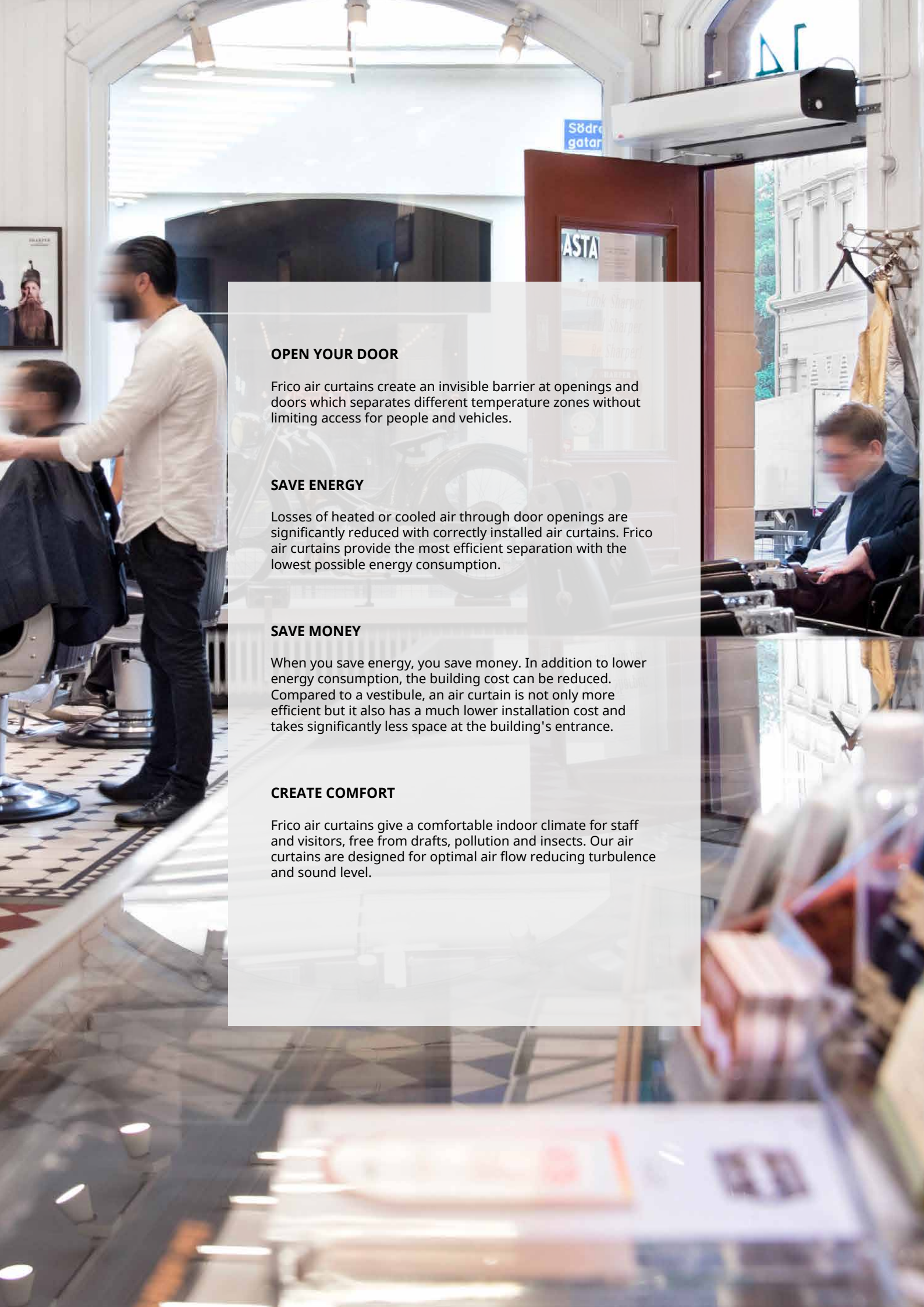
Air Curtain Catalogue

CREATING IDEAL
ENVIRONMENTS



OPEN YOUR DOOR

Frico air curtains create an invisible barrier at openings and doors which separates different temperature zones without limiting access for people and vehicles.

SAVE ENERGY

Losses of heated or cooled air through door openings are significantly reduced with correctly installed air curtains. Frico air curtains provide the most efficient separation with the lowest possible energy consumption.

SAVE MONEY

When you save energy, you save money. In addition to lower energy consumption, the building cost can be reduced. Compared to a vestibule, an air curtain is not only more efficient but it also has a much lower installation cost and takes significantly less space at the building's entrance.

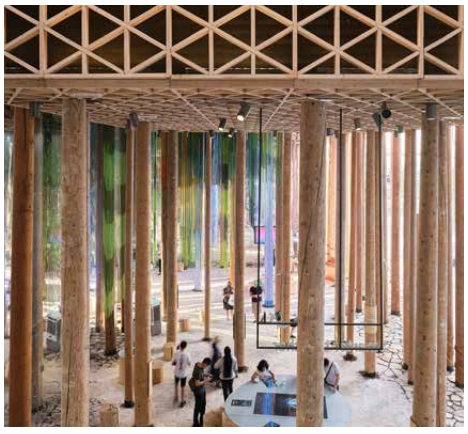
CREATE COMFORT

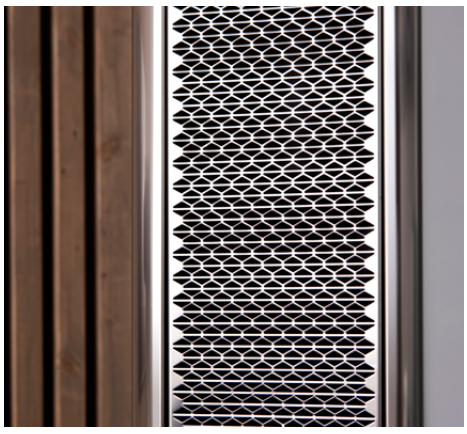
Frico air curtains give a comfortable indoor climate for staff and visitors, free from drafts, pollution and insects. Our air curtains are designed for optimal air flow reducing turbulence and sound level.

Cover photo:
Swedish Pavillion The Forest
by Alessandro Ripellino Architects, Studio Adrien Gardère and Luigi Pardo Architetti,
Expo 2020, Dubai

Photografer: Alessandro Ripellino

The Swedish pavilion The Forest, located in the sustainability district of the Expo 2020, has several Frico Air Curtains of the Sierra and Pamir line installed to reduce energy consumption and keep visitors cool and comfortable in the heat of Dubai.





Good reasons to choose Frico

More than 85 years experience in developing products for the varied Nordic climate has provided us with a unique knowledge bank. This is our foundation when creating today's energy efficient solutions for a comfortable indoor climate.

Leading technology and design

Today Frico is the leading supplier of air curtains, radiant heaters and fan heaters in Europe, and the products are designed according to good Scandinavian tradition. As market leaders we run development and offer both electrical and water heated products and also air curtains without heat. For our air curtains the Thermozone Technology guarantee efficient separation with minimum use of energy and a low sound level.

Keeping our promises

Frico has access to one of Europe's most modern and advanced air and sound laboratories. It helps us to ensure that our products deliver what we promise. We regularly carry out tests and measurements during the development of new products, but also to improve existing products. The measurements are carried out according to the AMCA and ISO standards. In our test facility we carry out tests within the following areas:
Airflow
Sound
Winding temperature
Air velocity
Heating capacity

Climate-smart

At Frico, we are proud to be able to offer energy-efficient products for a better indoor climate. In our product development work, the focus is on achieving the greatest possible function with the least possible energy consumption – without compromising on our core values of trust, competence and design.

This means that our products not only manage the local climate in business complexes, industrial buildings, offices or summer cottages; with optimum energy efficiency, we ensure that our products are climate-smart.

Frico's headoffice is located outside Gothenburg in Sweden and we are a part of the Systemair Group. Today Frico is represented in 70 countries world wide either by subsidiaries or distributors. Updated information is always available on our website www.frico.net.

We manufacture at production units in Skinnskatteberg, Sweden and at other ISO-certified production units in Europe. Our warehouses are strategically placed in several places in Europe.

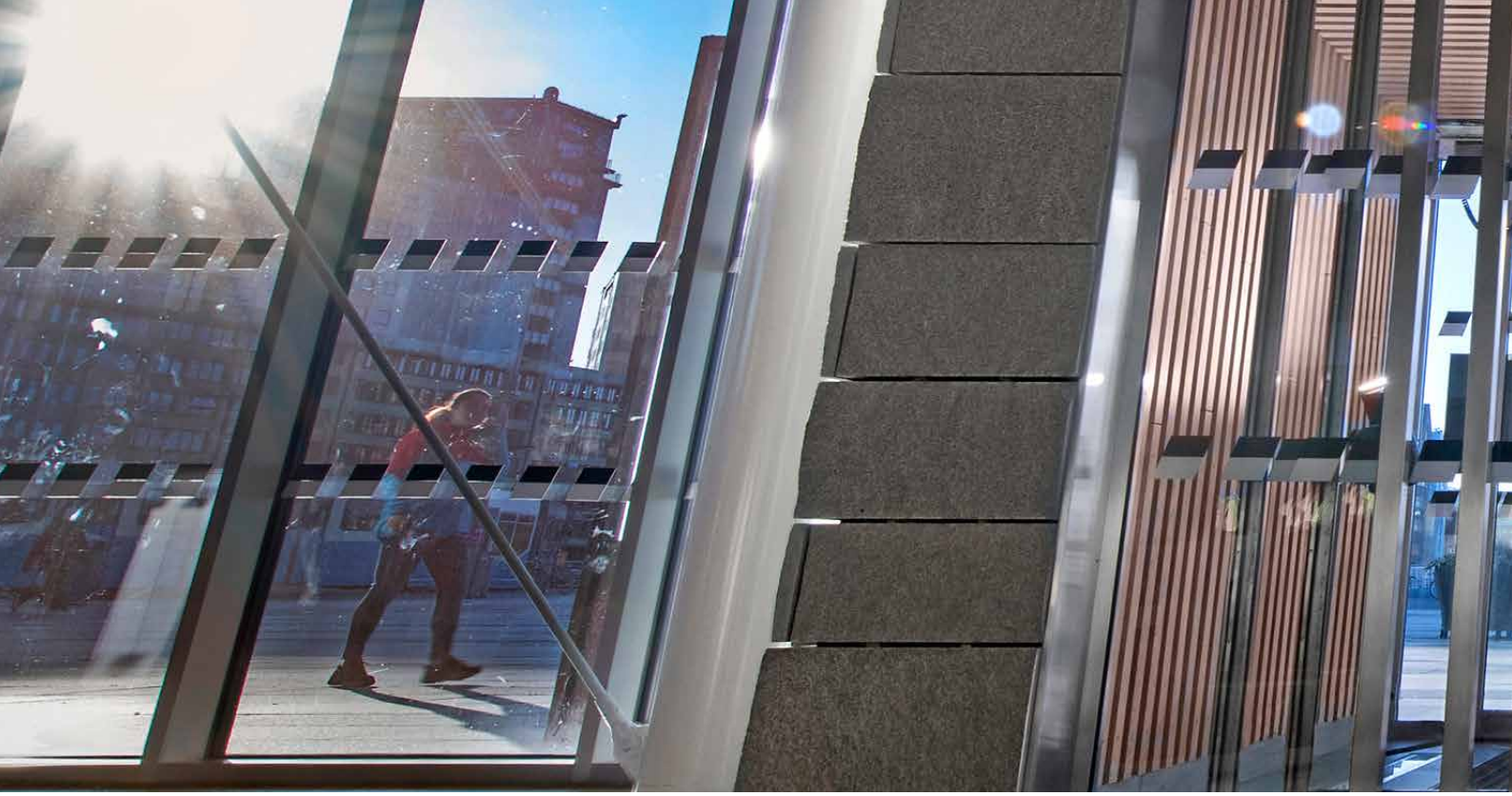
Trust, Competence and Care
You can feel assured with Frico as a partner. We work according to our core values - trust, competence and care - in all aspects, from product development to contact with you the customer. Most of our products are kept in stock, which gives you short delivery times, and our well developed distribution network gives you access to maintenance, service and support. Our experience and knowledge guarantee the best solution for a comfortable indoor climate. And we offer products that can blend in with your environment or can be a design element that stands out.

Qualified local support
Frico is present locally in some 70 countries worldwide with a network of wholly-owned subsidiaries and independent distributors. Our highly qualified representatives are carefully chosen and together we are able to provide you with the best possible support. To find your nearest Frico subsidiary or distributor, please visit www.frico.net.

Frico Academy
Frico Academy is an important platform for networking and sharing inspiration and knowledge between us and our distributors around the world. Through the Frico Academy we share our knowledge on theory and technology, as well as product knowledge and experience in manufacturing and product development.

It is easy to choose Frico
We simplify everyday life by giving you relevant product information together with our knowledge within heating. At www.frico.net you will always find updated information, you can receive help to select the correct product and get inspiration from among our references, see our news, manuals, wiring diagram etc.

The product selection guide at www.frico.net helps you to find the right product and to easily collate all technical data, accessories and heating calculations to your documents.



Frico's Thermozone technology optimizes the air curtain

THERMOZONE® TECHNOLOGY

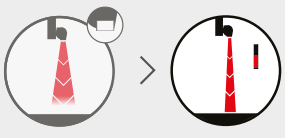
Frico air curtains create an invisible barrier at openings and doors which separates different temperature zones without limiting access for people and vehicles. With Thermozone Technology an efficient air separation is created in combination with a low sound level, giving comfortable climate and large energy savings. Frico air curtains are appreciated worldwide for their quality and operating efficiency, and are currently used in over 70 countries.

Energy savings and good indoor climate

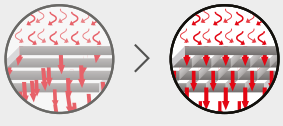
In many premises, for example shops, department stores, industrial premises and goods terminals, doors remain open for a large part of the day. This means discomfort for customers and staff at the same time as there are significant losses of expensively heated or cooled air, especially when the temperature difference between outdoor and indoor air is great. Frico air curtains give a comfortable indoor climate, free from drafts, and the losses of heated or cooled air are significantly reduced with correctly installed air curtains. The air curtain also keeps out insects and emissions.

Optimized air curtains

Air curtains with Thermozone technology have optimized performance and minimized sound levels. Thermozone technology creates a highly uniform air barrier with a perfect balance between air volume and air velocity. This gives optimal curtain effect for doors and entrances. This balance does not just make the air curtain more effective but also has other advantages. The indoor climate is more comfortable if the sound level and the turbulence are reduced and the energy costs are lower. Read more about Thermozone technology in the Technical handbook in this catalogue and at www.frico.se.



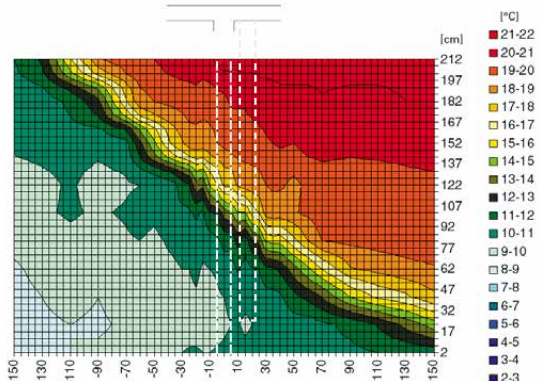
Thermozone technology creates the most efficient air barrier.



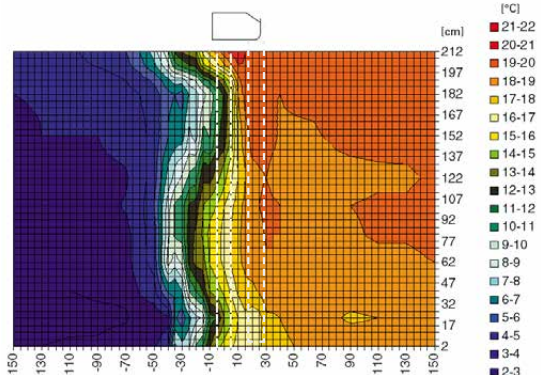
Frico's outlet grilles generate an even airflow that creates an efficient air barrier.

By reducing the turbulence inside the air curtain, the sound level is reduced.

The invisible door



Air flows out of an unprotected opening.



With a correctly set air curtain there is a sharp separation between the different temperature zones.

Intelligent regulation

How efficient an air curtain is and how much energy can be saved depends to a large part on the control system. Many factors that affect the air curtain vary over time. The variations can be long term, for example seasonal, or more temporary, for example when the sun goes behind clouds, the premises fills with people or when a door is opened. FC Control system helps to create many smart and energy saving features. In addition to our four packages, components can be added to expand and customize the system.

Low sound level and high performance

Air curtains with Thermozone technology are developed and manufactured in Frico's facility in Skinnskatteberg. They are tested at one of the most modern and advanced air and sound laboratories in Europe which means that we can guarantee the data stated in our product information. Thanks to the sophisticated equipment and our long experience we can build air curtains with extremely low sound levels and very high air flow performance.

Design

Frico collaborates with leading architects and product designs in the product development. The air curtains blends in well in the environment and the designed for fit into both exclusive shop interiors as industrial environments. With recessed installation the air curtains become nearly invisible, only the outlet grille is visible.

Air curtain experts

Frico knows air curtains. The company was founded in 1932 and we developed our first air curtains 50 years ago. Frico is the initiator and holds the chair of the air curtain group at Eurovent, the European Committee for manufacturers of HVAC. We are happy to share our knowledge and experience and we are always available to help you choose the right product.

Select the right air curtain

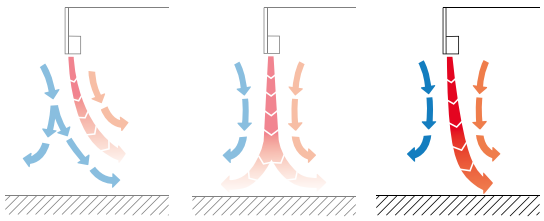
For optimal air curtain effect, it is important to choose the right air curtain. We have air curtains for all openings from small kiosk hatches to large industrial doors. They blow from above, from the side or from below. Choose between electrical, water heated or unheated versions.

To get the most out of the product, the following hints are important to bear in mind.

- To ensure that the air flow reaches the floor at the optimal air speed, the installation height (not the height of the opening) determines the choice of air curtain.
- The air curtain units should cover the whole width (or height) of the opening. The air curtains can be obtained in different lengths. For wide (high) openings, several units are mounted beside (on top) of each other.
- The units should be positioned as close to the opening as possible.
- For optimal performance it is important that the pressure difference between outside and inside is not too big.

The Quick selection guide on the following pages will help you to find the right product.

You will find more information about air curtain technology, dimensioning and control, in the Technical handbook.



Air velocity is too low

Air velocity is too high

Correct air velocity

If you choose an air curtain based purely on air volume you may get an air curtain that only gives good protection close to the outlet, where the impact on the door opening is less.

By setting requirements for the air velocity and uniformity of the air beam at floor level, you have an air curtain that covers the whole door opening.

Our air curtains

Type	Heating	Control	Mounting	Recommended installation height
Commercial				
Sierra		FC Control system	Horizontal / Vertical	3,5 m
Pamir 2500		FC Control system	Horizontal	2,5 m
Pamir 3500		FC Control system	Horizontal / Vertical	3,5 m
Pamir 4200		FC Control system	Horizontal / Vertical	4,2 m
Arden 3500		FC Control system	Horizontal	3,5 m
Arden 4200		FC Control system	Horizontal	4,2 m
PA2200C		Remote control	Horizontal	2,2 m
PA3200C		Remote control	Horizontal	3,2 m
AR3200C		Remote control	Horizontal	3,2/2,8 m
AR200		Control system SIRe	Horizontal	2,5 m
Portier		Other controls	Horizontal	2,5 m
ADA		Other controls	Horizontal	2,5 m
PA1508		Integrated control	Horizontal	Small openings
Industry				
Pamir 5000		FC Control system	Horizontal / Vertical	5 m
AGI6000		Other controls	Horizontal / Vertical	6 m
UF600		Other controls	Vertical	6 m
Cold rooms				
PAECS		Integrated control	Horizontal	2,5 m
PAEC2500		Integrated control	Horizontal	2,5 m
PAEC3200		Integrated control	Horizontal	3,2 m
ADA Cool		Other controls	Horizontal	3 m
Revolving doors				
Scand		FC Control system	Vertical	-
Ruwen		FC Control system	Horizontal	-

 Ambient, no heat

 Electrical heat

 Water heat

Recommended installation height varies depending on the relevant premises. See www.frico.net for further information.

Quick selection guide Frico air curtains

Horizontal mounting
The air curtains are mounted horizontally above the opening, creating a vertical air barrier.

Surface mounting
These air curtains can be mounted on a wall or in the ceiling using threaded bars or cables.

Installation height

Commercial

2,2 m	**PA2200C**
2,5 m	**Pamir 2500**
2,5 m	**Portier**
2,5 m	**ADA**
3,2 m	**PA3200C**
3,5 m	**Sierra**
3,5 m	**Pamir 3500**
4,2 m	**Pamir 4200**
-	**PA1508**

Industry

5 m	**Pamir 5000**
6 m	**AGI6000**

Cold rooms

2,5 m	**PAECS**
2,5 m	**PAEC2500**
3,2 m	**PAEC3200**
3 m	**ADA Cool**

Recessed mounting
These air curtains are installed recessed into suspended ceilings.

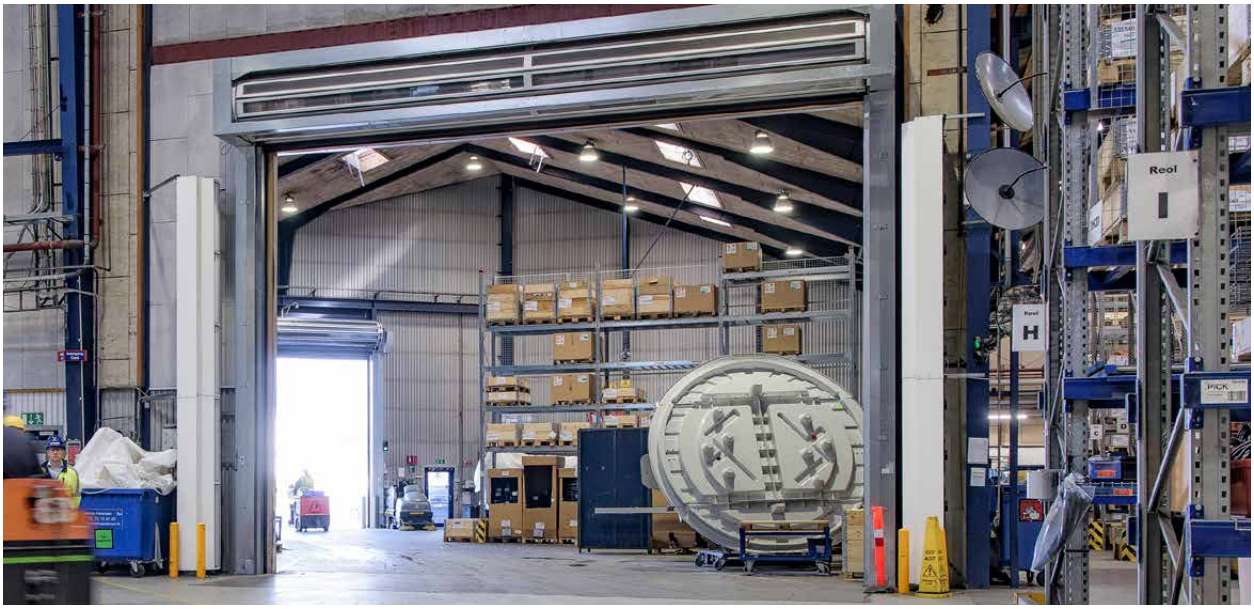
Installation height

Commercial

2,5 m	**AR200**
3,2/2,8 m	**AR3200C**
3,5 m	**Arden 3500**
4,2 m	**Arden 4200**

Revolving doors

-	**Ruwen**



Vertical mounting
The air curtains are mounted vertically next to the opening, creating a horizontal air barrier. Two air curtains are installed, one on each side of the opening.

Commercial

5 m	**Sierra**
5 m	**Pamir 3500**
6 m	**Pamir 4200**

Installation width*

Industry

7 m	**Pamir 5000**
8 m	**AGI6000**

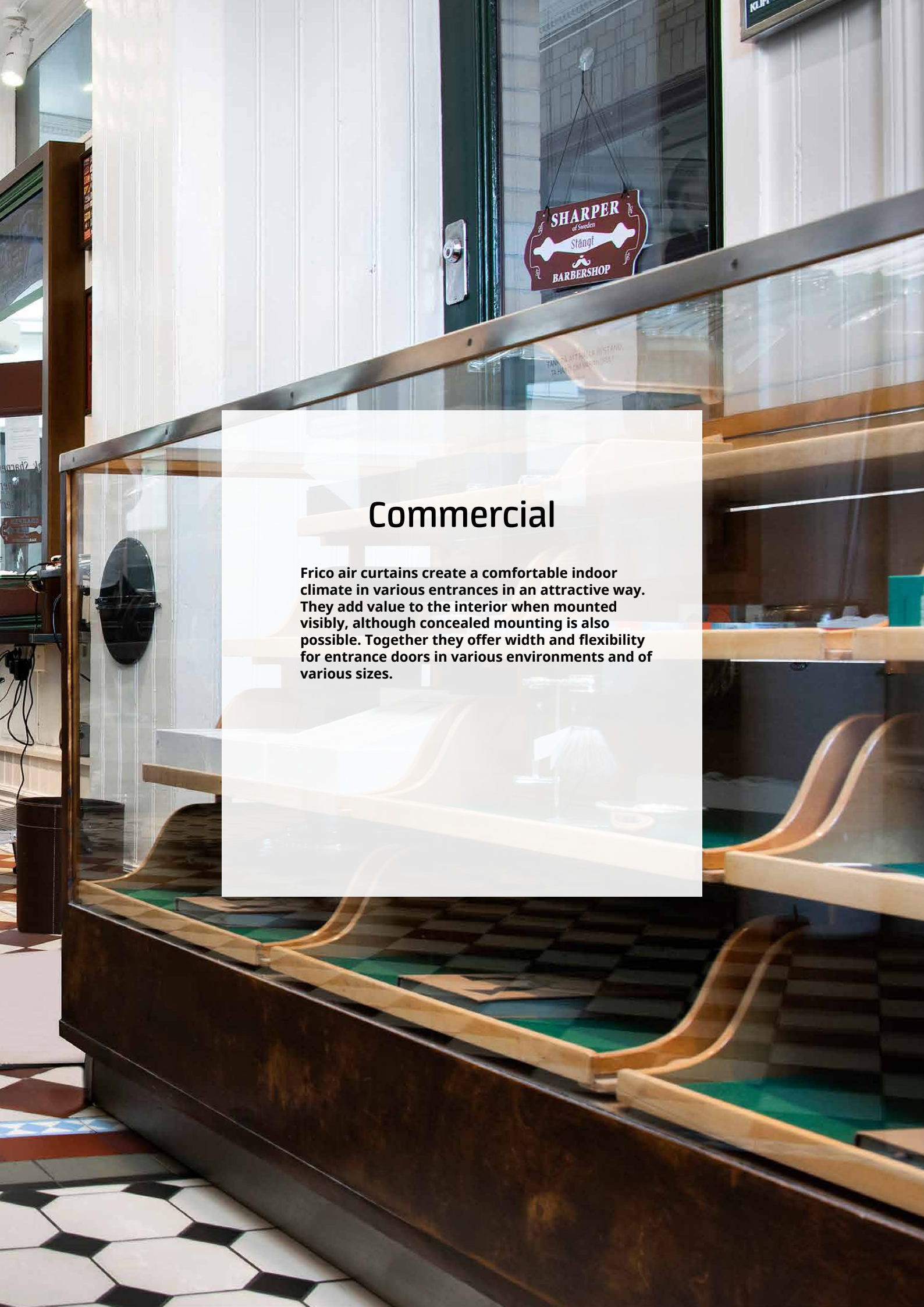
Installation width*

Revolving doors

-	**Scand**

*) Two units, one on each side of the opening.


Södra Larm-
gatan 15-11
BASTARD
BURGE



Commercial

Frico air curtains create a comfortable indoor climate in various entrances in an attractive way. They add value to the interior when mounted visibly, although concealed mounting is also possible. Together they offer width and flexibility for entrance doors in various environments and of various sizes.

Sierra

Unique energy-efficient air curtain for exclusive establishments

Sierra with a recommended installation height of 3,5 m or width of 5 m, has a striking design suitable for exclusive establishments. Sierra is equipped with energy-efficient EC motors which enable stepless control of the airflow. Customized to perfectly fit your entrance and make it unique, Sierra can be ordered with a finish in polished, brushed or mirror polished stainless steel or in the colour of your choice. The air curtain is available for horizontal or vertical installation.

Energy efficient and sustainable

The air curtain is equipped with EC motors that are up to 50% more energy efficient than traditional AC motors, and have a lower weight which makes for easier installations and greener transports.

Intelligent control options

Sierra is supplemented with an intelligent control system that allows you to optimize your comfort with minimum effort. Smart and automatic features enable simple set-up and operation for different Frico products groups.

High performance

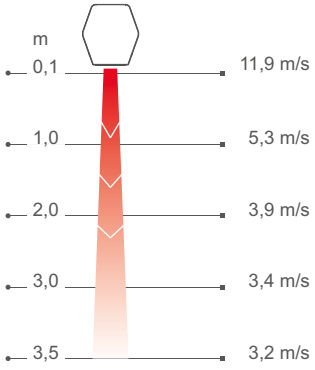
Frico air curtains are developed and manufactured in Sweden. The air curtains are tested in one of the most modern and advanced air and sound laboratories in Europe which means that we can guarantee a high performance product.

Sierra

Available in 3 versions:

- Ambient (without heat)
- Electrical heating
- Water heating

Air velocity profile



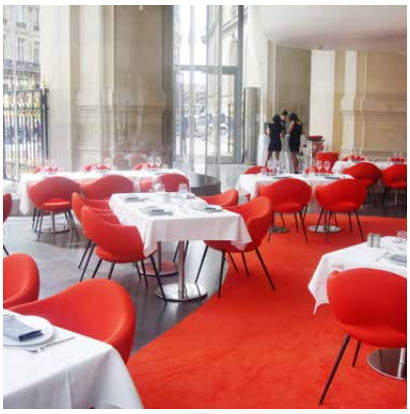
Measurements according to ISO 27327-1. Average values for products in the series.

Design and specifications are subject to change without notice.

Sierra

Frico's Thermozone technology optimizes the air curtain

Frico air curtains create an invisible barrier at openings and doors which separates different temperature zones without limiting access for people and vehicles. Thermozone technology creates a highly uniform air barrier with a perfect balance between air volume and air velocity, regardless of whether it is the heat or the cold that you want to keep inside.



Great energy savings

In many premises doors remain open for a significant part of the day, this results in huge losses of expensively heated or cooled air, especially when the temperature difference between outdoor and indoor air is great. With correctly installed air curtains great energy savings can be obtained.

Comfortable indoor climate

Air curtains with Thermozone technology have optimized performance to provide a comfortable indoor climate free from drafts. The air curtain also keeps out emissions and insects.

Low sound level

With Thermozone technology Frico manufactures air curtains with very high airflow performance. This does not just make the air curtain more effective, but also has other advantages such as extremely low sound levels and reduced turbulence.

Create the optimal solution to suit your specific needs

After you selected the air curtain to suit your specific needs (ambient, electrical heating, water heating) and length 1, 1,5, 2, or 2,5 m you assemble your control and accessory options:

Select control system

Choose one of our FC Control systems.

Add valve system

Water heated units must be supplemented with a valve system.

Select mounting options

Add mounting accessories if needed.

Technical specifications

Ambient, no heat - SIFEC A (IP20)

Voltage motor: 230V~

Type	Output [kW]	Airflow*1 [m³/h]	Sound power*2 [dB(A)]	Sound pressure*3 [dB(A)]	Amperage motor [A]	Weight [kg]
SIFEC10A-H	0	900/1850	77	46/61	2,3	48
SIFEC15A-H	0	1400/2750	79	48/63	3,2	60
SIFEC20A-H/V	0	1850/3600	82	48/66	4,1	71
SIFEC25A-H/V	0	2400/4500	83	49/67	5,1	82

Electrical heat - SIFEC E (IP20)

Type	Output steps [kW]	Airflow*1 [m³/h]	Δt*4 [°C]	Sound power*2 [dB(A)]	Sound pressure*3 [dB(A)]	Amperage motor [A]	Voltage [V] Amperage [A] (heat)	Weight [kg]
SIFEC10E8-H	2,7/5,5/8,1	900/1850	26/13	77	46/61	2,3	400V3~/11,7	48
SIFEC15E12-H	3,9/7,8/12	1400/2750	26/13	79	48/63	3,2	400V3~/16,9	62
SIFEC20E16-H/V	5,4/11/16	1850/3600	26/13	82	48/66	4,1	400V3~/23,4	75
SIFEC25E20-H/V	6,6/13/20	2400/4500	25/13	83	49/67	5,1	400V3~/28,6	89

Water heat - SIFEC WL, coil for low water temperature (≤80 °C) (IP20)

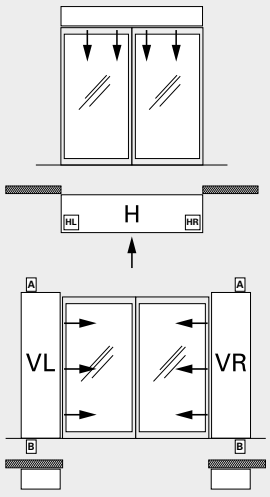
Type	Output*5 H*7 [kW]	V*8 [kW]	Airflow*1 [m³/h]	Δt*4,5 H*7 [°C]	V*8 [°C]	Water volume [l]	Sound power*2 [dB(A)]	Sound pressure*3 [dB(A)]	Amperage motor [A]	Weight [kg]
SIFEC10WL-H	8,5	-	850/1700	19/15	-	2,0	77	46/61	2,3	67
SIFEC15WL-H	14	-	1250/2600	24/19	-	3,2	79	48/63	3,2	79
SIFEC20WL-H/V	21	21	1650/3300	24/19	24/19	4,3	82	48/66	4,1	90
SIFEC25WL-H/V	28	25	2200/4250	24/20	22/17	5,4	83	49/67	5,1	101

Water heat - SIFEC WH, coil for high temperature water (≥80 °C) (IP20)

Type	Output*6 H*7 [kW]	V*8 [kW]	Airflow*1 [m³/h]	Δt*4,6 H*7 [°C]	V*8 [°C]	Water volume [l]	Sound power*2 [dB(A)]	Sound pressure*3 [dB(A)]	Amperage motor [A]	Weight [kg]
SIFEC10WH-H	11	-	850/1700	24/18	-	1,1	77	46/61	2,3	63
SIFEC15WH-H	15	-	1250/2600	23/17	-	1,9	79	48/63	3,2	75
SIFEC20WH-H/V	20	28	1650/3300	24/18	32/25	2,5	82	48/66	4,1	86
SIFEC25WH-H/V	26	32	2200/4250	23/18	29/22	3,3	83	49/67	5,1	97

*1) Low/high airflow (2V/10V).
*2) Sound power (L_{WA}) measurements according to ISO 27327-2: 2014, Installation type E.
*3) Sound pressure (L_{pA}). Conditions: Distance to the unit 5 metres. Directional factor: 2. Equivalent absorption area: 200 m². At low/high airflow (2V/10V).
*4) Δt = temperature rise of passing air at maximum heat output and low/high airflow (2V/10V).
*5) Applicable at water temperature 60/40 °C, air temperature, in +18 °C.
*6) Applicable at water temperature 80/60 °C, air temperature, in +18 °C.
*7) Horizontal mounting
*8) Vertical mounting
*5,6) See www.frico.net for additional calculations.

Approved for 220V/1ph/60Hz and 380V/3ph/60Hz. Product performance for 220V/1ph/60Hz and 380V/3ph/60Hz will differ from stated data.



Product key

Type - Unit shape - Connections position - Material / Colour
Example: SIFEC20WL - VL - A - P

Type	See Technical specifications.
Unit shape	HL (Horizontal, connections on the left) HR (Horizontal, connections on the right) VL (Vertical left) or VR (Vertical right) seen from inside
Connection position	A or B, see sketch
Material/Colour	P = Polished stainless steel B = Brushed stainless steel MP = Mirror polished stainless steel State RAL code = Powder coating RAL State NCS code = Powder coating NCS

Contact Frico before ordering for more information about the product and special adaptations.

Manufactured in Sweden with a corrosion proof housing made of hot zinc-plate and powder coated steel panels. Front and back are made of polished or brushed stainless steel but also available in mirror-polished stainless steel or in powder coated steel, any RAL/NCS colour. Colour intake grille, outlet grille and ends: black, RAL 9005.

CE

Horizontal mounting

The recommended installation height of Sierra is 3,5 m. The air curtain can be installed on a wall or supended from a ceiling. When the air curtain is mounted horizontally the outlet air grille must be facing downwards as close to the door as possible.

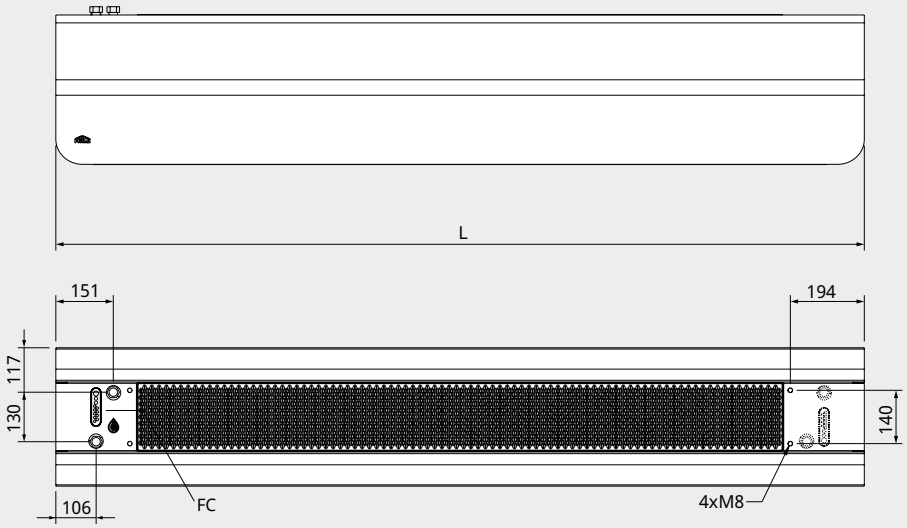
Connection

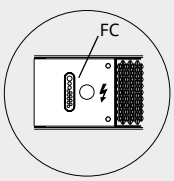
An easy to open front and inlet grille allow quick access to facilitate both installation and maintenance.

The air curtain has an integrated PC board which is connected to the selected external control system FC. Control is supplied by 230V~ to the terminal block. The PC board is accessed via cable glands on the top of the unit. Communication- and sensor cables are connected to the PC board. The electrical connection is made on the top of the unit.

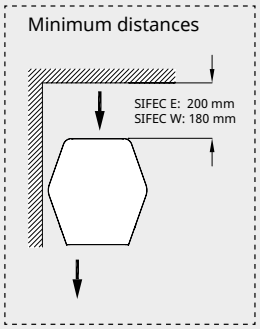
Water heated units are connected to the water system on top of the unit. Flexible hoses are available as accessories. Water heated units must always be supplemented with a valve kit mounted outside the unit. See Valves and Accessories.

Inside thread : 3/4", DN20





	L [mm]
SIFEC10-H	1124
SIFEC15-H	1624
SIFEC20-H	2124
SIFEC25-H	2624



Minimum distance from outlet to floor for electrically heated units is 1800 mm.

For wiring diagrams and other technical information, please see the manual and www.frico.net.

Sierra

Vertical mounting

Vertical mounting

The recommended installation width of Sierra is 5 m with air curtains on both sides of the opening.

The air curtain is mounted vertically as close as possible to the door. For the best effect air curtains should be placed on both sides of the opening. The extension hood (accessory) fills the space between the unit and the ceiling and provides a neater installation.

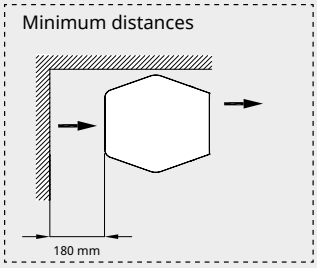
Connection

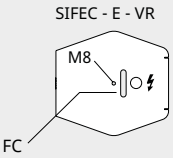
An easy to open front and inlet grille allow quick access to facilitate both installation and maintenance.

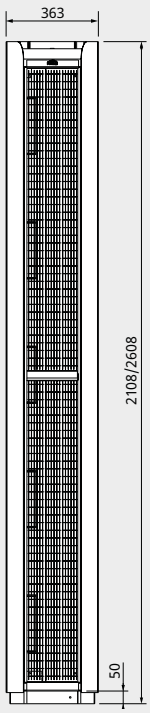
The air curtain has an integrated PC board which is connected to the selected external control system FC. Control is supplied by 230V~ to the terminal block. The PC board is accessed via cable glands on the top or bottom of the unit. Communication- and sensor cables are connected to the PC board.

The electrical connection is made on the top or bottom of the unit depending on selection.

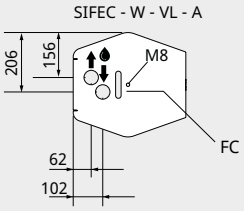
Water heated units are connected to the water system on top or bottom of the unit depending on selection. See product key. Flexible hoses are available as accessories. Water heated units must always be supplemented with a valve kit mounted outside the unit. See Valves and Accessories. Connections made from below the unit must be prepared in the floor according to the drawing.

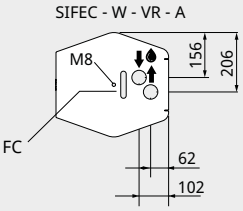




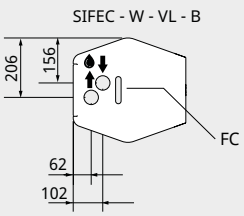


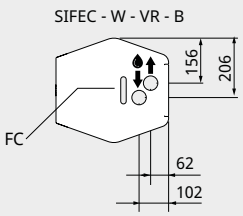
Upper part of the unit seen from above.





Bottom part of the unit seen from above.





Inside thread : 1", DN25

For wiring diagrams and other technical information, please see the manual and www.frico.net.

	L [mm]
SIFEC20-V	2108
SIFEC25-V	2608

Recommended installation width varies depending on the relevant premises. See www.frico.net for further information.

Sierra

FC Control system

Frico air curtains come with an integrated PC-board and are supplemented with the intelligent control system FC of your choice, working together to create many smart and energy saving features. There are four different packages to choose from, depending on your requirements.

FC Direct

Entry level
- *Door contact*
- *Calendar function*
- *Filter timer*
- *Built-in temperature sensor*

FC Smart

FC Direct +
- *Control via app (Bluetooth)*
- *Wireless sensors possible*
- *Adjustable calendar function*
- *Away and Boost function*
- *Adjustable filter timer*
- *Vestibule function*
- *Zone possibility*
- *Enhanced water control possible*

FC Pro

FC Direct + FC Smart +
- *Automatic air flow control*
- *Automatic heat blocking*

FC Building - BMS

FC Direct +
- *0-10V, potential free contact or Modbus*
- *Automatic air flow control**
- *Automatic heat blocking**
- *Heat and fan settings*
- *Alarm indication*
- *Read values*
- *Enhanced water control possible*

** Requires outdoor temp signal*

FC Direct

Entry level control system for a great start. The door contact provides an automatic energy-saving function, as the air curtain becomes active only when the door is open. When the door is closed, it remains on stand-by or runs on a lower fan speed if extra heat is needed. With the calender function, you can choose periods of comfort and reduced mode. The control panel has a built-in temperature sensor, which is used for control when external sensors are not used.

FC Smart

Second level control system for full freedom. FC Smart comes with all features from FC Direct plus additional energy saving features and the possibility of app control (Bluetooth). The app gives you access to all functions in the system, allowing you to set it up exactly the way you want it. It also enables you to create different zones with different settings in a larger system. The app FRICO CONTROL is available for both iOS and Android.

FC Pro

Third level control system for maximum savings. FC Pro comes with all features from FC Direct and FC Smart plus additional automatic energy saving features. By receiving and reacting to information about indoor and outdoor temperatures, the right amount of heat and air flow is added to avoid overshoots and thus reducing energy consumption.

FC Building - BMS system

Comprehensive control system for buildings, with the option to control via 0-10V, potential free contact (e.g. a relay) and/or Modbus RTU (RS485). FC Building enables you to receive product information status and alarms. Modbus allows for full use of all the energy saving features within the control system.

Item number	Type	Description
74684	**FCDA**	FC Direct, first level control system
74685	**FCSA**	FC Smart, second level control system
74686	**FCPA**	FC Pro, third level control system
74687	**FCBA**	FC Building, BMS system

Sierra

Control system content and accessories

FC Control system helps to create many smart and energy saving features. In addition to our four packages, components can be added to expand and customize the system. With the app levels (FC Smart and FC Pro) it is also possible to create and control different zones. Each added zone needs to be equipped with one FC Direct and can be designed to fit its specific needs by adding different accessories.

FC Direct, control kit
Control panel for fan and heat, door contact and 5 m communication cable. Used for additional zones with FC Smart and FC Pro. IP44.

FCRTX, external room temperature sensor
For reading of the room temperature on another location than that of the control panel, incl. 10 m sensor cable. IP20.

FCOTX, outdoor temperature sensor
Reading the outdoor temperature, incl. 10 m sensor cable. Enables automatic air curtain control and heat blocking. IP44.

FCLAP, local access point
Local access point for extra wireless sensors (when operating more than 8 sensors) and extended range for wireless sensors or app control (Bluetooth), incl. 10 m communication cable. IP44.

FCSC/FCBC, cable
FCSC Sensor cable available in 10 or 25 m for extra length. FCBC Communication cable for additional products within the same zone, available in 5, 10 or 25 m.

FCDC, door contact
The door contact regulates the airflow on/off. Allows you to control air curtains at different doorways individually within the same zone.

FCTXRF, indoor/outdoor wireless sensor
Indoor/outdoor wireless sensor with same features as FCRTX and FCOTX. The set up as outdoor or indoor sensor is made by a switch inside the sensor. Range up to 50 m. Battery life: 3-5 years. IP44.

FC Direct

Content
- *FCCF control panel*
- *FCBC05*
- *FCDC*

FC Smart

Content
- *FCCF control panel*
- *FCBC10*
- *FCDC*
- *FCLAP*

FC Pro

Content
- *FCCF control panel*
- *FCBC10*
- *FCDC*
- *FCLAP*
- *FCTXRF*

FC Building - BMS

Content
- *FCCF control panel*
- *FCBC10*
- *FCDC*
- *FCBAP building access point*

Item number	Type	Description	Dimensions
74684	**FCDA**	FC Direct, first level control system	89x89x26 mm (FCCF)
74694	**FCRTX**	External room temperature sensor	39x39x23 mm
74695	**FCOTX**	Outdoor temperature sensor	39x39x23 mm
74699	**FCLAP**	Local access point for extra wireless sensors and extended range	89x89x26 mm
74718	**FCBC05**	Extra communication cable, 5 m	5 m
74719	**FCBC10**	Extra communication cable, 10 m	10 m
74720	**FCBC25**	Extra communication cable, 25 m	25 m
74721	**FCSC10**	Extra sensor cable, 10 m	10 m
74722	**FCSC25**	Extra sensor cable, 25 m	25 m
17495	**FCDC**	Door contact	
74703	**FCTXRF**	Indoor/outdoor wireless sensor (for FC Smart, FC Pro)	89x89x26 mm

Sierra

Water control

Water heated units must be supplemented with valves. The valve system controls the water flow and activates maximum heat only when needed. By activating the built-in bypass feature, a small leakage flow is let through to make sure there is always hot water in the heating coil, providing frost protection and faster heating. The return water temperature sensor is making sure that as much energy as possible from the water in the coil is used, thus reducing energy consumption.

VPFC, pressure independent and modulating valve system
Two way pressure independent control and adjustment valve with modulating actuator and shut-off valve.

FCWTA, return water temperature sensor
Enables control of return water temperature and automatic bypass function, which provides extended frost protection and reduced energy consumption.

Item number	Type	DN	Flow range l/s
238293	**VPFC15LF**	DN15	0,012-0,068
238294	**VPFC15NF**	DN15	0,024-0,13
238295	**VPFC20**	DN20	0,058-0,32
238296	**VPFC25**	DN25	0,10-0,60
238297	**VPFC32**	DN32	0,22-1,03
74702	**FCWTA**	Return water temperature sensor	

Accessories - water heated units

FH1020, flexible hoses
Flexible hoses for easy and practical installation of water heated unit. Length 1 m. DN20, 1" inside/outside thread.

FH1025, flexible hoses
Flexible hoses for easy and practical installation of water heated unit. Length 1 m. DN25, 1" inside/outside thread.

Item number	Type	Used for	Consists of
237568	**FH1020**	SIFEC10/15/20/25W-H	2
330955	**FH1025**	SIFEC10/15/20/25W-V	2

Sierra

Accessories - horizontal mounting

SIFW, wall bracket
Brackets for installing a unit horizontally on a wall. Two brackets are required for each unit.
Available in four designs:
- SIFWBB, brushed stainless steel
- SIFWBP, polished stainless steel
- SIFWBMP, mirror polished stainless steel
- SIFWB, powder coated steel (state RAL/NCS code)

PA34CB, ceiling brackets
Ceiling brackets for installing the unit from the ceiling using wires or threaded bars (not included). Best combined with vibration dampers (PA34VD) when using threaded bars.

PA34WS, wire suspension kit
Galvanized wires with wire locks to secure the unit from the ceiling. Length 3 m. Used together with ceiling brackets (PA34CB).

PA34TR, threaded bars
Threaded bars for installing unit on to a ceiling. Length 1 m. Used together with ceiling brackets (PA34CB). Supplemented with vibration dampers (PA34VD) for reduced vibration.

PA34VD, vibration dampers
Reduces vibrations for ceiling installations with threaded bars.

Item number	Type	Used for	Consists of
251886	**SIFWBB**	SIFEC10/15/20/25-H	1
251887	**SIFWBP**	SIFEC10/15/20/25-H	1
251888	**SIFWBMP**	SIFEC10/15/20/25-H	1
251889	**SIFWB**	SIFEC10/15/20/25-H	1
18059	**PA34CB15**	SIFEC10/15-H	4
18060	**PA34CB20**	SIFEC20-H	6
18061	**PA34CB30**	SIFEC25-H	8
18062	**PA34WS15**	SIFEC10/15-H	4
18063	**PA34WS20**	SIFEC20-H	6
18064	**PA34WS30**	SIFEC25-H	8
18056	**PA34TR15**	SIFEC10/15-H	4
18057	**PA34TR20**	SIFEC20-H	6
18058	**PA34TR30**	SIFEC25-H	8
18065	**PA34VD15**	SIFEC10/15-H	4
18066	**PA34VD20**	SIFEC20-H	6
18067	**PA34VD30**	SIFEC25-H	8

Accessories - vertical mounting

SIFEH, extension hood
Fills the space between the unit and the ceiling for vertical mounting and provides a neater installation. Height 150-1000 mm.

AXP300, collision protection
Floor placed protection against impact from e.g. shopping trolleys.

Item number	Type	Used for	Consists of
FE10234	**SIFEH**	SIFEC20/25-V	1
10028	**AXP300**	SIFEC20/25-V	1

Pamir 2500

Slim air curtain for entrances, with energy efficient control

Pamir 2500, with a recommended installation height of 2,5 m, has a modern and sleek design developed to fit all entrances and door ways in shops, offices and public premises. The air curtain is available for horizontal installation with wall brackets included. The front is easy to remove, which facilitates installation and allows easy maintenance.

Optimized door protection

In order to generate the best possible door protection in any given condition, the air curtain automatically adjusts the airflow based on outdoor temperature and room temperature.

Intelligent control options

The Pamir series is supplemented with an intelligent control system that allows you to optimize your comfort with minimum effort. Smart and automatic features enable simple set-up and operation for different Frico products groups.

High performance

Frico air curtains are developed and manufactured in Sweden. The air curtains are tested in one of the most modern and advanced air and sound laboratories in Europe which means that we can guarantee a high performance product.

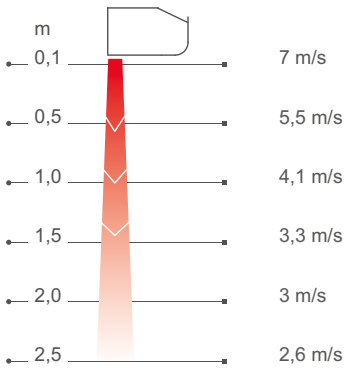
Pamir 2500

THERMOZONE TECHNOLOGY

Available in 3 versions:

- Ambient (without heat)
- Electrical heating
- Water heating

Air velocity profile



Measurements according to ISO 27327-1. Average values for products in the series.

Design and specifications are subject to change without notice.

Pamir 2500

Frico's Thermozone technology optimizes the air curtain

Frico air curtains create an invisible barrier at openings and doors which separates different temperature zones without limiting access for people and vehicles. Thermozone technology creates a highly uniform air barrier with a perfect balance between air volume and air velocity, regardless of whether it is the heat or the cold that you want to keep inside.

Great energy savings

In many premises doors remain open for a significant part of the day, this results in huge losses of expensively heated or cooled air, especially when the temperature difference between outdoor and indoor air is great. With correctly installed air curtains great energy savings can be obtained.

Comfortable indoor climate

Air curtains with Thermozone technology have optimized performance to provide a comfortable indoor climate free from drafts. The air curtain also keeps out emissions and insects.

Low sound level

With Thermozone technology Frico manufactures air curtains with very high airflow performance. This does not just make the air curtain more effective, but also has other advantages such as extremely low sound levels and reduced turbulence.

Create the optimal solution to suit your specific needs

After you selected the air curtain to suit your specific needs (ambient, electrical heating, water heating) and length 1, 1,5, or 2 m you assemble your control and accessory options:

Select control system

Choose one of our FC Control systems.

Add valve system

Water heated units must be supplemented with a valve system.

Select mounting options

Add mounting accessories if needed.

Pamir 2500

Technical specifications

Ambient, no heat - PAF2500 A (IP21)

Voltage motor: 230V~

Item number	Type	Output [kW]	Airflow*1 [m³/h]	Sound power*2 [dB(A)]	Sound pressure*3 [dB(A)]	Amperage motor [A]	Length [mm]	Weight [kg]
246826	**PAF2510A**	0	900/1300	70	43/53	0,5	1050	16
246830	**PAF2515A**	0	1250/2100	71	44/54	0,7	1560	24
246834	**PAF2520A**	0	1800/2600	72	44/55	1,0	2050	32

Electrical heat - PAF2500 E (IP20)

Item number	Type	Output steps [kW]	Airflow*1 [m³/h]	Δt*4 [°C]	Sound power*2 [dB(A)]	Sound pressure*3 [dB(A)]	Amperage motor [A]	Voltage [V] Amperage [A] (heat)	Length [mm]	Weight [kg]
246823	**PAF2510E05**	1,7/3,3/5,0	900/1450	17/11	68	42/51	0,5	400V3~/7,2	1050	19
246824	**PAF2510E08**	3,0/5,0/8,0	900/1450	27/17	68	42/51	0,5	400V3~/11,5	1050	20
246827	**PAF2515E08**	2,7/5,3/8,0	1400/2200	18/11	69	40/52	0,7	400V3~/11,5	1560	30
246828	**PAF2515E12**	4,0/8,0/12	1400/2200	26/17	69	40/52	0,7	400V3~/17,3	1560	32
246831	**PAF2520E10**	3,4/6,6/10	1800/2900	17/11	70	43/53	1,0	400V3~/14,4	2050	36
246832	**PAF2520E16**	6,0/10/16	1800/2900	27/17	70	43/53	1,0	400V3~/23,1	2050	40

Water heat - PAF2500 W (IP21)

Item number	Type	Output*5 [kW]	Airflow*1 [m³/h]	Δt*4,5 [°C]	Water volume [l]	Sound power*2 [dB(A)]	Sound pressure*3 [dB(A)]	Amperage motor [A]	Length [mm]	Weight [kg]
246825	**PAF2510W**	4,7	900/1300	12/11	0,7	69	42/53	0,45	1050	18
246829	**PAF2515W**	9,2	1250/2100	16/13	1,1	70	41/54	0,6	1560	26
246833	**PAF2520W**	11	1800/2600	15/13	1,4	71	43/55	0,9	2050	35

*1) Lowest/highest airflow of totally 3 fan steps.
*2) Sound power (L_{WA}) measurements according to ISO 27327-2: 2014, Installation type E.
*3) Sound pressure (L_{pA}). Conditions: Distance to the unit 5 metres. Directional factor: 2. Equivalent absorption area: 200 m². At lowest/highest airflow.
*4) Δt = temperature rise of passing air at maximum heat output and lowest/highest airflow.
*5) Applicable at water temperature 60/40 °C, air temperature, in +18 °C. See www.frico.net for additional calculations.

Pamir 2500 A and W are approved for 220V/1ph/60Hz. Product performance for 220V/1ph/60Hz will differ from stated data.

Manufactured in Sweden with a corrosion proof housing made of hot zinc-plate and powder coated steel panels. Front is made of powder coated steel. Colour front: white, RAL 9016. Colour grille, rear section and ends: grey, RAL 7046.

CE

Pamir 2500

Mounting

Mounting

The recommended installation height of Pamir 2500 is 2,5 m. The air curtain is installed horizontally with the outlet air grille facing downwards as close to the door as possible. For the protection of wider doorways, several units can be mounted in series alongside each other.

The unit can be mounted with included wall brackets or be supplemented with accessories for mounting from the ceiling.

Connection

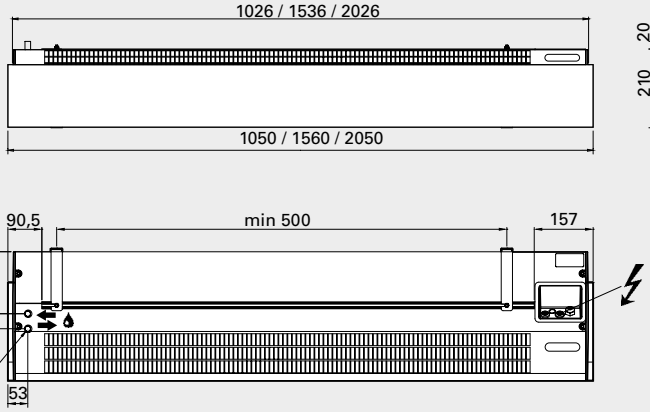
The front is easy to remove, which facilitates installation and allows easy maintenance.

The air curtain has an integrated PC board which is connected to the selected external control system FC. **The PC board is accessed via cable glands on the top of the unit.** Communication- and sensor cables are connected to the PC board.

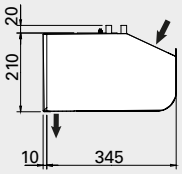
Units without heat and with water heat are connected with 1,5 m cord and plug. For electrical heated units the electrical connection is made on the top of the unit. **Control (230V~) and power supply for heat (400V3~) should be connected to a terminal block in the terminal box.**

Water heated units are connected to the water system on top of the unit. Flexible hoses are available as accessories. **Water heated units must always be supplemented with a valve kit mounted outside the unit. See Valves and Accessories.**

All models

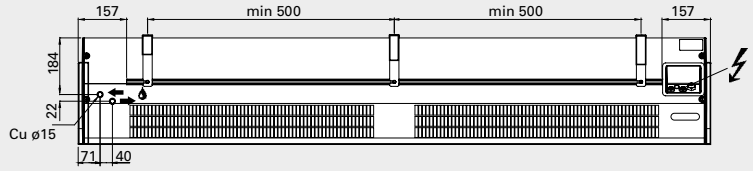


ø15 mm smooth copper pipe

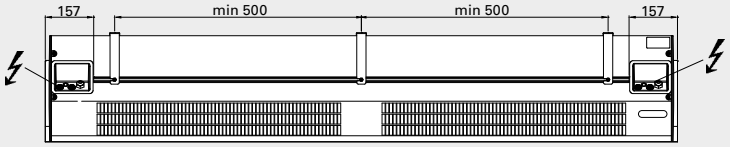


2 metre units

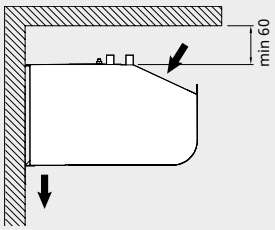
Unit without heating or with water heating



Unit with electrical heating



Minimum distances



Minimum distance from outlet to floor for electrically heated units is 1800 mm.

For wiring diagrams and other technical information, please see the manual. Recommended installation height varies depending on the relevant premises. See www.frico.net for further information.

Pamir 2500

FC Control system

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FC Direct

Entry level

- Door contact
- Calendar function
- Filter timer
- Built-in temperature sensor

FC Smart

FC Direct +

- Control via app (Bluetooth)
- Wireless sensors possible
- Adjustable calendar function
- Away and Boost function
- Adjustable filter timer
- Vestibule function
- Zone possibility
- Enhanced water control possible

FC Pro

FC Direct + FC Smart +

- Automatic air flow control
- Automatic heat blocking

FC Building - BMS

FC Direct +

- 0-10V, potential free contact or Modbus
- Automatic air flow control*
- Automatic heat blocking*
- Heat and fan settings
- Alarm indication
- Read values
- Enhanced water control possible

** Requires outdoor temp signal*

FC Direct

Entry level control system for a great start. The door contact provides an automatic energy-saving function, as the air curtain becomes active only when the door is open. When the door is closed, it remains on stand-by or runs on a lower fan speed if extra heat is needed. With the calender function, you can choose periods of comfort and reduced mode. The control panel has a built-in temperature sensor, which is used for control when external sensors are not used.

FC Smart

Second level control system for full freedom. FC Smart comes with all features from FC Direct plus additional energy saving features and the possibility of app control (Bluetooth). The app gives you access to all functions in the system, allowing you to set it up exactly the way you want it. It also enables you to create different zones with different settings in a larger system. The app FRICO CONTROL is available for both iOS and Android.

FC Pro

Third level control system for maximum savings. FC Pro comes with all features from FC Direct and FC Smart plus additional automatic energy saving features. By receiving and reacting to information about indoor and outdoor temperatures, the right amount of heat and air flow is added to avoid overshoots and thus reducing energy consumption.

FC Building - BMS system

Comprehensive control system for buildings, with the option to control via 0-10V, potential free contact (e.g. a relay) and/or Modbus RTU (RS485). FC Building enables you to receive product information status and alarms. Modbus allows for full use of all the energy saving features within the control system.

Item number	Type	Description
74684	**FCDA**	FC Direct, first level control system
74685	**FCSA**	FC Smart, second level control system
74686	**FCPA**	FC Pro, third level control system
74687	**FCBA**	FC Building, BMS system

Pamir 2500

Control system content and accessories

FC Control system helps to create many smart and energy saving features. In addition to our four packages, components can be added to expand and customize the system. With the app levels (FC Smart and FC Pro) it is also possible to create and control different zones. Each added zone needs to be equipped with one FC Direct and can be designed to fit its specific needs by adding different accessories.

FC Direct, control kit
Control panel for fan and heat, door contact and 5 m communication cable. Used for additional zones with FC Smart and FC Pro. IP44.

FCRTX, external room temperature sensor
For reading of the room temperature on another location than that of the control panel, incl. 10 m sensor cable. IP20.

FCOTX, outdoor temperature sensor
Reading the outdoor temperature, incl. 10 m sensor cable. Enables automatic air curtain control and heat blocking. IP44.

FCLAP, local access point
Local access point for extra wireless sensors (when operating more than 8 sensors) and extended range for wireless sensors or app control (Bluetooth), incl. 10 m communication cable. IP44.

FCSC/FCBC, cable
FCSC Sensor cable available in 10 or 25 m for extra length. FCBC Communication cable for additional products within the same zone, available in 5, 10 or 25 m.

FCDC, door contact
The door contact regulates the airflow on/off. Allows you to control air curtains at different doorways individually within the same zone.

FCTXRF, indoor/outdoor wireless sensor
Indoor/outdoor wireless sensor with same features as FCRTX and FCOTX. The set up as outdoor or indoor sensor is made by a switch inside the sensor. Range up to 50 m. Battery life: 3-5 years. IP44.

FC Direct

Content
- FCCF control panel
- FCBC05
- FCDC

FC Smart

Content
- FCCF control panel
- FCBC10
- FCDC
- FCLAP

FC Pro

Content
- FCCF control panel
- FCBC10
- FCDC
- FCLAP
- FCTXRF

FC Building - BMS

Content
- FCCF control panel
- FCBC10
- FCDC
- FCBAP building access point

Item number	Type	Description	Dimensions
74684	**FCDA**	FC Direct, first level control system	89x89x26 mm (FCCF)
74694	**FCRTX**	External room temperature sensor	39x39x23 mm
74695	**FCOTX**	Outdoor temperature sensor	39x39x23 mm
74699	**FCLAP**	Local access point for extra wireless sensors and extended range	89x89x26 mm
74718	**FCBC05**	Extra communication cable, 5 m	5 m
74719	**FCBC10**	Extra communication cable, 10 m	10 m
74720	**FCBC25**	Extra communication cable, 25 m	25 m
74721	**FCSC10**	Extra sensor cable, 10 m	10 m
74722	**FCSC25**	Extra sensor cable, 25 m	25 m
17495	**FCDC**	Door contact	
74703	**FCTXRF**	Indoor/outdoor wireless sensor (for FC Smart, FC Pro)	89x89x26 mm

Water control

Water heated units must be supplemented with valves. The valve system controls the water flow and activates maximum heat only when needed. By activating the built-in bypass feature, a small leakage flow is let through to make sure there is always hot water in the heating coil, providing frost protection and faster heating. The return water temperature sensor is making sure that as much energy as possible from the water in the coil is used, thus reducing energy consumption.

VPFC, pressure independent and modulating valve system
Two way pressure independent control and adjustment valve with modulating actuator and shut-off valve.

FCWTA, return water temperature sensor
Enables control of return water temperature and automatic bypass function, which provides extended frost protection and reduced energy consumption.

Item number	Type	DN	Flow range l/s
238293	**VPFC15LF**	DN15	0,012-0,068
238294	**VPFC15NF**	DN15	0,024-0,13
238295	**VPFC20**	DN20	0,058-0,32
238296	**VPFC25**	DN25	0,10-0,60
238297	**VPFC32**	DN32	0,22-1,03
74702	**FCWTA**	Return water temperature sensor	

Accessories - water heated units

FHDN15, flexible hoses
Flexible hoses for easy and practical installation of water heated unit. Used together with water connection kit PAWAK or similar. DN15, inside thread, 90° bend.

PA2EF, external intake filter
Fine mesh filter that prevents ingress of dirt and deposits to water heated units. The filter is easy to attach and remove thanks to the integrated magnetic strips. Makes maintenance easier since the unit does not need to be opened.

PAWAK15, water connection kit
Kit with pipe connections with compression fitting on one end and outside thread (1/2” DN15) on the other to facilitate the connection of the plain copper pipes at the water coil.

Item number	Type	Used for	Consists of
77179	**FHDN15**	PAF2500W	2
14875	**PA2EF10**	PAF2510W	
14876	**PA2EF15**	PAF2515W	
14877	**PA2EF20**	PAF2520W	
27279	**PAWAK**	PAF2500W	

Pamir 2500

Accessories - mounting

PA2PF, ceiling mounting brackets
Mountings for installing the unit in the ceiling using hanging brackets or threaded bars (not included).

PA34TR, threaded bars
Threaded bars for installing unit on to a ceiling. Length 1 m. Used together with ceiling mounting brackets PA2PF.

PA2P, hanging brackets
Hanging brackets for installing the unit suspended from the ceiling. Length 1 m. The hanging brackets are covered by a white plastic trim to cover the cables. The brackets may be cut to shorter length, if required. Used together with ceiling mounting brackets PA2PF.

Item number	Type	Used for	Consists of
19415	**PA2PF15**	PAF2510, PAF2515	4
19417	**PA2PF20**	PAF2520	6
14875	**PA2EF10**	PAF2510W	
14876	**PA2EF15**	PAF2515W	
14877	**PA2EF20**	PAF2520W	
18056	**PA34TR15**	PAF2510, PAF2515	4
18057	**PA34TR20**	PAF2520	6
19568	**PA2P15**	PAF2510, PAF2515	2
19569	**PA2P20**	PAF2520	3

Pamir 3500

Sleek and energy efficient air curtain for commercial premises

Pamir 3500, with a recommended installation height of 3,5 m or width of 5 m, has a modern and sleek design developed to fit all entrances. The air curtain is available for horizontal, vertical and recessed installation. The Pamir series is equipped with energy-efficient EC motors which enable stepless control of the airflow. An easy to open front allows quick access to facilitate both installation and maintenance.

Energy efficient and sustainable

The air curtain is equipped with EC motors that are up to 50% more energy efficient than traditional AC motors, and have a lower weight which makes for easier installations and greener transports.

Intelligent control options

The Pamir series is supplemented with an intelligent control system that allows you to optimize your comfort with minimum effort. Smart and automatic features enable simple set-up and operation for different Frico products groups.

High performance

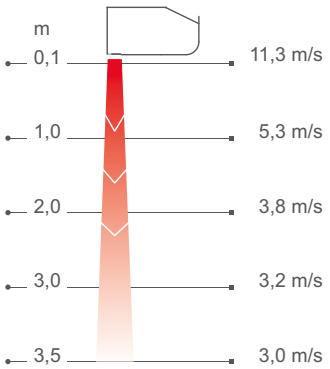
Frico air curtains are developed and manufactured in Sweden. The air curtains are tested in one of the most modern and advanced air and sound laboratories in Europe which means that we can guarantee a high performance product.

Pamir 3500

Available in 3 versions:

- Ambient (without heat)
- Electrical heating
- Water heating

Air velocity profile



Measurements according to ISO 27327-1. Average values for products in the series.

Design and specifications are subject to change without notice.

Pamir 3500

Frico's Thermozone technology optimizes the air curtain

Frico air curtains create an invisible barrier at openings and doors which separates different temperature zones without limiting access for people and vehicles. Thermozone technology creates a highly uniform air barrier with a perfect balance between air volume and air velocity, regardless of whether it is the heat or the cold that you want to keep inside.

Great energy savings

In many premises doors remain open for a significant part of the day, this results in huge losses of expensively heated or cooled air, especially when the temperature difference between outdoor and indoor air is great. With correctly installed air curtains great energy savings can be obtained.

Comfortable indoor climate

Air curtains with Thermozone technology have optimized performance to provide a comfortable indoor climate free from drafts. The air curtain also keeps out emissions and insects.

Low sound level

With Thermozone technology Frico manufactures air curtains with very high airflow performance. This does not just make the air curtain more effective, but also has other advantages such as extremely low sound levels and reduced turbulence.

Create the optimal solution to suit your specific needs

After you selected the air curtain to suit your specific needs (ambient, electrical heating, water heating) and length 1, 1,5, 2, or 2,5 m you assemble your control and accessory options:

Select control system

Choose one of our FC Control systems.

Add valve system

Water heated units must be supplemented with a valve system.

Select mounting options

Horizontal, recessed or vertical installation.

Pamir 3500

Technical specifications

Ambient, no heat - PAFEC3500 A (IP24**)

Voltage motor: 230V~

Item number	Type	Output [kW]	Airflow*1 [m³/h]	Sound power*2 [dB(A)]	Sound pressure*3 [dB(A)]	Amperage motor [A]	Length [mm]	Weight [kg]
189577	**PAFEC3510A**	0	900/1800	75	44/60	2,3	1039	33
189581	**PAFEC3515A**	0	1400/2700	78	46/63	3,2	1549	41,5
189585	**PAFEC3520A**	0	1900/3500	79	47/64	4,1	2039	63
189589	**PAFEC3525A**	0	2350/4400	80	47/65	5,1	2549	71,5

Electrical heat - PAFEC3500 E (IP20)

Item number	Type	Output steps [kW]	Airflow*1 [m³/h]	Δt*4 [°C]	Sound power*2 [dB(A)]	Sound pressure*3 [dB(A)]	Amperage motor [A]	Voltage [V] Amperage [A] (heat)	Length [mm]	Weight [kg]
189576	**PAFEC3510E08**	2,7/5,4/8,1	900/1800	27/13	76	44/60	2,3	400V3~/11,7	1039	37
189580	**PAFEC3515E12**	3,9/7,8/12	1400/2700	26/13	79	46/63	3,2	400V3~/16,9	1549	50
189584	**PAFEC3520E16**	5,4/11/16	1900/3500	25/14	80	47/64	4,1	400V3~/23,4	2039	70
189588	**PAFEC3525E20**	6,6/13/20	2350/4400	25/14	81	47/65	5,1	400V3~/28,6	2549	89

Water heat - PAFEC3500 WL, coil for low water temperature (≤80 °C) (IP24**)

Item number	Type	Output*5 [kW]	Airflow*1 [m³/h]	Δt*4,5 [°C]	Water volume [l]	Sound power*2 [dB(A)]	Sound pressure*3 [dB(A)]	Amperage motor [A]	Length [mm]	Weight [kg]
189579	**PAFEC3510WL**	11	850/1700	24/19	1,5	75	42/59	2,3	1039	42
189583	**PAFEC3515WL**	18	1350/2600	25/20	2,4	77	45/61	3,2	1549	57,5
189587	**PAFEC3520WL**	24	1800/3400	25/21	3,2	78	45/62	4,1	2039	73
189591	**PAFEC3525WL**	31	2250/4300	26/21	4,0	80	47/64	5,1	2549	89,5

Water heat - PAFEC3500 WH, coil for high temperature water (≥80 °C) (IP24**)

Item number	Type	Output*6 [kW]	Airflow*1 [m³/h]	Δt*4,6 [°C]	Water volume [l]	Sound power*2 [dB(A)]	Sound pressure*3 [dB(A)]	Amperage motor [A]	Length [mm]	Weight [kg]
189578	**PAFEC3510WH**	9,9	850/1700	22/17	1,1	75	42/59	2,3	1039	39
189582	**PAFEC3515WH**	15	1350/2600	22/17	1,6	77	45/61	3,2	1549	55,5
189586	**PAFEC3520WH**	21	1800/3400	23/18	2,2	78	45/62	4,1	2039	71
189590	**PAFEC3525WH**	26	2250/4300	23/18	2,7	80	47/64	5,1	2549	84,5

Water heat - PAFEC3500 WLL, coil for very low temperature water (≤60 °C) (IP24**)

Item number	Type	Output*7 [kW]	Airflow*1 [m³/h]	Δt*4,7 [°C]	Water volume [l]	Sound power*2 [dB(A)]	Sound pressure*3 [dB(A)]	Amperage motor [A]	Length [mm]	Weight [kg]
189594	**PAFEC3510WLL**	6,8	800/1600	15/13	2,0	74	42/58	2,3	1039	44
189592	**PAFEC3515WLL**	10	1250/2500	14/12	4,1	76	44/60	3,2	1549	62,5
189593	**PAFEC3520WLL**	15	1700/3300	15/13	5,6	77	44/61	4,1	2039	80
189595	**PAFEC3525WLL**	19	2100/4200	15/13	8,3	79	46/63	5,1	2549	96,5

*1) Low/high airflow (2V/10V).
*2) Sound power (L_{WA}) measurements according to ISO 27327-2: 2014, Installation type E.
*3) Sound pressure (L_{pA}). Conditions: Distance to the unit 5 metres. Directional factor: 2. Equivalent absorption area: 200 m². At low/high airflow (2V/10V).
*4) Δt = temperature rise of passing air at maximum heat output and low/high airflow (2V/10V).
*5) Applicable at water temperature 60/40 °C, air temperature, in +18 °C.
*6) Applicable at water temperature 80/60 °C, air temperature, in +18 °C.
*7) Applicable at water temperature 40/30 °C, air temperature, in +18 °C.
*5,6,7) See www.frico.net for additional calculations.
**) Horizontal mounting and vertical mounting to the right (seen from the inside): IP24.
Vertical mounting to the left (seen from the inside): IP21.

Approved for 220V/1ph/60Hz and 380V/3ph/60Hz. Product performance for 220V/1ph/60Hz and 380V/3ph/60Hz will differ from stated data.

Manufactured in Sweden with a corrosion proof housing made of hot zinc-plate and powder coated steel panels. Front and service hatch are made of powder coated aluminium. Colour front and service hatch: white, RAL 9016. Colour grille, rear section and ends: grey, RAL 7046.

CE

Pamir 3500

Horizontal mounting

Horizontal mounting

The recommended installation height of Pamir 3500 is 3,5 m. The air curtain can be installed on a wall or supended from a ceiling. It can also be installed recessed into suspended ceilings.

When the air curtain is mounted horizontally the outlet air grille must be facing downwards as close to the door as possible. For the protection of wider openings, several units can be mounted next to each other using a joining kit. Design kits which conceals cables, pipes and mountings are available for both wall and ceiling installations.

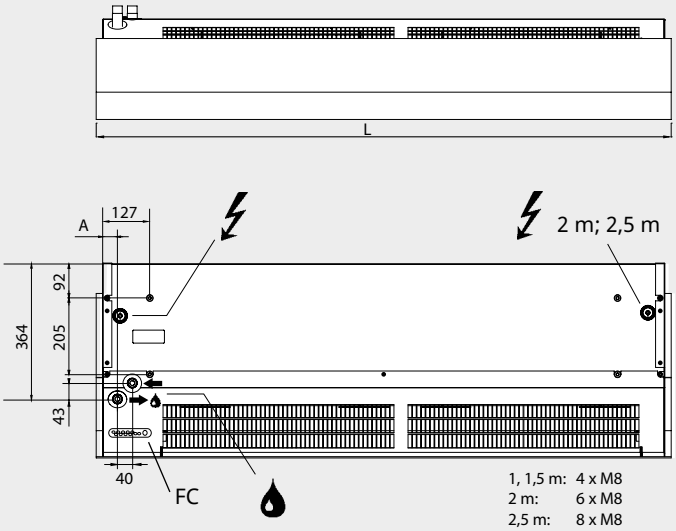
Connection

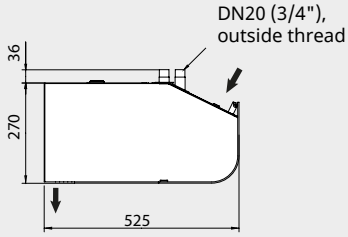
An easy to open front allows quick access to facilitate both installation and maintenance.

The air curtain has an integrated PC board which is connected to the selected external control system FC. Control is supplied by 230V~ to the PC board. The PC board is accessed via cable glands on the top of the unit. Communication- and sensor cables are connected to the PC board.

The electrical connection is made on the top of the unit. Power supply for electrical heated air curtains (400V3~) is routed via the motor compartment.

Water heated units are connected to the water system on top of the unit. Flexible hoses are available as accessories. Water heated units must always be supplemented with a valve kit mounted outside the unit. See Valves and Accessories.

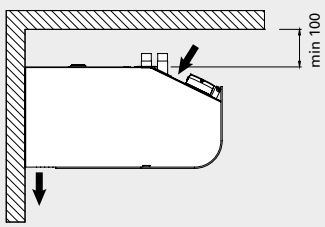




For wiring diagrams and other technical information, please see the manual and www.frico.net.

	L [mm]	A [mm]
PAFEC3510	1039	40
PAFEC3515	1549	40
PAFEC3520	2039	40
PAFEC3525	2549	39

Minimum distances



Minimum distance from outlet to floor for electrically heated units is 1800 mm.

Recommended installation height varies depending on the relevant premises. See www.frico.net for further information.

Pamir 3500

Vertical mounting

Vertical mounting

The recommended installation width of Pamir 3500 is 5 m with air curtains on both sides of the opening. Units from 1,5 metres and longer may be used vertically. They can be reversed and placed on either side of the door.

The air curtain is mounted vertically as close as possible to the door. For the best effect air curtains should be placed on both sides of the opening. Each unit must be supplemented with a vertical kit (accessory) to mount it on the floor and also to mount two units on top of each other for higher entrances. The air curtain must always be secured at the top. The design kit (accessory) is used to hide pipes and cables.

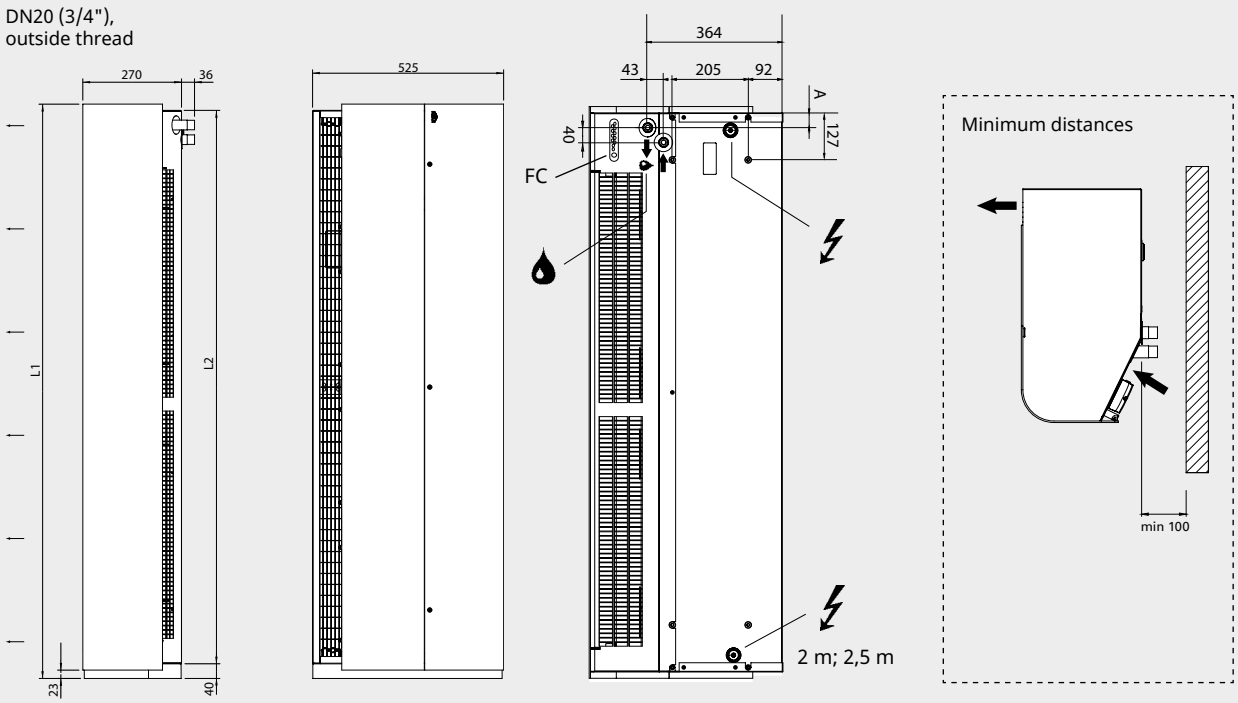
Connection

An easy to open front allows quick access to facilitate both installation and maintenance.

The air curtain has an integrated PC board which is connected to the selected external control system FC. Control is supplied by 230V~ to the PC board. The PC board is accessed via cable glands on the back of the unit. Communication- and sensor cables are connected to the PC board.

The electrical connection is made on the back of the unit. Power supply for electrical heated air curtains (400V3~) is routed via the motor compartment.

Water heated units are connected to the water system on the back of the unit. Flexible hoses are available as accessories. Water heated units must always be supplemented with a valve kit mounted outside the unit. See Valves and Accessories.



	L1 [mm]	L2 [mm]
PAFEC3515	1572	1515
PAFEC3520	2062	2004
PAFEC3525	2572	2515

The unit can be reversed and placed on either side of the door. Connections and PC Board are positioned near floor level when the air curtain is placed to the left of the door and at the top when it is placed to the right (seen from the inside). For wiring diagrams and other technical information, please see the manual and www.frico.net.

Recommended installation width varies depending on the relevant premises. See www.frico.net for further information.

Pamir 3500

FC Control system

Frico air curtains come with an integrated PC-board and are supplemented with the intelligent control system FC of your choice, working together to create many smart and energy saving features. There are four different packages to choose from, depending on your requirements.

FC Direct

Entry level
- *Door contact*
- *Calendar function*
- *Filter timer*
- *Built-in temperature sensor*

FC Smart

FC Direct +
- *Control via app (Bluetooth)*
- *Wireless sensors possible*
- *Adjustable calendar function*
- *Away and Boost function*
- *Adjustable filter timer*
- *Vestibule function*
- *Zone possibility*
- *Enhanced water control possible*

FC Pro

FC Direct + FC Smart +
- *Automatic air flow control*
- *Automatic heat blocking*

FC Building - BMS

FC Direct +
- *0-10V, potential free contact or Modbus*
- *Automatic air flow control**
- *Automatic heat blocking**
- *Heat and fan settings*
- *Alarm indication*
- *Read values*
- *Enhanced water control possible*

** Requires outdoor temp signal*

FC Direct

Entry level control system for a great start. The door contact provides an automatic energy-saving function, as the air curtain becomes active only when the door is open. When the door is closed, it remains on stand-by or runs on a lower fan speed if extra heat is needed. With the calender function, you can choose periods of comfort and reduced mode. The control panel has a built-in temperature sensor, which is used for control when external sensors are not used.

FC Smart

Second level control system for full freedom. FC Smart comes with all features from FC Direct plus additional energy saving features and the possibility of app control (Bluetooth). The app gives you access to all functions in the system, allowing you to set it up exactly the way you want it. It also enables you to create different zones with different settings in a larger system. The app FRICO CONTROL is available for both iOS and Android.

FC Pro

Third level control system for maximum savings. FC Pro comes with all features from FC Direct and FC Smart plus additional automatic energy saving features. By receiving and reacting to information about indoor and outdoor temperatures, the right amount of heat and air flow is added to avoid overshoots and thus reducing energy consumption.

FC Building - BMS system

Comprehensive control system for buildings, with the option to control via 0-10V, potential free contact (e.g. a relay) and/or Modbus RTU (RS485). FC Building enables you to receive product information status and alarms. Modbus allows for full use of all the energy saving features within the control system.

Item number	Type	Description
74684	**FCDA**	FC Direct, first level control system
74685	**FCSA**	FC Smart, second level control system
74686	**FCPA**	FC Pro, third level control system
74687	**FCBA**	FC Building, BMS system

Pamir 3500

Control system content and accessories

FC Control system helps to create many smart and energy saving features. In addition to our four packages, components can be added to expand and customize the system. With the app levels (FC Smart and FC Pro) it is also possible to create and control different zones. Each added zone needs to be equipped with one FC Direct and can be designed to fit its specific needs by adding different accessories.

FC Direct, control kit
Control panel for fan and heat, door contact and 5 m communication cable. Used for additional zones with FC Smart and FC Pro. IP44.

FCRTX, external room temperature sensor
For reading of the room temperature on another location than that of the control panel, incl. 10 m sensor cable. IP20.

FCOTX, outdoor temperature sensor
Reading the outdoor temperature, incl. 10 m sensor cable. Enables automatic air curtain control and heat blocking. IP44.

FCLAP, local access point
Local access point for extra wireless sensors (when operating more than 8 sensors) and extended range for wireless sensors or app control (Bluetooth), incl. 10 m communication cable. IP44.

FCSC/FCBC, cable
FCSC Sensor cable available in 10 or 25 m for extra length. FCBC Communication cable for additional products within the same zone, available in 5, 10 or 25 m.

FCDC, door contact
The door contact regulates the airflow on/off. Allows you to control air curtains at different doorways individually within the same zone.

FCTXRF, indoor/outdoor wireless sensor
Indoor/outdoor wireless sensor with same features as FCRTX and FCOTX. The set up as outdoor or indoor sensor is made by a switch inside the sensor. Range up to 50 m. Battery life: 3-5 years. IP44.

FC Direct

Content

- *FCCF control panel*
- *FCBC05*
- *FCDC*

FC Smart

Content

- FCCF control panel
- FCBC10
- FCDC
- FCLAP

FC Pro

Content

- FCCF control panel
- FCBC10
- FCDC
- FCLAP
- FCTXRF

FC Building - BMS

Content

- FCCF control panel
- FCBC10
- FCDC
- FCBAP building access point

Item number	Type	Description	Dimensions
74684	**FCDA**	FC Direct, first level control system	89x89x26 mm (FCCF)
74694	**FCRTX**	External room temperature sensor	39x39x23 mm
74695	**FCOTX**	Outdoor temperature sensor	39x39x23 mm
74699	**FCLAP**	Local access point for extra wireless sensors and extended range	89x89x26 mm
74718	**FCBC05**	Extra communication cable, 5 m	5 m
74719	**FCBC10**	Extra communication cable, 10 m	10 m
74720	**FCBC25**	Extra communication cable, 25 m	25 m
74721	**FCSC10**	Extra sensor cable, 10 m	10 m
74722	**FCSC25**	Extra sensor cable, 25 m	25 m
17495	**FCDC**	Door contact	
74703	**FCTXRF**	Indoor/outdoor wireless sensor (for FC Smart, FC Pro)	89x89x26 mm

Pamir 3500

Water control

Water heated units must be supplemented with valves. The valve system controls the water flow and activates maximum heat only when needed. By activating the built-in bypass feature, a small leakage flow is let through to make sure there is always hot water in the heating coil, providing frost protection and faster heating. The return water temperature sensor is making sure that as much energy as possible from the water in the coil is used, thus reducing energy consumption.

VPFC, pressure independent and modulating valve system
Two way pressure independent control and adjustment valve with modulating actuator and shut-off valve.

FCWTA, return water temperature sensor
Enables control of return water temperature and automatic bypass function, which provides extended frost protection and reduced energy consumption.

Item number	Type	DN	Flow range l/s
238293	**VPFC15LF**	DN15	0,012-0,068
238294	**VPFC15NF**	DN15	0,024-0,13
238295	**VPFC20**	DN20	0,058-0,32
238296	**VPFC25**	DN25	0,10-0,60
238297	**VPFC32**	DN32	0,22-1,03
74702	**FCWTA**	Return water temperature sensor	

Accessories - water heated units

FHDN20, flexible hoses
Flexible hoses for easy and practical installation of water heated unit. FHDN20: length 350 mm. FHDN2010: length 1 m. DN20, inside thread, 90° bend.

PA34EF, external intake filter
Fine mesh filter that prevents ingress of dirt and deposits to water heated units. The filter is easy to attach and remove thanks to the integrated magnetic strips. Makes maintenance easier since the unit does not need to be opened.

DTV200S, filter pressure guard
Measures the differential pressure, which indicates how dirty the filter is in water heated units. The metering hose is connected to the suction side of the unit (after the filter). Adjustment is performed on site depending on the unit and the environment. Adjustable range 20-300 Pa. Potential free, changeover alarm contact.

Item number	Type	Used for	Consists of
18055	**FHDN20**	PAFECW3510/3515/3520/3525	2
88906	**FHDN2010**	PAFECW3510/3515/3520/3525	2
19064	**PA34EF10**	PAFECW3510	1
19065	**PA34EF15**	PAFECW3515	1
19066	**PA34EF20**	PAFECW3520	1
19067	**PA34EF25**	PAFECW3525	1
17597	**DTV200S**	PAFECW3510/3515/3520/3525	1

Pamir 3500

Accessories - horizontal mounting

PA34WB/PAWBL, wall brackets
Brackets for installing unit horizontally on a wall. PAWBL is used when the unit must be mounted further out from the wall. PA34WB: length 400 mm, PAWBL: length 560 mm.

PA34CB, ceiling brackets
Ceiling brackets for installing the unit from the ceiling using wires or threaded bars (not included). Best combined with vibration dampers (PA34VD) when using threaded bars.

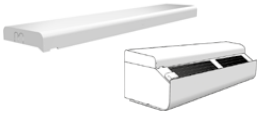
PA34WS, wire suspension kit
Galvanized wires with wire locks to secure the unit from the ceiling. Length 3 m. Used together with ceiling brackets (PA34CB).

PA34TR, threaded bars
Threaded bars for installing unit on to a ceiling. Length 1 m. Used together with ceiling brackets (PA34CB). Supplemented with vibration dampers (PA34VD) for reduced vibration.

PA34VD, vibration dampers
Reduces vibrations for ceiling installations with threaded bars.

PA3JK, joining kit
Used to join horizontal units together for a sleek and unified installation. Consists of joint bracket and mounting parts.

PA3XT, outlet extension
Outlet extension with telescopic function. Used for recessed installation of units in suspended ceilings. 130-200 mm.



PA3DW, design kit for wall mounting
Used to conceal mountings, cables and pipes. Used together with ceiling brackets PA34WB.

PA3DC, design kit for ceiling mounting
Used to conceal mountings, cables and pipes. The design kit has a telescope function that can be adapted for the installation. It can also be extended with one or more extension parts. Two design kits are required for 1 and 1.5 metre units, while 2 metre units need three kits and 2.5 metre units need four kits. Avaliable in: small 200-300 mm, medium 300-500 mm, large 500-900 mm, extension 420 mm.

Item number	Type	Used for	Consists of
18044	**PA34WB15**	PAFEC3510/3515	2
18045	**PA34WB20**	PAFEC3520	3
18046	**PA34WB30**	PAFEC3525	4
214951	**PAWBL15**	PAFEC3510/3515	2
214952	**PAWBL20**	PAFEC3520	3
214953	**PAWBL30**	PAFEC3525	4
18059	**PA34CB15**	PAFEC3510/3515	4
18060	**PA34CB20**	PAFEC3520	6
18061	**PA34CB30**	PAFEC3525	8
18062	**PA34WS15**	PAFEC3510/3515	4
18063	**PA34WS20**	PAFEC3520	6
18064	**PA34WS30**	PAFEC3525	8
18056	**PA34TR15**	PAFEC3510/3515	4
18057	**PA34TR20**	PAFEC3520	6
18058	**PA34TR30**	PAFEC3525	8
18065	**PA34VD15**	PAFEC3510/3515	4

Item number	Type	Used for	Consists of
18066	**PA34VD20**	PAFEC3520	6
18067	**PA34VD30**	PAFEC3525	8
110759	**PA3JK**	PAFEC3500	1
19085	**PA3XT10**	PAFEC3510	1
19086	**PA3XT15**	PAFEC3515	1
19087	**PA3XT20**	PAFEC3520	1
19088	**PA3XT25**	PAFEC3525	1
110834	**PA3DW10**	PAFEC3510	1
110835	**PA3DW15**	PAFEC3515	1
110836	**PA3DW20**	PAFEC3520	1
110837	**PA3DW25**	PAFEC3525	1
13552	**PADCS**	PAFEC3500	1
13553	**PA3DCM**	PAFEC3500	1
13555	**PA3DCL**	PAFEC3500	1
13556	**PA3DXT**	PAFEC3500	1

Accessories - vertical mounting

PA3JK, vertical kit
Used to adapt a horizontal unit for vertical installation. Includes floor frame and mounting parts to support the top. Vertical kit allows two units to be installed on top of each other. One vertical kit is needed per unit.

AXP300, collision protection
Floor placed protection against impact from e.g. shopping trolleys.

PA3VDW, design kit for vertical mounting
Used to conceal cables and pipes.

PA3HE, extension hood
Fills the space between the unit and the ceiling for vertical mounting and provides a neater installation. Height 100-2000 mm. State distance between the top of the air curtain and the ceiling when ordering. A vertical kit is included. PA3HEVDW: extension hood for units with design kit.

Item number	Type	Used for	Consists of
110759	**PA3JK**	PAFEC3510/3515/3520/3525	1
10028	**AXP300**	PAFEC3510/3515/3520/3525	1
110751	**PA3VDW15**	PAFEC3515	1
110752	**PA3VDW20**	PAFEC3520	1
110753	**PA3VDW25**	PAFEC3525	1
FE10244	**PA3HE**	PAFEC3510/3515/3520/3525	1
FE10246	**PA3HEVDW**	PAFEC3510/3515/3520/3525	1

Vertical mounted Pamir 3500 with a design kit used to hide pipes and cables.

Pamir 4200

Stylish and energy efficient air curtain for large commercial premises

Pamir 4200, with a recommended installation height of 4,2 m or width of 6 m, has a modern and sleek design developed to fit all entrances. The air curtain is available for horizontal, vertical and recessed installation. The Pamir series is equipped with energy-efficient EC motors which enable stepless control of the airflow. An easy to open front allows quick access to facilitate both installation and maintenance.

Energy efficient and sustainable

The air curtain is equipped with EC motors that are up to 50% more energy efficient than traditional AC motors, and have a lower weight which makes for easier installations and greener transports.

Intelligent control options

The Pamir series is supplemented with an intelligent control system that allows you to optimize your comfort with minimum effort. Smart and automatic features enable simple set-up and operation for different Frico products groups.

High performance

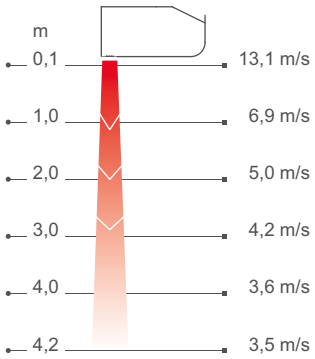
Frico air curtains are developed and manufactured in Sweden. The air curtains are tested in one of the most modern and advanced air and sound laboratories in Europe which means that we can guarantee a high performance product.

Pamir 4200

Available in 3 versions:

- Ambient (without heat)
- Electrical heating
- Water heating

Air velocity profile



Measurements according to ISO 27327-1. Average values for products in the series.

Design and specifications are subject to change without notice.

Pamir 4200

Frico's Thermozone technology optimizes the air curtain

Frico air curtains create an invisible barrier at openings and doors which separates different temperature zones without limiting access for people and vehicles. Thermozone technology creates a highly uniform air barrier with a perfect balance between air volume and air velocity, regardless of whether it is the heat or the cold that you want to keep inside.

Great energy savings

In many premises doors remain open for a significant part of the day, this results in huge losses of expensively heated or cooled air, especially when the temperature difference between outdoor and indoor air is great. With correctly installed air curtains great energy savings can be obtained.

Comfortable indoor climate

Air curtains with Thermozone technology have optimized performance to provide a comfortable indoor climate free from drafts. The air curtain also keeps out emissions and insects.

Low sound level

With Thermozone technology Frico manufactures air curtains with very high airflow performance. This does not just make the air curtain more effective, but also has other advantages such as extremely low sound levels and reduced turbulence.

Create the optimal solution to suit your specific needs

After you selected the air curtain to suit your specific needs (ambient, electrical heating, water heating) and length 1, 1,5, 2, or 2,5 m you assemble your control and accessory options:

Select control system

Choose one of our FC Control systems.

Add valve system

Water heated units must be supplemented with a valve system.

Select mounting options

Horizontal, recessed or vertical installation.

Pamir 4200

Technical specifications

Ambient, no heat - PAFEC4200 A (IP24**)

Voltage motor: 230V~

Item number	Type	Output [kW]	Airflow*1 [m³/h]	Sound power*2 [dB(A)]	Sound pressure*3 [dB(A)]	Amperage motor [A]	Length [mm]	Weight [kg]
230355	**PAFEC4210A**	0	1200/2400	78	46/62	3,2	1039	43
230360	**PAFEC4215A**	0	1800/3500	79	47/64	4,1	1549	57
230365	**PAFEC4220A**	0	2300/4700	81	48/65	6,0	2039	76
230370	**PAFEC4225A**	0	3100/6150	83	50/67	6,9	2549	92

Electrical heat - PAFEC4200 E (IP20)

Item number	Type	Output steps [kW]	Airflow*1 [m³/h]	Δt*4 [°C]	Sound power*2 [dB(A)]	Sound pressure*3 [dB(A)]	Amperage motor [A]	Voltage [V] Amperage [A] (heat)	Length [mm]	Weight [kg]
230356	**PAFEC4210E12**	3,9/7,8/12	1200/2400	30/15	78	46/62	3,2	400V3~/16,9	1039	44
230361	**PAFEC4215E18**	6,0/12/18	1800/3500	30/15	80	47/64	4,1	400V3~/26	1549	64
230366	**PAFEC4220E24**	7,8/16/24	2300/4700	30/15	81	48/65	6,0	400V3~/33,8	2039	85
230371	**PAFEC4225E30**	9,9/20/30	3100/6150	29/15	83	50/67	6,9	400V3~/42,9	2549	100

Water heat - PAFEC4200 WL, coil for low water temperature (≤80 °C) (IP24**)

Item number	Type	Output*5 [kW]	Airflow*1 [m³/h]	Δt*4,5 [°C]	Water volume [l]	Sound power*2 [dB(A)]	Sound pressure*3 [dB(A)]	Amperage motor [A]	Length [mm]	Weight [kg]
230358	**PAFEC4210WL**	15	1100/2300	24/19	1,9	78	45/62	3,2	1039	50
230363	**PAFEC4215WL**	23	1700/3400	25/20	3,0	80	46/64	4,1	1549	66
230368	**PAFEC4220WL**	32	2200/4600	25/20	4,1	81	47/65	6,0	2039	91
230373	**PAFEC4225WL**	41	2800/5750	26/21	5,2	83	49/67	6,9	2549	110

Water heat - PAFEC4200 WH, coil for high temperature water (≥80 °C) (IP24**)

Item number	Type	Output*6 [kW]	Airflow*1 [m³/h]	Δt*4,6 [°C]	Water volume [l]	Sound power*2 [dB(A)]	Sound pressure*3 [dB(A)]	Amperage motor [A]	Length [mm]	Weight [kg]
230357	**PAFEC4210WH**	13	1100/2300	22/17	1,3	78	45/62	3,2	1039	49
230362	**PAFEC4215WH**	19	1700/3400	22/17	2,0	80	46/64	4,1	1549	66
230367	**PAFEC4220WH**	27	2200/4600	23/18	2,7	81	47/65	6,0	2039	88
230372	**PAFEC4225WH**	33	2800/5750	22/17	3,8	83	49/67	6,9	2549	106

Water heat - PAFEC4200 WLL, coil for very low temperature water (≤60 °C) (IP24**)

Item number	Type	Output*7 [kW]	Airflow*1 [m³/h]	Δt*4,7 [°C]	Water volume [l]	Sound power*2 [dB(A)]	Sound pressure*3 [dB(A)]	Amperage motor [A]	Length [mm]	Weight [kg]
230359	**PAFEC4210WLL**	9,3	1000/2200	15/12	2,5	77	45/61	3,2	1039	53
230364	**PAFEC4215WLL**	14	1600/3300	15/13	4,7	79	46/63	4,1	1549	73
230369	**PAFEC4220WLL**	19	2100/4450	15/13	7,5	80	46/64	6,0	2039	99
230374	**PAFEC4225WLL**	24	2700/5600	15/13	9,6	82	48/66	6,9	2549	120

*1) Low/high airflow (2V/10V).
*2) Sound power (L_{WA}) measurements according to ISO 27327-2: 2014, Installation type E.
*3) Sound pressure (L_{pA}). Conditions: Distance to the unit 5 metres. Directional factor: 2. Equivalent absorption area: 200 m². At low/high airflow (2V/10V).
*4) Δt = temperature rise of passing air at maximum heat output and low/high airflow (2V/10V).
*5) Applicable at water temperature 60/40 °C, air temperature, in +18 °C.
*6) Applicable at water temperature 80/60 °C, air temperature, in +18 °C.
*7) Applicable at water temperature 40/30 °C, air temperature, in +18 °C.
*5,6,7) See www.frico.net for additional calculations.
**) Horizontal mounting and vertical mounting to the right (seen from the inside): IP24.
Vertical mounting to the left (seen from the inside): IP21.

Approved for 220V/1ph/60Hz and 380V/3ph/60Hz. Product performance for 220V/1ph/60Hz and 380V/3ph/60Hz will differ from stated data.

Manufactured in Sweden with a corrosion proof housing made of hot zinc-plate and powder coated steel panels. Front and service hatch are made of powder coated aluminium. Colour front and service hatch: white, RAL 9016. Colour grille, rear section and ends: grey, RAL 7046.

CE

Pamir 4200

Horizontal mounting

Horizontal mounting

The recommended installation height of Pamir 4200 is 4,2 m. The air curtain can be installed on a wall or supended from a ceiling. It can also be installed recessed into suspended ceilings.

When the air curtain is mounted horizontally the outlet air grille must be facing downwards as close to the door as possible. For the protection of wider openings, several units can be mounted next to each other using a joining kit. Design kits which conceals cables, pipes and mountings are available for both wall and ceiling installations.

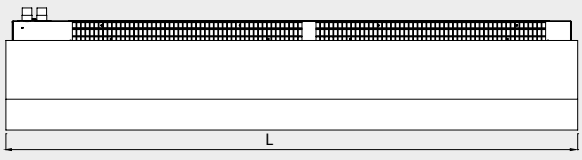
Connection

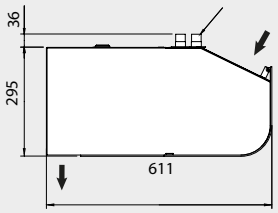
An easy to open front allows quick access to facilitate both installation and maintenance.

The air curtain has an integrated PC board which is connected to the selected external control system FC. Control is supplied by 230V~ to the PC board. The PC board is accessed via cable glands on the top of the unit. Communication- and sensor cables are connected to the PC board.

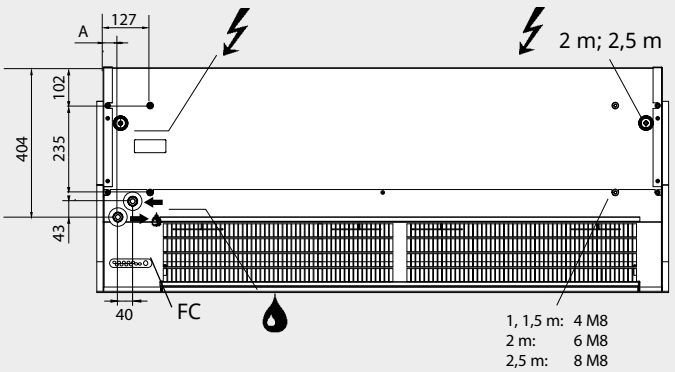
The electrical connection is made on the top of the unit. Power supply for electrical heated air curtains (400V3~) is routed via the motor compartment.

Water heated units are connected to the water system on top of the unit. Flexible hoses are available as accessories. Water heated units must always be supplemented with a valve kit mounted outside the unit. See Valves and Accessories.





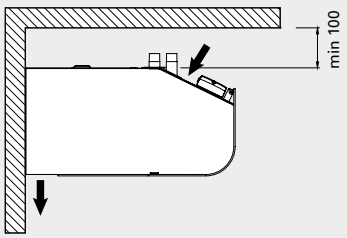
DN20 (3/4"), outside thread



For wiring diagrams and other technical information, please see the manual and www.frico.net.

	L [mm]	A [mm]
PAFEC4210	1039	40
PAFEC4215	1549	40
PAFEC4220	2039	40
PAFEC4225	2549	39

Minimum distances



Minimum distance from outlet to floor for electrically heated units is 1800 mm.

Recommended installation height varies depending on the relevant premises. See www.frico.net for further information.

Pamir 4200

Vertical mounting

Vertical mounting

The recommended installation width of Pamir 4200 is 6 m with air curtains on both sides of the opening. Units from 1,5 metres and longer may be used vertically. They can be reversed and placed on either side of the door.

The air curtain is mounted vertically as close as possible to the door. For the best effect air curtains should be placed on both sides of the opening. Each unit must be supplemented with a vertical kit (accessory) to mount it on the floor and also to mount two units on top of each other for higher entrances. The air curtain must always be secured at the top. The design kit (accessory) is used to hide pipes and cables.

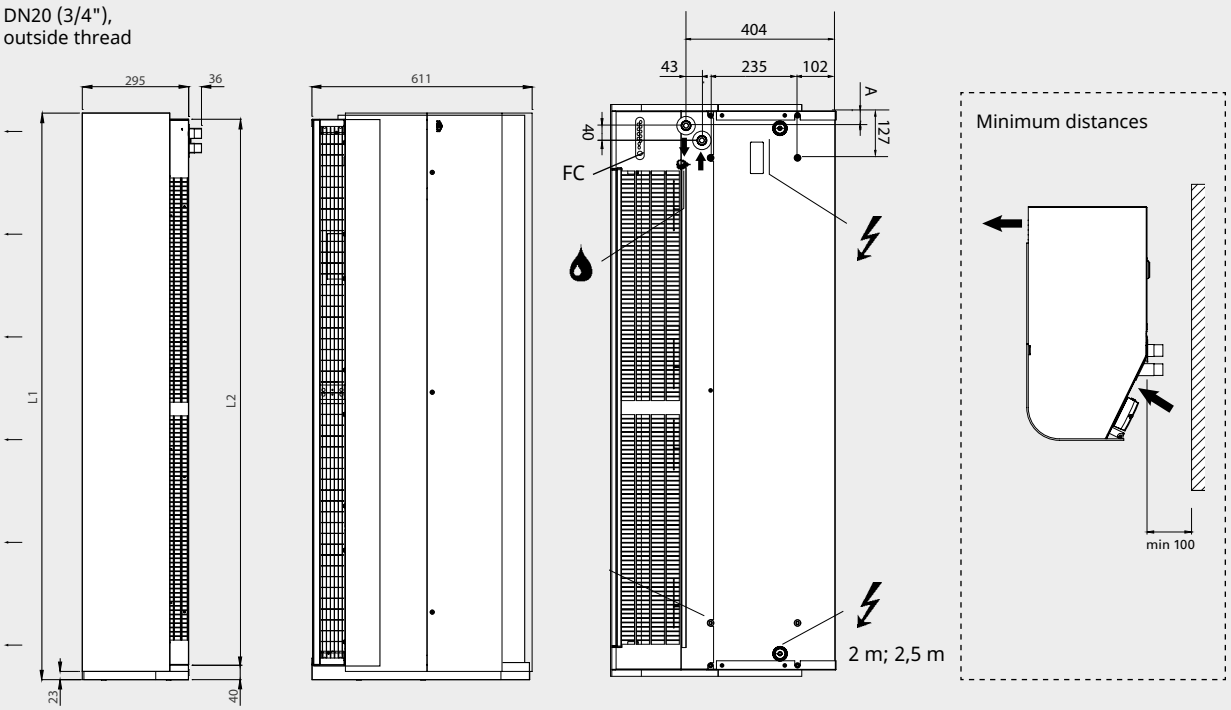
Connection

An easy to open front allows quick access to facilitate both installation and maintenance.

The air curtain has an integrated PC board which is connected to the selected external control system FC. Control is supplied by 230V~ to the PC board. The PC board is accessed via cable glands on the back of the unit. Communication- and sensor cables are connected to the PC board.

The electrical connection is made on the back of the unit. Power supply for electrical heated air curtains (400V3~) is routed via the motor compartment.

Water heated units are connected to the water system on the back of the unit. Flexible hoses are available as accessories. Water heated units must always be supplemented with a valve kit mounted outside the unit. See Valves and Accessories.



	L1 [mm]	L2 [mm]
PAFEC4215	1572	1515
PAFEC4220	2062	2004
PAFEC4225	2572	2515

The unit can be reversed and placed on either side of the door. Connections and PC Board are positioned near floor level when the air curtain is placed to the left of the door and at the top when it is placed to the right (seen from the inside). For wiring diagrams and other technical information, please see the manual and www.frico.net.

Recommended installation width varies depending on the relevant premises. See www.frico.net for further information.

Pamir 4200

FC Control system

Frico air curtains come with an integrated PC-board and are supplemented with the intelligent control system FC of your choice, working together to create many smart and energy saving features. There are four different packages to choose from, depending on your requirements.

FC Direct

Entry level

- *Door contact*
- *Calendar function*
- *Filter timer*
- *Built-in temperature sensor*

FC Smart

FC Direct +

- *Control via app (Bluetooth)*
- *Wireless sensors possible*
- *Adjustable calendar function*
- *Away and Boost function*
- *Adjustable filter timer*
- *Vestibule function*
- *Zone possibility*
- *Enhanced water control possible*

FC Pro

FC Direct + FC Smart +

- *Automatic air flow control*
- *Automatic heat blocking*

FC Building - BMS

FC Direct +

- *0-10V, potential free contact or Modbus*
- *Automatic air flow control**
- *Automatic heat blocking**
- *Heat and fan settings*
- *Alarm indication*
- *Read values*
- *Enhanced water control possible*

** Requires outdoor temp signal*

FC Direct

Entry level control system for a great start. The door contact provides an automatic energy-saving function, as the air curtain becomes active only when the door is open. When the door is closed, it remains on stand-by or runs on a lower fan speed if extra heat is needed. With the calender function, you can choose periods of comfort and reduced mode. The control panel has a built-in temperature sensor, which is used for control when external sensors are not used.

FC Smart

Second level control system for full freedom. FC Smart comes with all features from FC Direct plus additional energy saving features and the possibility of app control (Bluetooth). The app gives you access to all functions in the system, allowing you to set it up exactly the way you want it. It also enables you to create different zones with different settings in a larger system. The app FRICO CONTROL is available for both iOS and Android.

FC Pro

Third level control system for maximum savings. FC Pro comes with all features from FC Direct and FC Smart plus additional automatic energy saving features. By receiving and reacting to information about indoor and outdoor temperatures, the right amount of heat and air flow is added to avoid overshoots and thus reducing energy consumption.

FC Building - BMS system

Comprehensive control system for buildings, with the option to control via 0-10V, potential free contact (e.g. a relay) and/or Modbus RTU (RS485). FC Building enables you to receive product information status and alarms. Modbus allows for full use of all the energy saving features within the control system.

Item number	Type	Description
74684	**FCDA**	FC Direct, first level control system
74685	**FCSA**	FC Smart, second level control system
74686	**FCPA**	FC Pro, third level control system
74687	**FCBA**	FC Building, BMS system

Pamir 4200

Control system content and accessories

FC Control system helps to create many smart and energy saving features. In addition to our four packages, components can be added to expand and customize the system. With the app levels (FC Smart and FC Pro) it is also possible to create and control different zones. Each added zone needs to be equipped with one FC Direct and can be designed to fit its specific needs by adding different accessories.

FC Direct, control kit
Control panel for fan and heat, door contact and 5 m communication cable. Used for additional zones with FC Smart and FC Pro. IP44.

FCRTX, external room temperature sensor
For reading of the room temperature on another location than that of the control panel, incl. 10 m sensor cable. IP20.

FCOTX, outdoor temperature sensor
Reading the outdoor temperature, incl. 10 m sensor cable. Enables automatic air curtain control and heat blocking. IP44.

FCLAP, local access point
Local access point for extra wireless sensors (when operating more than 8 sensors) and extended range for wireless sensors or app control (Bluetooth), incl. 10 m communication cable. IP44.

FCSC/FCBC, cable
FCSC Sensor cable available in 10 or 25 m for extra length. FCBC Communication cable for additional products within the same zone, available in 5, 10 or 25 m.

FCDC, door contact
The door contact regulates the airflow on/off. Allows you to control air curtains at different doorways individually within the same zone.

FCTXRF, indoor/outdoor wireless sensor
Indoor/outdoor wireless sensor with same features as FCRTX and FCOTX. The set up as outdoor or indoor sensor is made by a switch inside the sensor. Range up to 50 m. Battery life: 3-5 years. IP44.

FC Direct

Content
- *FCCF control panel*
- *FCBC05*
- *FCDC*

FC Smart

Content
- *FCCF control panel*
- *FCBC10*
- *FCDC*
- *FCLAP*

FC Pro

Content
- *FCCF control panel*
- *FCBC10*
- *FCDC*
- *FCLAP*
- *FCTXRF*

FC Building - BMS

Content
- *FCCF control panel*
- *FCBC10*
- *FCDC*
- *FCBAP building access point*

Item number	Type	Description	Dimensions
74684	**FCDA**	FC Direct, first level control system	89x89x26 mm (FCCF)
74694	**FCRTX**	External room temperature sensor	39x39x23 mm
74695	**FCOTX**	Outdoor temperature sensor	39x39x23 mm
74699	**FCLAP**	Local access point for extra wireless sensors and extended range	89x89x26 mm
74718	**FCBC05**	Extra communication cable, 5 m	5 m
74719	**FCBC10**	Extra communication cable, 10 m	10 m
74720	**FCBC25**	Extra communication cable, 25 m	25 m
74721	**FCSC10**	Extra sensor cable, 10 m	10 m
74722	**FCSC25**	Extra sensor cable, 25 m	25 m
17495	**FCDC**	Door contact	
74703	**FCTXRF**	Indoor/outdoor wireless sensor (for FC Smart, FC Pro)	89x89x26 mm

Pamir 4200

Water control

Water heated units must be supplemented with valves. The valve system controls the water flow and activates maximum heat only when needed. By activating the built-in bypass feature, a small leakage flow is let through to make sure there is always hot water in the heating coil, providing frost protection and faster heating. The return water temperature sensor is making sure that as much energy as possible from the water in the coil is used, thus reducing energy consumption.

VPFC, pressure independent and modulating valve system
Two way pressure independent control and adjustment valve with modulating actuator and shut-off valve.

FCWTA, return water temperature sensor
Enables control of return water temperature and automatic bypass function, which provides extended frost protection and reduced energy consumption.

Item number	Type	DN	Flow range l/s
238293	**VPFC15LF**	DN15	0,012-0,068
238294	**VPFC15NF**	DN15	0,024-0,13
238295	**VPFC20**	DN20	0,058-0,32
238296	**VPFC25**	DN25	0,10-0,60
238297	**VPFC32**	DN32	0,22-1,03
74702	**FCWTA**	Return water temperature sensor	

Accessories - water heated units

FHDN20, flexible hoses
Flexible hoses for easy and practical installation of water heated unit. FHDN20: length 350 mm. FHDN2010: length 1 m. DN20, inside thread, 90° bend.

PA34EF, external intake filter
Fine mesh filter that prevents ingress of dirt and deposits to water heated units. The filter is easy to attach and remove thanks to the integrated magnetic strips. Makes maintenance easier since the unit does not need to be opened.

DTV200S, filter pressure guard
Measures the differential pressure, which indicates how dirty the filter is in water heated units. The metering hose is connected to the suction side of the unit (after the filter). Adjustment is performed on site depending on the unit and the environment. Adjustable range 20-300 Pa. Potential free, changeover alarm contact.

Item number	Type	Used for	Consists of
18055	**FHDN20**	PAFECW4210/4215/4220/4225	2
88906	**FHDN2010**	PAFECW4210/4215/4220/4225	2
19064	**PA34EF10**	PAFECW4210	1
19065	**PA34EF15**	PAFECW4215	1
19066	**PA34EF20**	PAFECW4220	1
19067	**PA34EF25**	PAFECW4225	1
17597	**DTV200S**	PAFECW4210/4215/4220/4225	1

Pamir 4200

Accessories - horizontal mounting

PA34WB/PAWBL, wall brackets
Brackets for installing unit horizontally on a wall. PAWBL is used when the unit must be mounted further out from the wall. PA34WB: length 400 mm, PAWBL: length 560 mm.

PA34CB, ceiling brackets
Ceiling brackets for installing the unit from the ceiling using wires or threaded bars (not included). Best combined with vibration dampers (PA34VD) when using threaded bars.

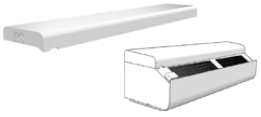
PA34WS, wire suspension kit
Galvanized wires with wire locks to secure the unit from the ceiling. Length 3 m. Used together with ceiling brackets (PA34CB).

PA34TR, threaded bars
Threaded bars for installing unit on to a ceiling. Length 1 m. Used together with ceiling brackets (PA34CB). Supplemented with vibration dampers (PA34VD) for reduced vibration.

PA34VD, vibration dampers
Reduces vibrations for ceiling installations with threaded bars.

PA4JK, joining kit
Used to join horizontal units together for a sleek and unified installation. Consists of joint bracket and mounting parts.

PA4XT, outlet extension
Outlet extension with telescopic function. Used for recessed installation of units in suspended ceilings. 130-200 mm.



PA4DW, design kit for wall mounting
Used to conceal mountings, cables and pipes. Used together with ceiling brackets PA34WB.

PA4DC, design kit for ceiling mounting
Used to conceal mountings, cables and pipes. The design kit has a telescope function that can be adapted for the installation. It can also be extended with one or more extension parts. Two design kits are required for 1 and 1.5 metre units, while 2 metre units need three kits and 2.5 metre units need four kits. Avaliable in: small 200-300 mm, medium 300-500 mm, large 500-900 mm, extension 420 mm.

Item number	Type	Used for	Consists of
18044	**PA34WB15**	PAFEC4210/4215	2
18045	**PA34WB20**	PAFEC4220	3
18046	**PA34WB30**	PAFEC4225	4
214951	**PAWBL15**	PAFEC4210/4215	2
214952	**PAWBL20**	PAFEC4220	3
214953	**PAWBL30**	PAFEC4225	4
18059	**PA34CB15**	PAFEC4210/4215	4
18060	**PA34CB20**	PAFEC4220	6
18061	**PA34CB30**	PAFEC4225	8
18062	**PA34WS15**	PAFEC4210/4215	4
18063	**PA34WS20**	PAFEC4220	6
18064	**PA34WS30**	PAFEC4225	8
18056	**PA34TR15**	PAFEC4210/4215	4
18057	**PA34TR20**	PAFEC4220	6
18058	**PA34TR30**	PAFEC4225	8
18065	**PA34VD15**	PAFEC4210/4215	4

Item number	Type	Used for	Consists of
18066	**PA34VD20**	PAFEC4220	6
18067	**PA34VD30**	PAFEC4225	8
110760	**PA4JK**	PAFEC4200	1
19090	**PA4XT10**	PAFEC4210	1
19091	**PA4XT15**	PAFEC4215	1
19092	**PA4XT20**	PAFEC4220	1
19093	**PA4XT25**	PAFEC4225	1
110838	**PA4DW10**	PAFEC4210	1
110839	**PA4DW15**	PAFEC4215	1
110840	**PA4DW20**	PAFEC4220	1
110841	**PA4DW25**	PAFEC4225	1
13557	**PA4DCS**	PAFEC4200	1
13559	**PA4DCM**	PAFEC4200	1
13560	**PA4DCL**	PAFEC4200	1
13561	**PA4DXT**	PAFEC4200	1

Accessories - vertical mounting

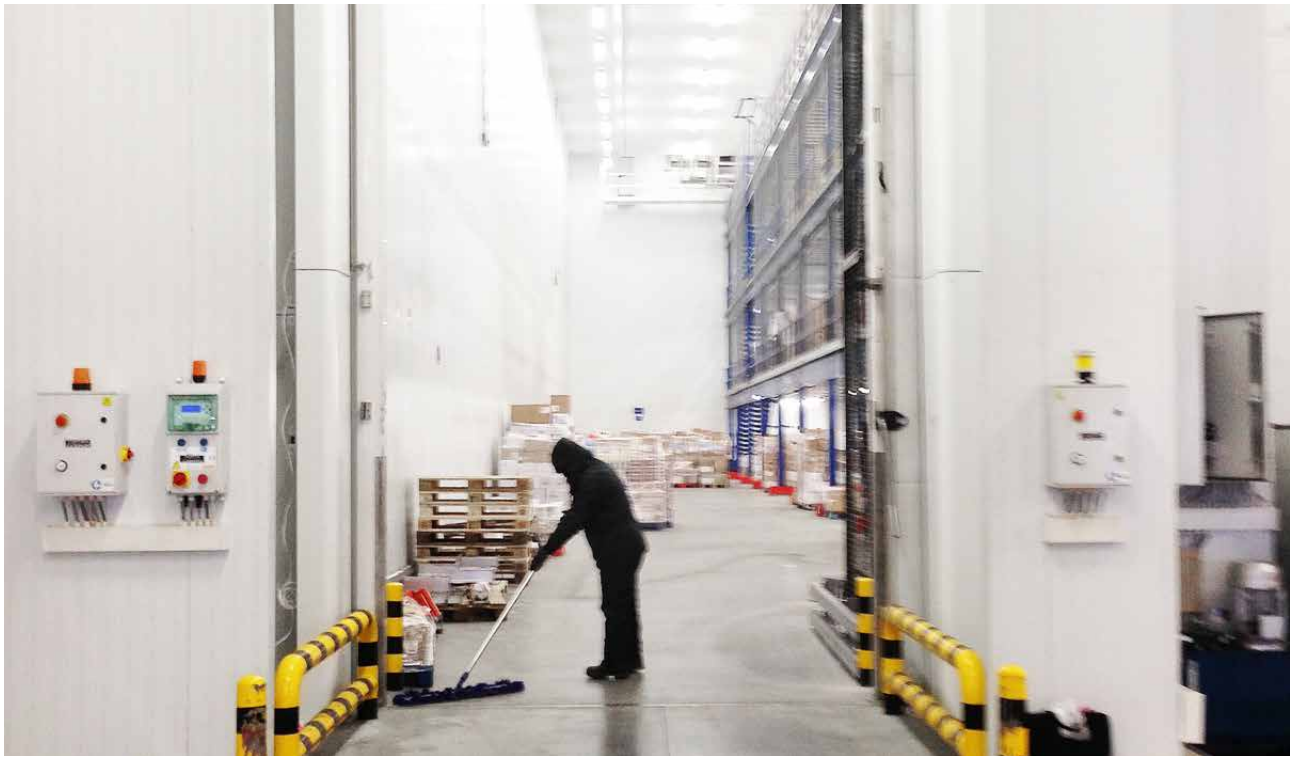
PA4JK, vertical kit
Used to adapt a horizontal unit for vertical installation. Includes floor frame and mounting parts to support the top. Vertical kit allows two units to be installed on top of each other. One vertical kit is needed per unit.

AXP300, collision protection
Floor placed protection against impact from e.g. shopping trolleys.

PA4VDW, design kit for vertical mounting
Used to conceal cables and pipes.

PA4HE, extension hood
Fills the space between the unit and the ceiling for vertical mounting and provides a neater installation. Height 100-2000 mm. State distance between the top of the air curtain and the ceiling when ordering. A vertical kit is included. PA4HEVDW: extension hood for units with design kit.

Item number	Type	Used for	Consists of
110760	**PA4JK**	PAFEC4210/4215/4220/4225	1
10028	**AXP300**	PAFEC4210/4215/4220/4225	1
110754	**PA4VDW15**	PAFEC4215	1
110755	**PA4VDW20**	PAFEC4220	1
110756	**PA4VDW25**	PAFEC4225	1
FE10245	**PA4HE**	PAFEC4210/4215/4220/4225	1
FE10247	**PA4HEVDW**	PAFEC4210/4215/4220/4225	1



Vertical mounted Pamir 4200 with a vertical kit to allow two units to be installed on top of each other.

Arden 3500

Recessed and energy efficient air curtain for commercial premises

Arden 3500, with a recommended installation height of 3,5 m, is very unobtrusive and with that particularly suitable for environments where the design is important. The air curtain is equipped with energy-efficient EC motors which enable stepless control of the airflow. Arden is intended for recessed installation, the frame and hatch can be painted in colours that blend well with the premises.

Energy efficient and sustainable

The air curtain is equipped with EC motors that are up to 50% more energy efficient than traditional AC motors, and have a lower weight which makes for easier installations and greener transports.

Intelligent control options

The Arden series is supplemented with an intelligent control system that allows you to optimize your comfort with minimum effort. Smart and automatic features enable simple set-up and operation for different Frico products groups.

High performance

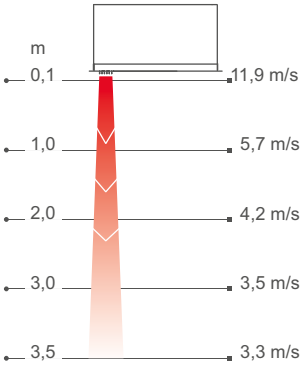
Frico air curtains are developed and manufactured in Sweden. The air curtains are tested in one of the most modern and advanced air and sound laboratories in Europe which means that we can guarantee a high performance product.

Arden 3500

Available in 3 versions:

- Ambient (without heat)
- Electrical heating
- Water heating

Air velocity profile



Measurements according to ISO 27327-1. Average values for products in the series.

Design and specifications are subject to change without notice.

Arden 3500

Frico's Thermozone technology optimizes the air curtain

Frico air curtains create an invisible barrier at openings and doors which separates different temperature zones without limiting access for people and vehicles. Thermozone technology creates a highly uniform air barrier with a perfect balance between air volume and air velocity, regardless of whether it is the heat or the cold that you want to keep inside.

Great energy savings

In many premises doors remain open for a significant part of the day, this results in huge losses of expensively heated or cooled air, especially when the temperature difference between outdoor and indoor air is great. With correctly installed air curtains great energy savings can be obtained.

Comfortable indoor climate

Air curtains with Thermozone technology have optimized performance to provide a comfortable indoor climate free from drafts. The air curtain also keeps out emissions and insects.

Low sound level

With Thermozone technology Frico manufactures air curtains with very high airflow performance. This does not just make the air curtain more effective, but also has other advantages such as extremely low sound levels and reduced turbulence.

Create the optimal solution to suit your specific needs

After you selected the air curtain to suit your specific needs (ambient, electrical heating, water heating) and length 1, 1,5, or 2 m you assemble your control and accessory options:

Select control system

Choose one of our FC Control systems.

Add valve system

Water heated units must be supplemented with a valve system.

Select mounting options

Mounting accessories for recessed installation.

Technical specifications

Ambient, no heat - ARFEC3500 A (IP20)

Voltage motor: 230V~

Item number	Type	Output [kW]	Airflow*1 [m³/h]	Sound power*2 [dB(A)]	Sound pressure*3 [dB(A)]	Amperage motor [A]	Length [mm]	Weight [kg]
190544	**ARFEC3510A**	0	1000/1900	76	43/60	2,3	1057	35
190548	**ARFEC3515A**	0	1550/3000	78	44/62	3,2	1567	49
190552	**ARFEC3520A**	0	2250/3800	79	45/63	4,1	2073	60

Electrical heat - ARFEC3500 E (IP20)

Item number	Type	Output steps [kW]	Airflow*1 [m³/h]	Δt*4 [°C]	Sound power*2 [dB(A)]	Sound pressure*3 [dB(A)]	Amperage motor [A]	Voltage [V] Amperage [A] (heat)	Length [mm]	Weight [kg]
190545	**ARFEC3510E09**	4,5/9,0	1000/1900	26/14	76	43/60	2,3	400V3~/13	1057	35
190549	**ARFEC3515E14**	6,8/14	1550/3000	26/13	77	44/62	3,2	400V3~/19,5	1567	53
190553	**ARFEC3520E18**	9,0/18	2250/3800	24/14	78	45/63	4,1	400V3~/26	2073	65

Water heat - ARFEC3500 W (IP20)

Item number	Type	Output*5 [kW]	Airflow*1 [m³/h]	Δt*4,5 [°C]	Water volume [l]	Sound power*2 [dB(A)]	Sound pressure*3 [dB(A)]	Amperage motor [A]	Length [mm]	Weight [kg]
190546	**ARFEC3510W**	8,3	1000/1900	16/13	1,3	75	43/59	2,3	1057	39,3
190550	**ARFEC3515W**	12	1500/2800	16/13	2,1	76	43/60	3,2	1567	55
190554	**ARFEC3520W**	17	2100/3700	17/14	2,9	77	45/61	4,2	2073	70,3

Water heat - ARFEC3500 WLL, coil for very low temperature water (≤60 °C) (IP20)

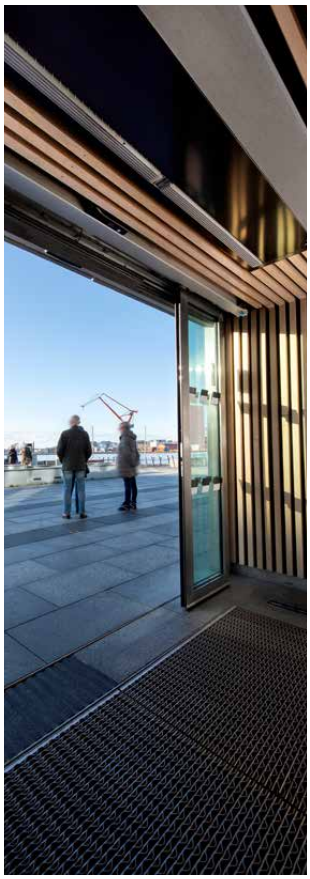
Item number	Type	Output*6 [kW]	Airflow*1 [m³/h]	Δt*4,6 [°C]	Water volume [l]	Sound power*2 [dB(A)]	Sound pressure*3 [dB(A)]	Amperage motor [A]	Length [mm]	Weight [kg]
190547	**ARFEC3510WLL**	8,0	1000/1900	14/12	2,6	75	43/59	2,3	1057	42,4
190551	**ARFEC3515WLL**	12	1500/2800	15/13	4,2	76	43/60	3,2	1567	58
190555	**ARFEC3520WLL**	16	2100/3700	15/13	5,8	77	45/61	4,2	2073	73,3

*1) Low/high airflow (2V/10V).
*2) Sound power (L_{WA}) measurements according to ISO 27327-2: 2014, Installation type E.
*3) Sound pressure (L_{pA}). Conditions: Distance to the unit 5 metres. Directional factor: 2. Equivalent absorption area: 200 m². At low/high airflow (2V/10V).
*4) Δt = temperature rise of passing air at maximum heat output and low/high airflow (2V/10V).
*5) Applicable at water temperature 60/40 °C, air temperature, in +18 °C.
*6) Applicable at water temperature 40/30 °C, air temperature, in +18 °C.
*5,6) See www.frico.net for additional calculations.

Approved for 220V/1ph/60Hz and 380V/3ph/60Hz. Product performance for 220V/1ph/60Hz and 380V/3ph/60Hz will differ from stated data.

Manufactured in Sweden with a frame and hatch made of hot zinc-plate and powder coated steel panels. Colour frame and hatch: white, RAL 9016. Colour grille: grey, RAL 7046. The frame and hatch can be painted in an optional colour.

CE



Mounting

The recommended installation height of Arden 3500 is 3,5 m. The air curtain is designed to be installed into suspended ceilings. The unit is ready for suspension with threaded bars (accessory) on its outside. The threaded bars can also be fixed on the inside of the unit e.g. when mounted on a solid suspended ceiling.

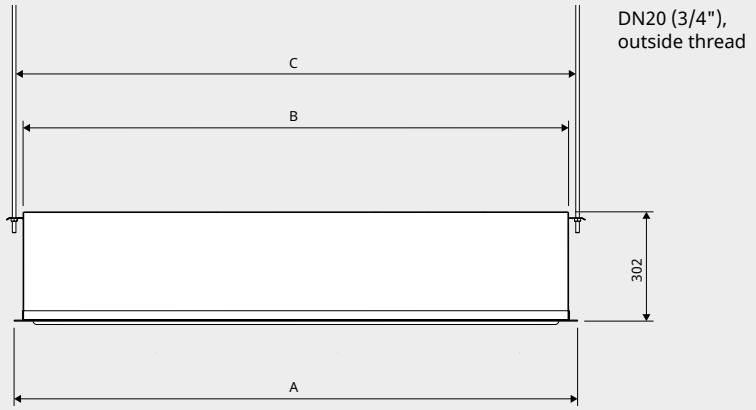
The air curtain is installed horizontally with the outlet air grille facing downwards as close to the door as possible, concealed in the false ceiling. For the protection of wider doorways, several units can be mounted in series alongside each other. For a discreet installation with only the outlet and inlet visible in the ceiling the unit can be supplemented with a outlet/inlet extension.

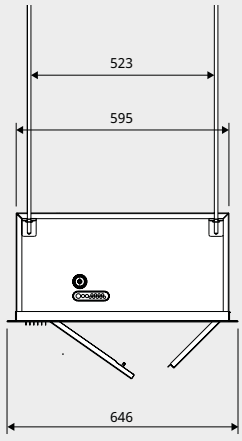
Connection

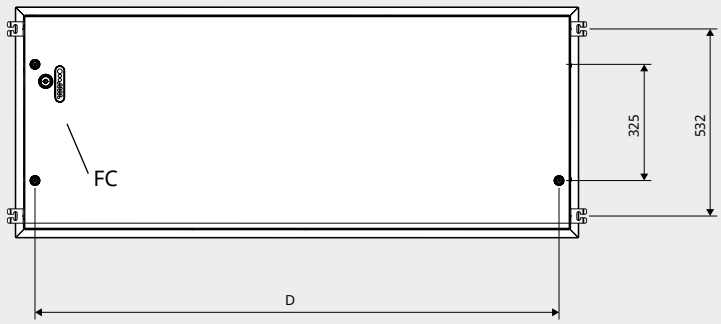
Service and maintenance are easily made through the service hatch at the bottom of the unit. The air curtain has an integrated PC board which is connected to the selected external control system FC. **The PC board is accessed via cable glands on the side or the top of the unit.** Communication- and sensor cables are connected to the PC board.

The electrical connection can be made either on the side or the top of the unit and routed via the motor compartment.

Water heated units are connected to the water system inside the unit, through holes made during installation on the top or the side of the unit. Flexible hoses are available as accessories. **Water heated units must always be supplemented with a valve kit mounted outside the unit. See Valves and Accessories.**







Type	A [mm]	B [mm]	C [mm]	D [mm]
ARFEC3510	1057	1016	1067	956
ARFEC3515	1567	1526	1577	1466
ARFEC3520	2073	2031	2083	1971

Minimum distance from outlet to floor for electrically heated units is 1800 mm.

For wiring diagrams and other technical information, please see the manual. Recommended installation height varies depending on the relevant premises. See www.frico.net for further information.

Arden 3500

FC Control system

Frico air curtains come with an integrated PC-board and are supplemented with the intelligent control system FC of your choice, working together to create many smart and energy saving features. There are four different packages to choose from, depending on your requirements.

FC Direct

Entry level

- Door contact
- Calendar function
- Filter timer
- Built-in temperature sensor

FC Smart

FC Direct +

- Control via app (Bluetooth)
- Wireless sensors possible
- Adjustable calendar function
- Away and Boost function
- Adjustable filter timer
- Vestibule function
- Zone possibility
- Enhanced water control possible

FC Pro

FC Direct + FC Smart +

- Automatic air flow control
- Automatic heat blocking

FC Building - BMS

FC Direct +

- 0-10V, potential free contact or Modbus
- Automatic air flow control*
- Automatic heat blocking*
- Heat and fan settings
- Alarm indication
- Read values
- Enhanced water control possible

** Requires outdoor temp signal*

FC Direct

Entry level control system for a great start. The door contact provides an automatic energy-saving function, as the air curtain becomes active only when the door is open. When the door is closed, it remains on stand-by or runs on a lower fan speed if extra heat is needed. With the calender function, you can choose periods of comfort and reduced mode. The control panel has a built-in temperature sensor, which is used for control when external sensors are not used.

FC Smart

Second level control system for full freedom. FC Smart comes with all features from FC Direct plus additional energy saving features and the possibility of app control (Bluetooth). The app gives you access to all functions in the system, allowing you to set it up exactly the way you want it. It also enables you to create different zones with different settings in a larger system. The app FRICO CONTROL is available for both iOS and Android.

FC Pro

Third level control system for maximum savings. FC Pro comes with all features from FC Direct and FC Smart plus additional automatic energy saving features. By receiving and reacting to information about indoor and outdoor temperatures, the right amount of heat and air flow is added to avoid overshoots and thus reducing energy consumption.

FC Building - BMS system

Comprehensive control system for buildings, with the option to control via 0-10V, potential free contact (e.g. a relay) and/or Modbus RTU (RS485). FC Building enables you to receive product information status and alarms. Modbus allows for full use of all the energy saving features within the control system.

Item number	Type	Description
74684	**FCDA**	FC Direct, first level control system
74685	**FCSA**	FC Smart, second level control system
74686	**FCPA**	FC Pro, third level control system
74687	**FCBA**	FC Building, BMS system

Arden 3500

Control system content and accessories

FC Control system helps to create many smart and energy saving features. In addition to our four packages, components can be added to expand and customize the system. With the app levels (FC Smart and FC Pro) it is also possible to create and control different zones. Each added zone needs to be equipped with one FC Direct and can be designed to fit its specific needs by adding different accessories.

FC Direct, control kit
Control panel for fan and heat, door contact and 5 m communication cable. Used for additional zones with FC Smart and FC Pro. IP44.

FCRTX, external room temperature sensor
For reading of the room temperature on another location than that of the control panel, incl. 10 m sensor cable. IP20.

FCOTX, outdoor temperature sensor
Reading the outdoor temperature, incl. 10 m sensor cable. Enables automatic air curtain control and heat blocking. IP44.

FCLAP, local access point
Local access point for extra wireless sensors (when operating more than 8 sensors) and extended range for wireless sensors or app control (Bluetooth), incl. 10 m communication cable. IP44.

FCSC/FCBC, cable
FCSC Sensor cable available in 10 or 25 m for extra length. FCBC Communication cable for additional products within the same zone, available in 5, 10 or 25 m.

FCDC, door contact
The door contact regulates the airflow on/off. Allows you to control air curtains at different doorways individually within the same zone.

FCTXRF, indoor/outdoor wireless sensor
Indoor/outdoor wireless sensor with same features as FCRTX and FCOTX. The set up as outdoor or indoor sensor is made by a switch inside the sensor. Range up to 50 m. Battery life: 3-5 years. IP44.

FC Direct

Content
- FCCF control panel
- FCBC05
- FCDC

FC Smart

Content
- FCCF control panel
- FCBC10
- FCDC
- FCLAP

FC Pro

Content
- FCCF control panel
- FCBC10
- FCDC
- FCLAP
- FCTXRF

FC Building - BMS

Content
- FCCF control panel
- FCBC10
- FCDC
- FCBAP building access point

Item number	Type	Description	Dimensions
74684	**FCDA**	FC Direct, first level control system	89x89x26 mm (FCCF)
74694	**FCRTX**	External room temperature sensor	39x39x23 mm
74695	**FCOTX**	Outdoor temperature sensor	39x39x23 mm
74699	**FCLAP**	Local access point for extra wireless sensors and extended range	89x89x26 mm
74718	**FCBC05**	Extra communication cable, 5 m	5 m
74719	**FCBC10**	Extra communication cable, 10 m	10 m
74720	**FCBC25**	Extra communication cable, 25 m	25 m
74721	**FCSC10**	Extra sensor cable, 10 m	10 m
74722	**FCSC25**	Extra sensor cable, 25 m	25 m
17495	**FCDC**	Door contact	
74703	**FCTXRF**	Indoor/outdoor wireless sensor (for FC Smart, FC Pro)	89x89x26 mm

Water control

Water heated units must be supplemented with valves. The valve system controls the water flow and activates maximum heat only when needed. By activating the built-in bypass feature, a small leakage flow is let through to make sure there is always hot water in the heating coil, providing frost protection and faster heating. The return water temperature sensor is making sure that as much energy as possible from the water in the coil is used, thus reducing energy consumption.

VPFC, pressure independent and modulating valve system
Two way pressure independent control and adjustment valve with modulating actuator and shut-off valve.

FCWTA, return water temperature sensor
Enables control of return water temperature and automatic bypass function, which provides extended frost protection and reduced energy consumption.

Item number	Type	DN	Flow range l/s
238293	**VPFC15LF**	DN15	0,012-0,068
238294	**VPFC15NF**	DN15	0,024-0,13
238295	**VPFC20**	DN20	0,058-0,32
238296	**VPFC25**	DN25	0,10-0,60
238297	**VPFC32**	DN32	0,22-1,03
74702	**FCWTA**	Return water temperature sensor	

Accessories - water heated units

FH1020, flexible hoses
Flexible hoses for easy and practical installation of water heated unit. Length 1 m. DN20, 1" inside/outside thread.

DTV200S, filter pressure guard
Measures the differential pressure, which indicates how dirty the filter is in water heated units. The metering hose is connected to the suction side of the unit (after the filter). Adjustment is performed on site depending on the unit and the environment. Adjustable range 20-300 Pa. Potential free, changeover alarm contact. There is no separate filter in Arden 3500 as the design of the coil and the grille makes it unnecessary.

Item number	Type	Used for	Consists of
237568	**FH1020**	ARFEC3500W	2
17597	**DTV200S**	ARFEC3500W	1

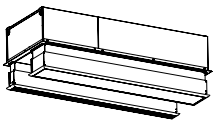
Accessories - mounting

PA34TR, threaded bars
Threaded bars for installing unit on to a ceiling. Length 1 m. Used together with ceiling brackets (PA34CB). Supplemented with vibration dampers (PA34VD) for reduced vibration.

PA34CB, ceiling brackets
Ceiling brackets for installing the unit from the ceiling using wires or threaded bars (not included). Best combined with vibration dampers (PA34VD) when using threaded bars.

PA34VD, vibration dampers
Reduces vibrations for ceiling installations with threaded bars.

AR35XTT, extension
Outlet/inlet extension for a discreet installation with only the outlet and inlet visible in the ceiling. Height 130-210 mm.



Item number	Type	Used for	Consists of
18056	**PA34TR15**	ARFEC3510/3515	4
18057	**PA34TR20**	ARFEC3520	6
18059	**PA34CB15**	ARFEC3510/3515	4
18060	**PA34CB20**	ARFEC3520	6
18065	**PA34VD15**	ARFEC3510/3515	4
18066	**PA34VD20**	ARFEC3520	6
19070	**AR35XTT10**	ARFEC3510	
19071	**AR35XTT15**	ARFEC3515	
19072	**AR35XTT20**	ARFEC3520	

Arden 4200

Recessed and energy efficient air curtain for large commercial premises

Arden 4200, with a recommended installation height of 4,2 m, is very unobtrusive and with that particularly suitable for environments where the design is important. The air curtain is equipped with energy-efficient EC motors which enable stepless control of the airflow. Arden is intended for recessed installation, the frame and hatch can be painted in colours that blend well with the premises.

Energy efficient and sustainable

The air curtain is equipped with EC motors that are up to 50% more energy efficient than traditional AC motors, and have a lower weight which makes for easier installations and greener transports.

Intelligent control options

The Arden series is supplemented with an intelligent control system that allows you to optimize your comfort with minimum effort. Smart and automatic features enable simple set-up and operation for different Frico products groups.

High performance

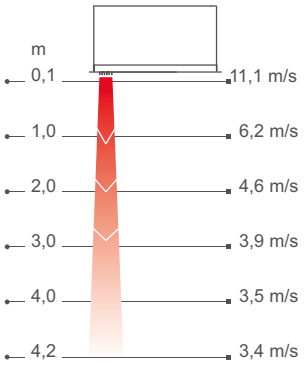
Frico air curtains are developed and manufactured in Sweden. The air curtains are tested in one of the most modern and advanced air and sound laboratories in Europe which means that we can guarantee a high performance product.

Arden 4200

Available in 3 versions:

- Ambient (without heat)
- Electrical heating
- Water heating

Air velocity profile



Measurements according to ISO 27327-1. Average values for products in the series.

Design and specifications are subject to change without notice.

Arden 4200

Frico's Thermozone technology optimizes the air curtain

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Great energy savings

In many premises doors remain open for a significant part of the day, this results in huge losses of expensively heated or cooled air, especially when the temperature difference between outdoor and indoor air is great. With correctly installed air curtains great energy savings can be obtained.

Comfortable indoor climate

Air curtains with Thermozone technology have optimized performance to provide a comfortable indoor climate free from drafts. The air curtain also keeps out emissions and insects.

Low sound level

With Thermozone technology Frico manufactures air curtains with very high airflow performance. This does not just make the air curtain more effective, but also has other advantages such as extremely low sound levels and reduced turbulence.

Create the optimal solution to suit your specific needs

After you selected the air curtain to suit your specific needs (ambient, electrical heating, water heating) and length 1, 1,5, or 2 or 2,5 m you assemble your control and accessory options:

Select control system

Choose one of our FC Control systems.

Add valve system

Water heated units must be supplemented with a valve system.

Select mounting options

Mounting accessories for recessed installation.

Technical specifications

Ambient, no heat - ARFEC4200 A (IP20)

Voltage motor: 230V~

Item number	Type	Output [kW]	Airflow*1 [m³/h]	Sound power*2 [dB(A)]	Sound pressure*3 [dB(A)]	Amperage motor [A]	Length [mm]	Weight [kg]
230283	**ARFEC4210A**	0	1300/2500	74	41/58	3,2	1067	52
230287	**ARFEC4215A**	0	1950/3650	76	43/60	4,1	1577	71
230291	**ARFEC4220A**	0	2500/4900	78	44/62	6,0	2067	94
230295	**ARFEC4225A**	0	3200/6350	81	46/65	6,9	2579	120

Electrical heat - ARFEC4200 E (IP20)

Item number	Type	Output steps [kW]	Airflow*1 [m³/h]	Δt*4 [°C]	Sound power*2 [dB(A)]	Sound pressure*3 [dB(A)]	Amperage motor [A]	Voltage [V] Amperage [A] (heat)	Length [mm]	Weight [kg]
230284	**ARFEC4210E12**	3,9/7,8/12	1300/2500	27/10	74	41/58	3,2	400V3~/16,9	1067	53
230288	**ARFEC4215E18**	6,0/12/18	1950/3650	28/15	76	43/60	4,1	400V3~/26	1577	74
230292	**ARFEC4220E24**	7,8/16/24	2500/4900	28/14	78	44/62	6,0	400V3~/33,8	2067	96
230296	**ARFEC4225E30**	9,9/20/30	3200/6350	28/14	81	46/65	6,9	400V3~/42,9	2579	124

Water heat - ARFEC4200 W (IP20)

Item number	Type	Output*5 [kW]	Airflow*1 [m³/h]	Δt*4,5 [°C]	Water volume [l]	Sound power*2 [dB(A)]	Sound pressure*3 [dB(A)]	Amperage motor [A]	Length [mm]	Weight [kg]
230285	**ARFEC4210W**	15	1200/2400	24/19	1,9	73	40/57	3,2	1067	58
230289	**ARFEC4215W**	23	1700/3400	25/20	3,0	75	42/59	4,1	1577	79
230293	**ARFEC4220W**	32	2300/4700	25/20	4,0	76	44/60	6,0	2067	106
230297	**ARFEC4225W**	41	2800/5750	26/21	5,1	79	46/63	6,9	2579	135

Water heat - ARFEC4200 WLL, coil for very low temperature water (≤60 °C) (IP20)

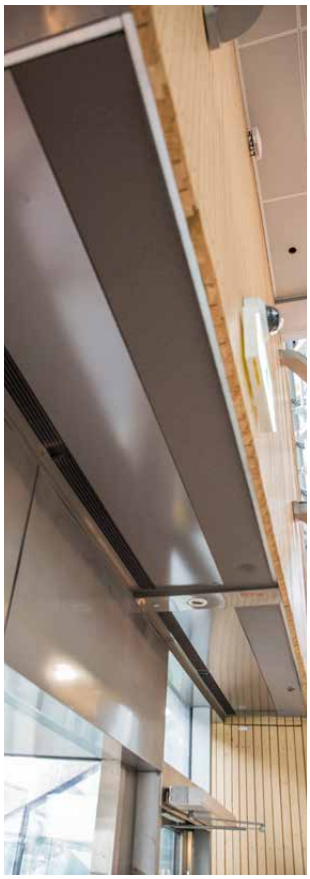
Item number	Type	Output*6 [kW]	Airflow*1 [m³/h]	Δt*4,6 [°C]	Water volume [l]	Sound power*2 [dB(A)]	Sound pressure*3 [dB(A)]	Amperage motor [A]	Length [mm]	Weight [kg]
230286	**ARFEC4210WLL**	9,6	1100/2300	15/12	3,1	72	40/56	3,2	1067	59
230290	**ARFEC4215WLL**	14	1600/3300	15/13	4,7	74	42/58	4,1	1577	81
230294	**ARFEC4220WLL**	19	2200/4600	15/13	7,5	75	43/59	6,0	2067	109
230298	**ARFEC4225WLL**	24	2700/5600	15/13	9,6	78	45/62	6,9	2579	138

*1) Low/high airflow (2V/10V).
*2) Sound power (L_{WA}) measurements according to ISO 27327-2: 2014, Installation type E.
*3) Sound pressure (L_{pA}). Conditions: Distance to the unit 5 metres. Directional factor: 2. Equivalent absorption area: 200 m². At low/high airflow (2V/10V).
*4) Δt = temperature rise of passing air at maximum heat output and low/high airflow (2V/10V).
*5) Applicable at water temperature 60/40 °C, air temperature, in +18 °C.
*6) Applicable at water temperature 40/30 °C, air temperature, in +18 °C.
*5,6) See www.frico.net for additional calculations.

Approved for 220V/1ph/60Hz and 380V/3ph/60Hz. Product performance for 220V/1ph/60Hz and 380V/3ph/60Hz will differ from stated data.

Manufactured in Sweden with a frame and hatch made of hot zinc-plate and powder coated steel panels. Colour frame and hatch: white, RAL 9016. Colour grille: grey, RAL 7046. The frame and hatch can be painted in an optional colour.

CE



Mounting

The recommended installation height of Arden 4200 is 4,2 m. The air curtain is designed to be installed into suspended ceilings. The unit is ready for suspension with threaded bars (accessory) on its outside. The threaded bars can also be fixed on the inside of the unit e.g. when mounted on a solid suspended ceiling.

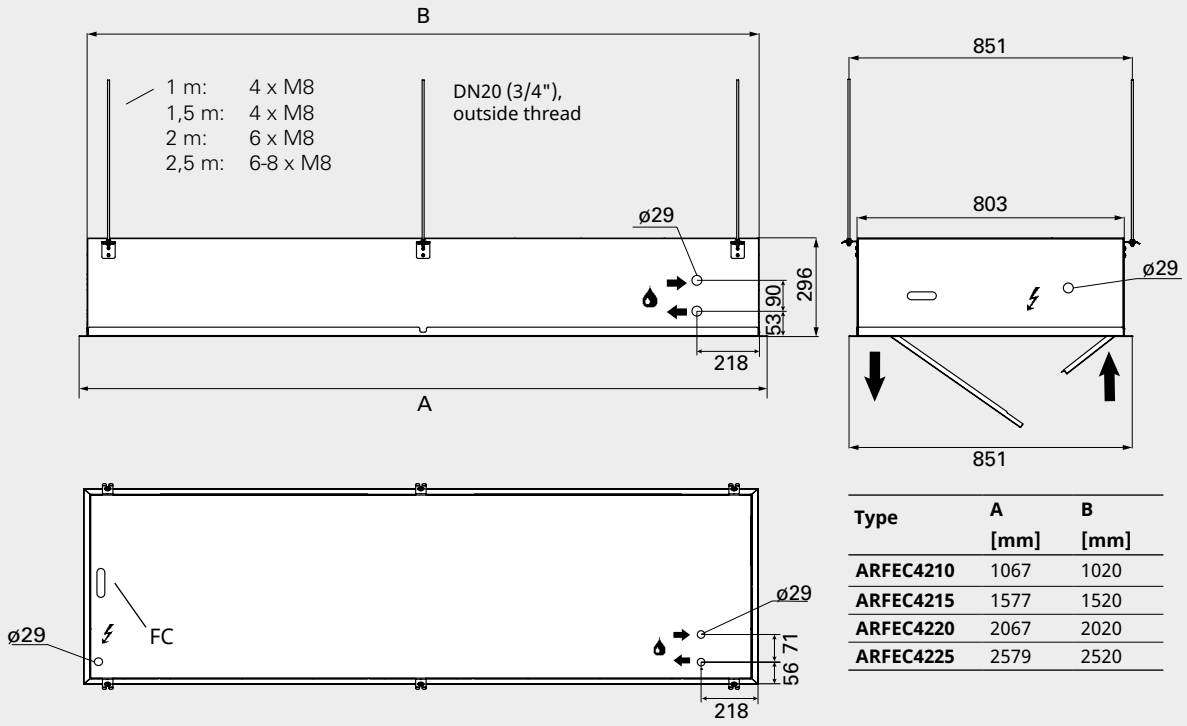
The air curtain is installed horizontally with the outlet air grille facing downwards as close to the door as possible, concealed in the false ceiling. For the protection of wider doorways, several units can be mounted in series alongside each other. For a discreet installation with only the outlet and inlet visible in the ceiling the unit can be supplemented with a outlet/inlet extension.

Connection

Service and maintenance are easily made through the service hatch at the bottom of the unit. The air curtain has an integrated PC board which is connected to the selected external control system FC. The PC board is accessed via cable glands on the side or the top of the unit. Communication- and sensor cables are connected to the PC board.

The electrical connection can be made either on the side or the top of the unit and routed via the motor compartment.

Water heated units are connected to the water system inside the unit, through holes made during installation on the top or the side of the unit. Flexible hoses are available as accessories. Water heated units must always be supplemented with a valve kit mounted outside the unit. See Valves and Accessories.



Type	A [mm]	B [mm]
ARFEC4210	1067	1020
ARFEC4215	1577	1520
ARFEC4220	2067	2020
ARFEC4225	2579	2520

Minimum distance from outlet to floor for electrically heated units is 1800 mm.

For wiring diagrams and other technical information, please see the manual. Recommended installation height varies depending on the relevant premises. See www.frico.net for further information.

Arden 4200

FC Control system

Frico air curtains come with an integrated PC-board and are supplemented with the intelligent control system FC of your choice, working together to create many smart and energy saving features. There are four different packages to choose from, depending on your requirements.

FC Direct

Entry level

- Door contact
- Calendar function
- Filter timer
- Built-in temperature sensor

FC Smart

FC Direct +

- *Control via app (Bluetooth)*
- *Wireless sensors possible*
- *Adjustable calendar function*
- *Away and Boost function*
- *Adjustable filter timer*
- *Vestibule function*
- *Zone possibility*
- *Enhanced water control possible*

FC Pro

FC Direct + FC Smart +

- *Automatic air flow control*
- *Automatic heat blocking*

FC Building - BMS

FC Direct +

- *0-10V, potential free contact or Modbus*
- *Automatic air flow control**
- *Automatic heat blocking**
- *Heat and fan settings*
- *Alarm indication*
- *Read values*
- *Enhanced water control possible*

** Requires outdoor temp signal*

FC Direct

Entry level control system for a great start. The door contact provides an automatic energy-saving function, as the air curtain becomes active only when the door is open. When the door is closed, it remains on stand-by or runs on a lower fan speed if extra heat is needed. With the calender function, you can choose periods of comfort and reduced mode. The control panel has a built-in temperature sensor, which is used for control when external sensors are not used.

FC Smart

Second level control system for full freedom. FC Smart comes with all features from FC Direct plus additional energy saving features and the possibility of app control (Bluetooth). The app gives you access to all functions in the system, allowing you to set it up exactly the way you want it. It also enables you to create different zones with different settings in a larger system. The app FRICO CONTROL is available for both iOS and Android.

FC Pro

Third level control system for maximum savings. FC Pro comes with all features from FC Direct and FC Smart plus additional automatic energy saving features. By receiving and reacting to information about indoor and outdoor temperatures, the right amount of heat and air flow is added to avoid overshoots and thus reducing energy consumption.

FC Building - BMS system

Comprehensive control system for buildings, with the option to control via 0-10V, potential free contact (e.g. a relay) and/or Modbus RTU (RS485). FC Building enables you to receive product information status and alarms. Modbus allows for full use of all the energy saving features within the control system.

Item number	Type	Description
74684	**FCDA**	FC Direct, first level control system
74685	**FCSA**	FC Smart, second level control system
74686	**FCPA**	FC Pro, third level control system
74687	**FCBA**	FC Building, BMS system

Arden 4200

Control system content and accessories

FC Control system helps to create many smart and energy saving features. In addition to our four packages, components can be added to expand and customize the system. With the app levels (FC Smart and FC Pro) it is also possible to create and control different zones. Each added zone needs to be equipped with one FC Direct and can be designed to fit its specific needs by adding different accessories.

FC Direct, control kit
Control panel for fan and heat, door contact and 5 m communication cable. Used for additional zones with FC Smart and FC Pro. IP44.

FCRTX, external room temperature sensor
For reading of the room temperature on another location than that of the control panel, incl. 10 m sensor cable. IP20.

FCOTX, outdoor temperature sensor
Reading the outdoor temperature, incl. 10 m sensor cable. Enables automatic air curtain control and heat blocking. IP44.

FCLAP, local access point
Local access point for extra wireless sensors (when operating more than 8 sensors) and extended range for wireless sensors or app control (Bluetooth), incl. 10 m communication cable. IP44.

FCSC/FCBC, cable
FCSC Sensor cable available in 10 or 25 m for extra length. FCBC Communication cable for additional products within the same zone, available in 5, 10 or 25 m.

FCDC, door contact
The door contact regulates the airflow on/off. Allows you to control air curtains at different doorways individually within the same zone.

FCTXRF, indoor/outdoor wireless sensor
Indoor/outdoor wireless sensor with same features as FCRTX and FCOTX. The set up as outdoor or indoor sensor is made by a switch inside the sensor. Range up to 50 m. Battery life: 3-5 years. IP44.

FC Direct

Content
- FCCF control panel
- FCBC05
- FCDC

FC Smart

Content
- FCCF control panel
- FCBC10
- FCDC
- FCLAP

FC Pro

Content
- FCCF control panel
- FCBC10
- FCDC
- FCLAP
- FCTXRF

FC Building - BMS

Content
- FCCF control panel
- FCBC10
- FCDC
- FCBAP building access point

Item number	Type	Description	Dimensions
74684	**FCDA**	FC Direct, first level control system	89x89x26 mm (FCCF)
74694	**FCRTX**	External room temperature sensor	39x39x23 mm
74695	**FCOTX**	Outdoor temperature sensor	39x39x23 mm
74699	**FCLAP**	Local access point for extra wireless sensors and extended range	89x89x26 mm
74718	**FCBC05**	Extra communication cable, 5 m	5 m
74719	**FCBC10**	Extra communication cable, 10 m	10 m
74720	**FCBC25**	Extra communication cable, 25 m	25 m
74721	**FCSC10**	Extra sensor cable, 10 m	10 m
74722	**FCSC25**	Extra sensor cable, 25 m	25 m
17495	**FCDC**	Door contact	
74703	**FCTXRF**	Indoor/outdoor wireless sensor (for FC Smart, FC Pro)	89x89x26 mm

Water control

Water heated units must be supplemented with valves. The valve system controls the water flow and activates maximum heat only when needed. By activating the built-in bypass feature, a small leakage flow is let through to make sure there is always hot water in the heating coil, providing frost protection and faster heating. The return water temperature sensor is making sure that as much energy as possible from the water in the coil is used, thus reducing energy consumption.

VPFC, pressure independent and modulating valve system
Two way pressure independent control and adjustment valve with modulating actuator and shut-off valve.

FCWTA, return water temperature sensor
Enables control of return water temperature and automatic bypass function, which provides extended frost protection and reduced energy consumption.

Item number	Type	DN	Flow range l/s
238293	**VPFC15LF**	DN15	0,012-0,068
238294	**VPFC15NF**	DN15	0,024-0,13
238295	**VPFC20**	DN20	0,058-0,32
238296	**VPFC25**	DN25	0,10-0,60
238297	**VPFC32**	DN32	0,22-1,03
74702	**FCWTA**	Return water temperature sensor	

Accessories - water heated units

FH1020, flexible hoses
Flexible hoses for easy and practical installation of water heated unit. Length 1 m. DN20, 1" inside/outside thread.

DTV200S, filter pressure guard
Measures the differential pressure, which indicates how dirty the filter is in water heated units. The metering hose is connected to the suction side of the unit (after the filter). Adjustment is performed on site depending on the unit and the environment. Adjustable range 20-300 Pa. Potential free, changeover alarm contact.

Item number	Type	Used for	Consists of
237568	**FH1020**	ARFEC4200W	2
17597	**DTV200S**	ARFEC4200W	1

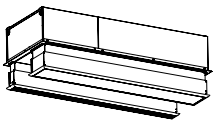
Accessories - mounting

PA34TR, threaded bars
Threaded bars for installing unit on to a ceiling. Length 1 m. Used together with ceiling brackets (PA34CB). Supplemented with vibration dampers (PA34VD) for reduced vibration.

PA34CB, ceiling brackets
Ceiling brackets for installing the unit from the ceiling using wires or threaded bars (not included). Best combined with vibration dampers (PA34VD) when using threaded bars.

PA34VD, vibration dampers
Reduces vibrations for ceiling installations with threaded bars.

AR42XTT, extension
Outlet/inlet extension for a discreet installation with only the outlet and inlet visible in the ceiling. Height 130-210 mm.



Item number	Type	Used for	Consists of
18056	**PA34TR15**	ARFEC4210/4215	4
18057	**PA34TR20**	ARFEC4220	6
18058	**PA34TR30**	ARFEC4225	8
18059	**PA34CB15**	ARFEC4210/4215	4
18060	**PA34CB20**	ARFEC4220	6
18061	**PA34CB30**	ARFEC4225	8
18065	**PA34VD15**	ARFEC4210/4215	4
18066	**PA34VD20**	ARFEC4220	6
18067	**PA34VD30**	ARFEC4225	8
88060	**AR42XTT10**	ARFEC4210	
88061	**AR42XTT15**	ARFEC4215	
88062	**AR42XTT20**	ARFEC4220	
88063	**AR42XTT25**	ARFEC4225	

PA2200C

Stylish air curtain for entrances, with remote and integrated control

PA2200C is a compact air curtain, suitable for most small entrances. The air curtain has an integrated control system and can also be remote controlled which makes it very easy to install and use. Its recommended installation height is 2,2 m. The air curtain is available for horizontal installation with wall brackets included. The front is easy to remove, which facilitates installation and allows easy maintenance.

Leading technology and design

Frico collaborates with leading architects and product designs in the product development. The air curtains blends in well in the environment and the designed for fit into both exclusive shop interiors as industrial environments.

Plug & play

The air curtain has a control panel discretely integrated in the gable end and can be controlled by a separate remote control.

High performance

Frico air curtains are developed and manufactured in Sweden. The air curtains are tested in one of the most modern and advanced air and sound laboratories in Europe which means that we can guarantee a high performance product.

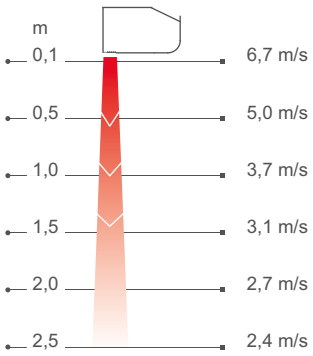
PA2200C

THERMOZONE TECHNOLOGY

Available in 3 versions:

- Ambient (without heat)
- Electrical heating
- Water heating

Air velocity profile



Measurements according to ISO 27327-1. Average values for products in the series.

Design and specifications are subject to change without notice.

PA2200C

Frico's Thermozone technology optimizes the air curtain

Frico air curtains create an invisible barrier at openings and doors which separates different temperature zones without limiting access for people and vehicles. Thermozone technology creates a highly uniform air barrier with a perfect balance between air volume and air velocity, regardless of whether it is the heat or the cold that you want to keep inside.

Great energy savings

In many premises doors remain open for a significant part of the day, this results in huge losses of expensively heated or cooled air, especially when the temperature difference between outdoor and indoor air is great. With correctly installed air curtains great energy savings can be obtained.

Comfortable indoor climate

Air curtains with Thermozone technology have optimized performance to provide a comfortable indoor climate free from drafts. The air curtain also keeps out emissions and insects.

Low sound level

With Thermozone technology Frico manufactures air curtains with very high airflow performance. This does not just make the air curtain more effective, but also has other advantages such as extremely low sound levels and reduced turbulence.

Create the optimal solution to suit your specific needs

After you selected the air curtain to suit your specific needs (ambient, electrical heating, water heating) and length 1, 1,5, or 2 m you assemble your control and accessory options:

Accessories - Control options

Motor alarm board or Door switch control .

Add valve system

Water heated units must be supplemented with a valve system.

Select mounting options

Add mounting accessories if needed.

PA2200C

Technical specifications

Ambient, no heat - PA2200C A (IP21)

Voltage motor: 230V~

Item number	Type	Output [kW]	Airflow*1 [m³/h]	Sound power*2 [dB(A)]	Sound pressure*3 [dB(A)]	Amperage motor [A]	Length [mm]	Weight [kg]
8051	**PA2210CA**	0	900/1200	67	42/51	0,45	1050	16
8220	**PA2215CA**	0	1150/1800	67	40/52	0,5	1560	24
8659	**PA2220CA**	0	1800/2400	68	43/53	0,9	2050	32

Electrical heat - PA2200C E (IP20)

Item number	Type	Output steps [kW]	Airflow*1 [m³/h]	Δt*4 [°C]	Sound power*2 [dB(A)]	Sound pressure*3 [dB(A)]	Amperage motor [A]	Voltage [V] Amperage [A] (heat)	Length [mm]	Weight [kg]
8040	**PA2210CE03**	2/3	900/1200	10/7,5	67	42/51	0,45	230V~/13	1050	17
8042	**PA2210CE05**	3,3/5	900/1200	17/12,5	67	42/51	0,45	400V3~/7,2	1050	17
19422	**PA2210CE08**	5/8	900/1200	27/20	67	42/51	0,45	400V3~/11,5	1050	18
8158	**PA2215CE08**	4/8	1150/1800	21/13	67	40/52	0,5	400V3~/11,5	1560	26
8668	**PA2215CE12**	8/12	1150/1800	31/20	67	40/52	0,5	400V3~/17,3	1560	28
8454	**PA2220CE10**	5/10	1800/2400	17/12,5	69	43/53	0,9	400V3~/14,4	2050	34
8749	**PA2220CE16**	10/16	1800/2400	27/20	69	43/53	0,9	400V3~/23,1	2050	36

Water heat - PA2200C W (IP21)

Item number	Type	Output*5 [kW]	Airflow*1 [m³/h]	Δt*4,5 [°C]	Water volume [l]	Sound power*2 [dB(A)]	Sound pressure*3 [dB(A)]	Amperage motor [A]	Length [mm]	Weight [kg]
8052	**PA2210CW**	7	700/1200	21/17	0,38	67	39/52	0,4	1050	17
8222	**PA2212CW**	11	1000/1750	23/18	0,81	68	37/53	0,5	1560	26
8660	**PA2220CW**	14	1400/2400	22/18	0,74	68	40/53	0,8	2050	35

*1) Lowest/highest airflow of totally 3 fan steps.
*2) Sound power (L_{WA}) measurements according to ISO 27327-2: 2014, Installation type E.
*3) Sound pressure (L_{pA}). Conditions: Distance to the unit 5 metres. Directional factor: 2. Equivalent absorption area: 200 m². At lowest/highest airflow.
*4) Δt = temperature rise of passing air at maximum heat output and lowest/highest airflow.
*5) Applicable at water temperature 80/60 °C, air temperature, in +18 °C.

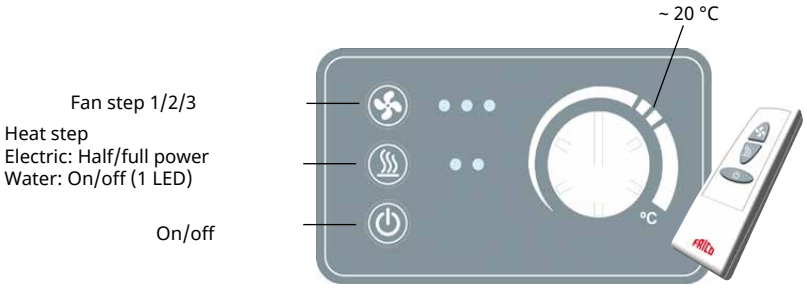
Approved for 220V/1ph/60Hz. Product performance for 220V/1ph/60Hz will differ from stated data.

CE

Manufactured in Sweden with a corrosion proof housing made of hot zinc-plate and powder coated steel panels. Plastic ends. Colour front: white, RAL 9016. Colour grille, rear section, ends and brackets: grey, RAL 7046.

Controls

Unit with electrical heating
Unit with water heating



- Remote control.
- Integrated control panel on end of unit
  - 3 fan steps, 2 electrical heating steps (electrical), heating on / off (water).
- Manual regulation of the fan.
- Automatic heating control.

Unit without heating

- Remote control.
- Integrated control panel on end of unit
  - 3 fan steps.
- Manual regulation of the fan.

PA2200C

Mounting

Mounting

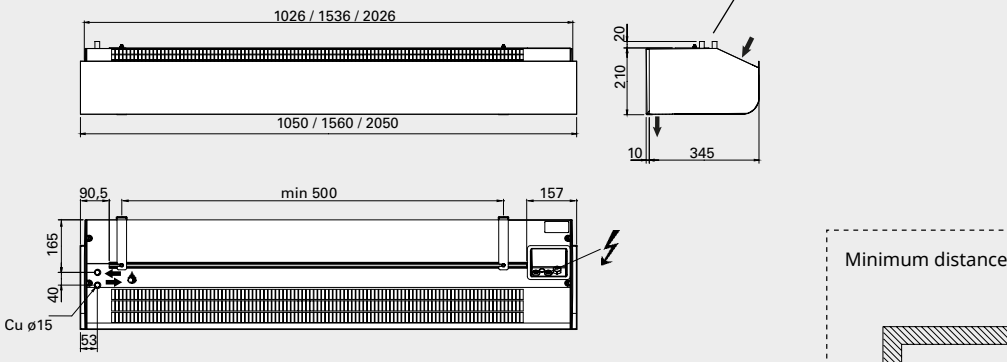
The recommended installation height of PA2200C is 2,2 m. The air curtain is installed horizontally with the outlet air grille facing downwards as close to the door as possible. The unit can be mounted with included wall brackets or be supplemented with accessories for mounting from the ceiling.

Connection

The front is easy to remove, which facilitates installation and allows easy maintenance.
Units without heat and with water heat are connected with 1,5 m cord and plug. The electrical connection is made on the top of the unit. The 3 kW unit is connected via the integrated control card using a 1,5 m cable and plug. Other units are intended for permanent installation. Control (230V~) and power supply for heat (400V3~) should be connected to a terminal block in the terminal box.

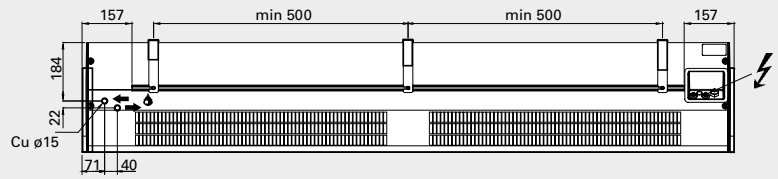
Water heated units are connected to the water system on top of the unit. Flexible hoses are available as accessories. Water heated units must always be supplemented with a valve kit mounted outside the unit. See Valves and Accessories.

All models

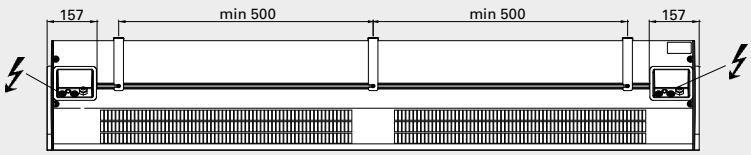


2 metre units

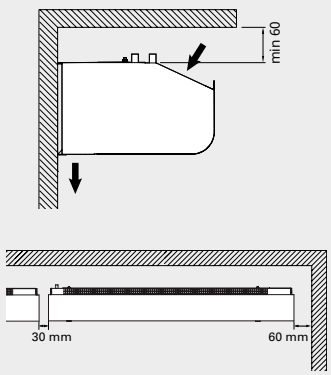
Unit without heating or with water heating



Unit with electrical heating



Minimum distances



Minimum distance from outlet to floor for electrically heated units is 1800 mm.

Recommended installation height varies depending on the relevant premises. See www.frico.net for further information.

PA2200C

Accessories - Control options

PAMLK, motor alarm board
Accessory allows connection for a motor alarm signal in units where this facility is not already available. PAMLK plugs between motor wiring harness and main PC board. Use potential free contact on PAMLK board.

PA2DR, door switch control
Contains a door switch for door indication and a special remote control intended to activate auto mode in the unit.

Item number	Type	Used for	Consists of
18690	**PAMLK**	PA2210C/2215C/2220C	1
15662	**PA2DR**	PA2210C/2215C/2220C	1

Accessories - mounting

PA2PF, ceiling mounting brackets
Mountings for installing the unit in the ceiling using hanging brackets or threaded bars (not included).

PA34TR, threaded bars
Threaded bars for installing unit on to a ceiling. Length 1 m. Used together with ceiling mounting brackets PA2PF.

PA2P, hanging brackets
Hanging brackets for installing the unit suspended from the ceiling. Length 1 m. The hanging brackets are covered by a white plastic trim to cover the cables. The brackets may be cut to shorter length, if required. Used together with ceiling mounting brackets PA2PF.

Item number	Type	Used for	Consists of
19415	**PA2PF15**	PA2210C/2215C	4
19417	**PA2PF20**	PA2220C	6
18056	**PA34TR15**	PA2210C/2215C	4
18057	**PA34TR20**	PA2220C	6
19568	**PA2P15**	PA2210C/2215C	2
19569	**PA2P20**	PA2220C	3

PA2200C

Water control

Water heated units must be supplemented with valves. The valve system controls the water flow and activates maximum heat only when needed. By activating the built-in bypass feature, a small leakage flow is let through to make sure there is always hot water in the heating coil, providing frost protection and faster heating.

VLSP, pressure independent valve system on/off
Two way pressure independent control and adjustment valve with on/off actuator, shut-off valve and bypass. DN15/20/25/32. 230V.

VOT, three way control valve and actuator on/off
3-way control valve with on/off actuator, DN15/20/25. 230V.
The valve kit consists of the following:
TRVS, 3-way control valve
SD230, actuator on/off 230V

Item number	Type	DN	Flow range l/s
79379	**VLSP15LF**	DN15	0,012 - 0,068
79380	**VLSP15NF**	DN15	0,024 - 0,13
79381	**VLSP20**	DN20	0,058 - 0,32
79382	**VLSP25**	DN25	0,10 - 0,60
19031	**VOT15**	DN15	
19032	**VOT20**	DN20	
19033	**VOT25**	DN25	

Accessories - water heated units

FHDN15, flexible hoses
Flexible hoses for easy and practical installation of water heated unit. Used together with water connection kit PAWAK or similar. DN15, inside thread, 90° bend.

PA2EF, external intake filter
Fine mesh filter that prevents ingress of dirt and deposits to water heated units. The filter is easy to attach and remove thanks to the integrated magnetic strips. Makes maintenance easier since the unit does not need to be opened.

PAWAK15, water connection kit
Kit with pipe connections with compression fitting on one end and outside thread (1/2” DN15) on the other to facilitate the connection of the plain copper pipes at the water coil.

Item number	Type	Used for	Consists of
77179	**FHDN15**	PA2210CW/2215CW/2220CW	2
14875	**PA2EF10**	PA2210CW	1
14876	**PA2EF15**	PA2215CW	1
14877	**PA2EF20**	PA2220CW	1
27279	**PAWAK15**	PA2210CW/2215CW/2220CW	1

PA3200C

Stylish air curtain for commercial premises, with remote and integrated control

PA3200C is a compact air curtain for commercial buildings and small industrial entrances. The air curtain has an integrated control system and can also be remote controlled which makes it very easy to install and use. Its recommended installation height is 3,2 m. The air curtain is available for horizontal installation with wall brackets included. The front is easy to remove, which facilitates installation and allows easy maintenance.

Leading technology and design

Frico collaborates with leading architects and product designs in the product development. The air curtains blends in well in the environment and the designed for fit into both exclusive shop interiors as industrial environments.

Plug & play

The air curtain has a control panel discretely integrated in the gable end and can be controlled by a separate remote control.

High performance

Frico air curtains are developed and manufactured in Sweden. The air curtains are tested in one of the most modern and advanced air and sound laboratories in Europe which means that we can guarantee a high performance product.

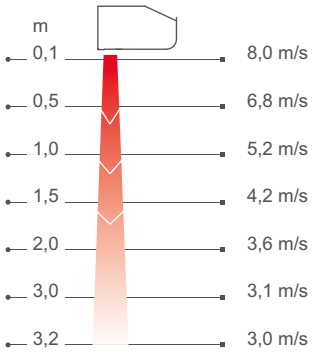
PA3200C

THERMOZONE TECHNOLOGY

Available in 3 versions:

- Ambient (without heat)
- Electrical heating
- Water heating

Air velocity profile



Measurements according to ISO 27327-1. Average values for products in the series.

Design and specifications are subject to change without notice.

PA3200C

Frico's Thermozone technology optimizes the air curtain

Frico air curtains create an invisible barrier at openings and doors which separates different temperature zones without limiting access for people and vehicles. Thermozone technology creates a highly uniform air barrier with a perfect balance between air volume and air velocity, regardless of whether it is the heat or the cold that you want to keep inside.

Great energy savings

In many premises doors remain open for a significant part of the day, this results in huge losses of expensively heated or cooled air, especially when the temperature difference between outdoor and indoor air is great. With correctly installed air curtains great energy savings can be obtained.

Comfortable indoor climate

Air curtains with Thermozone technology have optimized performance to provide a comfortable indoor climate free from drafts. The air curtain also keeps out emissions and insects.

Low sound level

With Thermozone technology Frico manufactures air curtains with very high airflow performance. This does not just make the air curtain more effective, but also has other advantages such as extremely low sound levels and reduced turbulence.

Create the optimal solution to suit your specific needs

After you selected the air curtain to suit your specific needs (ambient, electrical heating, water heating) and length 1, 1,5, or 2 m you assemble your control and accessory options:

Accessories - Control options

Motor alarm board or Door switch control .

Add valve system

Water heated units must be supplemented with a valve system.

Select mounting options

Add mounting accessories if needed.

PA3200C

Technical specifications

Ambient, no heat - PA3200C A (IP21)

Voltage motor: 230V~

Item number	Type	Output [kW]	Airflow*1 [m³/h]	Sound power*2 [dB(A)]	Sound pressure*3 [dB(A)]	Amperage motor [A]	Length [mm]	Weight [kg]
19802	**PA3210CA**	0	1100/1750	73	46/57	0,7	1068	22
19805	**PA3215CA**	0	1700/2750	74	46/59	1,0	1578	32
19808	**PA3220CA**	0	2300/3500	75	50/60	1,3	2068	42

Electrical heat - PA3200C E (IP20)

Item number	Type	Output steps [kW]	Airflow*1 [m³/h]	Δt*4 [°C]	Sound power*2 [dB(A)]	Sound pressure*3 [dB(A)]	Amperage motor [A]	Voltage [V] Amperage [A] (heat)	Length [mm]	Weight [kg]
19801	**PA3210CE08**	5/8	1100/1750	22/13	72	46/57	0,65	400V3~/11,5	1068	26
19804	**PA3215CE12**	8/12	1700/2750	21/13	75	46/59	1,0	400V3~/17,3	1578	37
19807	**PA3220CE16**	10/16	2300/3500	22/13	76	50/60	1,3	400V3~/23,1	2068	51

Water heat - PA3200C W (IP21)

Item number	Type	Output*5 [kW]	Airflow*1 [m³/h]	Δt*4,5 [°C]	Water volume [l]	Sound power*2 [dB(A)]	Sound pressure*3 [dB(A)]	Amperage motor [A]	Length [mm]	Weight [kg]
19809	**PA3210CW**	8	1050/1700	16/14	1,3	70	45/55	0,65	1068	26
19810	**PA3212CW**	14	1850/2700	17/15	2,1	73	46/57	0,7	1578	36
19811	**PA3220CW**	18	2200/3300	18/16	2,7	74	49/58	1,3	2068	48

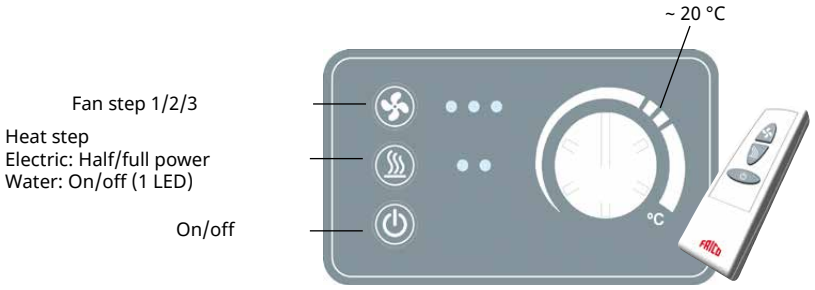
*1) Lowest/highest airflow of totally 3 fan steps.
*2) Sound power (L_{WA}) measurements according to ISO 27327-2: 2014, Installation type E.
*3) Sound pressure (L_{pA}). Conditions: Distance to the unit 5 metres. Directional factor: 2. Equivalent absorption area: 200 m². At lowest/highest airflow.
*4) Δt = temperature rise of passing air at maximum heat output and lowest/highest airflow.
*5) Applicable at water temperature 60/40 °C, air temperature, in +18 °C. See www.frico.net for additional calculations.

CE

Manufactured in Sweden with a corrosion proof housing made of hot zinc-plate and powder coated steel panels. Plastic ends. Colour front: white, RAL 9016. Colour grille, rear section, ends and brackets: grey, RAL 7046.

Controls

Unit with electrical heating
Unit with water heating



- Remote control.
- Integrated control panel on end of unit
  - 3 fan steps, 2 electrical heating steps (electrical), heating on / off (water).
- Manual regulation of the fan.
- Automatic heating control.

Unit without heating

- Remote control.
- Integrated control panel on end of unit
  - 3 fan steps.
- Manual regulation of the fan.

PA3200C

Mounting

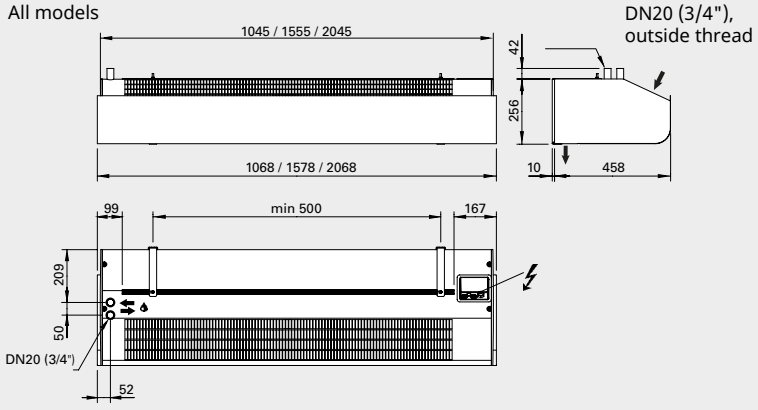
Mounting

The recommended installation height of PA3200C is 3,2 m. The air curtain is installed horizontally with the outlet air grille facing downwards as close to the door as possible. The unit can be mounted with included wall brackets or be supplemented with accessories for mounting from the ceiling.

Connection

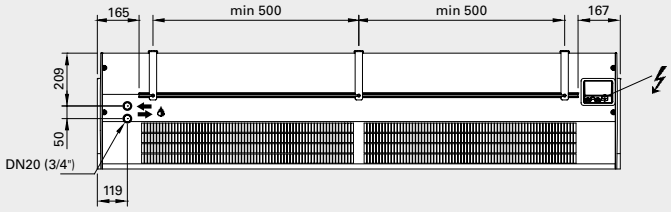
The front is easy to remove, which facilitates installation and allows easy maintenance.
Units without heat and with water heat are connected with 1,5 m cord and plug.
The electrical connection is made on the top of the unit. Control (230V~) and power supply for heat (400V3~) should be connected to a terminal block in the terminal box.
Water heated units are connected to the water system on top of the unit. Flexible hoses are available as accessories. Water heated units must always be supplemented with a valve kit mounted outside the unit. See Valves and Accessories.

All models

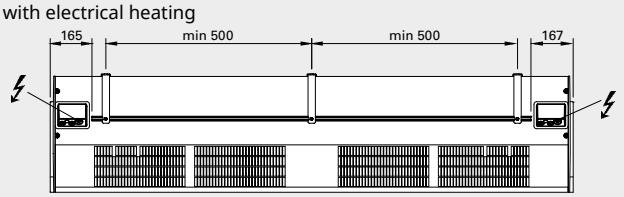


2 metre units

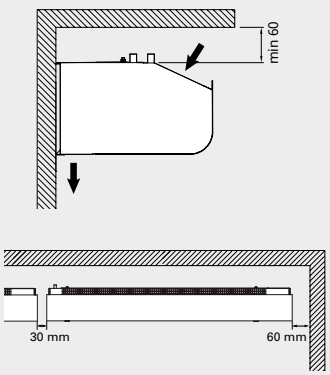
Unit without heating or with water heating



Unit with electrical heating



Minimum distances



Minimum distance from outlet to floor for electrically heated units is 1800 mm.

Recommended installation height varies depending on the relevant premises. See www.frico.net for further information.

Accessories - Control options

PAMLK, motor alarm board
Accessory allows connection for a motor alarm signal in units where this facility is not already available. PAMLK plugs between motor wiring harness and main PC board. Use potential free contact on PAMLK board.

PA2DR, door switch control
Contains a door switch for door indication and a special remote control intended to activate auto mode in the unit.

Item number	Type	Used for	Consists of
18690	**PAMLK**	PA3210C/3215C/3220C	1
15662	**PA2DR**	PA3210C/3215C/3220C	1

Accessories - mounting

PA3PF, ceiling mounting brackets
Mountings for installing the unit in the ceiling using hanging brackets or threaded bars (not included).

PA34TR, threaded bars
Threaded bars for installing unit on to a ceiling. Length 1 m. Used together with ceiling mounting brackets PA3PF.

PA2P, hanging brackets
Hanging brackets for installing the unit suspended from the ceiling. Length 1 m. The hanging brackets are covered by a white plastic trim to cover the cables. The brackets may be cut to shorter length, if required. Used together with ceiling mounting brackets PA3PF.

Item number	Type	Used for	Consists of
25256	**PA3PF15**	PA3210C/3215C	4
25257	**PA3PF20**	PA3220C	6
18056	**PA34TR15**	PA3210C/3215C	4
18057	**PA34TR20**	PA3220C	6
19568	**PA2P15**	PA3210C/3215C	2
19569	**PA2P20**	PA3220C	3

PA3200C

Water control

Water heated units must be supplemented with valves. The valve system controls the water flow and activates maximum heat only when needed. By activating the built-in bypass feature, a small leakage flow is let through to make sure there is always hot water in the heating coil, providing frost protection and faster heating.

VLSP, pressure independent valve system on/off
Two way pressure independent control and adjustment valve with on/off actuator, shut-off valve and bypass. DN15/20/25/32. 230V.

VOT, three way control valve and actuator on/off
3-way control valve with on/off actuator, DN15/20/25. 230V.
The valve kit consists of the following:
TRVS, 3-way control valve
SD230, actuator on/off 230V

Item number	Type	DN	Flow range l/s
79379	**VLSP15LF**	DN15	0,012 - 0,068
79380	**VLSP15NF**	DN15	0,024 - 0,13
79381	**VLSP20**	DN20	0,058 - 0,32
79382	**VLSP25**	DN25	0,10 - 0,60
19031	**VOT15**	DN15	
19032	**VOT20**	DN20	
19033	**VOT25**	DN25	

Accessories - water heated units

FHDN20, flexible hoses
Flexible hoses for easy and practical installation of water heated unit. FHDN20: length 350 mm. FHDN2010: length 1 m. DN20, inside thread, 90° bend.

PA34EF, external intake filter
Fine mesh filter that prevents ingress of dirt and deposits to water heated units. The filter is easy to attach and remove thanks to the integrated magnetic strips. Makes maintenance easier since the unit does not need to be opened.

Item number	Type	Used for	Consists of
18055	**FHDN20**	PA3210CW/3215CW/3220CW	2
88906	**FHDN2010**	PA3210CW/3215CW/3220CW	2
19064	**PA34EF10**	PA3210CW	1
19065	**PA34EF15**	PA3210CW	1
19066	**PA34EF20**	PA3220CW	1

AR3200C

Recessed air curtain for commercial premises, with remote and integrated control

AR3200C is a compact air curtain intended for recessed mounting in commercial buildings and small industrial entrances. Recommended installation height for ambient and electrically heated units is 3,2 metres and recommended installation height for water heated unit is 2,8 metres. The air curtain has an integrated control system and can also be remote controlled which makes it very easy to install and use.

Leading technology and design

Frico collaborates with leading architects and product designs in the product development. The air curtains blends in well in the environment and the designed for fit into both exclusive shop interiors as industrial environments.

Reduced dimensions and integrated frame

Thanks to small dimensions and an integrated frame, AR3200 is very easy to install. The frame and hatch can be finished in any colour to perfectly match the environment.

High performance

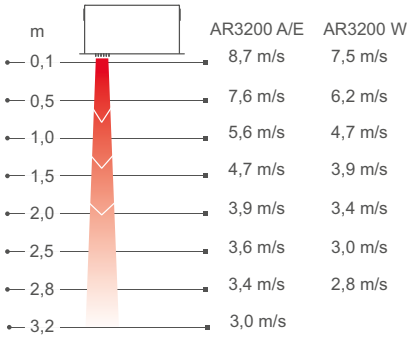
Frico air curtains are developed and manufactured in Sweden. The air curtains are tested in one of the most modern and advanced air and sound laboratories in Europe which means that we can guarantee a high performance product.

AR3200C

Available in 3 versions:

- Ambient (without heat)
- Electrical heating
- Water heating

Air velocity profile



Measurements according to ISO 27327-1. Average values for products in the series.

Design and specifications are subject to change without notice.

AR3200C

Frico's Thermozone technology optimizes the air curtain

Frico air curtains create an invisible barrier at openings and doors which separates different temperature zones without limiting access for people and vehicles. Thermozone technology creates a highly uniform air barrier with a perfect balance between air volume and air velocity, regardless of whether it is the heat or the cold that you want to keep inside.

Great energy savings

In many premises doors remain open for a significant part of the day, this results in huge losses of expensively heated or cooled air, especially when the temperature difference between outdoor and indoor air is great. With correctly installed air curtains great energy savings can be obtained.

Comfortable indoor climate

Air curtains with Thermozone technology have optimized performance to provide a comfortable indoor climate free from drafts. The air curtain also keeps out emissions and insects.

Low sound level

With Thermozone technology Frico manufactures air curtains with very high airflow performance. This does not just make the air curtain more effective, but also has other advantages such as extremely low sound levels and reduced turbulence.

Create the optimal solution to suit your specific needs

After you selected the air curtain to suit your specific needs (ambient, electrical heating, water heating) and length 1, 1,5, or 2 m you assemble your control and accessory options:

Accessories - Control options

Motor alarm board or Door switch control .

Add valve system

Water heated units must be supplemented with a valve system.

Select mounting options

Add mounting accessories if needed.

AR3200C

Technical specifications

Voltage motor: 230V~

Ambient, no heat - AR3200C A (IP21)

Item number	Type	Output [kW]	Airflow*1 [m³/h]	Sound power*2 [dB(A)]	Sound pressure*3 [dB(A)]	Amperage motor [A]	Length [mm]	Weight [kg]
48350	**AR3210CA**	0	1000/1800	73	43/57	0,7	1078	29
48354	**AR3215CA**	0	1600/2900	73	43/57	1,3	1588	40
48358	**AR3220CA**	0	2100/3900	76	44/60	1,6	2078	55

Electrical heat - AR3200C E (IP20)

Item number	Type	Output steps [kW]	Airflow*1 [m³/h]	Δt*4 [°C]	Sound power*2 [dB(A)]	Sound pressure*3 [dB(A)]	Amperage motor [A]	Voltage [V] Amperage [A] (heat)	Length [mm]	Weight [kg]
48346	**AR3210CE03**	2/3	1000/1800	9/5	73	43/57	0,7	230V~/13	1078	30
48347	**AR3210CE05**	3,3/5	1000/1800	15/8	73	43/57	0,7	230V~/21,7 400V3N~/7,2	1078	30
48348	**AR3210CE08**	5/8	1000/1800	24/13	73	43/57	0,7	400V3N~/11,6	1078	31
48351	**AR3215CE08**	4/8	1600/2900	15/8	73	43/57	1,3	400V3N~/11,6	1588	41
48352	**AR3215CE12**	8/12	1600/2900	22/12	73	43/57	1,3	400V3N~/17,3	1588	42
48355	**AR3220CE10**	5/10	2100/3900	14/8	76	44/60	1,6	400V3N~/14,5	2078	57
48356	**AR3220CE16**	10/16	2100/3900	23/12	76	44/60	1,6	400V3N~/23,1	2078	59

Water heat - AR3200C W (IP21)

Item number	Type	Output*5 [kW]	Airflow*1 [m³/h]	Δt*4,5 [°C]	Water volume [l]	Sound power*2 [dB(A)]	Sound pressure*3 [dB(A)]	Amperage motor [A]	Length [mm]	Weight [kg]
48349	**AR3210CW**	8,2	1000/1500	19/16	1,1	69	44/53	0,6	1078	30
48353	**AR3215CW**	14	1700/2600	19/16	1,7	72	48/56	1,0	1588	41
48357	**AR3220CW**	18	2500/3150	18/17	2,3	72	50/56	1,2	2078	56

*1) Lowest/highest airflow of totally 3 fan steps.
*2) Sound power (L_{WA}) measurements according to ISO 27327-2: 2014, Installation type E.
*3) Sound pressure (L_{pA}). Conditions: Distance to the unit 5 metres. Directional factor: 2. Equivalent absorption area: 200 m². At lowest/highest airflow.
*4) Δt = temperature rise of passing air at maximum heat output and lowest/highest airflow.
*5) Applicable at water temperature 60/40 °C, air temperature, in +18 °C.

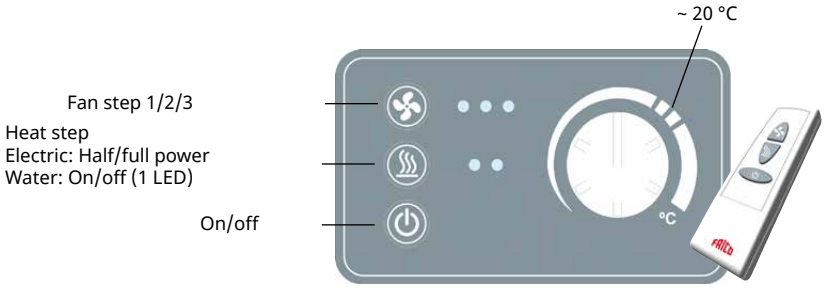
Manufactured in Sweden with a frame and hatch made of hot zinc-plate and powder coated steel panels. Colour frame and hatch: white, RAL 9016. Colour grille: grey, RAL 7046. The frame and hatch can be painted in an optional colour.

CE

Controls

The control system is integrated in the air curtain. The air curtain can be regulated with a remote control or by the control panel placed inside the service hatch. The air speed is set manually. The heat is controlled automatically.

Door switch control PA2DR is available as an accessory for a door switch function. Possibility of using external on/off.



- Remote control.
- Integrated control panel on end of unit
  - 3 fan steps, 2 electrical heating steps (electrical), heating on /off (water).
- Manual regulation of the fan.
- Automatic heating control.

Mounting

AR3200C

Mounting

Recommended installation height for ambient and electrically heated units is 3,2 metres and recommended installation height for water heated unit is 2,8 metres. The air curtain is designed to be installed into suspended ceilings. The unit is ready for suspension with threaded bars (accessory) on its outside. The threaded bars can also be fixed on the inside of the unit e.g. when mounted on a solid suspended ceiling.

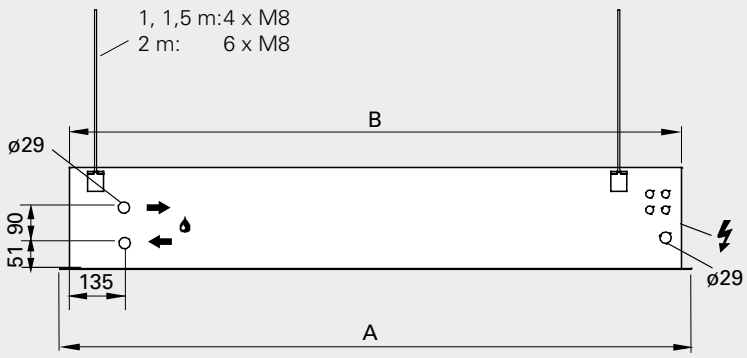
The air curtain is installed horizontally with the outlet air grille facing downwards as close to the door as possible, concealed in the false ceiling. For the protection of wider doorways, several units can be mounted in series alongside each other.

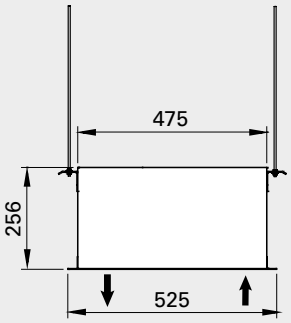
Connection

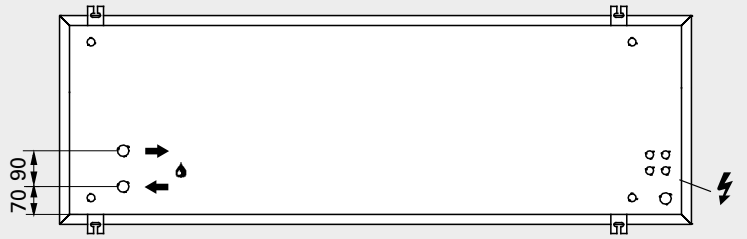
Service and maintenance are easily made through the service hatch at the bottom of the unit.
The electrical connection is made on the side or on the top of the unit. Control (230V~) and power supply for heat (400V3~) should be connected to a terminal block in the terminal box.

Water heated units are connected to the water system inside the unit, through holes made during installation on the top or the side of the unit. Flexible hoses are available as accessories. Water heated units must always be supplemented with a valve kit mounted outside the unit. See Valves and Accessories.

DN15 (1/2"), outside thread







	A [mm]	B [mm]
AR3210C	1078	1028
AR3215C	1588	1538
AR3220C	2078	2028

Minimum distance from outlet to floor for electrically heated units is 1800 mm.

Recommended installation height varies depending on the relevant premises. See www.frico.net for further information.

AR3200C

Accessories - Control options

PAMLK, motor alarm board
Accessory allows connection for a motor alarm signal in units where this facility is not already available. PAMLK plugs between motor wiring harness and main PC board. Use potential free contact on PAMLK board.

PA2DR, door switch control
Contains a door switch for door indication and a special remote control intended to activate auto mode in the unit.

Item number	Type	Used for	Consists of
18690	**PAMLK**	AR3210C/3215C/3220C	1
15662	**PA2DR**	AR3210C/3215C/3220C	1

Accessories - mounting

PA34TR, threaded bars
Threaded bars for installing unit on to a ceiling. Length 1 m. Used together with ceiling brackets (PA34CB). Supplemented with vibration dampers (PA34VD) for reduced vibration.

PA34CB, ceiling brackets
Ceiling brackets for installing the unit from the ceiling using wires or threaded bars (not included). Best combined with vibration dampers (PA34VD) when using threaded bars.

PA34VD, vibration dampers
Reduces vibrations for ceiling installations with threaded bars.

Item number	Type	Used for	Consists of
18056	**PA34TR15**	AR3210C/3515C	4
18057	**PA34TR20**	AR3220C	6
18059	**PA34CB15**	AR3210C/3515C	4
18060	**PA34CB20**	AR3220C	6
18065	**PA34VD15**	AR3210C/3515C	4
18066	**PA34VD20**	AR3220C	6

AR3200C

Water control

Water heated units must be supplemented with valves. The valve system controls the water flow and activates maximum heat only when needed. By activating the built-in bypass feature, a small leakage flow is let through to make sure there is always hot water in the heating coil, providing frost protection and faster heating.

VLSP, pressure independent valve system on/off
Two way pressure independent control and adjustment valve with on/off actuator, shut-off valve and bypass. DN15/20/25/32. 230V.

VOT, three way control valve and actuator on/off
3-way control valve with on/off actuator, DN15/20/25. 230V.
The valve kit consists of the following:
TRVS, 3-way control valve
SD230, actuator on/off 230V

Item number	Type	DN	Flow range l/s
79379	**VLSP15LF**	DN15	0,012 - 0,068
79380	**VLSP15NF**	DN15	0,024 - 0,13
79381	**VLSP20**	DN20	0,058 - 0,32
79382	**VLSP25**	DN25	0,10 - 0,60
79417	**VLSP32**	DN32	0,22 - 1,03
19031	**VOT15**	DN15	
19032	**VOT20**	DN20	
19033	**VOT25**	DN25	

Accessories - water heated units

FHDN15, flexible hoses
Flexible hoses for easy and practical installation of water heated unit. DN15, inside thread, 90° bend.

Item number	Type	Used for	Consists of
18055	**FHDN15**	AR3210CW/3215CW/3220CW	2

AR200

Recessed air curtain for smaller entrances

AR200, with a recommended installation height of 2,5 m, is a compact air curtain, suitable for most small entrances. A low height makes it possible to install AR200 where ceiling space is limited. The recessed installation and low sound level makes AR200 very discreet. Units with electrical heat are convertible between several outputs making it simple and flexible to adapt the output to current need.

Great energy savings

In many premises doors remain open for a significant part of the day, this results in huge losses of expensively heated or cooled air, especially when the temperature difference between outdoor and indoor air is great. With correctly installed air curtains great energy savings can be obtained.

Control system SIRe

AR200 is supplemented with SIRe control system via an external PC board. SIRe enables many smart and energy saving features. One SIRe can control up to nine AR200 air curtains. Each AR200 requires an external PC board SIReB1XA.

High performance

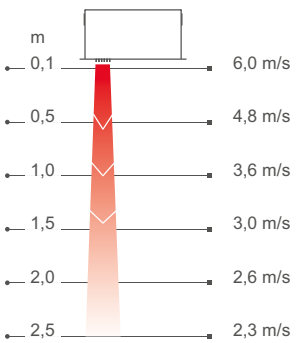
Frico air curtains are developed and manufactured in Sweden. The air curtains are tested in one of the most modern and advanced air and sound laboratories in Europe which means that we can guarantee a high performance product.

AR200

Available in 3 versions:

- Ambient (without heat)
- Electrical heating
- Water heating

Air velocity profile



Measurements according to ISO 27327-1. Average values for products in the series.

Design and specifications are subject to change without notice.

AR200

Technical specifications

Ambient, no heat - AR200 A (IP20)

Voltage motor: 230V~

Item number	Type	Output [kW]	Airflow*1 [m³/h]	Sound power*2 [dB(A)]	Sound pressure*3 [dB(A)]	Amperage [A]	Length [mm]	Weight [kg]
3261	**AR210A**	0	650/1200	66	34/50	0,5	1042	18
3262	**AR215A**	0	950/1750	66	34/50	0,6	1552	25
3260	**AR220A**	0	1300/2400	70	40/54	1,0	2042	36

Electrical heat - AR200 E (IP20)

Item number	Type	Output steps 400V3N~ [kW]	Output steps 230V~ [kW]	Airflow*1 [m³/h]	Δt*4 [°C]	Sound power*2 [dB(A)]	Sound pressure*3 [dB(A)]	Voltage [V]	Amperage 400V3N~ [A]	Amperage 230V~ [A]	Length [mm]	Weight [kg]
3263	**AR210E09**	3	-	650/1200	13/7	66	34/50	400V3N~	4,3	-	1042	23
		6/9	-	650/1200	41/22	66	34/50	400V3N~	13	-	1042	23
		-	3	650/1200	13/7	66	34/50	230V~	-	13	1042	23
		-	3/5	650/1200	23/12	66	34/50	230V~	-	22	1042	23
3264	**AR215E11**	4,5	-	950/1750	14/8	66	34/50	400V3N~	6,5	-	1552	32
		6,8/11,3	-	950/1750	35/20	66	34/50	400V3N~	16	-	1552	32
		-	4,5	950/1750	14/8	66	34/50	230V~	-	20	1552	32
		-	4,5/6,8	950/1750	21/12	66	34/50	230V~	-	30	1552	32
3265	**AR220E18**	6	-	1300/2400	13/7	70	40/54	400V3N~	8,7	-	2042	44
		12/18	-	1300/2400	41/22	70	40/54	400V3N~	26	-	2042	44
		-	6	1300/2400	13/7	70	40/54	230V~	-	26	2042	44
		-	6/10	1300/2400	23/12	70	40/54	230V~	-	43	2042	44

Water heat - AR200 W (IP20)

Item number	Type	Output*5 [kW]	Airflow*1 [m³/h]	Δt*4,5 [°C]	Water volume [l]	Sound power*2 [dB(A)]	Sound pressure*3 [dB(A)]	Amperage [A]	Length [mm]	Weight [kg]
2435	**AR210W**	6,6	700/1000	24/21	0,5	64	41/49	0,4	1042	21
2436	**AR215W**	10	1000/1600	24/20	0,9	66	37/50	0,6	1552	39
2437	**AR220W**	13	1400/2000	32/20	1,1	69	44/53	1,0	2042	42

*1) Lowest/highest airflow of totally 3 fan steps.
*2) Sound power (L_{WA}) measurements according to ISO 27327-2: 2014, Installation type E.
*3) Sound pressure (L_{pA}). Conditions: Distance to the unit 5 metres. Directional factor: 2. Equivalent absorption area: 200 m². At lowest/highest airflow.
*4) Δt = temperature rise of passing air at maximum heat output and lowest/highest airflow.
*5) Applicable at water temperature 80/60 °C, air temperature, in +18 °C.
Approved for 220V/1ph/60Hz and 380V/3ph/60Hz. Product performance for 220V/1ph/60Hz and 380V/3ph/60Hz will differ from stated data. AR200E is delivered as 9 kW, 11 kW and 18 kW (400V3N~) models, but they are convertible to 230V~ and different outputs as shown in above table.

Manufactured in Sweden. Bottom plate in white lacquered aluminium. Colour: RAL 9016. The bottom plate can easily be removed and painted in an optional colour. Non visible parts made of hot zinc plated steel panels.

CE

Create the optimal solution to suit your specific needs

Select control system

Control system SIRe: There are three different levels with different functionality to choose from, Basic, Competent or Advanced.

Add valve system

Water heated units must be supplemented with a valve system.

Select mounting options

Add mounting accessories if needed.

Mounting

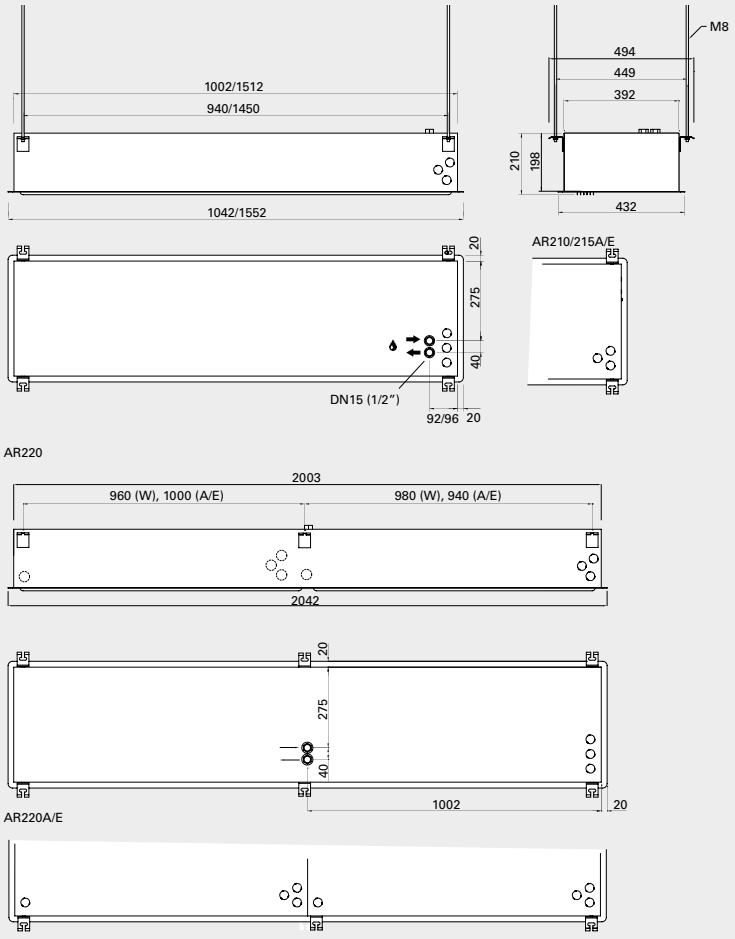
The recommended installation height of AR200 is 2,5 m. The air curtain is installed horizontally with the outlet air grille facing downwards as close to the door as possible, concealed in the false ceiling. The only visible part of the unit is the underside which is level with the ceiling. The bottom plate must be accessible, nothing should prevent it being fully opened. The unit is ready for suspension with threaded bars (accessory) on its outside. For the protection of wider doorways, several units can be mounted in series alongside each other.

Connection

Service and maintenance are easily made through the service hatch at the bottom of the unit. The electrical connection is made on the side or on the top of the unit. Control (230V~) and power supply for heat (400V3~) should be connected to a terminal block in the terminal box. 2-metre and longer units require dual power supplies. The electrical heated units can be switched between different outputs and for 230V~/400V3~.

Water heated units are connected to the water system on top of the unit. Water heated units must always be supplemented with a valve kit mounted outside the unit. See Valves and Accessories.

DN15 (1/2"), inside thread



Minimum distance from outlet to floor for electrically heated units is 1800 mm.

Recommended installation height varies depending on the relevant premises. See www.frico.net for further information.

AR200

Control system SIRe

AR200 is supplemented with SIRe control system. With SIRe control system, the air curtain will always perform at its best. You'll never have to think about switching it on or off. It even adapts to the season outside, and with calendar function the air curtain automatically runs during the hours it is needed. The SIRe control system is available in three different versions with different functionalities; Basic, Competent and Advanced. One SIRe can control up to nine AR200 air curtains. Each AR200 requires an external PC board SIReB1XA.

SIRe Basic

- Manual regulation of the fan and temperature
- Automatic control of fan speed and temperature via the integrated temperature sensor

SIRe Competent

- All functions for Basic
- Calendar function
- Filter alarm
- Simple BMS control - on/off, fan speed and alarm functions
- Flexible mode - for doors that open and close frequently
- Open mode - for doors that stay open

SIRe Advanced

- All functions for Competent
- Eco mode - extra energy-efficient mode
- Comfort mode - when comfort is important
- Advanced BMS control - 0-10V, potential free contact or Modbus
- Max limit of return water temperature.*
- Proactive regulation – measures outdoor temperatures for proactive reaction.

** Requires sensor SIReWTA*

SIReBN + SIReB1XA

SIRe Basic

SIRe Basic gives simple control at a low cost. Manual or automatic control of heat and fan speed via the integrated temperature sensor. Control system SIRe Basic for AR200 is composed of control kit SIReBN and PC board SIReB1XA (ordered separately).

SIReACY/Z + SIReB1XA

SIRe Competent

By using the included door contact, SIRe Competent learns the needs of the entrance it is installed in, e.g. opening frequency. It has calendar function, service timer, and analogue BMS communication (0-10V fan speed, on/off, common alarm signal). Control system SIRe Competent for AR200 is composed of control kit SIReAC and PC board SIReB1XA (ordered separately).

SIReAAY/Z + SIReB1XA

SIRe Advanced

SIRe Advanced anticipates and learns the needs of the entrance it is installed in, based on opening frequency, outdoor and indoor temperature, etc... It allows communiction with BMS systems, analogue or via Modbus/RTU. Because the fan speed is adapted, the sound level is optimized and is never higher than is necessary for comfort. With SIRe Advanced it is possible to choose between Eco and Comfort mode dependent on whether energy savings or optimal comfort has been prioritised. The return water temperature can be limited, thus ensuring that the available heat is exploited to the maximum. Control system SIRe Advanced for AR200 is composed of control kit SIReAA and PC board SIReB1XA (ordered separately).

Item number	Type	Used for	Consists of
33481	**SIReBN**	AR200A/E/W	1
33488/33489	**SIReACY/SIReACZ***	AR200A/E/W	1
33490/33491	**SIReAAY/SIReAAZ***	AR200A/E/W	1
74061	**SIReB1XAE**	AR200E	1
74062	**SIReB1XAW**	AR200A/W	1

*[1]) SIRexxxY communicates in Swedish, Norwegian, English, German, French, Spanish, Dutch, Italian, Danish and Finnish.
SIRexxxZ communicates in Russian, Ukrainian, Polish, Czech, Slovak, Romanian, Hungarian, Turkish, Portuguese and English.

AR200

Control system content and accessories

SIRe Basic

Content

- SIReUB1, control unit with built in room temperature sensor. Wall unit cover included.
- SIReCC, modular cable, RJ12 (6p/6c), 5 m
- SIReBX1A, external PC-board (ordered separately)

SIRe Competent

Content

- SIReUA1Y, control unit with built in room temperature sensor. Wall unit cover included.
- SIReC1XN, PC board HUB Competent
- FCDC, door contact
- SIReCC, modular cables, RJ12 (6p/6c), 3 m resp. 5 m
- SIReBX1A, external PC-board (ordered separately)

SIRe Advanced

Content

- SIReUA1Y, control unit with built in room temperature sensor. Wall unit cover included.
- SIReA1XN, PC board HUB Advanced
- SIReOTX, outdoor temperature sensor
- FCDC, door contact
- SIReCC, modular cables, RJ12 (6p/6c), 3 m resp. 5 m
- SIReBX1A, external PC-board (ordered separately)

SIReBX1A, external PC-board
External PC-board for AR200 units to allow SIRe control.

FCDC, door contact
Indicates door status. Potential free, changeover contact.

SIReRTX, external room temperature sensor
Used to obtain a better measuring point in the premises when the control unit is located so that the internal room temperature sensor does not show a relevant value. 10 m. cable with modular connector RJ11 (4p/4c).

SIReWTA, return water sensor
Clamp-on sensor for return water temperature control. 3 m. cable with modular connector RJ11 (4p/4c). Should be mounted on the return pipe on the heating coil.

SIReCJ4/SIReCJ6, joint piece
Used to join two RJ11 (4p/4c) respectively RJ12 (6p/6c).

SIReCC, modular cables
Modular cables RJ11 (4p/4c) and RJ12 (6p/6c). Available in lengths of 3, 5, 10 and 15 m (RJ12 also in 40 m).

Item number	Type	Used for	Consists of
74061	**SIReB1XAE**	AR200E	1
74062	**SIReB1XAW**	AR200A/W	1
17495	**FCDC**	AR200A/E/W	1
17539	**SIReRTX**	AR200A/E/W	1
17613	**SIReWTA**	AR200W	1
17616	**SIReCJ4**	AR200A/E/W	1
17615	**SIReCJ6**	AR200A/E/W	1
17542	**SIReCC603**	AR200A/E/W	1 (3 m)

Item number	Type	Used for	Consists of
17543	**SIReCC605**	AR200A/E/W	1 (5 m)
17544	**SIReCC610**	AR200A/E/W	1 (10 m)
17545	**SIReCC615**	AR200A/E/W	1 (15 m)
17773	**SIReCC640**	AR200A/E/W	1 (40 m)
17546	**SIReCC403**	AR200A/E/W	1 (3 m)
17547	**SIReCC405**	AR200A/E/W	1 (5 m)
17548	**SIReCC410**	AR200A/E/W	1 (10 m)
17549	**SIReCC415**	AR200A/E/W	1 (15 m)

AR200

Water control

Water heated units must be supplemented with valves. The valve system controls the water flow and activates maximum heat only when needed. By activating the built-in bypass feature, a small leakage flow is let through to make sure there is always hot water in the heating coil, providing frost protection and faster heating.

Used with SIRe Basic and Competent.

VLSP, pressure independent valve system on/off
Two way pressure independent control and adjustment valve with on/off actuator, shut-off valve and bypass. DN15/20/25/32. 230V.

VOT, three way control valve and actuator on/off
3-way control valve with on/off actuator, DN15/20/25. 230V.
The valve kit consists of the following:
TRVS, 3-way control valve
SD230, actuator on/off 230V

Item number	Type	DN	Flow range l/s
79379	**VLSP15LF**	DN15	0,012 - 0,068
79380	**VLSP15NF**	DN15	0,024 - 0,13
79381	**VLSP20**	DN20	0,058 - 0,32
79382	**VLSP25**	DN25	0,10 - 0,60
79417	**VLSP32**	DN32	0,22 - 1,03
19031	**VOT15**	DN15	
19032	**VOT20**	DN20	
19033	**VOT25**	DN25	

Used with SIRe Advanced.

VLP, pressure independent and modulating valve system
Two way pressure independent control and adjustment valve with modulating actuator and shut-off valve. DN15/20/25/32. 24V.

VMT, three way control valve and modulating actuator
3-way control valve with modulating actuator. DN15/20/25. 24V.
The valve kit consists of the following:
TRVS, 3-way control valve
SDM24, modulating actuator 24V
ST23024, 24V transformer for 1-7 actuators

Item number	Type	DN	Flow range l/s
79375	**VLP15LF**	DN15	0,012 - 0,068
79376	**VLP15NF**	DN15	0,024 - 0,13
79377	**VLP20**	DN20	0,058 - 0,32
79378	**VLP25**	DN25	0,10 - 0,60
19034	**VMT15**	DN15	
19035	**VMT20**	DN20	
19036	**VMT25**	DN25	

Accessories - mounting

PA34TR, threaded bars
Threaded bars for installing unit on to a ceiling. Length 1 m. Used together with ceiling brackets (PA34CB). Supplemented with vibration dampers (PA34VD) for reduced vibration.

PA34CB, ceiling brackets
Ceiling brackets for installing the unit from the ceiling using wires or threaded bars (not included). Best combined with vibration dampers (PA34VD) when using threaded bars.

PA34VD, vibration dampers
Reduces vibrations for ceiling installations with threaded bars.

Item number	Type	Used for	Consists of
18056	**PA34TR15**	AR210/AR215	4
18057	**PA34TR20**	AR220	6
18059	**PA34CB15**	AR210/AR215	4
18060	**PA34CB20**	AR220	6
18065	**PA34VD15**	AR210/AR215	4
18066	**PA34VD20**	AR220	6


AR200

Portier

Design air curtain for entrances

Portier is an exclusive air curtain in brushed stainless steel intended for entrance doors in e.g. shops, banks, hotels and restaurants. The elegant design of the air curtain makes it particularly suitable for environments where demands are made on a high standard of design. Its recommended installation height is 2,5 m.

Create comfort

Adjustable outlet grille makes it possible to direct the air for optimum air curtain effect. For the protection of wider openings, several units can be mounted next to each other using a joining kit.

Installation options

Simple suspension using fixing nuts on the upper side for installation with wall brackets, suspension kit or wire/ threaded rod.

High performance

Frico air curtains are developed and manufactured in Sweden. The air curtains are tested in one of the most modern and advanced air and sound laboratories in Europe which means that we can guarantee a high performance product.

Portier

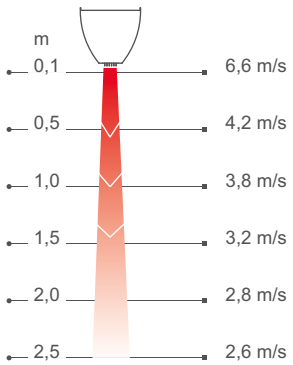
THERMOZONE TECHNOLOGY

Available in 2 versions:

- Ambient (without heat)
- Electrical heating

Recommended installation height for entrances: 2,5 m

Air velocity profile



Measurements according to ISO 27327-1. Average values for products in the series.

Design and specifications are subject to change without notice.

Portier

Frico's Thermozone technology optimizes the air curtain

Frico air curtains create an invisible barrier at openings and doors which separates different temperature zones without limiting access for people and vehicles. Thermozone technology creates a highly uniform air barrier with a perfect balance between air volume and air velocity, regardless of whether it is the heat or the cold that you want to keep inside.

Great energy savings

In many premises doors remain open for a significant part of the day, this results in huge losses of expensively heated or cooled air, especially when the temperature difference between outdoor and indoor air is great. With correctly installed air curtains great energy savings can be obtained.

Comfortable indoor climate

Air curtains with Thermozone technology have optimized performance to provide a comfortable indoor climate free from drafts. The air curtain also keeps out emissions and insects.

Low sound level

With Thermozone technology Frico manufactures air curtains with very high airflow performance. This does not just make the air curtain more effective, but also has other advantages such as extremely low sound levels and reduced turbulence.

Technical specifications

Voltage motor: 230V~

Ambient, no heat - Portier A (IP21)

Item number	Type	Output [kW]	Airflow [m³/h]	Sound power*¹ [dB(A)]	Sound pressure*² [dB(A)]	Amperage [A]	Length [mm]	Weight [kg]
2136	**PS210A**	0	1000/1300	70	44/54	0,45	1020	14
2351	**PS215A**	0	1300/2000	72	46/56	0,55	1530	20

Electrical heat - Portier E (IP21)

Item number	Type	Output steps [kW]	Airflow [m³/h]	Δt*³ [°C]	Sound power*¹ [dB(A)]	Sound pressure*² [dB(A)]	Voltage [V]	Amperage [A]	Length [mm]	Weight [kg]
2164	**PS210E03**	1,5/3	950/1200	10/8	66	44/50	230V~/400V3N~*⁴	13,4/4,8	1020	17
2140	**PS210E06**	3/6	950/1200	19/15	66	44/50	400V3N~*⁴	9,2	1020	17
2077	**PS210E09**	4,5/9	950/1200	28/23	66	44/50	400V3N~*⁴	13,5	1020	17
2085	**PS215E09**	4,5/9	1200/1900	23/14	66	39/50	400V3N~*⁴	13,5	1530	24
2079	**PS215E14**	6,7/13,5	1200/1900	34/21	66	39/50	400V3~ + 230V~	20,0	1530	24

*¹) Sound power (L_{WA}) measurements according to ISO 27327-2: 2014, Installation type E.
*²) Sound pressure (L_{pA}). Conditions: Distance to the unit 5 metres. Directional factor: 2. Equivalent absorption area: 200 m². At lowest/highest airflow.
*³) Δt = temperature rise of passing air at maximum heat output and highest airflow.
*⁴) Alternative 400 V3~ + 230 V~ (operating supply) if the current is greater than 16 A. Applies when connecting several units.

Approved for 220V/1ph/60Hz and 380V/3ph/60Hz. Product performance for 220V/1ph/60Hz and 380V/3ph/60Hz will differ from stated data.

Manufactured in Sweden. Housing in brushed stainless steel. Colour outlet grille and ends: black, RAL 9005.

CE

Portier

Control options

Unit without heating

Level 1
Airflow is set manually.
Control kit:

- CB20, control box, 2 fan steps.

Level 2
Airflow is set manually. The door contact regulates the airflow on/off.
Control kit:

- CB20, control box, 2 fan steps.
- MDC, magnetic door contact with a time relay.

Unit with electrical heating

Level 1
Airflow is set manually. The room thermostat controls the heat output in two steps.
Control kit:

- CB22, control box, 2 fan steps and 2 heating steps.
- RTI2, electronic 2-step thermostat.

Level 2
Airflow and heat output are controlled automatically based on the opening of the door and the room temperature. When the door is open the fan runs at high speed, when the door closes the fan will continue to run at high speed for the desired time (2s–10 min.) set on MDC. When the door is closed the fan runs at low speed if there is a need for heating, if not the fan is switched off.

The room thermostat controls the heat output. E.g. the thermostat is set on 23 °C and the difference between the steps 4 °C. The thermostat will activate below 19 °C when the door is closed. When the door opens, the thermostat will activate below 23 °C and normally the heat is switched on.
Control kit:

- CB22, control box, 2 fan steps and 2 heating steps.
- MDC, magnetic door contact with a time relay.
- RTI2, electronic 2-step thermostat.

Portier

Mounting

Mounting

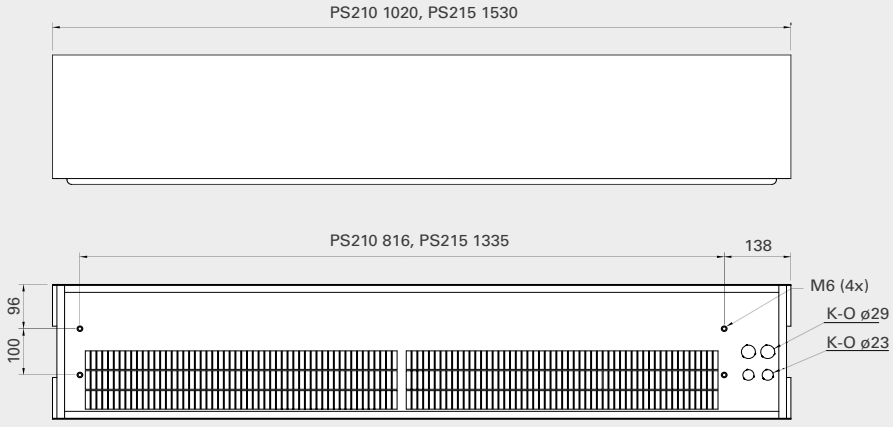
The recommended installation height of Portier is 2,5 m. The air curtain is installed horizontally with the outlet air grille facing downwards as close to the door as possible.

Numerous installation options are available: wall mounting with the wall mounting kit or ceiling mounting with pendulum mounting kit and suspension bracket. The air curtain can be suspended from wires or threaded rods.

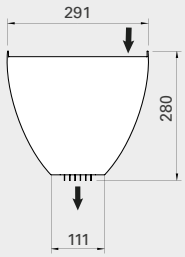
Minimum distance from outlet to floor for electrically heated units is 1800 mm. For the protection of wider openings, several units can be mounted next to each other using a joining kit.

Connection

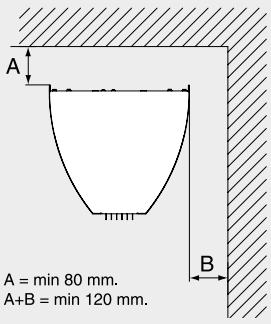
The electrical connection is made on the top of the unit. Control (230V~) and power supply for heat (400V3~) should be connected to a terminal block in the terminal box. For units with electrical heating, power and control should be supplied separately.



Minimum distance from outlet to floor for electrically heated units is 1800 mm.



Minimum distances



Recommended installation height varies depending on the relevant premises. See www.frico.net for further information.

Accessories - Control options

CB20, control box
Controls the airflow in 2 steps. Can control several units. Max input 12 A. IP44.

CB22, control box
Controls the airflow in 2 steps and heat output in 2 steps. Can control several units. Max input 10 A. IP44.

RTI2, electronic 2-step thermostat
Processor controlled 2-step thermostat with concealed dial. Setting range +5 – +35 °C. Connection voltage 230 V (two potential free contacts). Max. breaking current: 16/10 A (230/400 V). IP44.

MDC, magnetic door contact with time relay
Starts the air curtain or increases from low to high speed when the door is opened. When the door is closed, the fan continues to run for the preset time (2 s–10 min). This prevents the fan from starting/stopping continuously and is especially suitable for doors that are frequently opened. Three alternating volt-free contacts 10 A, 230 V~ activated when the contacts make. A MDCDC is included in MDC. IP44.

Item number	Type	Used for	Consists of
10737	**CB20**	PS210A/15A	1
10738	**CB22**	PS210E/15E	1
10231	**RTI2**	PS210E/15E	1
11600	**MDC**	PS210A/15A/10E/15E	1

Accessories - mounting

P2WB, wall mounting kit
Used for installing unit horizontally on a wall. Consists of wall brackets and mounting parts.

P2JK, joining kit
Used to join horizontal units together for a sleek and unified installation. Consists of joint bracket and mounting parts.

ADPK1, suspension kit
The hanging brackets are covered by a white plastic trim to cover the cables. The brackets may be cut to shorter length, if required.

ADPF1, suspension brackets
Ceiling brackets for installing the unit from the ceiling using wires or threaded bars (not included). Consists of 4 brackets, 2 for the unit and 2 for the ceiling.

Item number	Type	Used for	Consists of
10695	**P2WB**	PS210A/15A/10E/15E	2
10696	**P2JK**	PS210A/15A/10E/15E	1
10727	**ADPK1**	PS210A/15A/10E/15E	2
10728	**ADPF1**	PS210A/15A/10E/15E	4

Portier

ADA

Air curtain for air conditioned premises

ADA is suitable to use, for example, to keep the cold air inside air conditioned premises. The air curtain creates an air barrier that prevents the intrusion of warm air and also insects, exhaust fumes, smoke, dust, etc. The cost of air conditioning will be substantially lower when the loss of conditioned air is reduced.

Leading technology and design

Frico collaborates with leading architects and product designs in the product development. The air curtains blends in well in the environment and the designed for fit into both exclusive shop interiors as industrial environments.

Compact and easily positioned

Thanks to compact design and air intake at the front, the air curtain can be mounted where space is limited between the ceiling and the upper edge of the doorway.

High performance

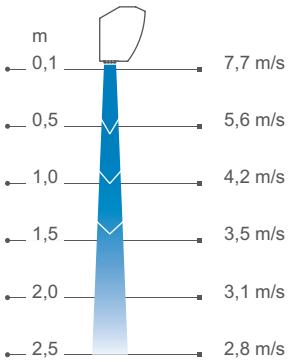
Frico air curtains are developed and manufactured in Sweden. The air curtains are tested in one of the most modern and advanced air and sound laboratories in Europe which means that we can guarantee a high performance product.

ADA

Ambient (without heat)

Recommended installation height for entrances: 2,5 m

Air velocity profile



Measurements according to ISO 27327-1.
Average values for products in the series.

Design and specifications are subject to change without notice.

ADA

Frico's Thermozone technology optimizes the air curtain

Frico air curtains create an invisible barrier at openings and doors which separates different temperature zones without limiting access for people and vehicles. Thermozone technology creates a highly uniform air barrier with a perfect balance between air volume and air velocity, regardless of whether it is the heat or the cold that you want to keep inside.

Great energy savings

In many premises doors remain open for a significant part of the day, this results in huge losses of expensively heated or cooled air, especially when the temperature difference between outdoor and indoor air is great. With correctly installed air curtains great energy savings can be obtained.

Comfortable indoor climate

Air curtains with Thermozone technology have optimized performance to provide a comfortable indoor climate free from drafts. The air curtain also keeps out emissions and insects.

Low sound level

With Thermozone technology Frico manufactures air curtains with very high airflow performance. This does not just make the air curtain more effective, but also has other advantages such as extremely low sound levels and reduced turbulence.

Technical specifications

Ambient, no heat - ADA (IP21)

Voltage motor: 230V~

Item number	Type	Output [kW]	Airflow [m³/h]	Sound power*¹ [dB(A)]	Sound pressure*² [dB(A)]	Amperage motor [A]	Length [mm]	Weight [kg]
5984	**ADA090H**	0	800/1150	70	43/54	0,50	900	9,5
5985	**ADA120H**	0	1100/1400	67	44/51	0,55	1200	11,7

*¹) Sound power (L_{WA}) measurements according to ISO 27327-2: 2014, Installation type E.
*²) Sound pressure (L_{pA}). Conditions: Distance to the unit 5 metres. Directional factor: 2. Equivalent absorption area: 200 m². At lowest/highest airflow.

Approved for 220V/1ph/60Hz. Product performance for 220V/1ph/60Hz will differ from stated data.

Manufactured in Sweden with a corrosion proof housing made of hot zinc-plate and powder coated steel panels. Colour front: white, RAL 9016, NCS S 0500-N.

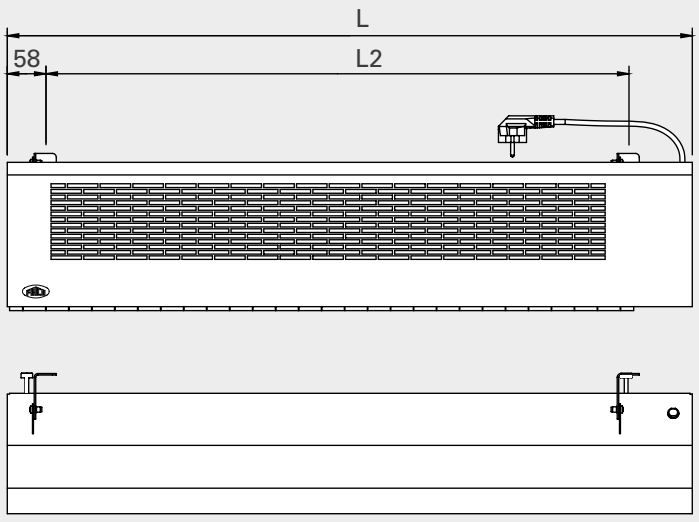
Mounting

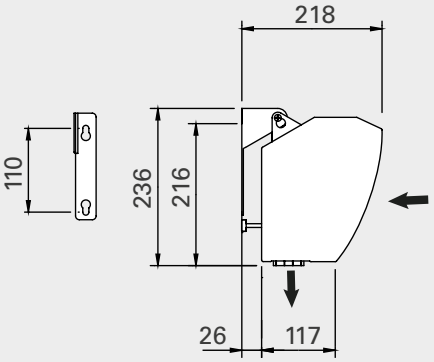
Mounting

The air curtain is installed horizontally with the outlet air grille facing downwards as close to the door as possible. Wall brackets included. Recommended installation height for entrances: 2,5 m. The unit can be tilted for optimum output. For the protection of wider doorways, several units can be mounted in series alongside each other.

Connection

The unit is fitted with a 1.8 m cable and plug on delivery.





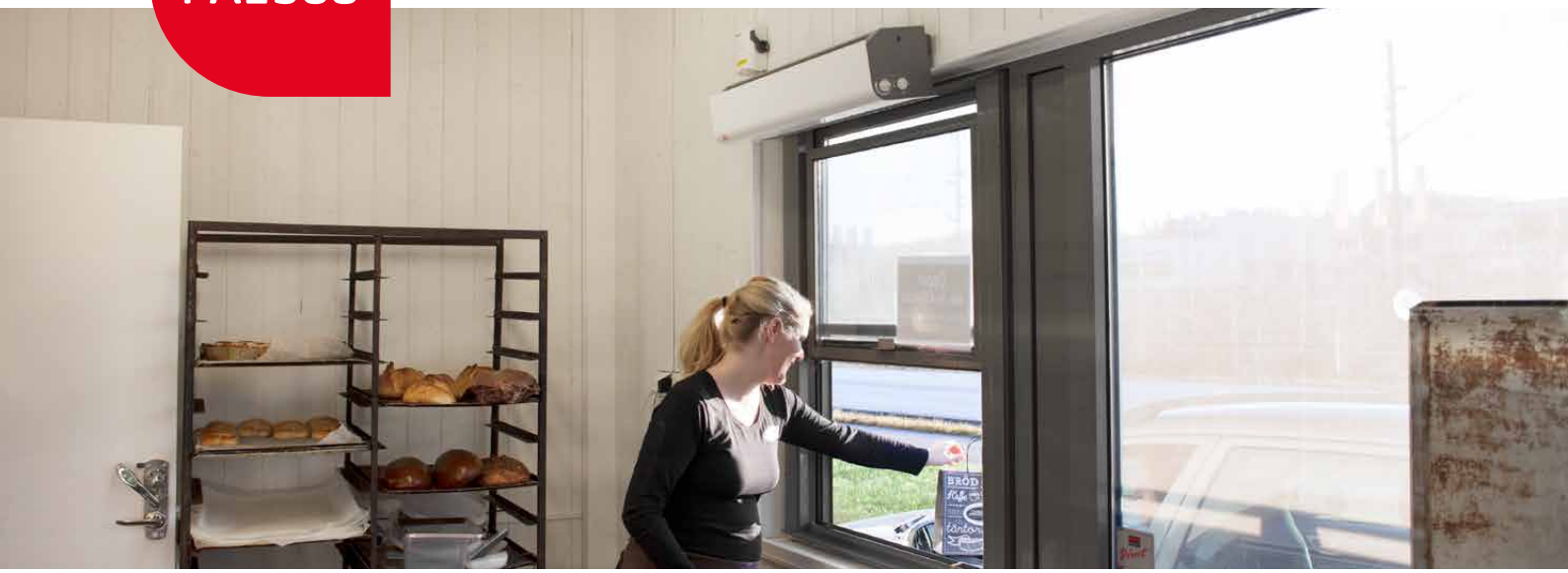
	L [mm]	L2 [mm]
ADA090H	900	747
ADA120H	1200	1047

Recommended installation height varies depending on the relevant premises. See www.frico.net for further information.

For mounting, connection, wiring diagrams and other technical information, please see the manual.

ADA

PA1508



Air curtain for small openings

PA1508 is primarily intended for small openings such as kiosk and service hatches and cashier benches where a long, narrow air flow is required. This creates a temperature separating air barrier that prevents cold air from pushing in and hot air from flowing out. PA1508 also gives additional heat and in this way also improves the working environment. The air curtain has a built-in thermostat for heat and switch to set the fan and heating steps.

Compact and easily positioned

With its compact construction and timeless design the unit is easy to place in any doorway. The intuitive controls are easily accessible, placed on the gable end. The front can be finished in any colour to perfectly match the environment.

Great energy savings

Working behind a service hatch is often associated with cold draughts and poor air quality due to exhaust fumes. PA1508 provides an excellent remedy for these problems. With correctly installed air curtains great energy savings can be obtained.

High performance

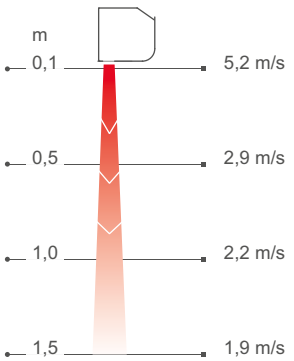
Frico air curtains are developed and manufactured in Sweden. The air curtains are tested in one of the most modern and advanced air and sound laboratories in Europe which means that we can guarantee a high performance product.

PA1508

Electrical heating

The air curtain has a built-in thermostat for heat and switch to set the fan and heating steps.

Air velocity profile



Measurements according to ISO 27327-1.
Average values for products in the series.

PA1508

Technical specifications

Electrical heat - PA1508 (IP20)

Voltage motor: 230V~

Item number	Type	Output [kW]	Airflow [m³/h]	Δt*¹ [°C]	Sound power*² [dB(A)]	Sound pressure*³ [dB(A)]	Amperage (heat) [A]	Length [mm]	Weight [kg]
3791	**PA1508E02**	1/2	270/400	22/15	66	39/50	8,7	790	7,5
3792	**PA1508E03**	2/3	270/400	34/23	66	39/50	13,0	790	7,5
3793	**PA1508E05**	3/4,5	270/400	51/34	66	39/50	19,6	790	7,5

*¹) Δt = temperature rise of passing air at maximum heat output and lowest/highest airflow.
*²) Sound power (L_{WA}) measurements according to ISO 27327-2: 2014, Installation type E.
*³) Sound pressure (L_{pA}). Conditions: Distance to the unit 5 metres. Directional factor: 2. Equivalent absorption area: 200 m². At lowest/highest airflow.

Manufactured in Sweden with a corrosion proof housing made of hot zinc-plate and powder coated steel panels. Plastic ends. Colour front: white, RAL 9016. Colour grille, rear section, ends and brackets: grey, RAL 7046.

Mounting

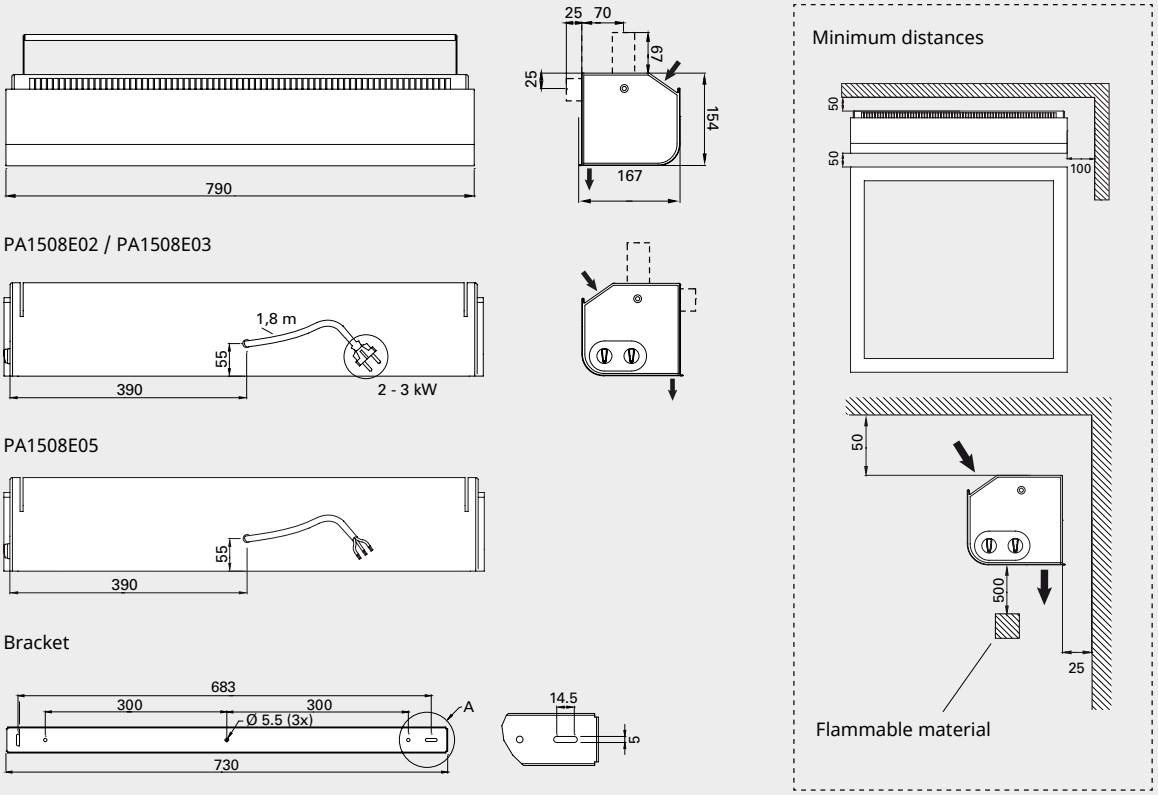
Mounting

The air curtain is installed horizontally with the supply air grille facing downwards as close to the opening as possible. Bracket is supplied for wall or ceiling mounting. The unit can be tilted for optimum output. Minimum distance from outlet to floor is 1800 mm.

Connection

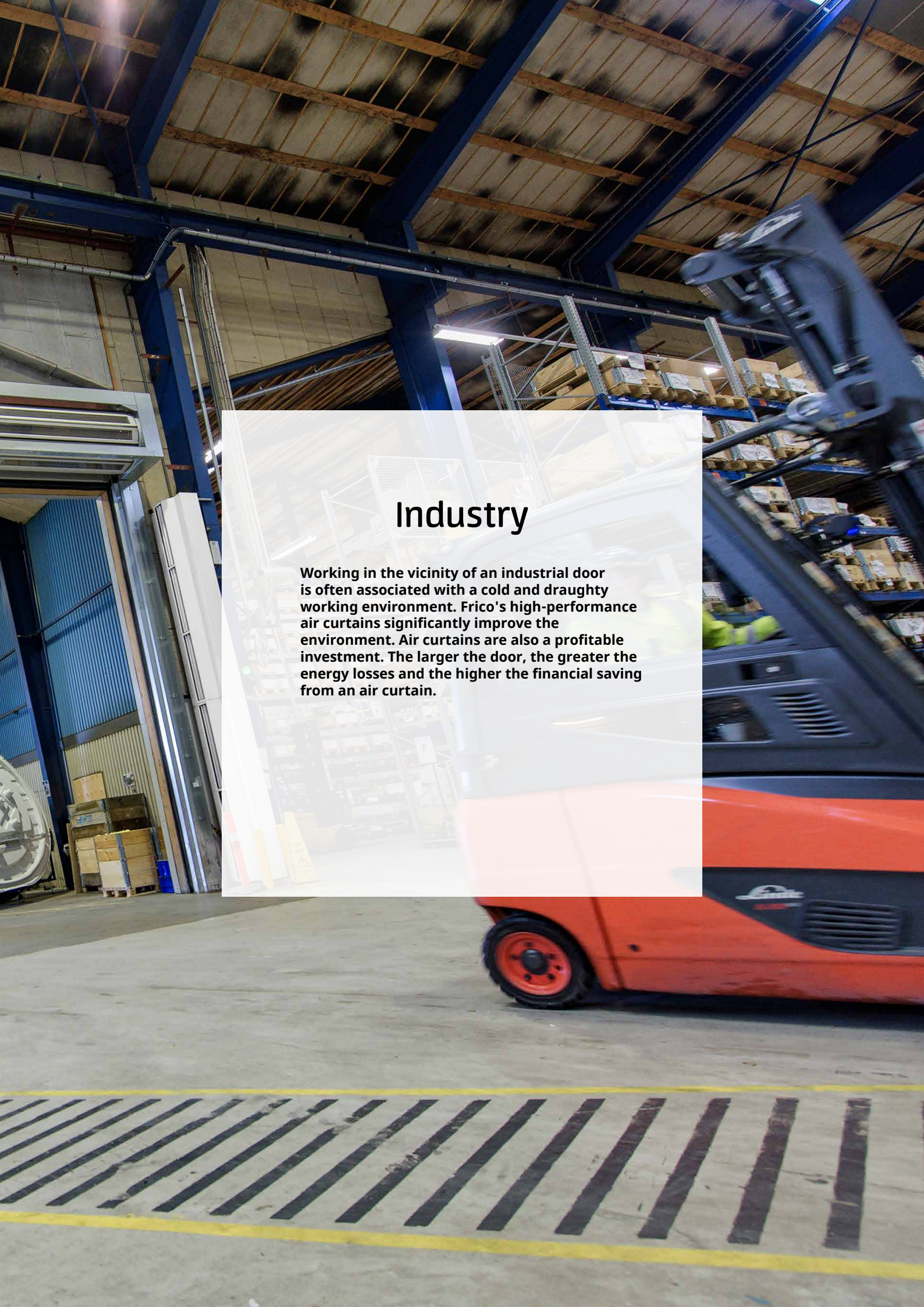
Units with 2-3 kW are supplied with a 1,8 m cable and plug. Units with 4,5 kW are supplied with a 1,3 m cable without plug. The socket for PA1508E03 must be fused for 16 A.

The PA1508E05 must be permanently connected to a fused mains supply using a cable of a minimum 4 mm² section.



For mounting, connection, wiring diagrams and other technical information, please see the manual.


Sweeping Card
Marius Pedersen
Tlf. 70 13 40 40
www.mariuspedersen.dk
Klar plastfolie



Industry

Working in the vicinity of an industrial door is often associated with a cold and draughty working environment. Frico's high-performance air curtains significantly improve the environment. Air curtains are also a profitable investment. The larger the door, the greater the energy losses and the higher the financial saving from an air curtain.

Pamir 5000

Stylish and energy efficient air curtain for industrial premises

Pamir 5000, with a recommended installation height of 5 m or width of 7 m, has a modern and sleek design developed to fit all entrances. The air curtain is available for horizontal, vertical and recessed installation. The Pamir series is equipped with energy-efficient EC motors which enable stepless control of the airflow. An easy to open front allows quick access to facilitate both installation and maintenance.

Energy efficient and sustainable

The air curtain is equipped with EC motors that are up to 50% more energy efficient than traditional AC motors, and have a lower weight which makes for easier installations and greener transports.

Intelligent control options

The Pamir series is supplemented with an intelligent control system that allows you to optimize your comfort with minimum effort. Smart and automatic features enable simple set-up and operation for different Frico products groups.

High performance

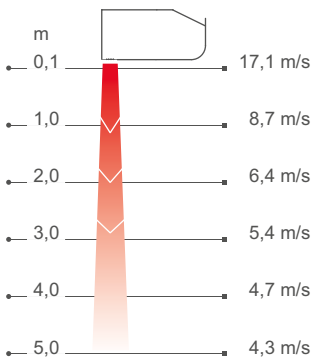
Frico air curtains are developed and manufactured in Sweden. The air curtains are tested in one of the most modern and advanced air and sound laboratories in Europe which means that we can guarantee a high performance product.

Pamir 5000

Available in 3 versions:

- Ambient (without heat)
- Electrical heating
- Water heating

Air velocity profile



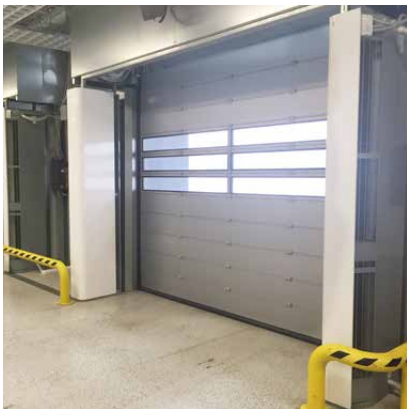
Measurements according to ISO 27327-1. Average values for products in the series.

Design and specifications are subject to change without notice.

Pamir 5000

Frico's Thermozone technology optimizes the air curtain

Frico air curtains create an invisible barrier at openings and doors which separates different temperature zones without limiting access for people and vehicles. Thermozone technology creates a highly uniform air barrier with a perfect balance between air volume and air velocity, regardless of whether it is the heat or the cold that you want to keep inside.



Great energy savings

In many premises doors remain open for a significant part of the day, this results in huge losses of expensively heated or cooled air, especially when the temperature difference between outdoor and indoor air is great. With correctly installed air curtains great energy savings can be obtained.

Comfortable indoor climate

Air curtains with Thermozone technology have optimized performance to provide a comfortable indoor climate free from drafts. The air curtain also keeps out emissions and insects.

Low sound level

With Thermozone technology Frico manufactures air curtains with very high airflow performance. This does not just make the air curtain more effective, but also has other advantages such as extremely low sound levels and reduced turbulence.

Create the optimal solution to suit your specific needs

After you selected the air curtain to suit your specific needs (ambient, electrical heating, water heating) and length 1, 1,5, 2, or 2,5 m you assemble your control and accessory options:

Select control system

Choose one of our FC Control systems.

Add valve system

Water heated units must be supplemented with a valve system.

Select mounting options

Horizontal, recessed or vertical installation.

Technical specifications

Ambient, no heat - PAFEC5000 A (IP24**)

Voltage motor: 230V~

Item number	Type	Output [kW]	Airflow*1 [m³/h]	Sound power*2 [dB(A)]	Sound pressure*3 [dB(A)]	Amperage motor [A]	Length [mm]	Weight [kg]
230375	**PAFEC5010A**	0	900/2950	80	34/66	4,4	1039	39
230379	**PAFEC5015A**	0	1350/4200	84	35/68	5,6	1549	51
230383	**PAFEC5020A**	0	1700/5900	86	39/70	8,1	2039	67
230387	**PAFEC5025A**	0	2150/7200	87	41/71	9,2	2549	82

Electrical heat - PAFEC5000 E (IP20)

Item number	Type	Output steps [kW]	Airflow*1 [m³/h]	Δt*4 [°C]	Sound power*2 [dB(A)]	Sound pressure*3 [dB(A)]	Amperage motor [A]	Voltage [V] Amperage [A] (heat)	Length [mm]	Weight [kg]
230376	**PAFEC5010E12**	3,9/7,8/12	900/2950	40/12	80	34/66	4,4	400V3~/16,9	1039	46
230380	**PAFEC5015E18**	6,0/12/18	1350/4200	40/13	84	35/68	5,6	400V3~/26	1549	66
230384	**PAFEC5020E24**	7,8/16/24	1700/5900	40/12	86	39/70	8,1	400V3~/33,8	2039	86
230388	**PAFEC5025E30**	9,9/20/30	2150/7200	42/12	87	41/71	9,2	400V3~/42,9	2549	104

Water heat - PAFEC5000 WL, coil for low water temperature (≤80 °C) (IP24**)

Item number	Type	Output*5 [kW]	Airflow*1 [m³/h]	Δt*4,5 [°C]	Water volume [l]	Sound power*2 [dB(A)]	Sound pressure*3 [dB(A)]	Amperage motor [A]	Length [mm]	Weight [kg]
230378	**PAFEC5010WL**	17	650/2700	28/18	1,9	82	32/66	4,3	1039	46
230382	**PAFEC5015WL**	26	1150/3950	27/19	3,0	82	33/66	5,5	1549	62
230386	**PAFEC5020WL**	35	1550/5400	27/19	4,1	83	35/67	8,0	2039	82
230390	**PAFEC5025WL**	46	1850/6900	28/20	5,2	85	37/69	9,1	2549	100

Water heat - PAFEC5000 WH, coil for high temperature water (≥80 °C) (IP24**)

Item number	Type	Output*6 [kW]	Airflow*1 [m³/h]	Δt*4,6 [°C]	Water volume [l]	Sound power*2 [dB(A)]	Sound pressure*3 [dB(A)]	Amperage motor [A]	Length [mm]	Weight [kg]
230377	**PAFEC5010WH**	14	650/2700	26/16	1,3	82	32/66	4,3	1039	45
230381	**PAFEC5015WH**	21	1150/3950	25/16	2,0	82	33/66	5,5	1549	60
230385	**PAFEC5020WH**	30	1550/5400	26/16	2,7	83	35/67	8,0	2039	79
230389	**PAFEC5025WH**	37	1850/6900	26/16	3,8	85	37/69	9,1	2549	96

*1) Low/high airflow (2V/10V).
*2) Sound power (L_{WA}) measurements according to ISO 27327-2: 2014, Installation type E.
*3) Sound pressure (L_{pA}). Conditions: Distance to the unit 5 metres. Directional factor: 2. Equivalent absorption area: 200 m². At low/high airflow (2V/10V).
*4) Δt = temperature rise of passing air at maximum heat output and low/high airflow (2V/10V).
*5) Applicable at water temperature 60/40 °C, air temperature, in +18 °C.
*6) Applicable at water temperature 80/60 °C, air temperature, in +18 °C.
*7) Applicable at water temperature 40/30 °C, air temperature, in +18 °C.
*5,6,7) See www.frico.net for additional calculations.
**) Horizontal mounting and vertical mounting to the right (seen from the inside): IP24.
Vertical mounting to the left (seen from the inside): IP21.

Approved for 220V/1ph/60Hz and 380V/3ph/60Hz. Product performance for 220V/1ph/60Hz and 380V/3ph/60Hz will differ from stated data.

Manufactured in Sweden with a corrosion proof housing made of hot zinc-plate and powder coated steel panels. Front and service hatch are made of powder coated aluminium. Colour front and service hatch: white, RAL 9016. Colour grille, rear section and ends: grey, RAL 7046.

CE

Horizontal mounting

Horizontal mounting

The recommended installation height of Pamir 5000 is 5 m. The air curtain can be installed on a wall or supended from a ceiling. It can also be installed recessed into suspended ceilings.

When the air curtain is mounted horizontally the outlet air grille must be facing downwards as close to the door as possible. For the protection of wider openings, several units can be mounted next to each other using a joining kit. Design kits which conceals cables, pipes and mountings are available for both wall and ceiling installations.

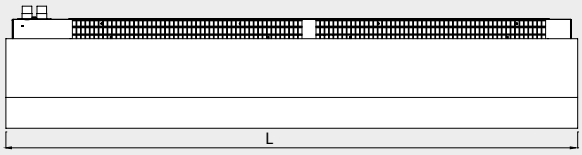
Connection

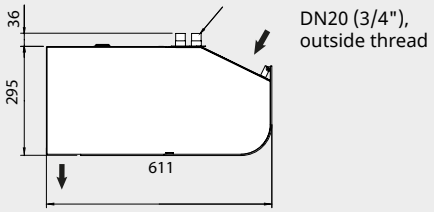
An easy to open front allows quick access to facilitate both installation and maintenance.

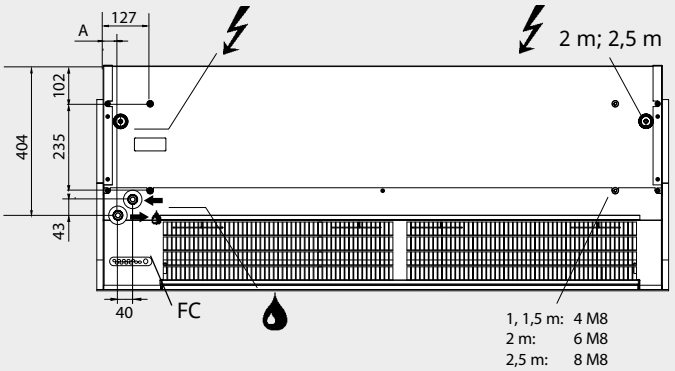
The air curtain has an integrated PC board which is connected to the selected external control system FC. Control is supplied by 230V~ to the PC board. The PC board is accessed via cable glands on the top of the unit. Communication- and sensor cables are connected to the PC board.

The electrical connection is made on the top of the unit. Power supply for electrical heated air curtains (400V3~) is routed via the motor compartment.

Water heated units are connected to the water system on top of the unit. Flexible hoses are available as accessories. Water heated units must always be supplemented with a valve kit mounted outside the unit. See Valves and Accessories.



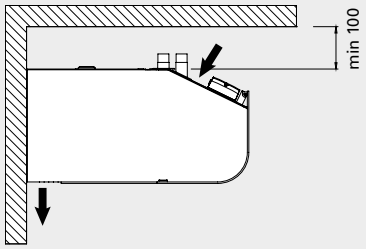




For wiring diagrams and other technical information, please see the manual and www.frico.net.

	L [mm]	A [mm]
PAFEC5010	1039	40
PAFEC5015	1549	40
PAFEC5020	2039	40
PAFEC5025	2549	39

Minimum distances



Minimum distance from outlet to floor for electrically heated units is 1800 mm.

Recommended installation height varies depending on the relevant premises. See www.frico.net for further information.

Vertical mounting

Vertical mounting

The recommended installation width of Pamir 5000 is 7 m with air curtains on both sides of the opening. Units from 1,5 metres and longer may be used vertically. They can be reversed and placed on either side of the door.

The air curtain is mounted vertically as close as possible to the door. For the best effect air curtains should be placed on both sides of the opening. Each unit must be supplemented with a vertical kit (accessory) to mount it on the floor and also to mount two units on top of each other for higher entrances. The air curtain must always be secured at the top. The design kit (accessory) is used to hide pipes and cables.

Connection

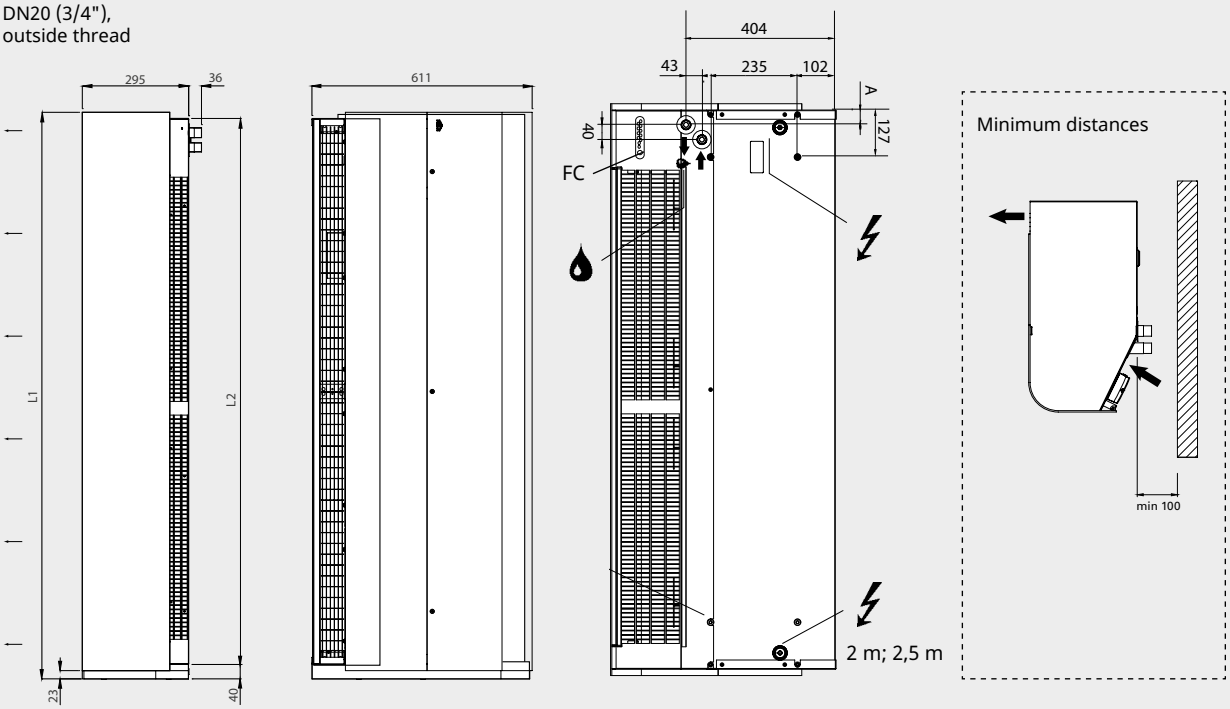
An easy to open front allows quick access to facilitate both installation and maintenance.

The air curtain has an integrated PC board which is connected to the selected external control system FC. Control is supplied by 230V~ to the PC board. The PC board is accessed via cable glands on the back of the unit. Communication- and sensor cables are connected to the PC board.

The electrical connection is made on the back of the unit. Power supply for electrical heated air curtains (400V3~) is routed via the motor compartment.

Water heated units are connected to the water system on the back of the unit. Flexible hoses are available as accessories. Water heated units must always be supplemented with a valve kit mounted outside the unit. See Valves and Accessories.

DN20 (3/4"),
outside thread



	L1 [mm]	L2 [mm]
PAFEC5015	1572	1515
PAFEC5020	2062	2004
PAFEC5025	2572	2515

The unit can be reversed and placed on either side of the door. Connections and PC Board are positioned near floor level when the air curtain is placed to the left of the door and at the top when it is placed to the right (seen from the inside). For wiring diagrams and other technical information, please see the manual and www.frico.net.

Recommended installation width varies depending on the relevant premises. See www.frico.net for further information.

Pamir 5000

FC Control system

Frico air curtains come with an integrated PC-board and are supplemented with the intelligent control system FC of your choice, working together to create many smart and energy saving features. There are four different packages to choose from, depending on your requirements.

FC Direct

Entry level

- *Door contact*
- *Calendar function*
- *Filter timer*
- *Built-in temperature sensor*

FC Smart

FC Direct +

- *Control via app (Bluetooth)*
- *Wireless sensors possible*
- *Adjustable calendar function*
- *Away and Boost function*
- *Adjustable filter timer*
- *Vestibule function*
- *Zone possibility*
- *Enhanced water control possible*

FC Pro

FC Direct + FC Smart +

- *Automatic air flow control*
- *Automatic heat blocking*

FC Building - BMS

FC Direct +

- *0-10V, potential free contact or Modbus*
- *Automatic air flow control**
- *Automatic heat blocking**
- *Heat and fan settings*
- *Alarm indication*
- *Read values*
- *Enhanced water control possible*

** Requires outdoor temp signal*

FC Direct

Entry level control system for a great start. The door contact provides an automatic energy-saving function, as the air curtain becomes active only when the door is open. When the door is closed, it remains on stand-by or runs on a lower fan speed if extra heat is needed. With the calender function, you can choose periods of comfort and reduced mode. The control panel has a built-in temperature sensor, which is used for control when external sensors are not used.

FC Smart

Second level control system for full freedom. FC Smart comes with all features from FC Direct plus additional energy saving features and the possibility of app control (Bluetooth). The app gives you access to all functions in the system, allowing you to set it up exactly the way you want it. It also enables you to create different zones with different settings in a larger system. The app FRICO CONTROL is available for both iOS and Android.

FC Pro

Third level control system for maximum savings. FC Pro comes with all features from FC Direct and FC Smart plus additional automatic energy saving features. By receiving and reacting to information about indoor and outdoor temperatures, the right amount of heat and air flow is added to avoid overshoots and thus reducing energy consumption.

FC Building - BMS system

Comprehensive control system for buildings, with the option to control via 0-10V, potential free contact (e.g. a relay) and/or Modbus RTU (RS485). FC Building enables you to receive product information status and alarms. Modbus allows for full use of all the energy saving features within the control system.

Item number	Type	Description
74684	**FCDA**	FC Direct, first level control system
74685	**FCSA**	FC Smart, second level control system
74686	**FCPA**	FC Pro, third level control system
74687	**FCBA**	FC Building, BMS system

Pamir 5000

Control system content and accessories

FC Control system helps to create many smart and energy saving features. In addition to our four packages, components can be added to expand and customize the system. With the app levels (FC Smart and FC Pro) it is also possible to create and control different zones. Each added zone needs to be equipped with one FC Direct and can be designed to fit its specific needs by adding different accessories.

FC Direct, control kit
Control panel for fan and heat, door contact and 5 m communication cable. Used for additional zones with FC Smart and FC Pro. IP44.

FCRTX, external room temperature sensor
For reading of the room temperature on another location than that of the control panel, incl. 10 m sensor cable. IP20.

FCOTX, outdoor temperature sensor
Reading the outdoor temperature, incl. 10 m sensor cable. Enables automatic air curtain control and heat blocking. IP44.

FCLAP, local access point
Local access point for extra wireless sensors (when operating more than 8 sensors) and extended range for wireless sensors or app control (Bluetooth), incl. 10 m communication cable. IP44.

FCSC/FCBC, cable
FCSC Sensor cable available in 10 or 25 m for extra length. FCBC Communication cable for additional products within the same zone, available in 5, 10 or 25 m.

FCDC, door contact
The door contact regulates the airflow on/off. Allows you to control air curtains at different doorways individually within the same zone.

FCTXRF, indoor/outdoor wireless sensor
Indoor/outdoor wireless sensor with same features as FCRTX and FCOTX. The set up as outdoor or indoor sensor is made by a switch inside the sensor. Range up to 50 m. Battery life: 3-5 years. IP44.

FC Direct

Content
- *FCCF control panel*
- *FCBC05*
- *FCDC*

FC Smart

Content
- *FCCF control panel*
- *FCBC10*
- *FCDC*
- *FCLAP*

FC Pro

Content
- *FCCF control panel*
- *FCBC10*
- *FCDC*
- *FCLAP*
- *FCTXRF*

FC Building - BMS

Content
- *FCCF control panel*
- *FCBC10*
- *FCDC*
- *FCBAP building access point*

Item number	Type	Description	Dimensions
74684	**FCDA**	FC Direct, first level control system	89x89x26 mm (FCCF)
74694	**FCRTX**	External room temperature sensor	39x39x23 mm
74695	**FCOTX**	Outdoor temperature sensor	39x39x23 mm
74699	**FCLAP**	Local access point for extra wireless sensors and extended range	89x89x26 mm
74718	**FCBC05**	Extra communication cable, 5 m	5 m
74719	**FCBC10**	Extra communication cable, 10 m	10 m
74720	**FCBC25**	Extra communication cable, 25 m	25 m
74721	**FCSC10**	Extra sensor cable, 10 m	10 m
74722	**FCSC25**	Extra sensor cable, 25 m	25 m
17495	**FCDC**	Door contact	
74703	**FCTXRF**	Indoor/outdoor wireless sensor (for FC Smart, FC Pro)	89x89x26 mm

Water control

Water heated units must be supplemented with valves. The valve system controls the water flow and activates maximum heat only when needed. By activating the built-in bypass feature, a small leakage flow is let through to make sure there is always hot water in the heating coil, providing frost protection and faster heating. The return water temperature sensor is making sure that as much energy as possible from the water in the coil is used, thus reducing energy consumption.

VPFC, pressure independent and modulating valve system
Two way pressure independent control and adjustment valve with modulating actuator and shut-off valve.

FCWTA, return water temperature sensor
Enables control of return water temperature and automatic bypass function, which provides extended frost protection and reduced energy consumption.

Item number	Type	DN	Flow range l/s
238293	**VPFC15LF**	DN15	0,012-0,068
238294	**VPFC15NF**	DN15	0,024-0,13
238295	**VPFC20**	DN20	0,058-0,32
238296	**VPFC25**	DN25	0,10-0,60
238297	**VPFC32**	DN32	0,22-1,03
74702	**FCWTA**	Return water temperature sensor	

Accessories - water heated units

FHDN20, flexible hoses
Flexible hoses for easy and practical installation of water heated unit. FHDN20: length 350 mm. FHDN2010: length 1 m. DN20, inside thread, 90° bend.

PA34EF, external intake filter
Fine mesh filter that prevents ingress of dirt and deposits to water heated units. The filter is easy to attach and remove thanks to the integrated magnetic strips. Makes maintenance easier since the unit does not need to be opened.

DTV200S, filter pressure guard
Measures the differential pressure, which indicates how dirty the filter is in water heated units. The metering hose is connected to the suction side of the unit (after the filter). Adjustment is performed on site depending on the unit and the environment. Adjustable range 20-300 Pa. Potential free, changeover alarm contact.

Item number	Type	Used for	Consists of
18055	**FHDN20**	PAFECW5010/5015/5020/5025	2
88906	**FHDN2010**	PAFECW5010/5015/5020/5025	2
19064	**PA34EF10**	PAFECW5010	1
19065	**PA34EF15**	PAFECW5015	1
19066	**PA34EF20**	PAFECW5020	1
19067	**PA34EF25**	PAFECW5025	1
17597	**DTV200S**	PAFECW5010/5015/5020/5025	1

Pamir 5000

Accessories - horizontal mounting

PA34WB/PAWBL, wall brackets
Brackets for installing unit horizontally on a wall. PAWBL is used when the unit must be mounted further out from the wall. PA34WB: length 400 mm, PAWBL: length 560 mm.

PA34CB, ceiling brackets
Ceiling brackets for installing the unit from the ceiling using wires or threaded bars (not included). Best combined with vibration dampers (PA34VD) when using threaded bars.

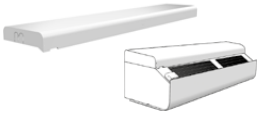
PA34WS, wire suspension kit
Galvanized wires with wire locks to secure the unit from the ceiling. Length 3 m. Used together with ceiling brackets (PA34CB).

PA34TR, threaded bars
Threaded bars for installing unit on to a ceiling. Length 1 m. Used together with ceiling brackets (PA34CB). Supplemented with vibration dampers (PA34VD) for reduced vibration.

PA34VD, vibration dampers
Reduces vibrations for ceiling installations with threaded bars.

PA4JK, joining kit
Used to join horizontal units together for a sleek and unified installation. Consists of joint bracket and mounting parts.

PA4XT, outlet extension
Outlet extension with telescopic function. Used for recessed installation of units in suspended ceilings. 130-200 mm.



PA4DW, design kit for wall mounting
Used to conceal mountings, cables and pipes. Used together with ceiling brackets PA34WB.

PA4DC, design kit for ceiling mounting
Used to conceal mountings, cables and pipes. The design kit has a telescope function that can be adapted for the installation. It can also be extended with one or more extension parts. Two design kits are required for 1 and 1.5 metre units, while 2 metre units need three kits and 2.5 metre units need four kits. Avaliable in: small 200-300 mm, medium 300-500 mm, large 500-900 mm, extension 420 mm.

Item number	Type	Used for	Consists of
18044	**PA34WB15**	PAFEC5010/5015	2
18045	**PA34WB20**	PAFEC5020	3
18046	**PA34WB30**	PAFEC5025	4
214951	**PAWBL15**	PAFEC5010/5015	2
214952	**PAWBL20**	PAFEC5020	3
214953	**PAWBL30**	PAFEC5025	4
18059	**PA34CB15**	PAFEC5010/5015	4
18060	**PA34CB20**	PAFEC5020	6
18061	**PA34CB30**	PAFEC5025	8
18062	**PA34WS15**	PAFEC5010/5015	4
18063	**PA34WS20**	PAFEC5020	6
18064	**PA34WS30**	PAFEC5025	8
18056	**PA34TR15**	PAFEC5010/5015	4
18057	**PA34TR20**	PAFEC5020	6
18058	**PA34TR30**	PAFEC5025	8
18065	**PA34VD15**	PAFEC5010/5015	4

Item number	Type	Used for	Consists of
18066	**PA34VD20**	PAFEC5020	6
18067	**PA34VD30**	PAFEC5025	8
110760	**PA4JK**	PAFEC5000	1
19090	**PA4XT10**	PAFEC5010	1
19091	**PA4XT15**	PAFEC5015	1
19092	**PA4XT20**	PAFEC5020	1
19093	**PA4XT25**	PAFEC5025	1
110838	**PA4DW10**	PAFEC5010	1
110839	**PA4DW15**	PAFEC5015	1
110840	**PA4DW20**	PAFEC5020	1
110841	**PA4DW25**	PAFEC5025	1
13557	**PA4DCS**	PAFEC5000	1
13559	**PA4DCM**	PAFEC5000	1
13560	**PA4DCL**	PAFEC5000	1
13561	**PA4DXT**	PAFEC5000	1

Accessories - vertical mounting

PA4JK, vertical kit
Used to adapt a horizontal unit for vertical installation. Includes floor frame and mounting parts to support the top. Vertical kit allows two units to be installed on top of each other. One vertical kit is needed per unit.

AXP300, collision protection
Floor placed protection against impact from e.g. shopping trolleys.

PA4VDW, design kit for vertical mounting
Used to conceal cables and pipes.

PA4HE, extension hood
Fills the space between the unit and the ceiling for vertical mounting and provides a neater installation. Height 100-2000 mm. State distance between the top of the air curtain and the ceiling when ordering. A vertical kit is included. PA4HEVDW: extension hood for units with design kit.

Item number	Type	Used for	Consists of
110760	**PA4JK**	PAFEC5010/5015/5020/5025	1
10028	**AXP300**	PAFEC5010/5015/5020/5025	1
110754	**PA4VDW15**	PAFEC5015	1
110755	**PA4VDW20**	PAFEC5020	1
110756	**PA4VDW25**	PAFEC5025	1
FE10245	**PA4HE**	PAFEC5010/5015/5020/5025	1
FE10247	**PA4HEVDW**	PAFEC5010/5015/5020/5025	1

Vertical mounted Pamir 5000 with a vertical kit to allow two units to be installed on top of each other.

AGI 6000

Robust air curtain for large industrial doors

AGI is a robust air curtain intended for vertical or horizontal installation in large doorways such as logistic centres, loading bays and warehouses. With its powerful fans and high enclosure classification it is specially suitable for industrial environments. Its recommended installation height is 6 m. The recommended installation width of AGI6000 is 8 m with air curtains on both sides of the opening.

For doors in industrial environments

AGI has a stable and simple design. It is available in four different lengths of up to 3 metres, which makes it easy to create a continuous air curtain for large doors. In vertical installation two units can be put on top of each other.

Great energy savings

In many premises doors remain open for a significant part of the day, this results in huge losses of expensively heated or cooled air, especially when the temperature difference between outdoor and indoor air is great. With correctly installed air curtains great energy savings can be obtained.

High performance

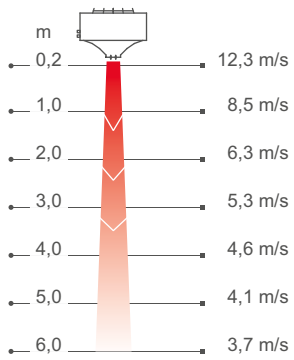
Frico air curtains are developed and manufactured in Sweden. The air curtains are tested in one of the most modern and advanced air and sound laboratories in Europe which means that we can guarantee a high performance product.

AGI6000

Available in 2 versions:

- Ambient (without heat)
- Water heating

Air velocity profile



Measurements according to ISO 27327-1. Average values for products in the series.

Technical specifications

Voltage motor: 400V3~

Horizontal mounting - Recommended installation height 6 m

Ambient, no heat - AGIH6000 A (IP54)

Item number	Type	Output [kW]	Airflow [m³/h]	Sound power*¹ [dB(A)]	Sound pressure*² [dB(A)]	Amperage motor [A]	Length [mm]	Weight [kg]
11448	**AGIH6012A**	0	6600	85	69	2,0	1200	51
11449	**AGIH6018A**	0	9600	87	71	2,8	1800	75
11450	**AGIH6024A**	0	12600	88	72	3,7	2400	97
11451	**AGIH6030A**	0	15600	89	73	4,7	3000	120

Water heat - AGIH6000 WL, coil for low water temperature (≤80 °C) (IP54)

Item number	Type	Output*⁴ [kW]	Airflow [m³/h]	Δt*³,⁴ [°C]	Water volume [l]	Sound power*¹ [dB(A)]	Sound pressure*² [dB(A)]	Amperage motor [A]	Length [mm]	Weight [kg]
11440	**AGIH6012WL**	33	6600	15	6,6	85	69	2,0	1200	72
11441	**AGIH6018WL**	46	9600	14	10,1	87	71	2,8	1800	112
11442	**AGIH6024WL**	61	12600	14	14,0	88	72	3,7	2400	150
11443	**AGIH6030WL**	77	15600	14	17,6	89	73	4,7	3000	185

Water heat - AGIH6000 WH, coil for high temperature water (≥80 °C) (IP54)

Item number	Type	Output*⁵ [kW]	Airflow [m³/h]	Δt*³,⁵ [°C]	Water volume [l]	Sound power*¹ [dB(A)]	Sound pressure*² [dB(A)]	Amperage motor [A]	Length [mm]	Weight [kg]
11444	**AGIH6012WH**	39	6600	17	4,6	85	69	2,0	1200	65
11445	**AGIH6018WH**	58	9600	18	7,0	87	71	2,8	1800	98
11446	**AGIH6024WH**	78	12600	18	9,5	88	72	3,7	2400	128
11447	**AGIH6030WH**	97	15600	18	12,0	89	73	4,7	3000	158

Vertical mounting - Recommended installation width 8 m

Ambient, no heat - AGIV6000 A (IP54)

Item number	Type	Output [kW]	Airflow [m³/h]	Sound power*¹ [dB(A)]	Sound pressure*² [dB(A)]	Amperage motor [A]	Length [mm]	Weight [kg]
11428	**AGIV6012A**	0	6600	85	69	2,0	1250	56
11429	**AGIV6018A**	0	9600	87	71	2,8	1850	80
11430	**AGIV6024A**	0	12600	88	72	3,7	2450	102
11431	**AGIV6030A**	0	15600	89	73	4,7	3050	125

Water heat - AGIV6000 WL, coil for low water temperature (≤80 °C) (IP54)

Item number	Type	Output*⁴ [kW]	Airflow [m³/h]	Δt*³,⁴ [°C]	Water volume [l]	Sound power*¹ [dB(A)]	Sound pressure*² [dB(A)]	Amperage motor [A]	Length [mm]	Weight [kg]
11432	**AGIV6012WH**	33	6600	15	6,6	85	69	2,0	1250	77
11434	**AGIV6018WH**	46	9600	14	10,1	87	71	2,8	1850	119
11436	**AGIV6024WH**	61	12600	14	14,0	88	72	3,7	2450	157
11438	**AGIV6030WH**	77	15600	14	17,6	89	73	4,7	3050	192

Water heat - AGIV6000 WH, coil for high temperature water (≥80 °C) (IP54)

Item number	Type	Output*⁵ [kW]	Airflow [m³/h]	Δt*³,⁵ [°C]	Water volume [l]	Sound power*¹ [dB(A)]	Sound pressure*² [dB(A)]	Amperage motor [A]	Length [mm]	Weight [kg]
11433	**AGIV6012WL**	39	6600	17	4,6	85	69	2,0	1250	70
11435	**AGIV6018WL**	58	9600	18	7,0	87	71	2,8	1850	103
11437	**AGIV6024WL**	78	12600	18	9,5	88	72	3,7	2450	133
11439	**AGIV6030WL**	97	15600	18	12,0	89	73	4,7	3050	163

*¹) Sound power (L_{WA}) measurements according to ISO 27327-2: 2014, Installation type E.
*²) Sound pressure (L_{pA}). Conditions: Distance to the unit 5 metres. Directional factor: 2. Equivalent absorption area: 200 m².
*³) Δt = temperature rise of passing air at maximum heat output and highest airflow.
*⁴) Applicable at water temperature 60/40 °C, air temperature, in +18 °C.
*⁵) Applicable at water temperature 80/60 °C, air temperature, in +18 °C.
Approved for 380V/3ph/60Hz. Product performance for 380V/3ph/60Hz will differ from stated data.
Manufactured in Sweden with a corrosion proof housing made of hot zinc-plate and powder coated steel panels. Colour: grey, RAL9006.

CE

AGI6000

Horizontal mounting

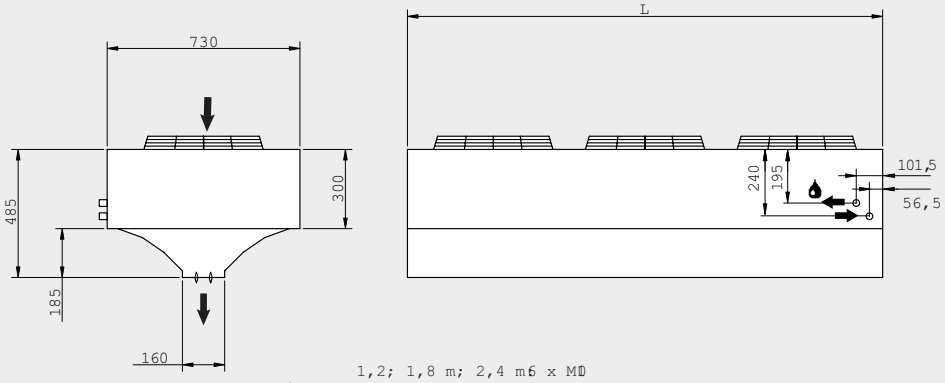
Mounting

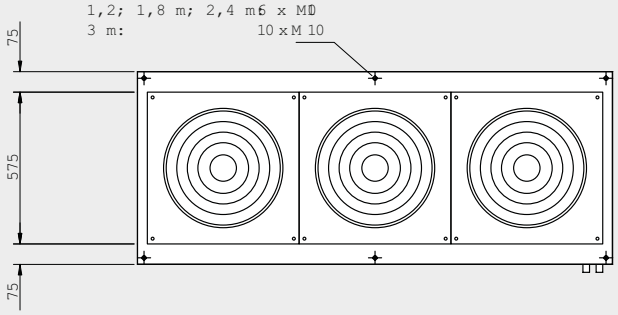
The recommended installation height of AGI6000 is 6 m. The air curtain is installed horizontally with the supply air grille facing downwards as close to the door as possible. The unit is suspended from the ceiling by threaded rods. For the protection of wider doorways, several units can be mounted in series alongside each other.

Connection

Control (400V3~) is connected to the terminal block in the junction box. The water coil is connected via connections with dimensions as given in the table (see diagram) on the side of the unit. Water heated units must always be supplemented with a valve kit, see Valves and Accessories.

	L [mm]
AGI6012	1200
AGI6018	1800
AGI6024	2400
AGI6030	3000





Connection dimensions, inside thread

AGI6012	DN25 (1")
AGI6018	DN25 (1")
AGI6024	DN25 (1")
AGI6030	DN32 (1 1/4")

For wiring diagrams and other technical information, please see the manual and www.frico.net.

Recommended installation height varies depending on the relevant premises. See www.frico.net for further information.

Vertical mounting

Mounting

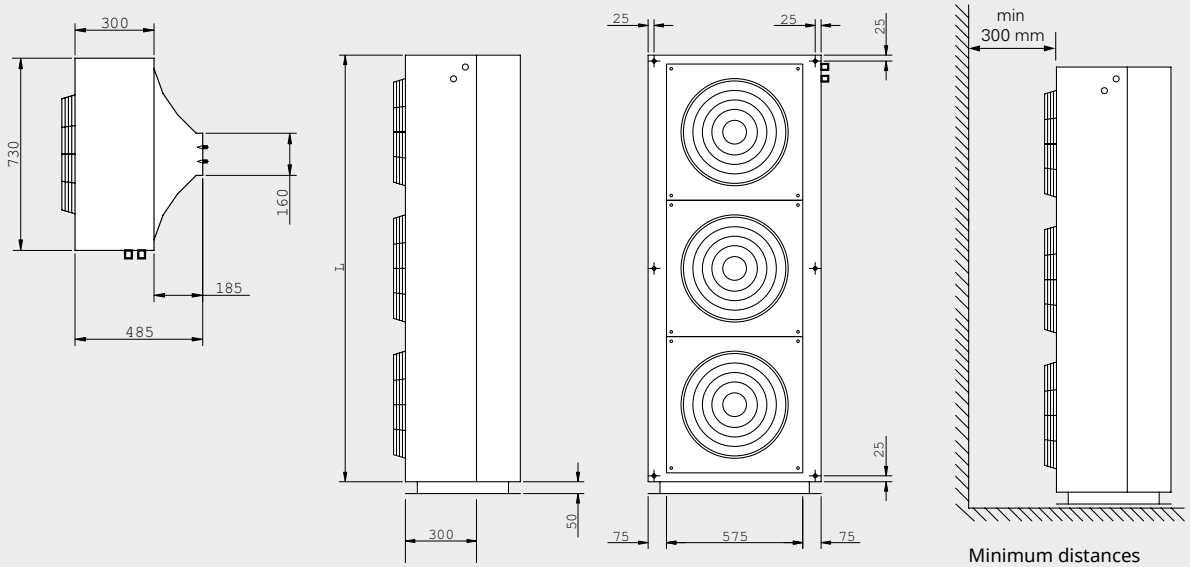
The recommended installation width of AGI6000 is 8 m with air curtains on both sides of the opening. The air curtain is mounted vertically as close as possible to the door. For the best effect air curtains should be placed on both sides of the opening.

The unit can be turned and positioned on either side of the door. Two units can be mounted directly on top of each other.

The air curtain is mounted on a floor frame which is included. The frame is attached horizontally to the floor using fasteners appropriate for the surface. The air curtain must always be secured at the top.

Connection

Control (400V3~) is connected to the terminal block in the junction box. The water coil is connected via connections with dimensions as given in the table (see diagram) on the side of the unit. Water heated units must always be supplemented with a valve kit, see Valves and Accessories.



Minimum distances

	L [mm]
AGI6012	1200
AGI6018	1800
AGI6024	2400
AGI6030	3000

Connection dimensions, inside thread

AGI6012	DN25 (1")
AGI6018	DN25 (1")
AGI6024	DN25 (1")
AGI6030	DN32 (1 1/4")

For wiring diagrams and other technical information, please see the manual and www.frico.net.

Recommended installation width varies depending on the relevant premises. See www.frico.net for further information.

AGI6000

Control options

Unit without heating

Level 1
Airflow is set manually. The position limit switch regulates the airflow on/off.
Control kit:

- - RTRD, 5-step fan speed control.
- - AGB304, position limit switch.

Unit with water heating

Level 1
Airflow is set manually. The position limit switch regulates the airflow on/off. Room thermostat controls the heat output via actuator/valve on/off.
Control kit:

- - RTRD, 5-step fan speed control.
- - AGB304, position limit switch.
- - T10S, room thermostat IP30.

Note! A valve set VRS25 (option: TVVS25 with SD20) should be added for a complete control kit.

Unit with water heating

Level 2
Airflow and heat output are controlled automatically based on the opening of the door and the room temperature. When the door is open the fan runs at high speed, when the door closes the fan will continue to run at high speed for the desired time (2s–10 min.) set on MDC. When the door is closed the fan runs at low speed if there is a need for heating, if not the fan is switched off.

The room thermostat controls the heat output on/off.

E.g. the thermostat is set on 23 °C and the difference between the steps 4 °C. The thermostat will activate below 19 °C when the door is closed. When the door opens, the thermostat will activate below 23 °C and normally the heat is switched on.

Control kit:

- - RTRDU, 5-step fan speed control, high/low speed.
- MDC, magnetic door contact with a time relay.
- RTI2, electronic 2-step thermostat.

Note! A valve set VRS25 (option: TVVS25 with SD20) should be added for a complete control kit.

Accessories - Control options

RTRD, 5-step fan speed control
With RTRD the air velocity is adjusted in 5 steps for optimum efficiency. The air velocity is set to accommodate different external conditions.

T10S, electronic thermostat
Processor controlled thermostat with concealed and visible dials. Setting range +5 – +30 °C. Closing contact for heating or cooling. Connection voltage: 230 V. Max. breaking current: 10 A. IP30.

RTI2, electronic 2-step thermostats
Processor controlled 2-step thermostats for room heating /cooling. Available with concealed or visible knob. Adjustable temperature difference between the steps (1–10 degrees). Save reduction via external connection timer (1–10 degrees). External sensor (RTS01) available as an accessory. High protection class (IP44).

MDC, magnetic door contact with time relay
Starts the air curtain or increases from low to high speed when the door is opened. When the door is closed, the fan continues to run for the preset time (2 s–10 min). This prevents the fan from starting/stopping continuously and is especially suitable for doors that are frequently opened. Three alternating volt-free contacts 10 A, 230 V~ activated when the contacts make. A MDCDC is included in MDC. IP44.

MDCDC, magnetic door contact
Indicates door status. Extra MDCDC are used when several doors are connected to a MDC. IP44.

AGB304, position limit switch
Starts the air curtain or activates a fan speed control when the door is opened. When the door closes, AGB304 stops the air curtain or changes fan speed through a fan speed control. Alternating contact 4 A, 230 V~. IP67.

Item number	Type	Description	Consists of
32594	**RTRD3**	3 A, IP54	1
32399	**RTRD5.2**	5,2 A, IP54	1
10068	**RTRD7**	7 A, IP21	1
10065	**RTRD14**	14 A, IP21	1
10071	**RTRDU7**	7 A, IP21, high/low speed	1
24727	**T10S**	IP30	1
10231	**RTI2**	IP44	1
11600	**MDC**	IP44	1
11095	**MDCDC**	IP44	1
10016	**AGB304**	IP44	1

Accessories - mounting

GP1010, threaded bar
Threaded bar for mounting in ceilings. Length 1 m. M10. Six are required for 1.2, 1.8 and 2.4 metre units and 3 metre units need ten.

Item number	Type	Used for	Consists of
27423	**GP1010**	AGIV6012/18/24/30	1

VRS20/25, valve kit
3-way control valve with on/off actuator, adjustment valve, shut off valve and bypass. DN15/20/25. 230V.

The valve kit consists of the following:
• AV20/25, stop valve
• JVF20/25, adjustment valve
• TRVS20/25, on/off 3-way control valve
• BPV10, by-pass valve
• SD20, actuator on/off 230V~

The stop valve (AV20/25) consists of a ball valve which is either open or closed. It is used to turn the water flow off and on. The water flow can be fine-tuned manually with the adjustment valve and can also be completely turned off. The water flow may be read off the valve. The kv value for JVF20 is 3,5 and for JVF25 it is 5,5.

If the 3-way valve (TRVS20/25) is closed, the flow through the by-pass valve (BPV10) is low to ensure presence of warm water in the heating coil. This leads to instant heat supply when needed and some degree of frost protection. The actuator (SD20) works on/off.

The valve kit is available with two different valve dimensions: VRS20 - DN20 (3/4”) and VRS25 - DN25 (1”). The by-pass valve dimension is DN10 (3/8”). To regulate VRS20/25, a suitable thermostat has to be added.

TVVS20/25, 2-way control valve
TVVS20: maximum close-off pressure 150 kPa (1,5 bar), kvs 2,6, DN20 (3/4").
TVVS25: maximum close-off pressure 70 kPa (0,7 bar), kvs 4,5, DN25 (1").
Pressure class PN16.

SD20, actuator on/off 230V~
SD20 regulates the heat supply. Works on/off. A 5 second closing of the valve prevents sudden pressure changes in the pipe system.

Item number	Type	DN	Flow range l/s
24733	**VRS20**	DN20	0,011 - 0,01
24734	**VRS25**	DN25	0,0013 - 0,13
24729	**TVVS20**	DN20	-
24730	**TVVS25**	DN25	-
10073	**SD20**	-	-


AGI6000
Operation
2700
Munters
MG90

UF600

Air curtain with floor outlet for large industrial doorways

UF600 creates a very effective air barrier when air at high speed is pushed out through a narrow channel situated in the floor inside the door opening. An air barrier directed upwards from the floor gives the best possible protection against cold air flowing into the premises.

For doors in industrial environments

UF600 consists of a pillar with inlet hood, silencers and fans, as well as a floor channel with its slot at floor level. The pillar is placed outside (or inside) the door on either side of the opening. The floor channel is cast in floor. Its width is adapted to the specific door.

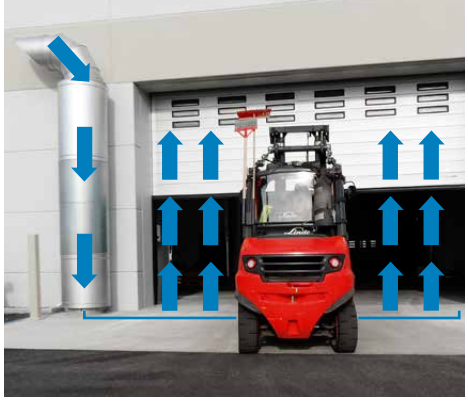
Great energy savings

In many premises doors remain open for a significant part of the day, this results in huge losses of expensively heated or cooled air, especially when the temperature difference between outdoor and indoor air is great. With correctly installed air curtains great energy savings can be obtained.

Installation alternatives

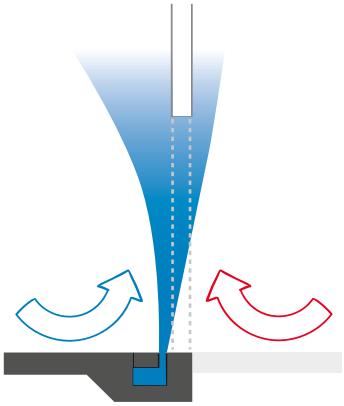
Very large doors require several pillars and separated floor channels. The pillars can be positioned on each or the same side of the opening. Model for doors with rail traffic is available for special order.

UF600



Ambient (without heat)

Principle



Design and specifications are subject to change without notice.

Technical specifications

Ambient, no heat - UF600 - Indoor installation (IP54)

Voltage motor: 400V3~

Item number	Type	Output [kW]	Air velocity* [m/s]	Dimensions floor channel [mm]	Diameter fans [mm]
79840	**UF601 Indoor**	2x4	30	600x600	500
79841	**UF602 Indoor**	2x7,5	35	750x750	630
79842	**UF603 Indoor**	2x11	38	750x750	630
79843	**UF604 Indoor**	2x15	38	750x750	630
79844	**UF605 Indoor**	2x18,5	40	750x750	630

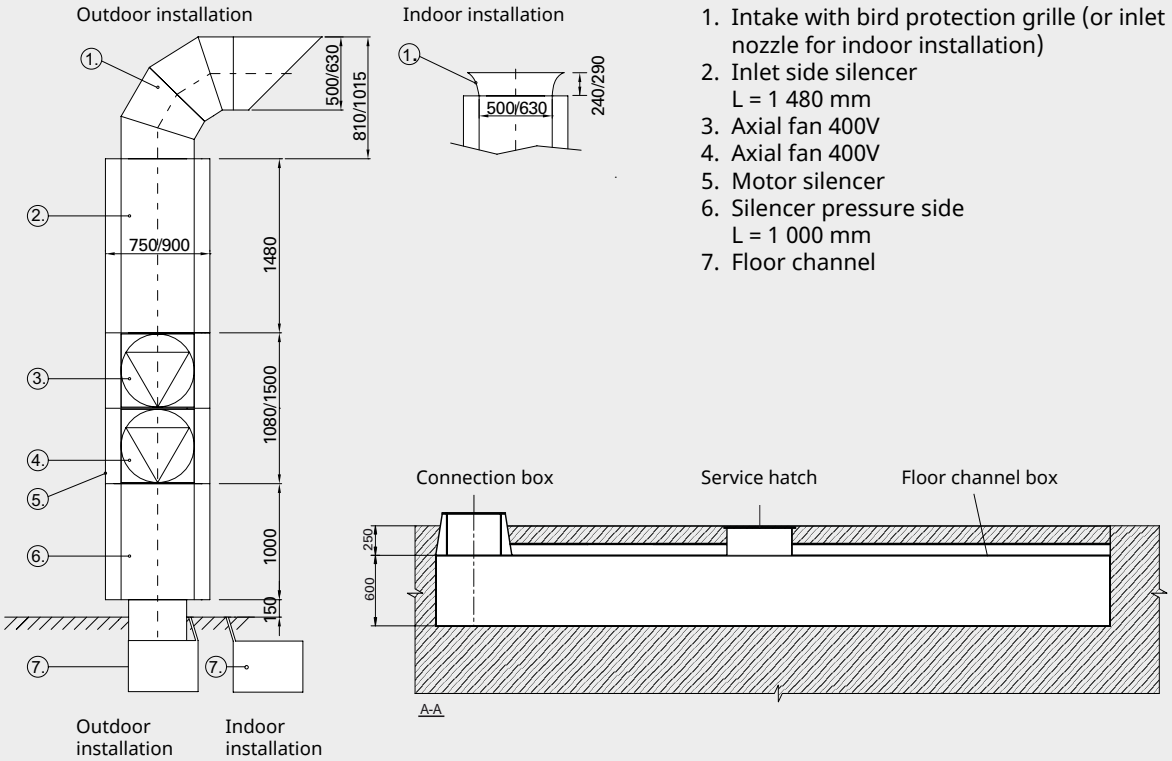
Ambient, no heat - UF600 - Outdoor installation (IP54)

Item number	Type	Output [kW]	Air velocity* [m/s]	Dimensions floor channel [mm]	Diameter fans [mm]
79845	**UF601 Outdoor**	2x4	30	600x600	500
79846	**UF602 Outdoor**	2x7,5	35	750x750	630
79847	**UF603 Outdoor**	2x11	38	750x750	630
79848	**UF604 Outdoor**	2x15	38	750x750	630
79849	**UF605 Outdoor**	2x18,5	40	750x750	630

*) Depends on the design of the floor channel.

Approved for 380V/3ph/60Hz. Product performance for 380V/3ph/60Hz will differ from stated data.

Made of galvanised, hot zinc-plated steel.



1. Intake with bird protection grille (or inlet nozzle for indoor installation)
2. Inlet side silencer L = 1 480 mm
3. Axial fan 400V
4. Axial fan 400V
5. Motor silencer
6. Silencer pressure side L = 1 000 mm
7. Floor channel

Door width [m]

Door height [m]	3 m	4 m	5 m	6 m	7 m	8 m	10 m
3 m	UF601	UF601	UF601	UF601			
4 m		UF602	UF602	UF602			
5 m			UF603	UF603	UF604	UF605	
6 m				UF604		UF605	UF605

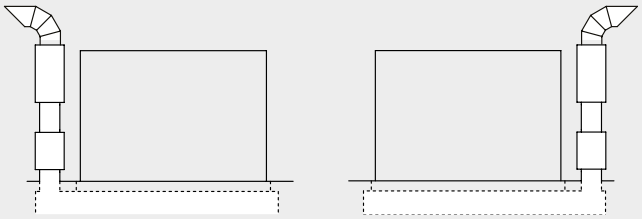
Other door sizes on request. For larger openings, two pillars are required. Please contact Frico.

The fan pillar
The fan pillar can be positioned on either side of the door. For large doors, two fan pillars are often required. They should be positioned one on each side. When two units are placed on each side of the doorway, the floor channel has to be divided by a steel wall in the middle to prevent the fans from working against each other.

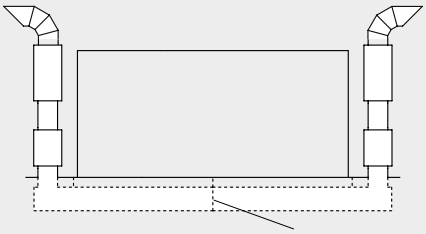
Floor channel
The floor channel box is a steel construction that is cast into the concrete floor. The outlet opening is at floor level, as close to the floor opening as possible. The length of the box and the angle and column width is determined at the project planning stage. There is not normally a need for drainage. If there is a risk of large amounts of water running into the floor channel, a drainage pipe should be connected to the existing 1" connection (internal thread).

Air curtain slot
To compensate for the inward-directed pressure force, the air curtain slot is directed at an outward angle of about 15°. The air curtain slot should be at least 200 mm wider than the door opening. Internal door protectors should be mounted next to the door if the distance between the air curtain slot and the door is greater than 150 mm, see fig.

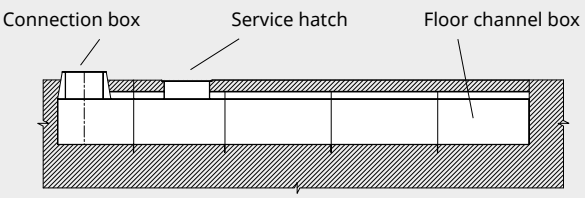
Always contact Frico for projections and dimensioning!



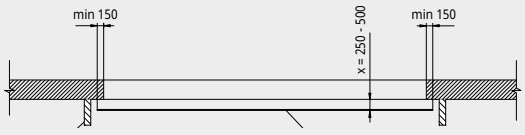
The positioning of the columns.



Steel wall



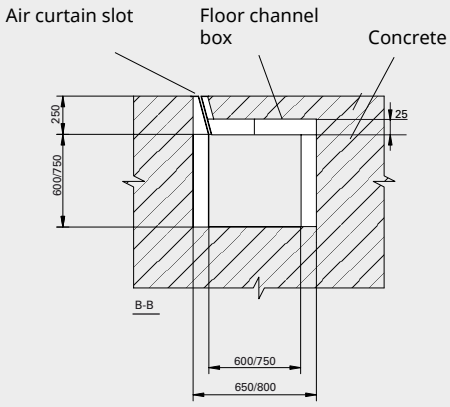
Floor channel



Door protector

Air curtain slot

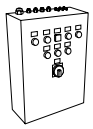
Air curtain slot



Cross section through floor channel for UF601-602.

For wiring diagrams and other technical information, please see the manual and www.frico.net.

Accessories - Control options

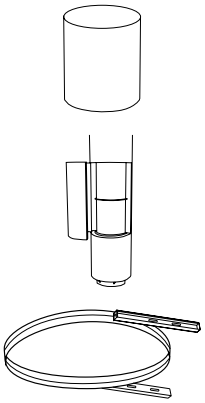


UFC, control box
Y/D-start with time delay between the motors. Possibility to use with door switch or position limit switch or external on/off. Integrated motor protection for each fan. Alarm and running indication.

AGB304, position limit switch
Starts the air curtain when the door is opened and stops it when the door is closed. Alternating contact 4 A, 230 V~. IP67.

Item number	Type	Used for	Consists of
935221	**UFC601**	UF601	1
930934	**UFC602**	UF602	1
935222	**UFC603**	UF603	1
930961	**UFC604**	UF604	1
935213	**UFC605**	UF605	1
10016	**AGB304**	UF601-605	1

Accessories - mounting



UFEH, pillar extension
For indoor mounting the air intake should be above the door opening, therefore an extension of the pillar is sometimes necessary. This is placed between the inlet hood and the upper silencer.

UFMS, motor silencer
Additional motor silencer which gives a lower sound level and a uniform tower.

UFS, securing strip
The securing strip is mounted round the upper silencer and fixed to the outside wall to avoid the risk of tipping.

Item number	Type	Description	Used for
95241	**UFEH05**	Ø500 mm / L: 500 mm	UF601
95242	**UFEH10**	Ø500 mm / L: 1000 mm	UF601
95243	**UFEH15**	Ø500 mm / L: 1500 mm	UF601
95244	**UFEH20**	Ø500 mm / L: 2000 mm	UF601
95245	**UFEH605**	Ø630 mm / L: 500 mm	UF602-605
95246	**UFEH610**	Ø630 mm / L: 1000 mm	UF602-605
95247	**UFEH615**	Ø630 mm / L: 1500 mm	UF602-605
95248	**UFEH620**	Ø630 mm / L: 2000 mm	UF602-605
84765	**UFMS750**	Ø750 mm	UF601
84766	**UFMS900**	Ø900 mm	UF602-605
84763	**UFS750**	Ø750 mm	UF601
84764	**UFS900**	Ø900 mm	UF602-605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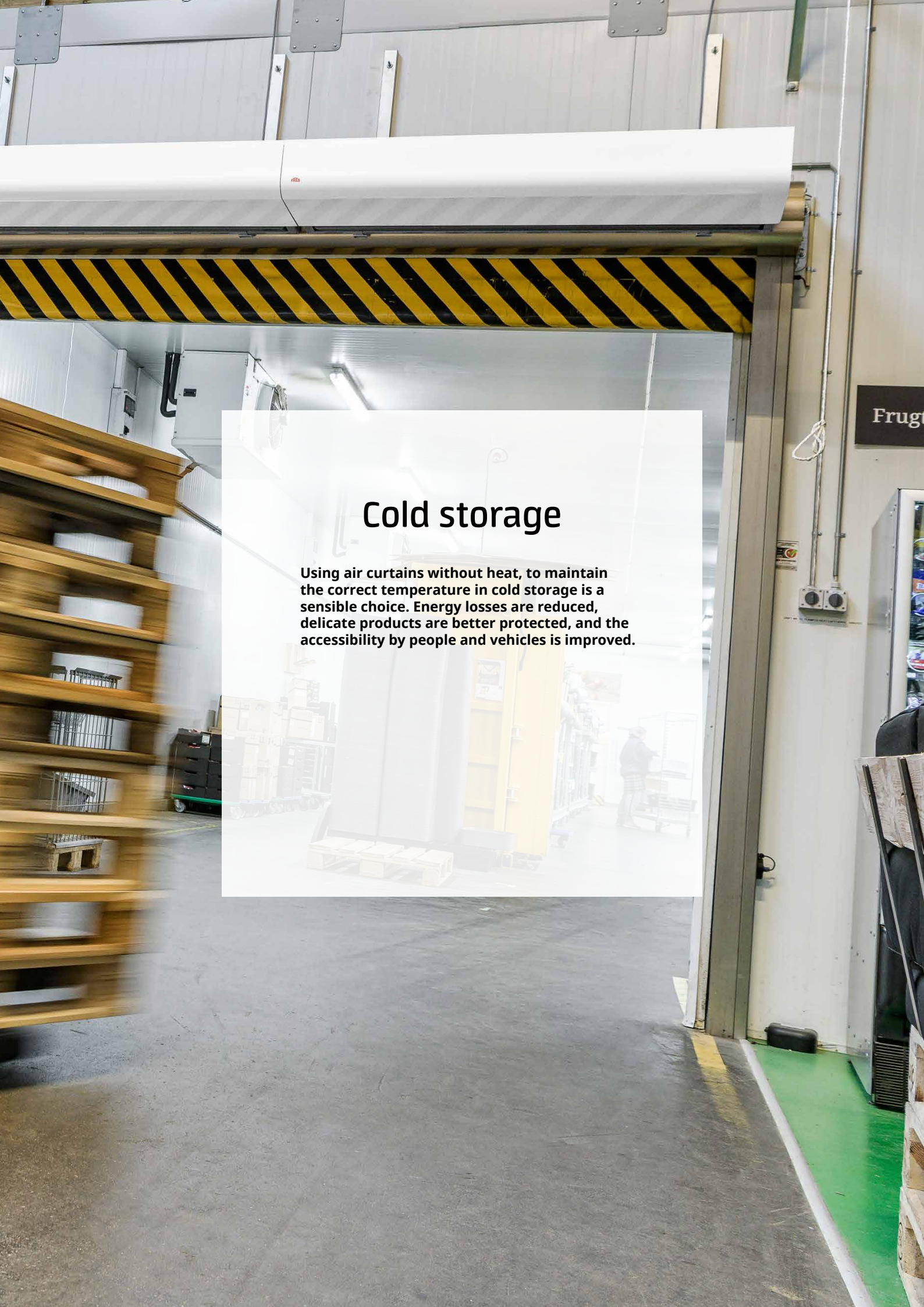


Cold storage

Using air curtains without heat, to maintain the correct temperature in cold storage is a sensible choice. Energy losses are reduced, delicate products are better protected, and the accessibility by people and vehicles is improved.

PAECS

Slim and cost effective air curtain with EC motor and integrated controls for cold rooms

PAECS creates an effective barrier between temperature zones. Stepless control that can be set for open and closed door allows precise adjustment for every installation, with optimised protection at the lowest possible energy consumption. PAECS is the perfect choice for cold room and freezer applications.

Energy efficient and sustainable

The air curtain is equipped with EC motors that are up to 50% more energy efficient than traditional AC motors, and have a lower weight which makes for easier installations and greener transports.

Integrated control

The air curtain has stepless control using an internal or external potentiometer (accessory).

High performance

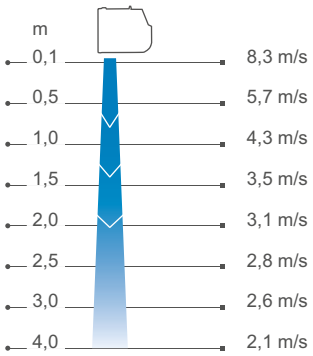
Frico air curtains are developed and manufactured in Sweden. The air curtains are tested in one of the most modern and advanced air and sound laboratories in Europe which means that we can guarantee a high performance product.

PAECS

Ambient (without heat)

Installation height for cold storage: up to 4 m

Air velocity profile

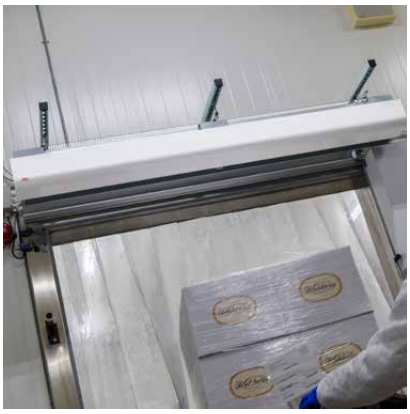


Measurements according to ISO 27327-1.
Average values for products in the series.

PAECS

Frico's Thermozone technology optimizes the air curtain

Frico air curtains create an invisible barrier at openings and doors which separates different temperature zones without limiting access for people and vehicles. Thermozone technology creates a highly uniform air barrier with a perfect balance between air volume and air velocity, regardless of whether it is the heat or the cold that you want to keep inside.



Great energy savings

In many premises doors remain open for a significant part of the day, this results in huge losses of expensively heated or cooled air, especially when the temperature difference between outdoor and indoor air is great. With correctly installed air curtains great energy savings can be obtained.

Comfortable indoor climate

Air curtains with Thermozone technology have optimized performance to provide a comfortable indoor climate free from drafts. The air curtain also keeps out emissions and insects.

Low sound level

With Thermozone technology Frico manufactures air curtains with very high airflow performance. This does not just make the air curtain more effective, but also has other advantages such as extremely low sound levels and reduced turbulence.

Technical specifications

Ambient, no heat - PAECS (IP44)

Voltage motor: 230V~

Item number	Type	Output [kW]	Airflow [m³/h]	Sound power*¹ [dB(A)]	Sound pressure*² [dB(A)]	Amperage motor*³ [A]	Length [mm]	Weight [kg]
154846	**PAECS10**	0	1450	77	44/62	0,14/0,79	1050	15
154847	**PAECS15**	0	2200	78	45/62	0,20/1,17	1560	20
154848	**PAECS20**	0	3100	83	51/67	0,40/2,04	2050	30

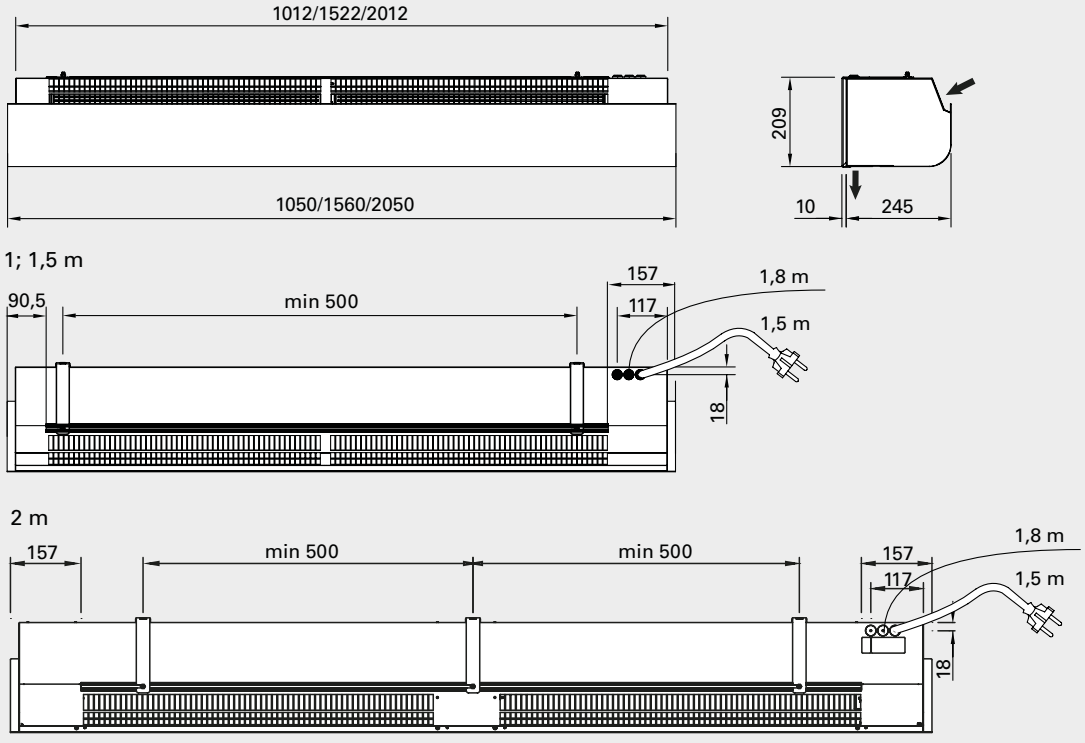
*¹) Sound power (L_{WA}) measurements according to ISO 27327-2: 2014, Installation type E.
*²) Sound pressure (L_{pA}). Conditions: Distance to the unit 5 metres. Directional factor: 2. Equivalent absorption area: 200 m².
At 50% and 100% airflow.
*³) Applicable at 50% and 100% airflow.

Approved for 200-240V, 50/60Hz. Product performance for 60Hz will differ from stated data.

Manufactured in Sweden with a corrosion proof housing made of hot zinc-plate and powder coated steel panels. Colour front: white, RAL 9016. Colour grille, rear section, ends and brackets: grey, RAL 7046.

Mounting
PAECS is the perfect choice for cold room and freezer applications. Installation height for cold storage: up to 4 m. The air curtain unit is installed horizontally with the outlet air grille facing downwards as close to the door as possible. When the unit is used to protect cold storage or freezer rooms, it must be mounted on the outside of the conditioned space. Wall brackets included. Threaded rods, hanging brackets and ceiling mounting brackets for ceiling mounting are available as accessories, see accessories pages and separate manuals.

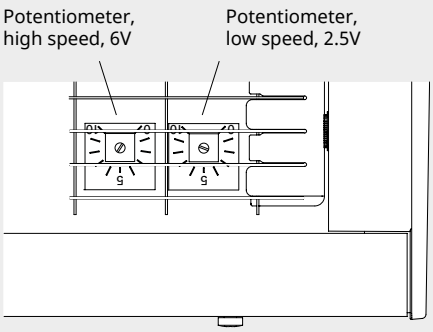
Connection
The unit is connected with a 1.5m cord and plug. Prepared with extracted control wiring so that external control can be connected easily. NB! A door contact must be connected before connecting the unit to the power supply.



Recommended installation height varies depending on the relevant premises. See www.frico.net for further information.

For mounting, connection, wiring diagrams and other technical information, please see the manual.

Control options



Internal potentiometer for low and high speed (accessible through the outlet grille).

Stepless airflow control with door contact/position limit switch
When the door is closed the fan runs at low speed, set on the internal potentiometer 0-10V, which is located inside the outlet grille. When the door opens, the fan runs at high speed, set on an external potentiometer. This control option gives low response time and the best protection.

Control kit:
FCDC, door contact or AGB304, position limit switch

BMS control
The air curtain can also be controlled via BMS (0-10V).

Accessories

FCDC, door contact
Indicates door status. Potential free, changeover contact.

AGB304, position limit switch
Starts the air curtain or activates a fan speed control when the door is opened. When the door closes, AGB304 stops the air curtain or changes fan speed through a fan speed control. Alternating contact 4 A, 230 V~. IP67.

PA2PF, ceiling mounting brackets
Mountings for installing the unit in the ceiling using hanging brackets or threaded bars (not included).

PA34TR, threaded bars
Threaded bars for installing unit on to a ceiling. Length 1 m. Used together with ceiling mounting brackets PA2PF.

PA2P, hanging brackets
Hanging brackets for installing the unit suspended from the ceiling. Length 1 m. The hanging brackets are covered by a white plastic trim to cover the cables. The brackets may be cut to shorter length, if required. Used together with ceiling mounting brackets PA2PF.

Item number	Type	Used for	Consists of
17495	**FCDC**	PAECS10/15/20	1
10016	**AGB304**	PAECS10/15/20	1
19415	**PA2PF15**	PAECS10/15	4
19417	**PA2PF20**	PAECS20	6
18056	**PA34TR15**	PAECS10/15	4
18057	**PA34TR20**	PAECS20	6
19568	**PA2P15**	PAECS10/15	2
19569	**PA2P20**	PAECS20	3

PAEC 2500

Stylish air curtain with EC motor and integrated controls, for cold rooms

PAEC2500 protects cold and freezer rooms efficiently at very low operating costs and can give energy savings of up to 85%. The stepless control allows precise adjustment, which means that PAEC is the perfect choice for cold and freezer room applications and also for use in air conditioned premises, for example, to separate the outside from the inside.

Energy efficient and sustainable

The air curtain is equipped with EC motors that are up to 50% more energy efficient than traditional AC motors, and have a lower weight which makes for easier installations and greener transports.

Integrated control

The air curtain has stepless control using an internal or external potentiometer (accessory).

High performance

Frico air curtains are developed and manufactured in Sweden. The air curtains are tested in one of the most modern and advanced air and sound laboratories in Europe which means that we can guarantee a high performance product.

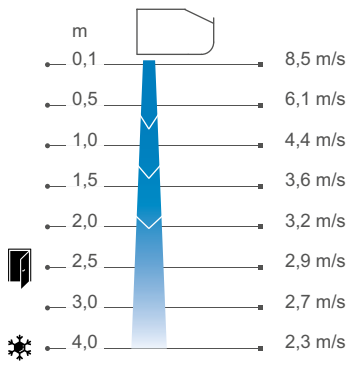
PAEC2500

Ambient (without heat)

Installation height for cold storage: up to 4 m

Recommended installation height for entrances: 2,5 m

Air velocity profile



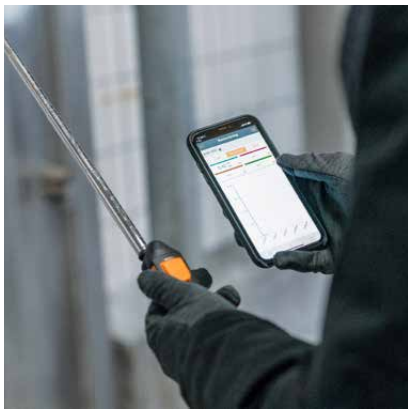
Measurements according to ISO 27327-1.
Average values for products in the series.

Design and specifications are subject to change without notice.

PAEC2500

Frico's Thermozone technology optimizes the air curtain

Frico air curtains create an invisible barrier at openings and doors which separates different temperature zones without limiting access for people and vehicles. Thermozone technology creates a highly uniform air barrier with a perfect balance between air volume and air velocity, regardless of whether it is the heat or the cold that you want to keep inside.



Great energy savings

In many premises doors remain open for a significant part of the day, this results in huge losses of expensively heated or cooled air, especially when the temperature difference between outdoor and indoor air is great. With correctly installed air curtains great energy savings can be obtained.

Comfortable indoor climate

Air curtains with Thermozone technology have optimized performance to provide a comfortable indoor climate free from drafts. The air curtain also keeps out emissions and insects.

Low sound level

With Thermozone technology Frico manufactures air curtains with very high airflow performance. This does not just make the air curtain more effective, but also has other advantages such as extremely low sound levels and reduced turbulence.

Technical specifications

Ambient, no heat - PAEC2500 A (IP44)

Voltage motor: 230V~

Item number	Type	Output [kW]	Airflow [m³/h]	Sound power*¹ [dB(A)]	Sound pressure*² [dB(A)]	Amperage motor*³ [A]	Length [mm]	Weight [kg]
84620	**PAEC2510A**	0	1400	70	33/35	0,15/0,8	1050	16
84621	**PAEC2515A**	0	2100	72	37/55	0,2/0,9	1560	23,5
84622	**PAEC2520A**	0	2800	71	34/54	0,3/1,6	2050	32

*¹) Sound power (L_{WA}) measurements according to ISO 27327-2: 2014, Installation type E.
*²) Sound pressure (L_{pA}). Conditions: Distance to the unit 5 metres. Directional factor: 2. Equivalent absorption area: 200 m². At 50% and 100% airflow.
*³) Applicable at 50% and 100% airflow.

Approved for 200-240V, 50/60Hz. Product performance for 60Hz will differ from stated data.

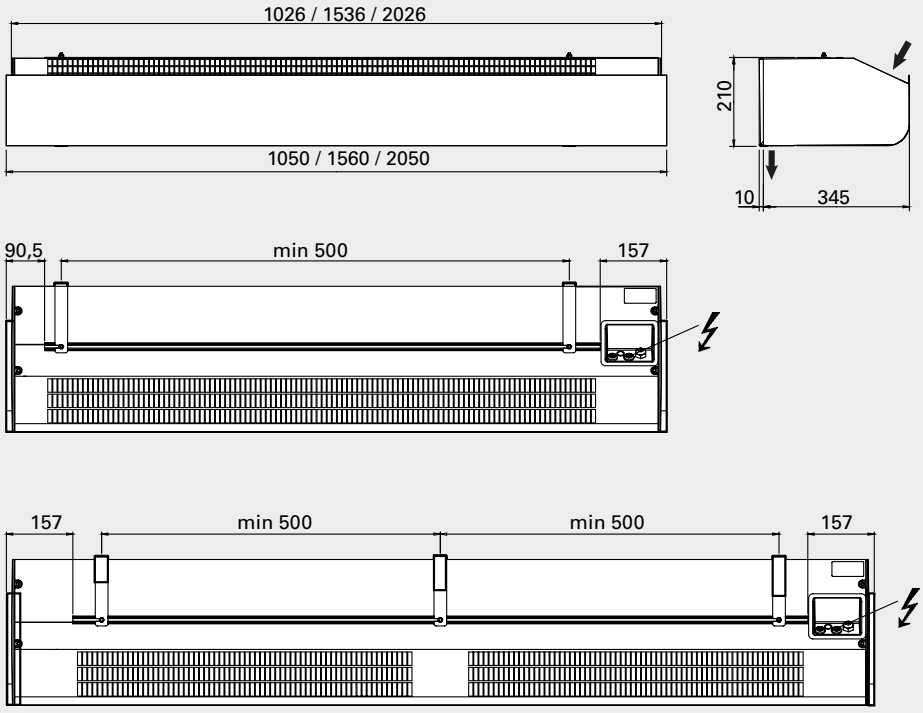
CE

Manufactured in Sweden with a corrosion proof housing made of hot zinc-plate and powder coated steel panels. Plastic ends. Colour front: white, RAL 9016. Colour grille, rear section, ends and brackets: grey, RAL 7046.

Mounting

Mounting
Installation height for cold storage: up to 4 m. Recommended installation height for entrances: 2,5 m. The air curtain unit is installed horizontally with the outlet air grille facing downwards as close to the door as possible. When the unit is used to protect cold storage or freezer rooms, it must be mounted on the outside of the conditioned space. Wall brackets included. Threaded rods, hanging brackets and ceiling mounting brackets for ceiling mounting are available as accessories, see accessories pages and separate manuals.

Connection
The unit is connected with a 1.5m cord and plug. The front is easy to remove, which facilitates installation and allows easy maintenance.



Recommended installation height varies depending on the relevant premises. See www.frico.net for further information.

For mounting, connection, wiring diagrams and other technical information, please see the manual.

Control options

Stepless airflow control
The airflow is set manually on the internal potentiometer 0-10V, which is located inside the outlet grille.

Stepless airflow control with external potentiometer
The airflow is set manually on an external potentiometer 0-10V.

Control kit:
PAMP10, external potentiometer

Stepless airflow control with door contact/position limit switch
When the door is closed the fan runs at low speed, set on the internal potentiometer 0-10V, which is located inside the outlet grille. When the door opens, the fan runs at high speed, set on an external potentiometer. This control option gives low response time and the best protection.

Control kit:
PAMP10, external potentiometer
FCDC, door contact or AGB304, position limit switch

BMS control
The air curtain can also be controlled via BMS (0-10V).

Accessories - Control options

PAMP10, external potentiometer
Potentiometer for stepless control. The required output voltage is steplessly set between 0-10V. Potential free contact for ON / OFF connection of external equipment. The potentiometer can be installed recessed (IP44) or externally (IP54). PAMP10 can control up to eight units (2 m: four units).

FCDC, door contact
Indicates door status. Potential free, changeover contact.

AGB304, position limit switch
Starts the air curtain or activates a fan speed control when the door is opened. When the door closes, AGB304 stops the air curtain or changes fan speed through a fan speed control. Alternating contact 4 A, 230 V~. IP67.

Accessories - mounting

PA2PF, ceiling mounting brackets
Mountings for installing the unit in the ceiling using hanging brackets or threaded bars (not included).

PA34TR, threaded bars
Threaded bars for installing unit on to a ceiling. Length 1 m. Used together with ceiling mounting brackets PA2PF.

PA2P, hanging brackets
Hanging brackets for installing the unit suspended from the ceiling. Length 1 m. The hanging brackets are covered by a white plastic trim to cover the cables. The brackets may be cut to shorter length, if required. Used together with ceiling mounting brackets PA2PF.

Item number	Type	Used for	Consists of
87675	**PAMP10**	PAEC2510/2515/2520	1
17495	**FCDC**	PAEC2510/2515/2520	1
10016	**AGB304**	PAEC2510/2515/2520	1
19415	**PA2PF15**	PAEC2510/2515	4
19417	**PA2PF20**	PAEC2520	6
18056	**PA34TR15**	PAEC2510/2515	4
18057	**PA34TR20**	PAEC2520	6
19568	**PA2P15**	PAEC2510/2515	2
19569	**PA2P20**	PAEC2520	3


PAEC2500

PAEC 3200

Stylish air curtain with EC motor and integrated controls, for cold rooms

PAEC3200 protects cold and freezer rooms efficiently at very low operating costs and can give energy savings of up to 85%. The stepless control allows precise adjustment, which means that PAEC is the perfect choice for cold and freezer room applications and also for use in air conditioned premises, for example, to separate the outside from the inside.

Energy efficient and sustainable

The air curtain is equipped with EC motors that are up to 50% more energy efficient than traditional AC motors, and have a lower weight which makes for easier installations and greener transports.

Integrated control

The air curtain has stepless control using an internal or external potentiometer (accessory).

High performance

Frico air curtains are developed and manufactured in Sweden. The air curtains are tested in one of the most modern and advanced air and sound laboratories in Europe which means that we can guarantee a high performance product.

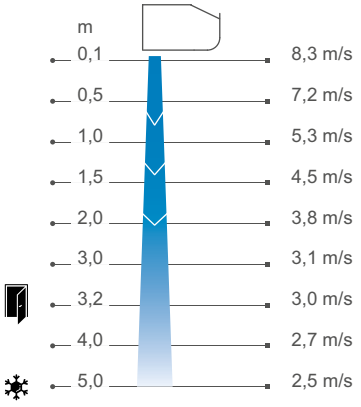
PAEC3200

Ambient (without heat)

Installation height for cold storage: up to 5 m

Recommended installation height for entrances: 3,2 m

Air velocity profile



Measurements according to ISO 27327-1.
Average values for products in the series.

Design and specifications are subject to change without notice.

PAEC3200

Frico's Thermozone technology optimizes the air curtain

Frico air curtains create an invisible barrier at openings and doors which separates different temperature zones without limiting access for people and vehicles. Thermozone technology creates a highly uniform air barrier with a perfect balance between air volume and air velocity, regardless of whether it is the heat or the cold that you want to keep inside.

Great energy savings

In many premises doors remain open for a significant part of the day, this results in huge losses of expensively heated or cooled air, especially when the temperature difference between outdoor and indoor air is great. With correctly installed air curtains great energy savings can be obtained.

Comfortable indoor climate

Air curtains with Thermozone technology have optimized performance to provide a comfortable indoor climate free from drafts. The air curtain also keeps out emissions and insects.

Low sound level

With Thermozone technology Frico manufactures air curtains with very high airflow performance. This does not just make the air curtain more effective, but also has other advantages such as extremely low sound levels and reduced turbulence.

Technical specifications

Ambient, no heat - PAEC3200 A (IP44)

Voltage motor: 230V~

Item number	Type	Output [kW]	Airflow [m³/h]	Sound power*¹ [dB(A)]	Sound pressure*² [dB(A)]	Amperage motor*³ [A]	Length [mm]	Weight [kg]
77517	**PAEC3210A**	0	1950	74	40/58	0,19/1,15	1068	22
77518	**PAEC3215A**	0	2700	74	39/58	0,2/1,2	1578	32
77519	**PAEC3220A**	0	3800	77	43/61	0,36/2,3	2068	42

*¹) Sound power (L_{WA}) measurements according to ISO 27327-2: 2014, Installation type E.
*²) Sound pressure (L_{pA}). Conditions: Distance to the unit 5 metres. Directional factor: 2. Equivalent absorption area: 200 m². At 50% and 100% airflow.
*³) Applicable at 50% and 100% airflow.

CE

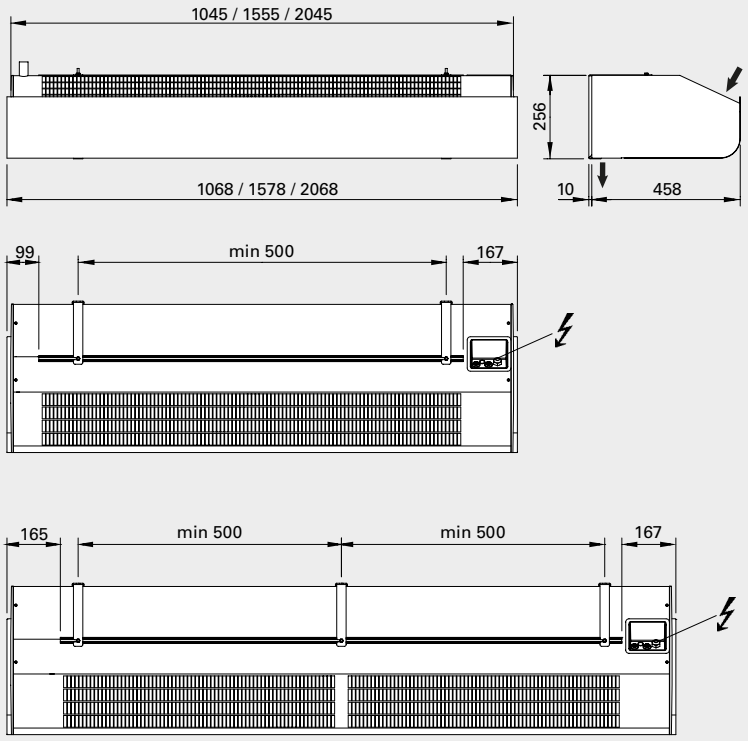
Approved for 200-240V, 50/60Hz. Product performance for 60Hz will differ from stated data.

Manufactured in Sweden with a corrosion proof housing made of hot zinc-plate and powder coated steel panels. Plastic ends. Colour front: white, RAL 9016. Colour grille, rear section, ends and brackets: grey, RAL 7046.

Mounting

Mounting
Installation height for cold storage: up to 5 m. Recommended installation height for entrances: 3,2 m. The air curtain unit is installed horizontally with the outlet air grille facing downwards as close to the door as possible. When the unit is used to protect cold storage or freezer rooms, it must be mounted on the outside of the conditioned space. Wall brackets included. Threaded rods, hanging brackets and ceiling mounting brackets for ceiling mounting are available as accessories, see accessories pages and separate manuals.

Connection
The unit is connected with a 1.5m cord and plug. The front is easy to remove, which facilitates installation and allows easy maintenance.



Recommended installation height varies depending on the relevant premises. See www.frico.net for further information.

For mounting, connection, wiring diagrams and other technical information, please see the manual.

Control options

Stepless airflow control
The airflow is set manually on the internal potentiometer 0-10V, which is located inside the outlet grille.

Stepless airflow control with external potentiometer
The airflow is set manually on an external potentiometer 0-10V.

Control kit:
PAMP10, external potentiometer

Stepless airflow control with door contact/position limit switch
When the door is closed the fan runs at low speed, set on the internal potentiometer 0-10V, which is located inside the outlet grille. When the door opens, the fan runs at high speed, set on an external potentiometer. This control option gives low response time and the best protection.

Control kit:
PAMP10, external potentiometer
FCDC, door contact or AGB304, position limit switch

BMS control
The air curtain can also be controlled via BMS (0-10V).

Accessories - Control options

PAMP10, external potentiometer
Potentiometer for stepless control. The required output voltage is steplessly set between 0-10V. Potential free contact for ON / OFF connection of external equipment. The potentiometer can be installed recessed (IP44) or externally (IP54). PAMP10 can control up to eight units (2 m: four units).

FCDC, door contact
Indicates door status. Potential free, changeover contact.

AGB304, position limit switch
Starts the air curtain or activates a fan speed control when the door is opened. When the door closes, AGB304 stops the air curtain or changes fan speed through a fan speed control. Alternating contact 4 A, 230 V~. IP67.

Accessories - mounting

PA3PF, ceiling mounting brackets
Mountings for installing the unit in the ceiling using hanging brackets or threaded bars (not included).

PA34TR, threaded bars
Threaded bars for installing unit on to a ceiling. Length 1 m. Used together with ceiling mounting brackets PA3PF.

PA2P, hanging brackets
Hanging brackets for installing the unit suspended from the ceiling. Length 1 m. The hanging brackets are covered by a white plastic trim to cover the cables. The brackets may be cut to shorter length, if required. Used together with ceiling mounting brackets PA3PF.

Item number	Type	Used for	Consists of
87675	**PAMP10**	PAEC3210/3215/3220	1
17495	**FCDC**	PAEC3210/3215/3220	1
10016	**AGB304**	PAEC3210/3215/3220	1
25256	**PA3PF15**	PAEC3210/3215	4
25257	**PA3PF20**	PAEC3220	6
18056	**PA34TR15**	PAEC3210/3215	4
18057	**PA34TR20**	PAEC3220	6
19568	**PA2P15**	PAEC3210/3215	2
19569	**PA2P20**	PAEC3220	3


PAEC3200

ADA Cool

Air curtain for cold stores

ADA Cool keeps the cold air in cold stores and also makes it possible to have an open cold store area without doors. ADA Cool has a simple connection making it possible to easily link units together in order to cover wide openings. The cost of cooling is significantly reduced and the cold air stays where it is needed. ADA Cool reduces ice formation and condensation by the doorway and improves visibility when compared to plastic strips and fast folding doors.

Leading technology and design

Frico collaborates with leading architects and product designs in the product development. The air curtains blends in well in the environment and the designed for fit into both exclusive shop interiors as industrial environments.

Compact and easily positioned

Thanks to compact design and air intake at the front, the air curtain can be mounted where space is limited between the ceiling and the upper edge of the doorway.

High performance

Frico air curtains are developed and manufactured in Sweden. The air curtains are tested in one of the most modern and advanced air and sound laboratories in Europe which means that we can guarantee a high performance product.

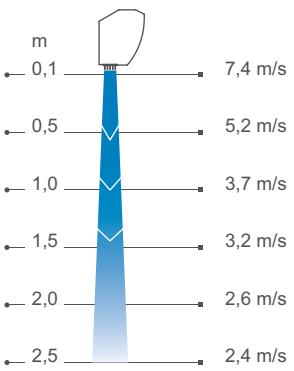
ADA Cool

THERMOZONE TECHNOLOGY

Ambient (without heat)

Installation height for cold storage: up to 2,5 m

Air velocity profile



Measurements according to ISO 27327-1.
Average values for products in the series.

Design and specifications are subject to change without notice.

ADA Cool

Frico's Thermozone technology optimizes the air curtain

Frico air curtains create an invisible barrier at openings and doors which separates different temperature zones without limiting access for people and vehicles. Thermozone technology creates a highly uniform air barrier with a perfect balance between air volume and air velocity, regardless of whether it is the heat or the cold that you want to keep inside.

Great energy savings

In many premises doors remain open for a significant part of the day, this results in huge losses of expensively heated or cooled air, especially when the temperature difference between outdoor and indoor air is great. With correctly installed air curtains great energy savings can be obtained.

Comfortable indoor climate

Air curtains with Thermozone technology have optimized performance to provide a comfortable indoor climate free from drafts. The air curtain also keeps out emissions and insects.

Low sound level

With Thermozone technology Frico manufactures air curtains with very high airflow performance. This does not just make the air curtain more effective, but also has other advantages such as extremely low sound levels and reduced turbulence.

Technical specifications

Ambient, no heat - ADA Cool (IP21)

Voltage motor: 230V~

Item number	Type	Output [kW]	Airflow [m³/h]	Sound power*¹ [dB(A)]	Sound pressure*² [dB(A)]	Amperage motor [A]	Length [mm]	Weight [kg]
2348	**ADAC090**	0	800/1150	70	43/54	0,50	900	9,5
10775	**ADAC120**	0	1100/1400	67	44/51	0,55	1200	11,7

*¹) Sound power (L_{WA}) measurements according to ISO 27327-2: 2014, Installation type E.
*²) Sound pressure (L_{pA}). Conditions: Distance to the unit 5 metres. Directional factor: 2. Equivalent absorption area: 200 m². At lowest/highest airflow.

Approved for 220V/1ph/60Hz. Product performance for 220V/1ph/60Hz will differ from stated data.
Manufactured in Sweden with a corrosion proof housing made of hot zinc-plate and powder coated steel panels. Colour front: white, RAL 9016, NCS S 0500-N.

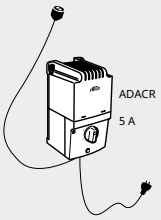
CE

Mounting

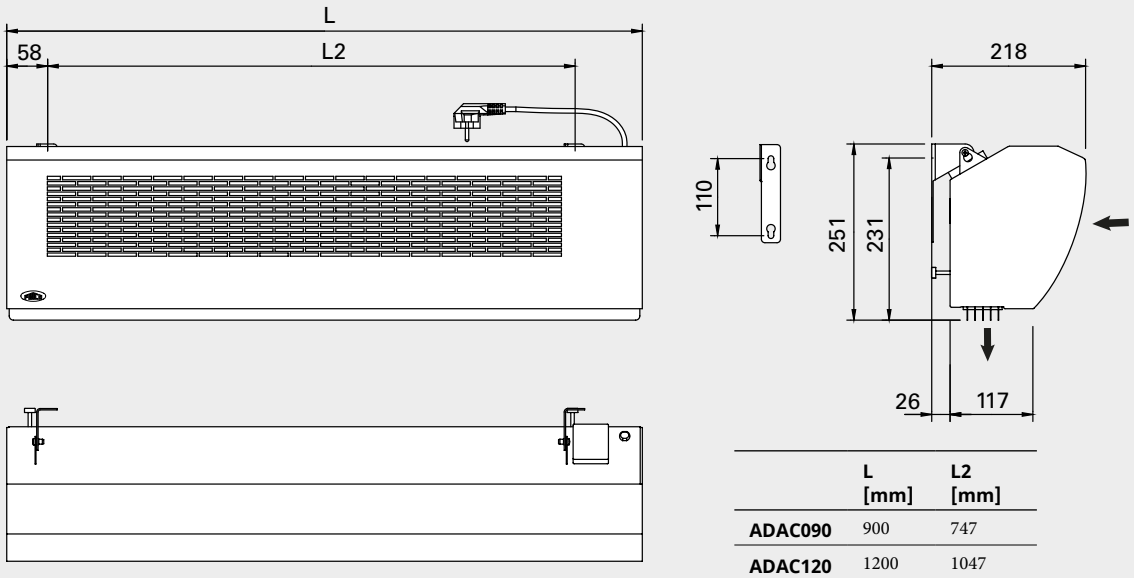
Mounting
The air curtain is installed horizontally with the outlet air grille facing downwards as close to the door as possible. Wall brackets included. Installation height for cold storage: up to 2,5 m. As the unit is to be used to protect cold storage or freezer rooms, it must be mounted on the outside of the conditioned space. Usually the unit must be angled away from the cold storage to prevent hot air from being blown in. For the protection of wider doorways, several units can be mounted in series alongside each other.

Connection
The unit is delivered with 1,8 m cord and plug and is supplied with sockets that make it easy to link up the units in series. The units should be supplemented with ADACR.

Controls



ADACR, 5-step fan speed control
ADACR is a control and connection set consisting of a 5-step fan speed control, flexible cable and earthed plug. Can control a maximum of 7-9 units (max. 7 units at 60 Hz). Max input: 5 A. Dimensions: 200x105x105 mm. IP30.



	L [mm]	L2 [mm]
ADAC090	900	747
ADAC120	1200	1047

Recommended installation height varies depending on the relevant premises. See www.frico.net for further information.

For mounting, connection, wiring diagrams and other technical information, please see the manual.


ADA Cool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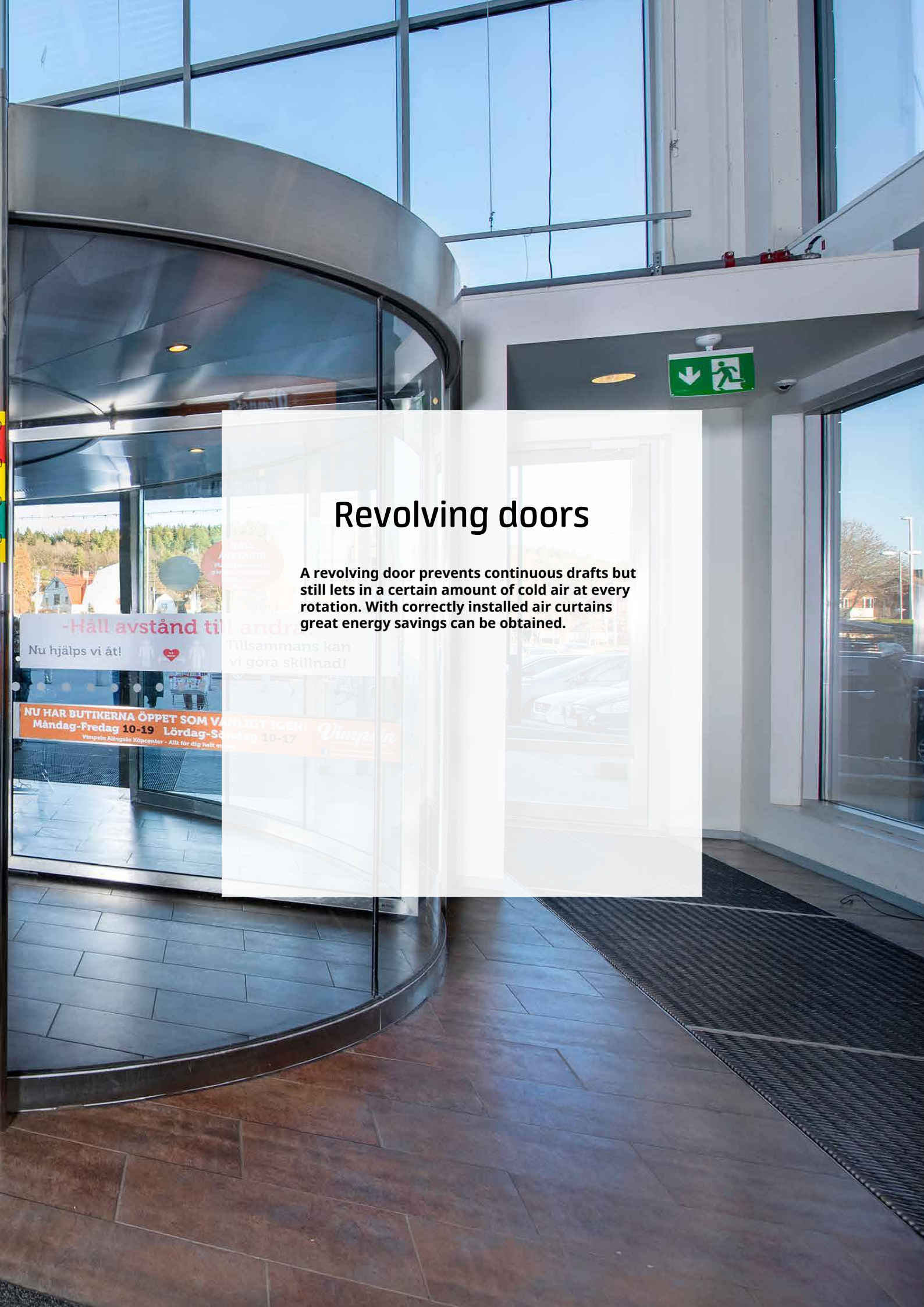


Revolving doors

A revolving door prevents continuous drafts but still lets in a certain amount of cold air at every rotation. With correctly installed air curtains great energy savings can be obtained.

Scand

Curved and energy-efficient air curtain for revolving doors

Scand is a vertical air curtain specially designed for revolving doors, with a curved design that integrates neatly with the door. The air curtain is adapted to customer needs and equipped with energy-efficient EC motors which enable stepless control of the airflow.

Energy efficient and sustainable

The air curtain is equipped with EC motors that are up to 50% more energy efficient than traditional AC motors, and have a lower weight which makes for easier installations and greener transports.

Intelligent control options

Scand is supplemented with an intelligent control system that allows you to optimize your comfort with minimum effort. Smart and automatic features enable simple set-up and operation for different Frico products groups.

High performance

Frico air curtains are developed and manufactured in Sweden. The air curtains are tested in one of the most modern and advanced air and sound laboratories in Europe which means that we can guarantee a high performance product.

Scand

Available in 2 versions:

- Electrical heating
- Water heating

A revolving door prevents continuous drafts but, still lets in a certain amount of cold air at every rotation. With correctly installed air curtains great energy savings can be obtained.

Product key

Type - Connection position - Total height - Material / colour

Example: SFFEC4WL - A - 2800 - P

Type	See Technical specifications.
Connection position	A = from above B = from below
Total height	Min. height 2200 mm. Max height 3000 mm. Extension without fans.
Material/Colour	P = Polished stainless steel B = Brushed stainless steel MP = Mirror polished stainless steel State RAL code = Powder coating RAL State NCS code = Powder coating NCS

Technical specifications

Electrical heat - SFFEC E (IP20)

Voltage motor: 230V~

Type	Output steps [kW]	Airflow*[1] [m³/h]	Δt*[4] [°C]	Sound power*[2] [dB(A)]	Sound pressure*[3] [dB(A)]	Amperage motor [A]	Voltage [V] Amperage [A] (heat)	Length*[7] [mm]	Weight [kg]
SFFEC4E16	5,4/11/16	1850/3600	26/13	82	48/66	4,1	400V3~/24	2200	70
SFFEC6E24	7,8/16/24	2300/4700	30/15	83	50/67	6	400V3~/34	2200	75

Water heat - SFFEC WH (IP20)

Type	Output*[5] [kW]	Output*[6] [kW]	Airflow*[1] [m³/h]	Δt*[4,5] [°C]	Δt*[4,6] [°C]	Water volume [l]	Sound power*[2] [dB(A)]	Sound pressure*[3] [dB(A)]	Amperage motor [A]	Length*[7] [mm]	Weight [kg]
SFFEC4WL	21	36	1650/3300	24/19	40/32	4,4	80	47/64	4,1	2200	80
SFFEC6WL	26	44	2200/4600	22/17	37/28	4,4	81	47/65	6	2200	90

*[1]) Low/high airflow (2V/10V).
*[2]) Sound power (L_{WA}) measurements according to ISO 27327-2: 2014, Installation type E.
*[3]) Sound pressure (L_{pA}). Conditions: Distance to the unit 5 metres. Directional factor: 2. Equivalent absorption area: 200 m². At low/high airflow (2V/10V).
*[4]) Δt = temperature rise of passing air at maximum heat output and low/high airflow (2V/10V).
*[5]) Applicable at water temperature 60/40 °C, air temperature, in +18 °C.
*[6]) Applicable at water temperature 80/60 °C, air temperature, in +18 °C.
*[7]) Standard height. Max. height 3000 mm (extension without fans). *[5,6]) See www.frico.net for additional calculations.

Approved for 220V/1ph/60Hz and 380V/3ph/60Hz. Product performance for 220V/1ph/60Hz and 380V/3ph/60Hz will differ from stated data.

Air curtains for installation to the right can be specially ordered.

Manufactured in Sweden with a corrosion proof housing made of polished, brushed or mirror polished stainless steel or powder coated steel, any RAL/NCS colour. Aluminium louvres. Colour intake grille: grey, RAL 7046. See product key on previous page.

CE

Mounting

The air curtain is vertically mounted to the left of the door seen from inside. The unit has a curved design which makes it an integrated part of the door. Standard length is 2200 mm. Lengths up to 3 m can be ordered according to the product key (extension without fans). Extension hoods, for heights up to 4 m , are available as an accessory. The air curtain must always be secured at the top. Air curtains for installation to the right can be specially ordered.

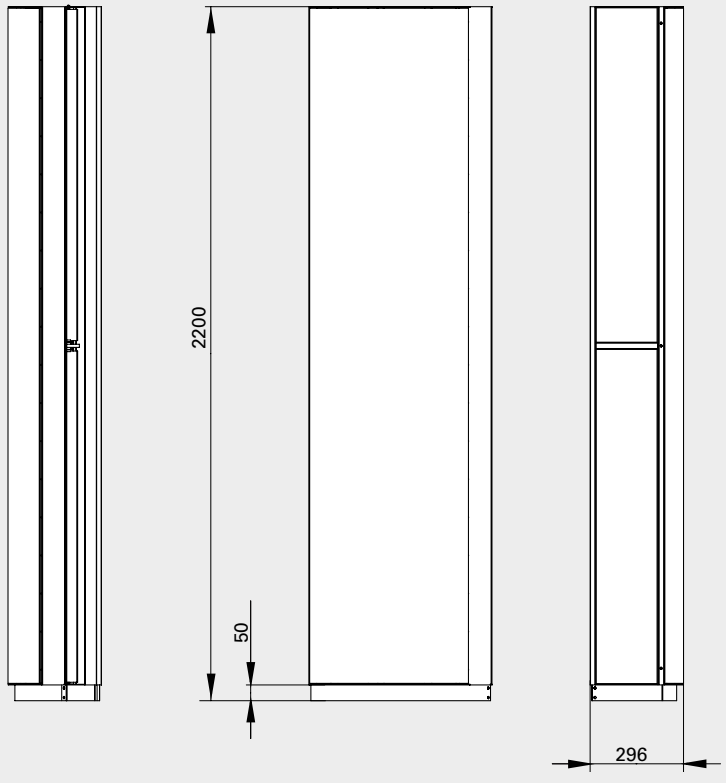
Connection

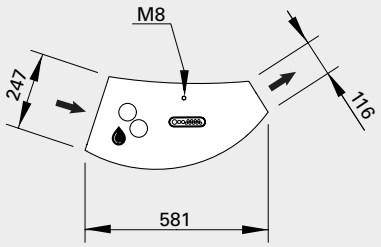
Service and maintenance are easily made through the service hatch on the side of the unit. The air curtain has an integrated PC board which is connected to the selected external control system FC.

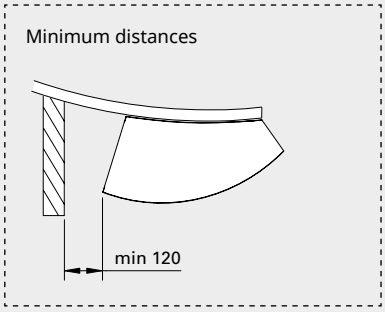
Control is supplied by 230V~ to the PC board. The PC board is accessed via cable glands on the top of the unit. Communication and sensor cables are connected to the PC board. The electrical connection may be done from above or below, according to ordering key.

Water heated units are connected to the water system from above or below, according to ordering key. Flexible hoses are available as accessories. Water heated units must always be supplemented with a valve kit mounted outside the unit. See Valves and Accessories.

Inside thread : 1", DN25







For wiring diagrams and other technical information, please see the manual and www.frico.net.

Recommended installation height varies depending on the relevant premises. See www.frico.net for further information.

Scand

FC Control system

Frico air curtains come with an integrated PC-board and are supplemented with the intelligent control system FC of your choice, working together to create many smart and energy saving features. There are four different packages to choose from, depending on your requirements.

FC Direct

Entry level

- *Door contact*
- *Calendar function*
- *Filter timer*
- *Built-in temperature sensor*

FC Smart

FC Direct +

- *Control via app (Bluetooth)*
- *Wireless sensors possible*
- *Adjustable calendar function*
- *Away and Boost function*
- *Adjustable filter timer*
- *Vestibule function*
- *Zone possibility*
- *Enhanced water control possible*

FC Pro

FC Direct + FC Smart +

- *Automatic air flow control*
- *Automatic heat blocking*

FC Building - BMS

FC Direct +

- *0-10V, potential free contact or Modbus*
- *Automatic air flow control**
- *Automatic heat blocking**
- *Heat and fan settings*
- *Alarm indication*
- *Read values*
- *Enhanced water control possible*

** Requires outdoor temp signal*

FC Direct

Entry level control system for a great start. The door contact provides an automatic energy-saving function, as the air curtain becomes active only when the door is open. When the door is closed, it remains on stand-by or runs on a lower fan speed if extra heat is needed. With the calender function, you can choose periods of comfort and reduced mode. The control panel has a built-in temperature sensor, which is used for control when external sensors are not used.

FC Smart

Second level control system for full freedom. FC Smart comes with all features from FC Direct plus additional energy saving features and the possibility of app control (Bluetooth). The app gives you access to all functions in the system, allowing you to set it up exactly the way you want it. It also enables you to create different zones with different settings in a larger system. The app FRICO CONTROL is available for both iOS and Android.

FC Pro

Third level control system for maximum savings. FC Pro comes with all features from FC Direct and FC Smart plus additional automatic energy saving features. By receiving and reacting to information about indoor and outdoor temperatures, the right amount of heat and air flow is added to avoid overshoots and thus reducing energy consumption.

FC Building - BMS system

Comprehensive control system for buildings, with the option to control via 0-10V, potential free contact (e.g. a relay) and/or Modbus RTU (RS485). FC Building enables you to receive product information status and alarms. Modbus allows for full use of all the energy saving features within the control system.

Item number	Type	Description
74684	**FCDA**	FC Direct, first level control system
74685	**FCSA**	FC Smart, second level control system
74686	**FCPA**	FC Pro, third level control system
74687	**FCBA**	FC Building, BMS system

Control system content and accessories

FC Control system helps to create many smart and energy saving features. In addition to our four packages, components can be added to expand and customize the system. With the app levels (FC Smart and FC Pro) it is also possible to create and control different zones. Each added zone needs to be equipped with one FC Direct and can be designed to fit its specific needs by adding different accessories.

FC Direct, control kit
Control panel for fan and heat, door contact and 5 m communication cable. Used for additional zones with FC Smart and FC Pro. IP44.

FCRTX, external room temperature sensor
For reading of the room temperature on another location than that of the control panel, incl. 10 m sensor cable. IP20.

FCOTX, outdoor temperature sensor
Reading the outdoor temperature, incl. 10 m sensor cable. Enables automatic air curtain control and heat blocking. IP44.

FCLAP, local access point
Local access point for extra wireless sensors (when operating more than 8 sensors) and extended range for wireless sensors or app control (Bluetooth), incl. 10 m communication cable. IP44.

FCSC/FCBC, cable
FCSC Sensor cable available in 10 or 25 m for extra length. FCBC Communication cable for additional products within the same zone, available in 5, 10 or 25 m.

FCDC, door contact
The door contact regulates the airflow on/off. Allows you to control air curtains at different doorways individually within the same zone.

FCTXRF, indoor/outdoor wireless sensor
Indoor/outdoor wireless sensor with same features as FCRTX and FCOTX. The set up as outdoor or indoor sensor is made by a switch inside the sensor. Range up to 50 m. Battery life: 3-5 years. IP44.

FC Direct

Content
- *FCCF control panel*
- *FCBC05*
- *FCDC*

FC Smart

Content
- *FCCF control panel*
- *FCBC10*
- *FCDC*
- *FCLAP*

FC Pro

Content
- *FCCF control panel*
- *FCBC10*
- *FCDC*
- *FCLAP*
- *FCTXRF*

FC Building - BMS

Content
- *FCCF control panel*
- *FCBC10*
- *FCDC*
- *FCBAP building access point*

Item number	Type	Description	Dimensions
74684	**FCDA**	FC Direct, first level control system	89x89x26 mm (FCCF)
74694	**FCRTX**	External room temperature sensor	39x39x23 mm
74695	**FCOTX**	Outdoor temperature sensor	39x39x23 mm
74699	**FCLAP**	Local access point for extra wireless sensors and extended range	89x89x26 mm
74718	**FCBC05**	Extra communication cable, 5 m	5 m
74719	**FCBC10**	Extra communication cable, 10 m	10 m
74720	**FCBC25**	Extra communication cable, 25 m	25 m
74721	**FCSC10**	Extra sensor cable, 10 m	10 m
74722	**FCSC25**	Extra sensor cable, 25 m	25 m
17495	**FCDC**	Door contact	
74703	**FCTXRF**	Indoor/outdoor wireless sensor (for FC Smart, FC Pro)	89x89x26 mm

Scand

Water control

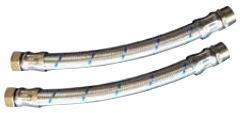
Water heated units must be supplemented with valves. The valve system controls the water flow and activates maximum heat only when needed. By activating the built-in bypass feature, a small leakage flow is let through to make sure there is always hot water in the heating coil, providing frost protection and faster heating. The return water temperature sensor is making sure that as much energy as possible from the water in the coil is used, thus reducing energy consumption.

VPFC, pressure independent and modulating valve system
Two way pressure independent control and adjustment valve with modulating actuator and shut-off valve.

FCWTA, return water temperature sensor
Enables control of return water temperature and automatic bypass function, which provides extended frost protection and reduced energy consumption.

Item number	Type	DN	Flow range l/s
238293	**VPFC15LF**	DN15	0,012-0,068
238294	**VPFC15NF**	DN15	0,024-0,13
238295	**VPFC20**	DN20	0,058-0,32
238296	**VPFC25**	DN25	0,10-0,60
238297	**VPFC32**	DN32	0,22-1,03
74702	**FCWTA**	Return water temperature sensor	

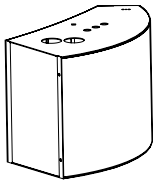
Accessories - water heated units



FH1025, flexible hose
Flexible hose (DN25, 1" inside/outside thread) for easy connection to the pipe system.

Item number	Type	Used for	Consists of
330955	**FH1025**	SFFEC4/6	2

Accessories - mounting



SFSEH, extension hood
Extends the unit, adapting it to the installation. Height 100-1000 mm. Special order to required dimension.

Item number	Type	Used for	Consists of
FE10129	**SFSEH**	SFFEC4/6	1

Ruwen

Discreet and energy-efficient air curtain for revolving doors

Ruwen is a customized air curtain installed above your revolving door, with the exhaust duct adapted to the diameter of the door. Ruwen is equipped with energy-efficient EC motors which enable stepless control of the airflow. The air curtain is custom made to your specifications which gives a neat and discrete solution.

Energy efficient and sustainable

The air curtain is equipped with EC motors that are up to 50% more energy efficient than traditional AC motors, and have a lower weight which makes for easier installations and greener transports.

Intelligent control options

Ruwen is supplemented with an intelligent control system that allows you to optimize your comfort with minimum effort. Smart and automatic features enable simple set-up and operation for different Frico products groups.

High performance

Frico air curtains are developed and manufactured in Sweden. The air curtains are tested in one of the most modern and advanced air and sound laboratories in Europe which means that we can guarantee a high performance product.

Ruwen

Available in 3 versions:

- Ambient (without heat)
- Electrical heating
- Water heating

A revolving door prevents continuous drafts but, still lets in a certain amount of cold air at every rotation. With correctly installed air curtains great energy savings can be obtained.

Product key

Type - R - W - X - Z - Material / colour
Example: RDFEC20WL - 2500 - 2900 - 2350 - 500 - P

See Dimension drawing for all measurements.

Type	
R	Radius of the revolving door.
W	The opening width of the revolving door
X	Depth of the revolving door outside the wall.
Z	Relevant height.
Material/ Colour	P = Polished stainless steel B = Brushed stainless steel MP = Mirror polished stainless steel State RAL code = Powder coating RAL State NCS code = Powder coating NCS

Technical specifications

Ambient, no heat - RDFEC A (IP20)

Voltage motor: 230V~

Type	Output [kW]	Airflow*[1] [m³/h]	Sound power*[2] [dB(A)]	Sound pressure*[3] [dB(A)]	Amperage motor [A]	Weight*[7] [kg]
RDFEC10A	0	1200/2400	78	46/62	3,2	60
RDFEC15A	0	1800/3500	79	47/64	4,1	130
RDFEC20A	0	2300/4700	81	48/65	6,0	180
RDFEC25A	0	3100/6150	83	50/67	6,9	200

Electrical heat - RDFEC E (IP20)

Type	Output steps [kW]	Airflow*[1] [m³/h]	Δt*[4] [°C]	Sound power*[2] [dB(A)]	Sound pressure*[3] [dB(A)]	Amperage motor [A]	Voltage [V] Amperage [A] (heat)	Weight*[7] [kg]
RDFEC10E12	3,9/7,8/12	1200/2400	30/15	78	46/62	3,2	400V3~/17	80
RDFEC15E18	6/12/18	1800/3500	30/15	80	47/64	4,1	400V3~/26	130
RDFEC20E24	7,8/16/24	2300/4700	30/15	81	48/65	6,0	400V3~/34	180
RDFEC25E30	9,9/20/30	3100/6150	29/14	83	50/67	6,9	400V3~/43	200

Water heat - RDFEC WL, coil for low water temperature (≤80 °C) (IP20)

Type	Output*[5] [kW]	Output*[6] [kW]	Airflow*[1] [m³/h]	Δt*[4,5] [°C]	Δt*[4,6] [°C]	Water volume [l]	Sound power*[2] [dB(A)]	Sound pressure*[3] [dB(A)]	Amperage motor [A]	Weight*[7] [kg]
RDFEC10WL	10	18	1100/2300	18/13	30/23	2,2	78	45/62	3,2	80
RDFEC15WL	16	28	1700/3400	18/14	31/24	3,4	80	46/64	4,1	130
RDFEC20WL	23	39	2200/4600	19/15	32/25	4,5	81	47/65	6,0	180
RDFEC25WL	30	50	2800/5750	20/15	33/26	5,7	83	49/67	6,9	200

*[1]) Low/high airflow (2V/10V).
*[2]) Sound power (L_{WA}) measurements according to ISO 27327-2: 2014, Installation type E.
*[3]) Sound pressure (L_{pA}). Conditions: Distance to the unit 5 metres. Directional factor: 2. Equivalent absorption area: 200 m². At low/high airflow (2V/10V).
*[4]) Δt = temperature rise of passing air at maximum heat output and low/high airflow (2V/10V).
*[5]) Applicable at water temperature 60/40 °C, air temperature, in +18 °C.
*[6]) Applicable at water temperature 80/60 °C, air temperature, in +18 °C.
*[7]) Approximate weight for air curtain and duct.
*[5,6]) See www.frico.net for additional calculations.

Approved for 220V/1ph/60Hz and 380V/3ph/60Hz. Product performance for 220V/1ph/60Hz and 380V/3ph/60Hz will differ from stated data.

Manufactured in Sweden with a corrosion proof housing made of hot zinc-plate and powder coated steel panels. Colour of air curtain and duct: white, RAL 9016, NCS S 0500-N. Colour of duct cover plate is customized.

CE

Product key

Type - R - W - X - Z - Material / colour

Example: RDFEC20WL - 2500 - 2900 - 2350 - 500 - P

Type See Technical specifications.

R The outer radius of the revolving door above the entrance height.

W The opening width of the revolving door

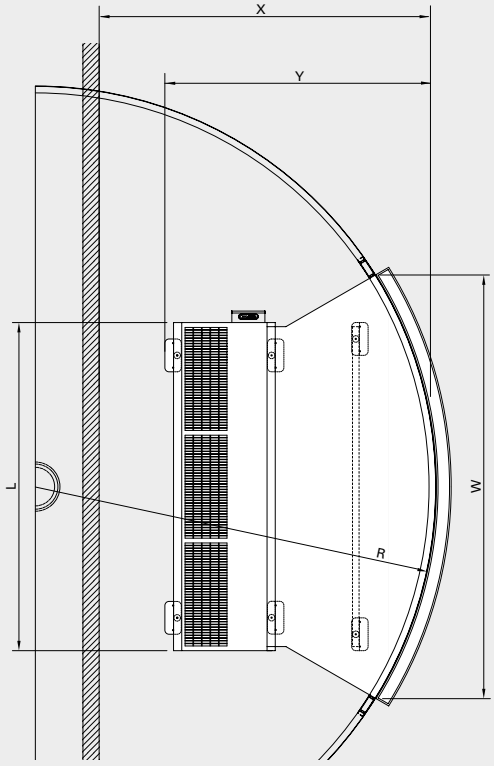
X The largest distance between the outer radius R of the revolving door and the wall to the outside.

Z The height between the inner ceiling of the revolving door (the position of the outlet of the duct) up to the outer roof of the revolving door (where the air curtain is mounted).

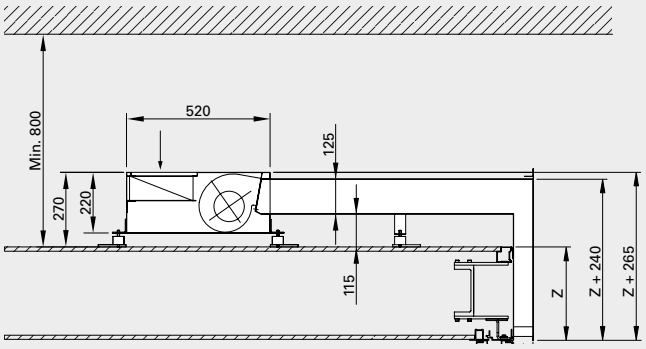
Material/ Colour
P = Polished stainless steel
B = Brushed stainless steel
MP = Mirror polished stainless steel
State RAL code = Powder coating RAL
State NCS code = Powder coating NCS
Only valid for duct cover plate. Air curtain and duct are made of powder coated steel panels, white, RAL9016.

Y is variable, depending on the other dimensions in the product key.

Top view



Side view



Type	L [mm]
RDFEC10 E/A/WL	1000
RDFEC15 E/A/WL	1500
RDFEC20 E/A/WL	2000
RDFEC25 E/A/WL	2500

Minimum distance from outlet to floor for electrically heated units is 1800 mm.

Mounting

The air curtain is installed horizontally on the top of the revolving door with vibration dampers on steel plates (100 x 200 mm) that distribute the weight. The unit could alternatively be mounted on beams (accessory).

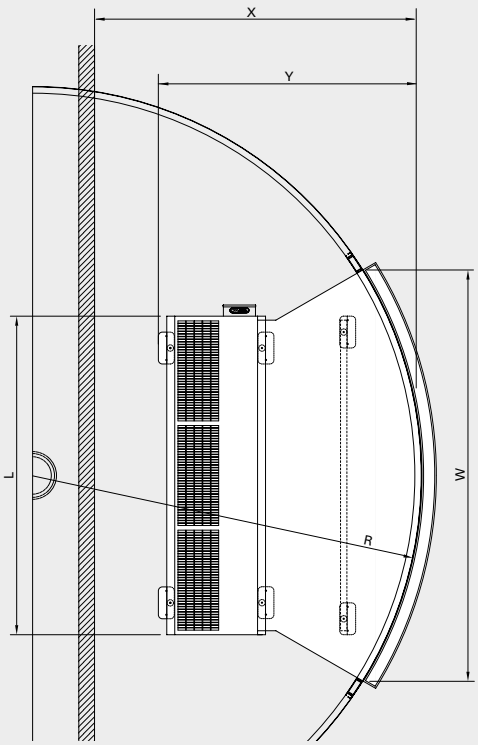
Connection

Service and maintenance are easily made through the service hatch on the top side of the unit. The air curtain has an integrated PC board, mounted on the side of the air curtain, which is connected to the selected external control system FC.

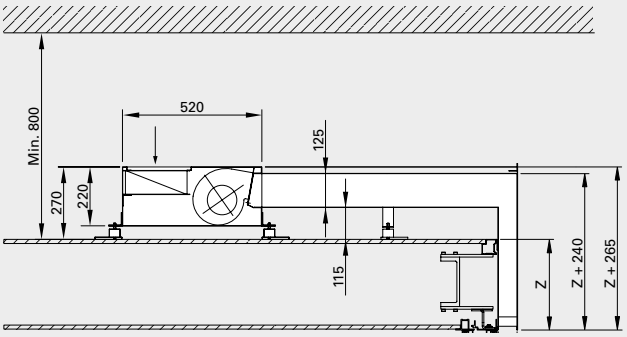
Control is supplied by 230V~ to the PC board. The PC board is accessed via cable glands on the side of the unit. Communication- and sensor cables are connected to the PC board. The electrical connection is made on the side of the unit.

Water heated units are connected to the water system on the side of the unit. Flexible hoses are available as accessories. Water heated units must always be supplemented with a valve kit mounted outside the unit. See Valves and Accessories.

Top view



Side view



W: The opening width of the revolving door
R: The outer radius of the revolving door above the entrance height.

Minimum distance from outlet to floor for electrically heated units is 1800 mm.

Type	L [mm]
RDFEC10 E/A/WL	1000
RDFEC15 E/A/WL	1500
RDFEC20 E/A/WL	2000
RDFEC25 E/A/WL	2500

For wiring diagrams and other technical information, please see the manual and www.frico.net.

Ruwen

FC Control system

Frico air curtains come with an integrated PC-board and are supplemented with the intelligent control system FC of your choice, working together to create many smart and energy saving features. There are four different packages to choose from, depending on your requirements.

FC Direct

Entry level

- *Door contact*
- *Calendar function*
- *Filter timer*
- *Built-in temperature sensor*

FC Smart

FC Direct +

- *Control via app (Bluetooth)*
- *Wireless sensors possible*
- *Adjustable calendar function*
- *Away and Boost function*
- *Adjustable filter timer*
- *Vestibule function*
- *Zone possibility*
- *Enhanced water control possible*

FC Pro

FC Direct + FC Smart +

- *Automatic air flow control*
- *Automatic heat blocking*

FC Building - BMS

FC Direct +

- *0-10V, potential free contact or Modbus*
- *Automatic air flow control**
- *Automatic heat blocking**
- *Heat and fan settings*
- *Alarm indication*
- *Read values*
- *Enhanced water control possible*

** Requires outdoor temp signal*

FC Direct

Entry level control system for a great start. The door contact provides an automatic energy-saving function, as the air curtain becomes active only when the door is open. When the door is closed, it remains on stand-by or runs on a lower fan speed if extra heat is needed. With the calender function, you can choose periods of comfort and reduced mode. The control panel has a built-in temperature sensor, which is used for control when external sensors are not used.

FC Smart

Second level control system for full freedom. FC Smart comes with all features from FC Direct plus additional energy saving features and the possibility of app control (Bluetooth). The app gives you access to all functions in the system, allowing you to set it up exactly the way you want it. It also enables you to create different zones with different settings in a larger system. The app FRICO CONTROL is available for both iOS and Android.

FC Pro

Third level control system for maximum savings. FC Pro comes with all features from FC Direct and FC Smart plus additional automatic energy saving features. By receiving and reacting to information about indoor and outdoor temperatures, the right amount of heat and air flow is added to avoid overshoots and thus reducing energy consumption.

FC Building - BMS system

Comprehensive control system for buildings, with the option to control via 0-10V, potential free contact (e.g. a relay) and/or Modbus RTU (RS485). FC Building enables you to receive product information status and alarms. Modbus allows for full use of all the energy saving features within the control system.

Item number	Type	Description
74684	**FCDA**	FC Direct, first level control system
74685	**FCSA**	FC Smart, second level control system
74686	**FCPA**	FC Pro, third level control system
74687	**FCBA**	FC Building, BMS system

Ruwen

Control system content and accessories

FC Control system helps to create many smart and energy saving features. In addition to our four packages, components can be added to expand and customize the system. With the app levels (FC Smart and FC Pro) it is also possible to create and control different zones. Each added zone needs to be equipped with one FC Direct and can be designed to fit its specific needs by adding different accessories.

FC Direct, control kit
Control panel for fan and heat, door contact and 5 m communication cable. Used for additional zones with FC Smart and FC Pro. IP44.

FCRTX, external room temperature sensor
For reading of the room temperature on another location than that of the control panel, incl. 10 m sensor cable. IP20.

FCOTX, outdoor temperature sensor
Reading the outdoor temperature, incl. 10 m sensor cable. Enables automatic air curtain control and heat blocking. IP44.

FCLAP, local access point
Local access point for extra wireless sensors (when operating more than 8 sensors) and extended range for wireless sensors or app control (Bluetooth), incl. 10 m communication cable. IP44.

FCSC/FCBC, cable
FCSC Sensor cable available in 10 or 25 m for extra length. FCBC Communication cable for additional products within the same zone, available in 5, 10 or 25 m.

FCDC, door contact
The door contact regulates the airflow on/off. Allows you to control air curtains at different doorways individually within the same zone.

FCTXRF, indoor/outdoor wireless sensor
Indoor/outdoor wireless sensor with same features as FCRTX and FCOTX. The set up as outdoor or indoor sensor is made by a switch inside the sensor. Range up to 50 m. Battery life: 3-5 years. IP44.

FC Direct

Content
- *FCCF control panel*
- *FCBC05*
- *FCDC*

FC Smart

Content
- *FCCF control panel*
- *FCBC10*
- *FCDC*
- *FCLAP*

FC Pro

Content
- *FCCF control panel*
- *FCBC10*
- *FCDC*
- *FCLAP*
- *FCTXRF*

FC Building - BMS

Content
- *FCCF control panel*
- *FCBC10*
- *FCDC*
- *FCBAP building access point*

Item number	Type	Description	Dimensions
74684	**FCDA**	FC Direct, first level control system	89x89x26 mm (FCCF)
74694	**FCRTX**	External room temperature sensor	39x39x23 mm
74695	**FCOTX**	Outdoor temperature sensor	39x39x23 mm
74699	**FCLAP**	Local access point for extra wireless sensors and extended range	89x89x26 mm
74718	**FCBC05**	Extra communication cable, 5 m	5 m
74719	**FCBC10**	Extra communication cable, 10 m	10 m
74720	**FCBC25**	Extra communication cable, 25 m	25 m
74721	**FCSC10**	Extra sensor cable, 10 m	10 m
74722	**FCSC25**	Extra sensor cable, 25 m	25 m
17495	**FCDC**	Door contact	
74703	**FCTXRF**	Indoor/outdoor wireless sensor (for FC Smart, FC Pro)	89x89x26 mm

Ruwen

Water control

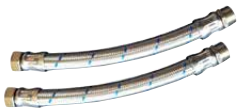
Water heated units must be supplemented with valves. The valve system controls the water flow and activates maximum heat only when needed. By activating the built-in bypass feature, a small leakage flow is let through to make sure there is always hot water in the heating coil, providing frost protection and faster heating. The return water temperature sensor is making sure that as much energy as possible from the water in the coil is used, thus reducing energy consumption.

VPFC, pressure independent and modulating valve system
Two way pressure independent control and adjustment valve with modulating actuator and shut-off valve.

FCWTA, return water temperature sensor
Enables control of return water temperature and automatic bypass function, which provides extended frost protection and reduced energy consumption.

Item number	Type	DN	Flow range l/s
238293	**VPFC15LF**	DN15	0,012-0,068
238294	**VPFC15NF**	DN15	0,024-0,13
238295	**VPFC20**	DN20	0,058-0,32
238296	**VPFC25**	DN25	0,10-0,60
238297	**VPFC32**	DN32	0,22-1,03
74702	**FCWTA**	Return water temperature sensor	

Accessories - water heated units



FH1025, flexible hose
Flexible hose (DN25, 1" inside/outside thread) for easy connection to the pipe system.

Item number	Type	Used for	Consists of
330955	**FH1025**	RDFEC10/15/20/25W	2

Accessories - mounting

RDSB, beam
If the revolving door roof cannot take the weight, Ruwen can be carried on a beam construction. Measurements 40x80 mm, state length when ordering.

Item number	Type	Used for	Consists of
	RDSB	RDFEC10/15/20/25	1

Ruwen

Controls

How efficient an air curtain is and how much energy can be saved depends to a large part on the control system. Many factors that affect the air curtain vary over time. The variations can be long term, for example seasonal, or more temporary, for example when the sun goes behind clouds, the premises fills with people or when a door is opened.

FC

Easy set-up and operation

The system automatically detects any products or sensors that are connected to it and immediately becomes functional. If anything is removed, a notification is sent out, and the system remains operational according to the new conditions.

Included in all levels.

Optimized energy consumption with door contact

An easily installed door contact is included in all control levels. This enables the air curtain to become active only when needed and remain on stand-by when the door is closed, thus saving energy.

Included in all levels.

Wireless sensors offer easier installations

Indoor and outdoor temperatures can be measured by wireless sensors, which allows for quicker and easier installations as no preparatory work is needed to connect cables through walls.

Applies to FCTXRF. Indoor/outdoor wireless sensor (for FC Smart, FC Pro)

Control with app

The Frico app with its user-friendly interface makes it easy to set up and control products directly from your smartphone or tablet, allowing you to control your comfort with ease. The app FRICO CONTROL is available for both iOS and Android.

Included in FC Smart and FC Pro.

Create zones

The zone feature allows you to create different zones for different conditions in a larger system, to create maximum comfort and energy savings in all areas. All zones can be controlled from the same app.

Available with FC Smart or FC Pro.

Automatic airflow control

In order to generate the best possible door protection in any given condition, the system automatically adjusts the airflow steplessly between 0–100% based on the indoor and outdoor temperature.

Included in FC Pro.

One system, numerous possibilities

FC Control allows you to optimize your comfort with minimum effort, customized to your specific needs. Read more about some of its many smart and automatic features below.

Energy savings with precise control

By receiving and reacting to information about the current room temperature in addition to the air curtain's inlet and outlet temperatures, the right amount of heat is added to avoid overshoots and thus reducing energy consumption.

Included in FC Pro.

Automatic heat blocking

To avoid unnecessary heating, the system automatically blocks any additional heat when the outdoor temperature reaches a given value (15°C by default).

Included in FC Pro.

Vestibule function

By installing two air curtains with a setting for vestibules, a dual function can be obtained. The outer air curtain operates with a higher airflow with less heat, providing a stronger outer shield. The inner air curtain operates with a lower airflow with more heat, providing more comfort and lower sound level.

Included in FC Smart and FC Pro.

Enhanced water control

Water heat is more accurate controlled with improved water functions and modulating actuators. Automatic functions such as bypass, frost protection and return water temperature control (with sensor FCWTA) improve product functionality without any additional effort.

Available with FC Smart, FC Pro or FC Building.

Content
- FCCF control panel
- FCBC05 communication cable, 5 m
- FCDC door contact

FC Direct

Entry level control system for a great start. The door contact provides an automatic energy-saving function, as the air curtain becomes active only when the door is open. When the door is closed, it remains on stand-by or runs on a lower fan speed if extra heat is needed. With the calender function, you can choose periods of comfort and reduced mode. The control panel has a built-in temperature sensor, which is used for control when external sensors are not used.

Item number	Type	Description
74684	**FCDA**	FC Direct, first level control system

Content
- FCCF control panel with built-in temperature sensor
- FCBC10 communication cable, 10 m
- FCDC door contact
- FCLAP local access point Bluetooth

FC Smart

Second level control system for full freedom. FC Smart comes with all features from FC Direct plus additional energy saving features and the possibility of app control (Bluetooth). The app gives you access to all functions in the system, allowing you to set it up exactly the way you want it. It also enables you to create different zones with different settings in a larger system. The app FRICO CONTROL is available for both iOS and Android.

Item number	Type	Description
74685	**FCSA**	FC Smart, second level control system

FC Control system

Frico air curtains come with an integrated PC-board and are supplemented with the intelligent control system FC of your choice, working together to create many smart and energy saving features. There are four different packages to choose from, depending on your requirements.

FC Direct

Entry level

- *Door contact*
- *Calendar function*
- *Filter timer*
- *Built-in temperature sensor*

FC Smart

FC Direct +

- *Control via app (Bluetooth)*
- *Wireless sensors possible*
- *Adjustable calendar function*
- *Away and Boost function*
- *Adjustable filter timer*
- *Vestibule function*
- *Zone possibility*
- *Enhanced water control possible*

FC Pro

FC Direct + FC Smart +

- *Automatic air flow control*
- *Automatic heat blocking*

FC Building - BMS

FC Direct +

- *0-10V, potential free contact or Modbus*
- *Automatic air flow control**
- *Automatic heat blocking**
- *Heat and fan settings*
- *Alarm indication*
- *Read values*
- *Enhanced water control possible*

** Requires outdoor temp signal*

Content

- FCCF control panel
- FCBC10 communication cable, 10 m
- FCDC door contact
- FCLAP local access point Bluetooth
- FCTXRF indoor/outdoor wireless sensor

FC Pro

Third level control system for maximum savings. FC Pro comes with all features from FC Direct and FC Smart plus additional automatic energy saving features. By receiving and reacting to information about indoor and outdoor temperatures, the right amount of heat and air flow is added to avoid overshoots and thus reducing energy consumption.

Item number	Type	Description
74686	**FCPA**	FC Pro, third level control system

Content

- FCCF control panel
- FCBC10 communication cable, 10 m
- FCDC door contact
- FCBAP building access point

FC Building - BMS system

Comprehensive control system for buildings, with the option to control via 0-10V, potential free contact (e.g. a relay) and/or Modbus RTU (RS485). FC Building enables you to receive product information status and alarms. Modbus allows for full use of all the energy saving features within the control system.

Item number	Type	Description
74687	**FCBA**	FC Buildning, BMS system

FC

Control system content and accessories

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FC Direct, control kit
Control panel for fan and heat, door contact and 5 m communication cable. Used for additional zones with FC Smart and FC Pro. IP44.

FCRTX, external room temperature sensor
For reading of the room temperature on another location than that of the control panel, incl. 10 m sensor cable. IP20.

FCOTX, outdoor temperature sensor
Reading the outdoor temperature, incl. 10 m sensor cable. Enables automatic air curtain control and heat blocking. IP44.

FCLAP, local access point
Local access point for extra wireless sensors (when operating more than 8 sensors) and extended range for wireless sensors or app control (Bluetooth), incl. 10 m communication cable. IP44.

FCSC/FCBC, cable
FCSC Sensor cable available in 10 or 25 m for extra length. FCBC Communication cable for additional products within the same zone, available in 5, 10 or 25 m.

FCDC, door contact
The door contact regulates the airflow on/off. Allows you to control air curtains at different doorways individually within the same zone.

FCTXRF, indoor/outdoor wireless sensor
Indoor/outdoor wireless sensor with same features as FCRTX and FCOTX. The set up as outdoor or indoor sensor is made by a switch inside the sensor. Range up to 50 m. Battery life: 3-5 years. IP44.

FC Direct

Content
- *FCCF control panel*
- *FCBC05*
- *FCDC*

FC Smart

Content
- *FCCF control panel*
- *FCBC10*
- *FCDC*
- *FCLAP*

FC Pro

Content
- *FCCF control panel*
- *FCBC10*
- *FCDC*
- *FCLAP*
- *FCTXRF*

FC Building - BMS

Content
- *FCCF control panel*
- *FCBC10*
- *FCDC*
- *FCBAP building access point*

Item number	Type	Description	Dimensions
74684	**FCDA**	FC Direct, first level control system	89x89x26 mm (FCCF)
74694	**FCRTX**	External room temperature sensor	39x39x23 mm
74695	**FCOTX**	Outdoor temperature sensor	39x39x23 mm
74699	**FCLAP**	Local access point for extra wireless sensors and extended range	89x89x26 mm
74718	**FCBC05**	Extra communication cable, 5 m	5 m
74719	**FCBC10**	Extra communication cable, 10 m	10 m
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74721	**FCSC10**	Extra sensor cable, 10 m	10 m
74722	**FCSC25**	Extra sensor cable, 25 m	25 m
17495	**FCDC**	Door contact	
74703	**FCTXRF**	Indoor/outdoor wireless sensor (for FC Smart, FC Pro)	89x89x26 mm


FC


BASTARD
BURGERS

Other controls

Timers and door contacts are useful accessories in an air curtain's control system. Frico offers several alternatives.

CBT, electronic timer
Electronic timer with alternating contact. Setting range 1/2-1-2-4 or 4-8-16-24 hours respectively. The setting range can be limited down to a maximum time of 1/2 hours. IP44.

KUR, digital time switch
Digital weekly timer with 8 different program steps (36 memory places) equipped with a changeover contact. Max. breaking current: 10 A. IP55.

MDC, magnetic door contact with time relay
Starts the air curtain or increases from low to high speed when the door is opened. When the door is closed, the fan continues to run for the preset time (2 s–10 min). This prevents the fan from starting/stopping continuously and is especially suitable for doors that are frequently opened. Three alternating volt-free contacts 10 A, 230 V~ activated when the contacts make. A MDCDC is included in MDC. IP44.

MDCDC, magnetic door contact
Indicates door status. Extra MDCDC are used when several doors are connected to a MDC. IP44.

AGB304, position limit switch
Starts the air curtain or activates a fan speed control when the door is opened. When the door closes, AGB304 stops the air curtain or changes fan speed through a fan speed control. Alternating contact 4 A, 230 V~. IP67.

Thermostats

Frico's thermostats create great comfort and save energy in public and commercial premises as well as in home environments. They control electrical and water borne floor heating, heat pumps, direct effect electric radiators/ convectors and air conditioning. They are also extremely suitable for use with electrically or water heated radiant heaters, fan heaters and air curtains. We offer everything from processor controlled wireless thermostats with advanced functions to the simplest bimetal thermostats.

T, TK, TD, basic offer thermostats
Processor controlled thermostats for room/floor heating. Available with concealed/ visible knob or digital display. Model with visible knob also available with switch and in 400 V.

On/off control (for slow systems) or proportional control (for faster systems) in the same thermostat. TD10 has adjustable P-band and time of cycle.

Internal and/or external sensors (external sensor RTS01 available as an accessory) give the possibility of selecting the sensor function e.g limiting external sensors (min/max). Save reduction either by built-in manual switch or via external timer.

RTI2, electronic 2-step thermostats
Processor controlled 2-step thermostats for room heating /cooling. Available with concealed or visible knob. Adjustable temperature difference between the steps (1–10 degrees). Save reduction via external connection timer (1–10 degrees). External sensor (RTS01) available as an accessory. High protection class (IP44).

KRT, capillary tube thermostats
Capillary tube thermostats for room heating/cooling. Available with concealed and visible knob, and control in 1 or 2 steps. KRT2800 controls in 2 steps and has adjustable temperature difference between the steps (1–4 degrees). KRT1901 has a temperature range of -35–+10 °C. High protection class (IP44 resp. IP55).

TBK, bimetal thermostats
Mechanical bimetal thermostats with acceleration resistance for room heating/ cooling. TBKS10 also has a 1-pole switch.

RTS01, external room temperature sensor
External sensor with 3 m cable. NTC10KΩ.

Technical specifications

Type	Voltage (supply)	Max input	Setting range	Limit floor heating	Save reduction	Proportional control*	Static differential	Protection class	Dimensions HxWxD
	[V]	[A]	[°C]	[°C]	[K]	[K/min]	[K]		[mm]
T10S	230V~	10	5–30	10–40	-4	2K/10min	0,5	IP30	80x80x31
TK10S	230V~	10	5–30	10–40	-4	2K/10min	0,5	IP30	80x80x31
TKS16	230V~	16	5–30	10–40	-4	2K/10min	0,5	IP30	80x80x39
TKS16400	400V2~	16	5–30	10–40	-4	2K/10min	0,5	IP30	80x80x39
TD10	230V~	10	5–37	5–37	Adjustable	Adjustable	0,3	IP30	80x80x31
RTI2	230V~	16/10, 230/400V~	5–35	-	Adjustable	-	0,5	IP44	155x87x43
RTI2V	230V~	16/10, 230/400V~	5–35	-	Adjustable	-	0,5	IP44	155x87x43
KRT1900	-	16/10, 230/400V~	0–40	-	-	-	1,0	IP55	165x57x60
KRT1901	-	16/10, 230/400V~	-35–+10	-	-	-	1,0	IP55	165x57x60
KRTV19	-	16/10, 230/400V~	0–40	-	-	-	1,0	IP44	165x57x60
KRT2800	-	16/10, 230/400V~	0–40	-	-	-	1,0	IP55	165x57x60
TBK10	230V~	10	5–30	-	-	-	0,5	IP30	85x82x39
TBKS10	230V~	10	5–30	-	-	-	0,5	IP30	80x80x43

*) P-band [K]/time of cycle [min]
Products beginning with T can be read as follows: K=knob, S=switch, D= digital display, B=bimetal.

Functions

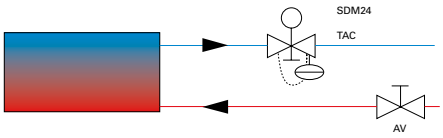
	Basic offer				Electronic 2-step		Capillary tube			Bimetallic	
	T10S	**TK10S**	**TKS16(400)**	**TD10**	**RTI2**	**RTI2V**	**KRT1900/1901**	**KRTV19**	**KRT2800**	**TBK10**	**TBKS10**
Internal sensor	X	X	X	X	X	X	X	X	X	X	X
External sensor	X*¹	X*¹	X*¹	X*¹	X*¹	X*¹					
Save reduction	X*²	X*²	X*²	X*²	X*²	X*²					
1-pole switch			X								X
Volt free contact	X	X	X	X	X	X	X	X	X		
Contact, 1-pole closing	X	X		X							
Contact, 1-pole alternating			X		X		X	X	X	X	X
Digital display				X							
Advanced extra functions*³				X							
Internal setting	X				X		X		X		
Processor controlled	X	X	X	X	X	X					
Bimetallic										X	X
Capillary tube							X	X	X		
Fits wall box system	X	X	X	X						X	X
Heating or cooling function	X	X	X	X	X	X	X	X	X	X	X
2-step					X	X			X		
Adjustable temp.diff. between the steps					X	X			X		

*¹) External sensor (RTS01) as accessory.
*²) Can be used with an external timer.
*³) See manuals on www.frico.se.

VPFC

VPFC, pressure independent and modulating valve system

Two way pressure independent control and adjustment valve with modulating actuator and shut-off valve. DN15/20/25/32. 24V. Used with FC control system or supplemented with suitable thermostat.



The valve system VPFC consists of the following:

- TAC, pressure independent regulation and adjustment valve
- AV, shut off valve
- SDM24, modulating actuator 24V

TAC, regulation and adjustment valve
The regulation and adjustment valve can be used to finely adjust or shut off the water flow manually. TAC is independent of the available differential pressure, which contributes to stable and accurate regulation (ensures the correct flow to the heater even if the differential pressure in the rest of the pipe system changes). The water flow is set with the grey button on the valve.

AV, shut off valve
The shut off valve consists of a ball valve which is either open or closed and is used to shut off the flow, when servicing for example.

SDM24, actuator
The actuator (SDM24) is modulating and gives the right temperature. FC control system is set to always allow through a small leak flow in order to provide a fast heat supply ex. when a door is opened and for some frost protection.

VPFC, complete valve system

Item number	Type	Description	DN	Flow range l/s
238293	**VPFC15LF**	TAC15LF + AV15 + SDM24	DN15	0,012 - 0,068
238294	**VPFC15NF**	TAC15NF + AV15 + SDM24	DN15	0,024 - 0,131
238295	**VPFC20**	TAC20 + AV20 + SDM24	DN20	0,058 - 0,319
238296	**VPFC25**	TAC25 + AV25 + SDM24	DN25	0,103 - 0,597
238297	**VPFC32**	TAC32 + AV32 + SDM24	DN32	0,222 - 1,028

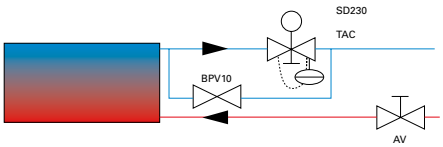
TAC15LF	Low flow	DN15	G20 3/4"	Outside thread
TAC15NF		DN15	G20 3/4"	Outside thread
TAC20		DN20	G25 1"	Outside thread
TAC25		DN25	G32 1 1/4"	Outside thread
TAC32		DN32	G40 1 1/2"	Outside thread

AV15	DN15	G15 1/2"	Inside thread
AV20	DN20	G20 3/4"	Inside thread
AV25	DN25	G25 1"	Inside thread
AV32	DN32	G32 1 1/4"	Inside thread

VLSP

VLSP, pressure independent valve system on/off

Two way pressure independent control and adjustment valve with on/off actuator, shut-off valve and bypass. DN15/20/25/32. 230V.



Used with SIRe Basic and Competent or supplemented with suitable thermostat.

The valve system VLSP consists of the following:

- TAC, pressure independent regulation and adjustment valve
- AV, shut off valveSD230, actuator on/off 230V
- BPV10, bypass valve

TAC, regulation and adjustment valve
The regulation and adjustment valve can be used to finely adjust or shut off the water flow manually. TAC is independent of the available differential pressure, which contributes to stable and accurate regulation (ensures the correct flow to the heater even if the differential pressure in the rest of the pipe system changes). The water flow is set with the grey button on the valve.

AV, shut off valve
The shut off valve consists of a ball valve which is either open or closed and is used to shut off the flow, when servicing for example.

BPV10, by-pass valve
If the valve is closed, a low flow passes through the by-pass valve (BPV10) so that there is always hot water in the water coil. This is to provide quick heat supply when a door is opened but also to provide a degree of frost protection. The by-pass valve is DN10 (3/8").

SD230, actuator
The actuator controls the heat supply on/off. In unpowered mode SD230 is open.

VLSP, complete valve system

Item number	Type	Description	DN	Flow range l/s
79379	**VLSP15LF**	TAC15LF + AV15 + SD230 + BPV10	DN15	0,012 - 0,068
79380	**VLSP15NF**	TAC15NF + AV15F + SD230 + BPV10	DN15	0,024 - 0,131
79381	**VLSP20**	TAC20 + AV20 + SD230 + BPV10	DN20	0,058 - 0,319
79382	**VLSP25**	TAC25 + AV25 + SD230 + BPV10	DN25	0,103 - 0,597
79417	**VLSP32**	TAC32 + AV32 + SD230 + BPV10	DN32	0,222 - 1,028

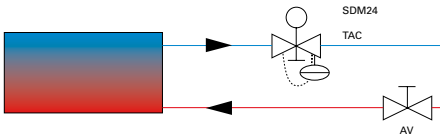
TAC15LF	Low flow	DN15	G20 3/4"	Outside thread
TAC15NF		DN15	G20 3/4"	Outside thread
TAC20		DN20	G25 1"	Outside thread
TAC25		DN25	G32 1 1/4"	Outside thread
TAC32		DN32	G40 1 1/2"	Outside thread

AV15	DN15	G15 1/2"	Inside thread
AV20	DN20	G20 3/4"	Inside thread
AV25	DN25	G25 1"	Inside thread
AV32	DN32	G32 1 1/4"	Inside thread

VLP

VLP, pressure independent and modulating valve system

Two way pressure independent control and adjustment valve with modulating actuator and shut-off valve. DN15/20/25/32. 24V.



Used with SIRe Advanced or supplemented with suitable thermostat.

The valve system VLP consists of the following:

- TAC, pressure independent regulation and adjustment valve
- AV, shut off valve
- SDM24, modulating actuator 24V
- ST23024, 24V transformer for 1-7 actuators

TAC, regulation and adjustment valve
The regulation and adjustment valve can be used to finely adjust or shut off the water flow manually. TAC is independent of the available differential pressure, which contributes to stable and accurate regulation (ensures the correct flow to the heater even if the differential pressure in the rest of the pipe system changes). The water flow is set with the grey button on the valve.

AV, shut off valve
The shut off valve consists of a ball valve which is either open or closed and is used to shut off the flow, when servicing for example.

SDM24, actuator
The actuator (SDM24) is modulating and gives the right temperature. SIRe is set to always allow through a small leak flow in order to provide a fast heat supply ex. when a door is opened and for some frost protection.

ST23024, 24V transformer for 1-7 actuators
The 24V transformer can be used for up to 7 actuators.

VLP, complete valve system

Item number	Type	Description	DN	Flow range l/s
	VLP15LF	TAC15LF + AV15 + SDM24 + ST23024	DN15	0,012 - 0,068
	VLP15NF	TAC15NF + AV15 + SDM24 + ST23024	DN15	0,024 - 0,131
	VLP20	TAC20 + AV20 + SDM24 + ST23024	DN20	0,058 - 0,319
	VLP25	TAC25 + AV25 + SDM24 + ST23024	DN25	0,103 - 0,597
	VLP32	TAC32 + AV32 + SDM24 + ST23024	DN32	0,222 - 1,028

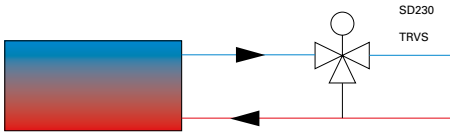
TAC15LF	Low flow	DN15	G20 3/4"	Outside thread
TAC15NF		DN15	G20 3/4"	Outside thread
TAC20		DN20	G25 1"	Outside thread
TAC25		DN25	G32 1 1/4"	Outside thread
TAC32		DN32	G40 1 1/2"	Outside thread

AV15	DN15	G15 1/2"	Inside thread
AV20	DN20	G20 3/4"	Inside thread
AV25	DN25	G25 1"	Inside thread
AV32	DN32	G32 1 1/4"	Inside thread

VOT

VOT, three way control valve and actuator on/off

3-way control valve with on/off actuator, DN15/20/25. 230V.
The valve kit consists of the following:
TRVS, 3-way control valve
SD230, actuator on/off 230V



Used with SIRe Basic and Competent or supplemented with suitable thermostat.

TRVS, 3-way control valve
The 3-way valve and the actuator controls the waterflow and provides a basic form of water regulation, without the possibility of adjusting or shutting the water flow off, e.g. when making maintenance.

SD230, actuator
The actuator controls the heat supply on/off. In unpowered mode SD230 is open.

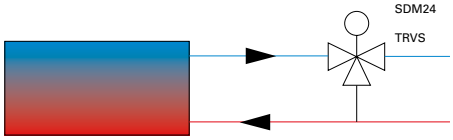
The valve kit is available in three different valve dimensions, DN15 (1/2”), DN20 (3/4”) and DN25 (1”).

Item number	Type	DN	Kvs
19031	**VOT15**	DN15	1,7
19032	**VOT20**	DN20	2,5
19033	**VOT25**	DN25	4,5

VMT

VMT, three way control valve and modulating actuator

3-way control valve with modulating actuator. DN15/20/25. 24V.
The valve kit consists of the following:
TRVS, 3-way control valve
SDM24, modulating actuator 24V
ST23024, 24V transformer for 1-7 actuators



Used with SIRe Advanced or supplemented with suitable thermostat.

TRVS, 3-way control valve
The 3-way valve and the actuator controls the waterflow and provides a basic form of water regulation, without the possibility of adjusting or shutting the water flow off, e.g. when making maintenance.

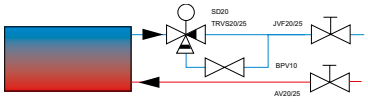
SDM24, actuator
The actuator (SDM24) is modulating and gives the right temperature. SIRe is set to always allow through a small leak flow in order to provide a fast heat supply ex. when a door is opened and for some frost protection.

ST23024, 24V transformer for 1-7 actuators
The 24V transformer can be used for up to 7 actuators.
The valve kit is available in three different valve dimensions, DN15 (1/2”), DN20 (3/4”) and DN25 (1”).

Item number	Type	DN	Kvs
19034	**VMT15**	DN15	1,7
19035	**VMT20**	DN20	2,5
19036	**VMT25**	DN25	4,5

VRS20/25

VRS20/25, valve kit



3-way control valve with on/off actuator, adjustment valve, shut off valve and bypass. DN15/20/25. 230V.

The valve kit consists of the following:
- AV20/25, stop valve
- JVF20/25, adjustment valve
- TRVS20/25, on/off 3-way control valve
- BPV10, by-pass valve
- SD20, actuator on/off 230V~

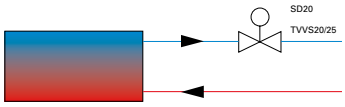
The stop valve (AV20/25) consists of a ball valve which is either open or closed. It is used to turn the water flow off and on. The water flow can be fine-tuned manually with the adjustment valve and can also be completely turned off. The water flow may be read off the valve. The kv value for JVF20 is 3,5 and for JVF25 it is 5,5.

If the 3-way valve (TRVS20/25) is closed, the flow through the by-pass valve (BPV10) is low to ensure presence of warm water in the heating coil. This leads to instant heat supply when needed and some degree of frost protection. The actuator (SD20) works on/off.

The valve kit is available with two different valve dimensions: VRS20 - DN20 (3/4”) and VRS25 - DN25 (1”). The by-pass valve dimension is DN10 (3/8”). To regulate VRS20/25, a suitable thermostat has to be added.

TVVS/TRVS

TVVS20/25, valves + SD20, actuator*



TVVS20/25, 2-way regulation valve and SD20, actuator on/off provides a basic form of water regulation, without the possibility of adjusting or shutting the water flow off, e.g. when making maintenance. A suitable thermostat is chosen to regulate TVVS20/25 and SD20. DN20/25.

TVVS20/25, 2-way control valve
TVVS20: maximum close-off pressure 150 kPa (1,5 bar), kvs 2,6, DN20 (3/4").
TVVS25: maximum close-off pressure 70 kPa (0,7 bar), kvs 4,5, DN25 (1").
Pressure class PN16.

TRVS20/25, 3-way control valve
If a 3-way valve is preferred, TRVS20/25 can be used instead of TVVS20/25.
TRVS20: maximum close-off pressure 100 kPa (1,0 bar), kvs 2,5, DN20 (3/4").
TRVS25: maximum close-off pressure 70 kPa (0,7 bar), kvs 4,5, DN25 (1").
Pressure class PN16.

SD20, actuator on/off 230V~
SD20 regulates the heat supply. Works on/off. A 5 second closing of the valve prevents sudden pressure changes in the pipe system. In unpowered mode, the SD20 valve is opened via spring return.

*) These products can not be used together with FC or SIRe control system.


NO
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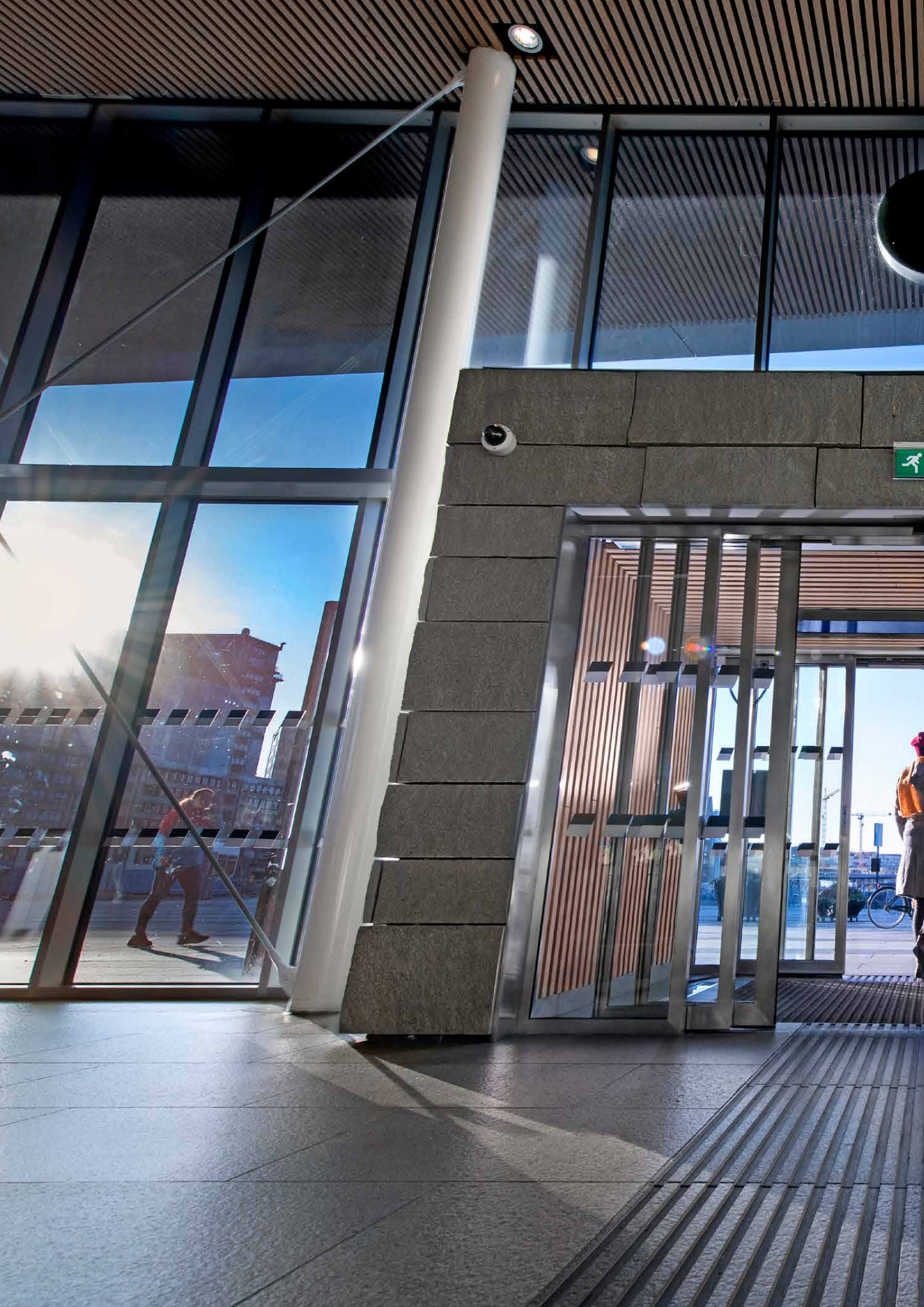


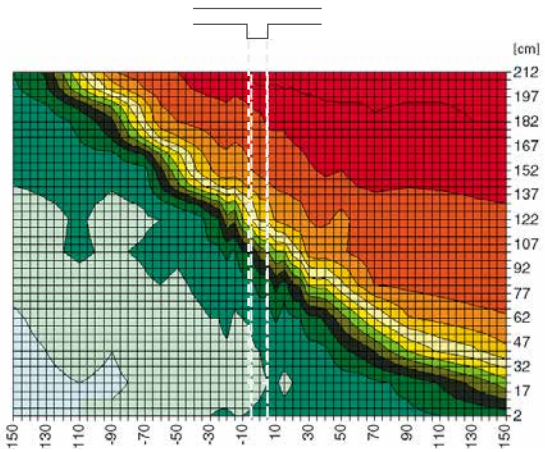
Technical handbook

The invisible door

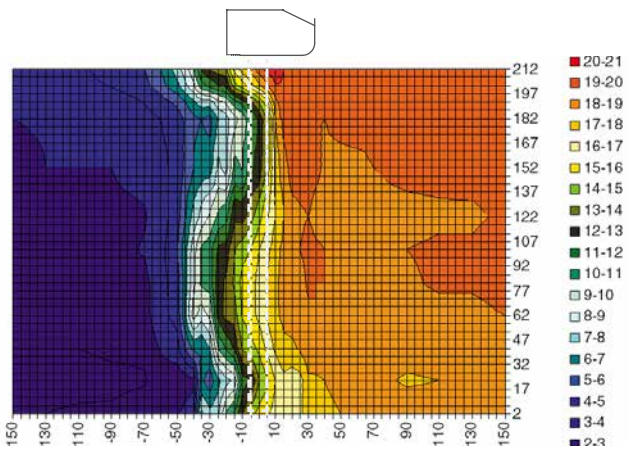
An open door is inviting and easy to pass through, but it also means a poor working environment and energy loss. An air curtain creates a comfortable environment and minimizes energy loss. Frico air curtains effectively separate indoors from outdoors, hot from cold.

Air curtains create an air barrier between hot and cold, both to prevent cold outdoor air from entering, while the heated air is kept inside, and to protect air conditioned premises and refrigerated rooms.

A correctly installed air curtain reduces draughts, creates a comfortable indoor environment and reduces energy losses at doors and doorways.



Air flows out of an unprotected opening.



With a correctly set air curtain there is a sharp separation between the different temperature zones.

Why is there a draught from an opening?

The amount of air that flows out through an open door depends on differences in pressure between the indoor and outdoor air.

This pressure differential is dependent on three factors:

- Different temperatures indoors and outdoors
- Different pressures indoors and outdoors
- Incoming wind speed at the door opening

Simply put; if the conditions on one side of the door differ in any way from those on the other side, then there will be a draught from the door opening. Air flows out through an open door to equalize the differences in pressure and temperature. In heated premises this means that hot air flows out and cold air flows in. Wind blowing towards the door also affects the airflow.

Temperature differential outdoor/indoor
Warm indoor air has a lower density and is lighter than cold outdoor air. Therefore there is a pressure differential at the door opening. The cold air flows in through the lower part of the opening and pushes the hot air through the upper section. The size of the airflow depends on the temperature differential between outdoor and indoor air. The air exchange is thus dependent on thermal pressure differentials. If the indoor and outdoor temperatures are known, then the density of the outdoor and indoor air can be determined and making it possible to calculate the pressure differential and airflow through the opening.

The airflow (Q_T) can be calculated using the following equation:

$$Q_T = \frac{W}{3} \cdot H^{1.5} \cdot C_d \cdot \sqrt{g \cdot \frac{\Delta\rho}{\rho_m}}$$

Opening	Q_T	=	airflow, temperature [m³/s]
	W	=	door width [m]
	H	=	door height [m]
	C_d	=	flow coefficient 0.6 - 0.9
	g	=	gravity coefficient (9.81 m/s²)
	$\Delta\rho$	=	the air masses' density differential
	ρ_m	=	the air masses' average density

Pressure differentials indoor/outdoor
In order for an air curtain to work well, it is important that there is not too great an overpressure or negative pressure in the premises.

Nearly all ventilation systems are mechanically adjusted and are based on the prevailing conditions when they were set. When the external conditions are changed, for example by variations in temperature, air pressure, wind influence and humidity, the balance is disturbed and replaced by positive or negative pressure (usually negative pressure).

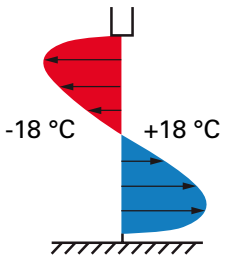
An air curtain can withstand a maximum of 5 Pa, depending on the conditions. But even small differences in pressure can significantly affect the efficiency of the air curtain.

The pressure differential between a building and its surroundings can be equalized using balanced ventilation, which increases comfort and reduces energy costs. Balanced ventilation can be achieved by pressure regulation via the ventilation system, but the most efficient way is to continuously measure the pressure differential between indoors and outdoors and use it to control the ventilation flow. Contact Frico for more information.

Airflow dependent on pressure differential (Q_P) can be calculated using the following equation:

$$Q_P = W \cdot H \cdot \sqrt{\frac{\Delta P \cdot 2}{\rho}} \cdot C_d \qquad (\Delta P \leq 5 \text{ Pa})$$

Opening	Q_P	=	airflow, pressure [m³/s]
	W	=	door width [m]
	H	=	door height [m]
	ΔP	=	pressure differential
	ρ	=	air density
	C_d	=	flow coefficient 0.6 - 0.9



Airflow caused by thermal pressure differentials.

Wind stress
When the wind blows towards an opening, air flows through the opening. The airflow is assumed to be evenly distributed across the whole door opening. The airflow is then proportional to the wind speed horizontally against the door opening. (After the pressure build up the airflow is limited to what escapes through leaks in the building.) A wind speed of 3 m/s corresponds to a load pressure of 5 Pa.

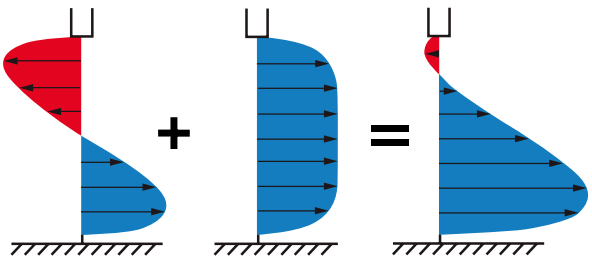
The air flow (Q_v) can be calculated using the following equation:

$$Q_v = W \cdot H \cdot C_v \cdot v$$

Opening	Q_v	=	airflow, wind [m^3/s]
	W	=	door width [m]
	H	=	door height [m]
	v	=	wind speed
	C_v	=	wind direction coefficient = 0.5 - 0.6 if perpendicular wind load towards the opening 0.25 - 0.36 if diagonal wind load towards the opening

The total airflow
The total airflow through open doors is the sum of the flow caused by temperature and pressure differentials and wind stresses.

$$Q_{tot} = Q_T + Q_V + Q_P$$



The total airflow is the sum of the flows caused by temperature and pressure differentials and wind stresses.

Important to remember

- If there is negative pressure in the building, the efficiency of the air curtain is considerably reduced. The ventilation should therefore be balanced. An air curtain cannot prevent a deficit in the amount of air that is due to unbalanced ventilation (negative pressure).
- If an opening is exposed to wind it affects the efficiency of the air curtain. An air curtain can withstand a wind speed of up to 3 m/s, depending on the conditions. In an existing opening that is exposed to greater wind loads you may supplement with more heating to improve the comfort.
- Where there are high wind stresses it is appropriate to supplement the air curtain with a revolving door or an air lock, ideally with the openings offset in relation to each other.
- The design of the building affects the function of the air curtain. In large buildings that are strongly affected by wind, premises with staircases where the chimney effect occurs and premises with draughts, more powerful curtains are required.
- Normally the air curtain unit is placed on the inside of the opening to the premises it should protect. When used to protect cold storage or a freezer room, the unit must be mounted on the warm side.
- The air curtains must be as close to the opening as possible and cover the full width of the opening.
- The direction and speed of the airflow should be adjusted to the conditions in the opening. Wind pressure and negative pressure affect the function of air curtains and try to bend the air stream inwards. The air stream should therefore be directed outwards to withstand the load.

Optimized air curtains

Separating climate zones is relatively easy if it is only the temperatures that differ. Handling an opening that is exposed to wind, pressure differentials and unbalanced ventilation is more difficult. Frico air curtains reduce the problems by creating an air barrier with the perfect balance between air volume and air velocity and a high uniformity of the air beam.

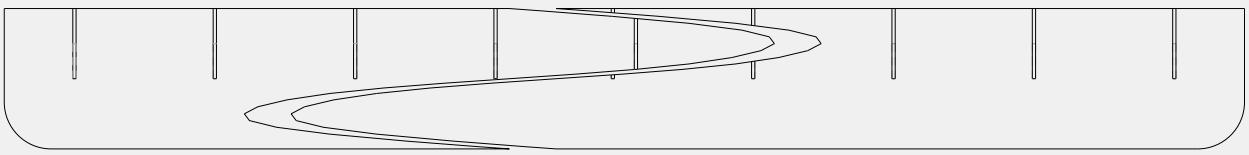
Frico has been developing air curtains for the demanding Scandinavian climate for 50 years. Our experience and knowledge has resulted in Thermozone technology, the theoretical foundation that we base the development of our air curtains on.

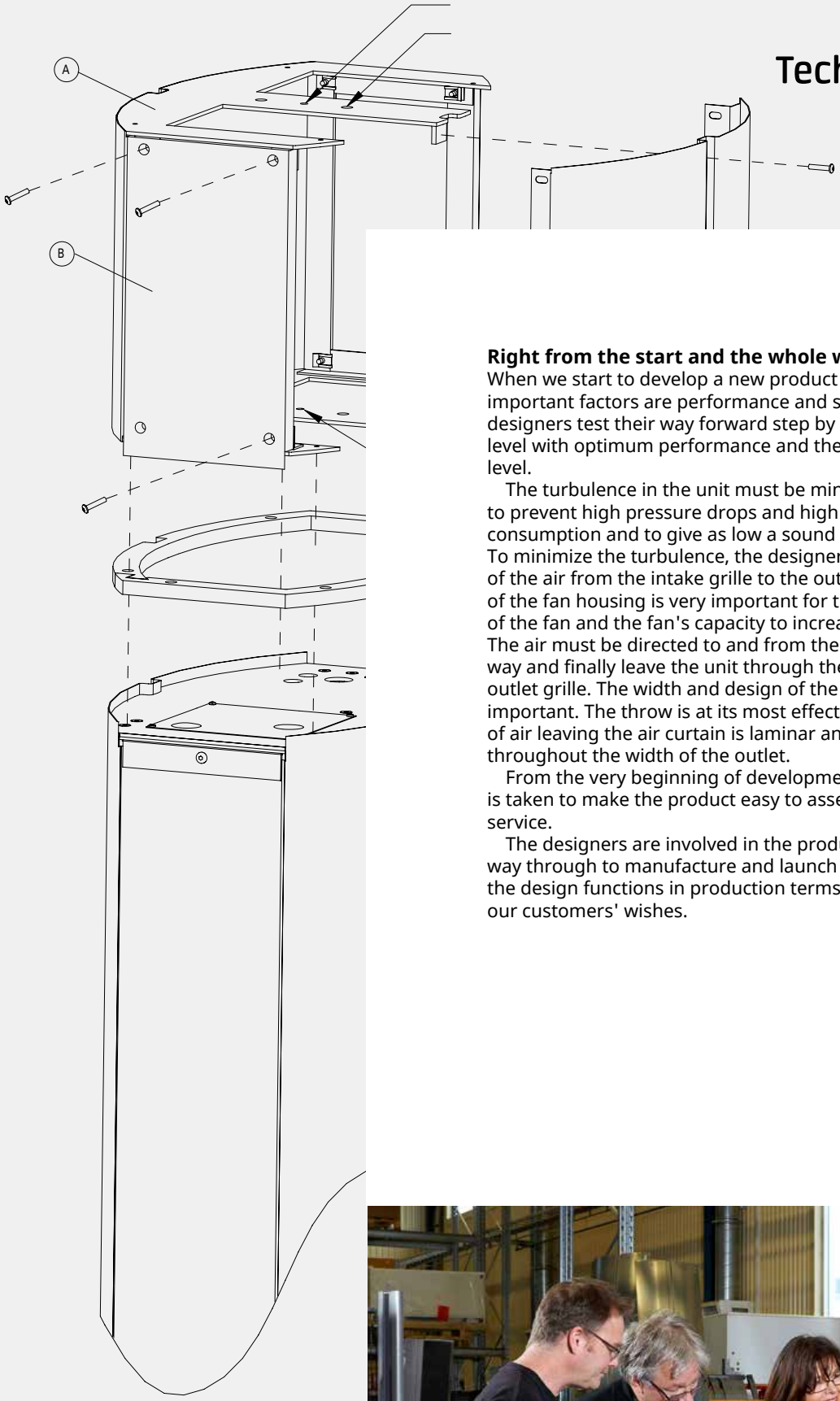
Thermozone technology gives optimum curtain effect with perfect balance between air volume and air velocity and a high uniformity of the air beam. This balance does not just make the air curtain more effective but also has other advantages. The indoor climate is more comfortable if the sound level and the turbulence are reduced and the energy costs are lower.

Air curtains with Thermozone technology have optimized performance and minimized sound levels.

Read more about Thermozone technology on the following pages.

THERMOZONE® TECHNOLOGY





Right from the start and the whole way
When we start to develop a new product the most important factors are performance and sound level. The designers test their way forward step by step to find a level with optimum performance and the lowest sound level.

The turbulence in the unit must be minimized to prevent high pressure drops and high energy consumption and to give as low a sound level as possible. To minimize the turbulence, the designers follow the path of the air from the intake grille to the outlet. The shape of the fan housing is very important for the performance of the fan and the fan's capacity to increase the pressure. The air must be directed to and from the fans in a natural way and finally leave the unit through the important outlet grille. The width and design of the outlet is very important. The throw is at its most effective when the flow of air leaving the air curtain is laminar and homogenous throughout the width of the outlet.

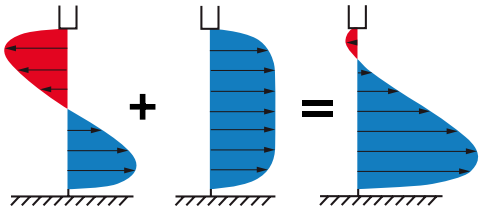
From the very beginning of development, consideration is taken to make the product easy to assemble, install and service.

The designers are involved in the product the whole way through to manufacture and launch to ensure that the design functions in production terms and that it meets our customers' wishes.

Optimized performance

Independent tests show that a correctly installed air curtain can reduce energy losses at an open door by up to 80%. A correctly installed air curtain covers the width and height of the opening and is adapted for the stresses that it is exposed to.

Protects the whole door opening
A correctly installed air curtain creates an air barrier that covers the whole opening and is adapted for the stresses that it is exposed to. In addition to the air volume from the air curtain, when dimensioning you must set requirements for the air velocity and the uniformity of the air beam at the floor level. Because it is at the floor level the stress is greatest. You then know that you have an air barrier that reaches the whole way down and gives the best possible protection.



The opening is affected by the differences in temperature, pressure and wind stress. The effect is greatest at floor level.

By setting requirements for the air velocity and uniformity of the air beam at floor level, you have an air curtain that covers the whole door opening.

...not just where it is least needed
Many people evaluate air curtains based on the air volume that they produce without considering the length of the air barrier. The air volume is measured closest to the unit, where the stresses are smallest. If you choose an air curtain based purely on air volume you may get an air curtain that only gives good protection close to the outlet.

If you choose an air curtain based purely on air volume you may get an air curtain that only gives good protection close to the outlet, where the impact on the door opening is less.

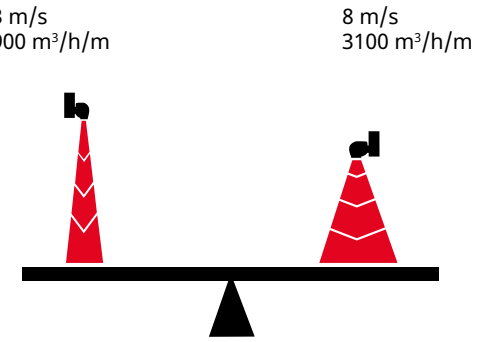
Air barrier power = impulse
To evaluate an air curtain's performance the term impulse is used, which describes what force an air barrier has.

Impulse = air volume x density x air velocity

$[kgm/s^2] = [m^3/s] \times [kg/m^3] \times [m/s]$

The unit for impulse is $[kgm/s^2]$, that is Newton (N), the SI unit for force. The impulse can be achieved in different ways. A product with high air velocity and small airflow can have the same impulse as a product with low air velocity and large airflow.

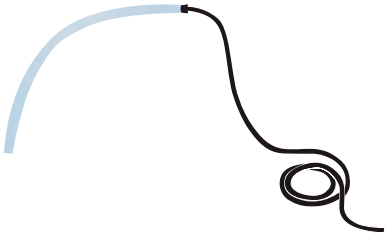
The impulse must be sufficiently large the whole way down to the floor in order to obtain an effective air barrier across the whole opening. It is therefore important to take air velocity into consideration when dimensioning.



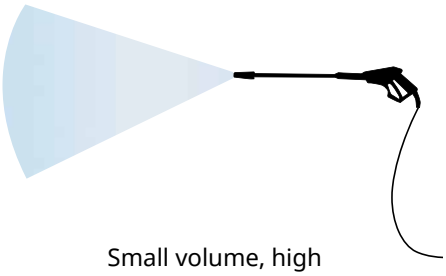
A product with high air velocity and small airflow can have the same impulse as a product with low air velocity and large airflow.

Balance between air volume and air velocity
Thermozone technology creates a balance between air volume and air velocity that gives optimum performance. The design of the outlet is a key factor in achieving this balance. To explain it we usually use the analogy of a hose pipe, because airflow is physically similar to water flow. With a hose pipe without a nozzle (large water volume and low pressure) you cannot reach far because the velocity of the water leaving the hose is too low. If you connect the hose to a pressure washer (low water volume and high pressure) the water leaves the pressure washer at high speed, but still does not reach further than a few metres, because of the turbulence created in the water flow by the high pressure washer. If you then connect the hose to a nozzle, the water volume and pressure can be adjusted and the range of the water jet can be optimized and reach a long way.

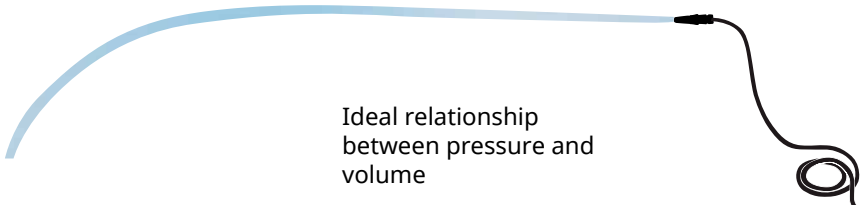
The performance is reduced in the same way in air curtains with low air velocity and large airflow or high air velocity and small airflow. They don't reach the floor. Large air volumes also require more heating and unnecessarily large amounts of energy. Thermozone technology creates a balance between air volume and air velocity that saves energy by using the minimum amount of air and gives optimal efficiency over the whole door opening.



Large volume, low pressure



Small volume, high pressure

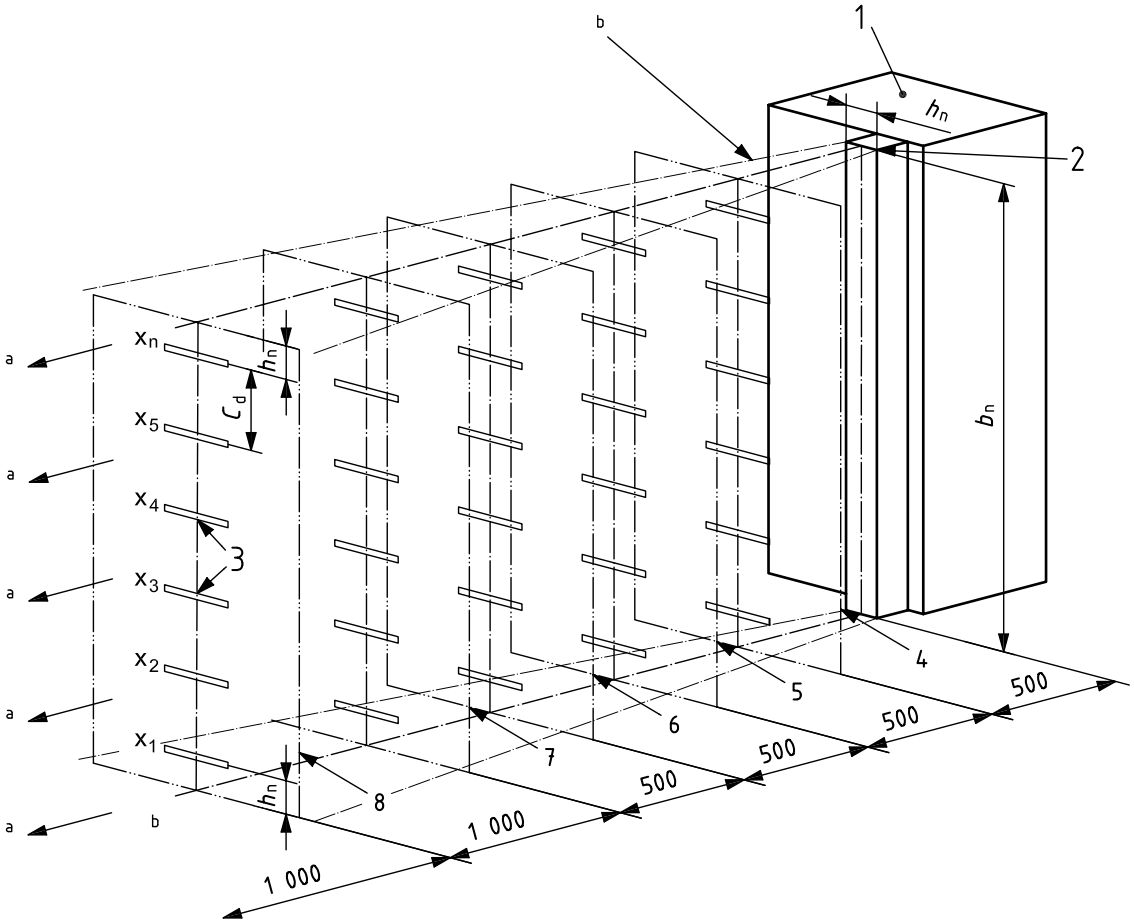


Ideal relationship between pressure and volume

High uniformity of the air velocity profile
Uniformity displays the velocity profile throughout the width of the profile. The uniformity of the air beam is important in order to achieve optimal performance. An air beam with high uniformity ensures good coverage of the total width of the opening.

How to measure
Uniformity of the air beam is measured by comparing air velocity at different positions throughout the width of the air curtain and is expressed in percentage. A uniformity of 100% implies the air beam has the same velocity throughout the entire width of the air curtain.

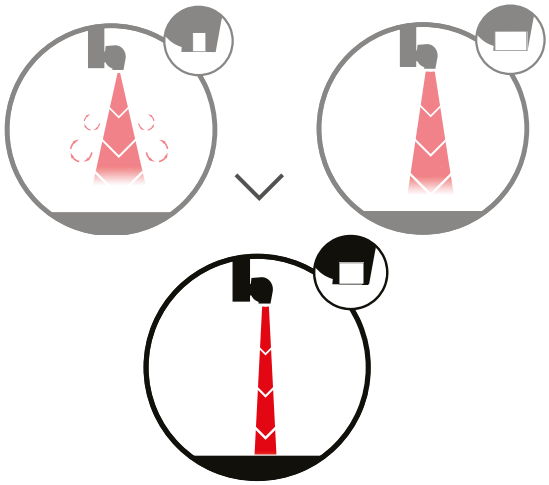
Why high uniformity is important
The strength of the air beam is determined on its lowest velocity at the floor level. An air beam with low uniformity will therefore need additional air in order to ensure minimum velocity is reached over the entire opening. More air in the air beam areas of high velocity creates turbulence, which has negative influence on the comfort. An air beam with high uniformity strikes the floor simultaneously with the same velocity over the whole opening, which minimize turbulence and maintains the strength of the air beam.



Optimized airflow geometry
The designs of the outlet and the inside of the unit are key factors in creating an air barrier that protects efficiently and has a minimal sound level.

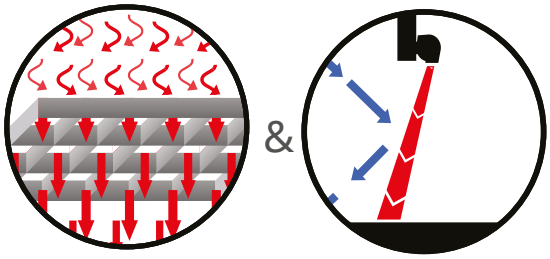
1

Depth of the outlet
At any given air volume, it is the depth of the outlet that determines the air velocity. Too small an outlet creates turbulence because of an air velocity which is too high, this shortens the throw length. If the outlet is too deep it reduces the air velocity and shortens the length. In Frico air curtains the throw length is optimized via the depth of the outlet.



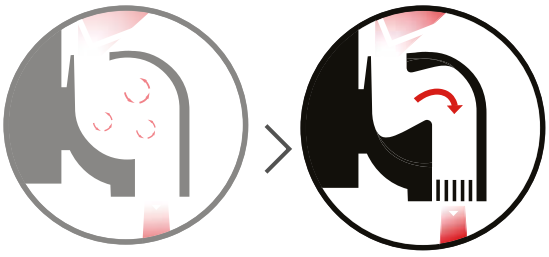
2

Outlet grille
Height, width and fin distance all play a part in the design of the outlet grille, so that the air is directed and turbulence minimized. The result is a uniform air stream and an effective air barrier. Frico's outlet grilles make it easy to direct the air to resist pressure loads in the opening, so that energy losses are minimized.



3

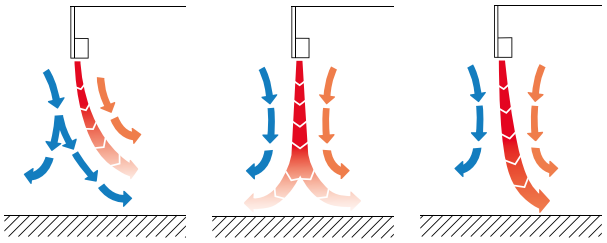
Minimized turbulence
Turbulence inside the air curtain gives higher pressure drops resulting in higher energy consumption and less uniformity of the air beam. In Frico air curtains the turbulence is minimized and the energy consumption is limited.



Technical handbook

Create maximum protection at floor level
Too low air velocity at floor level gives a curtain that cannot withstand stresses. Too high velocity gives turbulence that reduces the protective capacity of the air barrier and also has loud sound levels.

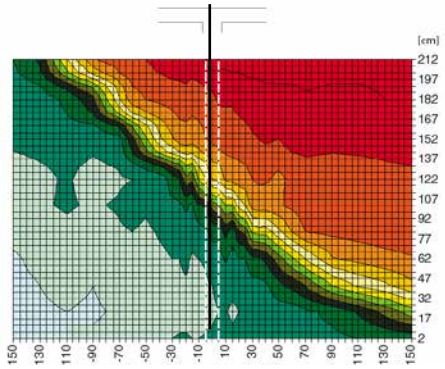
An air beam with correct velocity and high uniformity gives the best protection. Thermozone technology gives the most effective air barrier by ensuring that the air stream reaches the floor and at optimal velocity and uniformity. Thermozone technology solves the problem with the minimum amount of air.



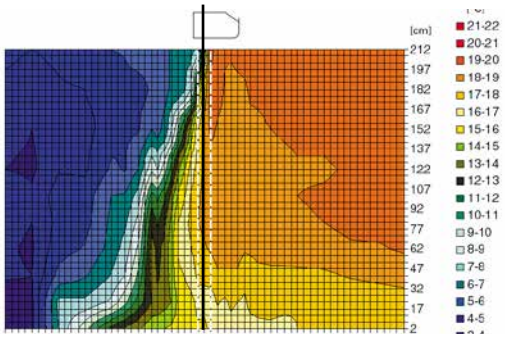
Air velocity is too low | Air velocity is too high | Correct air velocity

Test - protective effect
The environment replicated in this test is a dairy section directly attached to a room with normal room temperatue. Different operating cases were studied in a cross-sectional temperature measurement and the values were compiled in a diagram showing how the air streams affect the temperature in the areas around the opening.

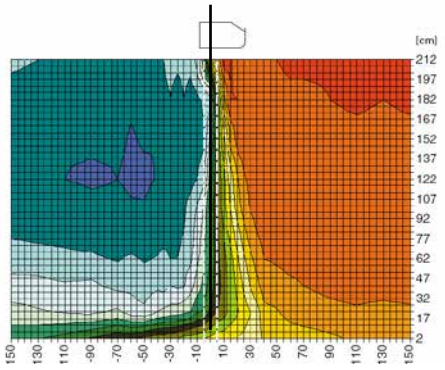
The clear red colour shows normal room temperature and the darkest blue colour shows the cold storage temperature. The values on the X-axis state the distance in centimetres from the unit, the values on the Y-axis state the distance in centimetres from the floor.



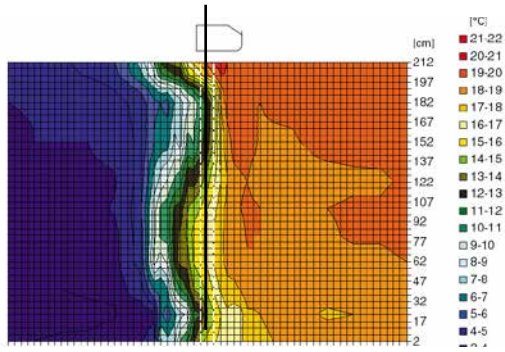
Opening without air curtain
In an unprotected opening the cold air flows out and the cold storage room becomes much too warm.



Opening with air curtain, wrong angle
If the angle is too small the hot air is blown into the cold storage room.



Opening with air curtain, too high speed
Excessive speed creates turbulence, which causes energy loss and increases the cold storage temperature.



Opening with correctly adjusted air curtain
With a correctly set air curtain unit there is a sharp separation between the different temperature zones.

The test was made with a Frico air curtain, and carried out by technicians from Malmö University, Sweden.

Dimensioning
Frico has supplied air curtains for over 50 years and our experience of dimensioning can be illustrated in a diagram.

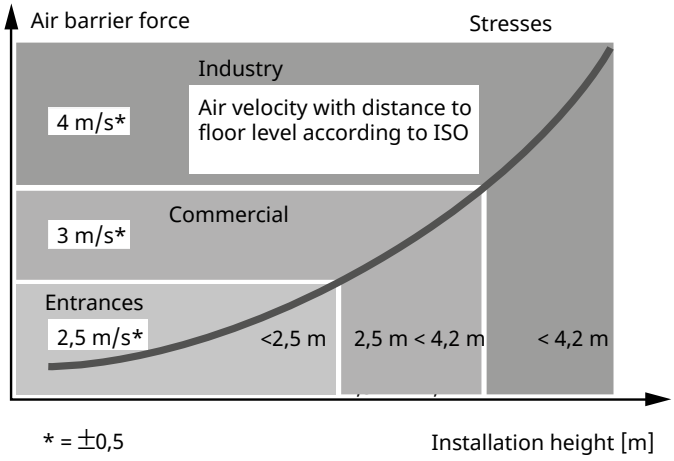
The relationship between the size of the door and how powerful the air curtain needs to be is not linear. The higher the door the greater the force required. We have chosen to use the distance to the floor as reference, together with the air velocity and the air beam uniformity measured in accordance with ISO 27327-1.

For an installation height less than 2.5 metres it is usually appropriate to select an air curtain with the capacity to deliver approx 2.5 m/s in a laboratory environment at a distance equal to the installation height. For other heights, see the diagram. In addition, the uniformity of the air beam should be ≥90% to ensure low turbulence and maximum strength of the air beam.

Please note that the air velocity at dimensioning is not the velocity the air should have at floor level in an actual installation, but the capacity the unit needs to be able to compensate for the wind loads and pressure differentials occurring in an actual doorway.

In many cases there are other factors to refer to, see the section "Important to remember" earlier in the handbook.

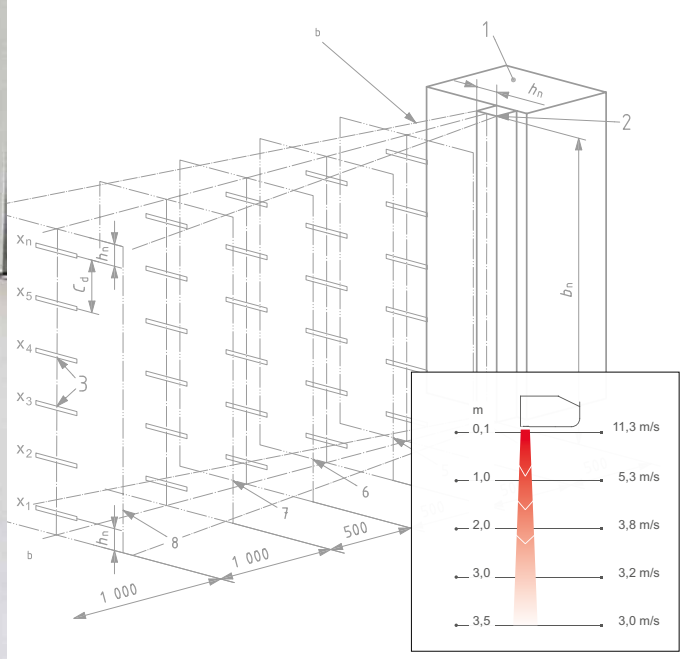
The air stream direction and velocity must be adjusted at installation to obtain an air curtain that works optimally. Read more about adjustment later in the handbook.



ISO measurements at our laboratory in Skinnskatteberg, which is one of the most advanced in heating and ventilation in Europe.

Air barrier velocity and uniformity
There is an ISO standard to measure the air barrier velocity and uniformity (ISO 27327-1 Laboratory methods of testing for aerodynamic performance rating).

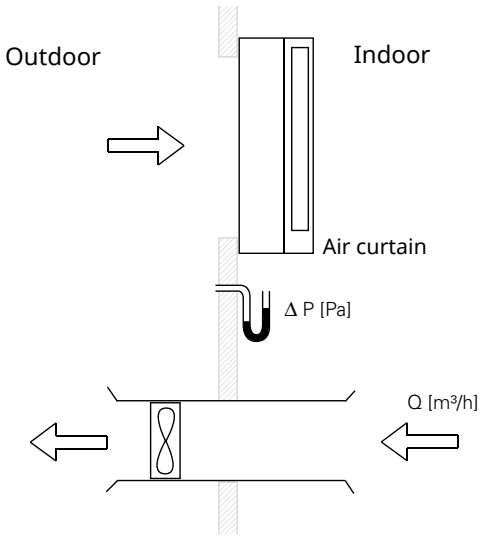
Frico measures all air curtains according to the ISO standard, the result is in the air velocity profile of the relevant product.



Air velocity profile Pamir 3500

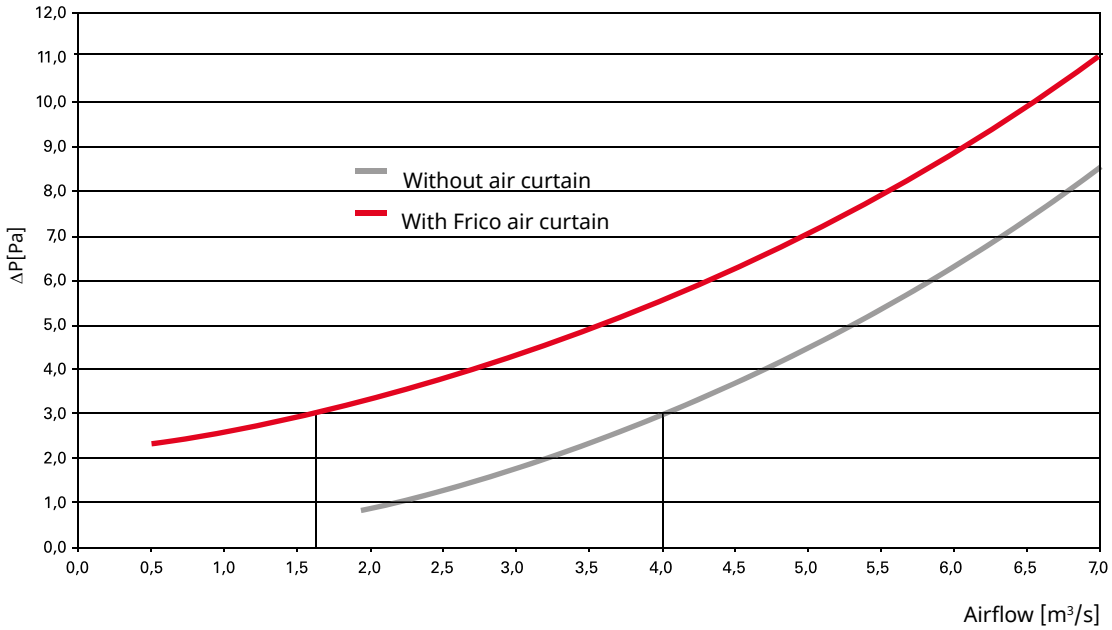
Tests - performance

Air curtain efficiency
Frico has developed a method to test air curtain performance. The test is full scale. The idea is to measure the volume of air that passes through a door with an air curtain is installed in comparison to a door without an air curtain. In the test all stresses are converted to a pressure evenly distributed across the door.



The test installation consists of two rooms that correspond to indoors and outdoors. A powerful fan with equipment to measure airflow is located between the rooms. The air curtain is installed above the opening. When the fan is run an airflow is created from one room to the other, exactly the same volume of air passes through the fan as through the opening. This gives rise to a pressure differential (ΔP) between the two rooms. The fan starts to run at low speed that then slowly increases. Information about airflow and pressure differential is stored on computer. This data is then used to create a curve, see diagram 1.

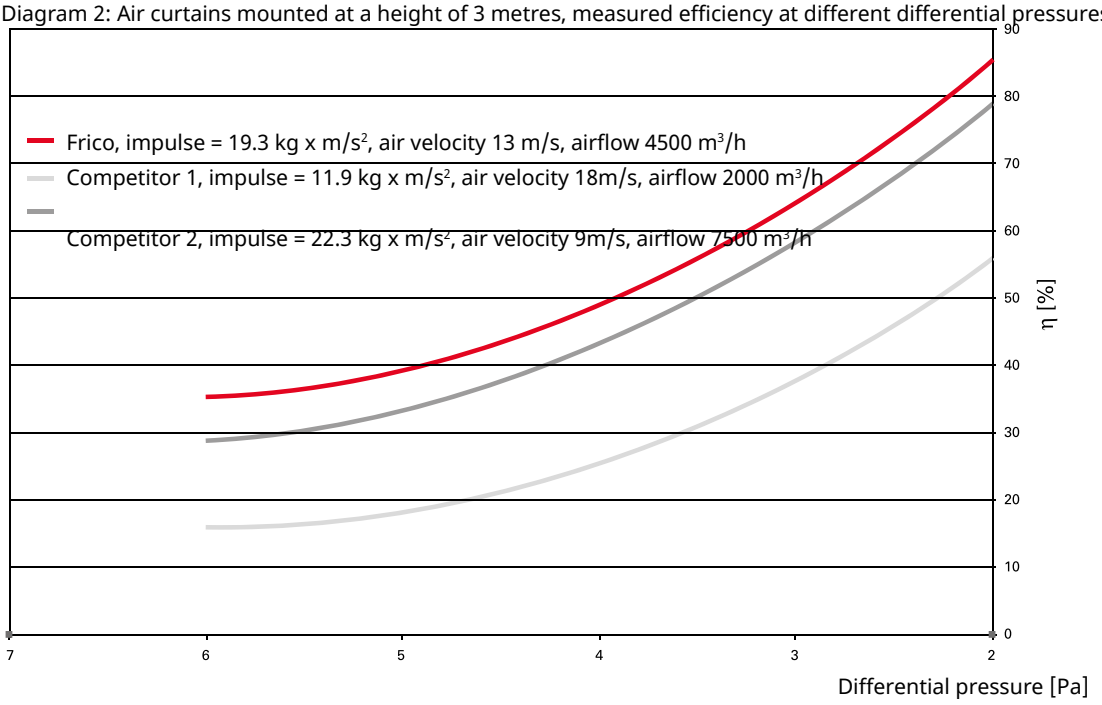
Diagram 1: Airflow through the opening with and without air curtain at different differential pressures.



Pressure and flow over the opening are measured with and without the air curtain. The result is two curves where the airflow at a particular pressure differential can be compared.

Example: At 3 Pa the airflow through the opening without the air curtain is 4 m³/s and with the air curtain is 1.6 m³/s. The difference in the airflow shows the perfomance of the air curtain. In this case it is (4–1.6)/4 ×100 = 60% less flow with the air curtain compared to without.

Diagram 2: Air curtains mounted at a height of 3 metres, measured efficiency at different differential pressures.



This also makes it possible to compare the performance of different products under the same conditions. Diagram 2 shows the result of testing three air curtain units that have been designed using different basic concepts. Competitor 1 has a high air velocity and small air flow and competitor 2 has a medium air velocity and large air flow.

The air curtain from Frico has an optimized air velocity and airflow that makes it more efficient than competitor 2 despite (22.3-19.3)/22.3 = approx 13% lower impulse.

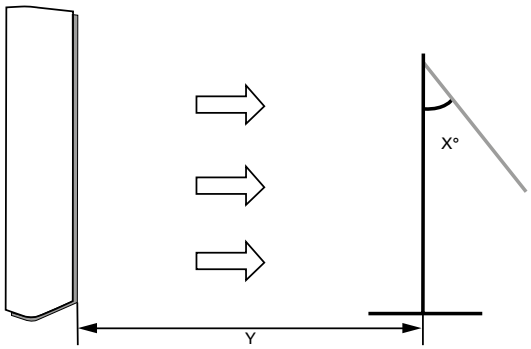
Tests - performance

Impulse at the floor

A practical test of different air curtains at floor level can be carried out by comparing the air throw length and power using a wind board.

To directly compare the throw length and power of different air curtains you can position them equidistantly on either side of a wind board and see which way the board moves.

At the same air volume, air curtains from Frico give a stronger impulse at ground level than competitors, which means greater protection. Frico air curtains maintain the impulse the whole way to the floor, which gives a lower operating cost, because the same strength of air barrier can be achieved using lower air volume.



The angle X indicates the air barrier force (impulse).

Y = corresponds to the distance to the floor

Impulse = air volume x density x air velocity

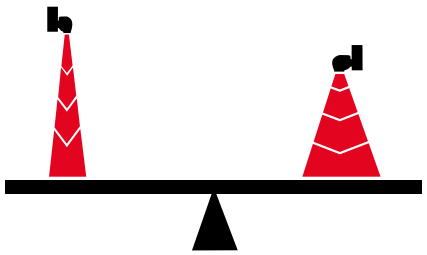
Large air volumes cost

Low air velocity can be compensated for by higher air volume to reach the floor. Large air volumes require more heating and therefore cost more. As shown by above test, Frico air curtains can give the same strength to the air barrier at floor level with lower air volume.

Calculation of output on an air curtain from Frico and an air curtain with low air velocity and large airflow shows that, in this example, Frico air curtain consumes 40% less than the competitors', but achieves the same impulse.

13 m/s
1900 m³/h/m

8 m/s
3100 m³/h/m



A product with high air velocity and small airflow can have the same impulse as a product with low air velocity and large airflow.

Conditions:

Same impulse
Desired temperature increase: 15 °C
Room temperature: 20 °C
Opening width: 2 m

T = 20 °C =>ρ = 1,2

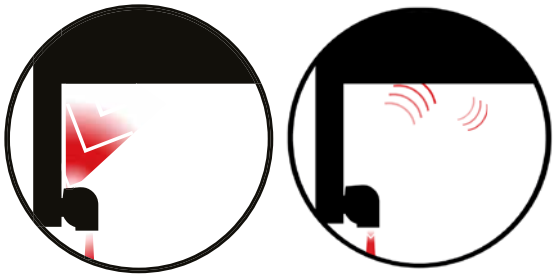
Competitor (3100 m³/h/m, 8 m/s)
$P = Q \cdot \Delta T \bullet \rho \cdot c_p = 2 \cdot 3100/3600 \cdot 15 \cdot 1.2 \cdot 1$ = approx 31 kW

Frico (1900 m³/h/m, 13 m/s)
$P = Q \cdot \Delta T \bullet \rho \cdot c_p = 2 \cdot 1900/3600 \cdot 15 \cdot 1.2 \cdot 1$ = approx 19 kW

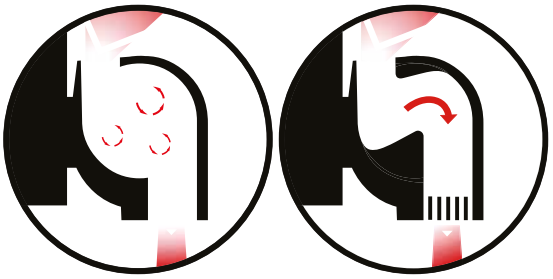
Minimized sound level

Sound is important for indoor comfort. At Frico we place great importance on the sound levels of our products. The fans we use together with our optimized air flow geometry provides a low sound level.

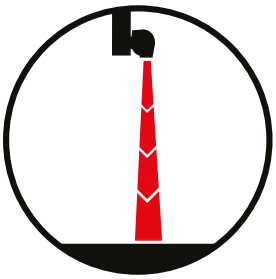
Air intake on the top
With the air intake placed on the top of the air curtain, the sound level experienced is minimized because the walls and ceilings absorb some of the sound before it spreads.



Turbulence - no thanks
Turbulence inside the air curtain causes higher levels of sound. In Frico air curtains turbulence is minimized and the sound level is limited.



Optimized amount of air
The sound level originating from the outlet depends on the air volume, a greater air volume increases the sound level. Optimum airflow in combination with the outlet grille gives a controlled air stream with less air volume and lower sound level.



Technical handbook

Sound facts
Sound is an important environmental factor, equally important as good light, fresh air and ergonomics. What we usually call the sound level of a product is actually the sound pressure level. The sound pressure level includes the distance to the sound source, the position of the sound source and acoustics of the room. This means that a silent product is essential, but the whole environment needs to be considered to achieve a comfortable sound level.

What is sound?
Sound is caused by air pressure fluctuations that evolve when a sound source vibrates. The sound waves that are produced are condensation and dillusion of air particles without the air in itself moving. A sound wave can have different velocities in different media. In air the sound has a velocity of 340 m/s.

How is sound measured?
Sound level is measured in decibel (dB). The dB is a logarithmic unit used to describe a ratio. If the sound level is increased by 10 dB, the result is twice as loud (matematically it is 6 dB, but the way we hear it, it is 10 dB).

It is also useful to know that two equally strong sound sources give an added sound level of 3 dB. Assume you have two entrances with two air curtains in each entrance, all four units with a sound level of 50 dB. The total sound level will then be 56 dB. The first opening will have a total sound level of 53 dB plus an extra 3 dB from the other opening.

Fundamental concepts

Sound pressure
Pressure develops when pressure waves move, for example in the air. The sound pressure is measured in Pascals (Pa). To clarify sound pressure a logarithmic scale is used which is based on the differences between the actual sound pressure level and the sound pressure at the threshold of hearing. The scale has the units decibels (dB(A)), where the threshold of hearing is 0 dB(A) and the threshold of pain is 120 dB(A).

The sound pressure decreases with the distance from the source and is also affected by the acoustics of the room.

Sound power
Sound power is the energy per time unit (Watt), which the object emits. Just like sound pressure, a logarithmic scale in decibels (dB(A)) is used to specify the sound power. Sound power is not dependent on the sound source nor the acoustics of the room, which therefore simplifies the comparisons of different objects.

Frequency
A sound source's periodical oscillation is its frequency. Frequency is measured as the number of oscillations per second, where one oscillation per second is 1 Hertz (Hz).

Points of reference – dB

0	The softest sound a person can hear
10	Normal breathing
30	Recommended max. level for bedrooms
40	Quiet office, library
50	Large office
60	Normal conversation
80	Ringing telephone
85	Noisy restaurant
110	Shouting in ear
120	The threshold of pain

Sound power level and sound pressure level
If the sound source emits a certain sound power level, the following will affect the sound pressure level:

1. Direction factor, Q
Specifies how the sound is distributed around the sound source. See figure below.

2. Distance from sound source
The distance from the sound source in metres.

3. The rooms equivalent absorption area
The ability for a surface to absorb sound can be expressed as an absorption factor, α, which has a value between 0 and 1. The value 1 corresponding to a fully absorbing surface and the value 0 to a fully reflective surface. The equivalent absorption area of a room is expressed in m^2. This can be calculated by multiplying the room's surface area by the surfaces' absorption factor.

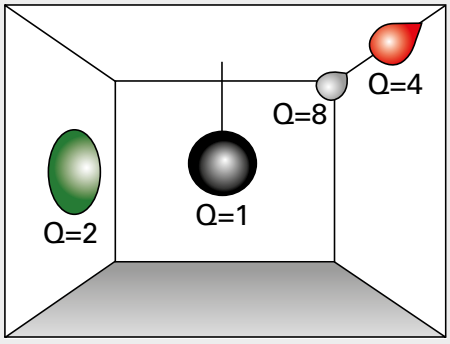
With these known factors it is possible to calculate the sound pressure if the sound power level is known.

Testing - sound

Our test facility for air and sound is among the most modern in Europe. We regularly carry out tests and measurements during the development of new products, but also to improve existing products. The measurements are carried out according to the AMCA and ISO standards.

This picture shows our acoustic chamber, where we measure the sound levels of our products. The acoustic chamber consists of a sound chamber standing on powerful springs with a background noise that is lower than can be detected by the human ear.

The sound levels of our products are stated for each product. Our sound measurements are carried out according to the international standards ISO27327-2 and ISO3741. The distance to the product is 5 m, directional factor 2 and the equivalent absorption area is 200 m^2.



The distribution of sound around the sound source.
Q = 1 Middle of room
Q = 2 On wall or roof
Q = 4 Between wall and roof
Q = 8 In corner

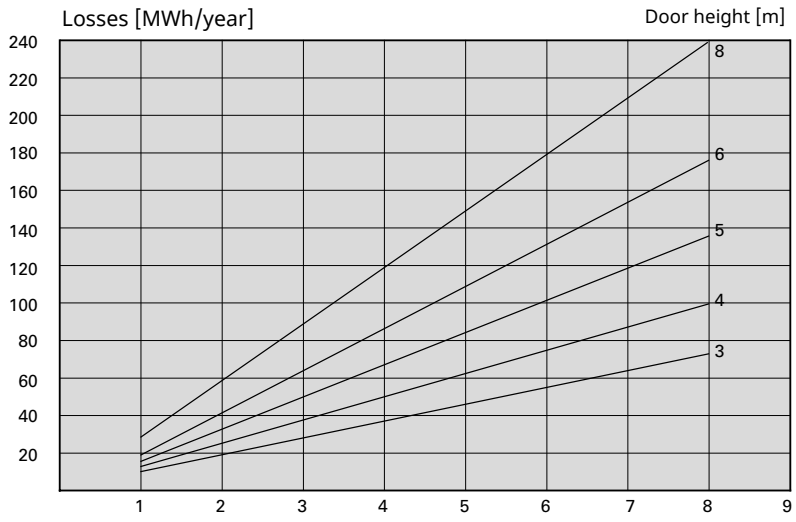
Technical handbook

Energy saving with air curtains

The diagram below illustrates how large energy losses can be from a door without air curtains as protection.

Conditions:

Large premises	
Average yearly temperature	6,5 °C
Annual average wind speed υ_{10}	4 m/s
Opening times	1 hour/day



Energy losses through unprotected doors.

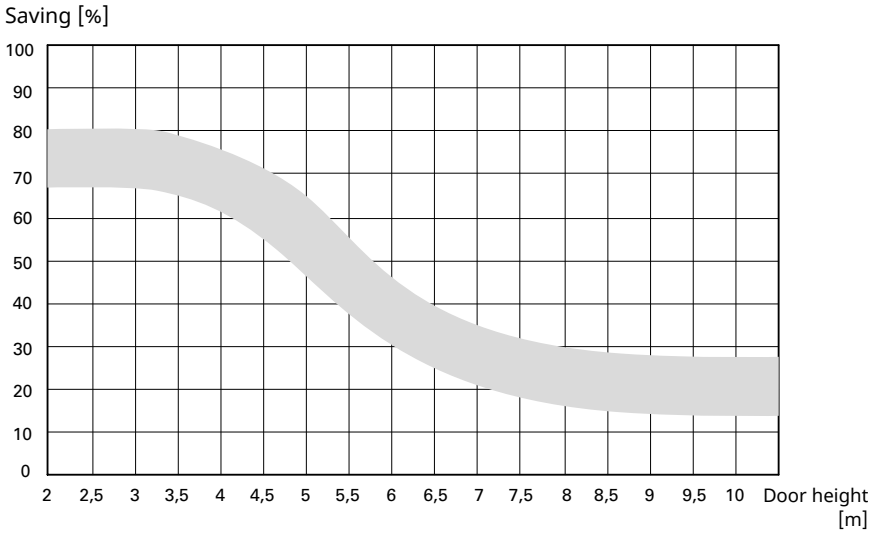
Calculation of energy savings

Door height	5	m
Door width	4	m
Number of days per week in operation	5	days
Time open during a day	1	hour
Average time open per opening	5	minutes
Dim. indoor temperature	18	°C
Dim. outdoor temperature	-18	°C
Average yearly temperature	5	°C
Wind speed	4	m/s
Room volume	6400	m^3

We will compare energy loss through an open, unprotected door with a similar door where air curtains have been installed. The calculation should only be viewed as an estimate. Calculation of energy savings is not an exact science. It is difficult to determine the impact of cross draughts, building seal, chimney effect, wind speed and direction. But what we can see is that there will be high energy losses if an opening is left completely unprotected.

If we compare the values from the diagram on the previous page with the diagram below, we can see that the air curtain eliminates up to 65 % of the air exchange through the door.

Energy loss, unprotected door: 69 MWh/year
Energy loss, curtain protected door: 24 MWh/year
Energy saving: 45 MWh/year



Estimated possible savings (efficiency) in doors of different heights.
The comparison applies to doors protected by an air curtain compared to the equivalent without protection.

Contact us at Frico for advice
You are very welcome to contact us if you want to discuss the requirements for your doors. With some information from you we can give an estimate of the possible energy savings.

Adjustment

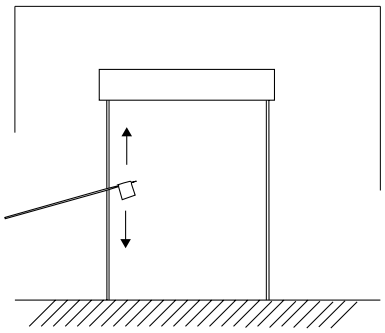
The direction and velocity of the air stream must be adjusted as follows to obtain optimum function from the air curtain. If the air velocity is too high, turbulence will occur which reduces the protective effect and the comfort inside the door. If velocity is too low, the barrier does not reach the floor and cannot protect the opening.

Cold storage and freezer rooms

Adjustment can be made using an anemometer. An alternative method is to attach a piece of thin paper on a rod. By moving it up and down the doorway it's easy to see how the air stream behaves. Start with middle speed and with the minimum unit angled outwards towards the hot side. Change to a higher or lower speed and try different angles (3 positions - 5, 10, 15 °) so that it neither blows inwards or outwards, but it may blow slightly towards the warm side.

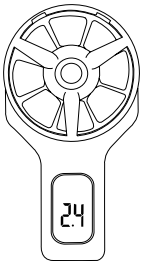
Entrances and doorways

External influences are greater at entrances and doorways, but an anemometer or simple adjustment tool can be used to give an indication that the installation is correct. The adjustment tool (or anemometer) is placed slightly further in than with a cold storage or freezer room. Initially the angle should be adjusted (5-15° outward) and then the fan speed adjusted until the inward air stream is minimal.



A small adjustment tool consisting of a simple stand and a free hanging piece of tissue paper is placed near the door inside the premises.

Tip! There are films showing adjustment at www.frico.net.



Example of anemometer.

Correct air velocity

The air velocity at dimensioning must be correct for the installation environment and height (see diagram under Dimensioning, earlier in the handbook). In an installation outside the laboratory environment, the air velocity at floor level will be affected by wind loads and pressure differentials. Our dimensioning recommendations (for air velocity at floor level) are made to withstand normal wind and pressure differences in a real environment. It is essential that the air curtain is correctly adjusted for the specific opening and the air velocity then adapted to how the conditions change over time.

Adjustment adapts your installation

Stresses vary between different installations and adjustment ensures that the air curtain functions perfectly in your particular installation.

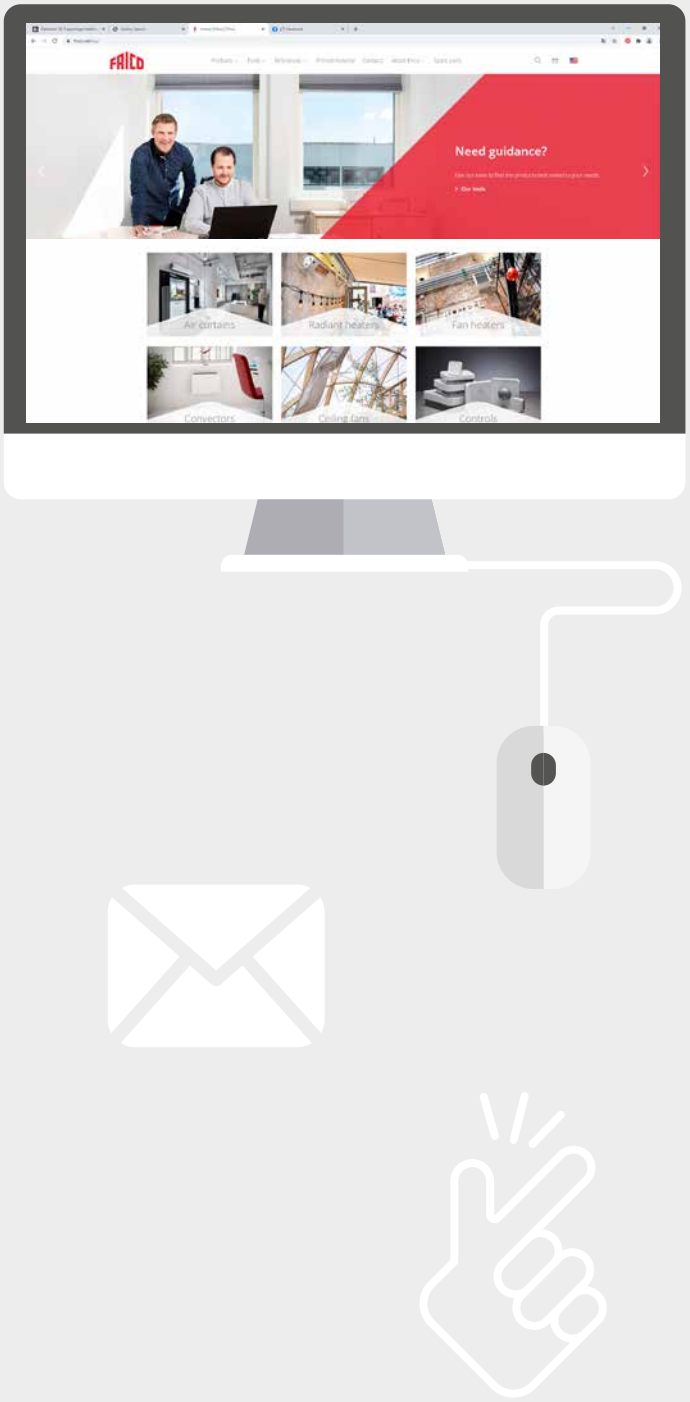
Controls take care of the rest

Adjustment is usually carried out once when commissioning, if and when the external influences change, the controls automatically compensate.

Just a click away

Smart tools

Information about all our products can be found on our website. There are also smart tools to help find the right product, make heating calculations and create specification texts.



Product selection guide
The product selection guide has a basic and an advanced level. What level is used depends on how much information is available about the installation. The product selection program should be used to get an idea of what products are suitable.

Specification text
Using this tool you can choose accessories for a selected product, make heating calculations and receive all the technical data in a specification sheet.

Heating calculations
Heating calculations can also be used as a separate tool. Calculations can be made in order to easily compare different water temperatures, fan settings etc.

Tables for dimensioning

Basic electrical formulas

Amperage

Direct current and 1-phase alternating current at cosφ=1	3-phase alternating current Y-connection	3-phase alternating current Δ-connection
I=U/R=P/U	$\mathbf{I_f=I}$	$I=I_f\ \sqrt{3}$

Voltage

Direct current and 1-phase alternating current at cosφ=1	3-phase alternating current Y-connection	3-phase alternating current Δ-connection
U=RI	$U=U_f\ \sqrt{3}$	$U_f=U$

Output

Direct current and 1-phase alternating current at cosφ=1	3-phase alternating current Y-connection	3-phase alternating current Δ-connection
P=UI	$P=\sqrt{3}UI\cos\varphi$	$P=\sqrt{3}\ UI\cos\varphi$

U = operating voltage in volts: with DC and singlephase AC between the two conductors, with 3-phase AC two phases (not between phase and zero).
U_f = voltage between phase and zero in a 3-phase cable.
$\sqrt{3} \cong 1.73$
I = amperage in ampere
I_f = amperage in ampere in phase wire
R = resistance in ohm
P = output in watt

Symbols for model types

Enclosure classes for electrical materials

IP, first figure	Protection against solid objects
0	No protection
1	Protection against solid objects ≥ 50 mm
2	Protection against solid objects ≥ 12.5 mm
3	Protection against solid objects ≥ 2.5 mm
4	Protection against solid objects ≥ 1.0 mm
5	Protection against dust
6	Dust-tight

IP, second figure	Protection against water
0	No protection
1	Protection against vertically dripping water
2	Protection against dripping water max 15°
3	Protection against sprinkled water
4	Protection against spraying with water
5	Protection against water jets
6	Protection against heavy seas
7	Protection against short immersion in water
8	Protection against the effects of long-term immersion in water

Dimensioning table for cables and wiring

Installation wires, open or in conduit		Connection wires		
Area [mm²]	Fuse [A]	Area [mm²]	Continuous current [A]	Fuse [A]
1,5	10	0,75	6	10
2,5	16	1	10	10
4	20			
6	25	1,5	16	16
10	35	2,5	25	20
16	63	4	32	25
25	80	6	40	35
35	100	10	63	63
50	125			
70	160			
95	200			
120	250			
150	250			
185	315			
240	315			
300	400			
400	500			

Dimensioning table

Current load at different outputs and voltages

Power	Voltage [V]					
[kW]	127/1	230/1	400/1	230/3	400/3	500/3
1,0	7,85	4,34	2,50	2,51	1,46	1,16
1,1	8,65	4,78	2,75	2,76	1,59	1,27
1,2	9,45	5,22	3,00	3,02	1,73	1,39
1,3	10,2	5,65	3,25	3,27	1,88	1,50
1,4	11,0	6,09	3,50	3,52	2,02	1,62
1,5	11,8	6,52	3,75	3,77	2,17	1,73
1,6	12,6	6,96	4,00	4,02	2,31	1,85
1,7	13,4	7,39	4,25	4,27	2,46	1,96
1,8	14,2	7,83	4,50	4,52	2,60	2,08
1,9	15,0	8,26	4,75	4,78	2,75	2,20
2,0	15,8	8,70	5,00	5,03	2,89	2,31
2,2	17,3	9,67	5,50	5,53	3,18	2,54
2,3	18,1	10,0	5,75	5,78	3,32	2,66
2,4	18,9	10,4	6,00	6,03	3,47	2,77
2,6	20,5	11,3	6,50	6,53	3,76	3,01
2,8	22,0	12,2	7,00	7,03	4,05	3,24
3,0	23,6	13,0	7,50	7,54	4,34	3,47
3,2	25,2	13,9	8,00	8,04	4,62	3,70
3,4	26,8	14,8	8,50	8,54	4,91	3,93
3,6	28,4	15,7	9,00	9,04	5,20	4,15
3,8	29,9	16,5	9,50	9,55	5,49	4,39
4,0	31,1	17,4	10,0	10,05	5,78	4,62
4,5	35,4	19,6	11,25	11,31	6,50	5,20
5,0	39,4	21,7	12,50	12,57	7,23	5,78
5,5	43,3	23,9	13,75	13,82	7,95	6,36
6,0	47,3	26,1	15,0	15,1	8,67	6,94
6,5	51,2	28,3	16,25	16,3	9,39	7,51
7,0	55,0	30,4	17,50	17,6	10,1	8,09
7,5	59,0	32,6	18,75	18,8	10,8	8,67
8,0	63,0	34,8	20,0	20,1	11,6	9,25
8,5	67,0	37,0	21,25	21,4	12,3	9,83
9,0	71,0	39,1	22,5	22,6	13,0	10,4
9,5	75,0	41,3	23,75	23,9	13,7	11,0
10,0	78,5	43,5	25,0	25,1	14,5	11,6

At outputs between 0.1 and 1 kW the read off current load is multiplied by 0.1. At outputs between 10 and 100 kW the read off current load is multiplied by 10.

CREATING IDEAL
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