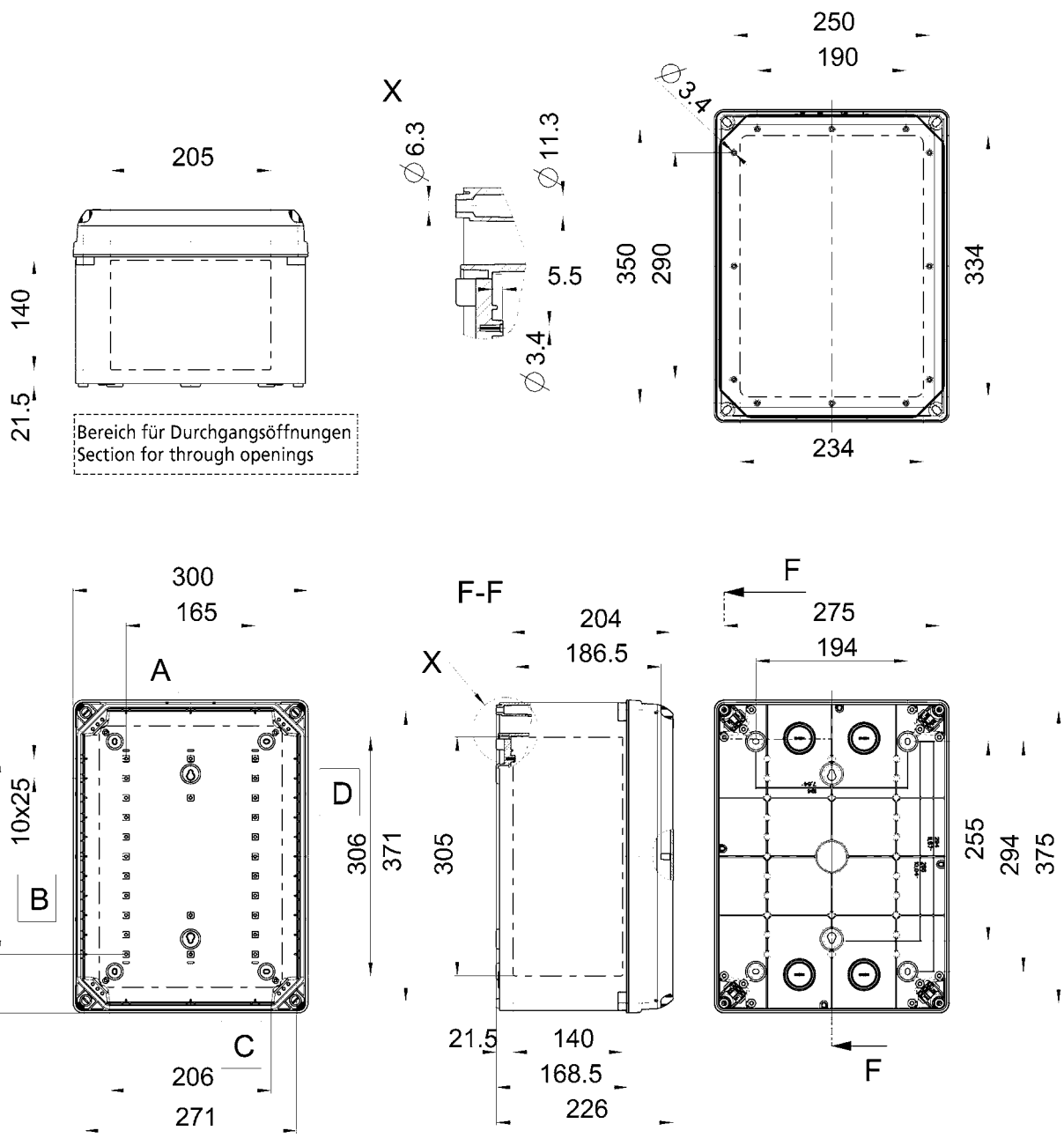
GEOS-L 3040-22

300 x 400 mm



Empty enclosure - Industrial Quality -, suitable for installation in harsh environments and exposed outside areas, base: glass fibre reinforced polycarbonate, grey, similar to RAL 7035, cover: Polycarbonate

Description	Design	Height/mm	Order no.
GEOS-L 3040-22-o	Cover, grey	226	70073401
GEOS-L 3040-22-to	Cover, transparent	226	70173401



Industrial- and Outdoor Enclosures GEOS

Empty Enclosures

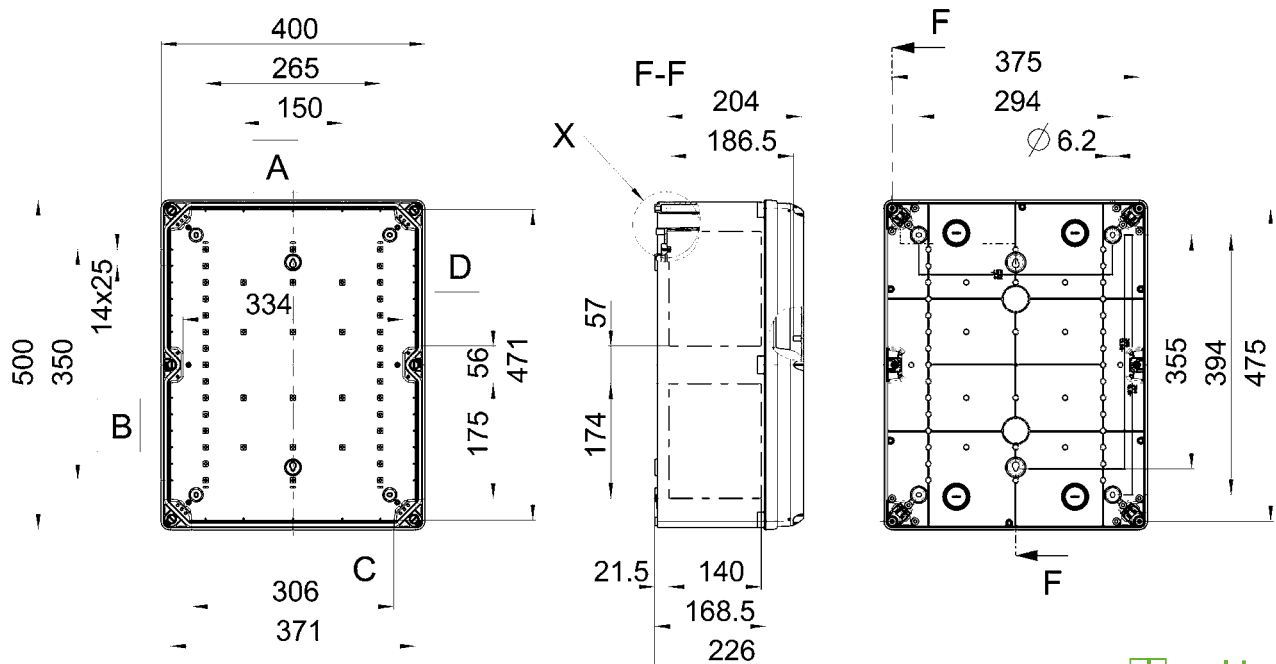
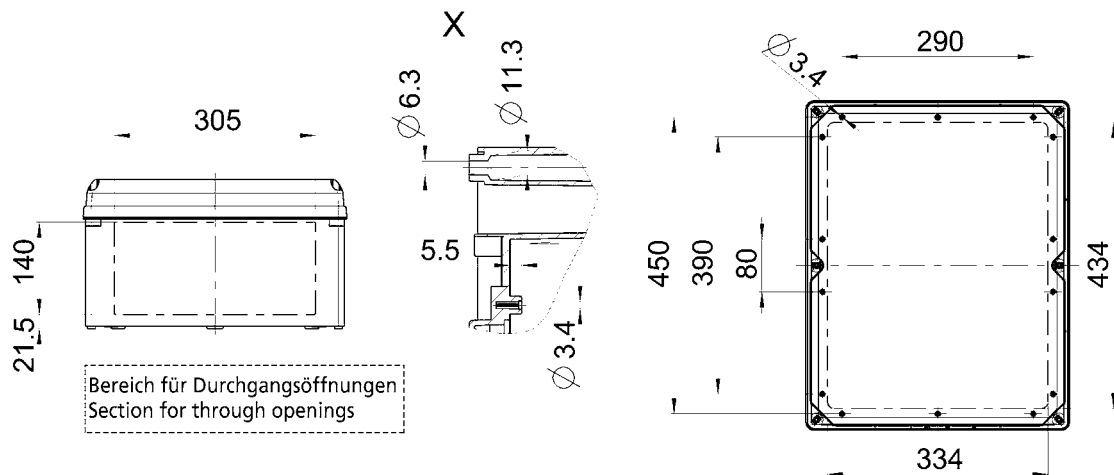
GEOS-L 4050-22

400 x 500 mm



Empty enclosure - Industrial Quality -, suitable for installation in harsh environments and exposed outside areas, base: glass fibre reinforced polycarbonate, grey, similar to RAL 7035, cover: Polycarbonate

Description	Design	Height/mm	Order no.
GEOS-L 4050-22-o	Cover, grey	226	70074501
GEOS-L 4050-22-to	Cover, transparent	226	70174501



Industrial- and Outdoor Enclosures GEOS

GEOS universal accessories

Mounting holder 35/7.5



Mounting holder set, for tool-free mounting of standard rails 35 x 7.5 mm and mounting plates at various heights, set = 4 pcs.

Description	Order no.
GEOS MH-18 for GEOS-L/S 3030-18, GEOS-L/S 3040-18, GEOS-S 4030-18	72002201
GEOS MH-22 for GEOS-L/S 3030-22, GEOS-L/S 3040-22, GEOS-L/S 4050-22, GEOS-S 4030-22, GEOS-S 5040-22	72002301

Mounting holder 35/15



Mounting holder set, for tool-free mounting of standard rails 35 x 15 mm and assembly plates at various heights, set = 4 pieces

Description	Order no.
GEOS MH-18 NS35/15 NEW for GEOS-L/S 3030-18, GEOS-L/S 3040-18, GEOS-S 4030-18	72002401
GEOS MH-22 NS35/15 NEW for GEOS-L/S 3030-22, GEOS-L/S 3040-22, GEOS-L/S 4050-22, GEOS-S 4030-22, GEOS-S 5040-22	72002501

Universal mounting holder



Universal mounting holder set, for mounting of standard rail GEOS NS 35-200 to 400 at various heights, assembly plate and additional fittings, set = 4 pieces

Description	Order no.
GEOS MHU-18 NEW for GEOS-L/S 3030-18, GEOS-L/S 3040-18, GEOS-S 4030-18	72002601
GEOS MHU-22 NEW for GEOS-L/S 3030-22, GEOS-L/S 3040-22, GEOS-L/S 4050-22, GEOS-S 4030-22, GEOS-S 5040-22	72002701

Standard rail



Standard rail in accordance with DIN EN 60715, 35 mm width, height 7.5 and 15 mm, including fixing screws, for floor mounting, optional assembly by means of assembly brackets at different heights possible

Description	Order no.
GEOS NS35-250 for GEOS-L/S 3030, GEOS-L/S 3040, GEOS-S 4030, length 250 mm, height 7.5 mm	72003101
GEOS NS35-350 for GEOS-L/S 3040, GEOS-L/S 4050, GEOS-S 5040, length 350 mm, height 7.5 mm	72003201
GEOS NS35-450 for GEOS-L/S 4050, GEOS-S 5040, length 450 mm, height 7.5 mm	72003301
GEOS NS35/15-250 NEW for GEOS-L/S 3030, GEOS-L/S 3040, GEOS-S 4030, length 250 mm, height 15 mm	72003601
GEOS NS35/15-350 NEW for GEOS-L/S 3040, GEOS-L/S 4050, GEOS-S 5040, length 350 mm, height 15 mm	72003701
GEOS NS35/15-450 NEW for GEOS-L/S 4050, GEOS-S 5040, length 450 mm, height 15 mm	72003801

Industrial- and Outdoor Enclosures GEOS

GEOS universal accessories

Standard rail



Standard rail in accordance to DIN EN 60715, width 35 mm at heights 7.5 and 15 mm, incl. fastening screws, for floor-mounting, GEOS 4050 (middle position), mounting using mounting holder in different heights not possible

Description	Order no.
GEOS NS35-327 Length 327 mm, Height 7.5 mm	72003401
GEOS NS35/15-327 NEW Length 327 mm, Height 15 mm	72003901

Universal mounting holder standard rail



Standard rail in accordance to DIN EN 60715, 35 mm wide, incl. fastening screws, for mounting on GEOS mounting holder MHU

Description	Order no.
GEOS NS35-200 NEW for GEOS-L/S 3030, GEOS-L/S 3040, length 200 mm, height 7.5 mm	72008101
GEOS NS35-300 NEW for GEOS-L/S 3040, GEOS-L/S 4050, length 300 mm, height 7.5 mm	72008201
GEOS NS35-400 NEW for GEOS-L-S 4050, length 400 mm, height 7.5 mm	72008301

Carrying frame NS35



Support frame with standard rails width 35 mm, at heights 7.5 and 15 mm, including. fixing screws for floor mounting. Optional assembly with mounting brackets at different heights possible, no contact protection

Description	Order no.
GEOS TGS 3040-2 2-row, 12 modules, standard rails 35 x 7.5 mm, for assembly in GEOS-L-S 3040	72006201
GEOS TGS 4050-3 3-row, 18 modules, standard rails 35 x 7.5 mm, for mounting in GEOS-L and S 4050	72006401
GEOS TGS 4050-2 2-row, 21 modules, standard rails 35 x 7.5 mm, for mounting in GEOS-L 4050 and GEOS-S 5040	72006501
GEOS TGS NS35/15 3040-2 NEW 2-row, 12 modules, standard rails 35 x 15 mm, for mounting in GEOS-L and S 3040	72007201
GEOS TGS NS35/15 4050-3 NEW 3-row, 18 modules, standard rails 35 x 15 mm, for mounting in GEOS-L and S 4050	72007401
GEOS TGS NS35/15 4050-2 NEW 2-row, 21 modules, standard rails 35 x 15 mm, for mounting in GEOS-L 4050 and GEOS-S 5040	72007301

Industrial- and Outdoor Enclosures GEOS

GEOS universal accessories

Assembly plate galvanized steel



Mounting plate made of galvanized steel, incl. fixing screws, for bottom mounting, optional mounting with mounting holder at various heights possible

Description	Dimensions/mm	Order no.
GEOS MPS-3030 for GEOS-L/S 3030-18 to 22	250 x 250 x 2	72001301
GEOS MPS-3040 for GEOS-L/S 3040-18 to 22, GEOS-S 4030-18 to 22	250 x 350 x 2	72001401
GEOS MPS-4050 for GEOS-L/S 4050-22, GEOS-S 5040-22	350 x 450 x 2	72001501

Assembly plate insulating material



Mounting plate made of insulating material, incl. fixing screws, for bottom mounting, optional mounting with mounting holder at various heights possible

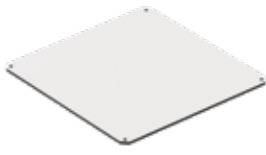
Description	Dimensions/mm	Order no.
GEOS MPI-3030 for GEOS-L/S 3030-18 to 22	250 x 250 x 5	72000301
GEOS MPI-3040 for GEOS-L/S 3040-18 to 22, GEOS-S 4030-18 to 22	250 x 350 x 5	72000401
GEOS MPI-4050 for GEOS-L/S 4050-22, GEOS-S 5040-22	350 x 450 x 5	72000501



Industrial- and Outdoor Enclosures GEOS

GEOS cabinet accessories

Cabinet installation board frame



Installation board made of insulating material for the frame of GEOS cabinets, incl. fixing screws, for individual use, e.g. for the installation of command and signalling devices, material thickness: 4 mm

Description	Dimensions/mm	Order no.
GEOS-S EPR 3030 NEW for GEOS-S 3030-18 to 22	231 x 231 x 4	72201301
GEOS-S EPR 3040/4030 NEW for GEOS-S 3040-18 to 22 and GEOS-S 4030-18 to 22	231 x 331 x 4	72201401
GEOS-S EPR 4050/5040 NEW for GEOS-S 4050-22 and GEOS-S 5040-22	331 x 431 x 4	72201501

Transparent cabinet installation board frame



Installation board made of clear transparent polycarbonate for the frame of GEOS cabinets, incl. fixing screws, for individual use, e.g. to protect fixtures located in the cabinet while at the same time ensuring visibility, material thickness: 4 mm

Description	Dimensions/mm	Order no.
GEOS-S EPR-t 3030 NEW for GEOS-S 3030-18 to 22	231 x 231 x 4	72210301
GEOS-S EPR-t 3040/4030 NEW for GEOS-S 3040-18 to 22 and GEOS-S 4030-18 to 22	231 x 331 x 4	72210401
GEOS-S EPR-t 4050/5040 NEW for GEOS-S 4050-22 and GEOS-S 5040-22	331 x 431 x 4	72210501

Cabinet accidental contact protection module



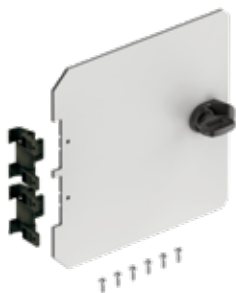
Contact protection modules for tool-free installation in the frame of GEOS cabinets, grey plastic similar to RAL 7035

Description	Order no.
GEOS-S BSM 3030-9 NEW for GEOS-S 3030-18 to 22, 9 TE, single-row	72208301
GEOS-S BSM 3030 NEW for GEOS-S 3030-18 to 22, smooth, without breakthroughs	72208401
GEOS-S BSM 3040-9 NEW for GEOS-S 3040-18 to 22, 9 TE, single-row	72208701
GEOS-S BSM 3040 NEW for GEOS-S 3040-18 to 22, smooth, without breakthroughs	72208801
GEOS-S BSM 4050-15 NEW for GEOS-S 4050-22, 15 TE, single-row, mounting on top/bottom end	72209101
GEOS-S BSM 4050-15/MIT NEW for GEOS-S 4050-22, 15 TE, single-row, mounting in middle	72209201
GEOS-S BSM 4050 NEW for GEOS-S 4050-22, smooth, without breakthroughs	72209301
GEOS-S BSM 3040-9/2 NEW for GEOS-S 3040-18 to 22, 18 TE, double-row. Set consisting of 2 x articles 72208701	72209701
GEOS-S BSM 4050-15/3 NEW for GEOS-S 4050-22, 45 TE, triple-row. Set consisting of 2 x articles 72209101 and 1 x article 72209201	72209801

Industrial- and Outdoor Enclosures GEOS

GEOS cabinet accessories

Cabinet inner door



Inner door made of insulating material for installation in GEOS cabinets, incl. fixing material and rotary twist lock with key, 3mm double bit, for individual use, e.g. for installation of displays, command and signalling devices, material thickness: 4 mm

Description	Order no.
GEOS-S IT 3030 NEW for GEOS-S 3030	72200301
GEOS-S IT 3040 NEW for GEOS-S 3040	72200401
GEOS-S IT 4030 NEW for GEOS-S 4030	72200501
GEOS-S IT 4050 NEW for GEOS-S 4050	72200601
GEOS-S IT 5040 NEW for GEOS-S 5040	72200701

Cabinet interior lighting set



Interior lighting set for lighting the interior of GEOS-S-control cabinets, including door contact switch and mounting accessories.

Description	Order no.
GEOS-S IBS 3030 NEW for GEOS-S 3030	72206301
GEOS-S IBS 3040/4030 NEW for GEOS-S 3040/4030	72206401
GEOS-S IBS 4050/5040 NEW for GEOS-S 4050/5040	72206501

Mains supply unit NT-35-24



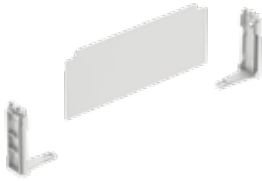
Mains supply unit for assembly on NS35 standard rail. Input voltage 85V to 264 V AC, output voltage 21.6 V -29 V DC. Output max. 15.2 W.

Description	Order no.
NT-35-24 NEW	72212001

Industrial- and Outdoor Enclosures GEOS

GEOS cabinet accessories

Cabinet partition wall



Partition wall made of insulating material for cabinets incl. carriers, to divide the enclosure

Description	Order no.
GEOS-S TW 30-18 NEW for GEOS-S 3030-18, GEOS-S 3040-18, GEOS-S 4030-18	72203201
GEOS-S TW 30-22 NEW for GEOS-S 3030-22, GEOS-S 3040-22, GEOS-S 4030-22	72203301
GEOS-S TW 40-18 NEW for GEOS-S 3040-18, GEOS-S 4030-18	72203401
GEOS-S TW 40-22 NEW for GEOS-S 3040-22, GEOS-S 4030-22, GEOS-S 4050-22, GEOS-S 5040-22	72203501
GEOS-S TW 50-22 NEW for GEOS-S 4050-22, GEOS-S 5040-22	72203601

Cabinet installation board door



Installation board made of insulating material for the door of GEOS cabinets, incl. fixing screws, for individual use, e.g. for installation of indicating elements and displays, material thickness: 4 mm

Description	Dimensions/mm	Order no.
GEOS-S EPT 3030 NEW for GEOS-S 3030-18 to 22	150 x 225 x 4	72202301
GEOS-S EPT 3040 NEW for GEOS-S 3040-18 to 22	150 x 325 x 4	72202401
GEOS-S EPT 4030 NEW for GEOS-S 4030-18 to 22	250 x 225 x 4	72202501
GEOS-S EPT 4050 NEW for GEOS-S 4050-22	250 x 425 x 4	72202601
GEOS-S EPT 5040 NEW for GEOS-S 5040-22	175 x 325 x 4	72202701

Cabinet door stop



Door stop for fixing the open cabinet door in two possible positions

Description	Order no.
GEOS-S TFS NEW for GEOS-S cabinets	72207001

Industrial- and Outdoor Enclosures GEOS

GEOS cabinet accessories

Cabinet twist lock set



Twist lock set with key for installation in GEOS-S control cabinets, set = 2 pieces

Description	Order no.
GEOS-S DRS-DB/3 NEW Double-bit 3 mm mandrel	72205001
GEOS-S DRS-DB/5 NEW Double-bit 5 mm mandrel	72205101
GEOS-S DRS-VK/8 NEW Square 8 mm	72205201
GEOS-S DRS-DK/8 NEW Triangle 8 mm	72205301
GEOS-S DRS-KB NEW Toggle handle	72205401
GEOS-S DRS-SZ NEW Countersunk slot	72205501

Cabinet cover screws set



Cabinet cover screws set

Description	Order no.
GEOS-S 3030 S NEW for cabinet GEOS-S 3030 as replacement need	72204001
GEOS-S 3040/4030 S NEW for cabinet GEOS-S 3040 and GEOS-S 4030 as replacement need	72204101
GEOS-S 4050/5040 S NEW for cabinet GEOS-S 4050 and GEOS-S 5040 as replacement need	72204201

Cabinet quick closing set



Cabinet quick closing set

Description	Order no.
GEOS-S 3030 SV NEW for cabinet GEOS-S 3030 as replacement need	72204301
GEOS-S 3040/4030 SV NEW for cabinet GEOS-S 3040 and GEOS-S 4030 as replacement need	72204401
GEOS-S 4050/5040 SV NEW for cabinet GEOS-S 4050 and GEOS-S 5040 as replacement need	72204501

Lock fittings



Profile-cylinders for GEOS-S cabinets with swivel lever

Description	Order no.
GEOS-S SGA-2 NEW in accordance to DIN 18252, 8 x 45° adjustable, with three keys, different locking	72206901
GEOS-S SGA-DB/3 NEW Double-bit 3 mm mandrel	72206001

Industrial- and Outdoor Enclosures GEOS

GEOS empty enclosure accessories

Empty enclosure box installation board



Installation board made of insulating material for empty enclosure, incl. fixing screws, for individual use, e.g. for installation of command and signalling devices, material thickness: 4 mm

Description	Dimensions/mm	Order no.
GEOS-L EP-3030 for GEOS-L 3030-18 to 22	276 x 276 x 4	72101301
GEOS-L EP-3040 for GEOS-L 3040-18 to 22	276 x 376 x 4	72101401
GEOS-L EP-4050 for GEOS-L 4050-22	376 x 476 x 4	72101501

Empty enclosure cover installation board



Installation board made of insulating material for mounting on the inside of the cover of empty enclosures, incl. fixing screws, for individual use, e.g. for the installation of command and signalling devices, material thickness: 4 mm

Description	Dimensions/mm	Order no.
GEOS-L EPD-3030 for GEOS-L 3030-18 to 22	276 x 276 x 4	72101601
GEOS-L EPD-3040 for GEOS-L 3040-18 to 22	276 x 376 x 4	72101701
GEOS-L EPD-4050 for GEOS-L 4050-22	376 x 476 x 4	72101801

Empty enclosure partition wall



Partition wall made of insulating material for empty enclosure incl. carriers, to divide the enclosure

Description	site of encl./mm	Order no.
GEOS-L TW 30-18 for GEOS-L 3030-18, GEOS-L 3040-18	300	72103201
GEOS-L TW 30-22 for GEOS-L 3030-22, GEOS-L 3040-22	300	72103301
GEOS-L TW 40-18 for GEOS-L 3040-18	400	72103401
GEOS-L TW 40-22 for GEOS-L 3040-22, GEOS-L 4050-22	400	72103501
GEOS-L TW 50-22 for GEOS-L 4050-22	500	72103601

Industrial- and Outdoor Enclosures GEOS

GEOS empty enclosure accessories

Empty enclosure contact protection cover



Protective cover for rail-mounted devices, incl. fixing screws, for mounting in GEOS-L empty enclosure

Description	Order no.
GEOS-L BSA 3030-1 1-row, 12 distribution units, for mounting in GEOS-L 3030 empty enclosure	72105101
GEOS-L BSA 3040-1 1-row, 18 distribution units, for mounting in GEOS-L 3040 empty enclosure	72105301
GEOS-L BSA 3040-2 2 row, 24 modules, for mounting in GEOS-L 3040 empty enclosure	72105201
GEOS-L BSA 4050-2 2 row, 42 modules, for mounting in GEOS-L 4050 empty enclosure	72105501
GEOS-L BSA 4050-3 3 row, 54 modules, for mounting in GEOS-L 4050 empty enclosure	72105401

High level mounting holder



Mounting holder set, for tool-free mounting of standard rails 35 x 7.5 mm and assembly plates at various heights, additional top position for mounting rail-mounted devices in conjunction with hinged windows in the cover of empty enclosures, set = 4 pieces

Description	Order no.
GEOS-L MHH-18 NEW for GEOS-L 3030-18, GEOS-L 3040-18	72102201
GEOS-L MHH-22 NEW for GEOS-L 3030-22, GEOS-L 3040-22, GEOS-L 4050-22	72102301

Empty enclosure cover retainer



Cover retainer made of stainless steel with fastening screws, mountable retroactively

Description	Order no.
GEOS-L DVS NEW For cover locks with GEOS empty enclosures, prevents cover from falling down unintentionally, set = 2 pieces	72103701

Empty enclosure cover screws set



Empty enclosure cover screws set

Description	Order no.
GEOS-L DS for empty enclosure GEOS-L 3030/3040 as replacement need	72104001
GEOS-L 4050 DS for empty enclosure GEOS-L 4050 as replacement need	72104101

Industrial- and Outdoor Enclosures GEOS

GEOS empty enclosure accessories

Empty enclosure quick closing set



Empty enclosure quick closing set

Description	Order no.
GEOS-L SV for empty enclosure GEOS-L 3030/3040 as replacement need	72104201
GEOS-L 4050 SV for empty enclosure GEOS-L 4050 as replacement need	72104301

Empty enclosure cover special head screws set



Cover screws set with safety function for GEOS-L empty enclosure, 8 mm triangular headform

Description	Order no.
GEOS-L DS/DK NEW for empty enclosure GEOS-L 3030/3040	72104401
GEOS-L 4050 DS/DK NEW for empty enclosure GEOS-L 4050	72104501



Industrial- and Outdoor Enclosures GEOS

GEOS fastening material accessories

External fixing lugs



Plastic outside fastening lip set, possible mounting angle of 0°, 45° or 90°, black, set = 4 pcs.

Description	Order no.
GEOS ABL-10 Wall distance 10 mm	72002001
GEOS ABL-40 Wall distance 40 mm	72002101

Stainless steel external fixing lug



External fixing lug set made of V4A stainless steel, mounting possible at an angle of 0° or 90°, set = 4 pieces

Description	Order no.
GEOS ABL-10/ES NEW Wall distance 10 mm	72007501
GEOS ABL-40/ES NEW Wall distance 40 mm	72007601

Mast clamp set



Mast clamp set made of hot-dip galvanized steel, set = 2 pieces

Description	Order no.
GEOS MSS-30 mounting on the 300mm enclosure side	72005001
GEOS MSS-40 mounting on the 400mm enclosure side	72005101
GEOS MSS-50 mounting on the 500mm enclosure side	72005201

Screw clamp set



Screw clamp set made of stainless steel V2A, in conjunction with mast clamp set GEOS MSS, set = 2 pieces

Description	Order no.
SRS 60-90 for mast diameters from 60 to 90mm	72004001
SRS 90-150 for mast diameters from 90 to 150mm	72004101
SRS 150-210 for mast diameters from 150 to 210mm	72004201

Industrial- and Outdoor Enclosures GEOS

GEOS fastening material accessories

Design plate



Design plate made of V2A stainless steel, 1 piece

Description	Order no.
GEOS DP-3030 for covering the rear side of GEOS 3030 enclosure when using the GEOS MSS mast clamp set	72013001
GEOS DP-3040 for covering the rear side of GEOS 3040 enclosure when using the GEOS MSS mast clamp set	72013101
GEOS DP-4050 for covering the rear side of GEOS 4050 enclosure when using the GEOS MSS mast clamp set	72013201



Industrial- and Outdoor Enclosures GEOS

GEOS general accessories

Ventilation element set



BEL Air ventilation element set, for preventing condensation build-up in enclosures, for vertical installation in enclosure walls and GFL combi flanges with corresponding knock-outs, at least two ventilation elements are required per enclosure

Description

BEL Air M40

M40, set = 2 pcs., air exchange rate: 30 l / day / set

Order no.

26344001

Cable gland, grey



Cable gland with strain relief, long thread, M_x 1.5 mm, with lock nut, polyamide, grey

Description	Sealing area/mm	Thread length/mm	Order no.
KVR M12 LG-MGM	2 - 6.5	12	22941201
KVR M16 LG-MGM	4 - 10.0	12	22941601
KVR M20 LG-MGM	6 - 12.0	15	22942001
KVR M25 LG-MGM	9 - 16	15	22942501
KVR M32 LG-MGM	11 - 21.0	15	22943201
KVR M40 LG-MGM	16 - 28.0	18	22944001
KVR M50 LG-MGM	21 - 34.5	18	22945001

Cable gland, black



Cable gland with strain relief, long thread, M_x 1.5 mm, with lock nut, polyamide, black

Description	Sealing area/mm	Thread length/mm	Order no.
KVR M12 LG-MGM/sw	2 - 6.5	12	22901201
KVR M16 LG-MGM/sw	4 - 10.0	12	22901601
KVR M20 LG-MGM/sw	6 - 12	15	22902001
KVR M25 LG-MGM/sw	9 - 16	15	22902501
KVR M32 LG-MGM/sw	11 - 21	15	22903201
KVR M40 LG-MGM/sw	16 - 28	18	22904001
KVR M50 LG-MGM/sw	21 - 34.5	18	22905001

Industrial- and Outdoor Enclosures GEOS

GEOS general accessories

Locknut, polyamide, grey



Lock nut for metric twist nipple and cable glands, polyamide

Description	Order no.
GMU PA M12 Thread M12x1.5	20841201
GMU PA M16 Thread M16x1.5	20841601
GMU PA M20 Thread M20x1.5	20842001
GMU PA M25 Thread M25x1.5	20842501
GMU PA M32 Thread M32x1.5	20843201
GMU PA M40 Thread M40x1.5	20844001
GMU PA M50 Thread M50x1.5	20845001
GMU PA M63 Thread M63x1.5	20846301

AK3 KS M50



M50 combination cable gland for lateral connection of enclosures AK/AK-F 14/28/42/56/70 including Plus types as well as industrial and outdoor enclosures of the GEOS series

Description	Order no.
AK3 KS M50	73383001

Hole cutter



Hole cutter

Description	Order no.
LFR through opening: M16-32, drill hole: 16.5-32.5 mm	19599501

Hole cutter



Hole cutter for hand and column drilling machines, high-quality industrial design with carbide cutting plates for high cutting performance, with centre drill (exchangeable) and ejector spring

Description	Order no.
LFR M40	19540001
LFR M50	19550001
LFR M63	19563001

OVERVIEW

Ambient conditions and mechanical properties of the GEOS enclosure system.

Enclosure empty			Enclosure with fittings			Max. relative humidity at 40 °C	Max. relative humidity at 25 °C (short-term)	Protection rating according to DIN EN 60529 / VDE 0470-1 ¹⁾	Shock-proof as per DIN EN 50102 / DE 0470 Part 100
Ambient temperature Minimum value	Ambient temperature Maximum value	Ambient temperature Average value over 24 h	Ambient temperature Minimum value	Ambient temperature Maximum value	Ambient temperature Average value over 24 h				
-35°C	80°C	60°C	-25°C	40°C	35°C	50%	95%	IP66/IP67	IK09

Additional note: The specified temperatures may be limited by the installed devices.

1) When used with suitable connectors or cable screw couplings.

OVERVIEW

Properties of the materials used in the GEOS enclosure systems.

Material	Use in the products:	Weak acids	Strong acids	Weak bases	Strong bases	Alcohol	Petrol	Benzene	Mineral oil	Diesel	Ammonia, gaseous (DLG Focus Test)	Vegetable fats	Animal fats	Halogen-free	Free of heavy metals, PVC and silicone	Flammability according to DIN EN 60695 (VDE 0471) / UL94
Polycarbonate, glass-fibre reinforced	GEOS Enclosure	O	X	X	X	O	Ø	X	O	Ø	O	O	Ø	yes	yes	960°C / V-2 (5VA*)
Polycarbonate, transparent	GEOS Cover / Door transparent	O	X	X	X	Ø	Ø	X	O	Ø	O	O	O	yes	yes	850°C / V-2 (5VA*)
Polycarbonate, grey	GEOS Cover / Door grey	O	X	X	X	O	Ø	X	O	Ø	O	O	Ø	yes	yes	960°C / V-2 (5VA*)
Polyamide 6, glass fibre-reinforced	Screw fittings to IP 68, Cover screws	X	X	O	O	O	O	Ø	O	O	O	O	O	yes	yes	750°C / HB/V-2

O = resistant Ø = partially resistant X = not resistant

* 5 Inch (127 mm) Flame test according to UL 746 C (comparable with the requirements of UL 94, 5VA)

The materials used by Spelsberg were subjected to a weathering test according to DIN 53 387 (replaced by DIN EN ISO 4892-2), a 1000 hour test at the „State Examination Office“ in Dortmund. The materials used in IQ products showed good result here. The material also passed the UV resistance test according to UL 746 C, without any limitations. When selecting the installation location, the climatic conditions and the occurrence of chemical influences should generally be examined in addition to the protection rating. Details of material properties and chemical resistance of the materials can be seen from the table, though these are simply guide values.

POWER LOSS DETAILS

for individually mounted GEOS enclosure

				$\Delta T = 10K$	$\Delta T = 20K$	$\Delta T = 30K$	$\Delta T = 40K$
Type	Mounting	Inner dimensions	Enclosure height	[W]			
GEOS-L/S 3030-18		290 x 290 x 152,5 mm	50%	8,5	20,2	33,4	47,7
			75%	6,9	16,4	27,2	38,9
GEOS-L/S 3030-22		290 x 290 x 198,5 mm	50%	10,5	24,9	41,2	59,0
			75%	8,6	20,3	33,6	48,1
GEOS-L/S 3040-18	Vertical	290 x 390 x 152,5 mm	50%	11,3	26,8	44,4	63,5
			75%	8,9	21,0	34,8	49,7
GEOS-L/S 3040-22	Horizontal	290 x 390 x 198,5 mm	50%	12,9	30,6	50,7	72,6
			75%	10,1	24,0	39,7	56,8
GEOS-L 3040-18 GEOS-S 4030-18	Vertical	290 x 390 x 152,5 mm	50%	11,1	26,4	43,6	62,4
			75%	9,4	22,3	37,0	52,9
GEOS-L 3040-22 GEOS-S 4030-22	Vertical	290 x 390 x 198,5 mm	50%	12,7	30,0	49,8	71,2
			75%	10,8	25,5	42,2	60,3
GEOS-L/S 4050-22	Horizontal	390 x 490 x 198,5 mm	50%	18,3	43,3	71,7	102,6
			75%	14,5	34,2	56,7	81,1
GEOS-L 4050-22 GEOS-S 5040-22	Vertical	390 x 490 x 198,5 mm	50%	18,0	42,7	70,8	101,2
			75%	15,2	35,9	59,5	85,1

Permissible power loss P_{per} in watts per DIN VDE 0660-507 for individually-mounted empty installations with stipulated ΔT .
Power loss at 50% of the enclosure height and [75%] of the enclosure height.

OUTDOOR INSTALLATION

Installation in the open - damp and wet areas and rooms

Basics

In general when selecting components, the manufacturer's specifications as to the product properties act only as a guide for the user. These properties should always be viewed in the context of the relevant installation requirements such as the installation regulations according to DIN VDE 0100-ff. Depending on the local circumstances, additional protective measures may have to be taken by the user. The individual factors are described in greater detail below.

Protection against UV radiation

UV radiation can cause severe structural damage, even destruction, in a wide variety of plastics. Products made from the material polystyrene (PS) should therefore not be used outdoors. Spelsberg developed the IQ series products for this installation scenario. Materials used in these products have high resistance against UV radiation.

In weathering tests according to DIN 53-387 (replaced by DIN EN ISO 4892-2) these materials demonstrated good results. These materials passed the weathering tests according to UL 746 C also without any limitations.

There are many influencing factors in outdoor installations



UV radiation

Thermal radiation e.g. the sun

Chemical influences

Condensate water

Rain, Snow

Water accumulation - frost

Protection against high temperatures

Installed electrical appliances generate power loss during operation. The enclosures manufactured by Spelsberg are tested during the approval test for maximum power loss in the enclosure. Detailed tables on this topic are provided in the catalogue, taking into account the ambient temperature and type of installation.

Switchgear assemblies are designed for ambient temperatures of between -25 °C and +35 °C (24-hour average). A temporary increase in temperature to 40 °C is not a problem.

Even if, for example, iQ products from Spelsberg are suitable for temperatures of between -40 °C and +80 °C, the manufacturer's instructions and the requirements of the relevant product safety standards, such as line current, fault circuit breakers or fuses, should be checked when designing the enclosure.

Solar radiation or other heat sources can cause additional increases in the internal temperature which are not permitted and must therefore be avoided.

Reliable operation of electrical equipment will no longer be under certain circumstances.

According to DIN VDE 0100-520,522.1.2 cable and conductor systems, including accessories, may only be installed or moved under ambient temperatures which are within the limit values specified by the manufacturer or in the relevant product standard.

Protection against chemical influences

For installations in areas with increased levels of hazardous substances in the environment, the suitability may be correspondingly reduced. Information is available in the table „Material Characteristics“. IQ products are resistant to mineral oil, vegetable fats and animal fats.



OUTDOOR INSTALLATION

Installation in the open - damp and wet areas and rooms

Protection against condensate water

The more tightly sealed the equipment, for example junction boxes or distribution boards, the bigger the likelihood of condensation forming. This is especially the case at locations, where highly fluctuating temperatures are expected. These effects are intensified by the power loss generated in the enclosures. Owing to the differences in temperature, a difference also arises in the pressure conditions, which causes the enclosure to draw in air when the temperature changes. The next time the temperature increases, the humidity in this air condenses on the cold surface of the enclosure, for example on the cover. This process is only reversible to a limited extent, so the water accumulates in the enclosure. Since this effect occurs regularly, even daily to an extent, a considerable volume of water may accumulate internally. If this enclosure has an increased protection rating, it will no longer discharge this water with the result that its seal actually has a negative impact. Thus, damage occurs.

According to DIN VDE 0100-520, precautions must be taken with respect to drainage of water if water accumulates or condensation can occur within cable and conductor systems. Spelsberg junction boxes in the various product groups have break-out condensation openings on the rear of the enclosure or mounting surfaces. These should be opened in such a way that in the installed state they are on the bottom side of the enclosure and have a wall clearance of 2 mm, so that any condensation may drain off. This only applies under the condition that no increased demands are imposed with respect to protection against accidental contact or foreign bodies (> IP2X or dust protection).

If requirements for contact protection or foreign body protection are also imposed on the enclosure, for example IP3X, we recommend use of Spelsberg ventilation seals. These seals come in the size M20, are fitted in the corresponding cable inlet openings on the bottom side and the side surfaces and offer splash water protection up to IPX4 when properly installed. We recommend an installation that allows the so-called „chimney effect“.

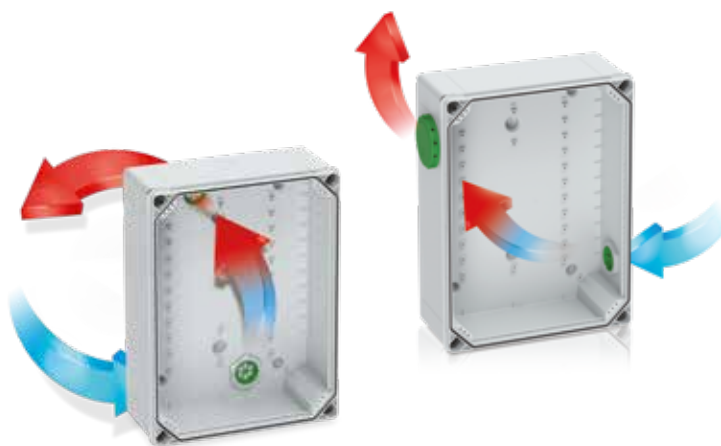
AK Air and BEL Air ventilation elements

The Air ventilation element prevents condensate water, while maintaining the high IP65 protection rating. Any condensate occurring is transported out of the enclosure immediately via air exchange. The continuous and high rate of air exchange allows the interior air to mix constantly with the environmental air and transports the moisture outwards. Air exchange also takes place in environments with almost constant air humidity and temperature, as the air in the interior of the enclosure heats up, e.g. due to the components.

Recommendation: At least one complete air exchange is provided per day via the BEL Air. With one set, this is achieved with an enclosure volume of up to 35 dm³. All enclosure parts, such as the seals, are permanently relieved of pressure through the constant pressure equalisation. The high air exchange rate guarantees a permanent exchange of the moist air with the surroundings. No appreciable pressure differences are required for this. However, with the pressure equalisation elements it is exactly these appreciable pressure differences that are required, at least temporarily, in order to achieve an air exchange. The Air ventilation elements therefore have a very large, open filter surface that guarantees a high air exchange without influencing the air flow. The constant pressure equalisation prevents pressure differences, thus ensuring that no mechanical forces can be exerted on the enclosure and seals.

DIN EN 61439-1

Section 8.2.2 of DIN EN 61439-1 concerns the protection against contact with live parts and the prevention of penetration of solid foreign objects and water. In addition, it is stated that closed switchgear assemblies must be protected from condensate inside the enclosure, without changing the type of protection.



Protection against plants and/or mould growth

The plastics used in electrical installation are organic materials. The risk of harm from plants, algae or mould must therefore be considered. According to DIN VDE 0100-520, 522.9.1, if experience or empirical evidence shows that plants and/or mould growth can cause damage, the cable and conductor system must be selected accordingly or special protective measures must be provided. Comment: A cable laying method that allows appropriate removal of such vegetation should be selected.

Notes for outdoor installation

The information on the type of protection and UV-resistance are often considered the only important aspects for outdoor installations. The protection rating tests carried out according to DIN EN 60529 are used as comparative tests and for classification of properties. The tests are limited to a few minutes and cannot emulate exposure to rain / snow or cleaning with water jets. In addition, the local conditions may differ so greatly that a general exposure test cannot be defined. However, in outdoor installations, other factors such as absolute temperature, frequency of temperature change, air humidity and chemical influences in particular play an important role. In addition to impairments through UV-effects, in outdoor installations damage is expected to arise predominantly as a result of chemical influences. So, the outside areas in the vicinity of filling stations, chemical facilities, landfill sites, compressors, sewerage treatment plants etc. should be subjected to particularly critical investigations beforehand. To increase the service life of the enclosure, it is advantageous to install the enclosure in an area that is protected from weather influences.

EXPLANATION OF PICTOGRAMS



Protection type

(IP-Code) according to DIN EN 60529 (VDE 0470-1)



Protection type

(indoor or outdoor use) protection against windblown dust and rain, splash water, water jets and corrosion. Protection against damage due to external ice formation on the cabinet.



Protection level

(IK Code) according to DIN EN 50102 (VDE 0470-100)



Protection class II

Equipment with protective insulation according to DIN VDE 0100-410



Rated voltage

for use in AC voltage systems, maximum permissible nominal voltage of the electrical grid



Rated voltage

for use in DC voltage systems, maximum permissible nominal voltage of the electrical grid



c UL us

(Underwriters Laboratories) approved (American and Canadian approval).



DLG Focus Test (in preparation)

for special innovations in machines and technical products - predominantly in agriculture and forestry applications.



DNV-GL

Approval for the maritime sector (Shipbuilding, ports, etc.) according to DNV-GL guidelines.



Halogen-free enclosure,

without halogens such as fluorine, chlorine and bromine.



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