

# Air curtains

For a comfortable indoor climate



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Welcome to the Frico air curtain catalogue!

Our ultimate ambition is to give you the best possible support and the finest technical solutions. With this catalogue we offer you our complete range of all products and accessories you need to get the most effective air curtain installations, regarding both comfort and energy savings. To have Frico as a partner is the safe choice. We work according to our core values - trust, competence and design - in all aspects, from product development to contact with you the customer.



Pontus Grimberg  
International Sales Director  
Frico AB



## 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.

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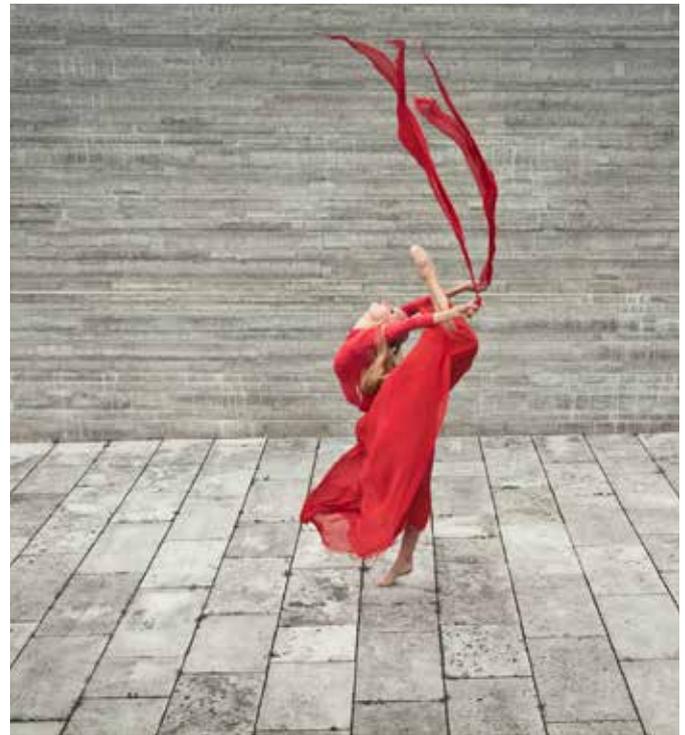
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## Good reasons to choose Frico

More than 80 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.

[www.frico.se](http://www.frico.se)

## Trust, Competence and Design

You can feel assured with Frico as a partner. We work according to our core values - trust, competence and design - 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.se](http://www.frico.se).

## 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.se](http://www.frico.se) 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.se](http://www.frico.se) helps you to find the right product and to easily collate all technical data, accessories and heating calculations to your documents.



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.se](http://www.frico.se).

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.



## Frico's Thermozone technology optimizes the air curtain



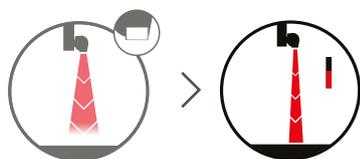
Frico air curtains create an invisible barrier at openings and doors which separates different temperature zones without limiting access for people and vehicles. With Thermozone Technology an efficient air separation is created in combination with a low sound level, giving comfortable climate and large energy savings. Frigo 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

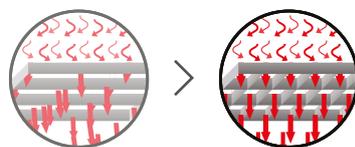
In many premises, for example shops, department stores, industrial premises and goods terminals, doors remain open for a large part of the day. This means discomfort for customers and staff at the same time as there are significant losses of expensively heated or cooled air, especially when the temperature difference between outdoor and indoor air is great. Frigo 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](http://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.

### Intelligent regulation

Most of our air curtains are prepared for the SIRE control system, which automatically manages the air curtain operations. The air curtain adapts itself to the present conditions in the entry. By sensing how often the door is opened and closed and measuring the outdoor temperature, the indoor temperature or even the return water temperature, the air curtain can give efficient protection with minimal energy consumption. With SIRE control the air curtain always has optimal operation. You do not even need to remember to turn it on or off. It even adapts itself to the seasons, and with its weekly calendar, the air curtain operates automatically when it is needed.

### 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.

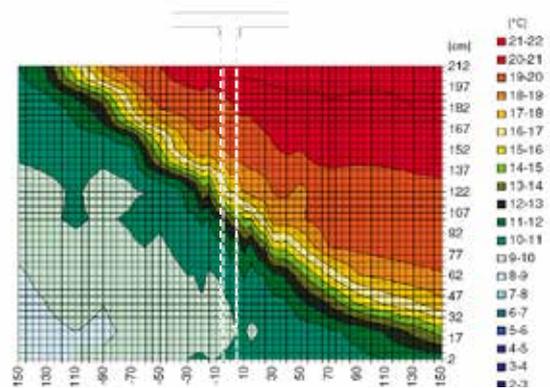
### Design

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.

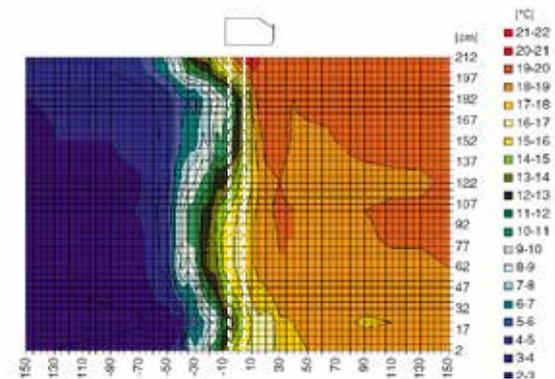
### Air curtain experts

Frico knows air curtains. The company was founded in 1932 and we developed our first air curtains 45 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.

### 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.

## Select the right air curtain

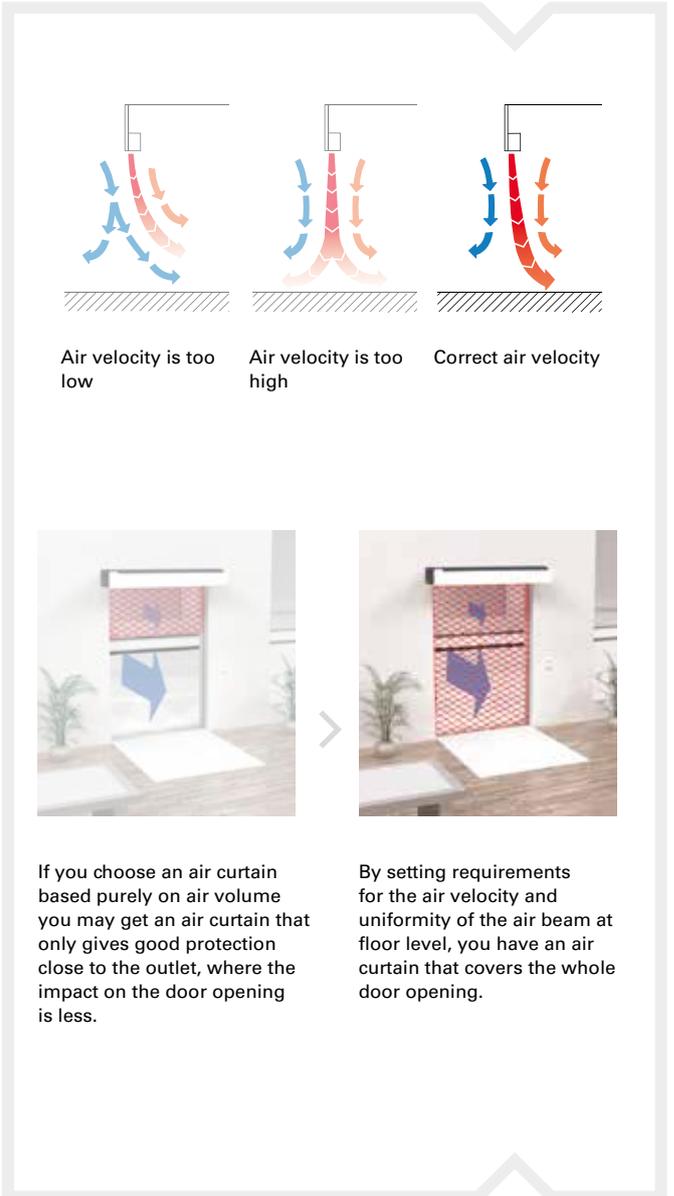
For optimal air curtain effect, it is important to choose the right air curtain. We have air curtains for all openings from small kiosk hatches to large industrial doors. They blow from above, from the side or from below. Choose between electrical, water heated or unheated versions.

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	Recommended installation height	Heat	Mounting	Extra
<b>Entrances</b>				
PA2200C	2,2 m	⚡ 🔥 ❄️	Horizontal	Remote control.
PA2500	2,5 m	⚡ 🔥 ❄️	Horizontal	SIRe control system.
Portier	2,5 m	⚡ ❄️	Horizontal	Brushed stainless steel.
ADA	2,5 m	❄️	Horizontal	Cable and plug.
AR200	2,5 m	⚡ 🔥 ❄️	Horizontal	Recessed mounting. SIRe control system.
<b>Commercial</b>				
Corinte	3 m	⚡ 🔥 ❄️	Horizontal/Vertical	SIRe control system. Polished, mirror polished or brushed stainless steel.
PA3200C	3,2 m	⚡ 🔥 ❄️	Horizontal	Remote control.
AR3200C	3,2 m	⚡ 🔥 ❄️	Horizontal	Recessed mounting. Remote control.
AR3500/4200	3,5/4,2 m	⚡ 🔥 ❄️	Horizontal	Recessed mounting. SIRe control system.
PA3500/4200	3,5/4,2 m	⚡ 🔥 ❄️	Horizontal/Vertical	SIRe control system.
<b>Industry</b>				
AGS5500/AGR5500	5,5 m	🔥 ❄️	Horizontal	SIRe control system. Surface and recessed mounting. Vertical unit is available as special order.
AGI4500/6000	4,5/6 m	🔥 ❄️	Horizontal/Vertical	
UF600	Large doorways	❄️	Vertical	Air barrier blown from below.
<b>Specific use</b>				
ADA Cool	Cold storage	❄️	Horizontal	Special terminales for easy connection of several units. Cable and plug.
PAEC2500/3200	Cold storage	❄️	Horizontal	EC motor
RDS	Revolving doors	⚡ 🔥	Horizontal	For revolving doors. SIRe control system.
SFS	Revolving doors	⚡ 🔥	Vertical	For revolving doors. SIRe control system.
AGDX/AGRDX	Heat pump		Horizontal	Heat pump solution. Surface and recessed mounting.
PA1508	Small openings	⚡	Horizontal	Cable and plug.
PA1006	Door heater	⚡	Horizontal	Cable and plug.

❄️ Ambient, no heat  
 ⚡ Electrical heat  
 🔥 Water heat

# 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.

**Classic**  
Many of our models have a classic yet stylish design that blend in well in most interiors.

Installation height

2,2 m	PA2200C ✱ † ♣	14
2,5 m	PA2500 ✱ † ♣	17
2,5 m	ADA ✱	23
3,2 m	PA3200C ✱ † ♣	32
3,5 m	PA3500 ✱ † ♣	42
4,2 m	PA4200 ✱ † ♣	42

Page

**Design**  
Our stainless steel air curtains are design elements well suitable for prestigious environments.

Installation height

2,5 m	Portier ✱ †	20
3 m	Corinte ✱ † ♣	28

Page

**Industry**  
These robust and powerful units are specifically designed for large doorways.

Installation height

4,2 m	PA4200 ✱ † ♣	42
4,5 m	AGI4500 ✱ ♣	56
5,5 m	AGS5500 ✱ ♣	52
6 m	AGI6000 ✱ ♣	56

Page

## Recessed mounting

These air curtains are installed recessed into suspended ceilings.



Installation height

2,5 m	AR200 ✱ † ♣	24
2,8 m	AR3200C ♣	35
3,2 m	AR3200C ✱ †	35
3,5 m	AR3500 ✱ † ♣	38
4,2 m	AR4200 ✱ † ♣	38
5,5 m	AGR5500 ✱ ♣	52

Page



### 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.



### Classic



Installation width\*

5 m	
PA3500 ✱ £ ⚡	42
6 m	
PA4200 ✱ £ ⚡	42

Page

### Design



Installation width\*

5 m	
Corinte ✱ £ ⚡	28

Page

### Industry



Installation width\*

6 m	
AGI4500 ✱ ⚡	56
8 m	
AGI6000 ✱ ⚡	56
12 m	
UF600 ✱	62

Page

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

Application

Cold storage	ADA Cool ✱	70
	PAEC2500/3200 ✱	72
Revolving doors	RDS £ ⚡	76
	SFS £ ⚡	78
Heat pump solution	AGDX/AGRDX	80
Service hatches	PA1508 £	85
Door heater	PA1006 £	86

Page



### Air curtains for specific use

These air curtains are designed for a specific application area such as revolving doors, service hatches or cold storage.



2,2 m



#### PA2200C

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.

2,5 m



#### PA2500

PA2500 creates a temperature dividing air barrier that effectively prevents cold drafts and gives excellent heating comfort in door ways, such as shops, offices and public premises.

The air curtain has many intelligent and energy saving features which provide fully automatic protection for the entrance, adaptable to each area of use.

2,5 m



#### AR200

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.

2,5 m



#### Portier

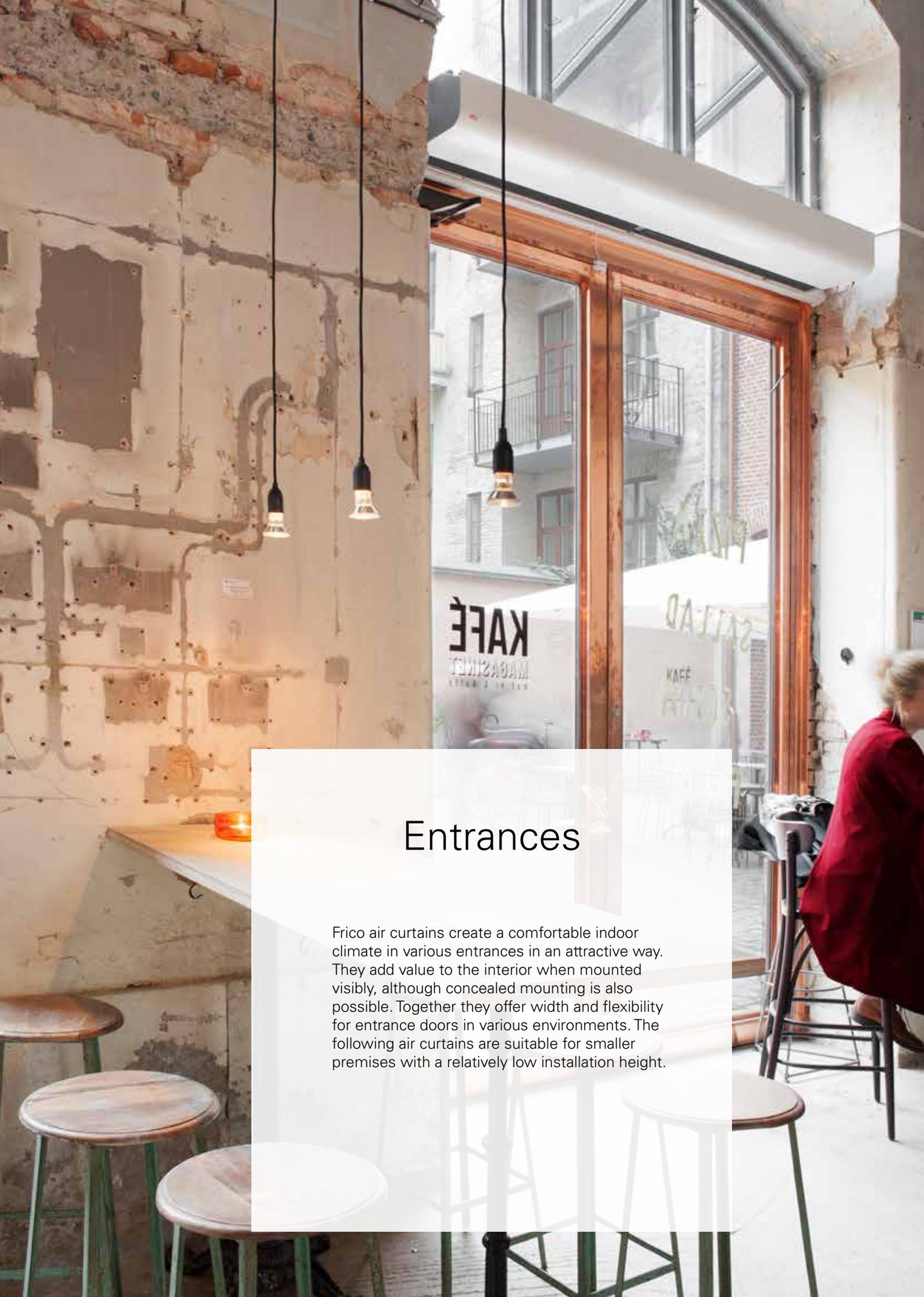
Portier is an exclusive air curtain in brushed stainless steel intended for entrance doors in e.g. shops, banks, hotels and restaurants. The elegant design of the air curtain makes it particularly suitable for environments where demands are made on a high standard of design.

2,5 m



#### ADA

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.



## Entrances

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. The following air curtains are suitable for smaller premises with a relatively low installation height.

PA2200C



## PA2200C

Stylish air curtain for entrances, with remote and integrated control

Recommended installation height 2,2 m\*

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.



Optimized airflow with Thermozone technology.

- Remote control and integrated regulation.
- 3 fan steps and 2 electrical heating steps.
- Units with 3 kW are equipped with 1,5 m cable and plug.
- Wall brackets included.
- The front is easy to remove, which facilitates installation and allows easy maintenance.
- Corrosion proof housing made of hot zinc-plate and powder enamelled steel panels. Plastic ends. Colour front: white, RAL 9016, NCS S 0500-N. Colour grille, rear section, ends and brackets: grey, RAL 7046.

### ✿ Ambient, no heat - PA2200C A (IP21)

Type	Output [kW]	Airflow* <sup>1</sup> [m <sup>3</sup> /h]	Sound level* <sup>2</sup> [dB(A)]	Voltage motor [V]	Amperage motor [A]	Length [mm]	Weight [kg]
PA2210CA	0	900/1200	42/51	230V~	0,45	1050	16
PA2215CA	0	1150/1800	40/52	230V~	0,5	1560	24
PA2220CA	0	1800/2400	43/53	230V~	0,9	2050	32

### ⚡ Electrical heat - PA2200C E (IP20)

Type	Output steps [kW]	Airflow* <sup>1</sup> [m <sup>3</sup> /h]	$\Delta t$ * <sup>3</sup> [°C]	Sound level* <sup>2</sup> [dB(A)]	Voltage motor [V]	Amperage motor [A]	Voltage [V] Amperage [A] (heat)	Length [mm]	Weight [kg]
PA2210CE03	2/3	900/1200	10/7,5	42/51	230V~	0,45	230V~/13	1050	17
PA2210CE05	3,3/5	900/1200	17/12,5	42/51	230V~	0,45	400V3~/7,2	1050	17
PA2210CE08	5/8	900/1200	27/20	42/51	230V~	0,45	400V3~/11,5	1050	18
PA2215CE08	4/8	1150/1800	21/13	40/52	230V~	0,5	400V3~/11,5	1560	26
PA2215CE12	8/12	1150/1800	31/20	40/52	230V~	0,5	400V3~/17,3	1560	28
PA2220CE10	5/10	1800/2400	17/12,5	43/53	230V~	0,9	400V3~/14,4	2050	34
PA2220CE16	10/16	1800/2400	27/20	43/53	230V~	0,9	400V3~/23,1	2050	36

### 💧 Water heat - PA2200C W (IP21)

Type	Output* <sup>4</sup> [kW]	Airflow* <sup>1</sup> [m <sup>3</sup> /h]	$\Delta t$ * <sup>3,4</sup> [°C]	Water volume [l]	Sound level* <sup>2</sup> [dB(A)]	Voltage motor [V]	Amperage motor [A]	Length [mm]	Weight [kg]
PA2210CW	7	700/1200	21/17	0,38	39/52	230V~	0,4	1050	17
PA2215CW	11	1000/1750	23/18	0,81	37/53	230V~	0,5	1560	26
PA2220CW	14	1400/2400	22/18	0,74	40/53	230V~	0,8	2050	35

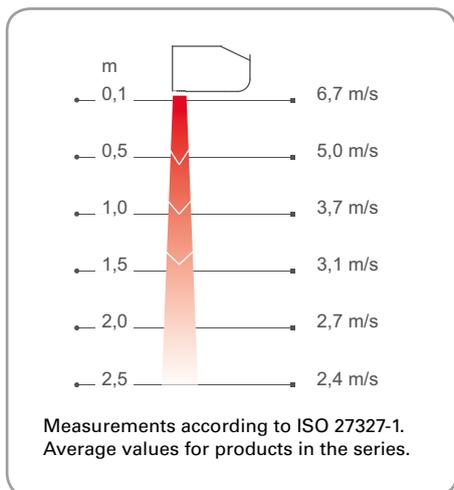
\*<sup>1</sup>) Lowest/highest airflow of totally 3 fan steps.

\*<sup>2</sup>) Conditions: Distance to the unit 5 metres. Directional factor: 2. Equivalent absorption area: 200 m<sup>2</sup>. At lowest/highest airflow.

\*<sup>3</sup>)  $\Delta t$  = temperature rise of passing air at maximum heat output and lowest/highest airflow.

\*<sup>4</sup>) Applicable at water temperature 80/60 °C, air temperature, in +18 °C.

Air velocity profile

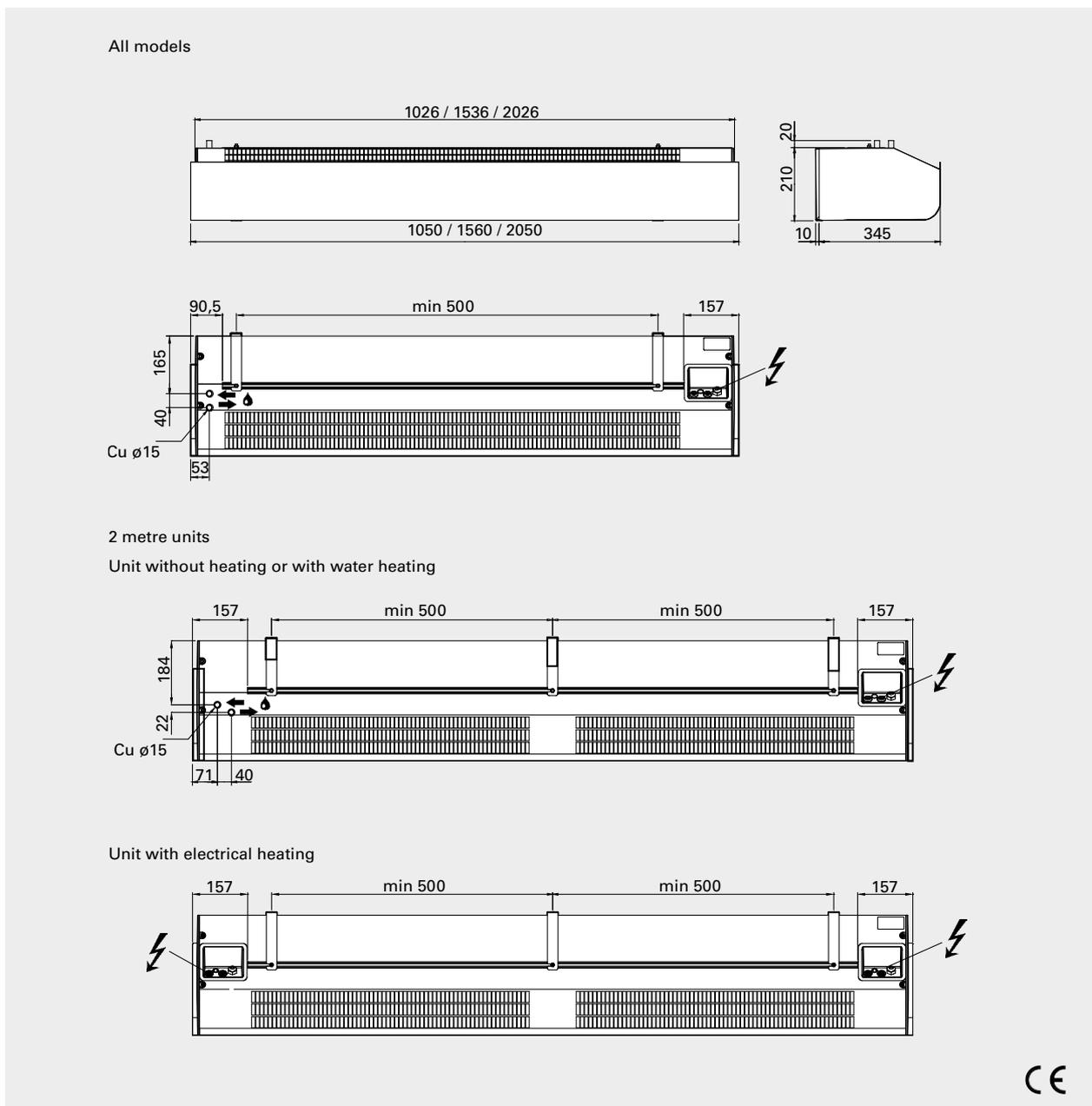


Control

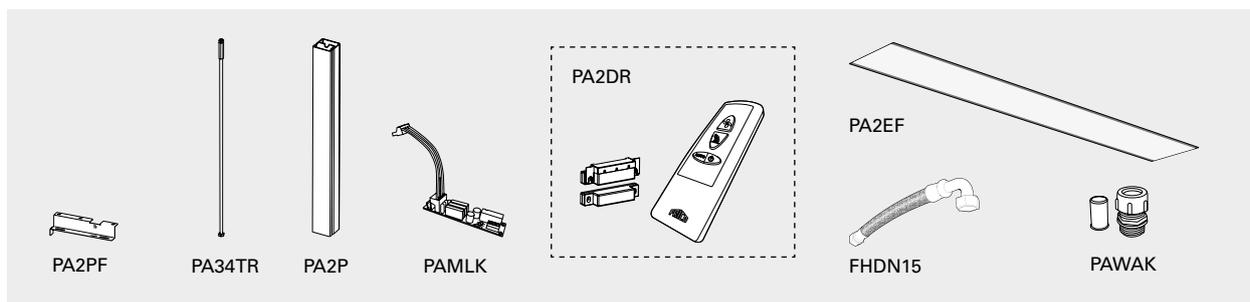
The control system is integrated in the air curtain. The air curtain has a control panel discretely integrated in the gable end and can be controlled by a separate remote control. The air speed is set manually. The heat is controlled automatically.

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

Dimensions



Controls and accessories



**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/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 PA2PF/PA3PF.

**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. For units with SIRE control (PA2500, AR3200) connection enables use of the provided motor protection terminals. For units without SIRE (PA2200/3200C, AR3200C), 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.

**Unit with water heating**

**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.

**PAWAK, 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.

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

Valve kit VOT or VLSP is used to control the water flow. For more information see the "Controls" section.

Type	Description	Quantity included	Length
<b>PA2PF15</b>	Ceiling mounting brackets for 1 and 1,5 metre units	4	
<b>PA2PF20</b>	Ceiling mounting brackets for 2 metre units	6	
<b>PA34TR15</b>	Threaded bars for 1 and 1,5 metre units	4	1 m
<b>PA34TR20</b>	Threaded bars for 2 metre units	6	1 m
<b>PA2P15</b>	Hanging brackets for 1 and 1,5 metre units	2	1 m
<b>PA2P20</b>	Hanging brackets for 2 metre units	3	1 m
<b>PAMLK</b>	Motor alarm board	1	
<b>PA2DR</b>	Door switch control		
<b>PA2EF10</b>	External intake filter for 1 metre water heated units	1	
<b>PA2EF15</b>	External intake filter for 1,5 metre water heated units	1	
<b>PA2EF20</b>	External intake filter for 2 metre water heated units	1	
<b>PAWAK</b>	Water connection kit		
<b>FHDN15</b>	Flexible hoses DN15, inside thread, 90° bend	2	1 m



## PA2500

Stylish air curtain for entrances, with intelligent control

Recommended installation height 2,5 m\*

PA2500 creates a temperature dividing air barrier that effectively prevents cold drafts and gives excellent heating comfort in door ways, such as shops, offices and public premises.

- 3 fan steps and 3 electrical heating steps, which give more even comfort and extra energy savings.
- Wall brackets included.
- The front is easy to remove, which facilitates installation and allows easy maintenance.
- Corrosion proof housing made of hot zinc-plate and powder enamelled steel panels. Plastic ends. Colour front: white, RAL 9016, NCS S 0500-N. Colour grille, rear section, ends and brackets: grey, RAL 7046.



Optimized airflow with Thermozone technology.

### ✿ Ambient, no heat - PA2500 A (IP21)

Type	Output [kW]	Airflow* <sup>1</sup> [m <sup>3</sup> /h]	Sound level* <sup>2</sup> [dB(A)]	Voltage motor [V]	Amperage motor [A]	Length [mm]	Weight [kg]
PA2510A	0	900/1300	43/53	230V~	0,5	1050	16
PA2515A	0	1250/2100	44/54	230V~	0,7	1560	23,5
PA2520A	0	1800/2600	44/55	230V~	1,0	2050	32

### ⚡ Electrical heat - PA2500 E (IP20)

Type	Output steps [kW]	Airflow* <sup>1</sup> [m <sup>3</sup> /h]	$\Delta t$ * <sup>3</sup> [°C]	Sound level* <sup>2</sup> [dB(A)]	Voltage motor [V]	Amperage motor [A]	Voltage [V] Amperage [A] (heat)	Length [mm]	Weight [kg]
PA2510E05	1,7/3,3/5	900/1450	17/10,5	42/51	230V~	0,5	400V3~/7,2	1050	19
PA2510E08	3/5/8	900/1450	27/16,5	42/51	230V~	0,5	400V3~/11,5	1050	20
PA2515E08	2,7/5,4/8	1400/2200	17,5/11	40/52	230V~	0,7	400V3~/11,5	1560	30
PA2515E12	3,9/8/12	1400/2200	26/16,5	40/52	230V~	0,7	400V3~/17,3	1560	32
PA2520E10	3,4/6,7/10	1800/2900	17/10,5	43/53	230V~	1,0	400V3~/14,4	2050	36
PA2520E16	6/10/16	1800/2900	27/16,5	43/53	230V~	1,0	400V3~/23,1	2050	40

### 💧 Water heat - PA2500 W (IP21)

Type	Output* <sup>4</sup> [kW]	Airflow* <sup>1</sup> [m <sup>3</sup> /h]	$\Delta t$ * <sup>3,4</sup> [°C]	Water volume [l]	Sound level* <sup>2</sup> [dB(A)]	Voltage motor [V]	Amperage motor [A]	Length [mm]	Weight [kg]
PA2510W	4,7	900/1300	12/11	0,71	42/53	230V~	0,45	1050	17,5
PA2515W	9,2	1250/2100	16/13	1,09	41/54	230V~	0,6	1560	26
PA2520W	11	1800/2600	15/13	1,42	43/55	230V~	0,9	2050	35

\*<sup>1</sup>) Lowest/highest airflow of totally 3 fan steps.

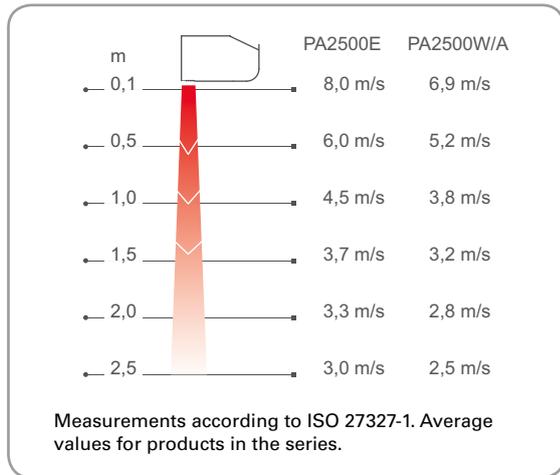
\*<sup>2</sup>) Conditions: Distance to the unit 5 metres. Directional factor: 2. Equivalent absorption area: 200 m<sup>2</sup>. At lowest/highest airflow.

\*<sup>3</sup>)  $\Delta t$  = temperature rise of passing air at maximum heat output and lowest/highest airflow.

\*<sup>4</sup>) Applicable at water temperature 60/40 °C, air temperature, in +18 °C.

# PA2500

## Air velocity profile

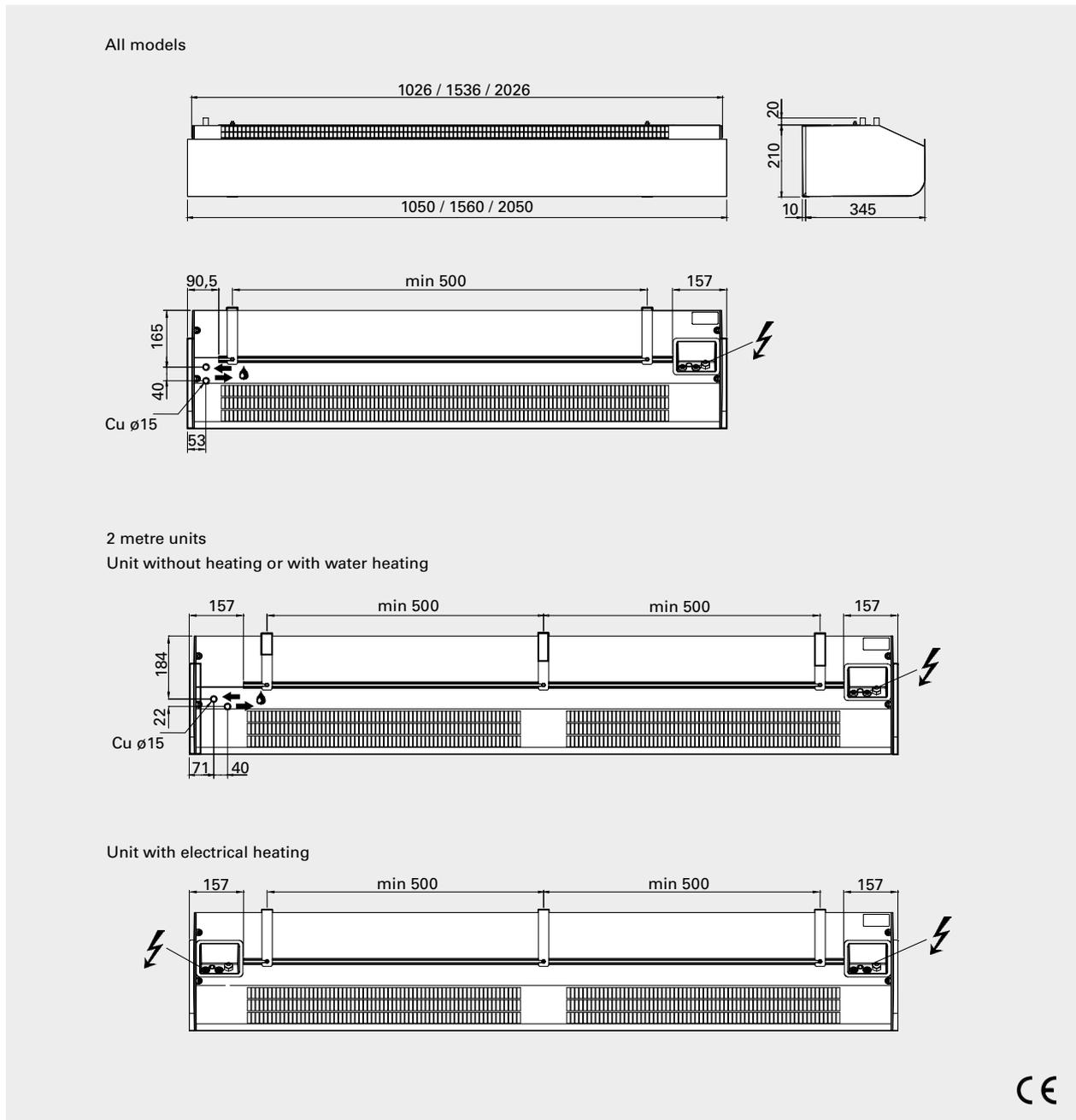


## Control

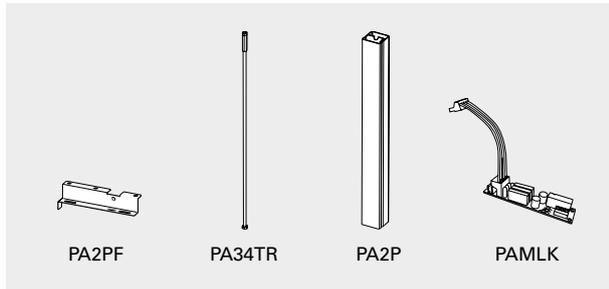
SIRe Basic      SIRe Competent      SIRe Advanced

This air curtain is supplied prepared for the SIRe control system that has many smart and energy saving functions. There are three different levels with different functionality to choose from, Basic, Competent or Advanced. Water heated units must always be supplemented with valves. For further information and options, see the "Controls" section.

## Dimensions



Accessories



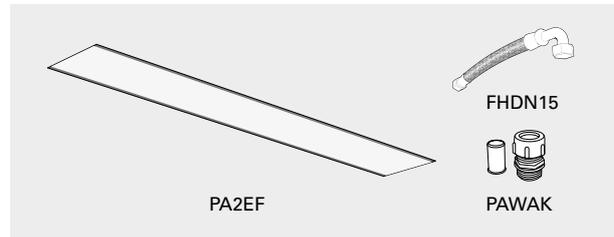
**PA2PF**, ceiling mounting brackets  
Mountings for installing the unit in the ceiling using hanging brackets or threaded bars (not included).

**PA34TR**, threaded bars  
Threaded bars for installing unit on to a ceiling. Length 1 m. Used together with ceiling mounting brackets PA2PF/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 PA2PF/PA3PF.

**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. For units with SIRE control (PA2500, AR3200) connection enables use of the provided motor protection terminals. For units without SIRE (PA2200/3200C, AR3200C), use potential free contact on PAMLK board.

Unit with water heating



**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.

**PAWAK**, 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.

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

Type	Description	Quantity included	Length
<b>PA2PF15</b>	Ceiling mounting brackets for 1 and 1,5 metre units	4	
<b>PA2PF20</b>	Ceiling mounting brackets for 2 metre units	6	
<b>PA34TR15</b>	Threaded bars for 1 and 1,5 metre units	4	1 m
<b>PA34TR20</b>	Threaded bars for 2 metre units	6	1 m
<b>PA2P15</b>	Hanging brackets for 1 and 1,5 metre units	2	1 m
<b>PA2P20</b>	Hanging brackets for 2 metre units	3	1 m
<b>PAMLK</b>	Motor alarm board	1	
<b>PA2EF10</b>	External intake filter for 1 metre water heated units	1	
<b>PA2EF15</b>	External intake filter for 1,5 metre water heated units	1	
<b>PA2EF20</b>	External intake filter for 2 metre water heated units	1	
<b>PAWAK</b>	Water connection kit		
<b>FHDN15</b>	Flexible hoses DN15, inside thread, 90° bend	2	1 m



## Portier

### Design air curtain for entrances

Recommended installation height 2,5 m\*

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.

- Low sound level.
- Adjustable outlet grille makes it possible to direct the air for optimum air curtain effect.
- Simple suspension using fixing nuts on the upper side for installation with wall brackets, suspension kit or wire/threaded rod.
- Housing in brushed stainless steel. Colour outlet grille and ends: black, RAL 9005.



Optimized airflow with Thermozone technology.

#### ✿ Ambient, no heat - Portier A (IP21)

Type	Output [kW]	Airflow [m <sup>3</sup> /h]	Sound level [dB(A)]*1	Voltage [V]	Amperage [A]	Length [mm]	Weight [kg]
PS210A	0	1300	54	230V~	0,45	1020	14
PS215A	0	2000	56	230V~	0,55	1530	20

#### ⚡ Electrical heat - Portier E (IP21)

Type	Output steps [kW]	Airflow [m <sup>3</sup> /h]	Δt*2 [°C]	Sound level [dB(A)]*1	Voltage [V]	Amperage [A]	Length [mm]	Weight [kg]
PS210E03	1,5/3	1200	8	50	230V~/400V3N~*3	13,4/4,8	1020	17
PS210E06	3/6	1200	15	50	400V3N~*3	9,2	1020	17
PS210E09	4,5/9	1200	23	50	400V3N~*3	13,5	1020	17
PS215E09	4,5/9	1900	14	50	400V3N~*3	13,5	1530	24
PS215E14	6,7/13,5	1900	21	50	400V3~ + 230V~	20,0	1530	24

\*1) Conditions: Distance to the unit 5 metres. Directional factor: 2. Equivalent absorption area: 200 m<sup>2</sup>.

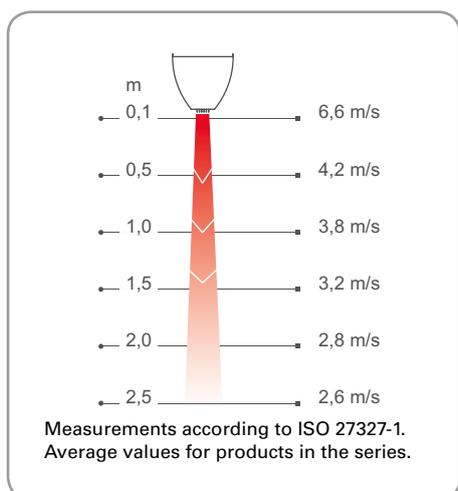
\*2) Δt = temperature rise of passing air at maximum heat output and highest airflow.

\*3) 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.

\*) Recommended installation height varies depending on the relevant premises. Read how to choose the right air curtain on page 8.

### Air velocity profile

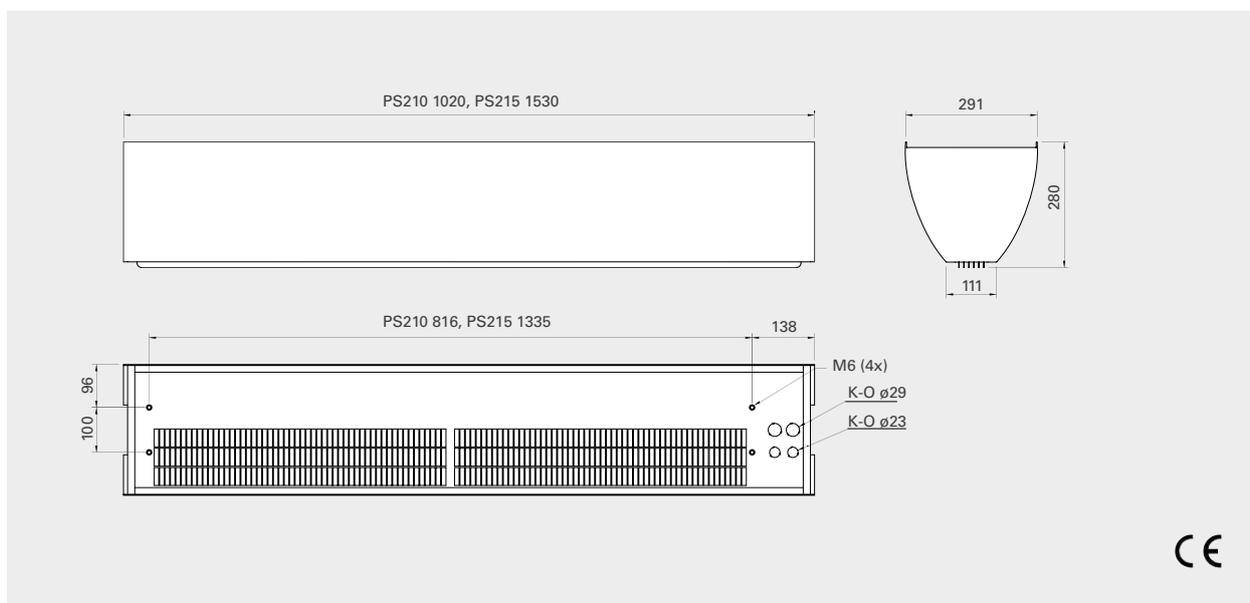


### Control

CB20      CB22      RTI2      MDC

- CB20, control box, 2 fan steps.
- CB22, control box, 2 fan steps and 2 heating steps.
- RTI2, electronic 2-step thermostat.
- MDC, magnetic door contact with a time relay.

### Dimensions



### Accessories

#### P2WB, wall mounting kit

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

#### P2JK, joining kit

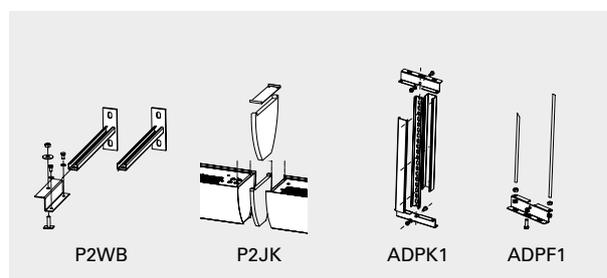
Used to join horizontal units together for a sleek and unified installation. Consists of joint bracket and mounting parts.

#### 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.



Type	Description
P2WB	Wall mounting kit (2 pcs)
P2JK	Joining kit (1 pc)
ADPK1	Suspension kit (2 pcs)
ADPF1	Suspension brackets (4 pcs)

### 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.

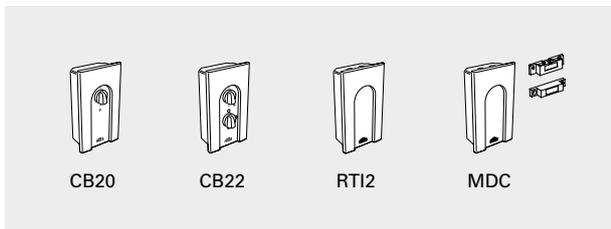
Level 2

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.



Type	Description
CB20	Control box Portier A, IP44
CB22	Control box Portier E, IP44
RTI2	Electronic 2-step thermostat, IP44
MDC	MDC, magnetic door contact with time relay, IP44





## ADA

### Air curtain for air conditioned premises

Recommended installation height 2,5 m\*

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.

- Built-in switch; high/low speed.
- Compact and easily positioned.
- Easy installation with 1,8 m cable and plug.
- Corrosion proof housing made of hot zinc-plate and powder enamelled steel panels. Colour: white, RAL 9016, NCS S 0500-N.



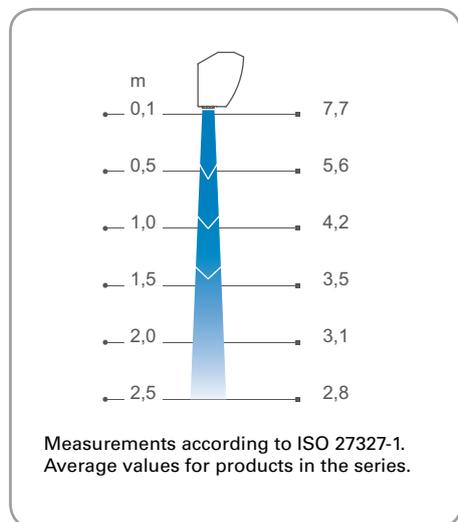
Optimized airflow with Thermozone technology.

#### ✿ Ambient, no heat - ADA (IP21)

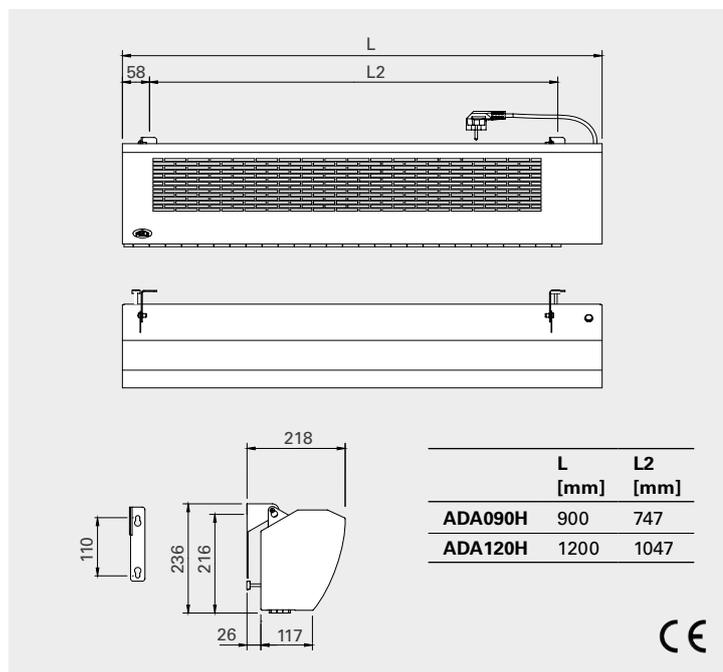
Type	Output [kW]	Airflow [m³/h]	Sound level* [dB(A)]	Voltage [V]	Amperage [A]	Length [mm]	Weight [kg]
ADA090H	0	800/1150	43/54	230V~	0,50	900	9,5
ADA120H	0	1100/1400	44/51	230V~	0,55	1200	11,7

\*) Conditions: Distance to the unit 5 metres. Directional factor: 2. Equivalent absorption area: 200 m². At lowest/highest airflow.

#### Air velocity profile



#### Dimensions



AR200



## AR200

### Recessed air curtain for smaller entrances

Recommended installation height 2,5 m\*

AR200 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.

- Just one model per length, but electrical units are convertible between several outputs and 230V~/400V3N~ making it simple and flexible to adapt the output to current need.
- Low unit height (200 mm).
- Bottom plate in white lacquered aluminium. Colour: RAL 9016, NCS S 0500-N. The bottom plate can easily be removed and painted in an optional colour. Non visible parts made of hot zinc plated steel panels.

#### 🌀 Ambient, no heat - AR200 A (IP20)

Type	Output [kW]	Airflow* <sup>1</sup> [m <sup>3</sup> /h]	Sound level* <sup>2</sup> [dB(A)]	Voltage [V]	Amperage [A]	Length [mm]	Weight [kg]
AR210A	0	650/1200	34/50	230V~	0,5	1042	18
AR215A	0	950/1750	34/50	230V~	0,6	1552	25
AR220A	0	1300/2400	40/54	230V~	1,0	2042	36

#### ⚡ Electrical heat - AR200 E (IP20)

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

#### 💧 Water heat - AR200 W (IP20)

Type	Output* <sup>4</sup> [kW]	Airflow* <sup>1</sup> [m <sup>3</sup> /h]	Δt* <sup>3,4</sup> [°C]	Water volume [l]	Sound level* <sup>2</sup> [dB(A)]	Voltage [V]	Amperage [A]	Length [mm]	Weight [kg]
AR210W	6,6	700/1000	24/21	0,5	41/49	230V~	0,4	1042	21
AR215W	10	1000/1600	24/20	0,9	37/50	230V~	0,6	1552	39
AR220W	13	1400/2000	23/20	1,1	44/53	230V~	1,0	2042	42

\*<sup>1</sup>) Lowest/highest airflow of totally 3 fan steps.

\*<sup>2</sup>) Conditions: Distance to the unit 5 metres. Directional factor: 2. Equivalent absorption area: 200 m<sup>2</sup>. At lowest/highest airflow.

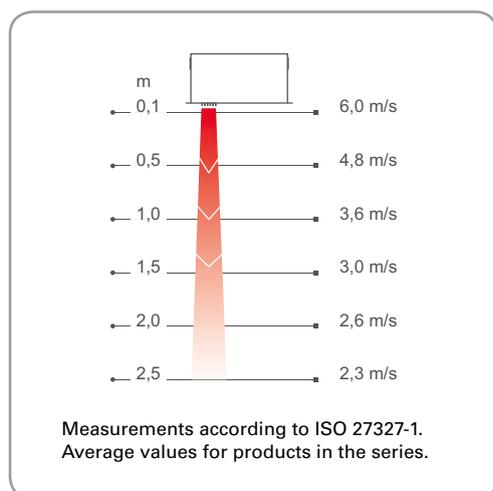
\*<sup>3</sup>) Δt = temperature rise of passing air at maximum heat output and lowest/highest airflow.

\*<sup>4</sup>) 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.

\*) Recommended installation height varies depending on the relevant premises. Read how to choose the right air curtain on page 8.

### Air velocity profile

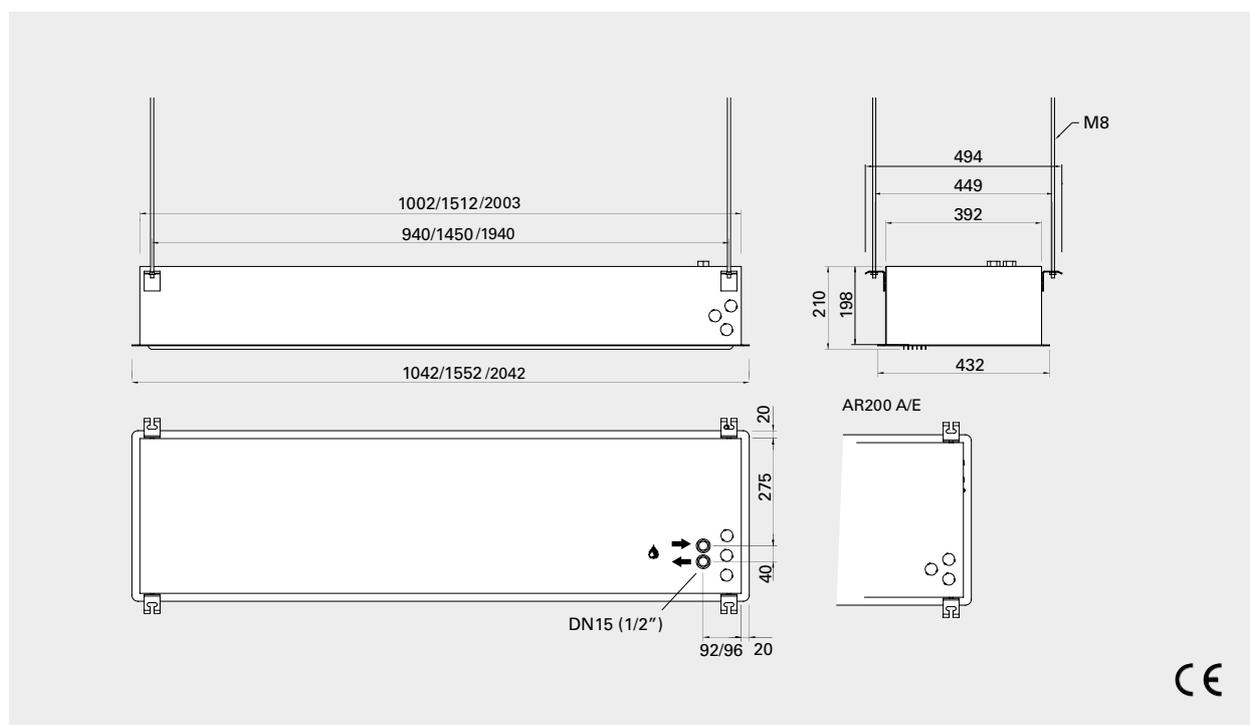


### Control

SIREB Basic    SIRE Competent    SIRE Advanced    SIREB1XA

This air curtain is regulated by the SIRE control system via an external PC board. There are three different levels with different functionality to choose from, Basic, Competent or Advanced. The air curtain can also be regulated by control box CB30/32N, see [www.frico.se](http://www.frico.se). Water heated units must always be supplemented with valves.  
For further information and options, see the "Controls" section.

### Dimensions



### Controls



This air curtain is regulated by the SIRE control system via an external PC board. One SIRE can control up to nine AR200 air curtains. Each AR200 requires an external PC board SIREB1XA.

Type	Description
<b>SIREBN</b>	Control system SIRE Basic
<b>SIREACY</b>	Control system SIRE Competent
<b>SIREAAY</b>	Control system SIRE Advanced
<b>SIREB1XAE</b>	External control board for AR200E
<b>SIREB1XAW</b>	External control board for AR200A/W

3 m



#### Corinte

Corinte is intended for exclusive shop entrances and other environments with high demands in respect of design and sound level. Mounted with one unit on either side of the opening, thus creating a classic symmetry, the curtain effect and comfort is optimized.

3,2 m



#### PA3200C

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.

2,8 m 

3,2 m 



#### AR3200C

AR3200C is a compact air curtain intended for recessed mounting in commercial buildings and small industrial entrances. The air curtain has an integrated control system and can also be remote controlled.

3,5 m

4,2 m



#### AR3500/4200

With its concealed placement, AR3500/4200 is very unobtrusive and with that particularly suitable for environments where the design is important.

The air curtain has many intelligent and energy saving features which provide fully automatic protection for the entrance, adaptable to each area of use.

3,5 m

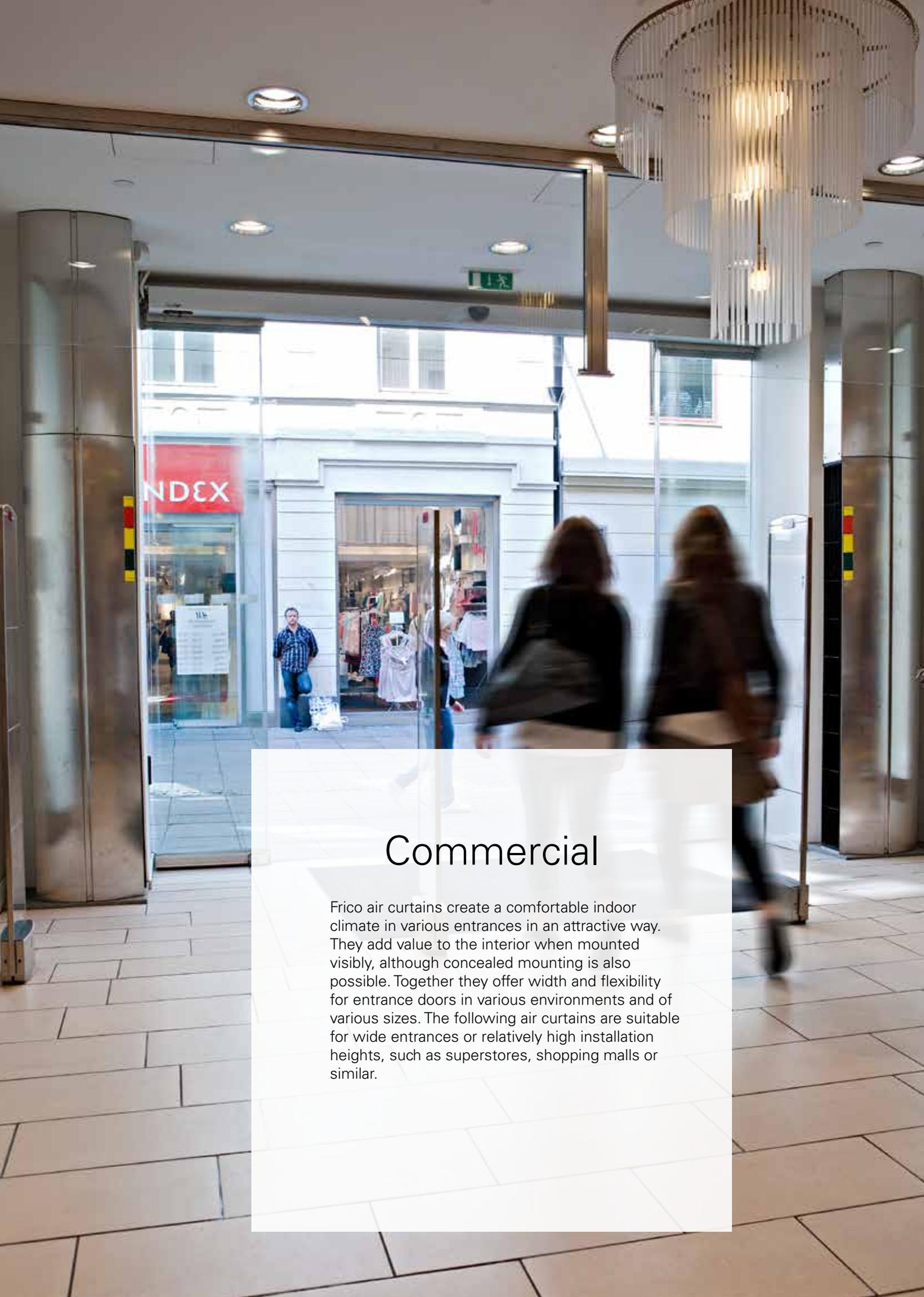
4,2 m



#### PA3500/4200

PA3500/4200 has a modern and stylish design developed to fit all entrances. The air curtain is available for horizontal, vertical and recessed installation.

The air curtain has many intelligent and energy saving features which provide fully automatic protection for the entrance, adaptable to each area of use.



## 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. The following air curtains are suitable for wide entrances or relatively high installation heights, such as superstores, shopping malls or similar.



# Corinte

Design air curtain for exclusive entrances, with intelligent control

Recommended installation height 3 m\*

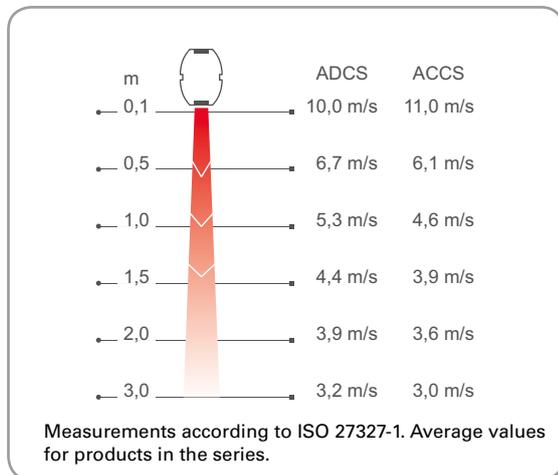
Corinte is intended for exclusive shop entrances and other environments with high demands in respect of design and sound level.

- Corinte is available in two models; ADCS and ACCS that have varying dimensions and performance.
- Recommended installation width 5 m (2 units, one on each side).
- Floor frame included for vertical installation.
- Customised production based on the product key.
- Available in polished, mirror-polished or brushed stainless steel. Also available in powder coated steel, any RAL/NCS colour. Colour intake and outlet grille: black, RAL 9005.



Optimized airflow with Thermozone technology.

## Air velocity profile



## Control

SIRe Basic      SIRe Competent      SIRe Advanced

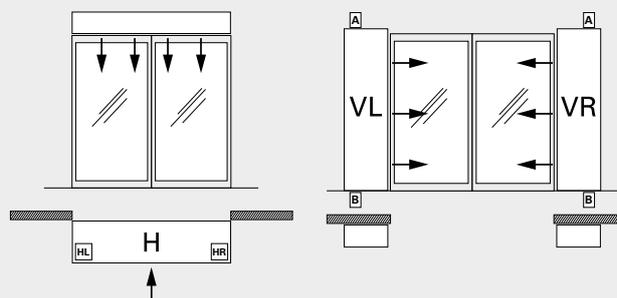
This air curtain is supplied prepared for the SIRe control system that has many smart and energy saving functions. There are three different levels with different functionality to choose from, Basic, Competent or Advanced. Water heated units must always be supplemented with valves. For further information and options, see the "Controls" section.

## Product key

Type - Unit shape - Connections position - Finish / Material  
Example: ADCS22WL - VL - A - P

<b>Type</b>	See technical specifications
<b>Unit shape</b>	HL (Horizontal, connections to the left), HR (Horizontal, connections to the right), VL (Vertical Left) or VR (Vertical Right)
<b>Connections position</b>	A or B, see figure
<b>Finish / material</b>	P = Polished bright annealed B = Brushed stainless steel MP = Mirror polished stainless steel State RAL code = Powder coating RAL State NCS code = Powder coating NCS

## Connections position



✿ Ambient, no heat - ADCS A (IP20)

Type	Output [kW]	Airflow* <sup>3</sup> [m <sup>3</sup> /h]	Sound level* <sup>4</sup> [dB(A)]	Output-motor [W]	Voltage motor [V]	Amperage motor [A]	Length [mm]	Weight [kg]
ADCS17A* <sup>1</sup>	0	1550/3300	43/62	960	230V~	4,2	1700	73
ADCS22A	0	2100/4500	44/63	1330	230V~	5,9	2200	95
ADCS25A* <sup>2</sup>	0	2400/5100	45/64	1520	230V~	6,6	2450	108

⚡ Electrical heat - ADCS E (IP20)

Type	Output steps [kW]	Airflow* <sup>3</sup> [m <sup>3</sup> /h]	$\Delta t$ * <sup>5</sup> [°C]	Sound level* <sup>4</sup> [dB(A)]	Output-motor [W]	Voltage motor [V]	Amperage motor [A]	Voltage [V] Amperage [A] (heat)	Length [mm]	Weight [kg]
ADCS17E* <sup>1</sup>	7,5/15	1550/3500	29/14	43/62	960	230V~	4,2	400V3~/21,7	1700	85
ADCS22E	10/20	2100/4500	29/13	44/63	1220	230V~	5,3	400V3~/28,9	2200	110
ADCS25E* <sup>2</sup>	11/22,5	2300/4900	30/14	45/64	1410	230V~	6,15	400V3~/32,5	2450	125

💧 Water heat - ADCS WL, coil for low water temperature ( $\leq 80$  °C) (IP20)

Type	Output* <sup>6</sup> [kW]	Airflow* <sup>3</sup> [m <sup>3</sup> /h]	$\Delta t$ * <sup>5,6</sup> [°C]	Water volume [l]	Sound level* <sup>4</sup> [dB(A)]	Output-motor [W]	Voltage motor [V]	Amperage motor [A]	Length [mm]	Weight [kg]
ADCS17WL* <sup>1</sup>	20	1500/3200	23/18	2,8	43/61	890	230V~	3,9	1700	85
ADCS22WL	29	2100/4400	24/19	3,6	44/62	1230	230V~	5,4	2200	110
ADCS25WL* <sup>2</sup>	33	2400/5000	24/19	4,0	45/63	1420	230V~	6,2	2450	125

\*<sup>1</sup>) Available only for horizontal mounting.

\*<sup>2</sup>) Available only for vertical mounting.

\*<sup>3</sup>) Lowest/highest airflow of totally 5 fan steps.

\*<sup>4</sup>) Conditions: Distance to the unit 5 metres. Directional factor: 2. Equivalent absorption area: 200 m<sup>2</sup>. At lowest/highest airflow.

\*<sup>5</sup>)  $\Delta t$  = temperature rise of passing air at maximum heat output and lowest/highest airflow.

\*<sup>6</sup>) Applicable at water temperature 60/40 °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.

⚡ Electrical heat - ACCS E (IP20)

Type	Outout steps [kW]	Airflow* <sup>2</sup> [m <sup>3</sup> /h]	$\Delta t$ * <sup>4</sup> [°C]	Sound level* <sup>3</sup> [dB(A)]	Voltage motor [V]	Amperage motor [A]	Voltage [V] Amperage [A] (heat)	Length [mm]	Weight [kg]
ACCS10E08* <sup>1</sup>	2,7/5,4/8,1	1050/2100	23/12	47/65	230V~	2,6	400V3~/11,7	1000	50
ACCS15E12* <sup>1</sup>	3,9/7,8/11	1500/3100	24/12	48/66	230V~	3,7	400V3~/16,9	1500	65
ACCS20E16	5,4/11/16	2100/4150	23/12	49/67	230V~	5,0	400V3~/23,4	2000	95
ACCS25E20	6,6/13/20	2550/5100	24/12	50/68	230V~	6,2	400V3~/28,6	2500	110
ACCS30E23	7,8/15/23	3000/5800	23/12	50/68	230V~	9,3	400V3~/33,8	3000	130

💧 Water heat - ACCS WL, coil for low water temperature ( $\leq 80$  °C) (IP20)

Type	Output* <sup>5</sup> H* <sup>6</sup> [kW] V* <sup>7</sup> [kW]	Airflow* <sup>2</sup> [m <sup>3</sup> /h]	$\Delta t$ * <sup>4,5</sup> H* <sup>6</sup> [°C] V* <sup>7</sup> [°C]	Water volume H* <sup>6</sup> [l] V* <sup>7</sup> [l]	Sound level* <sup>3</sup> [dB(A)]	Voltage motor [V]	Amperage motor [A]	Length [mm]	Weight [kg]
ACCS10WL* <sup>1</sup>	9,3 -	1000/1950	17/13 -	1,1 -	45/63	230V~	2,3	1000	50
ACCS15WL* <sup>1</sup>	18 -	1450/2900	23/18 -	1,9 -	46/64	230V~	3,3	1500	65
ACCS20WL	24 23	2000/3900	22/17 22/18	2,5 4,4	47/65	230V~	4,6	2000	95
ACCS25WL	30 26	2450/4750	23/18 21/16	3,3 4,4	48/66	230V~	5,6	2500	110
ACCS30WL	36 33	2850/5600	24/19 22/17	3,9 5,6	48/66	230V~	6,5	3000	130

\*<sup>1</sup>) Available only for horizontal mounting.

\*<sup>2</sup>) Lowest/highest airflow of totally 5 fan steps.

\*<sup>3</sup>) Conditions: Distance to the unit 5 metres. Directional factor: 2. Equivalent absorption area: 200 m<sup>2</sup>. At lowest/highest airflow.

\*<sup>4</sup>)  $\Delta t$  = temperature rise of passing air at maximum heat output and lowest/highest airflow.

\*<sup>5</sup>) Applicable at water temperature 60/40 °C, air temperature, in +18 °C.

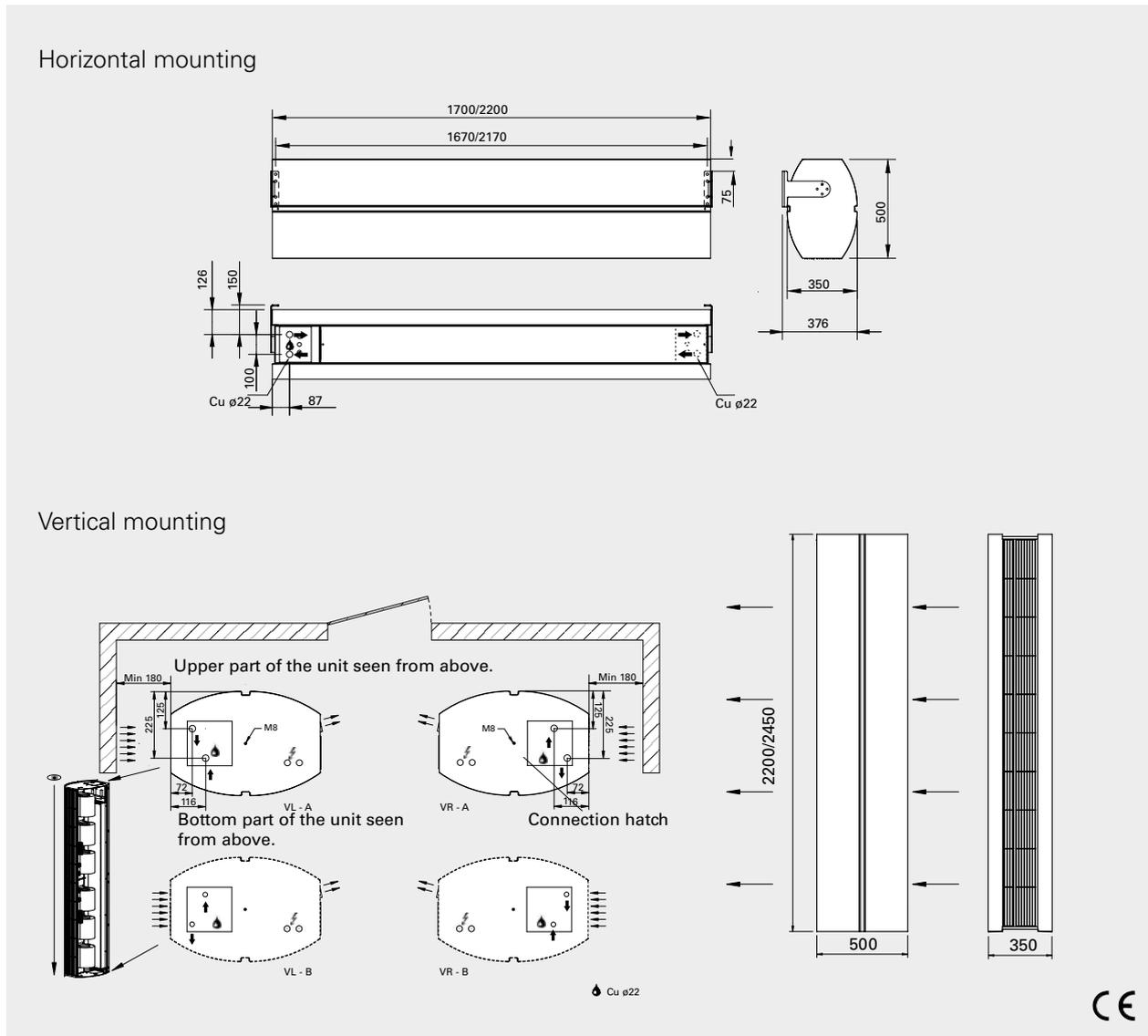
\*<sup>6</sup>) Horizontal mounting

\*<sup>7</sup>) Vertical mounting

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

For models with coil for high temperature water (WH), see [www.frico.se](http://www.frico.se).

Dimensions ADCS

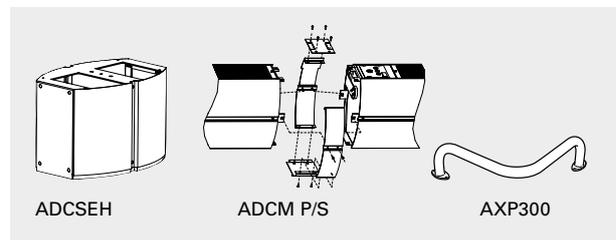


Accessories ADCS

**ADCSEH, extension hood**  
 Fills the space between the unit and the ceiling for vertical mounting and provides a neater installation. Height 100-1000 mm.

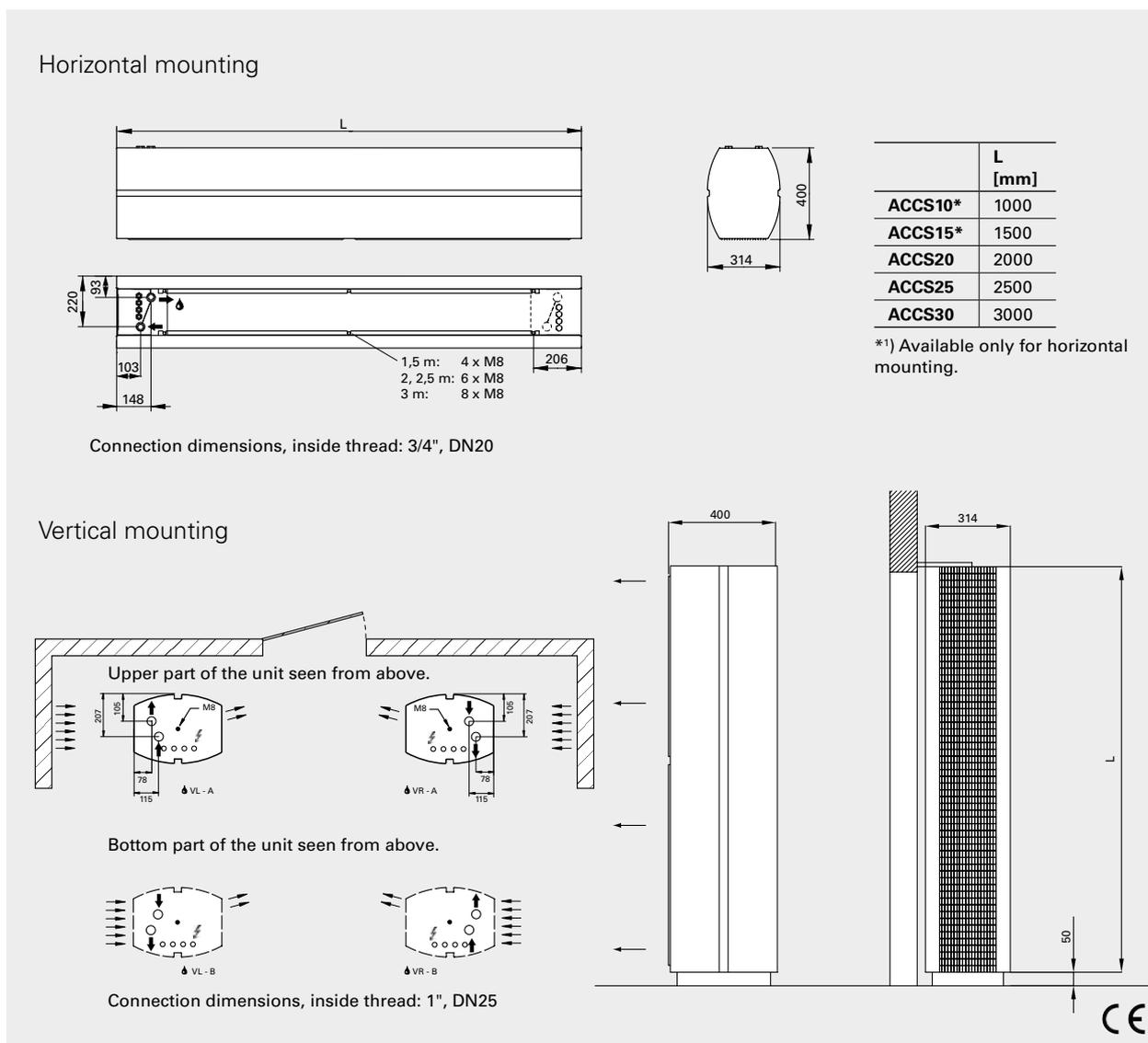
**ADCM P/S, joining kit**  
 Used to join horizontal units together for a sleek and unified installation. ADCMP for suspended installation and ADCMS for wall installation.

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



Type	Description
ADCSEH	Extension hood
ADCMP	Joining kit for suspended installation
ADCMS	Joining kit for wall installation
AXP300	Collision protection

## Dimensions ACCS



Commercial

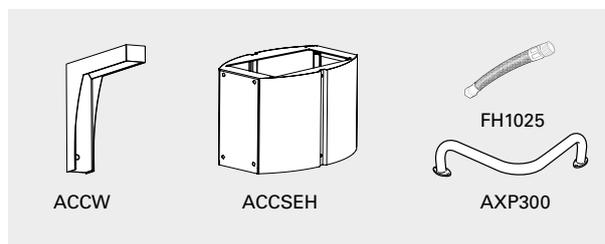
## Accessories ACCS

### ACCW, wall bracket

Brackets for installing unit horizontally on a wall. Two are required for 1 and 1.5 metre units, while 2 and 2.5 metre units need three and 3 metre units need four.

Available in three designs:

- ACCWBB, brushed stainless steel
- ACCWBP, polished stainless steel
- ACCWBMP, mirror polished stainless steel



### ACCSEH, extension hood

Fills the space between the unit and the ceiling for vertical mounting and provides a neater installation. Height 100-1000 mm.

### AXP300, collision protection

Floor placed protection against impact from e.g. shopping trolleys.

### FH1025, flexible hose

Flexible hose (DN25, 1" inside/outside thread) for easy connection to the pipe system.

Type	Description
ACCWBB	Wall bracket, brushed stainless steel
ACCWBP	Wall bracket, polished stainless steel
ACCW BMP	Wall bracket, mirror polished stainless steel
ACCSEH	Extension hood 100-1000 mm
AXP300	Collision protection
FH1025	Flexible hose DN25, inside/outside thread, length 1 m

PA3200C



## PA3200C

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

Recommended installation height 3,2 m\*

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.

- Remote control and integrated regulation.
- 3 fan steps and 2 electrical heating steps.
- Wall brackets included.
- The front is easy to remove, which facilitates installation and allows easy maintenance.
- Corrosion proof housing made of hot zinc-plate and powder enamelled steel panels. Plastic ends. Colour front: white, RAL 9016, NCS S 0500-N. Colour grille, rear section, ends and brackets: grey, RAL 7046.



Optimized airflow with Thermozone technology.

### ✿ Ambient, no heat - PA3200C A (IP21)

Type	Output [kW]	Airflow* <sup>1</sup> [m <sup>3</sup> /h]	Sound level* <sup>2</sup> [dB(A)]	Voltage motor [V]	Amperage motor [A]	Length [mm]	Weight [kg]
PA3210CA	0	1100/1750	46/57	230V~	0,7	1068	22
PA3215CA	0	1700/2750	46/59	230V~	1,0	1578	32
PA3220CA	0	2300/3500	50/60	230V~	1,3	2068	42

### ⚡ Electrical heat - PA3200C E (IP20)

Type	Output steps [kW]	Airflow* <sup>1</sup> [m <sup>3</sup> /h]	Δt* <sup>3</sup> [°C]	Sound level* <sup>2</sup> [dB(A)]	Voltage motor [V]	Amperage motor [A]	Voltage [V] Amperage [A] (heat)	Length [mm]	Weight [kg]
PA3210CE08	5/8	1100/1750	22/13	46/57	230V~	0,65	400V3~/11,5	1068	26
PA3215CE12	8/12	1700/2750	21/13	46/59	230V~	1,0	400V3~/17,3	1578	37
PA3220CE16	10/16	2300/3500	22/13	50/60	230V~	1,3	400V3~/23,1	2068	51

### 💧 Water heat - PA3200C W (IP21)

Type	Output* <sup>4</sup> [kW]	Airflow* <sup>1</sup> [m <sup>3</sup> /h]	Δt* <sup>3,4</sup> [°C]	Water volume [l]	Sound level* <sup>2</sup> [dB(A)]	Voltage motor [V]	Amperage motor [A]	Length [mm]	Weight [kg]
PA3210CW	8	1050/1700	16/14	1,3	45/55	230V~	0,65	1068	26
PA3215CW	14	1850/2700	17/15	2,1	46/57	230V~	0,7	1578	36
PA3220CW	18	2200/3300	18/16	2,7	49/58	230V~	1,3	2068	48

\*<sup>1</sup>) Lowest/highest airflow of totally 3 fan steps.

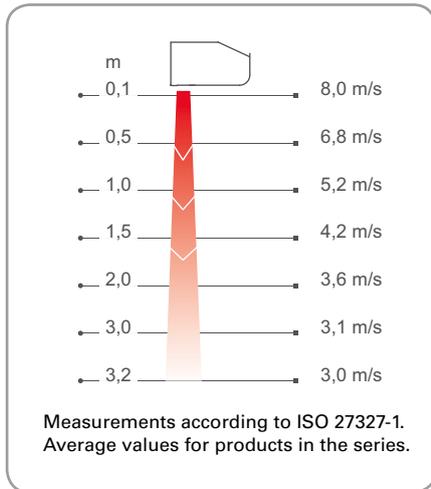
\*<sup>2</sup>) Conditions: Distance to the unit 5 metres. Directional factor: 2. Equivalent absorption area: 200 m<sup>2</sup>. At lowest/highest airflow.

\*<sup>3</sup>) Δt = temperature rise of passing air at maximum heat output and lowest/highest airflow.

\*<sup>4</sup>) Applicable at water temperature 60/40 °C, air temperature, in +18 °C.

\*) Recommended installation height varies depending on the relevant premises. Read how to choose the right air curtain on page 8.

Air velocity profile

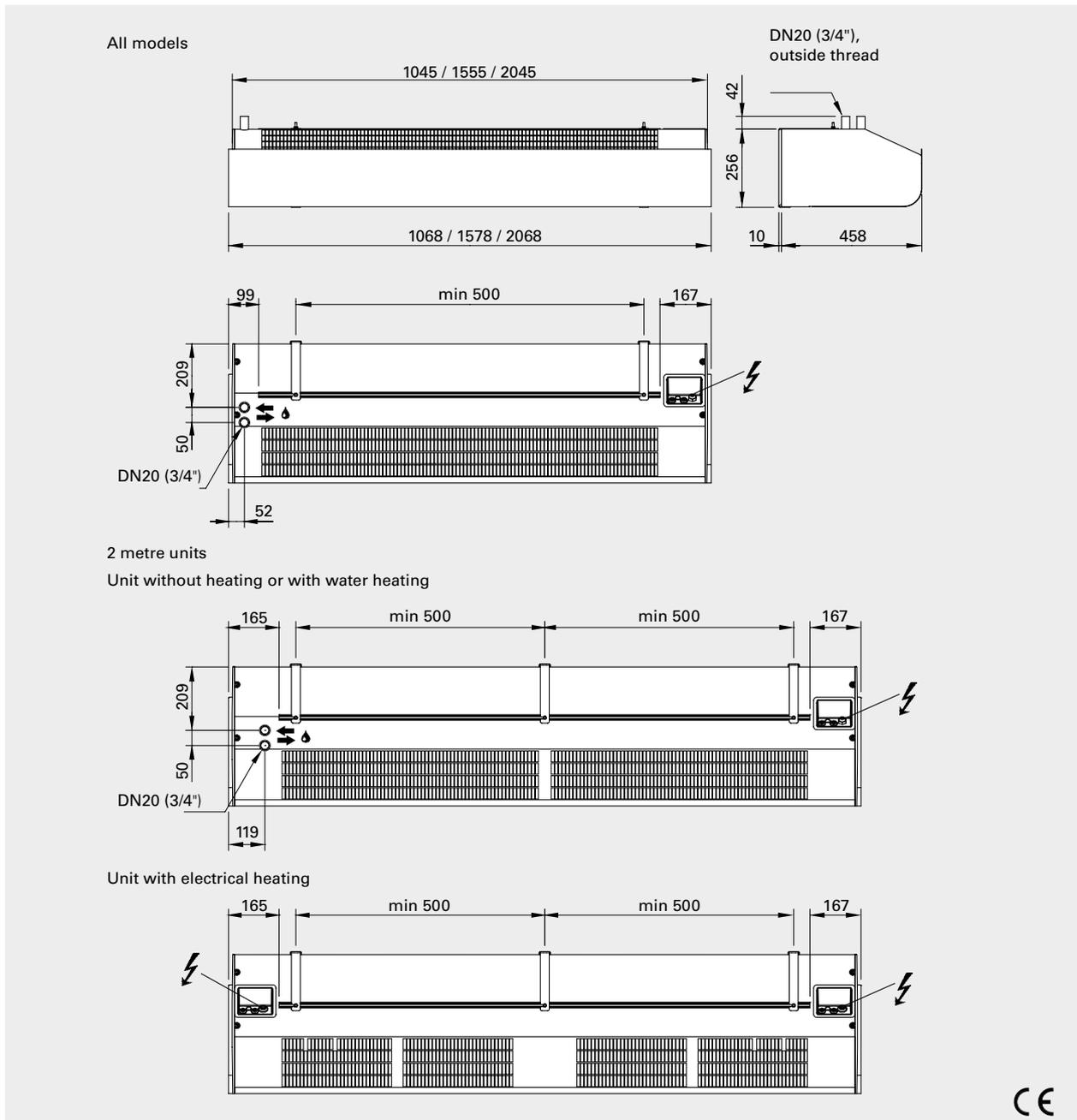


Control

The control system is integrated in the air curtain. The air curtain has a control panel discretely integrated in the gable end and can be controlled by a separate remote control. The air speed is set manually. The heat is controlled automatically.

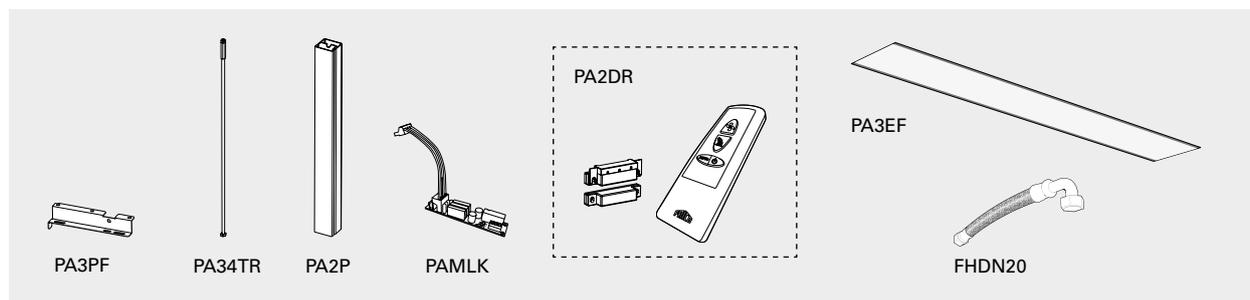
Door switch control PA2DR is available as an accessory for a door switch function. Possibility of using external on/off.

Dimensions



Commercial

## Controls and accessories



**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 PA2PF/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 PA2PF/PA3PF.

**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. For units with SIRE control (PA2500, AR3200) connection enables use of the provided motor protection terminals. For units without SIRE (PA2200/3200C, AR3200C), 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.

**Unit with water heating**

**PA3EF, 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.

**FHDN20, flexible hoses**  
Flexible hoses for easy and practical installation of water heated unit. FHDN20: length 350 mm. FHDN2010: length 1 m. DN20.

Valve kit VOT or VLSP is used to control the water flow. For more information see the "Controls" section.

Type	Description	Quantity included	Length
<b>PA3PF15</b>	Ceiling mounting brackets for 1 and 1,5 metre units	4	
<b>PA3PF20</b>	Ceiling mounting brackets for 2 metre units	6	
<b>PA34TR15</b>	Threaded bars for 1 and 1,5 metre units	4	1 m
<b>PA34TR20</b>	Threaded bars for 2 metre units	6	1 m
<b>PA2P15</b>	Hanging brackets for 1 and 1,5 metre units	2	1 m
<b>PA2P20</b>	Hanging brackets for 2 metre units	3	1 m
<b>PAMLK</b>	Motor alarm board	1	
<b>PA2DR</b>	Door switch control		
<b>PA3EF10</b>	External intake filter for 1 metre water heated units	1	
<b>PA3EF15</b>	External intake filter for 1,5 metre water heated units	1	
<b>PA3EF20</b>	External intake filter for 2 metre water heated units	1	
<b>FHDN20</b>	Flexible hoses DN20, inside thread, 90° bend	2	350 mm
<b>FHDN2010</b>	Flexible hoses DN20, inside thread, 90° bend	2	1 m



## AR3200C

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

Recommended installation height :

AR3200CA/E: 3,2 m

AR3200CW: 2,8 m

AR3200C is a compact air curtain intended for recessed mounting in commercial buildings and small industrial entrances.



Optimized airflow with Thermozone technology.

- Remote control and integrated regulation.
- 3 fan steps and 2 electrical heating steps.
- Reduced dimensions and integrated frame.
- Mounting with threaded bars. The threaded bars can also be fixed on the inside of the unit e.g. when mounted on a solid suspended ceiling.
- Corrosion proof frame and hatch made of hot zinc-plate and powder enamelled steel panels. Colour frame and hatch: white, RAL 9016, NCS S 0500-N. Colour grille: grey, RAL 7046. The frame and hatch can be painted in an optional colour. Non visible parts made of hot zinc plated steel panels.

### 🌀 Ambient, no heat - AR3200C A (IP21)

Type	Output [kW]	Airflow* <sup>1</sup> [m <sup>3</sup> /h]	Sound level* <sup>2</sup> [dB(A)]	Voltage motor [V]	Amperage motor [A]	Length [mm]	Weight [kg]
AR3210CA	0	1000/1800	43/57	230V~	0,7	1078	29
AR3215CA	0	1600/2900	43/57	230V~	1,3	1588	40
AR3220CA	0	2100/3900	44/60	230V~	1,6	2078	55

### ⚡ Electrical heat - AR3200C E (IP20)

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

### 💧 Water heat - AR3200C W (IP21)

Type	Output* <sup>4</sup> [kW]	Airflow* <sup>1</sup> [m <sup>3</sup> /h]	Δt* <sup>3,4</sup> [°C]	Water volume [l]	Sound level* <sup>2</sup> [dB(A)]	Amperage motor [A]	Intensité moteur [A]	Length [mm]	Weight [kg]
AR3210CW	8,2	1000/1500	19/16	1,1	44/53	230V~	0,6	1078	30
AR3215CW	14	1700/2600	19/16	1,7	48/56	230V~	1,0	1588	41
AR3220CW	18	2500/3150	18/17	2,3	50/56	230V~	1,2	2078	56

\*<sup>1</sup>) Lowest/highest airflow of totally 3 fan steps.

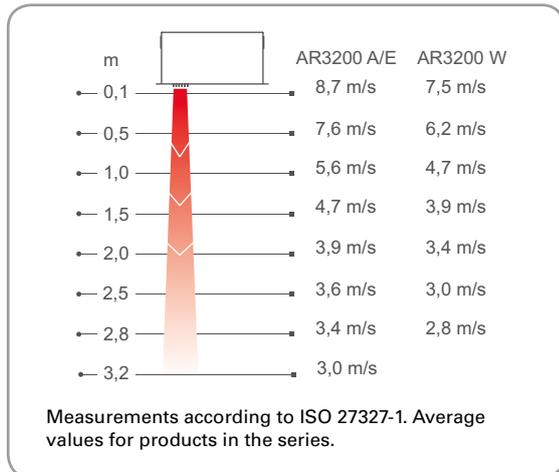
\*<sup>2</sup>) Conditions: Distance to the unit 5 metres. Directional factor: 2. Equivalent absorption area: 200 m<sup>2</sup>. At lowest/highest airflow.

\*<sup>3</sup>) Δt = temperature rise of passing air at maximum heat output and lowest/highest airflow.

\*<sup>4</sup>) Applicable at water temperature 60/40 °C, air temperature, in +18 °C.

# AR3200C

## Air velocity profile



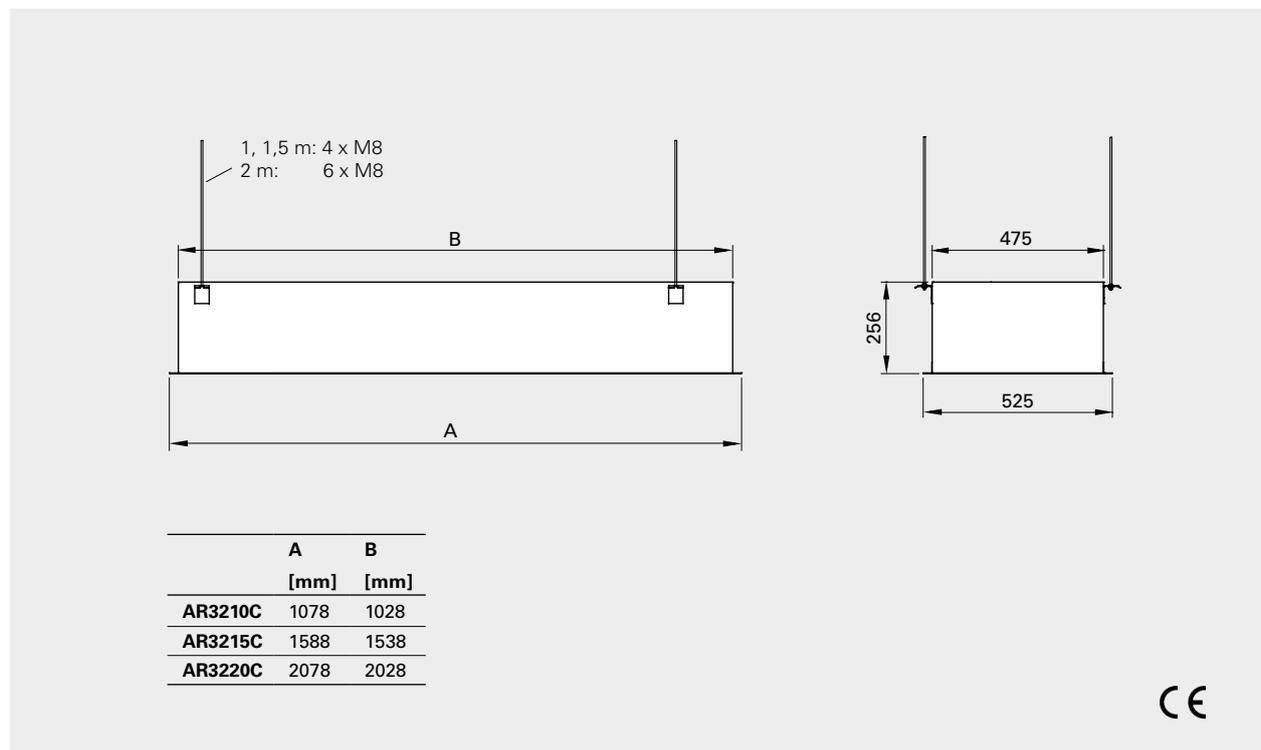
## Control

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.

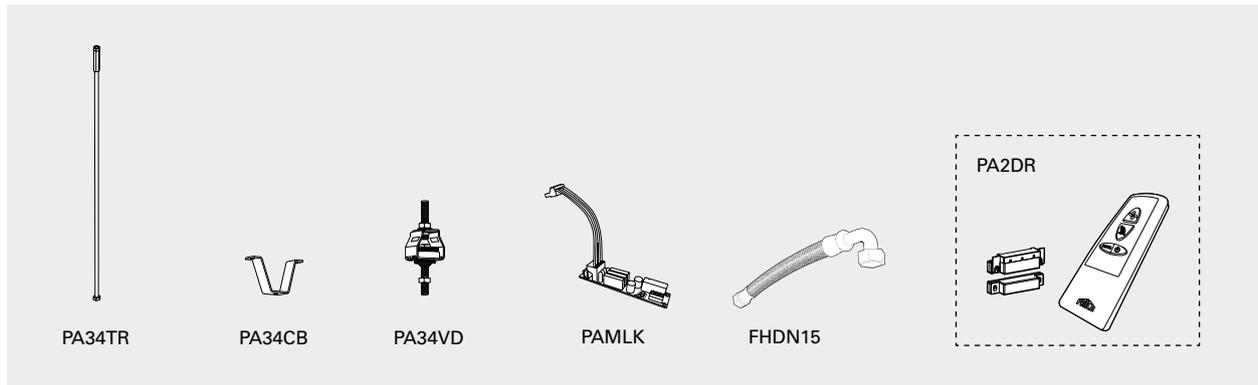


Door switch control PA2DR is available as an accessory for a door switch function. Possibility of using external on/off.

## Dimensions



## Accessories

**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.

**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. For units with SIRE control (PA2500, AR3200) connection enables use of the provided motor protection terminals. For units without SIRE (PA2200/3200C, AR3200C), use potential free contact on PAMLK board.

**FHDN15, flexible hoses**

Flexible hoses for easy and practical installation of water heated unit. DN15.

**PA2DR, door switch control**

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

Valve kit VOT or VLSP is used to control the water flow. For more information see the "Controls" section.

Type	Description	Quantity included	Length
<b>PA34TR15</b>	Threaded bars for 1 and 1,5 metre units	4	1 m
<b>PA34TR20</b>	Threaded bars for 2 metre units	6	1 m
<b>PA34CB15</b>	Ceiling brackets for 1 and 1,5 metre units	4	
<b>PA34CB20</b>	Ceiling brackets for 2 metre units	6	
<b>PA34VD15</b>	Vibration dampers for 1 and 1,5 metre units	4	
<b>PA34VD20</b>	Vibration dampers for 2 metre units	6	
<b>PAMLK</b>	Motor alarm board		
<b>FHDN15</b>	Flexible hoses DN15, inside thread, 90° bend	2	1 m
<b>PA2DR</b>	Door switch control		

AR3500/4200



## AR3500/4200

Recessed air curtain for commercial premises, with intelligent control

Recommended installation height \*

AR3500: 3,5 m

AR4200: 4,2 m

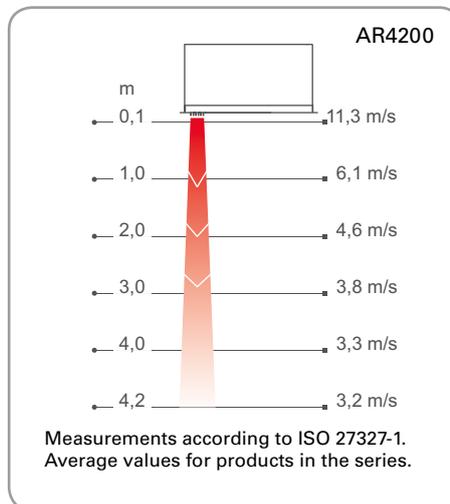
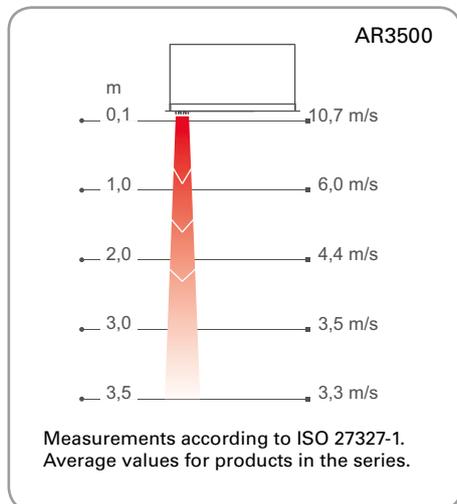
With its concealed placement, AR3500/4200 is very unobtrusive and with that particularly suitable for environments where the design is important.

- Low sound level.
- Mounting with threaded bars. The threaded bars can also be fixed on the inside of the unit e.g. when mounted on a solid suspended ceiling.
- Corrosion proof housing made of hot zinc-plate and powder enamelled steel panels. Colour frame and hatch: white, RAL 9016, NCS S 0500-N. Colour grille: grey, RAL 7046. The frame and hatch can be painted in an optional colour.



Optimized airflow with Thermozone technology.

Air velocity profile



Control



SIRe Basic



SIRe Competent



SIRe Advanced

This air curtain is supplied prepared for the SIRe control system that has many smart and energy saving functions. There are three different levels with different functionality to choose from, Basic, Competent or Advanced. Water heated units must always be supplemented with valves.

For further information and options, see the "Controls" section.

\*) Recommended installation height varies depending on the relevant premises. Read how to choose the right air curtain on page 8.

Recommended installation height 3,5 m

☼ Ambient, no heat - AR3500 A (IP20)

Type	Output [kW]	Airflow*1 [m³/h]	Sound level*2 [dB(A)]	Voltage Amperage (control)	Length [mm]	Weight [kg]
AR3510A	0	1100/2300	42/62	230V~/2,45 A	1057	38
AR3515A	0	1550/3400	43/63	230V~/3,5 A	1567	51
AR3520A	0	2200/4800	45/64	230V~/5,2 A	2073	70

⚡ Electrical heat - AR3500 E (IP20)

Type	Output steps [kW]	Airflow*1 [m³/h]	$\Delta t^{*3}$ [°C]	Sound level*2 [dB(A)]	Voltage Amperage (control)	Voltage Amperage (heat)	Length [mm]	Weight [kg]
AR3510E09	4,5/9	1100/2300	25/12	42/62	230V~/2,45 A	400 V3~/13 A	1057	42
AR3515E14	7/13,5	1550/3400	27/13	43/63	230V~/3,5 A	400 V3~/19,5 A	1567	58
AR3520E18	9/18	2200/4800	25/11	45/64	230V~/5,2 A	400 V3~/26 A	2073	78

💧 Water heat - AR3500 W (IP20)

Type	Output*4 [kW]	Airflow*1 [m³/h]	$\Delta t^{*3,4}$ [°C]	Water volume [l]	Sound level*2 [dB(A)]	Voltage [V]	Amperage [A]	Length [mm]	Weight [kg]
AR3510W	9,4	1100/2300	16/12	1,3	42/61	230V~	2,6	1057	42
AR3515W	14	1550/3400	16/12	2,1	42/62	230V~	3,6	1567	58
AR3520W	21	2200/4800	16/13	2,9	44/63	230V~	5,3	2073	78

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

Recommended installation height 4,2 m

☼ Ambient, no heat - AR4200 A (IP20)

Type	Output [kW]	Airflow*1 [m³/h]	Sound level*2 [dB(A)]	Voltage Amperage (control)	Length [mm]	Weight [kg]
AR4210A	0	1150/2800	46/60,5	230V~/4,1 A	1021	50
AR4215A	0	1650/3900	47/62	230V~/5,2 A	1530	70
AR4220A	0	2350/5600	49/63	230V~/8,1 A	2021	93
AR4225A	0	2850/6700	50/64	230V~/9,3 A	2533	118

⚡ Electrical heat - AR4200 E (IP20)

Type	Output steps [kW]	Airflow*1 [m³/h]	$\Delta t^{*3}$ [°C]	Sound level*2 [dB(A)]	Voltage Amperage (control)	Voltage Amperage (heat)	Length [mm]	Weight [kg]
AR4210E12	3,9/7,8/12	1150/2800	31/13	46/60,5	230V~/4,1 A	400 V3~/17 A	1021	58
AR4215E18	6,0/12/18	1650/3900	33/14	47/62	230V~/5,2 A	400 V3~/26 A	1530	81
AR4220E24	7,8/15/23	2350/5600	31/13	49/63	230V~/8,1 A	400 V3~/34 A	2021	107
AR4225E30	9,9/20/30	2850/6700	32/13	50/64	230V~/9,3 A	400 V3~/43 A	2533	137

💧 Water heat - AR4200 W (IP20)

Type	Output*4 [kW]	Airflow*1 [m³/h]	$\Delta t^{*3,4}$ [°C]	Water volume [l]	Sound level*2 [dB(A)]	Voltage [V]	Amperage [A]	Length [mm]	Weight [kg]
AR4210W	17	1100/2700	24/18	1,89	40/60	230V~	4,0	1021	57
AR4215W	25	1600/3800	25/19	2,97	42/60,5	230V~	5,5	1530	78
AR4220W	35	2300/5500	25/19	4,01	43/62	230V~	8,0	2021	105
AR4225W	44	2700/6500	26/20	5,07	45/62,5	230V~	9,6	2533	134

\*1) Lowest/highest airflow of totally 5 fan steps.

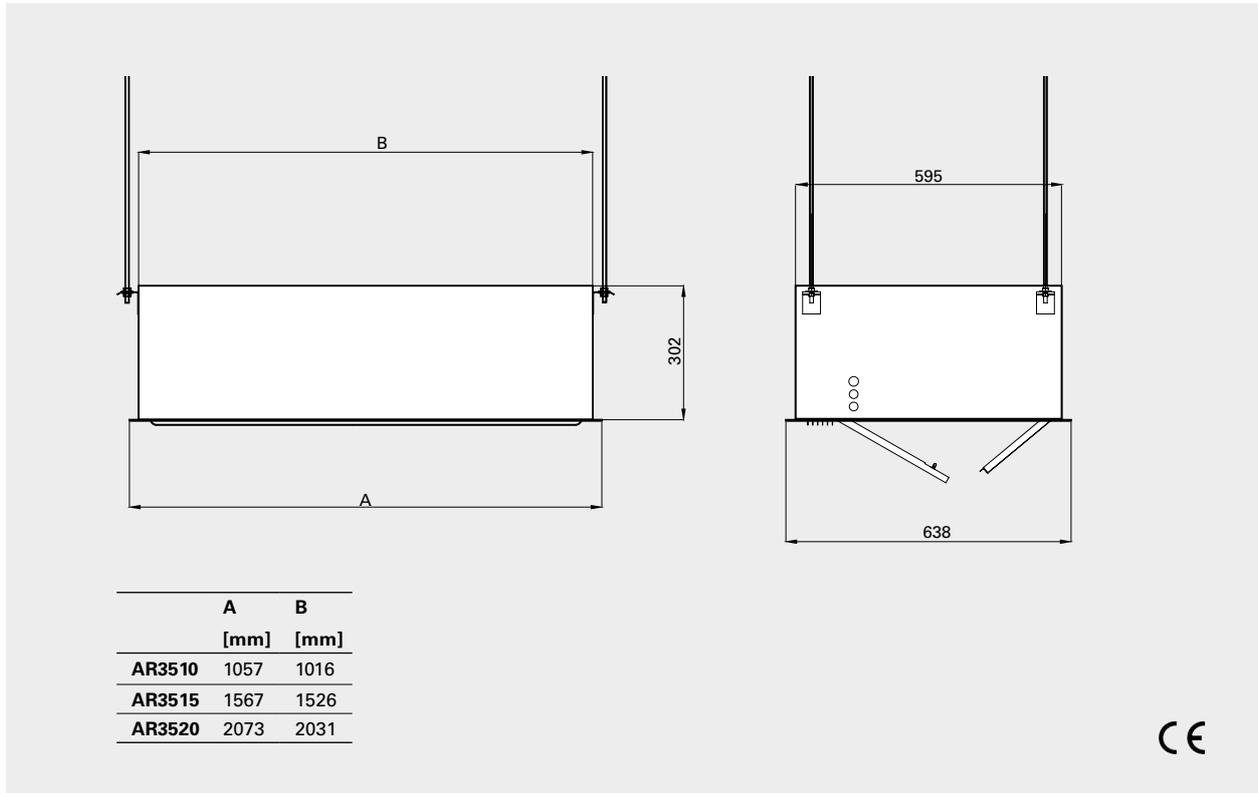
\*2) Conditions: Distance to the unit 5 metres. Directional factor: 2. Equivalent absorption area: 200 m². At lowest/highest airflow.

\*3)  $\Delta t$  = temperature rise of passing air at maximum heat output and lowest/highest airflow.

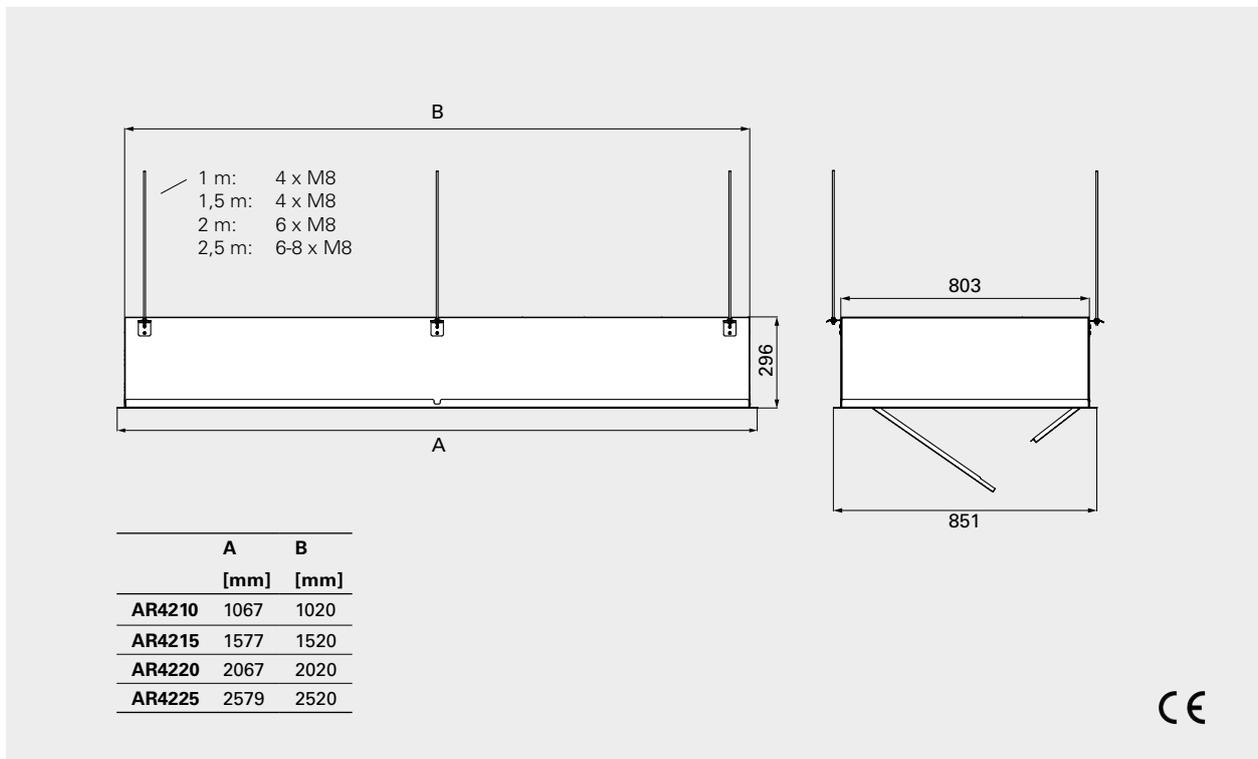
\*4) Applicable at water temperature 60/40 °C, air temperature, in +18 °C.

For models with coil for low temperature water (WLL), see [www.frico.se](http://www.frico.se).

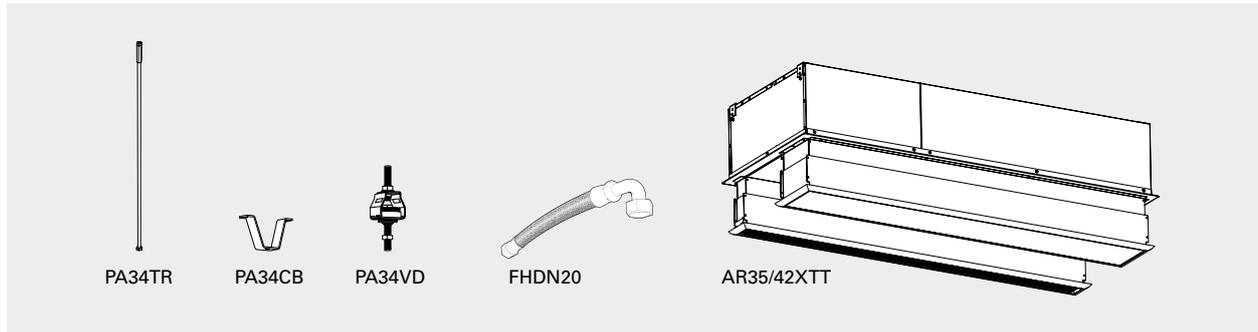
Dimensions AR3500



Dimensions AR4200



## Accessories

**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.

**FHDN20, flexible hoses**

Flexible hoses for easy and practical installation of water heated unit. FHDN20: length 350 mm. FHDN2010: length 1 m. DN20.

**AR35/42XTT, extension**

Outlet/inlet extension for a discreet installation with only the outlet and inlet visible in the ceiling.

Type	Description	Quantity included	Length
<b>PA34TR15</b>	Threaded bars for AR3510/3515/3520, AR4210/4215	4	1 m
<b>PA34TR20</b>	Threaded bars for AR4220	6	1 m
<b>PA34TR30</b>	Threaded bars for AR4225	8	1 m
<b>PA34CB15</b>	Ceiling brackets for AR3510/3515/3520, AR4210/4215	4	
<b>PA34CB20</b>	Ceiling brackets for AR4220	6	
<b>PA34CB30</b>	Ceiling brackets for AR4225	8	
<b>PA34VD15</b>	Vibration dampers for AR3510/3515/3520, AR4210/4215	4	
<b>PA34VD20</b>	Vibration dampers for AR4220	6	
<b>PA34VD30</b>	Vibration dampers for AR4225	8	
<b>FHDN20</b>	Flexible hoses DN20, inside thread, 90° bend	2	350 mm
<b>FHDN2010</b>	Flexible hoses DN20, inside thread, 90° bend	2	1 m
<b>AR35XTT10</b>	Outlet/inlet extension AR3510		130-210 mm
<b>AR35XTT15</b>	Outlet/inlet extension AR3515		130-210 mm
<b>AR35XTT20</b>	Outlet/inlet extension AR3520		130-210 mm
<b>AR42XTT10</b>	Outlet/inlet extension AR4210		146-235 mm
<b>AR42XTT15</b>	Outlet/inlet extension AR4215		146-235 mm
<b>AR42XTT20</b>	Outlet/inlet extension AR4220		146-235 mm
<b>AR42XTT25</b>	Outlet/inlet extension AR4225		146-235 mm

PA3500/4200



## PA3500/4200

Stylish air curtain for commercial and industrial premises, with intelligent control

Recommended installation height \*

PA3500: 3,5 m

PA4200: 4,2 m

PA3500/4200 has a modern and stylish design developed to fit all entrances. The air curtain is available for horizontal, vertical and recessed installation.

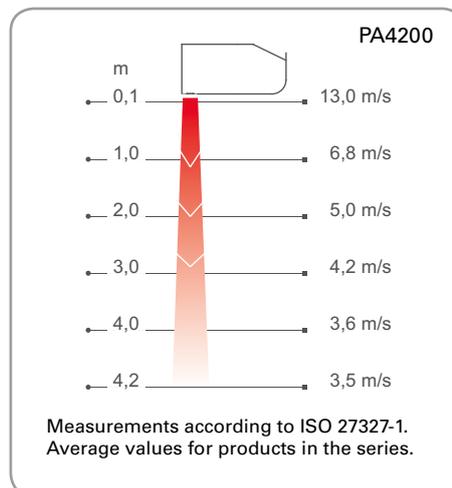
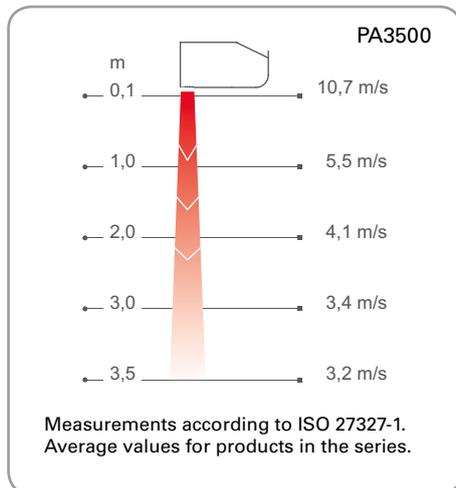


Optimized airflow with Thermozone technology.

- The air curtain is complemented with a vertical kit for vertical installation.
- Recommended installation width 5-6 m (2 units, one on each side).
- The accessory Design kit enables a neat installation with concealed mountings, pipes and cables.
- Corrosion proof housing made of hot zinc-plate and powder enamelled steel panels. Colour front and service hatch: white, RAL 9016, NCS S 0500-N. Colour grille, rear section and ends: grey, RAL 7046.



Air velocity profile



Control



SIRe Basic



SIRe Competent



SIRe Advanced

This air curtain is supplied prepared for the SIRe control system that has many smart and energy saving functions. There are three different levels with different functionality to choose from, Basic, Competent or Advanced. Water heated units must always be supplemented with valves.

For further information and options, see the "Controls" section.

Recommended installation height 3,5 m

✿ Ambient, no heat - PA3500 A (IP21)

Type	Output [kW]	Airflow* <sup>1</sup> [m <sup>3</sup> /h]	Sound level* <sup>2</sup> [dB(A)]	Output- motor [W]	Voltage motor [V]	Amperage motor [A]	Length [mm]	Weight [kg]
PA3510A	0	900/2000	41/61	580	230V~	2,6	1039	36
PA3515A	0	1400/3100	42/62	880	230V~	3,9	1549	50
PA3520A	0	1750/4000	43/63	1130	230V~	5,0	2039	65
PA3525A	0	2400/5250	44/64	1500	230V~	6,5	2549	79

⚡ Electrical heat - PA3500 E (IP20)

Type	Output step [kW]	Airflow* <sup>1</sup> [m <sup>3</sup> /h]	$\Delta t$ * <sup>3</sup> [°C]	Sound level* <sup>2</sup> [dB(A)]	Output- motor [W]	Voltage motor [V]	Amperage motor [A]	Voltage [V] Amperage [A] (heat)	Length [mm]	Weight [kg]
PA3510E08	2,7/5,4/8,1	900/2000	27/12	41/61	580	230V~	2,6	400V3~/11,7	1039	44
PA3515E12	3,9/7,8/12	1400/3100	26/12	42/62	880	230V~	3,9	400V3~/16,9	1549	63
PA3520E16	5,4/11/16	1750/4000	28/12	43/63	1130	230V~	5,0	400V3~/23,4	2039	80
PA3525E20	6,6/13/20	2400/5250	25/11,5	44/64	1500	230V~	6,5	400V3~/28,6	2549	104

💧 Water heat - PA3500 WL, coil for low water temperature ( $\leq 80$  °C) (IP21)

Type	Output* <sup>4</sup> [kW]	Airflow* <sup>1</sup> [m <sup>3</sup> /h]	$\Delta t$ * <sup>3,4</sup> [°C]	Water volume [l]	Sound level* <sup>2</sup> [dB(A)]	Output- motor [W]	Voltage motor [V]	Amperage motor [A]	Length [mm]	Weight [kg]
PA3510WL	12	950/1900	23/19	1,5	43/60	540	230V~	2,35	1039	43
PA3515WL	19	1350/2900	25/20	2,4	44/61	770	230V~	3,4	1549	60
PA3520WL	26	1800/3900	25/20	3,3	45/62	970	230V~	4,3	2039	75
PA3525WL	35	2300/5100	25/20	4,2	46/63	1310	230V~	5,7	2549	95

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

Recommended installation height 4,2 m

✿ Ambient, no heat - PA4200 A (IP21)

Type	Output [kW]	Airflow* <sup>1</sup> [m <sup>3</sup> /h]	Sound level* <sup>2</sup> [dB(A)]	Output motor [W]	Voltage motor [V]	Amperage motor [A]	Length [mm]	Weight [kg]
PA4210A	0	950/2400	46/66	920	230V~	4,0	1039	43
PA4215A	0	1300/3500	47/67	1260	230V~	5,5	1549	56
PA4220A	0	1900/4800	48/68	1840	230V~	8,0	2039	75
PA4225A	0	2300/5900	49/69	2140	230V~	9,3	2549	91

⚡ Electrical heat - PA4200 E (IP20)

Type	Output steps [kW]	Airflow* <sup>1</sup> [m <sup>3</sup> /h]	$\Delta t$ * <sup>3</sup> [°C]	Sound level* <sup>2</sup> [dB(A)]	Output motor [W]	Voltage motor [V]	Amperage motor [A]	Voltage [V] Amperage [A] (heat)	Length [mm]	Weight [kg]
PA4210E12	3,9/7,8/12	950/2400	38/15	46/66	920	230V~	4,0	400V3~/16,9	1039	50
PA4215E18	6,0/12/18	1300/3500	42/16	47/67	1260	230V~	5,5	400V3~/26,0	1549	71
PA4220E24	7,8/15/23	1900/4800	37/14	48/68	1840	230V~	8,0	400V3~/33,8	2039	94
PA4225E30	9,9/20/30	2300/5900	39/15	49/69	2140	230V~	9,3	400V3~/42,9	2549	113

💧 Water heat - PA4200 WL, coil for low water temperature ( $\leq 80$  °C) (IP21)

Type	Output* <sup>4</sup> [kW]	Airflow* <sup>1</sup> [m <sup>3</sup> /h]	$\Delta t$ * <sup>3,4</sup> [°C]	Water volume [l]	Sound level* <sup>2</sup> [dB(A)]	Output motor [W]	Voltage motor [V]	Amperage motor [A]	Length [mm]	Weight [kg]
PA4210WL	16	1050/2600	25/18	1,9	44/64	920	230V~	4,0	1039	50
PA4215WL	25	1600/3800	25/19	3,0	45/65	1330	230V~	5,8	1549	67
PA4220WL	35	2200/5300	25/19	4,1	46/66	1930	230V~	8,4	2039	90
PA4225WL	44	2800/6400	26/20	5,2	47/67	2280	230V~	9,9	2549	109

\*<sup>1</sup>) Lowest/highest airflow of totally 5 fan steps.

\*<sup>2</sup>) Conditions: Distance to the unit 5 metres. Directional factor: 2. Equivalent absorption area: 200 m<sup>2</sup>. At lowest/highest airflow.

\*<sup>3</sup>)  $\Delta t$  = temperature rise of passing air at maximum heat output and lowest/highest airflow.

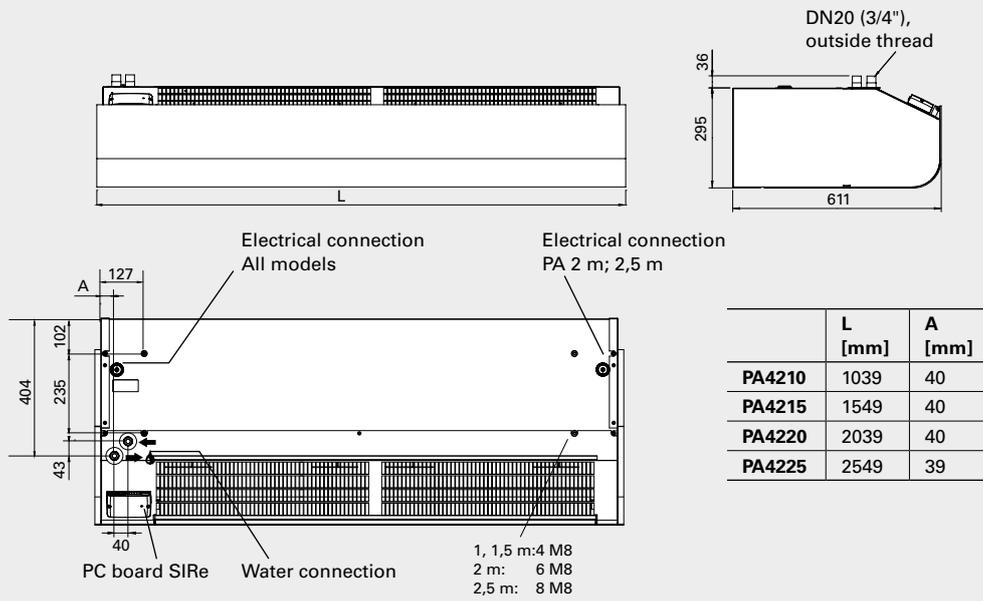
\*<sup>4</sup>) Applicable at water temperature 60/40 °C, air temperature, in +18 °C.

For models with coil for high temperature (WH) or low temperature water (WLL), see [www.frico.se](http://www.frico.se).



Dimensions PA4200

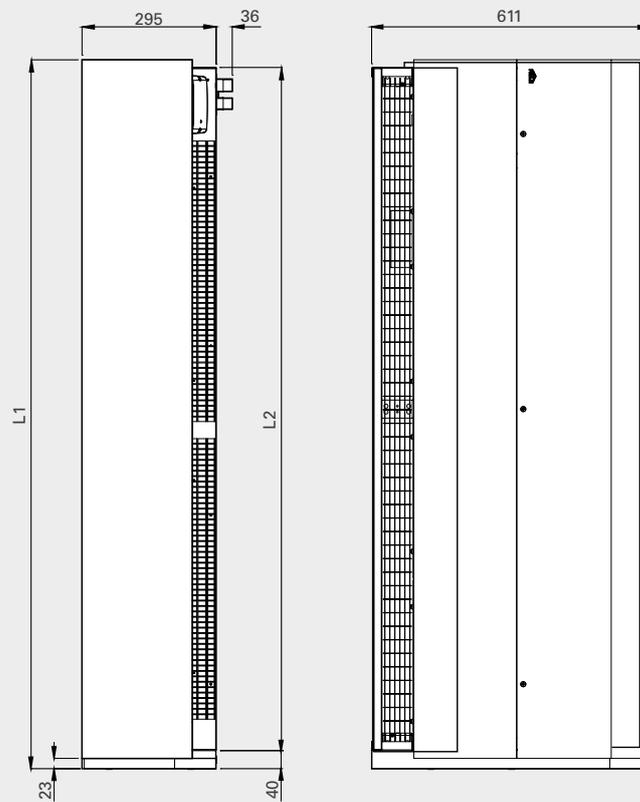
Horizontal mounting



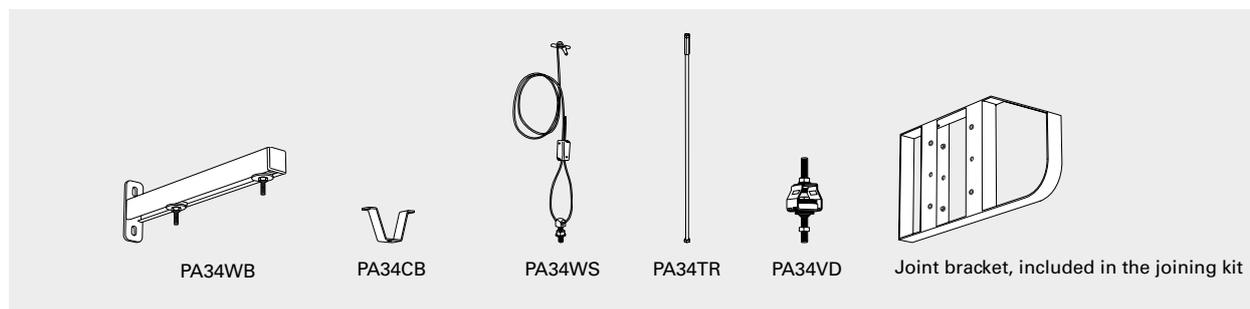
Vertical mounting

The unit can be reversed and placed on either side of the door. Connections and PC Board SIRE 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).

	L1 [mm]	L2 [mm]
PA4215	1572	1515
PA4220	2062	2004
PA4225	2572	2515



## Accessories PA3500/4200 - Horizontal mounting

**PA34WB, wall brackets**

Brackets for installing unit horizontally on a wall.

**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**

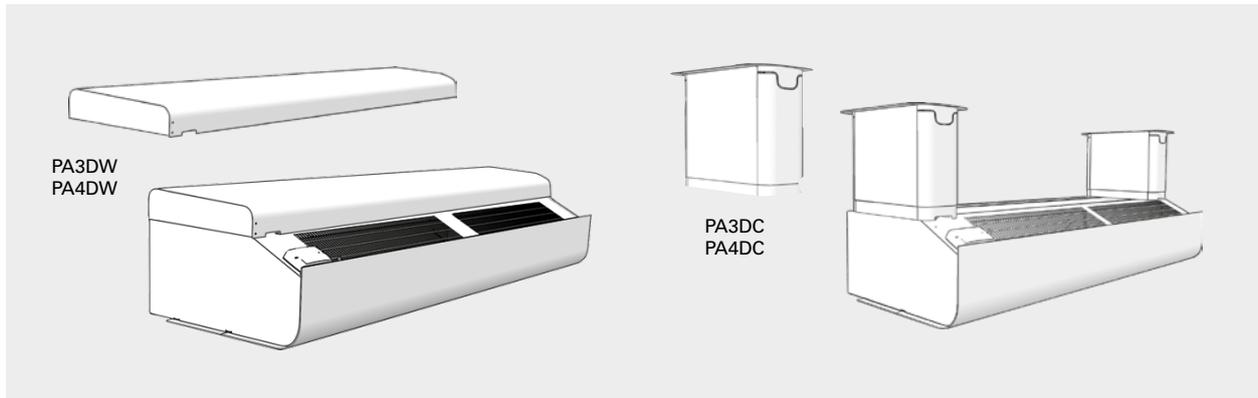
Reduces vibrations for ceiling installations with threaded bars.

**PA3JK/PA4JK, joining kit**

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

Type	Description	Quantity included	Length
<b>PA34WB15</b>	Wall brackets for 1 and 1,5 metre units	2	400 mm
<b>PA34WB20</b>	Wall brackets for 2 metre units	3	400 mm
<b>PA34WB30</b>	Wall brackets for 2,5 metre units	4	400 mm
<b>PA34CB15</b>	Ceiling brackets for 1 and 1,5 metre units	4	
<b>PA34CB20</b>	Ceiling brackets for 2 metre units	6	
<b>PA34CB30</b>	Ceiling brackets for 2,5 metre units	8	
<b>PA34WS15</b>	Wire suspension kit for 1 and 1,5 metre units	4	3 m
<b>PA34WS20</b>	Wire suspension kit for 2 metre units	6	3 m
<b>PA34WS30</b>	Wire suspension kit for 2,5 metre units	8	3 m
<b>PA34TR15</b>	Threaded bars for 1 and 1,5 metre units	4	1 m
<b>PA34TR20</b>	Threaded bars for 2 metre units	6	1 m
<b>PA34TR30</b>	Threaded bars for 2,5 metre units	8	1 m
<b>PA34VD15</b>	Vibration dampers for 1 and 1,5 metre units	4	
<b>PA34VD20</b>	Vibration dampers for 2 metre units	6	
<b>PA34VD30</b>	Vibration dampers for 2,5 metre units	8	
<b>PA3JK</b>	Joining kit for PA3500	1	
<b>PA4JK</b>	Joining kit for PA4200	1	

Accessories PA3500/4200 - Horizontal mounting



PA3DW/PA4DW, design kit for wall mounting  
Used to conceal mountings, cables and pipes. Used together with ceiling brackets PA34WB.

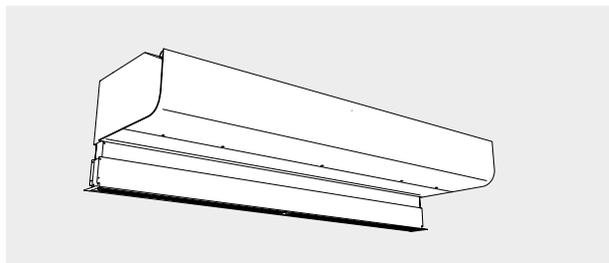
PA3DC/PA4DC, design kit for ceiling mounting  
Used to conceal mountings, cables and pipes. The design kit has a telescope function that can be adapted for the installation. It can also be extended with one or more extension parts.

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.

Type	Description	LxHxW [mm]
PA3DW10	Design kit for wall mounting PA3510	87x382x1006
PA3DW15	Design kit for wall mounting PA3515	87x382x1516
PA3DW20	Design kit for wall mounting PA3520	87x382x2006
PA3DW25	Design kit for wall mounting PA3525	87x382x2516
PA4DW10	Design kit for wall mounting PA4210	87x424x1006
PA4DW15	Design kit for wall mounting PA4215	87x424x1516
PA4DW20	Design kit for wall mounting PA4220	87x424x2006
PA4DW25	Design kit for wall mounting PA4225	87x424x2516

Type	Description
PA3DCS	Design kit for ceiling mounting PA3500, small, 200-300 mm (1 piece)
PA3DCM	Design kit for ceiling mounting PA3500, medium, 300-500 mm (1 piece)
PA3DCL	Design kit for ceiling mounting PA3500, large, 500-900 mm (1 piece)
PA3DXT	Design kit for ceiling mounting PA3500, extension, 420 mm (1 piece)
PA4DCS	Design kit for ceiling mounting PA4200, small, 200-300 mm (1 piece)
PA4DCM	Design kit for ceiling mounting PA4200, medium, 300-500 mm (1 piece)
PA4DCL	Design kit for ceiling mounting PA4200, large, 500-900 mm (1 piece)
PA4DXT	Design kit for ceiling mounting PA4200, extension, 420 mm (1 piece)

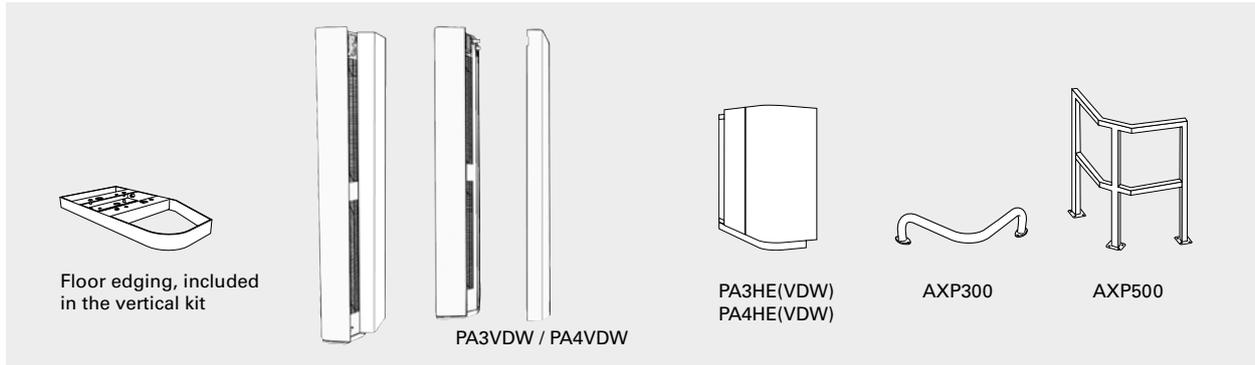
Recessed mounting in suspended ceilings



PA3XT/PA4XT, outlet extension  
Outlet extension with telescopic function. Used for recessed installation of units in suspended ceilings.

Type	Description
PA3XT10	Outlet extension for PA3510, 130-200 mm
PA3XT15	Outlet extension for PA3515, 130-200 mm
PA3XT20	Outlet extension for PA3520, 130-200 mm
PA3XT25	Outlet extension for PA3525, 130-200 mm
PA4XT10	Outlet extension for PA4210, 130-200 mm
PA4XT15	Outlet extension for PA4215, 130-200 mm
PA4XT20	Outlet extension for PA4220, 130-200 mm
PA4XT25	Outlet extension for PA4225, 130-200 mm

Accessories PA3500/4200 - Vertical mounting



**PA3JK/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.

**PA3HE/PA4HE, extension hood**  
Fills the space between the unit and the ceiling for vertical mounting and provides a neater installation.  
**PA3HEVDW/PA4HEVDW:** extension hood for units with design kit.

**PA3VDW/PA4VDW, design kit for vertical mounting**  
Used to conceal cables and pipes.

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

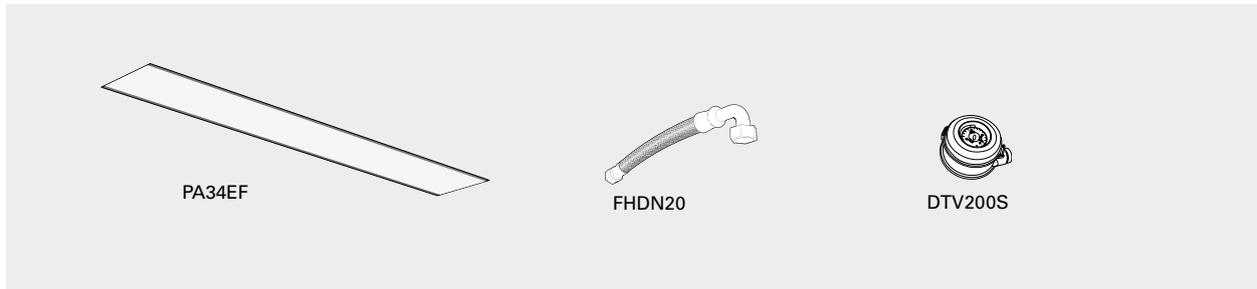
**AXP500, collision protection**  
Floor placed protection against impact from e.g. forklifts. Height 1 m. Colour: red, other colours on request.

Type	Description
<b>PA3JK</b>	Vertical kit PA3500
<b>PA3VDW15</b>	Design kit for vertical mounting PA3515
<b>PA3VDW20</b>	Design kit for vertical mounting PA3520
<b>PA3VDW25</b>	Design kit for vertical mounting PA3525
<b>PA4JK</b>	Vertical kit PA4200
<b>PA4VDW15</b>	Design kit for vertical mounting PA4215
<b>PA4VDW20</b>	Design kit for vertical mounting PA4220
<b>PA4VDW25</b>	Design kit for vertical mounting PA4225

Type	Description
<b>PA3HE</b>	Extension hood for PA3500
<b>PA3HEVDW</b>	Extension hood for PA3500 units with design kit
<b>PA4HE</b>	Extension hood for PA4200
<b>PA4HEVDW</b>	Extension hood for PA4200 units with design kit
<b>AXP300</b>	Collision protection
<b>AXP500</b>	Collision protection



## Accessories PA3500/4200 - Unit with water heating



**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.

**FHDN20, flexible hoses**  
 Flexible hoses for easy and practical installation of water heated unit. FHDN20: length 350 mm. FHDN2010: length 1 m. DN20.

**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.

Type	Description	Quantity included	Length
<b>PA34EF10</b>	External intake filter for 1 metre units		
<b>PA34EF15</b>	External intake filter for 1,5 metre units		
<b>PA34EF20</b>	External intake filter for 2 metre units		
<b>PA34EF25</b>	External intake filter for 2,5 metre units		
<b>FHDN20</b>	Flexible hoses DN20, inside thread, 90° bend	2	350 mm
<b>FHDN2010</b>	Flexible hoses DN20, inside thread, 90° bend	2	1 m
<b>DTV200S</b>	Filter pressure guard		



5,5 m



#### AGS5500/AGR5500

AGS/AGR is a powerful air curtain series intended for industrial doors but it can also be used for entryways in other large premises such as shopping malls. AGS5500 is surface mounted and AGR5500 is intended for recessed mounting.

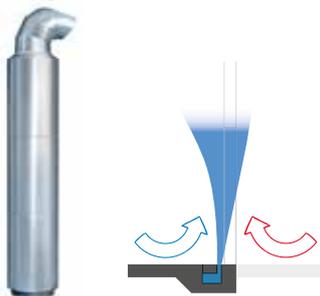
With its many clever, energy saving functions, the air curtain gives effective protection, specially adapted for your door.

4,5 m  
6,0 m



#### AGI4500/6000

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.



#### UF600

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.

The background image shows a large industrial facility with blue structural columns and overhead metal walkways. A red forklift is visible in the lower right corner. A white semi-transparent box is overlaid on the bottom half of the image, containing text.

## 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.

## AGS5500/AGR5500



## AGS5500/AGR5500

Air curtain for doors in industrial and large premises, with intelligent control

Recommended installation height 5,5 m\*

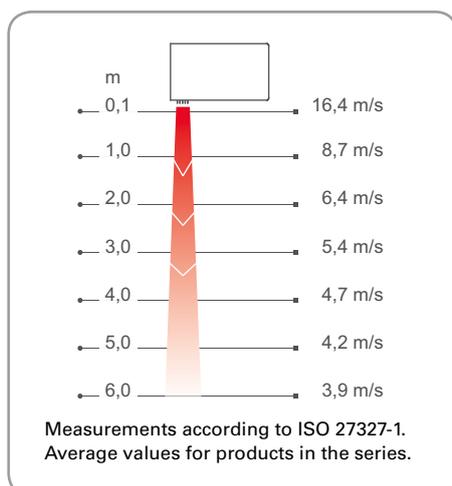
AGS/AGR is a powerful air curtain series intended for industrial doors but it can also be used for entryways in other large premises such as shopping malls. AGS5500 is surface mounted and AGR5500 is intended for recessed mounting.

- The following models are available for special order:
  - with electrical heating
  - with alternative water connections
  - for vertical installation
- The grille is easy to clean from the outside.
- Adjustable outlet grille makes it possible to direct the air for optimum air curtain effect.
- Corrosion proof housing made of hot zinc-plate and powder enamelled steel panels. Colour: white, RAL 9016, NCS S 0500-N. Colour grille: grey, RAL 7046.



Optimized airflow with Thermozone technology.

### Air velocity profile



### Control

SIRe Basic      SIRe Competent      SIRe Advanced

This air curtain is supplied prepared for the SIRe control system that has many smart and energy saving functions. There are three different levels with different functionality to choose from, Basic, Competent or Advanced. Water heated units must always be supplemented with valves. For further information and options, see the "Controls" section.

## Surface mounting

☼ Ambient, no heat - AGS5500 A (IP24)

Type	Output [kW]	Airflow* <sup>1</sup> [m <sup>3</sup> /h]	Sound level* <sup>2</sup> [dB(A)]	Voltage motor [V]	Amperage motor [A]	Length [mm]	Weight [kg]
AGS5515A	0	2500/5800	51/70	230V~	8,1	1515	109
AGS5520A	0	3750/8700	52/72	230V~	12,1	2010	144
AGS5525A	0	5000/11600	53/73	230V~	16,2	2520	183
AGS5530A	0	6250/14500	55/74	230V~	20,3	3030	218

💧 Water heat - AGS5500 WL, coil for low water temperature ( $\leq 80$  °C) (IP24)

Type	Output* <sup>4</sup> [kW]	Airflow* <sup>1</sup> [m <sup>3</sup> /h]	$\Delta t$ * <sup>3,4</sup> [°C]	Water volume [l]	Sound level* <sup>2</sup> [dB(A)]	Voltage motor [V]	Amperage motor [A]	Length [mm]	Weight [kg]
AGS5515WL	26	2500/5500	19/14	4,0	50/70	230V~	7,7	1515	129
AGS5520WL	45	3750/8250	22/16	8,1	51/71	230V~	11,6	2010	169
AGS5525WL	59	5000/11000	21/16	9,2	52/72	230V~	15,4	2520	213
AGS5530WL	71	6250/13750	20/15	11,0	54/74	230V~	19,3	3030	258

## Recessed mounting

☼ Ambient, no heat - AGR5500 A (IP24)

Type	Output [kW]	Airflow* <sup>1</sup> [m <sup>3</sup> /h]	Sound level* <sup>2</sup> [dB(A)]	Voltage motor [V]	Amperage motor [A]	Length [mm]	Weight [kg]
AGR5515A	0	2500/5800	51/70	230V~	8,1	1515	129
AGR5520A	0	3750/8700	52/72	230V~	12,1	2010	169
AGR5525A	0	5000/11600	53/73	230V~	16,2	2520	213
AGR5530A	0	6250/14500	55/74	230V~	20,3	3030	258

💧 Water heat - AGR5500 WL, coil for low water temperature ( $\leq 80$  °C) (IP24)

Type	Output* <sup>4</sup> [kW]	Airflow* <sup>1</sup> [m <sup>3</sup> /h]	$\Delta t$ * <sup>3,4</sup> [°C]	Water volume [l]	Sound level* <sup>2</sup> [dB(A)]	Voltage motor [V]	Amperage motor [A]	Length [mm]	Weight [kg]
AGR5515WL	26	2500/5500	19/14	4,0	50/70	230V~	7,7	1515	149
AGR5520WL	45	3750/8250	22/16	8,1	51/71	230V~	11,6	2010	194
AGR5525WL	59	5000/11000	21/16	9,2	52/72	230V~	15,4	2520	243
AGR5530WL	71	6250/13750	20/15	11,0	54/74	230V~	19,3	3030	298

\*<sup>1</sup>) Lowest/highest airflow of totally 5 fan steps.

\*<sup>2</sup>) Conditions: Distance to the unit 5 metres. Directional factor: 2. Equivalent absorption area: 200 m<sup>2</sup>. At lowest/highest airflow.

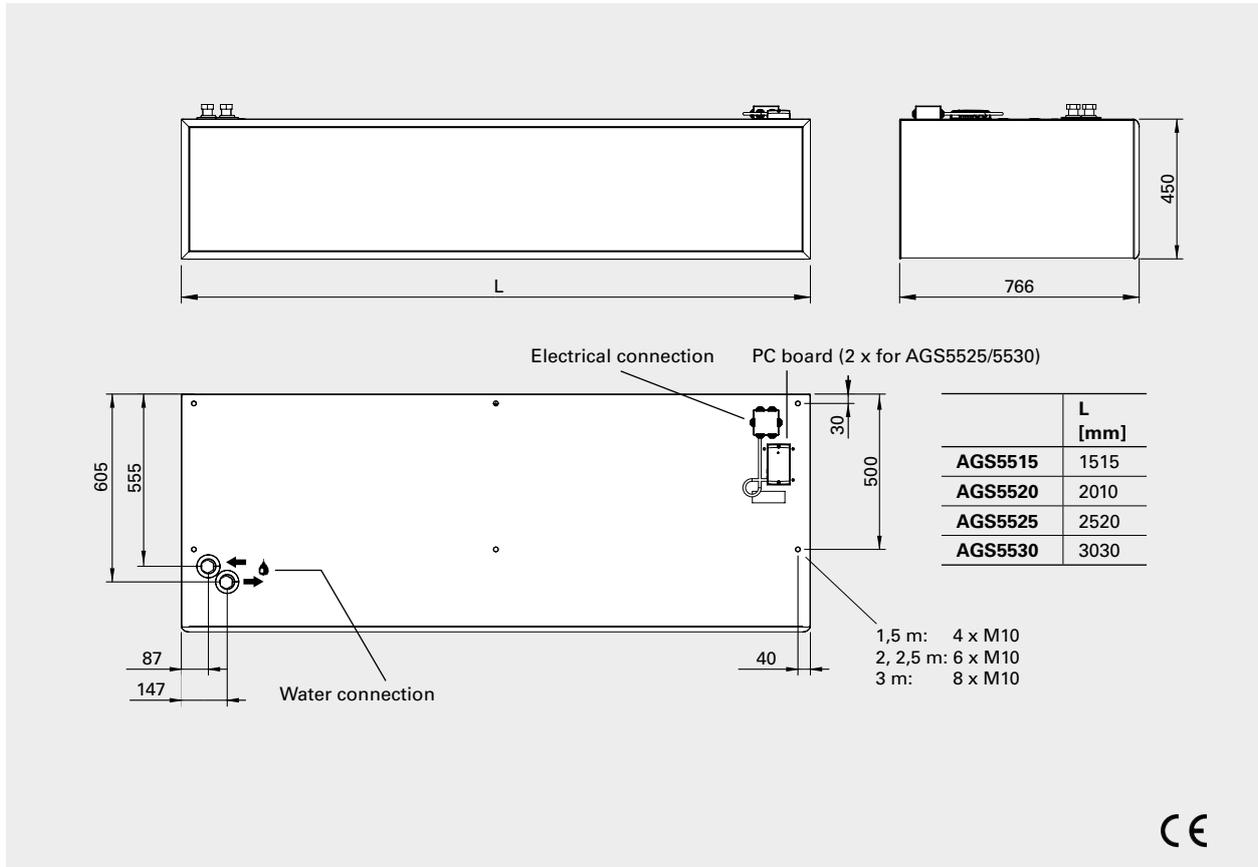
\*<sup>3</sup>)  $\Delta t$  = temperature rise of passing air at maximum heat output and lowest/highest airflow.

\*<sup>4</sup>) Applicable at water temperature 60/40 °C, air temperature, in +18 °C.

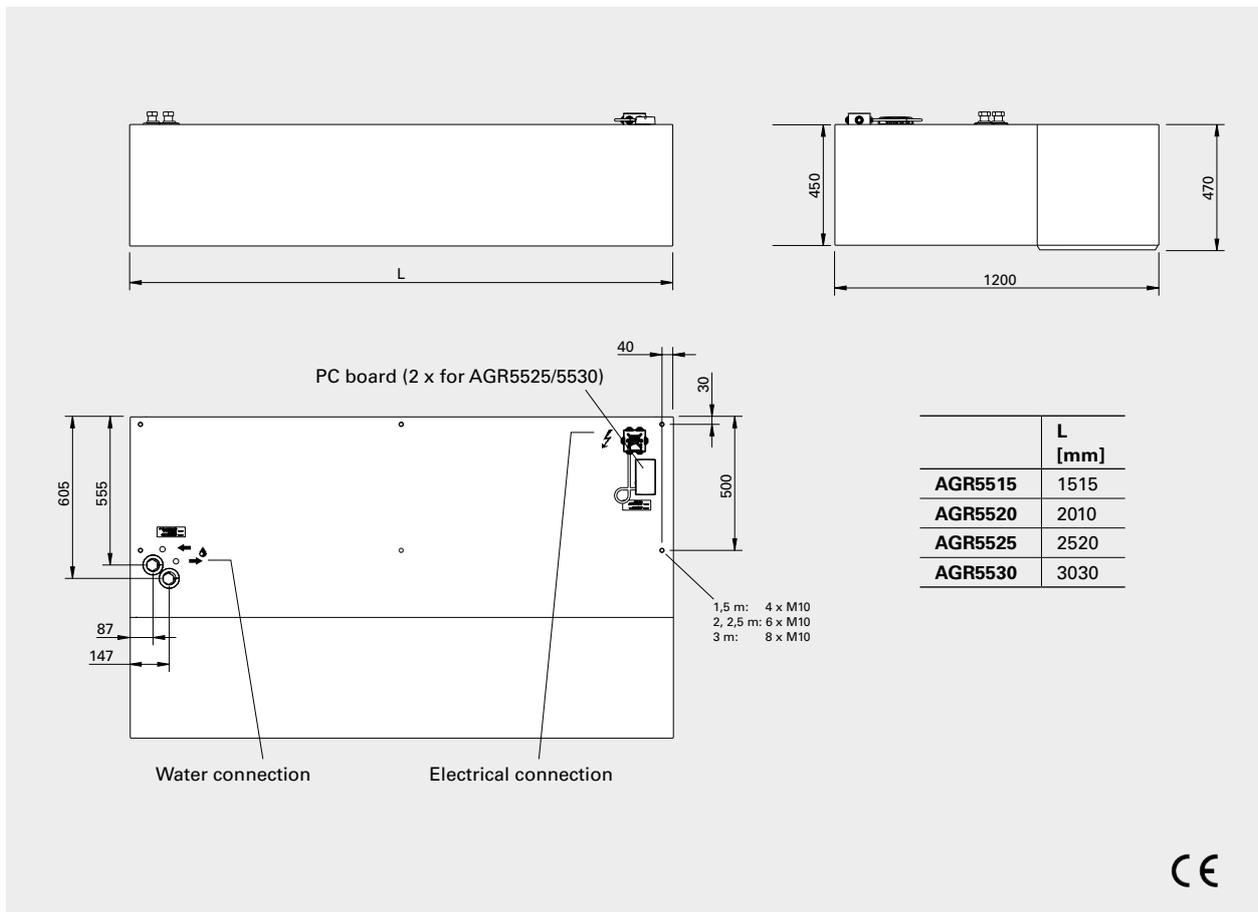
Models 1,5m – 2,5m approved for 220V/1ph/60Hz are available on request. Product performance for 220V/1ph/60Hz will differ from stated data.

For models with coil for high temperature water (WH), see [www.frico.se](http://www.frico.se).

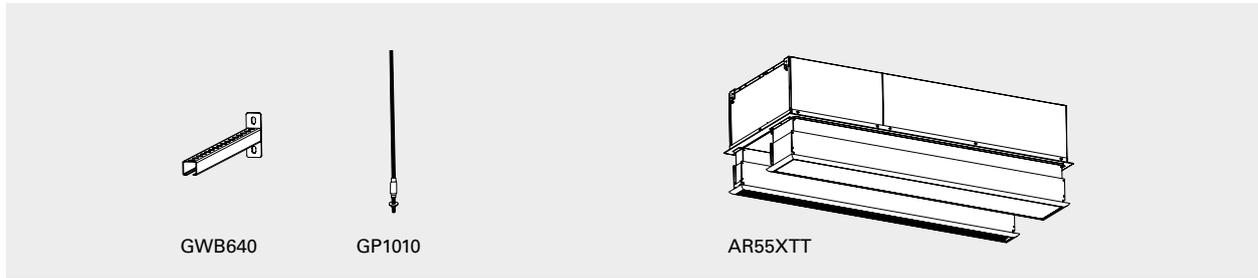
Dimensions AGS5500



Dimensions AGR5500



Accessories



**GWB640, wall bracket**  
 Brackets for installing unit horizontally on a wall. Two are required for 1 and 1.5 metre units, while 2 and 2.5 metre units need three and 3 metre units need four.

**AR55XTT, extension**  
 Outlet/inlet extension for a discreet installation with only the outlet and inlet visible in the ceiling.

**GP1010, threaded bar**  
 Threaded bar for mounting in ceilings. Length 1 m. M10. Four are required for 1 and 1.5 metre units, while 2 and 2.5 metre units need six and 3 metre units need eight.

Type	Description	Length
<b>GWB640</b>	Wall bracket	640 mm
<b>GP1010</b>	Threaded bar	1 m
<b>AR55XTT15</b>	Outlet/inlet extension AGR5515	133-200 mm
<b>AR55XTT20</b>	Outlet/inlet extension AGR5520	133-200 mm
<b>AR55XTT25</b>	Outlet/inlet extension AGR5525	133-200 mm
<b>AR55XTT30</b>	Outlet/inlet extension AGR5530	133-200 mm



## AGI4500/6000



AGIH4500



AGIV6000

## AGI4500/6000

Robust air curtain for large industrial doors

Recommended installation height \*

AGI4500: 4,5 m

AGI6000: 6 m

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.

- Simple suspension using fixing nuts on the upper side for installation with threaded rod.
- Adjustable outlet grille makes it possible to direct the air for optimum air curtain effect.
- AGI4500: Corrosion proof housing made of alu-zinc coated steel panels.  
AGI6000: Corrosion proof housing made of hot zinc-plate and powder enamelled steel panels.  
Colour: grey, RAL9006.

🌀 Ambient, no heat - AGIH4500 A Horizontal mounting (IP54)

Type	Output [kW]	Airflow [m³/h]	Sound level* <sup>1</sup> [dB(A)]	Voltage motor [V]	Amperage motor [A]	Length [mm]	Weight [kg]
AGIH4515A	0	5500	59	400V3~	1,1	1500	70
AGIH4520A	0	7300	60	400V3~	1,5	2000	90
AGIH4525A	0	9100	61	400V3~	1,9	2500	110
AGIH4530A	0	10900	62	400V3~	2,2	3000	130

💧 Water heat - AGIH4500 WL, coil for low water temperature (≤80 °C) Horizontal mounting (IP54)

Type	Output* <sup>3</sup> [kW]	Airflow [m³/h]	Δt* <sup>2,3</sup> [°C]	Water volume [l]	Sound level* <sup>1</sup> [dB(A)]	Voltage motor [V]	Amperage motor [A]	Length [mm]	Weight [kg]
AGIH4515WL	25	5500	13	7,2	59	400V3~	1,1	1500	90
AGIH4520WL	35	7300	14	9,7	60	400V3~	1,5	2000	110
AGIH4525WL	46	9100	15	12,3	61	400V3~	1,9	2500	130
AGIH4530WL	55	10900	15	14,6	62	400V3~	2,2	3000	150

🌀 Ambient, no heat - AGIV4500 A Vertical mounting (IP54)

Type	Output [kW]	Airflow [m³/h]	Sound level* <sup>1</sup> [dB(A)]	Voltage motor [V]	Amperage motor [A]	Height [mm]	Weight [kg]
AGIV4515A	0	5500	59	400V3~	1,1	1550	75
AGIV4520A	0	7300	60	400V3~	1,5	2050	95
AGIV4525A	0	9100	61	400V3~	1,9	2550	115
AGIV4530A	0	10900	62	400V3~	2,2	3050	135

💧 Water heat - AGIV4500 WL, coil for low water temperature (≤80 °C) Vertical mounting (IP54)

Type	Output* <sup>3</sup> [kW]	Airflow [m³/h]	Δt* <sup>2,3</sup> [°C]	Water volume [l]	Sound level* <sup>1</sup> [dB(A)]	Voltage motor [V]	Amperage motor [A]	Height [mm]	Weight [kg]
AGIV4515WL	25	5500	13	7,2	59	400V3~	1,1	1550	95
AGIV4520WL	35	7300	14	9,7	60	400V3~	1,5	2050	115
AGIV4525WL	46	9100	15	12,3	61	400V3~	1,9	2550	135
AGIV4530WL	55	10900	15	14,6	62	400V3~	2,2	3050	155

\*<sup>1</sup>) Conditions: Distance to the unit 5 metres. Directional factor: 2. Equivalent absorption area: 200 m<sup>2</sup>.

\*<sup>2</sup>) Δt = temperature rise of passing air at maximum heat output and highest airflow.

\*<sup>3</sup>) Applicable at water temperature 60/40 °C, air temperature, in +18 °C.

✿ Ambient, no heat - AGIH6000 A Horizontal mounting (IP54)

Type	Output [kW]	Airflow [m³/h]	Sound level*1 [dB(A)]	Voltage motor [V]	Amperage motor [A]	Length [mm]	Weight [kg]
AGIH6012A	0	6600	68	400V3~	1,9	1200	51
AGIH6018A	0	9600	70	400V3~	2,8	1800	75
AGIH6024A	0	12600	71	400V3~	3,8	2400	97
AGIH6030A	0	15600	72	400V3~	4,7	3000	120

💧 Water heat - AGIH6000 WL, coil for low water temperature (≤80 °C) Horizontal mounting (IP54)

Type	Output*3 [kW]	Airflow [m³/h]	Δt*2,3 [°C]	Water volume [l]	Sound level*1 [dB(A)]	Voltage motor [V]	Amperage motor [A]	Length [mm]	Weight [kg]
AGIH6012WL	32	6600	15	6,6	68	400V3~	1,9	1200	82
AGIH6018WL	46	9600	14	10,1	70	400V3~	2,8	1800	125
AGIH6024WL	61	12600	14	14,0	71	400V3~	3,8	2400	165
AGIH6030WL	77	15600	14	17,6	72	400V3~	4,7	3000	205

✿ Ambient, no heat - AGIV6000 A Vertical mounting (IP54)

Type	Output [kW]	Airflow [m³/h]	Sound level*1 [dB(A)]	Voltage motor [V]	Amperage motor [A]	Height [mm]	Weight [kg]
AGIV6012A	0	6600	68	400V3~	1,9	1250	56
AGIV6018A	0	9600	70	400V3~	2,8	1850	80
AGIV6024A	0	12600	71	400V3~	3,8	2450	102
AGIV6030A	0	15600	72	400V3~	4,7	3050	125

💧 Water heat - AGIV6000 WL, coil for low water temperature (≤80 °C) Vertical mounting (IP54)

Type	Output*3 [kW]	Airflow [m³/h]	Δt*2,3 [°C]	Water volume [l]	Sound level*1 [dB(A)]	Voltage motor [V]	Amperage motor [A]	Height [mm]	Weight [kg]
AGIV6012WL	32	6600	15	6,6	68	400V3~	1,9	1250	87
AGIV6018WL	46	9600	14	10,1	70	400V3~	2,8	1850	130
AGIV6024WL	61	12600	14	14,0	71	400V3~	3,8	2450	170
AGIV6030WL	77	15600	14	17,6	72	400V3~	4,7	3050	210

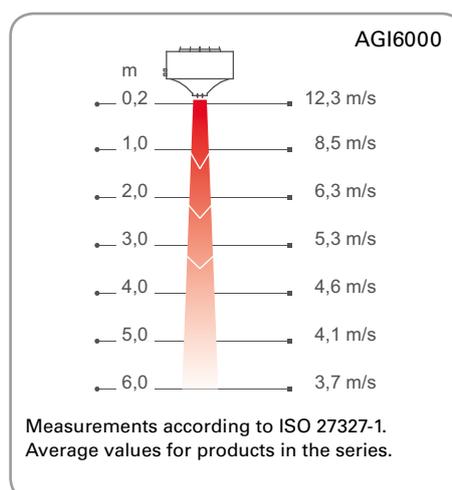
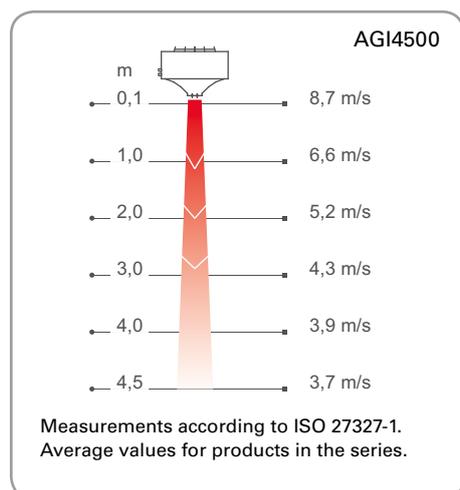
\*1) Conditions: Distance to the unit 5 metres. Directional factor: 2. Equivalent absorption area: 200 m².

\*2) Δt = temperature rise of passing air at maximum heat output and highest airflow.

\*3) Applicable at water temperature 60/40 °C, air temperature, in +18 °C.

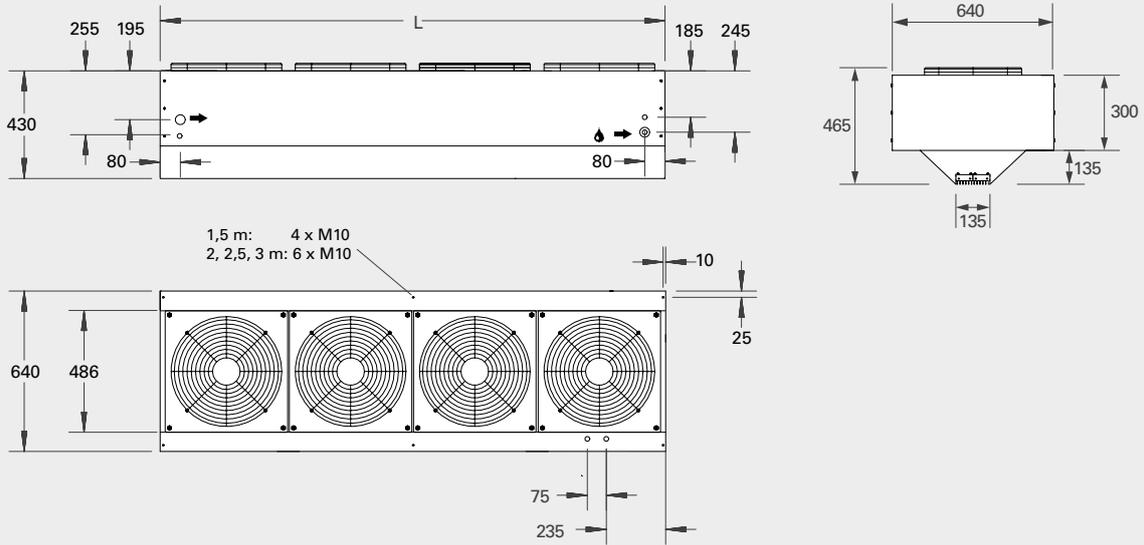
Approved for 380V/3ph/60Hz. Product performance for 380V/3ph/60Hz will differ from stated data. For models with coil for high temperature water (WH), see [www.frico.se](http://www.frico.se).

Air velocity profile



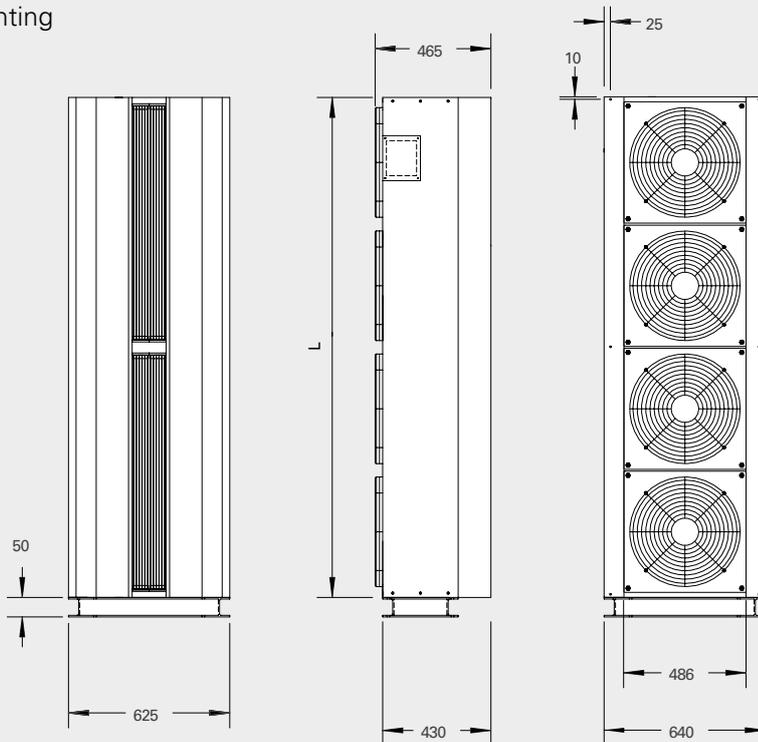
Dimensions AGI4500

Horizontal mounting



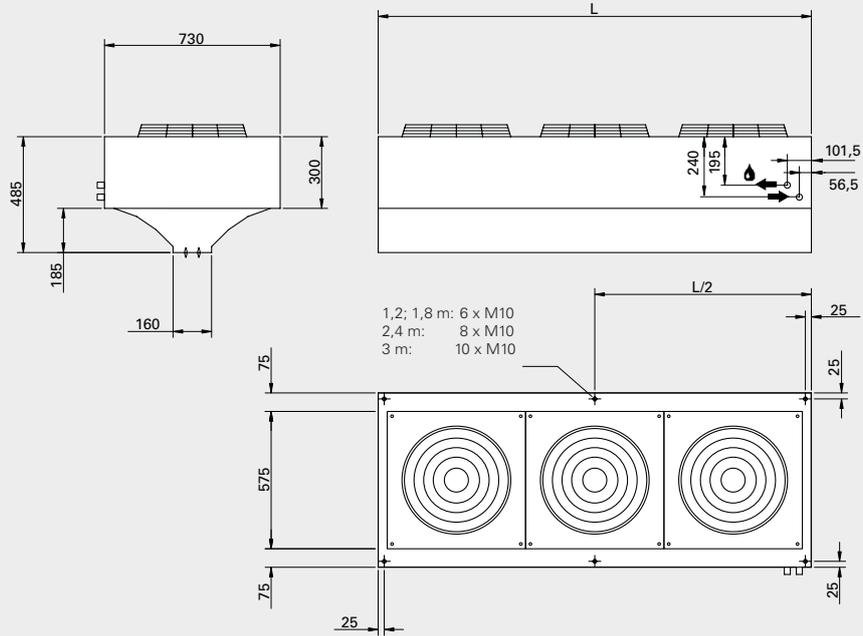
	L [mm]
<b>AGI4515</b>	1500
<b>AGI4520</b>	2000
<b>AGI4525</b>	2500
<b>AGI4530</b>	3000

Vertical mounting



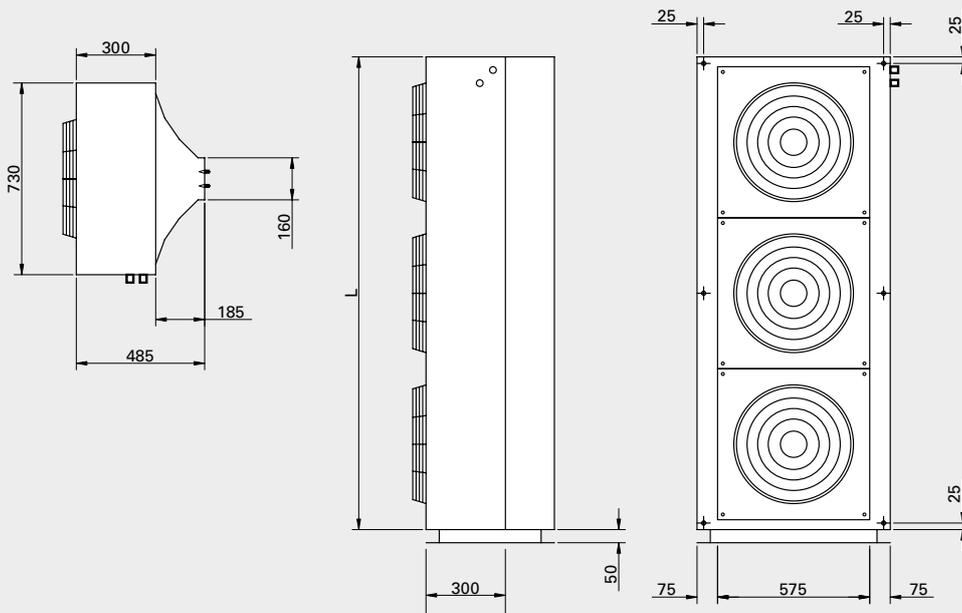
Dimensions AGI6000

Horizontal mounting

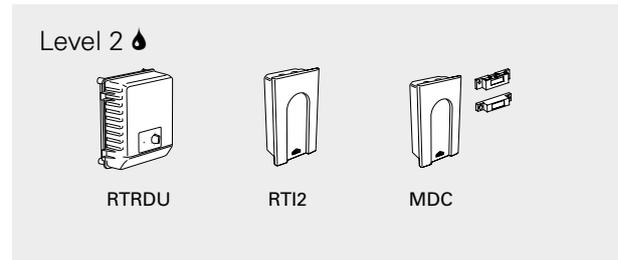
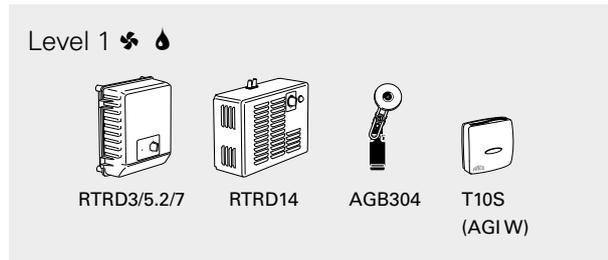


	L [mm]
<b>AGI6012</b>	1200
<b>AGI6018</b>	1800
<b>AGI6024</b>	2400
<b>AGI6030</b>	3000

Vertical mounting



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.

Type	Description	HxWxD [mm]
RTRD3	5-step fan speed control, 3 A, IP54	323x270x163
RTRD5.2	5-step fan speed control, 5,2 A, IP54	323x270x163
RTRD7	5-step fan speed control, 7 A, IP21	323x270x163
RTRD14	5-step fan speed control, 14 A, IP21	290x450x165
RTRDU7	5-step fan speed control, high/low speed, 7 A, IP21	323x270x163
T10S	Electronic thermostat, IP30	80x80x31
RTI2	Electronic 2-step room thermostat, IP44	155x87x43
AGB304	Position limit switch, IP44	
MDC	Magnetic door contact with time relay, IP44	155x87x43
MDCDC	Magnetic door contact	
VRS20	Valve kit DN20	
VRS25	Valve kit DN25	
TVVS20	2-way control valve DN20	
TVVS25	2-way control valve DN25	
SD20	Actuator 230V~	

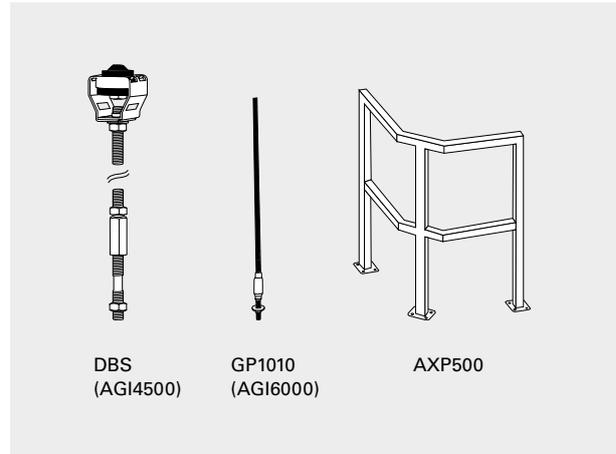
For further information and options, see the "Controls" section.

## Accessories

DBS, threaded bars with damper  
Threaded bars with damper for mounting in ceilings.  
Length 1 m. DBS10: M10. (AGI4500)

GP1010, threaded bar  
Threaded bar for mounting in ceilings. Length 1 m.  
M10. Six are required for 1.2 and 1.8 metre units, while  
2.4 metre units need eight and 3 metre units need ten.  
(AGI6000)

AXP500, collision protection  
Floor placed protection against impact from e.g.  
forklifts. Height 1 m. Colour: red, other colours on  
request.



Type	Description	Quantity included	Length
DBS10-4	Threaded bar with damper for AGI4515	4	1 m
DBS10-6	Threaded bar with damper for AGI4520/4525/4530	6	1 m
GP1010	Threaded bar for AGI6000	1	1 m
AXP500	Collision protection	1	1 m



UF600



## 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.

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 the floor.

- Short payoff period.
- Model for doors with rail traffic is available for special order.
- Very large doors require several pillars and separated floor channels. The pillars can be positioned on each or the same side of the opening.
- Made of galvanised, hot zinc-plated steel.



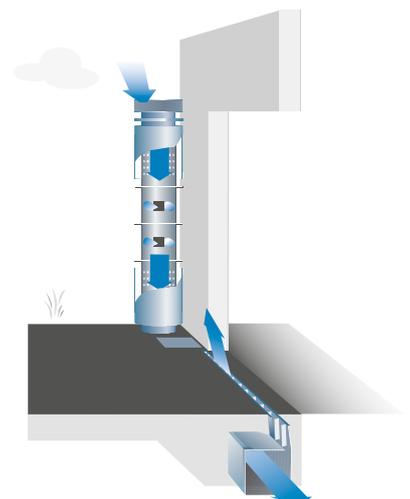
UF600 with motor silencer

✿ Ambient, no heat - UF600 (IP54)

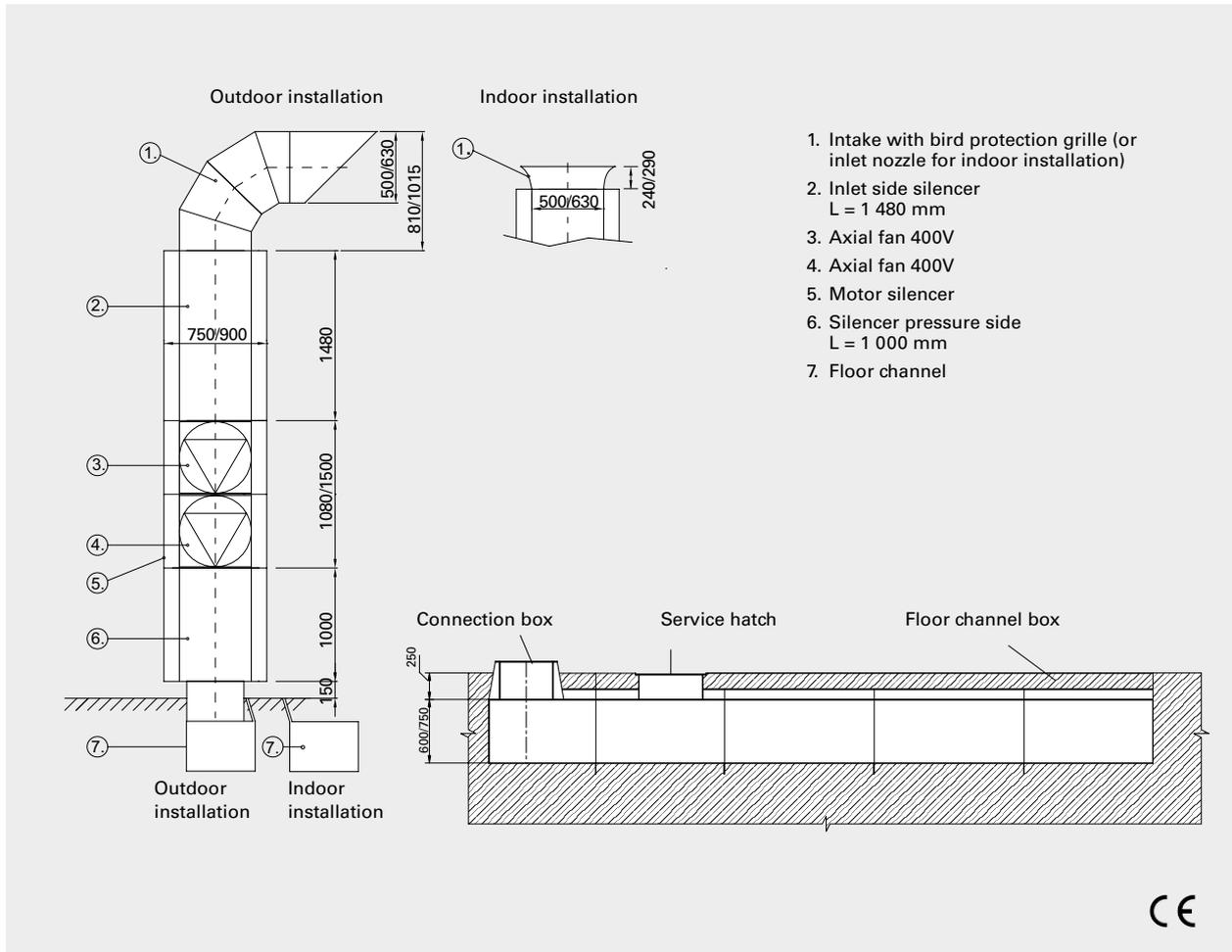
2x4	30	400V3~	2x7,4	600x600	500	750
2x7,5	35	400V3~	2x13,7	750x750	630	900
2x11	38	400V3~	2x22	750x750	630	900
2x15	38	400V3~	2x28,5	750x750	630	900
2x18,5	40	400V3~	2x33,7	750x750	630	900

\*) Depends on the design of the floor channel.

### Principle



Dimensions



Industry

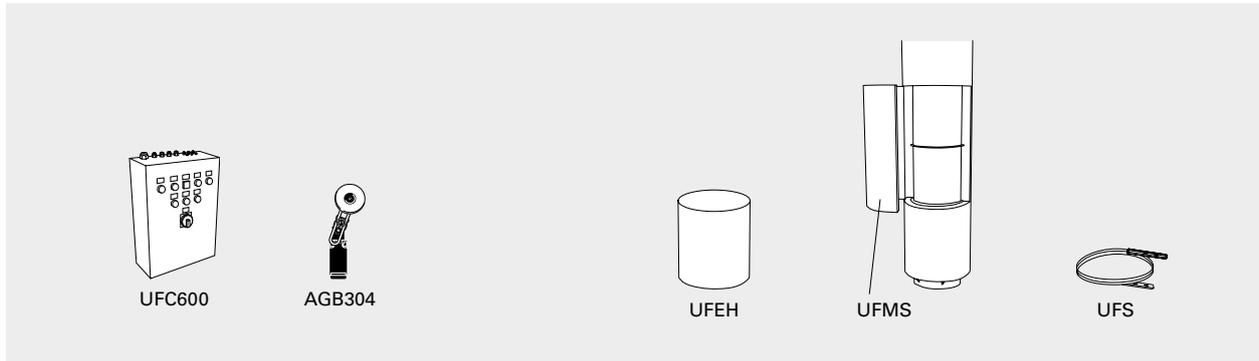
Dimensioning

		Door width [m]						
		3 m	4 m	5 m	6 m	7 m	8 m	10 m
Door height [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.

# UF600

## Controls and accessories



### UFC, control box

Y/D-start with time delay between the motors.  
Possibility of starting via door switch or position limit switch. Integrated motor protection for each fan.

### 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~. IP44.

### 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.

Type	Description	HxWxD [mm]
UFC601	Control box UF601	600x600x200
UFC602	Control box UF602	600x600x200
UFC603	Control box UF603	600x600x200
UFC604	Control box UF604	600x600x200
UFC605	Control box UF605	800x600x250
AGB304	Position limit switch, IP44	
UFEH505	Pillar extension, Ø500 mm, for UF601	L: 500
UFEH510	Pillar extension, Ø500 mm, for UF601	L: 1000
UFEH515	Pillar extension, Ø500 mm, for UF601	L: 1500
UFEH520	Pillar extension, Ø500 mm, for UF601	L: 2000
UFEH605	Pillar extension, Ø630 mm, for UF602-605	L: 500
UFEH610	Pillar extension, Ø630 mm, for UF602-605	L: 1000
UFEH615	Pillar extension, Ø630 mm, for UF602-605	L: 1500
UFEH620	Pillar extension, Ø630 mm, for UF602-605	L: 2000
UFMS750	Motor silencer Ø750 mm, for UF601	
UFMS900	Motor silencer Ø900 mm, for UF602-605	
UFS750	Securing strip Ø750 mm, for UF601	
UFS900	Securing strip Ø900 mm, for UF602-605	

## Performance

The energy efficiency can be estimated to approximately 75 %. This means that heat losses can be reduced to 25 % of what they would be if the door was unprotected.

The diagrams show how the temperature varies over time inside the open door and at different distances into the room, 4 and 20 metres, and at different heights above the floor.

**Conditions:**

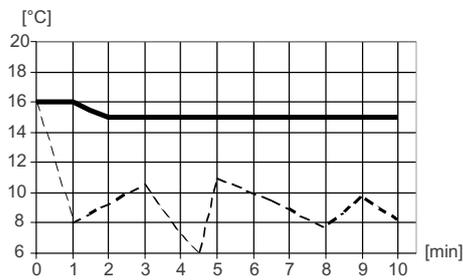
Door	4 x 4 m
Premises	2000 m <sup>2</sup>
Outdoor temperature	0 °C
Vacuum	4 Pa

With UF600  
 Unprotected door

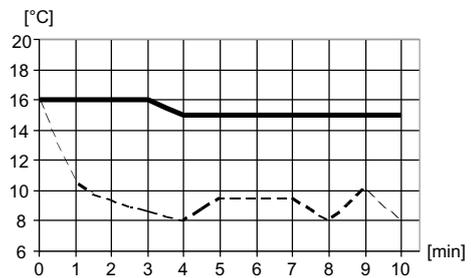
### 4 m inside the premises

10 cm above the floor

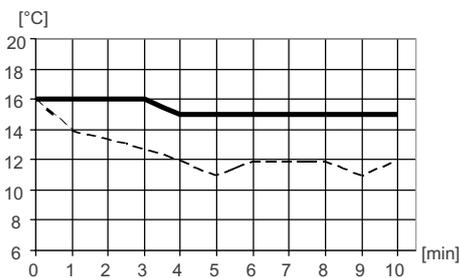


### 20 m inside the premises

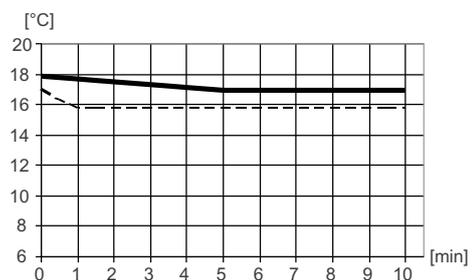
10 cm above the floor



150 cm above the floor



150 cm above the floor



## Cold storage



### ADA Cool

ADA Cool keeps the cold air in cold stores and also makes it possible to have an open cold store area without doors. The cost of cooling is significantly reduced and the cold air stays where it is needed.

### PAEC2500/3200

PAEC2500/3200 protects cold and freezer rooms efficiently at very low operating costs and can give energy savings of up to 85%.

## Revolving doors



### RDS

RDS is an ideal air curtain solution for revolving doors. The air curtain is installed above the door and the exhaust duct is adapted to the diameter of the door, which gives a neat and discrete solution.

### SFS

The SFS is an air curtain with many clever functions, specially designed for revolving doors. The air curtain is mounted vertically and its curved design integrates neatly with the door. SFS efficiently protects the exposed area just above the floor.

## Heat pump solution



### AGDX/AGRDX

Combining an AGDX air curtain with a dedicated heat pump creates a unique system which offers both comfort and energy-saving.

## Small openings



### PA1508

PA1508 is primarily intended for small openings such as kiosk and service hatches and cashier benches where a long, narrow air flow is required.

## Door heater



### PA1006

PA1006 is a compact door heater that heats the air around the door opening. This increases the comfort in the vicinity and gives personnel close to the opening a better working climate.



## Specific applications

### 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.

### Revolving doors

A revolving door prevents continuous drafts but still lets in a certain amount of cold air at every rotation. The air curtain prevents the cold air from penetrating and gives good heating comfort.

### Heat pump solution

Combining an air curtain with a dedicated heat pump creates a unique system which offers both comfort and energy-saving.

### Small openings

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.



## Cold storage

Cold storage is a demanding application. The large temperature differences result in energy losses, temperature increase in the cold sections, condensation, and ice build-up on the floor and on cooling equipment. Thanks to Thermozone technology these problems can be avoided.



### Advantages with air curtains in cold storage

#### Economy

- Less cold losses. To cool down air is expensive, and large savings can be made.
- The cooling equipment will have longer life and increased efficiency as ice build-up is reduced.
- Energy is also saved through reduced need for defrosting.
- Avoiding accidents caused by ice built-up on the floor and reducing maintenance on cooling equipment also means reduced costs for equipment being idle.

#### Safety

- Improved visibility due to reduced condensation, and less equipment to obscure line of sight.
- Ice build-up on the floor is prevented.

#### Hygiene

- A more stable temperature means better product quality control.

#### Accessibility

- Easier access for people and vehicles.

### Special features of Frico air curtains

#### Thermozone technology

Thermozone technology gives optimum curtain effect with perfect balance between air volume and air velocity. This provides the best possible separation with the lowest possible air flow.

#### Low sound level

The fans we use together with our optimized air flow geometry provides a low sound level.

#### Top control systems

Many of our air curtains have the intelligent control system SIRE that provides a range of options and enables an automatic process for the air curtain operation.

The Compact range of air curtains is equipped with an integrated simple and smart system, with remote control.

PAEC has stepless regulation of air flow which allows precise adjustment and makes a perfect choice in cold storage applications.

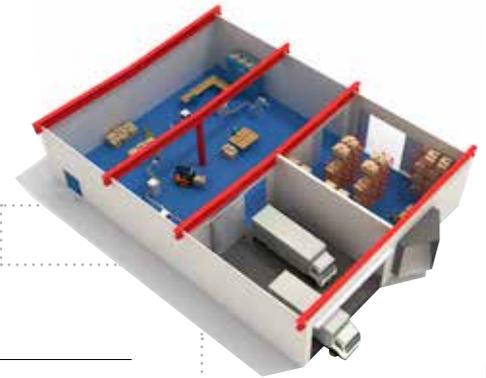
#### The market's lowest operating cost

The air curtain-series PAEC combines EC-motors with Fricos unique fan geometry. This provides air curtains with the market's lowest operating cost.



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.

- Ghent University, Belgium, 'Study, of air curtains used to restrict infiltration into refrigerated rooms', 2009
- Technical University of Catalonia, Spain, 'Application of Air Curtains in Refrigerated Chambers', 2008
- University of Coimbra, Portugal, – Department of Mechanical Engineering – Luís P. C. Neto - 'Study of aerodynamic sealing by air curtains', 2006



Cold room case

Input	
Door width:	2,5 m
Door height:	2,5 m
Mounting:	Horizontal mounting
Estimated floor area in the premises:	200-1000 m <sup>2</sup>
Temperature in the room outside the cold room:	18 °C
Temperature in the cold room:	- 23 °C
Number of days per week the door is in use:	5
Numbers of hours the business are open daily:	8
Average time the door is open daily:	1 hours/day
Estimated opening time:	30 seconds
Number of months when these conditions are fulfilled:	12



Result

Openings per day:	120
Average time between openings:	210 seconds
Airflow through the door due to temperature differences:	0 m <sup>3</sup> /h
Estimated loss of energy without Frico air curtains:	22 500 kWh
Energy savings with Frico air curtains:	13 900 kWh
Energy savings:	62 %





## ADA Cool

### Air curtain for cold stores

Recommended installation height 2,5 m\*

ADA Cool keeps the cold air in cold stores and also makes it possible to have an open cold store area without doors. 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.

- Specially designed outlet grilles for optimized performance.
- Compact and easily positioned.
- Easy installation with 1,8 m cable and plug.
- Several units can easily be linked together.
- Corrosion proof housing made of hot zinc-plate and powder enamelled steel panels. Colour: white, RAL 9016, NCS S 0500-N.



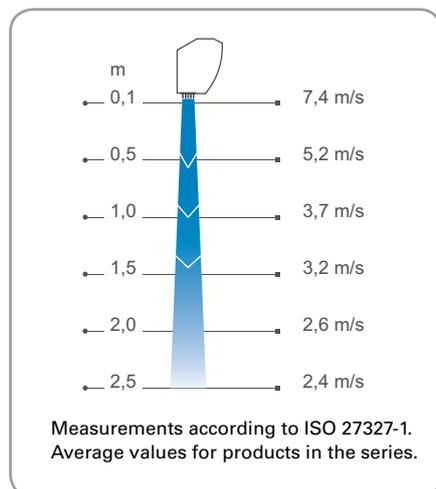
Optimized airflow with Thermozone technology.

### ✿ Ambient, no heat - ADA Cool (IP21)

Type	Output [kW]	Airflow [m³/h]	Sound level* [dB(A)]	Voltage [V]	Amperage [A]	Length [mm]	Weight [kg]
ADAC090	0	1150	54	230V~	0,50	900	9,6
ADAC120	0	1400	51	230V~	0,55	1200	11,8

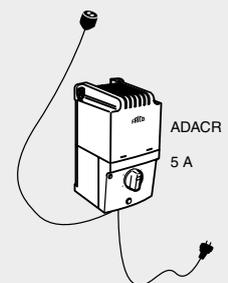
\*) Conditions: Distance to the unit 5 metres. Directional factor: 2. Equivalent absorption area: 200 m².

### Air velocity profile



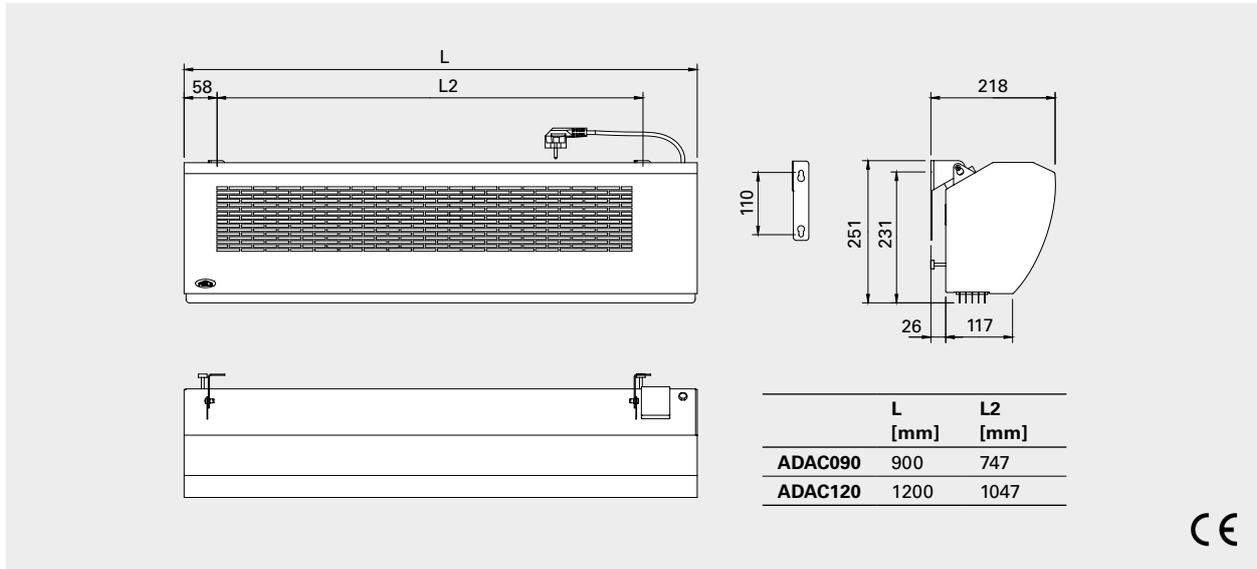
### Control

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.



\*) Recommended installation height varies depending on the relevant premises. Read how to choose the right air curtain on page 8.

## Dimensions



## Cold storage measurement

At Manuel Carvalho SA in Portugal the differences in efficiency between plastic strips and the Frico air curtain ADA Cool were measured. The temperature rise was measured over 24 hours, four days before the installation of ADA Cool and four days after.

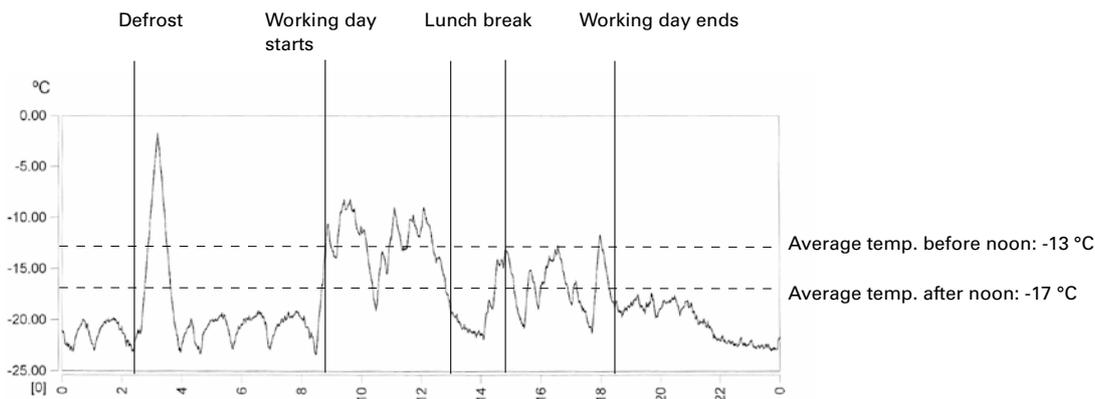
ADA Cool proved to be much more efficient in keeping the cold air inside the cold storage. Manuel Carvalho SA found further advantages compared with plastic strips.

Easier access is a benefit but furthermore the risk of accidents is reduced when build-up of ice on the floor is prevented, when the visibility is improved and trucks cannot get stuck in the plastic strips.

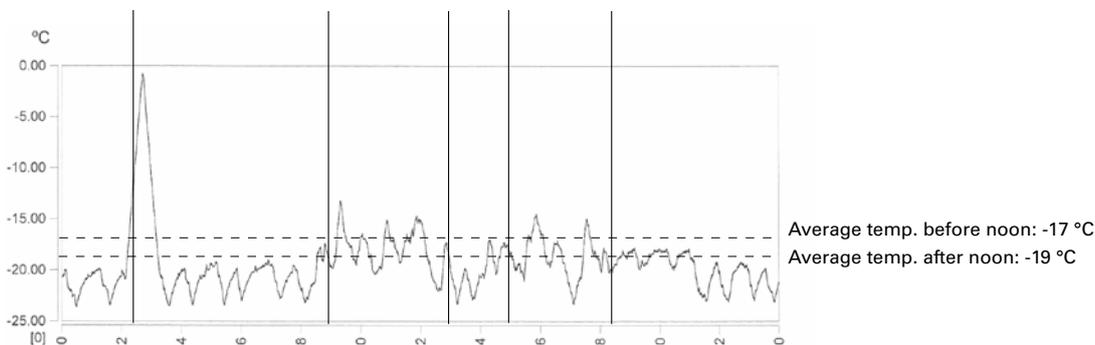
Customer: Manuel Carvalho SA, Portugal  
 Cold storage dimension: 23 x 11 x 6m  
 Dimension of opening: 2,2 x 2,5m  
 Cold storage temperature: -23 °C  
 Outside temperature: +20 °C  
 Door opened 100 times per day



Temperature increase over 24 hours with plastic strips



Temperature increase over 24 hours with Frico air curtain





## PAEC2500/3200

Stylish air curtain with EC motor and integrated controls, for cold rooms

Recommended installation height \*

PAEC2500: 2,5 m

PAEC3200: 3,2 m

PAEC2500/3200 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.

- Very low operating costs can be achieved thanks to the combination of EC motors and Frico's unique fan geometry.
- Stepless airflow control.
- Wall brackets included.
- The front is easy to remove, which facilitates installation and allows easy maintenance.
- Corrosion proof housing made of hot zinc-plate and powder enamelled steel panels. Plastic ends. Colour front: white, RAL 9016, NCS S 0500-N. Colour grille, rear section, ends and brackets: grey, RAL 7046.



Optimized airflow with Thermozone technology.

### ✿ Ambient, no heat - PAEC2500 A (IP44)

Type	Output [kW]	Airflow [m³/h]	Sound level* <sup>1</sup> [dB(A)]	Voltage motor [V]	Amperage motor* <sup>2</sup> [A]	Length [mm]	Weight [kg]
PAEC2510A	0	1400	33/53	230V~	0,15/0,80	1026	16
PAEC2515A	0	2100	37/55	230V~	0,20/0,90	1536	23,5
PAEC2520A	0	2800	34/54	230V~	0,30/1,60	2026	32

### ✿ Ambient, no heat - PAEC3200 A (IP44)

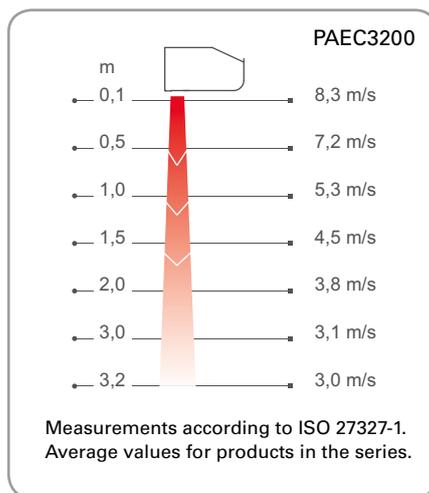
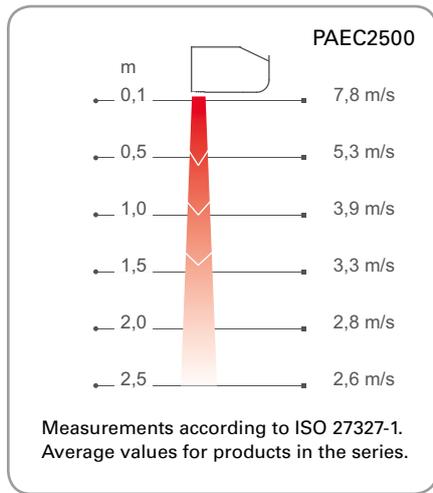
Type	Output [kW]	Airflow [m³/h]	Sound level* <sup>1</sup> [dB(A)]	Voltage motor [V]	Amperage motor* <sup>2</sup> [A]	Length [mm]	Weight [kg]
PAEC3210A	0	1950	40/58	230V~	0,19/1,15	1068	22
PAEC3215A	0	2700	39/58	230V~	0,20/1,20	1578	32
PAEC3220A	0	3800	43/61	230V~	0,36/2,30	2068	42

\*<sup>1</sup>) Conditions: Distance to the unit 5 metres. Directional factor: 2. Equivalent absorption area: 200 m². At 50% and 100% airflow.

\*<sup>2</sup>) Applicable at 50% and 100% airflow.

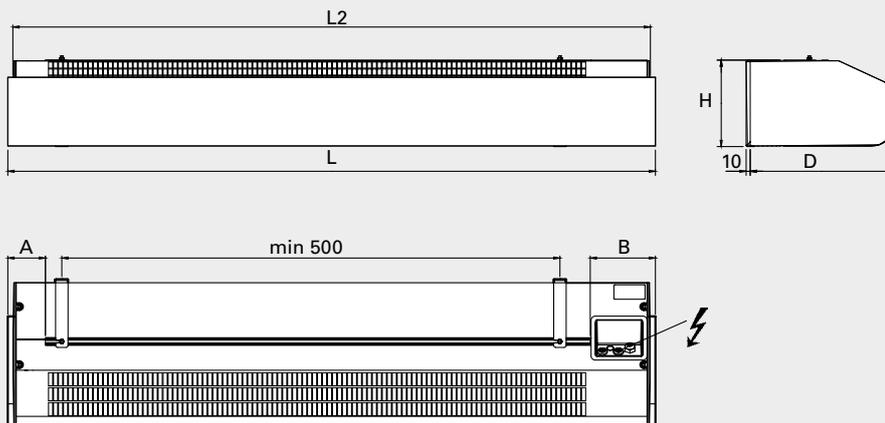
\*) Recommended installation height varies depending on the relevant premises. Read how to choose the right air curtain on page 8.

Air velocity profile

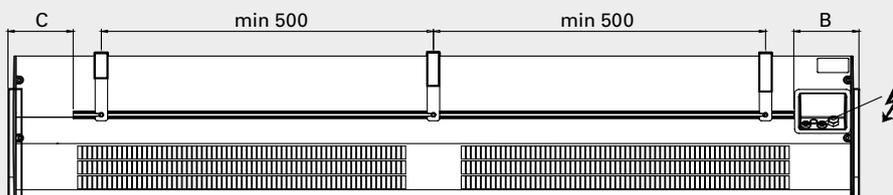


Dimensions

All models



2 metre units



[mm]	L	L2	H	D	A	B	C
<b>PAEC2510</b>	1050	1026	210	345	90,5	157	157
<b>PAEC2515</b>	1560	1536	210	345	90,5	157	157
<b>PAEC2520</b>	2050	2026	210	345	90,5	157	157
<b>PAEC3210</b>	1068	1045	256	458	99	167	165
<b>PAEC3215</b>	1578	1555	256	458	99	167	165
<b>PAEC3220</b>	2068	2045	256	458	99	167	165



## 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.

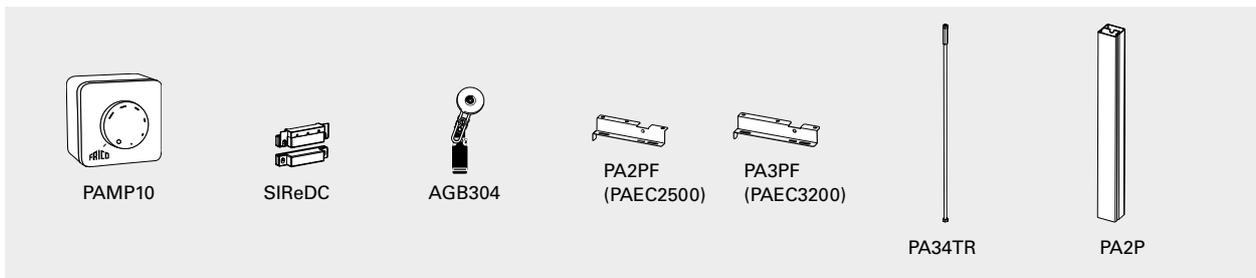
Control kit:

- PAMP10, external potentiometer
- SReDC, door contact or AGB304, position limit switch

### BMS control

The air curtain can also be controlled via BMS (0-10V).

## Accessories



### 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).

### SReDC, 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~. IP44.

### PA2PF/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 PA2PF/PA3PF.

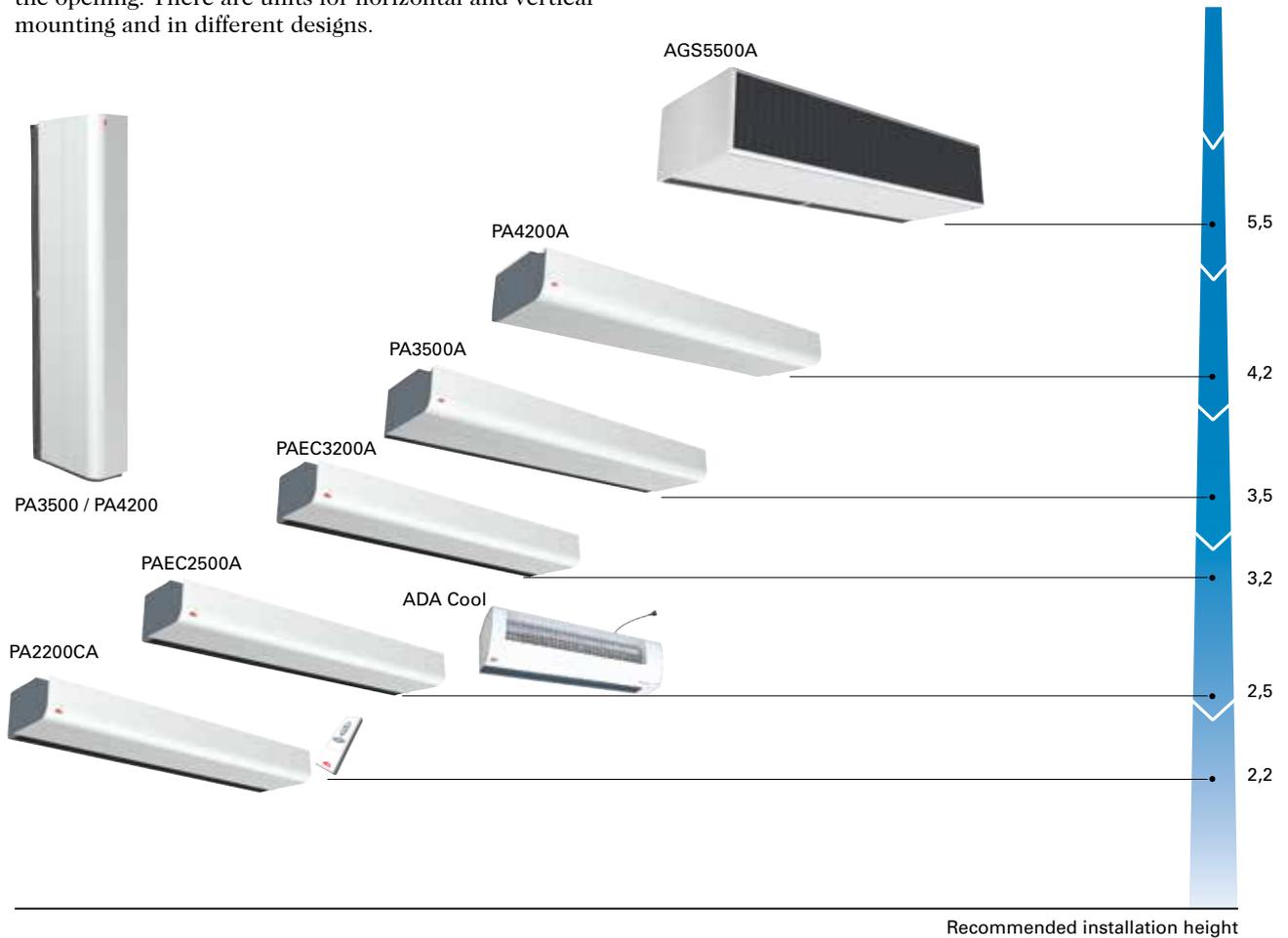
### PA2P, hanging brackets

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 PA2PF/PA3PF.

Type	Description	Quantity included	Length
<b>PAMP10</b>	External potentiometer		
<b>SReDC</b>	Door contact		
<b>AGB304</b>	Position limit switch, IP44		
<b>PA2PF15</b>	Ceiling mounting brackets for 1 and 1,5 metre units PAEC2500	4	
<b>PA2PF20</b>	Ceiling mounting brackets for 2 metre units PAEC2500	6	
<b>PA3PF15</b>	Ceiling mounting brackets for 1 and 1,5 metre units PAEC3200	4	
<b>PA3PF20</b>	Ceiling mounting brackets for 2 metre units PAEC3200	6	
<b>PA34TR15</b>	Threaded bars for 1 and 1,5 metre units	4	1 m
<b>PA34TR20</b>	Threaded bars for 2 metre units	6	1 m
<b>PA2P15</b>	Hanging brackets for 1 and 1,5 metre units	2	1 m
<b>PA2P20</b>	Hanging brackets for 2 metre units	3	1 m

Our cool models

Frico offers several models without heat that are suitable for keeping the cold in cold storages. Choose the appropriate unit according to the dimensions of the opening. There are units for horizontal and vertical mounting and in different designs.



Specific applications



Special solutions with high IP class available on request.





## RDS

Discreet air curtain for revolving doors, with intelligent control

RDS is an ideal air curtain solution for revolving doors. The air curtain is installed above the door and the exhaust duct is adapted to the diameter of the door, which gives a neat and discrete solution.

- Customised production based on the product key.
- The SIRE control system offers the possibility of frost protection for water heated units.
- The front of the duct is covered by a duct panel that is available in polished high gloss, polished or brushed stainless steel. It is also available in powder coated steel, in any RAL/NCS colour. Exhaust duct and air curtain in powder coated steel, white, RAL 9016. Aluminium louvres.

### 🌬 Ambient, no heat - RDS A (IP20)

Type	Output [kW]	Airflow* <sup>1</sup> [m <sup>3</sup> /h]	Sound level* <sup>2</sup> [dB(A)]	Voltage [V]	Amperage [A]	Length [mm]	Weight* <sup>6</sup> [kg]
RDS23A	0	950/2000	43/61	230V~	2,2	1000	80
RDS29A	0	1100/2600	47/63	230V~	4,4	1000	100
RDS38A	0	1550/3700	47/64	230V~	6,2	1500	150
RDS56A	0	2150/5200	48/65	230V~	8,7	2000	200
RDS65A	0	2600/6300	48/66	230V~	10,5	2500	220

### ⚡ Electrical heat - RDS E (IP20)

Type	Output steps [kW]	Airflow* <sup>1</sup> [m <sup>3</sup> /h]	$\Delta t$ * <sup>3</sup> [°C]	Sound level* <sup>2</sup> [dB(A)]	Voltage [V] Amperage [A] (control)	Voltage [V] Amperage [A] (heat)	Length [mm]	Weight* <sup>6</sup> [kg]
RDS23E08	2,7/5,4/8,1	950/2000	26/12	43/61	230V~/2,2	400V3~/11,7	1000	80
RDS29E12	3,9/7,8/12	1100/2600	33/14	47/63	230V~/4,4	400V3~/16,9	1000	100
RDS38E18	6,0/12/18	1550/3700	35/14	47/64	230V~/6,2	400V3~/26,0	1500	150
RDS56E23	7,8/15/23	2150/5200	32/13	48/65	230V~/8,7	400V3~/33,8	2000	200
RDS65E30	9,9/19/30	2600/6300	35/14	48/66	230V~/10,5	400V3~/42,9	2500	220

### 💧 Water heat - RDS WL, coil for low water temperature ( $\leq 80$ °C) (IP20)

Typ	Output* <sup>4</sup> [kW]	Output* <sup>5</sup> [kW]	Airflow* <sup>1</sup> [m <sup>3</sup> /h]	$\Delta t$ * <sup>3,4</sup> [°C]	$\Delta t$ * <sup>3,5</sup> [°C]	Water volume [l]	Sound level* <sup>1</sup> [dB(A)]	Voltage [V]	Amperage [A]	Length [mm]	Weight* <sup>6</sup> [kg]
RDS23WL	9,4	16	950/1950	19/14	32/24	2,2	43/61	230V~	2,2	1000	80
RDS29WL	10	17	900/2200	19/13	32/23	2,2	47/63	230V~	4,0	1000	100
RDS38WL	15	26	1300/3100	20/14	34/25	3,4	47/64	230V~	5,6	1500	150
RDS56WL	22	37	1850/4400	20/14	34/25	4,5	48/65	230V~	7,9	2000	200
RDS65WL	28	48	2250/5300	21/15	35/26	5,7	48/66	230V~	9,5	2500	220

\*<sup>1</sup>) Lowest/highest airflow of totally 5 fan steps.

\*<sup>2</sup>) Conditions: Distance to the unit 5 metres. Directional factor: 2. Equivalent absorption area: 200 m<sup>2</sup>. At lowest/highest airflow.

\*<sup>3</sup>)  $\Delta t$  = temperature rise of passing air at maximum heat output and lowest/highest airflow.

\*<sup>4</sup>) Applicable at water temperature 60/40 °C, air temperature, in +18 °C.

\*<sup>5</sup>) Applicable at water temperature 80/60 °C, air temperature, in +18 °C.

\*<sup>6</sup>) Approximate weight for air curtain and duct.

Select air curtain

To select which air curtain to order, multiply the width with the height of the opening of the revolving door, to get the surface of the opening. To create comfort in the entrance area between 3,5 and 5 kW heating per square metre of opening, depending on the lowest outdoor temperature, is needed.

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

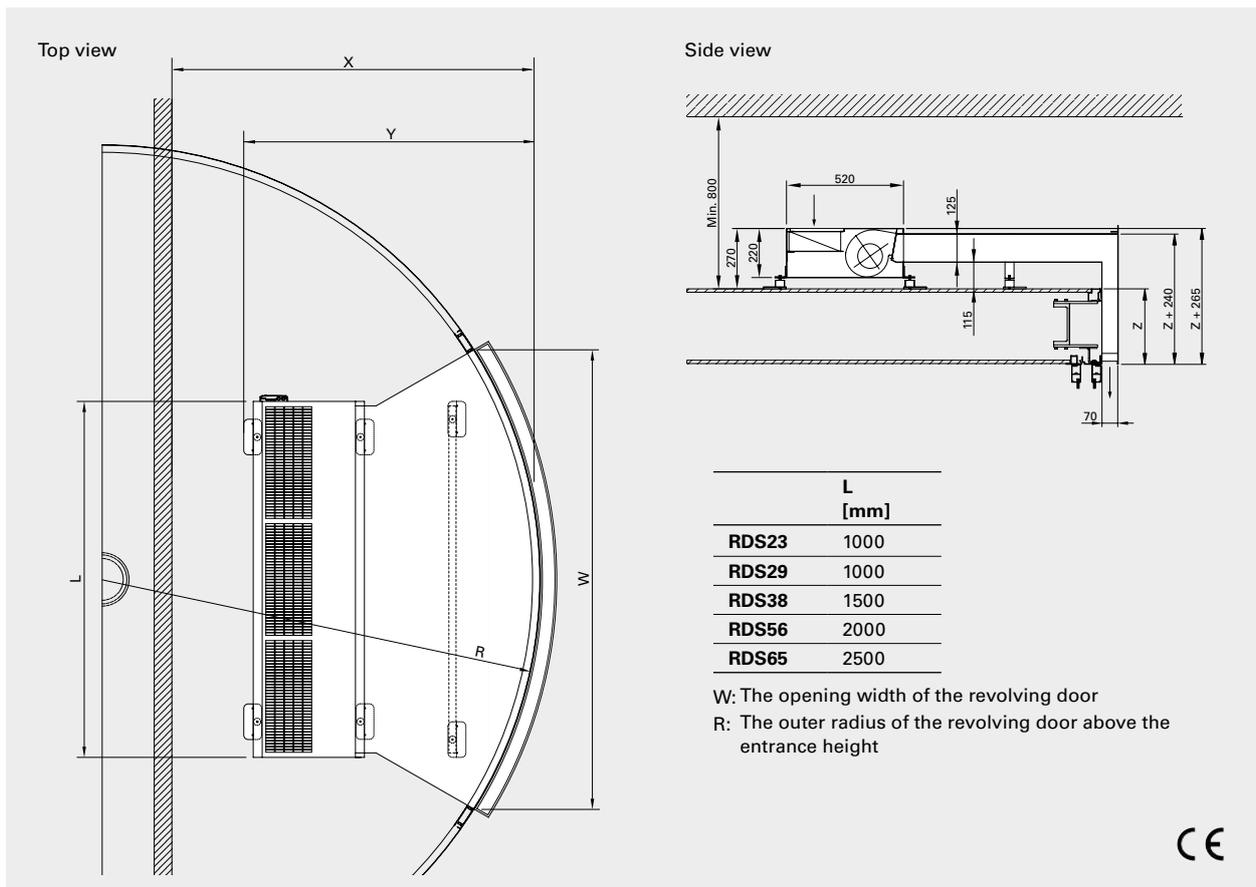
Product key

Type - R - W - X - Z - Material / colour  
 Example: RDS56WL - 2500 - 2900 - 2350 - 500 - P

<b>Type</b>	See Technical specifications.
<b>R</b>	The outer radius of the revolving door above the entrance height.
<b>W</b>	The opening width of the revolving door
<b>X</b>	The largest distance between the outer radius R of the revolving door and the wall to the outside
<b>Z</b>	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).
<b>Material/ colour</b>	P = Polished stainless steel B = Brushed stainless steel MP = Mirror polished stainless steel State RAL-kod = Powder coating RAL State NCS-kod = Powder coating NCS Only valid for duct cover plate. Air curtain and duct are made of powder lacquered steel panels, white, RAL9016.

Y is variable, depending on the other dimensions in the product key.

Dimensions



Specific applications

Control



SIRe Basic



SIRe Competent



SIRe Advanced

This air curtain is supplied prepared for the SIRe control system that has many smart and energy saving functions. There are three different levels with different functionality to choose from, Basic, Competent or Advanced. Water heated units must always be supplemented with valves.

For further information and options, see the "Controls" section.





## SFS

Design air curtain for revolving doors, with intelligent control

The SFS is an air curtain with many clever functions, specially designed for revolving doors. The air curtain is mounted vertically and its curved design integrates neatly with the door. SFS efficiently protects the exposed area just above the floor.

- Customised production based on the product key.
- 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.
- Available in polished high gloss, polished or brushed stainless steel. Also available in powder coated steel, any RAL/NCS colour. Aluminium louvres. Colour intake grille: grey, RAL 7046.

### ⚡ Electrical heat - SFS E (IP20)

Type	Output steps [kW]	Airflow* <sup>1</sup> [m <sup>3</sup> /h]	Δt* <sup>3</sup> [°C]	Sound level* <sup>2</sup> [dB(A)]	Voltage [V] Amperage [A] (control)	Voltage [V] Amperage [A] (heat)	Height* <sup>6</sup> [mm]	Weight [kg]
SFS23E08* <sup>7</sup>	2,7/5,4/8,1	1150/2500	21/10	44/63	230V~/2,7	400V3~/11,7	2200	75
SFS30E12* <sup>7</sup>	3,9/7,8/12	1550/3300	23/11	45/64	230V~/3,7	400V3~/16,9	2200	80
SFS38E16* <sup>7</sup>	5,4/11/16	1700/3900	28/12	48/67	230V~/5,2	400V3~/23,4	2200	80
SFS56E23	7,8/15/23	2500/5900	28/12	49/69	230V~/7,8	400V3~/33,8	2200	90

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

Type	Output* <sup>4</sup> [kW]	Output* <sup>5</sup> [kW]	Airflow* <sup>1</sup> [m <sup>3</sup> /h]	Δt* <sup>3,4</sup> [°C]	Δt* <sup>3,5</sup> [°C]	Water volume [l]	Sound level* <sup>2</sup> [dB(A)]	Voltage [V]	Amperage [A]	Height* <sup>6</sup> [mm]	Weight [kg]
SFS23WL* <sup>7</sup>	14	24	1150/2400	21/17	36/29	3,0	44/63	230V~	2,6	2200	75
SFS30WL* <sup>7</sup>	21	35	1550/3250	24/18	40/32	4,4	46/64	230V~	3,6	2200	80
SFS38WL* <sup>7</sup>	23	38	1700/3700	23/18	39/30	4,4	48/67	230V~	4,9	2200	80
SFS56WL	29	49	2500/5600	21/15	35/26	4,4	49/68	230V~	7,3	2200	90

\*<sup>1</sup>) Lowest/highest airflow of totally 5 fan steps.

\*<sup>2</sup>) Conditions: Distance to the unit 5 metres. Directional factor: 2. Equivalent absorption area: 200 m<sup>2</sup>. At lowest/highest airflow.

\*<sup>3</sup>) Δt = temperature rise of passing air at maximum heat output and lowest/highest airflow.

\*<sup>4</sup>) Applicable at water temperature 60/40 °C, air temperature, in +18 °C.

\*<sup>5</sup>) Applicable at water temperature 80/60 °C, air temperature, in +18 °C.

\*<sup>6</sup>) Standard height. Max. height 3000 mm (extension without fans).

\*<sup>7</sup>) Models in the series have different number of motors. In the production the motors will be mounted starting from the bottom of the unit, because it's most important to protect at the floor. Therefore it can be empty space above the motors, at the models that have a smaller number of motors.

Product key

Type - Connection position - Total height - Material / colour  
 Example: SFS30E12 - A - 2800 mm - P

<b>Type</b>	See Technical specifications.
<b>Connection position</b>	A = from above B = from below
<b>Total height</b>	Min. height 2200 mm. Max height 3000 mm. Extension without fans.
<b>Material/colour</b>	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

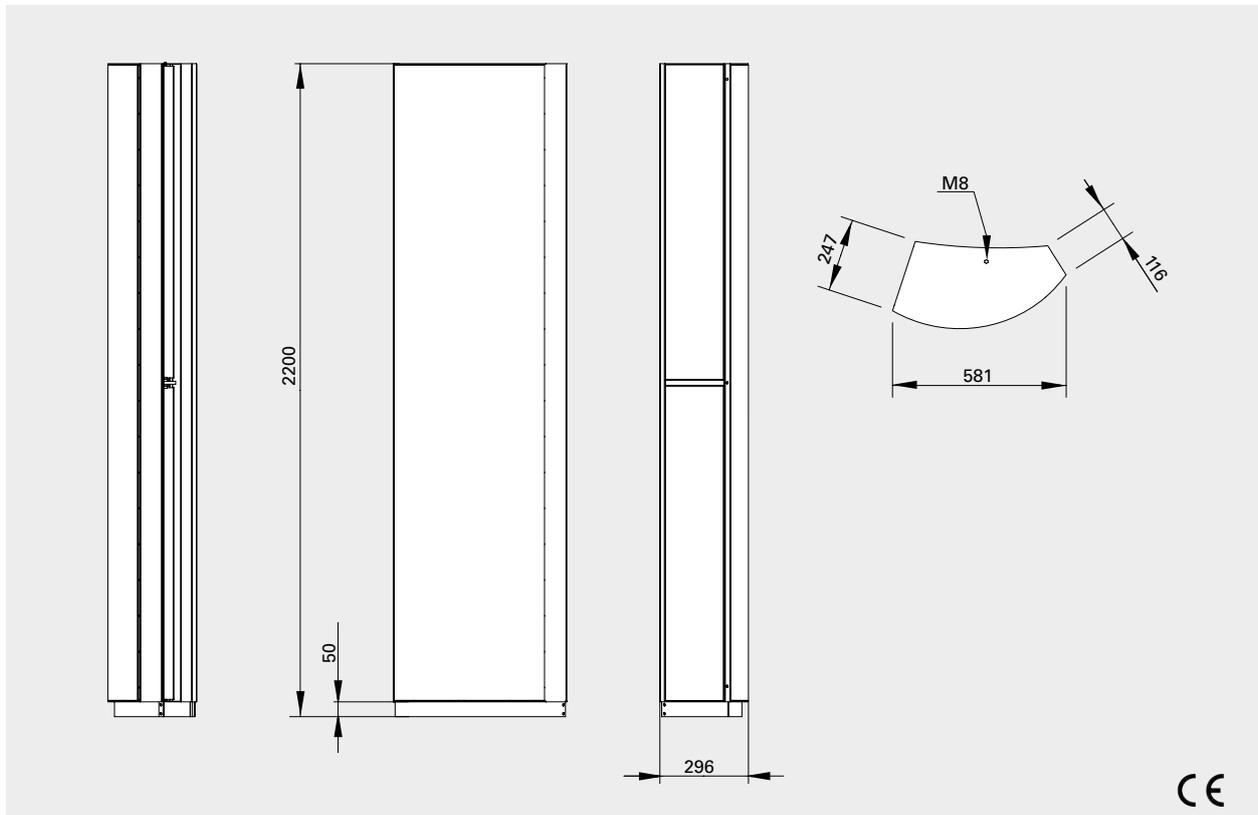
Control



SRe Basic      SRe Competent      SRe Advanced

This air curtain is supplied prepared for the SRe control system that has many smart and energy saving functions. There are three different levels with different functionality to choose from, Basic, Competent or Advanced. Water heated units must always be supplemented with valves. For further information and options, see the "Controls" section.

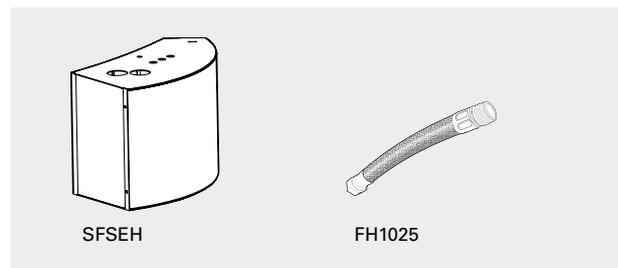
Dimensions



Accessories

SFSEH, extension hood  
 Extends the unit, adapting it to the installation. Height 100-1000 mm. Special order to required dimension.

FH1025, flexible hose  
 Flexible hose (DN25, 1" inside/outside thread) for easy connection to the pipe system.



Type	Description
SFSEH	Extension hood
FH1025	Flexible hose DN25, inside/outside thread, length 1 m

## AGDX/AGRDY



## AGDX/AGRDY

Recessed or surface mounted air curtain for heat pumps

Recommended installation height \*

AG/AGR3000DX: 3 m

AG/AGR4000DX: 4 m

Combining an AGDX air curtain with a dedicated heat pump creates a unique system which offers both comfort and energy-saving. The AGDX range is suitable for both heating and cooling mode.

AGDX air curtains are ideal for installations which require energy efficiency and low operating costs while protecting the environment.

- Heating and cooling mode.
- Compatible with all leading manufacturers of outdoor appliance.
- Energy-efficient, reduces operational costs.
- Reduces CO<sub>2</sub> emissions.
- Optional energy-saving design with EC motor.
- Built-in drip tray.
- Integrated humidity sensor ensures immediate evacuation of accumulated condensate.
- Corrosion proof housing made of hot zinc-plate and powder enamelled steel panels. Colour: white, RAL 9016, NCS S 0500-N. Colour grille: grey, RAL 7046.

Single-split solution



Multi-split solution (VRV system)



\*) Recommended installation height varies depending on the relevant premises. Read how to choose the right air curtain on page 8.

## Surface mounting

## AG3000DX Recommended installation height 3 m

Type	Heat output* <sup>1</sup> [kW]	Cooling output* <sup>2</sup> [kW]	Airflow [m <sup>3</sup> /h]	Volume condenser [l]	Sound level* <sup>3</sup> [dB(A)]	Voltage [V]	Amperage [A]	Refrigerant flow Heat/cool [m <sup>3</sup> /h]	Condensate cooling [l/h]	Length [mm]
<b>AG3010DX</b>	7,9	6,1	1800	1,64	46/63	230V~	2,8	2,07/3,66	0,86	1000
<b>AG3015DX</b>	12	9,7	2700	2,78	47/64	230V~	4,1	1,74/5,80	2,05	1500
<b>AG3020DX</b>	15	13	3600	3,87	48/65	230V~	5,5	2,54/7,94	3,21	2000
<b>AG3025DX</b>	19	17	4500	5,03	49/67	230V~	6,9	3,37/10,07	4,38	2500

## AG4000DX Recommended installation height 4 m

Type	Heat output* <sup>1</sup> [kW]	Cooling output* <sup>2</sup> [kW]	Airflow [m <sup>3</sup> /h]	Volume condenser [l]	Sound level* <sup>3</sup> [dB(A)]	Voltage [V]	Amperage [A]	Refrigerant flow Heat/cool [m <sup>3</sup> /h]	Condensate cooling [l/h]	Length [mm]
<b>AG4010DX</b>	12	9,0	2700	1,64	51/67	230V~	4,1	2,59/5,38	1,04	1000
<b>AG4015DX</b>	16	13	3600	2,78	51/68	230V~	5,5	4,22/7,66	2,55	1500
<b>AG4020DX</b>	23	20	5400	3,87	52/69	230V~	8,2	6,55/11,77	4,49	2000
<b>AG4025DX</b>	27	23	6300	5,03	53/71	230V~	9,6	4,13/13,99	5,86	2500

## Recessed mounting

## AGR3000DX Recommended installation height 3 m

Type	Heat output* <sup>1</sup> [kW]	Cooling output* <sup>2</sup> [kW]	Airflow [m <sup>3</sup> /h]	Volume condenser [l]	Sound level* <sup>3</sup> [dB(A)]	Voltage [V]	Amperage [A]	Refrigerant flow Heat/cool [m <sup>3</sup> /h]	Condensate cooling [l/h]	Length [mm]
<b>AGR3010DX</b>	7,9	6,1	1800	1,64	46/63	230V~	2,8	2,07/3,66	0,86	1000
<b>AGR3015DX</b>	12	9,7	2700	2,78	47/64	230V~	4,1	1,74/5,80	2,05	1500
<b>AGR3020DX</b>	15	13	3600	3,87	48/65	230V~	5,5	2,54/7,94	3,21	2000
<b>AGR3025DX</b>	19	17	4500	5,03	49/67	230V~	6,9	3,37/10,07	4,38	2500

## AGR4000DX Recommended installation height 4 m

Type	Heat output* <sup>1</sup> [kW]	Cooling output* <sup>2</sup> [kW]	Airflow [m <sup>3</sup> /h]	Volume condenser [l]	Sound level* <sup>3</sup> [dB(A)]	Voltage [V]	Amperage [A]	Refrigerant flow Heat/cool [m <sup>3</sup> /h]	Condensate cooling [l/h]	Length [mm]
<b>AGR4010DX</b>	12	9,0	2700	1,64	51/67	230V~	4,1	2,59/5,38	1,04	1000
<b>AGR4015DX</b>	16	13	3600	2,78	51/68	230V~	5,5	4,22/7,66	2,55	1500
<b>AGR4020DX</b>	23	20	5400	3,87	52/69	230V~	8,2	6,55/11,77	4,49	2000
<b>AGR4025DX</b>	27	23	6300	5,03	53/71	230V~	9,6	4,13/13,99	5,86	2500

\*<sup>1</sup>) Applicable at air temperature in/out 20/33 °C. Refrigerant R410A.

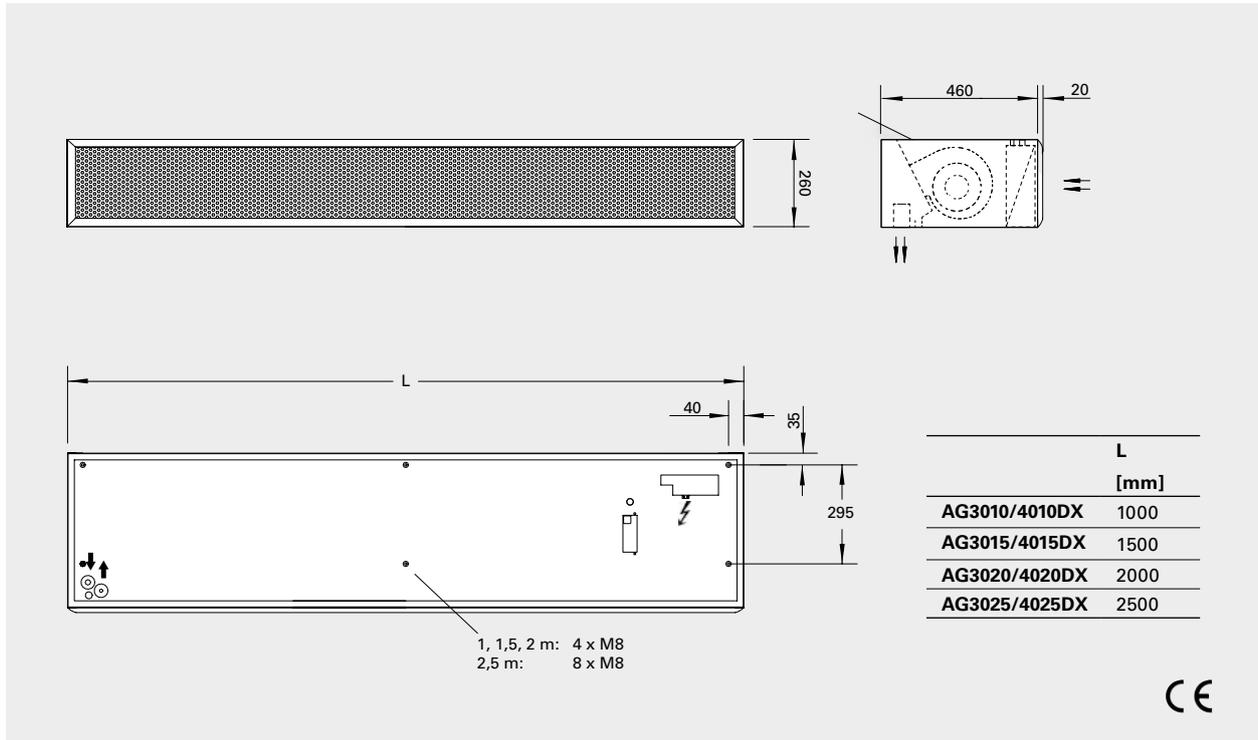
\*<sup>2</sup>) Applicable at air temperature in/out 27/18 °C. Refrigerant R410A.

\*<sup>3</sup>) Conditions: Distance to the unit 5 metres. Directional factor: 2. Equivalent absorption area: 200 m<sup>2</sup>. At lowest/highest airflow.

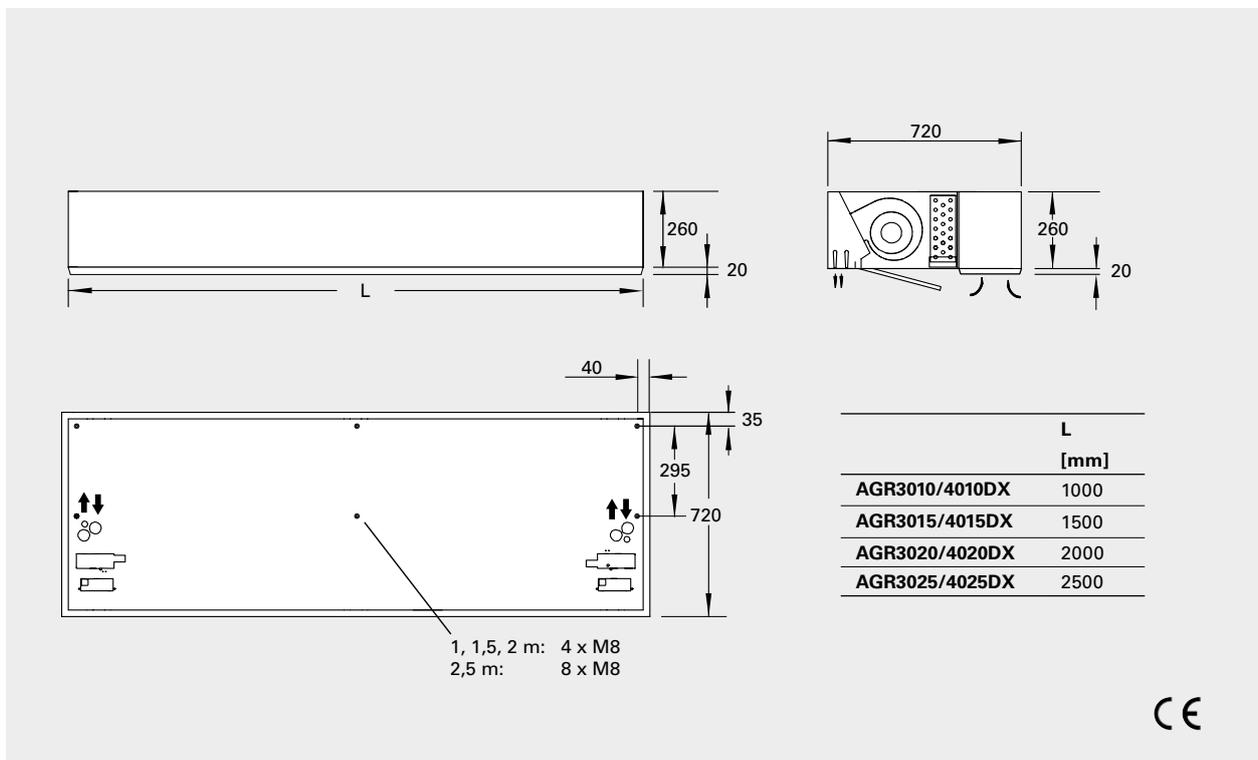
All models are also available with EC motor, either with protection class IP20 for heating only or protection class IP44 for cooling/heating.

# AGDX/AGRDX

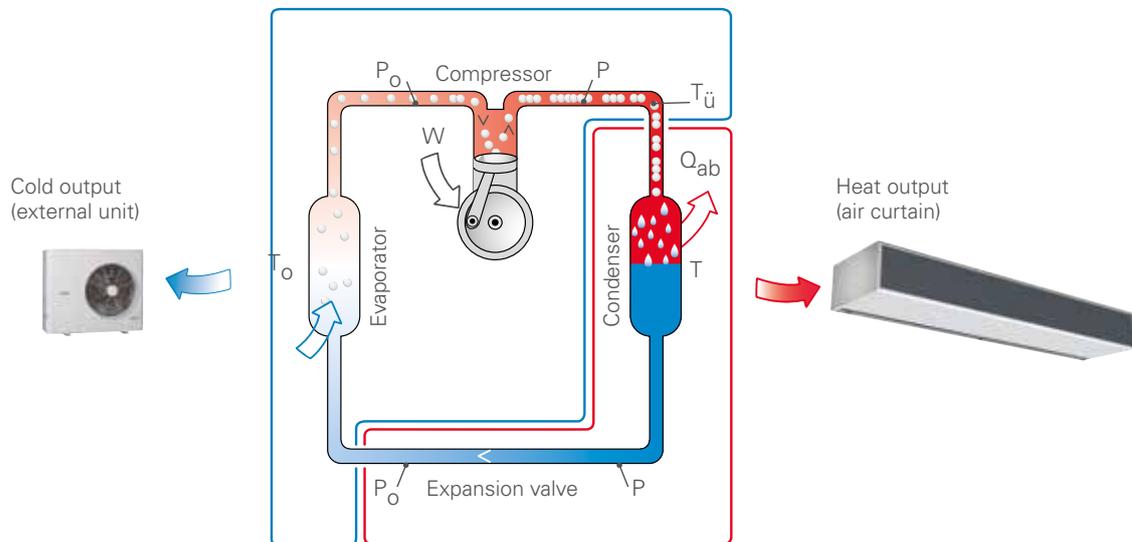
## Dimensions AGDX



## Dimensions AGRDX



## Operating principle



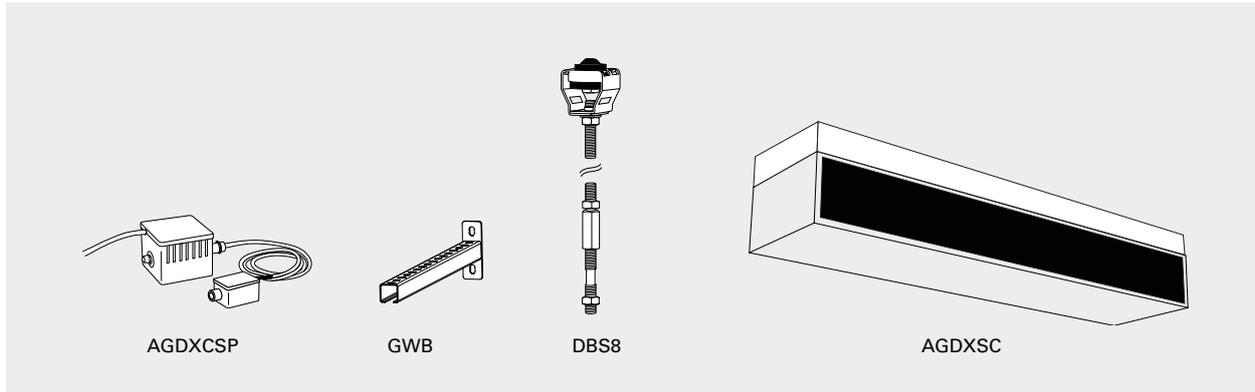
The gas (R410A) contained in a closed system is compressed and sent to the condenser under high pressure to act as a heat source.

This heat is used by the air curtain to heat openings efficiently and to reduce cold draughts.

Through the gradual cooling and pressure reduction by the expansion valve, the temperature decreases and thus reaches the heating process again via the compressor.

Thanks to the reversible technology, this process can be carried out in the opposite direction, and cool the room, either by being used as a source of cold air for the air curtain, or by limiting energy use in air-conditioned premises by preventing warm outside air from entering.

Accessories



**AGDXCSP, condensate pump**  
 For condensate water in drip tray. 230V, 0,5 A. Float casing: 53x35x34 mm. Pump unit: 145x88x66 mm.

**GWB, wall bracket**  
 GWB560: wall bracket 560 mm for standard option.  
 GWB720: wall bracket 720 mm for long distance from wall. Fasteners not included. Two are required for 1, 1.5 and 2 metre units, while 2.5 metre units need three.

**DBS, threaded bars with damper**  
 Threaded bars with damper for mounting in ceilings. Length 1 m. DBS8: M8.

**AGDXSC, suspension cover**  
 Suitable when mountings, cables and pipes should be concealed. Colour: white, RAL 9016.

Type	Description	Quantity included	Length
<b>AGDXCSP</b>	Condensate pump for AGDX/AGRDX	1	
<b>GWB560</b>	Wall bracket for AGDX/AGRDX	1	560 mm
<b>GWB720</b>	Wall bracket for AGDX/AGRDX	1	720 mm
<b>DBS8-4</b>	Threaded bars with damper for 1, 1,5 and 2 metre units	4	1 m
<b>DBS8-6</b>	Threaded bars with damper for 2,5 metre units	6	1 m
<b>AGDXSC10</b>	Suspension cover for AGDX3010/4010	1	H: 140 mm
<b>AGDXSC15</b>	Suspension cover for AGDX3015/4015	1	H: 140 mm
<b>AGDXSC20</b>	Suspension cover for AGDX3020/4020	1	H: 140 mm
<b>AGDXSC25</b>	Suspension cover for AGDX3025/4025	1	H: 140 mm



## 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.

- Built-in control.
- Compact and easily positioned.
- Low sound level.
- 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 unit is easily angled on the bracket, which is used for both wall and ceiling mounting.
- Corrosion proof housing made of hot zinc-plate and powder enamelled steel panels. Colour front: white, RAL 9016, NCS S 0500-N. Colour grille, rear section, ends and brackets: grey, RAL 7046.

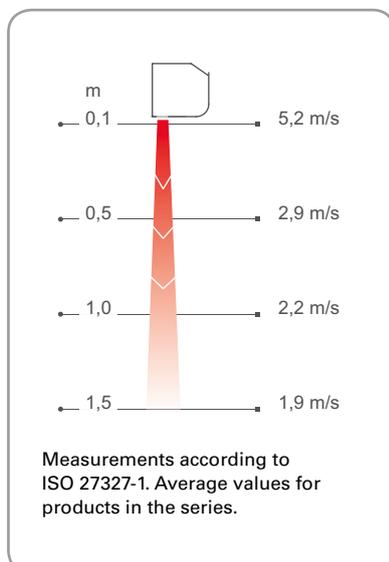
### ⚡ Electrical heat - PA1508 (IP20)

Type	Output [kW]	Airflow [m³/h]	Δt*1 [°C]	Sound level*2 [dB(A)]	Voltage [V]	Amperage (heat) [A]	Length [mm]	Weight [kg]
PA1508E02	1/2	270/400	22/15	39/50	230V~	9,3	790	7,5
PA1508E03	2/3	270/400	34/23	39/50	230V~	13,6	790	7,5
PA1508E05	3/4,5	270/400	51/34	39/50	230V~	20,2	790	7,5

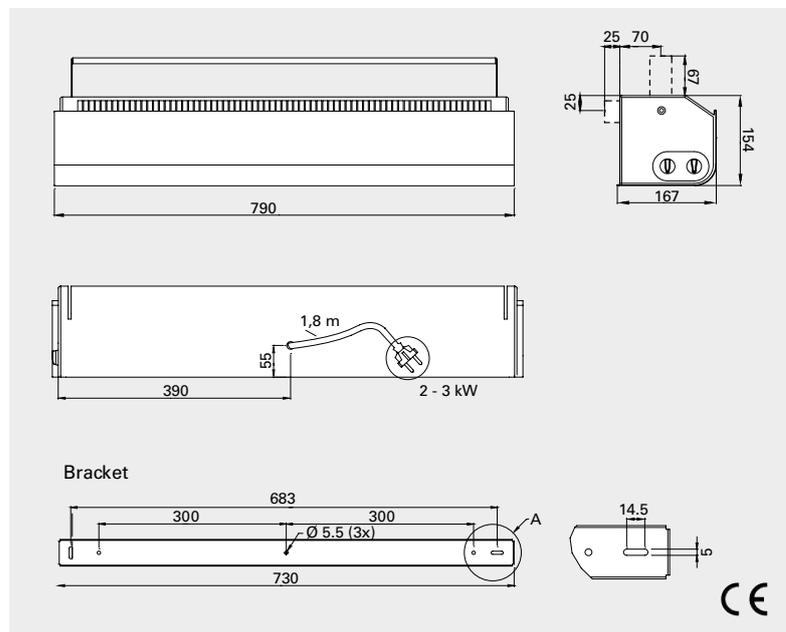
\*1) Δt = temperature rise of passing air at maximum heat output and lowest/highest airflow.

\*2) Conditions: Distance to the unit 5 metres. Directional factor: 2. Equivalent absorption area: 200 m². At lowest/highest airflow.

### Air velocity profile



### Dimensions



# Door heater PA1006



## Door heater PA1006

For increased comfort inside the door

PA1006 is a compact door heater which heats the incoming air and gives increased comfort on the inside. When wall mounted, the unit can act as a high level fan heater.

- Integrated selector for the fan and heating.
- Compact and easily positioned.
- Easy installation with 1,8 m cable and plug.
- Low sound level.
- The unit is easily angled on the bracket, which is used for both wall and ceiling mounting.
- Corrosion proof housing made of hot zinc-plate and powder enamelled steel panels. Colour front: white, RAL 9016, NCS S 0500-N. Colour grille, rear section, ends and brackets: grey, RAL 7046.

### Electrical heat - PA1006 (IP20)

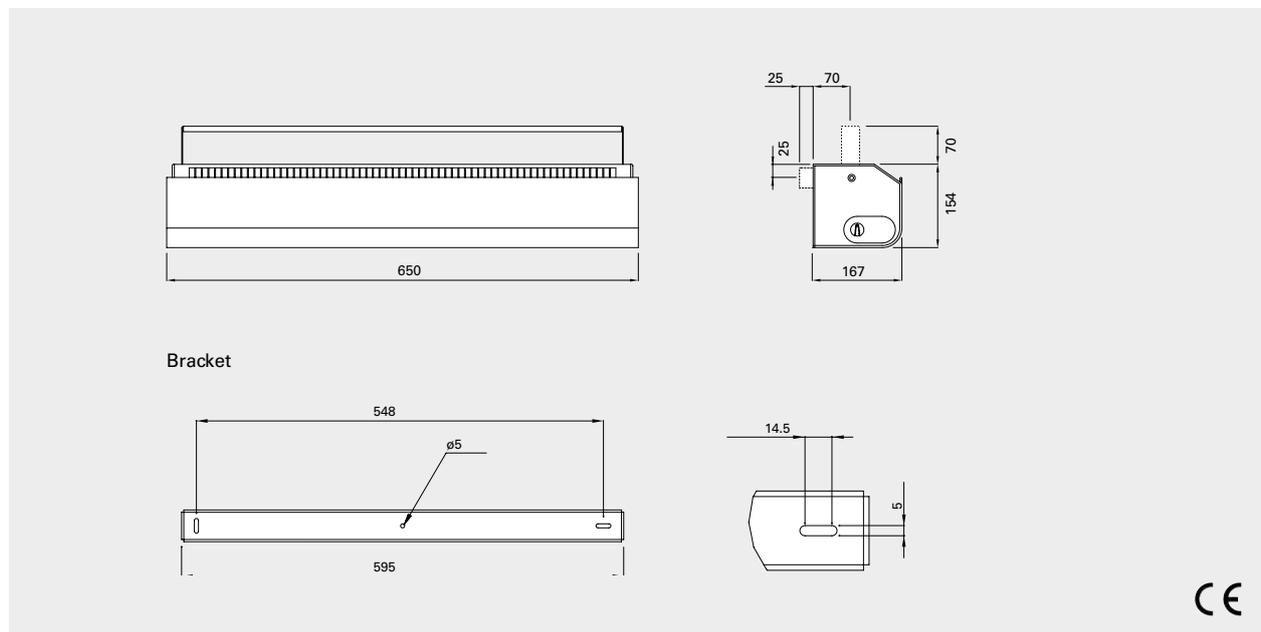
Type	Output	Airflow	$\Delta t^{*1}$	Sound level <sup>*2</sup>	Voltage	Amperage	Length	Weight
	[kW]	[m <sup>3</sup> /h]	[°C]	[dB(A)]	[V]	[A]	[mm]	[kg]
PA1006E03	0/1,5/3	230	39	44	230V~	13,5	650	5,3

\*1)  $\Delta t$  = temperature rise of passing air at maximum heat output and highest airflow.

\*2) Conditions: Distance to the unit 5 metres. Directional factor: 2. Equivalent absorption area: 200 m<sup>2</sup>.

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

### Dimensions





## Controls

### 88 SIRe Control system

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.



### 93 Other controls

Timers and door contacts are useful accessories in an air curtain's control system. Frico offers several alternatives.



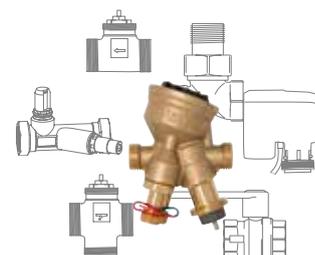
### 94 Thermostats

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.



### 96 Water control

When heating is not required, the valve restricts the water flow and only a small amount is allowed through so that there is always hot water in the heating coil. This is to be able to provide quick heat supply when a door is opened but also to provide a degree of frost protection. Without valves the unit gives off maximum heat energy as long as the fan is running, which means energy loss.



## SIRe Control system

Most of our air curtains are prepared for the intelligent SIRe control system, which automatically manages the air curtain operations. The air curtain adapts itself to the present conditions in the entry. By sensing how often the door opens/closes, outdoor temperature, indoor temperature or even the return water temperature, the air curtain will give you the most effective protection with the highest energy efficiency.



### Install and forget

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.



### Intelligent

Automatically adapts to your entrance

The air curtain automatically adapts to your entrance conditions. Depending on how often the door is opened/closed, or if it is left open continually, the integrated SIRe controls the air curtain operation so that optimal comfort and energy efficiency is achieved.



### Proactive

Anticipates for quicker reactions

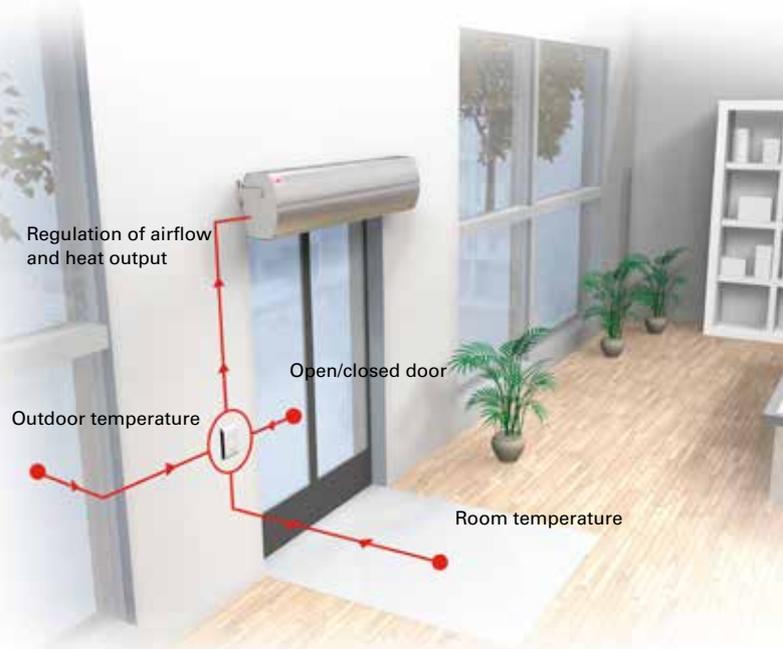
By measuring the outdoor temperature, the air curtain is always a step ahead. The integrated regulation ensures that the air curtain is prepared for changes in the outdoor temperature. For example, when a warm spring day turns into a chilly evening. The air speed is adjusted depending on the outdoor temperature change and stops the chill before it penetrates the premises.



### Adaptive

Expert on your entrance

SIRe has the capacity to learn precisely what happens at your entrance. The air curtain adapts so that it is always ready to operate fully as soon as the door is opened. It also considers the acoustic comfort by ensuring that the air curtain does not switch between high and low speeds too often.



### Eco mode

Save money and the environment at the same time

With SIRe intelligent regulation integrated in your air curtain, you get comfort in your entrance without wasting energy. If you want to increase the energy efficiency further, set SIRe in Eco mode. The air curtain then uses as little energy as possible without compromising too much on comfort. Energy savings of up to 35 percent are possible.



## BMS solutions

Endless possibilities



With our intelligent SIRe control system, the possibilities to control your air curtains via BMS are endless. You can either choose to control your air curtain by 0-10 V signals and potential free contacts (controlling on/off, fan speed, heating and alarm) or completely control all functions and receive indications from your air curtain via Modbus RTU (two threaded) BUS communication.

## Calendar function

Presets as required



SIRe has a calendar function for all the days of the week. The air curtain starts in the morning to ensure that it's always working to create a comfortable climate and save energy. Preset default setting may easily be adjusted by the user.

## Simple installation

"Plug and play"



An air curtain with integrated SIRe control system is easy to install. The different components are supplied together and are easy to assemble. The system self-checks that everything is correct and that it functions. Thanks to the preset default settings it is easy to start air curtain operation as soon as the system is in place.

SIRe is an intelligent and well designed low voltage control system which can be customised for each unique application and environment. The PC board SIRe is built into the air curtain on delivery and is equipped with modular connectors for easy connection of external components. The AR200 air curtain is supplied with an external PC board, see product chapter AR200. SIRe is supplied pre-programmed and is very easy to install and use.

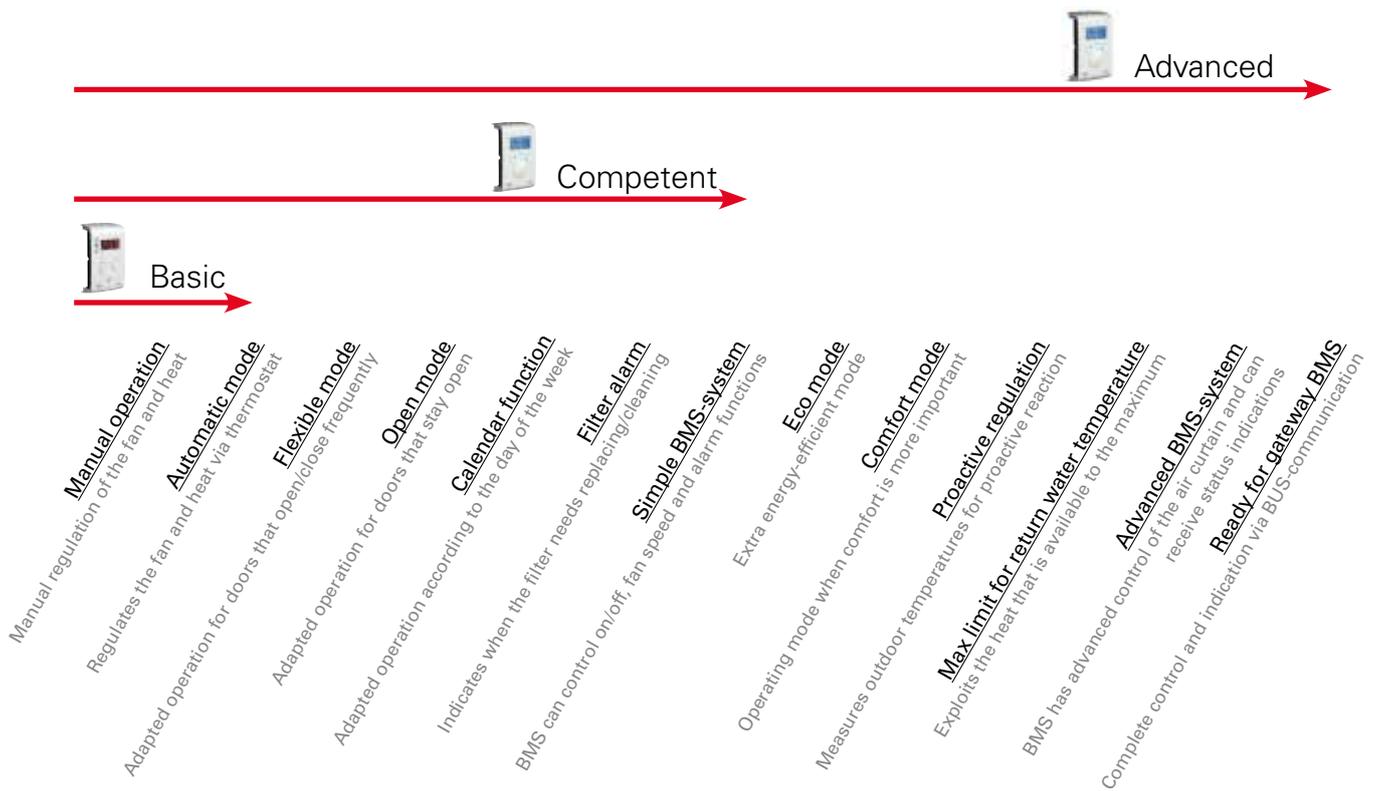
SIRe can control up to nine units. If more than one air curtain should be controlled by a single SIRe, an additional modular cable SIReCC RJ12 (6p/6c) per unit is needed. Cables between units can easily be joined together by using joint piece SIReCJ6.

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

Type	Description
<b>SIReBN</b>	Control system SIRe Basic
<b>SIReACY</b>	Control system SIRe Competent
<b>SIReAAY</b>	Control system SIRe Advanced

SIRe can be set to 18 languages, divided into two product versions.

- 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.



The SIRe control system is available in three different versions with different functionalities; Basic, Competent and Advanced.

SIRe Basic gives simple control at a low cost. SIRe Competent and SIRe Advanced anticipate and learn the needs of the entrance they are installed in (e.g. opening frequency and outdoor temperatures). It has calendar function and selectable switch off at set temperatures for up to nine units. 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.

#### Functions SIReBN Basic

- Manual regulation of the fan and temperature
- Automatic control of fan speed and temperature with integrated thermostat.

#### Functions SIReACY 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

#### Functions SIReAAY Advanced

- All functions for Competent
- Eco mode - extra energy-efficient mode
- Comfort mode - when comfort is important
- Advanced BMS control
- Max limit of return water temperature.
- Proactive regulation – measures outdoor temperatures for proactive reaction.



**Included in SIReAAY Advanced:**

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

**Accessories**

- SIReRTX, external room temperature sensor, RJ11 (4p/4c), 10 m
- SIReUR, kit for recessed installation
- SIReWTA, return water sensor, RJ11 (4p/4c), 3 m
- SIReCC, modular cable, RJ12 (6p/6c), 5, 10, 15, 40 m
- VLP, pressure independent and modulating valve system

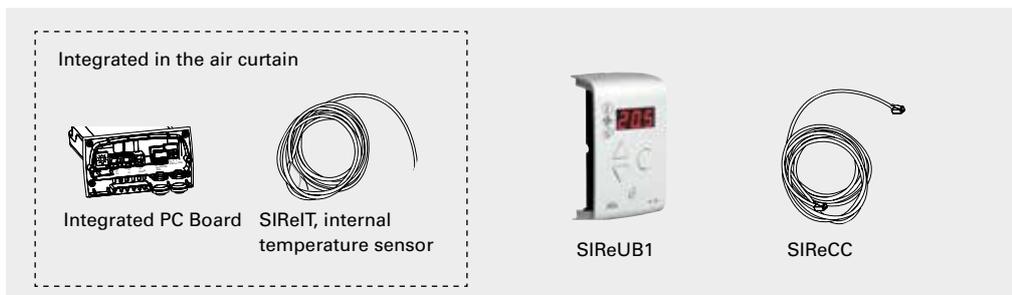


**Included in SIReACY Competent:**

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

**Accessories**

- SIReRTX, external room temperature sensor, RJ11 (4p/4c), 10 m
- SIReUR, kit for recessed installation
- SIReCC, modular cable, RJ12 (6p/6c), 5, 10, 15, 40 m
- VLSP, pressure independent valve system on/off



**Included in SIReBN Basic:**

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

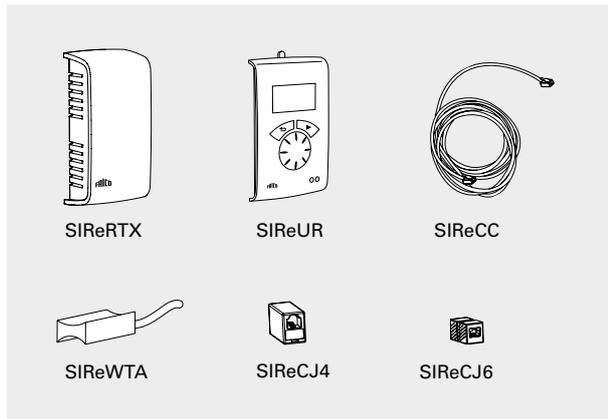
**Accessories**

- SIReRTX, external room temperature sensor, RJ11 (4p/4c), 10 m
- SIReCC, modular cable, RJ12 (6p/6c), 5, 10, 15, 40 m
- VLSP, pressure independent valve system on/off

<b>SIReUA1Y</b>	IP30
<b>SIReUB1</b>	IP30
<b>SIReA1XN</b>	IP10
<b>SIReC1XN</b>	IP10
<b>SIReOTX</b>	IP65
<b>SIReIT</b>	IP65
<b>SIReRTX</b>	IP30
<b>SIReUR</b>	IP30
<b>SIReWTA</b>	IP65

The AR200 air curtain is supplied with an external PC board, see product chapter AR200.

## SIRe Control system



### SIRe control system - options

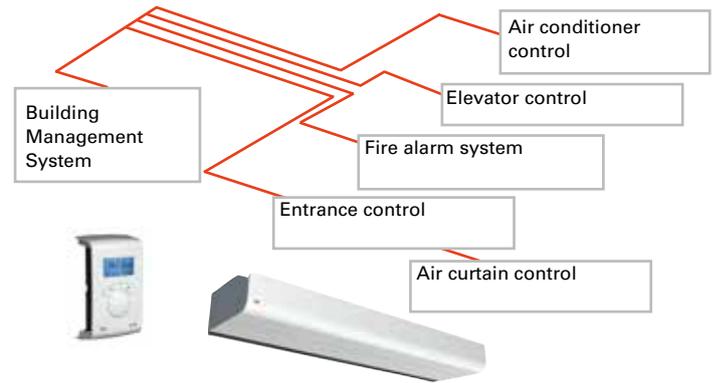
**SIReRTX**, external room temperature sensor  
Used to obtain a better measuring point in the premises when the control unit is located so that the internal room temperature sensor does not show a relevant value. 10 m. cable with modular connector RJ11 (4p/4c).

**SIReUR**, kit for recessed installation  
Kit for installing SIReUA1 recessed in a wall. Only protrudes 11 mm from the wall.

**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).



### Integration of Frico air curtains in an overall control system (BMS)

#### BMS-control - level 1

With SIRe Competent the air curtains can be integrated in an overall control system (BMS). The air curtain can be started/stopped and the fan speed regulated via the BMS system. A potential free closing contact is required for starting/stopping. A 0-10V control signal is required to control the fan speed. Input for alarm and night reduction via external potential free contact. Potential free contact for buzzer.

#### BMS-control - level 2

With SIRe Advanced the air curtains can be integrated in an overall control system (BMS). The air curtain can be started/stopped, the fan speed and heating regulated smoothly via the BMS system. A potential free closing contact is required for starting/stopping. A 0-10V control signal is required to control the fan speed and heating. Input for alarm and night reduction via external potential free contact. Potential free contact for buzzer and operation indication.

#### BMS-control - level 3

With SIRe Advanced it is also possible to communicate via Modbus RTU (RS485). Contact Frico for more information.

Type	Description
<b>SIReRTX</b>	External room temperature sensor, IP30
<b>SIReUR</b>	Kit for recessed installation, IP30
<b>SIReWTA</b>	Return water sensor, IP65
<b>SIReCJ4</b>	Used to join two RJ11(4/4)
<b>SIReCJ6</b>	Used to join two RJ12(6/6)
<b>SIReCC603</b>	Modular cable RJ12(6/6) 3 m
<b>SIReCC605</b>	Modular cable RJ12(6/6) 5 m
<b>SIReCC610</b>	Modular cable RJ12(6/6) 10 m
<b>SIReCC615</b>	Modular cable RJ12(6/6) 15 m
<b>SIReCC640</b>	Modular cable RJ12(6/6) 40 m
<b>SIReCC403</b>	Modular cable RJ11(4/4) 3 m
<b>SIReCC405</b>	Modular cable RJ11(4/4) 5 m
<b>SIReCC410</b>	Modular cable RJ11(4/4) 10 m
<b>SIReCC415</b>	Modular cable RJ11(4/4) 15 m

Other controls



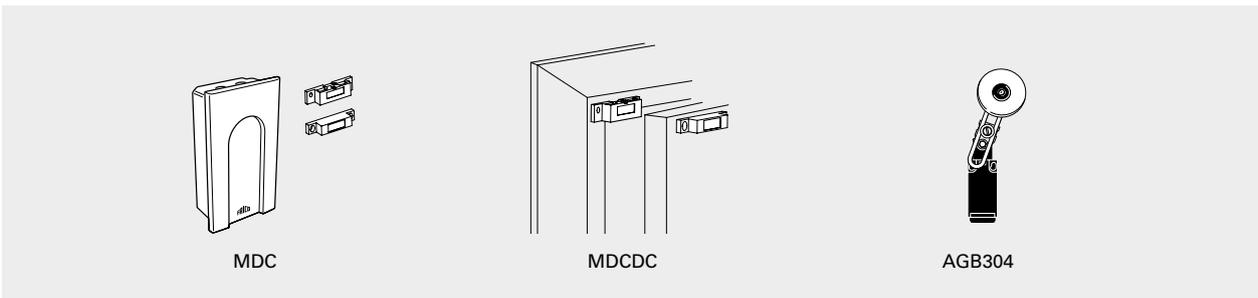
**CBT, electronic timer**  
Electronic timer with alternating contact. Setting range 1/2-1-2-4 or 4-8-16-24 hours respectively. The setting range can be limited down to a maximum time of 1/2 hours. IP44.

Type	Voltage [V]	Max input [A]	HxWxD [mm]
CBT	230V~	16	155x87x43



**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.

Type	Voltage [V]	Max input [A]	HxWxD [mm]
KUR	230V~	10	175x85x105



**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~. IP44.

# Controls

## 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.

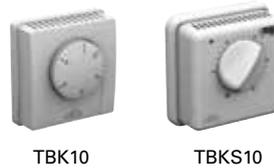
Internal and/or external sensors (external sensor RTS01 available as an accessory) give the possibility of selecting the sensor function e.g limiting external sensors (min/max). Save reduction either by built-in manual switch or via external timer. CE compliant.



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). CE compliant.



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). CE compliant.



TBK, bimetal thermostats  
 Mechanical bimetal thermostats with acceleration resistance for room heating/cooling. TBKS10 also has a 1-pole switch. CE compliant.



RTS01, external sensor (accessory)  
 External sensor of NTC-type 10 kOhm. 3 m cable included.

Type	Description
RTS01	External sensor

## 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

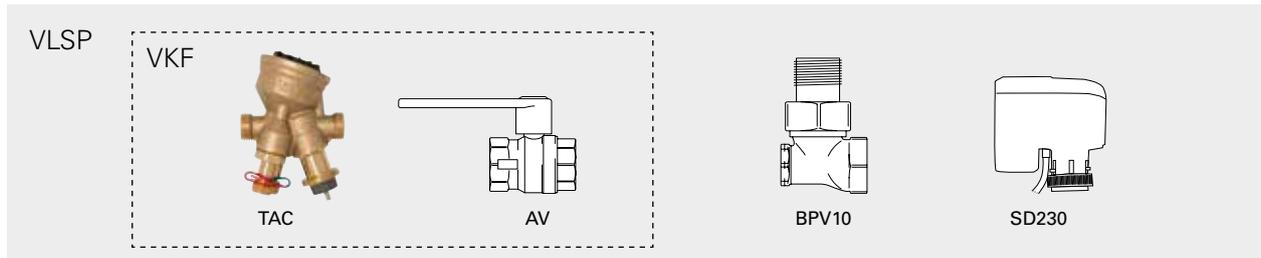
	Basic offer				Electronic 2-step		Capillary tube			Bimetallic	
	T10S	TK10S	TKS16(400)	TD10	RTI2	RTI2V	KRT1900/1901	KRTV19	KRT2800	TBK10	TBKS10
Internal sensor	X	X	X	X	X	X	X	X	X	X	X
External sensor	X*1	X*1	X*1	X*1	X*1	X*1					
Save reduction	X*2	X*2	X*2	X*2	X*2	X*2					
1-pole switch			X								X
Volt 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](http://www.frico.se).

## Water control

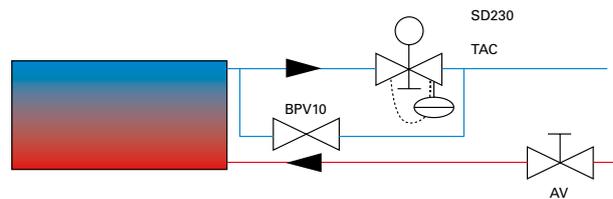


VLSP, pressure independent valve system on/off

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:

- VKF, valve kit
  - TAC, pressure independent regulation and adjustment valve
  - AV, shut off valve
- SD230, actuator on/off 230V
- BPV10, bypass valve



VKF, valve kit

The valve kit is available in four different valve dimensions, DN15 (1/2"), DN20 (3/4"), DN25 (1") and DN32 (1 1/4").

The valve kit consists of the following:

- TAC, pressure independent regulation and adjustment valve
- AV, shut off 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.

VKF, valve kit

Type	Description	DN	Flow range [l/s]
VKF15LF	TAC15LF + AV15	DN15	0,012 - 0,068
VKF15NF	TAC15NF + AV15	DN15	0,024 - 0,131
VKF20	TAC20 + AV20	DN20	0,058 - 0,319
VKF25	TAC25 + AV25	DN25	0,103 - 0,597
VKF32	TAC32 + AV32	DN32	0,222 - 1,028

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").

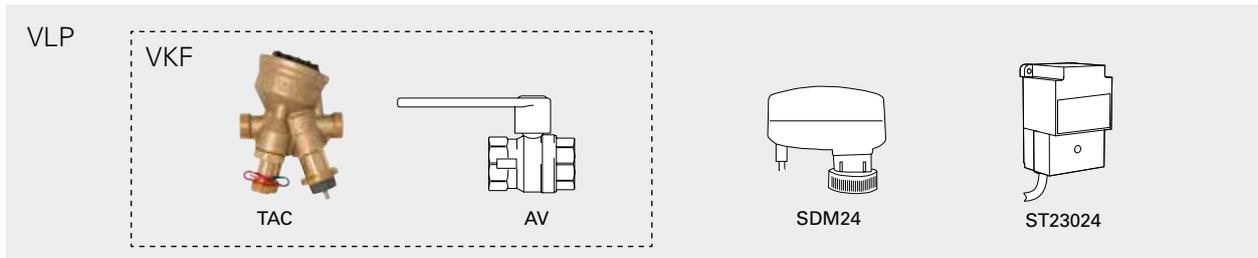
SD230, actuator

The actuator controls the heat supply on/off. In unpowered mode SD230 is open.

Type	Description
SD230	Actuator on/off 230V
BPV10	By-pass valve

VLSP, complete valve system

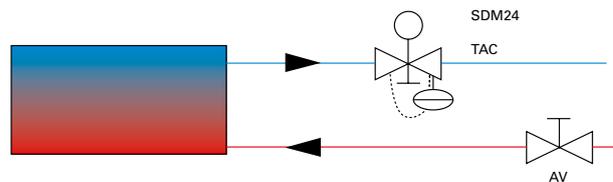
Type	Description
VLSP15LF	VKF15LF + SD230 + BPV10
VLSP15NF	VKF15NF + SD230 + BPV10
VLSP20	VKF20 + SD230 + BPV10
VLSP25	VKF25 + SD230 + BPV10
VLSP32	VKF32 + SD230 + BPV10



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:

- VKF, valve kit
  - TAC, pressure independent regulation and adjustment valve
  - AV, shut off valve
- SDM24, modulating actuator 24V
- ST23024, 24V transformer for 1-7 actuators



VKF, valve kit

The valve kit is available in four different valve dimensions, DN15 (1/2”), DN20 (3/4”), DN25 (1”) and DN32 (1 1/4”).

The valve kit consists of the following:

- TAC, pressure independent regulation and adjustment valve
- AV, shut off 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.

VKF, valve kit

Type	Description	DN	Flow range [l/s]
VKF15LF	TAC15LF + AV15	DN15	0,012 - 0,068
VKF15NF	TAC15NF + AV15	DN15	0,024 - 0,131
VKF20	TAC20 + AV20	DN20	0,058 - 0,319
VKF25	TAC25 + AV25	DN25	0,103 - 0,597
VKF32	TAC32 + AV32	DN32	0,222 - 1,028

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.

Type	Description
SDM24	Modulating actuator 24V
ST23024	24V transformer for 1-7 actuators

VLP, complete valve system

Type	Description
VLP15LF	VKF15LF + SDM24 + ST23024
VLP15NF	VKF15NF + SDM24 + ST23024
VLP20	VKF20 + SDM24 + ST23024
VLP25	VKF25 + SDM24 + ST23024
VLP32	VKF32 + SDM24 + ST23024



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

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"). Used with SIRE Basic and Competent or supplemented with suitable thermostat.

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

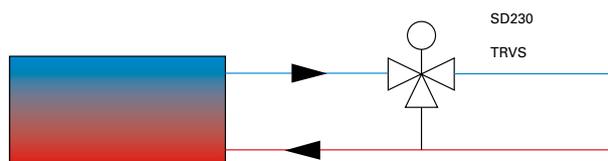
TRVS, 3-way control valve

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.

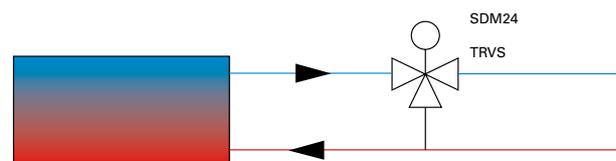
SDM24, actuator

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.

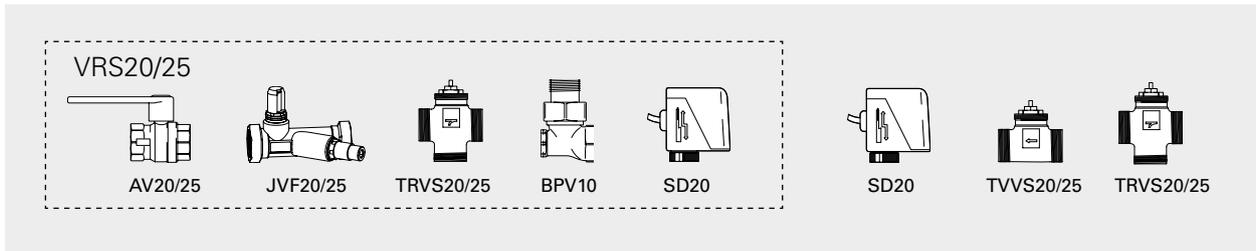
The valve kit is available in three different valve dimensions, DN15 (1/2"), DN20 (3/4") and DN25 (1"). Used with SIRE Advanced or supplemented with suitable thermostat.



Type	Connection	Kvs
VOT15	DN15	1,7
VOT20	DN20	2,5
VOT25	DN25	4,5



Type	Connection	Kvs
VMT15	DN15	1,7
VMT20	DN20	2,5
VMT25	DN25	4,5



**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, 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.

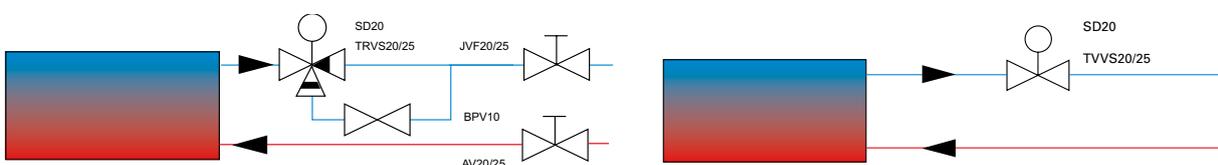
**TRVS20:** maximum close-off pressure 100 kPa (1,0 bar), kvs 2,5, DN20 (3/4").

**TRVS25:** maximum close-off pressure 70 kPa (0,7 bar), kvs 4,5, DN25 (1").

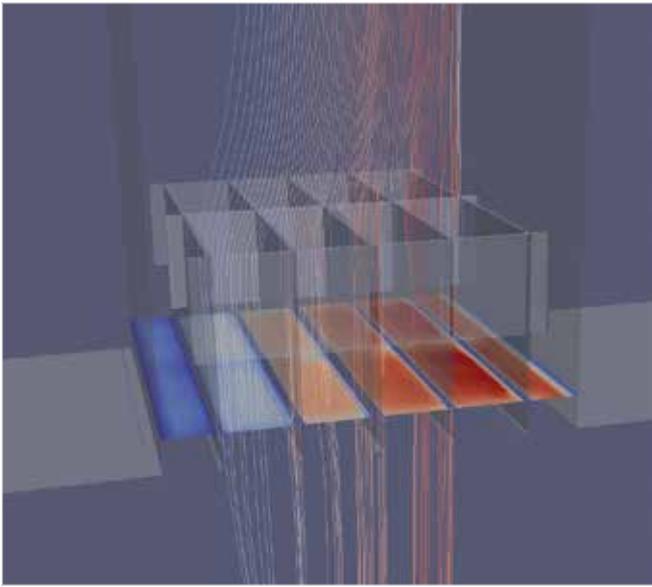
Pressure class PN16.

**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 SIRE control system.



# Technical handbook

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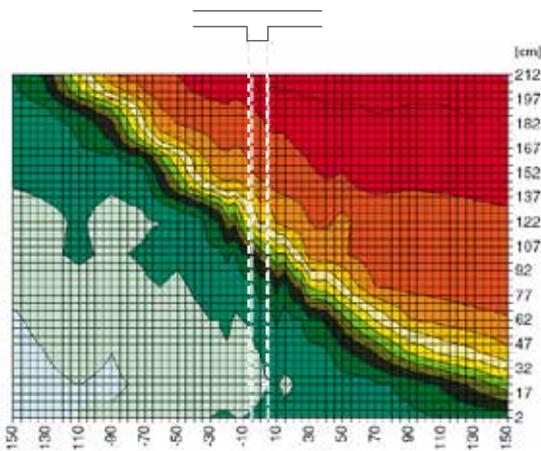


## The invisible door

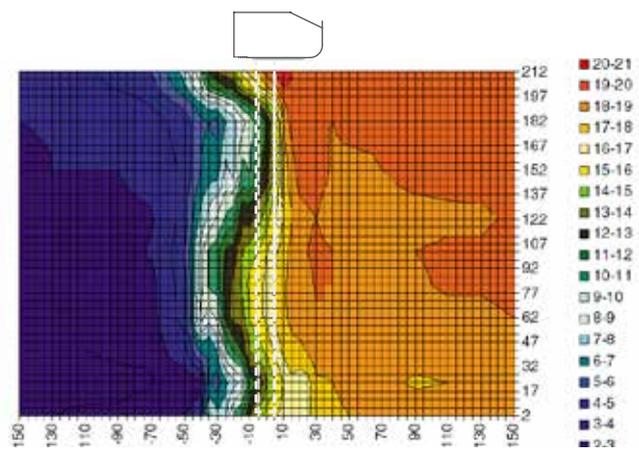
An open door is inviting and easy to pass through, but it also means a poor working environment and energy loss. An air curtain creates a comfortable environment and minimizes energy loss. Frico air curtains effectively separate indoors from outdoors, hot from cold.

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 [m <sup>3</sup> /s]
	$W$	=	door width [m]
	$H$	=	door height [m]
	$C_d$	=	flow coefficient 0.6 - 0.9
	$g$	=	gravity coefficient (9.81 m/s <sup>2</sup> )
	$\Delta\rho$	=	the air masses' density differential
	$\rho_m$	=	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).

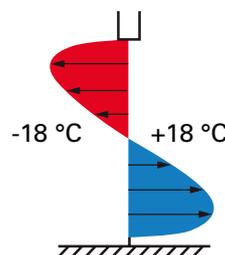
An air curtain can withstand a maximum of 5 Pa, depending on the conditions. But even small differences in pressure can significantly affect the efficiency of the air curtain.

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:

$$Q_p = W \cdot H \cdot \sqrt{\frac{\Delta P \cdot 2}{\rho}} \cdot C_d \quad (\Delta P \leq 5 \text{ Pa})$$

Opening	$Q_p$	=	airflow, pressure [m <sup>3</sup> /s]
	$W$	=	door width [m]
	$H$	=	door height [m]
	$\Delta P$	=	pressure differential
	$\rho$	=	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:

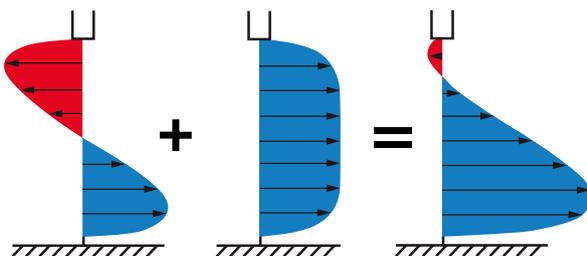
$$Q_v = W \cdot H \cdot C_v \cdot v$$

Opening	$Q_v$	=	airflow, wind [m <sup>3</sup> /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.

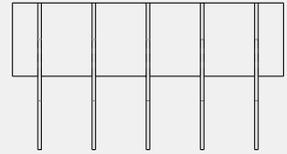
$$Q_{tot} = Q_T + Q_v + Q_p$$



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

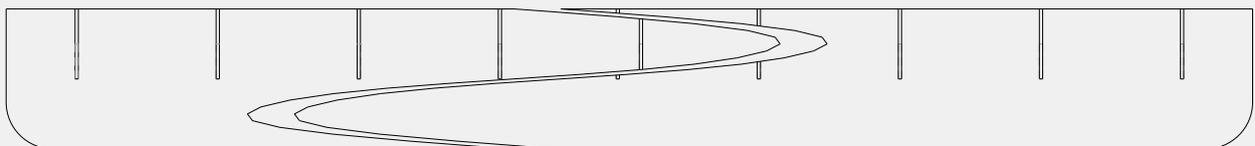
Separating climate zones is relatively easy if it is only the temperatures that differ. Handling an opening that is exposed to wind, pressure differentials and unbalanced ventilation is more difficult. Frico air curtains reduce the problems by creating an air barrier with the perfect balance between air volume and air velocity and a high uniformity of the air beam.

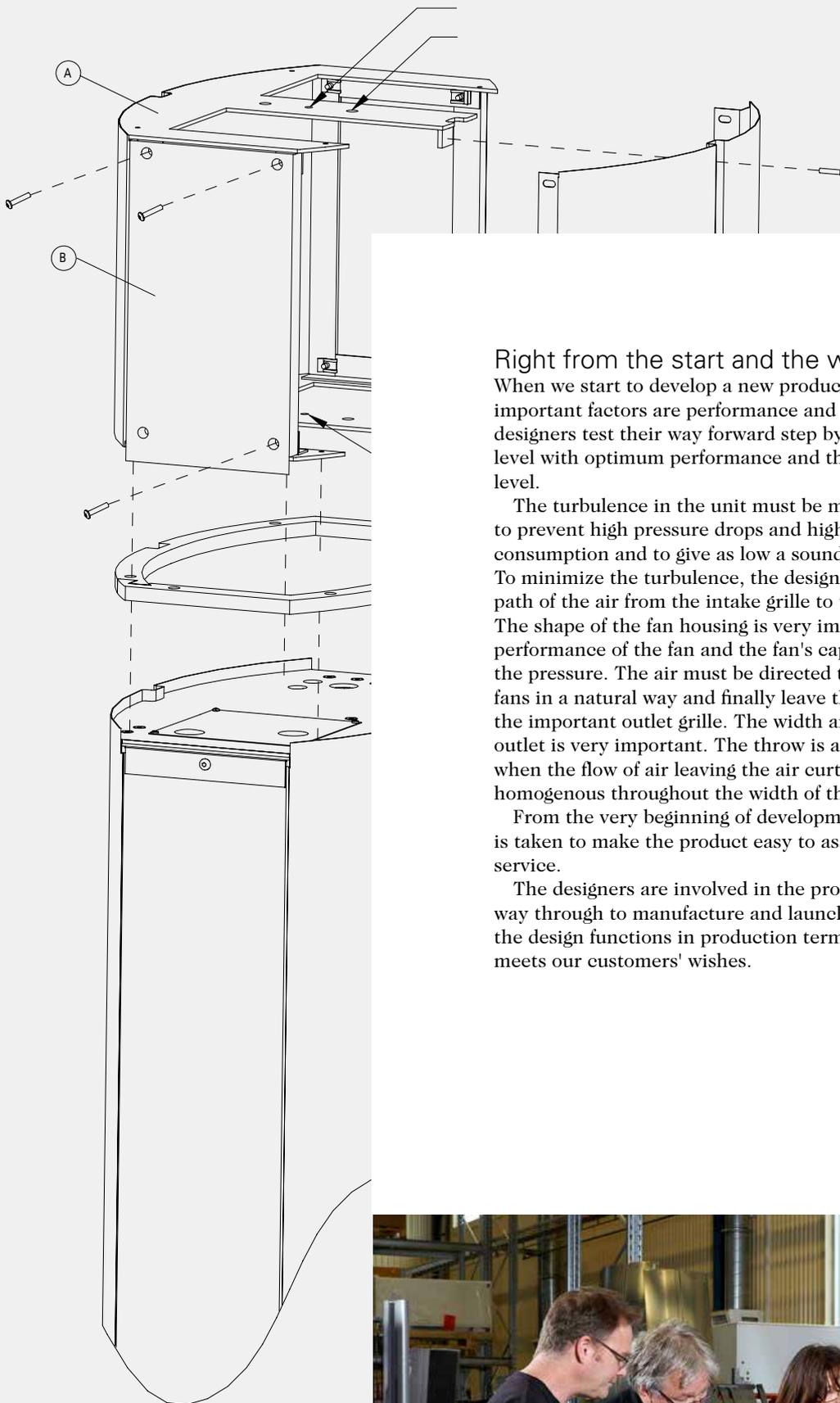
Frico has been developing air curtains for the demanding Scandinavian climate for 45 years. Our experience and knowledge has resulted in Thermozone technology, the theoretical foundation that we base the development of our air curtains on.

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.





### 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.

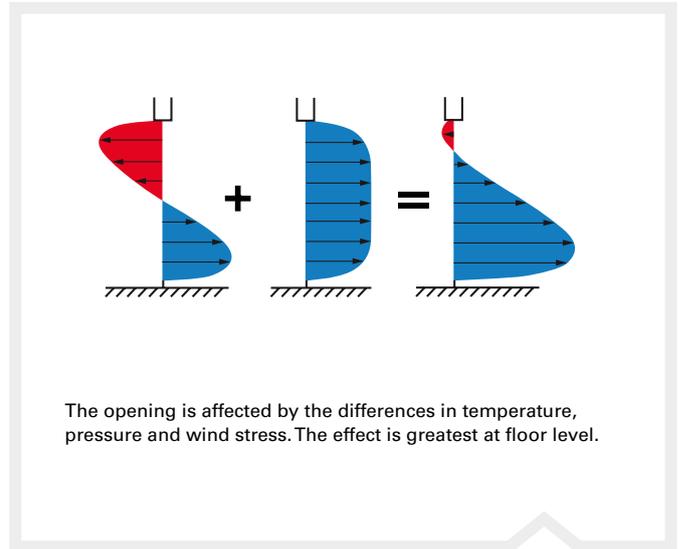


## Optimized performance

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.



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

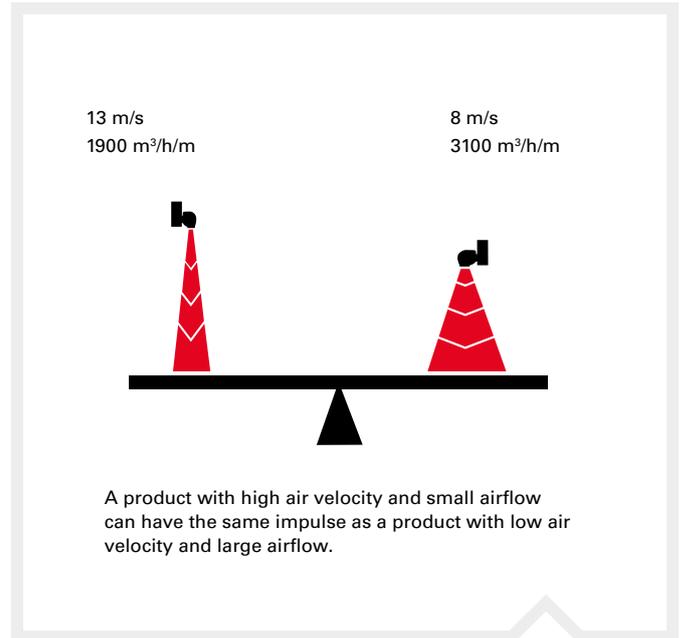
To evaluate an air curtain's performance the term impulse is used, which describes what force an air barrier has.

Impulse = air volume x density x air velocity

$$[\text{kgm/s}^2] = [\text{m}^3/\text{s}] \times [\text{kg}/\text{m}^3] \times [\text{m}/\text{s}]$$

The unit for impulse is  $[\text{kgm/s}^2]$ , 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.

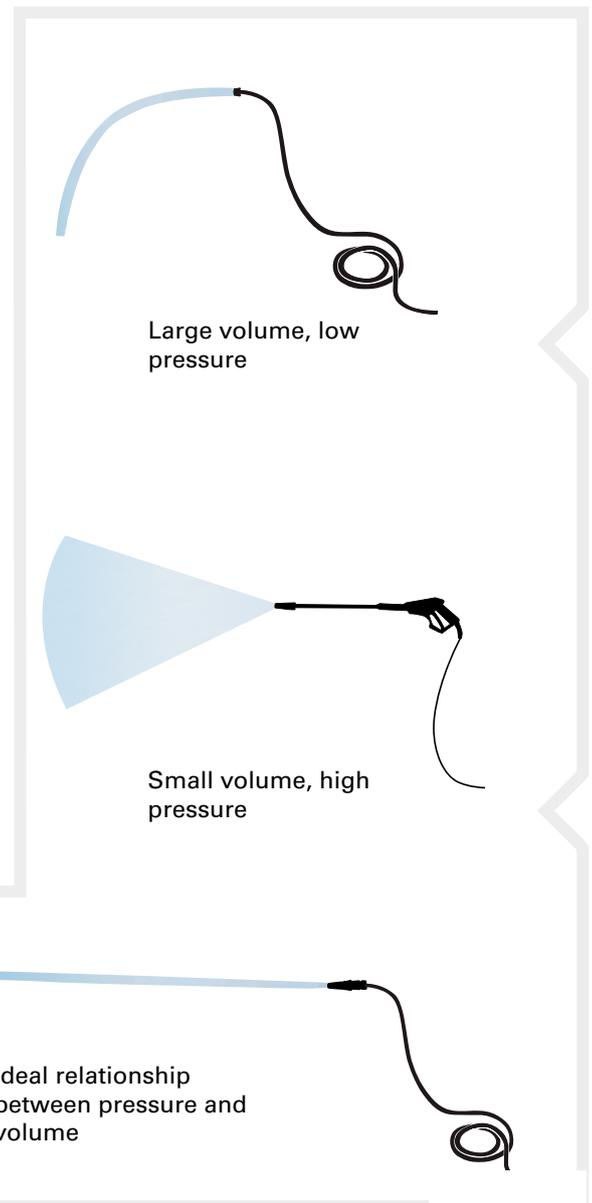
The impulse must be sufficiently large the whole way down to the floor in order to obtain an effective air barrier across the whole opening. It is therefore important to take air velocity into consideration when dimensioning.



### 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.

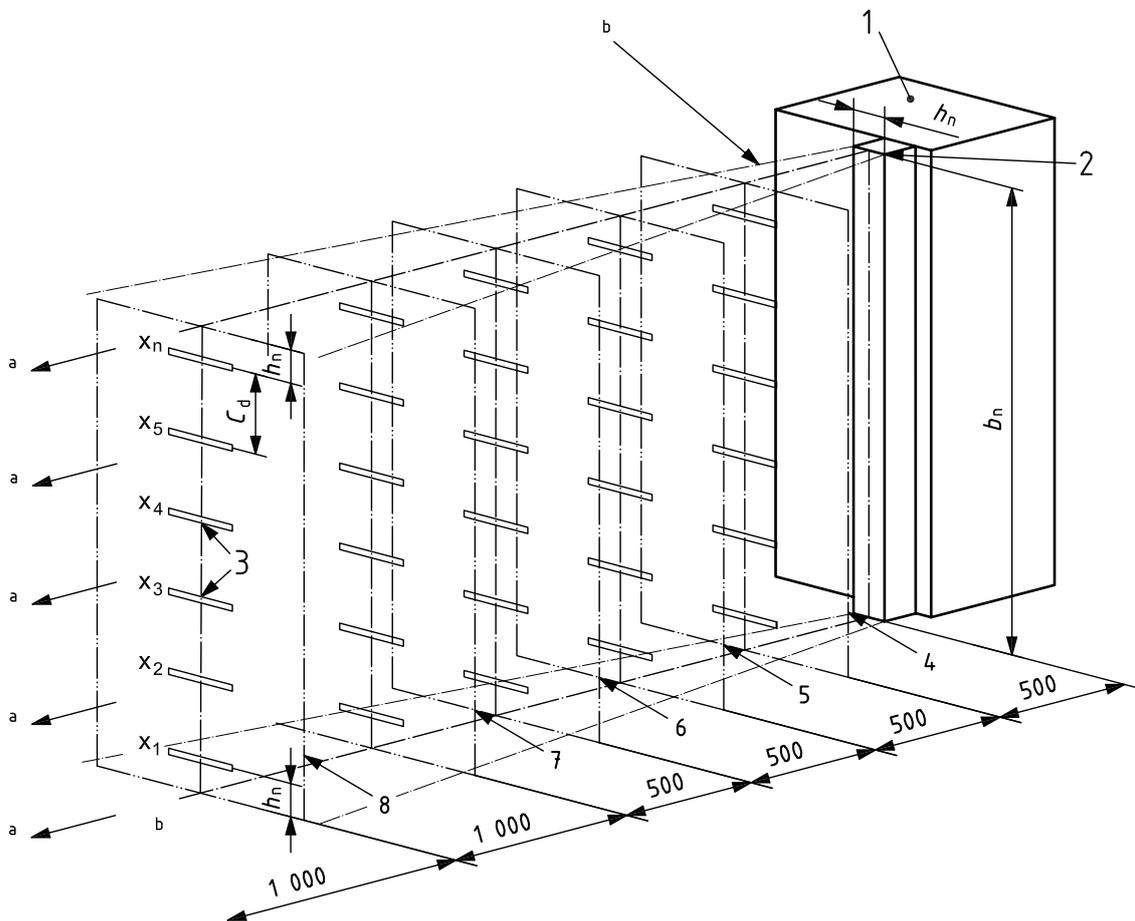
The performance is reduced in the same way in air curtains with low air velocity and large airflow or high air velocity and small airflow. They don't reach the floor. Large air volumes also require more heating and unnecessarily large amounts of energy. Thermozone technology creates a balance between air volume and air velocity that saves energy by using the minimum amount of air and gives optimal efficiency over the whole door opening.



**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.



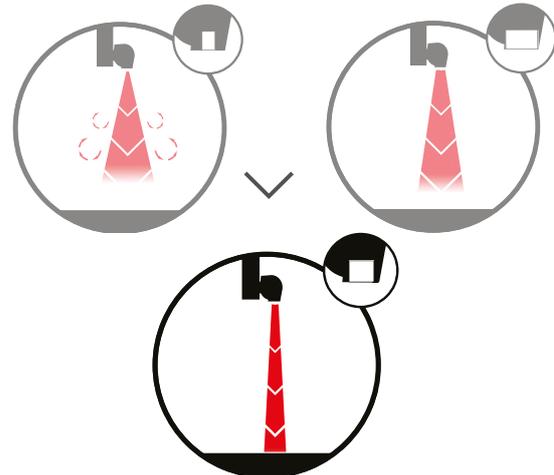
## Optimized airflow geometry

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

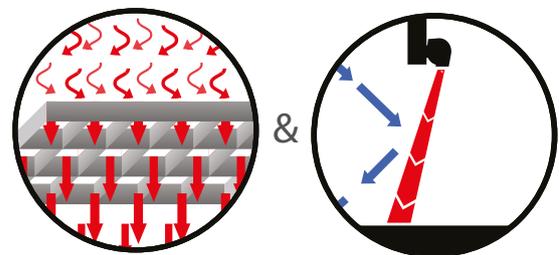
At any given air volume, it is the depth of the outlet that determines the air velocity. Too small an outlet creates turbulence because of an air velocity which is too high, this shortens the throw length. If the outlet is too deep it reduces the air velocity and shortens the length. In Frico air curtains the throw length is optimized via the depth of the outlet.



2

### Outlet grille

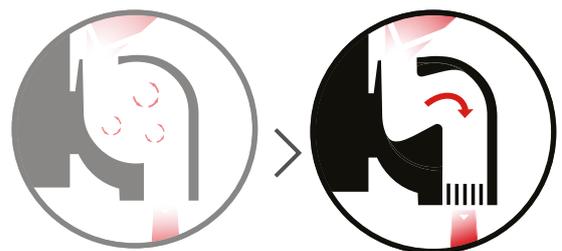
Height, width and fin distance all play a part in the design of the outlet grille, so that the air is directed and turbulence minimized. The result is a uniform air stream and an effective air barrier. Frico's outlet grilles make it easy to direct the air to resist pressure loads in the opening, so that energy losses are minimized.



3

### Minimized turbulence

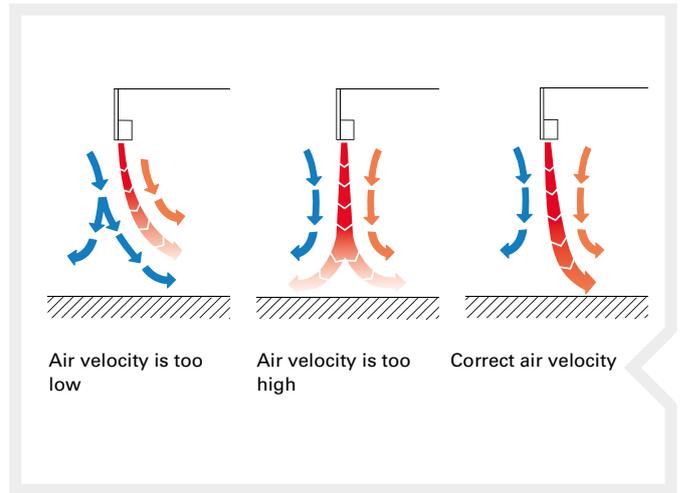
Turbulence inside the air curtain gives higher pressure drops resulting in higher energy consumption and less uniformity of the air beam. In Frico air curtains the turbulence is minimized and the energy consumption is limited.



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.

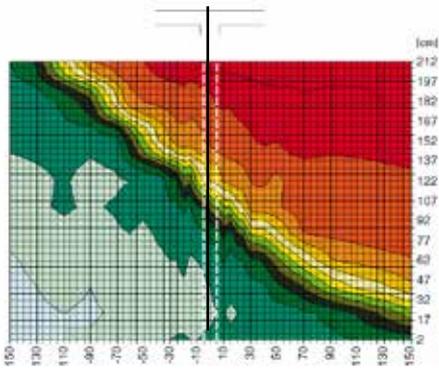
An air beam with correct velocity and high uniformity gives the best protection. Thermozone technology gives the most effective air barrier by ensuring that the air stream reaches the floor and at optimal velocity and uniformity. Thermozone technology solves the problem with the minimum amount of air.



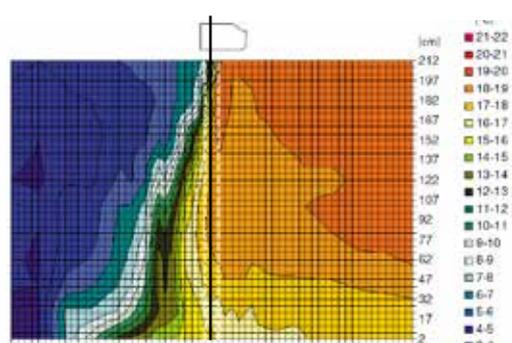
Test - protective effect

The environment replicated in this test is a dairy section directly attached to a room with normal room temperature. 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.

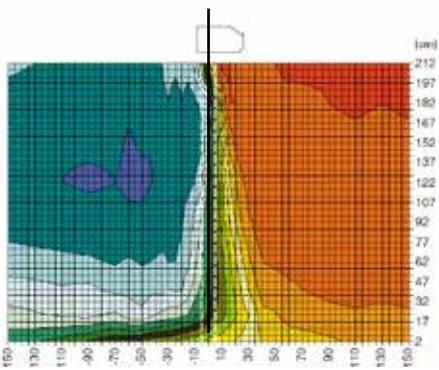
The clear red colour shows normal room temperature and the darkest blue colour shows the cold storage temperature. The values on the X-axis state the distance in centimetres from the unit, the values on the Y-axis state the distance in centimetres from the floor.



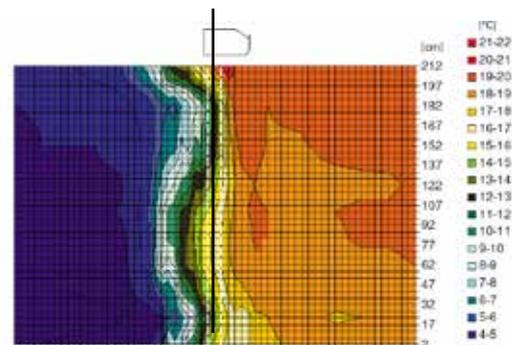
Opening without air curtain  
In an unprotected opening the cold air flows out and the cold storage room becomes much too warm.



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.

## Dimensioning

Frico has supplied air curtains for over 40 years and our experience of dimensioning can be illustrated in a diagram.

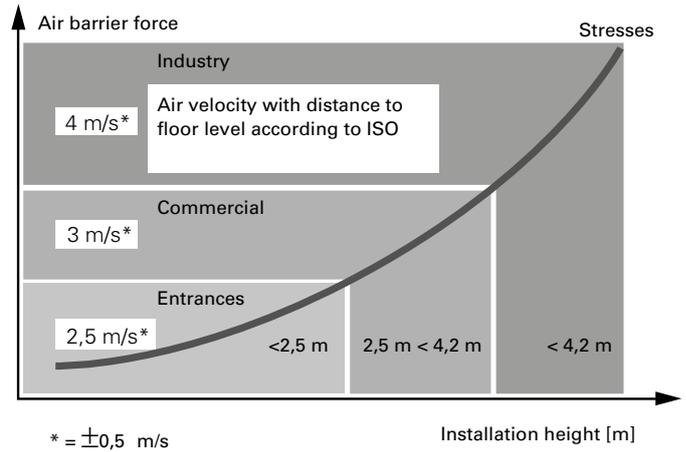
The relationship between the size of the door and how powerful the air curtain needs to be is not linear. The higher the door the greater the force required. We have chosen to use the distance to the floor as reference, together with the air velocity and the air beam uniformity measured in accordance 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  $\geq 90\%$  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.

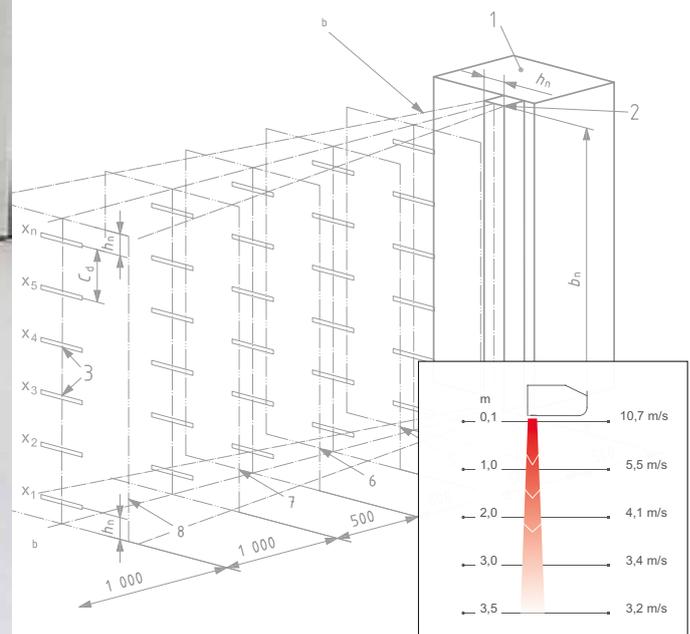


ISO measurements at our laboratory in Skinnskatteberg, which is one of the most advanced in heating and ventilation in Europe.

## 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.

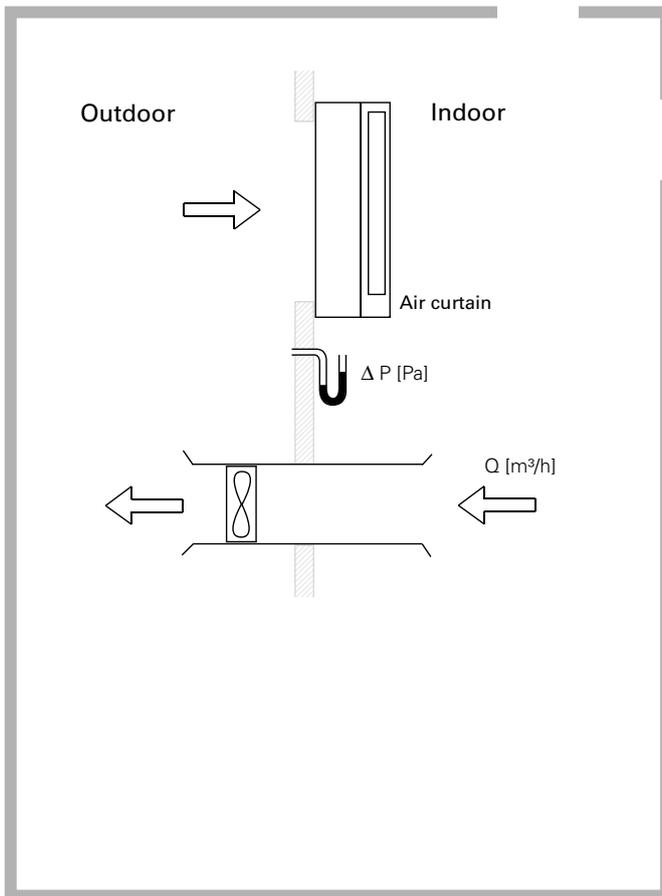


Air velocity profile PA3500

Tests - performance

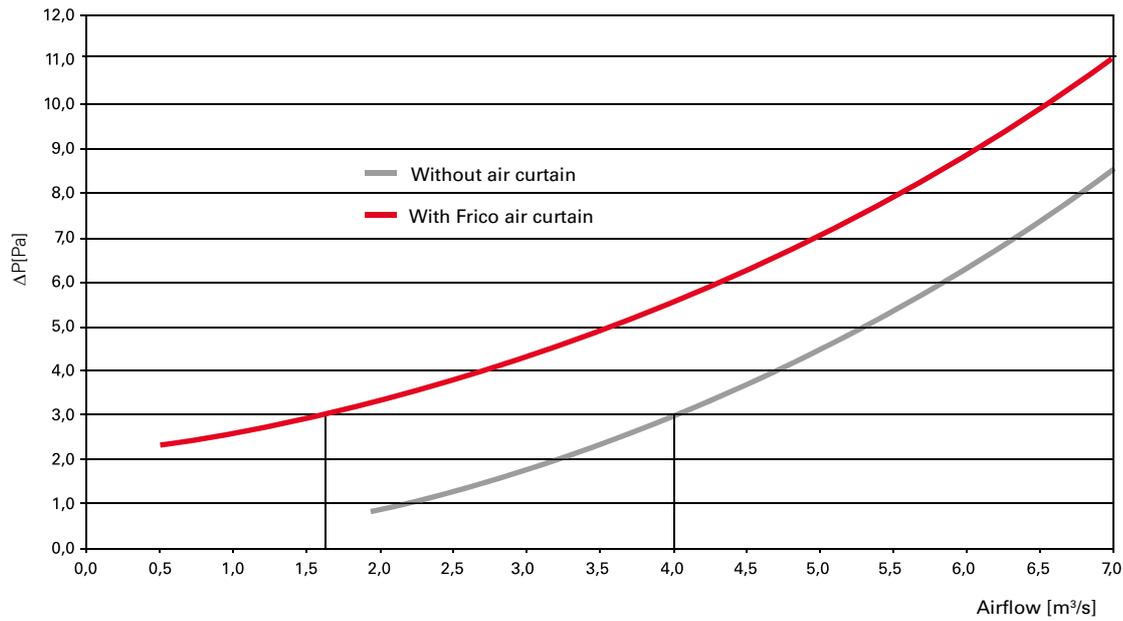
Air curtain efficiency

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 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 ( $\Delta P$ ) 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.

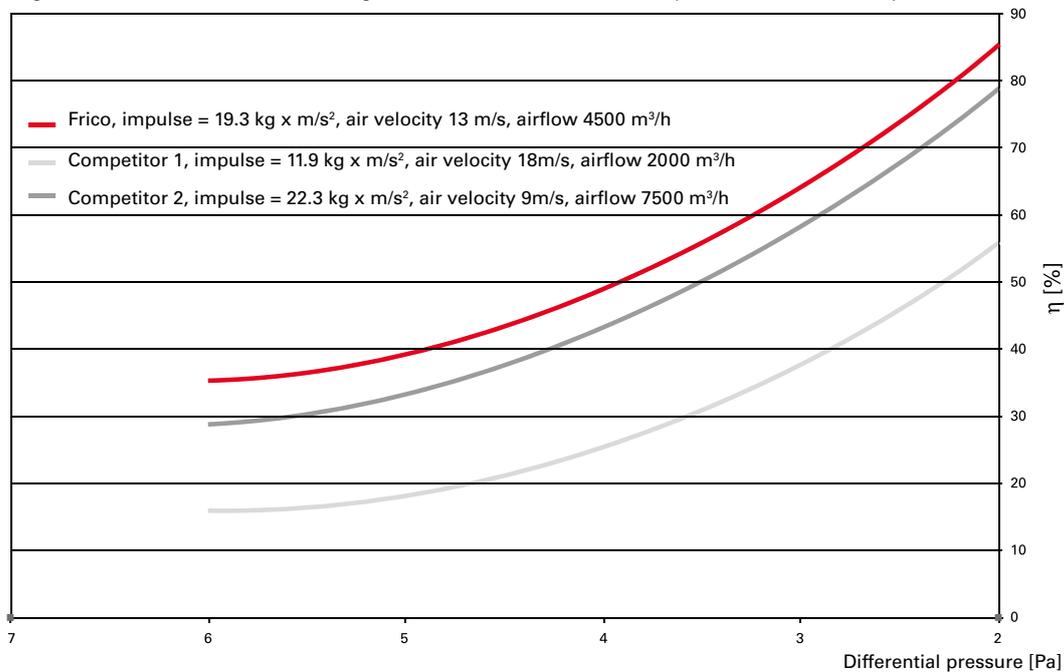
Diagram 1: Airflow through the opening with and without air curtain at different differential pressures.



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 performance of the air curtain. In this case it is  $(4-1.6)/4 \times 100 = 60\%$  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.

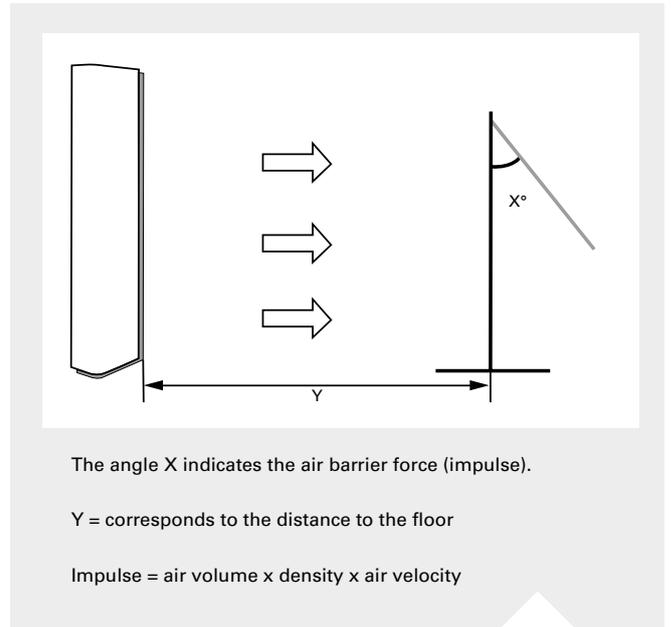
Tests - performance

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.

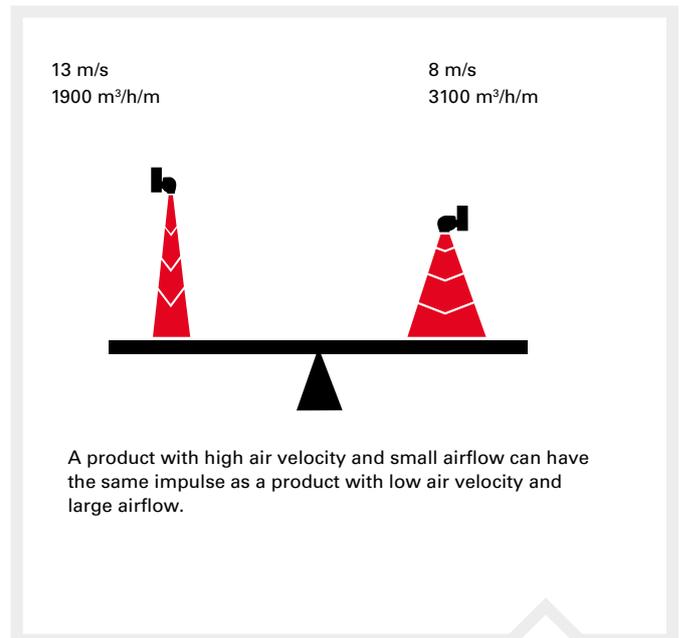
At the same air volume, air curtains from Frico give a stronger impulse at ground level than competitors, which means greater protection. Frico air curtains maintain the impulse the whole way to the floor, which gives a lower operating cost, because the same strength of air barrier can be achieved using lower air volume.



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.



Conditions:

- Same impulse
- Desired temperature increase: 15 °C
- Room temperature: 20 °C
- Opening width: 2 m

$T = 20\text{ °C} \Rightarrow \rho = 1,2$

Competitor (3100 m<sup>3</sup>/h/m, 8 m/s)  
 $P = Q \cdot \Delta T \cdot \rho \cdot c_p = 2 \cdot 3100/3600 \cdot 15 \cdot 1,2 \cdot 1 = \text{approx } 31\text{ kW}$

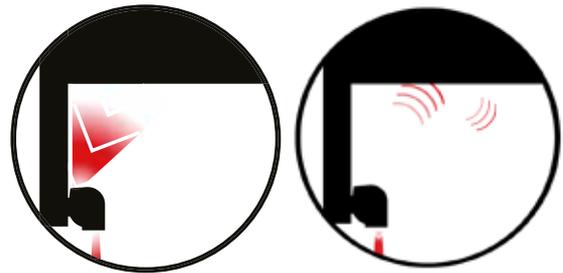
Frico (1900 m<sup>3</sup>/h/m, 13 m/s)  
 $P = Q \cdot \Delta T \cdot \rho \cdot c_p = 2 \cdot 1900/3600 \cdot 15 \cdot 1,2 \cdot 1 = \text{approx } 19\text{ kW}$

## 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.

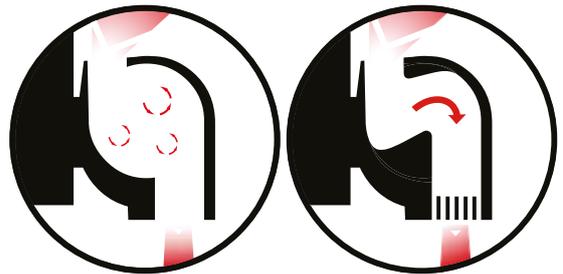
### Air intake on the top

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.



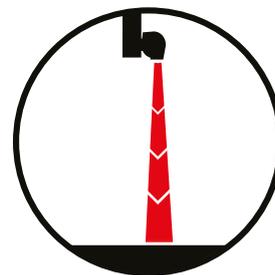
### Turbulence - no thanks

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.



## 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), where the threshold of hearing is 0 dB and the threshold of pain is 120 dB.

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. Sound power is calculated from the sound pressure and also uses a logarithmic scale. 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	Ringling 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,  $\alpha$ , 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.

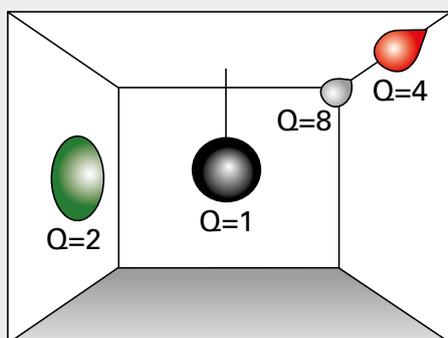
With these known factors it is possible to calculate the sound pressure if the sound power level is known.

## 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

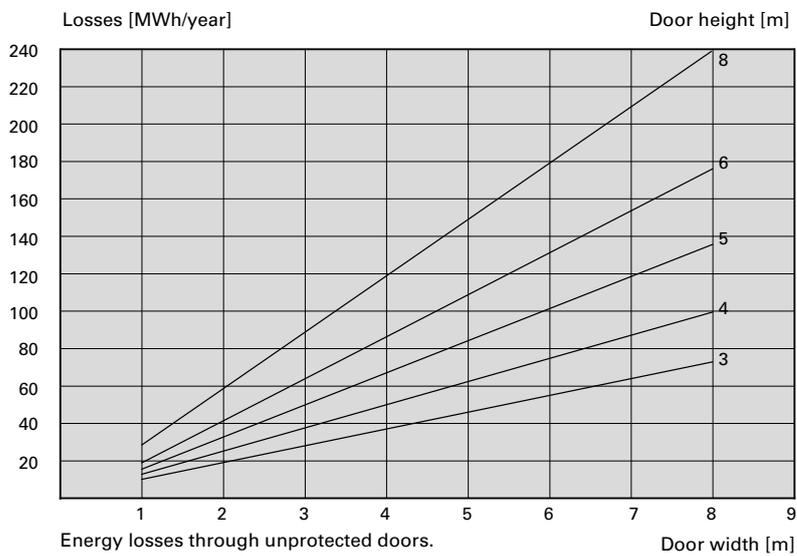


# Energy saving with air curtains

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  $v_{10}$  4 m/s  
Opening times 1 hour/day



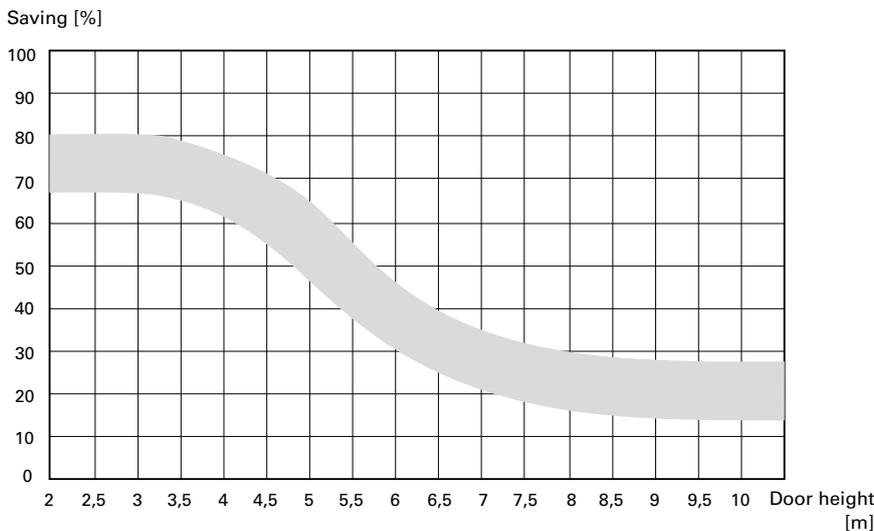
### Calculation of energy savings

Door height	5	
Door width	4	
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	
Room volume	6400	

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. See the following checklist with useful parameters.

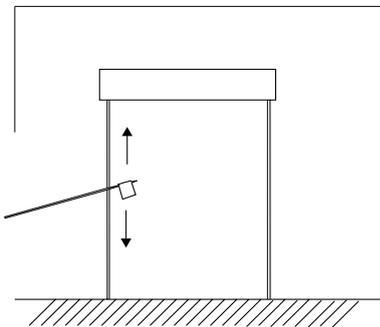


## Adjustment

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.



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.

### Correct air velocity

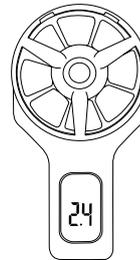
The air velocity at dimensioning must be correct for the installation environment and height (see diagram under Dimensioning, earlier in the handbook). In an installation outside the laboratory environment, the air velocity at floor level will be affected by wind loads and pressure differentials. Our 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.



### 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.

Tip! There are films showing adjustment at [www.frico.se/adjust](http://www.frico.se/adjust).



Example of anemometer.

### 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.

## 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.

### SIRe Control system

Most of our air curtains have an integrated intelligent control, SIRe, which automatically manages the air curtain operation, both in summer and winter. The control system can optimize either comfort, energy saving or a combination of these. SIRe is a smart and well designed, low voltage control system available in three different levels with different functionalities.

#### Basic

Basic includes basic functions covering manual control of fans and automatic heating with thermostats.

#### Competent

Competent is an automatic solution for daily air curtain operation.

The included door contact makes it possible to adapt operation of the air curtain to whether the door is open or closed. If the door is open the air curtain operates at high speed. When the door is closed the air curtain runs at low speed, but if there is no heating requirement the air curtain switches off. The air curtain can also be integrated with a heating system and be used for heating. In this way other heating costs can be reduced.

From function level Competent and upwards, a calendar function is included. For example, by reducing the temperature at night and weekends energy savings are possible. Each degree of room temperature reduction can save at least 5% of the total heating cost of the premises inside the door.

It is also possible to choose the functionality between the air curtain operating best for doors that are always open or for doors that are frequently opened and closed.

A common error is to turn the temperature up to max when it is cold, which results in over temperature which in turn impacts on comfort and energy consumption. With Competent it is possible to limit the range of room temperature setting.

#### Advanced

Advanced is a fully automatic solution for air curtain operation including all functions from Competent as well as further smart functions.

Advanced also includes the possibility of choosing between Eco mode or Comfort mode. Comfort mode prioritises comfort. Eco mode limits the outlet temperature and the energy consumption can be reduced by up to 35%.

Advanced measures the outdoor temperature allowing the air curtain to be one step ahead. The fan speed and temperature are always correct and assure optimal protection. The colder it is outdoors the higher the fan speed and vice versa in the summer. The automatic control, including the door contact, ensures that the air curtain operates when it should; you do not have to remember to switch it on. Many people forget that the air curtain is also of benefit when it is hot outdoors and don't switch the curtains on if it is manual, but cooling air is even more expensive than heating it.

When a water heated unit is controlled the return water temperature can be restricted. With a sensor on the return pipe more of the energy in the pipe can be utilised and the system that produces the heat - a heat pump or a district heating system - is significantly more efficient at a lower return temperature. In many cases you also pay a lower tariff if you can keep the return temperature down.

#### BMS

The air curtain operation can also be controlled via an overall control system. The air curtain can receive signals for fans and heating with voltage signal 0–10 V, but it also possible to control all functions and receive all indications via gateway Modbus RTU (RS485). Functionality for BMS is in Competent (on/off/fan speed and alarm function) and in Advanced (complete control with indication and via gateway).

#### Simple installation

The different components are supplied together and are easy to assemble. The system self-checks that everything is correct and that it functions. Thanks to the preset default settings it is easy to start air curtain operation as soon as the system is in place.

Read more on the product pages in the catalogue.

#### Other controls

Frico offer a wide selection of control panels, speed controls, door switches and thermostats for our other air curtains. Some of our air curtains have integrated controls. See product pages.

## Valve systems

Water heated units must always be supplemented with valves. When heating is not required, the valve restricts the water flow and only a small amount is allowed through so that there is always hot water in the heating coil. This is to be able to provide quick heat supply when a door is opened but also to provide a degree of frost protection. Without valves the unit gives off maximum heat energy as long as the fan is running, which means energy loss.



### Select the correct valve system for units with SIRE

Which valve system should be selected is related to the level of SIRE control (Basic, Competent or Advanced) and what information is available about available pressure and desired output.

In Basic and Competent the valves are controlled on/off and in Advanced a modulating actuator is used that controls the valve.

In order to select the correct valve size it is necessary to know what water flow is desired and what available pressure the pump in the pipe system can deliver to the valve. It is often difficult to know the available pressure and it varies with changes to the system, therefore it is often advantageous to select a pressure independent valve that compensates for variable pressure. Specifications about the Frico valve systems are found in the Water control chapter. There are diagrams and tables for valves on our website to help you make a precise selection.

Valve systems VLSP and VOT are used for SIRE Basic and Competent. Valve systems VLP and VMT are used for SIRE Advanced.

Valve systems for SRe 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. Controls heat supply on/off. The valve is pressure independent and ensures that the flow to the unit is correct even if the differential pressure in the rest of the pipe system changes, which contributes to stable and accurate control.

**Valve size**

To select the valve size the water flow must be known and available pressure must always lie in the range 15 – 350 kPa (DN15/20) and 23 – 350 kPa (DN25/32).

Select the smallest possible valve size that can achieve the desired flow. A valve setting between 6-8 is recommended.

In the example in the table a flow of 900 l/h is desired. VLSP20 is a suitable choice. If you instead had selected VLSP25 the valve setting would have been between 3 and 4, which would have given worse characteristics and an unnecessarily large valve.

The valve will compensate for variations in the pipe system, so that the desired water flow is maintained.

$q_{max}$

	1	2	3	4	5	6	7	8	9	10
<b>DN15LF</b>	44	71	97	123	148	170	190	210	227	245
<b>DN15</b>	88	150	200	248	295	340	380	420	450	470
<b>DN20</b>	210	335	460	575	680	780	890	990	1080	1150
<b>DN25</b>	370	610	830	1050	1270	1490	1720	1870	2050	2150
<b>DN32</b>	800	1220	1620	2060	2450	2790	3080	3350	3550	3700

$q_{max} = l/h$

Example of the tables for VLSP, which display the flow for different settings.

VOT, three way control valve and actuator on/off  
The 3-way control valve controls the water flow in combination with the actuator. Used when the adjustment, shut off and bypass valves and the differential pressure control are supplied in another way. Controls heat supply on/off. If a two way valve is required instead of the 3-way control valve included, the third valve opening can be easily plugged (not included).

On markets where there are requirements for a constant return flow (3-way control valve) this is a suitable choice.

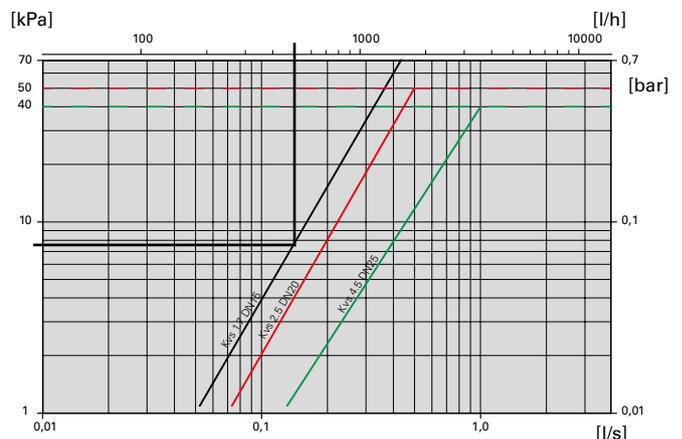
**Valve size**

To select the valve size both the water flow and pressure drop across the valve need to be known.

Select the valve size so that the pressure drop across the valve provides the required water volume.

In the example in the diagram, a flow of 500 l/h and a pressure drop of 7.5 kPa is required. VOT15 should be selected.

If you do not know the available pressure you can make an estimate, for example 10 kPa, and select the valve based on that; but if the actual pressure is higher than 10 kPa the water flow will be higher than required and vice versa.



Example of diagram for VOT, which displays the pressure drop for different flows.

Valve systems for SRe 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. Controls the heat supply steplessly, modulates and gives the right heating. The actuator is set to always release a small flow with SRe Advanced. The valve is pressure independent and ensures that the flow to the unit is correct even if the differential pressure in the rest of the pipe system changes, which contributes to stable and accurate control.

Valve size

To select the valve size the water flow must be known and available pressure must always lie in the range 15 – 350 kPa (DN15/20) and 23 – 350 kPa (DN25/32).

Select the smallest possible valve size that can achieve the desired flow. A valve setting between 6-8 is recommended.

In the example in the table a flow of 900 l/h is desired.

VLP20 is a suitable choice. If instead you had selected VLP25 the valve setting would have been between 3 and 4, which would have given worse circuit characteristics and an unnecessarily large valve.

The valve will compensate for variations in the pipe system, so that the desired water flow is maintained.

q <sub>max</sub>	1	2	3	4	5	6	7	8	9	10
<b>DN15LF</b>	44	71	97	123	148	170	190	210	227	245
<b>DN15</b>	88	150	200	248	295	340	380	420	450	470
<b>DN20</b>	210	335	460	575	680	780	890	990	1080	1150
<b>DN25</b>	370	610	830	1050	1270	1490	1720	1870	2050	2150
<b>DN32</b>	800	1220	1620	2060	2450	2790	3080	3350	3550	3700

q<sub>max</sub> = l/h

Example of the tables for VLP, which display the flow for different settings.

VMT, three way control valve and modulating actuator

The 3-way control valve controls the water flow in combination with the actuator. Used when the adjustment and shut off valves and the differential pressure control are supplied in another way. Controls the heat supply steplessly, modulates and gives the right heating. The actuator is set to always release a small flow with SRe Advanced. If a two way valve is required instead of the 3-way control valve included, the third valve opening can be easily plugged (not included).

On markets where there are requirements for a constant return flow (3-way control valve) this is a suitable choice.

Valve size

To select the valve size both water flow and available pressure need to be known.

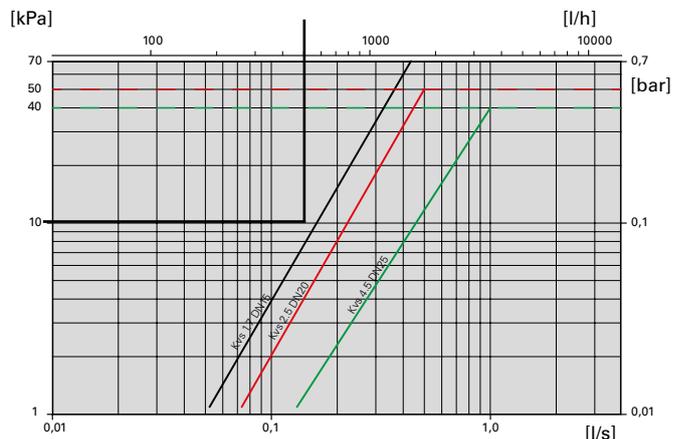
Select the size of the valve, where the pressure drop over the valve is at least as large as the pressure drop over the heating coil.

In the example, if you want a flow of 500 l/h, that is 0.14 l/s, the pressure drop must be at least 7.4 kPa (see table on previous page). VMT15 is therefore a suitable choice.

For modulated valves it is very important that the regulating valve is the correct size and has authority over the heating coil to prevent oscillation in the radiated heating output.

Too large a valve will give a large change in radiated output even at small adjustments.

Too small a pressure drop across the valve compared to the pressure drop in the coil affects the accuracy of the valve and therefore also increases the risk of oscillations.



Example of diagram for VMT, which displays the pressure drop for different flows.



## 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

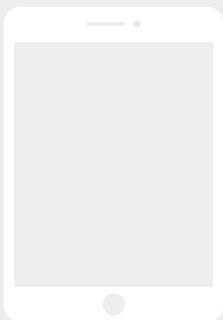
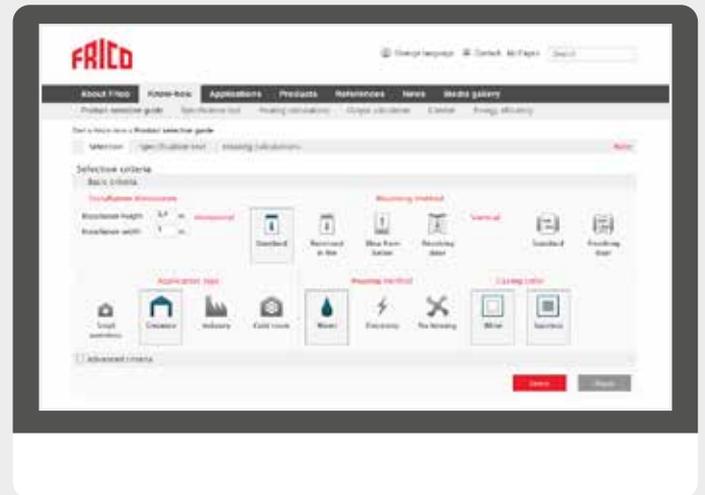
The product selection guide has a basic and an advanced level. What level is used depends on how much information is available about the installation. The product selection program should be used to get an idea of what products are suitable.

### 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 $\cos\varphi=1$	3-phase alternating current Y-connection	3-phase alternating current $\Delta$ -connection
$I=U/R=P/U$	$I_f=I$	$I=I_f \cdot 3$

### Voltage

Direct current and 1-phase alternating current at $\cos\varphi=1$	3-phase alternating current Y-connection	3-phase alternating current $\Delta$ -connection
$U=RI$	$U=U_f \cdot 3$	$U_f=U$

### Output

Direct current and 1-phase alternating current at $\cos\varphi=1$	3-phase alternating current Y-connection	3-phase alternating current $\Delta$ -connection
$P=UI$	$P= 3UI\cos\varphi$	$P= 3 UI \cos\varphi$

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

□ = normal design (no symbol), IPX0

● = drip-proof design, IPX1

▲ = splash-proof design, IPX4

▲▲ = jet-proof design, IPX5

## Enclosure classes for electrical materials

IP, first figure	Protection against solid objects
0	No protection
1	Protection against solid objects $\geq 50$ mm
2	Protection against solid objects $\geq 12.5$ mm
3	Protection against solid objects $\geq 2.5$ mm
4	Protection against solid objects $\geq 1.0$ 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 [mm <sup>2</sup> ]	Fuse [A]	Area [mm <sup>2</sup> ]	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 [kW]	Voltage [V]					
	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.



## Energy efficient products for a comfortable indoor climate



### Air curtains

It makes sound economic sense to create an efficient and invisible door that keeps the heat inside. Air curtains can be even more effective when used in air conditioned or cold storage buildings.

Thermozone technology with its precisely adjusted air velocity gives even protection throughout the opening. Frico air curtains provide the most efficient separation with the lowest possible energy consumption, regardless of whether it is the heat or the cold that you want to keep inside.

### Radiant heaters

Frico radiant heaters imitate the sun, the most comfortable and efficient heat source available. The heat is emitted only when the rays hit a surface and the room temperature can thus be lowered while occupants experience a comfortable environment. This makes radiant heaters well suited not only for total heating but also for zone and spot heating, for example to avoid cold draughts from windows.

Radiant heaters are easy to install and require minimum maintenance. They heat directly when switched on and give no air movement.

### Fan heaters

We are proud of the worldwide fame Frico fan heaters have gained. They are reliable and are designed for long life. Our range covers all needs. The investment cost is low compared to other heating systems.

A great advantage of fan heaters is the option of combining heating and ventilation. Frico fan heaters are compact, silent and light weight. They are available for electrical heating as well as for water heating.

### Convectors

Convection is the term for the rotating air movement where the air is affected by a heat source. The air is heated - rises upwards - cools and comes back to then be reheated. This gives good comfort through good heat distribution and the warm air flow directed upwards can be used to counteract cold draughts from large glass surfaces.

### Ceiling fans

Ceiling fans force over-heated air from the ceiling down to the occupation zone in premises with high ceilings so that the heat is maximally exploited. The ceiling fans can also be run in reverse, so that cold air can circulate through the room giving it a cooler feel.

### Thermostats and controls

The key to energy efficient heating and good comfort is the combination of heating products and good controls. Frico offers a wide range of thermostats and controls, read more under each product or in the Frico Catalogues.



The product selection guide at [www.frico.se](http://www.frico.se) helps you to find the right product and to easily collate all technical data, accessories and heating calculations to your documents.

Confiance  
Asiantuntimus  
Trust  
Дизайн  
Kompetanse  
Tillit  
Competência  
Компетентность  
Kompetenz  
Zaufanie  
Design  
Vertrauen  
Confiança  
Estetyka  
Kompetencja  
信任  
Доверие  
Competence  
能力  
Luotettavuus  
设计  
Competance



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