

FRIGOQUIP

FRIGOVENT AIR CURTAINS

for fridge and freezer doors



Technical catalog September 2020

The harmful exchange of air with open refrigerator or freezer doors



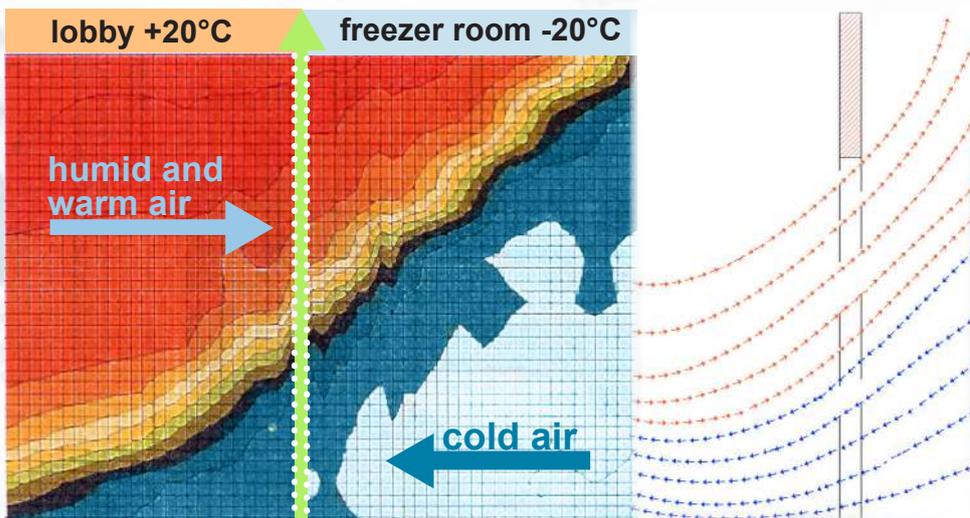
The problem

Cold air is heavier than warm air. Therefore, it outflows any freezer room through the lower part of the door.

Simultaneously, the more humid and warm outside air flows into the freezer room. Thereby, the outside air flows in through the upper part of the door as it is lighter than the cold air.



Thermography of air temperatures with an open and unprotected freezer door:



Proof through measurements

The thermography of unprotected freezer doors' air temperatures shows that freezer rooms heat up significantly due to the harmful air exchange caused by open doors.

This results in massive disadvantages for the cold store operators.

Consequences

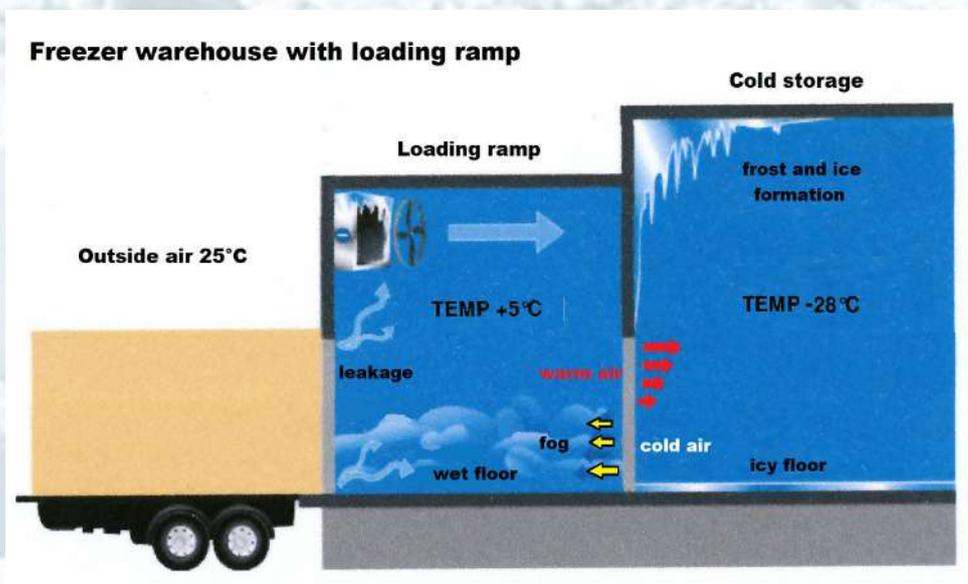
High energy costs, ice formation, risk of accidents and interruption of the cold chain.

- * Cooling down the warm inflowing air requires a high energy input.
- * The freezer room temperature rises and the cold chain is being interrupted.
- * Air humidity settles as frost and ice on ceiling, walls as well as goods.
- * Ice formation at the evaporator of the refrigerating machine which results in a reduction of the cooling capacity.
- * Ice formation on the freezer floor might lead to black ice.
- * Ice might fall from the ceiling.
- * Floors do not only become slippery but also uneven for forklift trucks.
- * The removal of the icing on the ceiling, goods or floor requires great effort.
- * Conventional strip curtains or swing doors ice up and cause a dangerous obstruction of vision which can easily lead to accidents.
- * Accidents and quality loss due to dangerous ice and frost formation as well as slippery surfaces cause substantial annual costs for the frozen food industry.



The solution: FRIGOVENT air curtains

Example: Freezer warehouse with loading ramp



Air Curtains easily seal door openings



Air Curtain Type A-225 above a freezer sliding door

What is an air curtain?

Air curtains prevent cold air losses from open cold room doors with the help of special blowers and without creating a physical barrier - like a door made of air.

FRIGOVENT air curtains are fastened above freezer room doors. They generate a turbulence-free air stream that is blown onto the floor in front of the door.

The air stream draws in the warm air that wants to flow into the freezer room as well as the cold air that wants to outflow.

As soon as the air stream hits the ground, it divides itself into two streams enabling the cold air to stay inside the freezer room and the warm air to stay outside.

As a result, cold air no longer escapes from the freezer and warm air can no longer flow in.

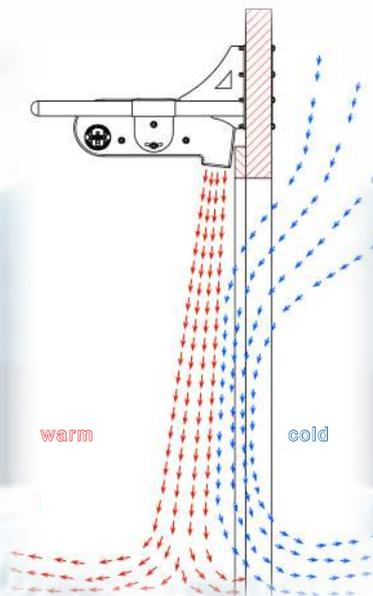
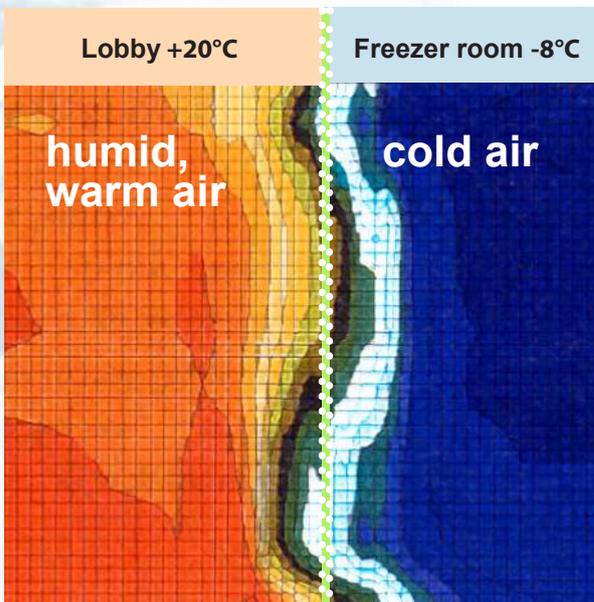
Significant electricity cost reduction

Electricity costs are reduced considerably by the use of air curtains because there is no more warm air in the freezer room that needs to be cooled after the door has been opened. Plus, there will be no longer iced evaporators that have to be defrosted.



FRIGOVENT Type B-225 above high speed door

Thermography of air temperatures of an open freezer room door, protected by an air curtain:



The thermography of the air temperatures of an open door with an air curtain proves that the freezer room is protected from a harmful air exchange.

The different temperature zones are clearly separated from each other.

As a result, many advantages arise in favor for cold store operators.



FRIGOVENT Type A-225 in meat factory

FRIGOVENT Air Curtains

...doors made of air



FRIGOVENT Type A-300
in the freezer rooms at -30°C

What advantages does a FRIGOVENT air curtain offer?

- * High energy cost savings
- * Reduction of frost formation on ceilings, walls and goods
- * Ice-free floor which reduces the risk of accidents
- * Ice-free evaporators which improve the efficiency of the cooling machine
- * Reduction of machine running times which is very energy costs saving
- * Quality preservation of the goods as cold chain remains preserved even with open doors
- * Saving energy contributes to climate protection and helps against global warming



FRIGOVENT Type D-375

1. Can be mounted above almost all kind of gates.

FRIGOVENT air curtains are self-supporting for a width of more than 10 meters. Sectional, rolling or sliding doors can freely move behind the air curtains. It is installed in between two consoles which are mounted on each side next to the door opening. We offer various mounting options: on the wall, ceiling or side walls. This allows us to install our air curtains almost anywhere - even under difficult conditions.

2. High operational safety.

Whenever the gate opens and moves away from the switch, the proximity switch of the air curtain immediately activates itself. The blowers are already running when the door is fully open.

The proximity switch is completely encapsulated without any moving parts. It is also waterproof and operates with only 12 volts. As a safety switch, it cannot cause electrical accidents.

3. Regulation of air speed and air volume.

When adjusting the air curtain, the blow-out angle and the air speed are set. The air speed and volume of our air curtains are infinitely adjustable.

4. Use of effective blowers with the most advanced motors.

Only centrifugal blowers with electronically commutated (EC) motors are used.

- * Up to 50% less power consumption than conventional motors
- * Easy to control, quiet, durable and particularly suitable for a permanent operation.
- * If EC motors are downscaled, the power consumption is further reduced in-line.
- * The air curtains reach their full effect after only 2-3 seconds.
- * The housing is made of stainless steel and the impellers are composed of fibre-reinforced plastic or aluminium.
- * Cantilevered over the length of up to 10 meters.
- * Mounting only requires two consoles.

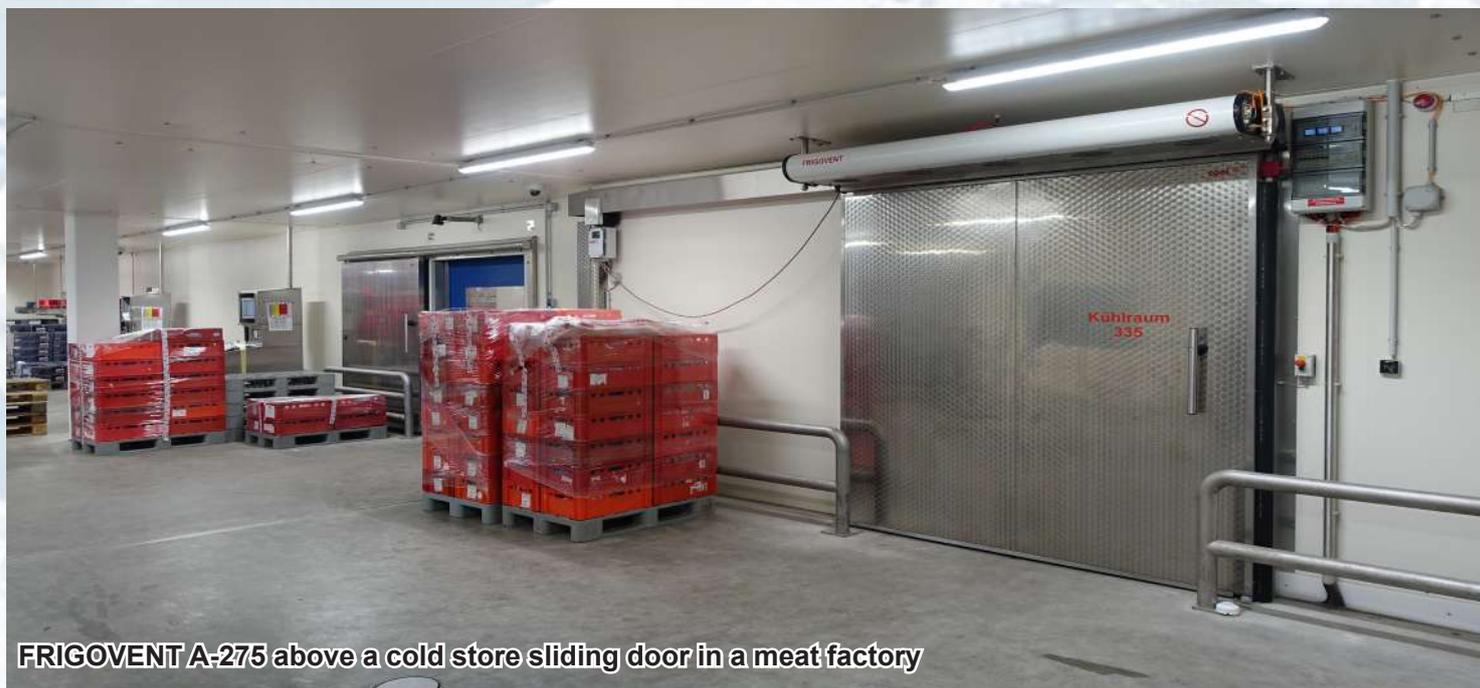
5. Optimum air flow for optimum effect.

FRIGOVENT air curtains are installed on the warm side of the wall above the freezer door. The blowers absorb air from the lobby and blow it out on the floor with the help of nozzles and an air rectifier. Consequently, both - the cold air that wants to flow out of the freezer room and the warm air that wants to flow into the cold room - are entrained by this air stream.

As soon as the air stream hits the floor, it is divided. This allows the cold air to remain inside the freezer room and the warm air to stay outside.

The air flow is generated by centrifugal blowers. It is compressed in the pressure compartment of the air curtain, then accelerated by a nozzle and subsequently distributed over the entire air curtain.

The air rectifier is located at the nozzle outlet. It consists of hundreds of small blowpipes through which air is blown. This ensures the air flow to be free from turbulences, strong, stable as well as far reaching. As a result, a homogeneous air stream is created which prevents the entrained air, the cold air from the freezer room and the warm air from the lobby, from being mixed.



FRIGOVENT A-275 above a cold store sliding door in a meat factory

6. Fast and easy service.

The system is electronically controlled. There is a plug-in device including all electronics and control components. In case of malfunction, that device can be easily removed and replaced. This eliminates the need for time-consuming troubleshooting and ensures fast repair. Thus, a worldwide 24-hour service is possible.



FRIGOVENT B-300 HB (horizontal blowing air curtain incl. bridge and blowing wall in front of the freezer room of a meat factory)

7. Corrosion-resistant, hygienic and physiologically perfect.

FRIGOVENT air curtains are mainly made of stainless steel - the consoles, adapters, motor housing, the outlet nozzles and the intervention protection. Stainless steel is absolutely corrosion-resistant, antibacterial and therefore hygienic. Thus, it is also physiological which makes it the most suitable material for this purpose.

8. Very long-lasting, quiet, maintenance-free and reliable.

The air curtain is corrosion-resistant and sound-insulated. The housing is made of a modern sandwich material with surfaces of painted aluminium and polyethylene in between. This material has good features regarding sound insulation, corrosion and stability. The centrifugal blowers are equipped with brushless DC motors and electronic commutation. This enables a particularly long life span and a wear-free performance. The impellers of the air curtain blowers of Type A and B are made of fibre-reinforced polyamide, the impellers of the other blowers are made of aluminium. All other parts of the air curtain are made of solid plastic or chrome-nickel steel.

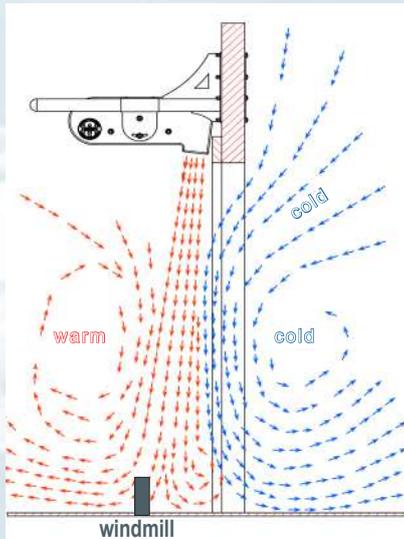
FRIGOVENT ...for the cold to stay inside the cold, even with open doors!



FRIGOVENT A-150 CNS with a stainless steel housing in front of a bakery freezer



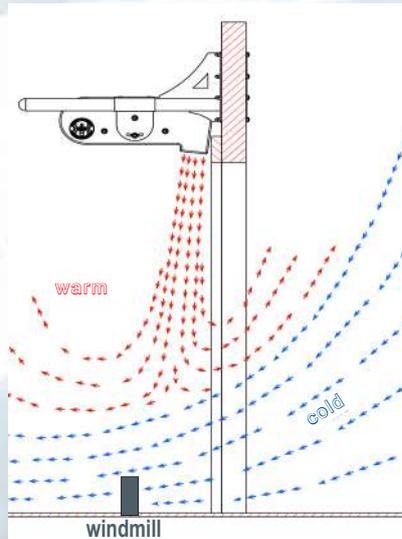
FRIGOVENT A-300 mounted in a freezing room at -30°C



Wrong setting

Air speed set too high. Disturbing air turbulences are created.

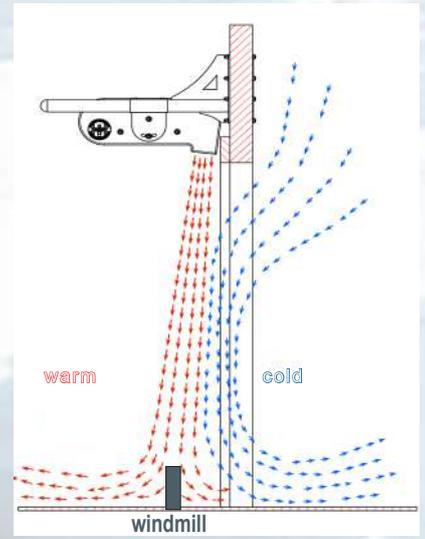
Reduce air speed!



Wrong setting

Air speed set too low. Air flow does not reach the ground and cold air escapes.

Increase air speed!



Correct setting

Air speed and blow-out angle are optimally adjusted.

Cold air cannot escape while warm air cannot enter the cold room.

Assembly and adjustment

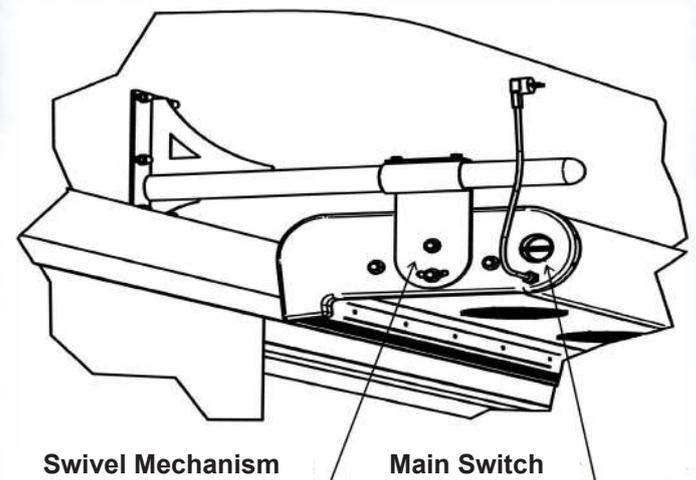
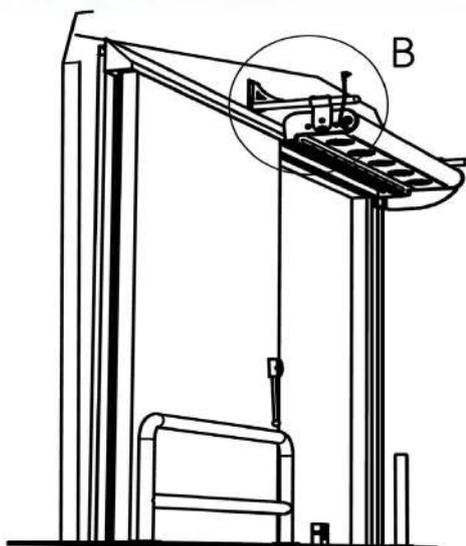
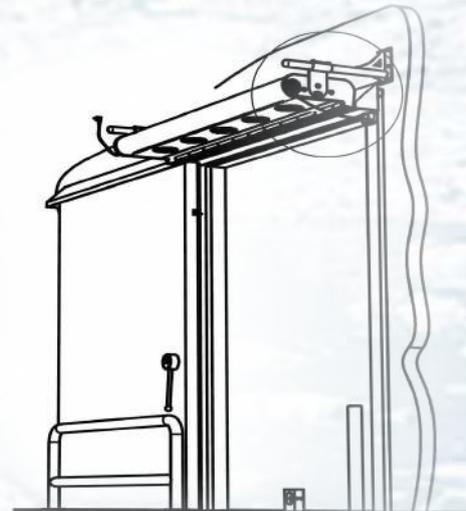
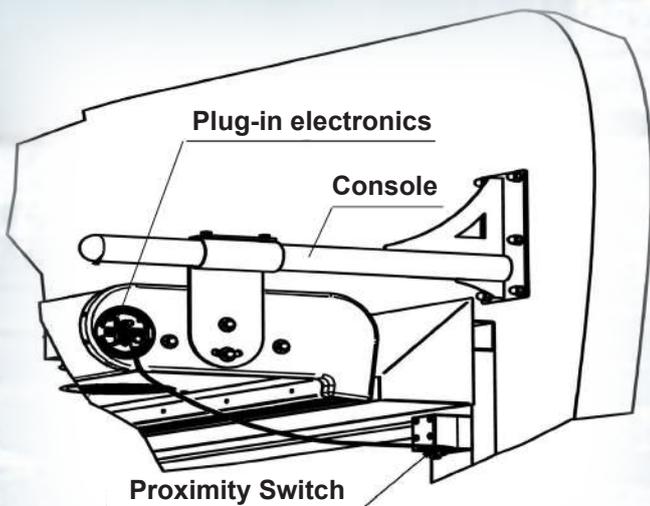
An air curtain is mounted with two consoles above the door opening. In freezer rooms, it is mounted on the warm side and in cold rooms, it can be mounted on both sides. Duplex air curtains are mounted on both sides of a freezer room door. The one inside the freezer room is equipped with a heating and a special control system.

The air flow can be adjusted with the help of the supplied windmill.

Components:

- * Housing with nozzle, blower and control
- * Two stainless steel consoles
- * Proximity switch with cable and connectors
- * Fixing material for masonry or alternatively for clamp mounting on a panel wall
- * Windmill for function test

1. A FRIGOVENT air curtain is positioned centrally above a door opening, fixed with two consoles.
2. The air curtain's side with the blow-out nozzle must be pushed onto the consoles as far as possible.
3. The proximity switch automatically activates the air curtain when the door opens. As soon as the door dissociates itself from the switch, the blowers start running.
4. The blowing angle needs to be adjusted, so the air flow hits the floor in front of the door vertically at an angle of 5° to 10°.
5. The air volume is regulated by a rotary controller. The air stream needs to reach the ground but the air speed must be kept low. Otherwise the air stream will be mixed with the air from the lobby.
6. An optimal adjustment is guaranteed when no exchange of air between the freezer room and the lobby is possible. To test if there is an air exchange, the windmill needs to be placed on the threshold underneath the air curtain.
7. Air curtains must not be installed in front of doors with strip curtains as they hinder the air stream of the air curtain.
8. The nozzle should be about 10 cm wider than the door opening. Additionally, we recommend side bulkheads made of soft PVC strips for the avoidance of side air intake.



Cost savings with an air curtain: Calculation example

Cost calculation

How much does it cost to have freezer room door of 200 x 250 cm open for 40 seconds?

For this purpose, it must be determined how much cold air is lost. Cold air is about 20% heavier than warm air. Therefore, it flows out at the bottom of the door opening. The same amount of warm air enters the cold room through the upper part of the opening as it is lighter. The speed of the air movement is about 1m/sec.

Consequently, 2.5 m³ of cold air is lost per second assuming an open freezer door of 200 x 250 cm. Thus, 100 m³ of cold air is lost with an open time of 40 seconds.

The same amount of warm air flows into the freezer room and needs to be cooled down.

To cool down 1 m³ warm air, e.g. from +20°C to -20°C, it requires 100 KJ. 100 KJ equals 0.028 KW/h or 24 Kcal.

To produce 100 m³ of cold air, 120 m³ of warm air are extracted at a rate of 0.028 KW/h.
 $120 \times 0.028 = 3.36 \text{ KW/h.}$

For this process, a cooling machine needs to generate approximately 3.00 KW/h.

With electricity costs of 15-20 cents per KW/h, a door opening costs 0.50 EURO.

A door opening with a cold air loss of 100 m³ costs at least 50 cents. With 30 openings daily

the costs per day are 15 EURO, the costs per month 300 EURO and the costs per year 3.600 EURO.

By using an air curtain, you can save 80-90% of these costs.

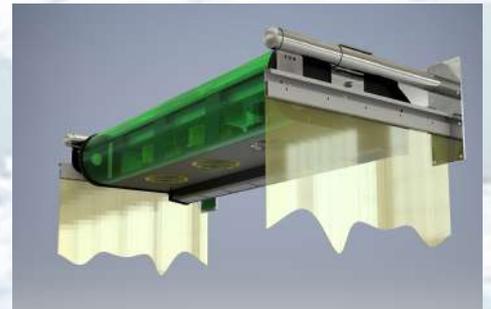
This is how you can determine whether it makes sense to acquire an air curtain:

You can collect the condensed water in a bucket that accumulates at the evaporator.

When cooling down the warm air to replace the lost cold air, 15g of condensed water are produced per m³.

A bucket with 10 liters of condensed water proves the loss of 650 m³ cold air.

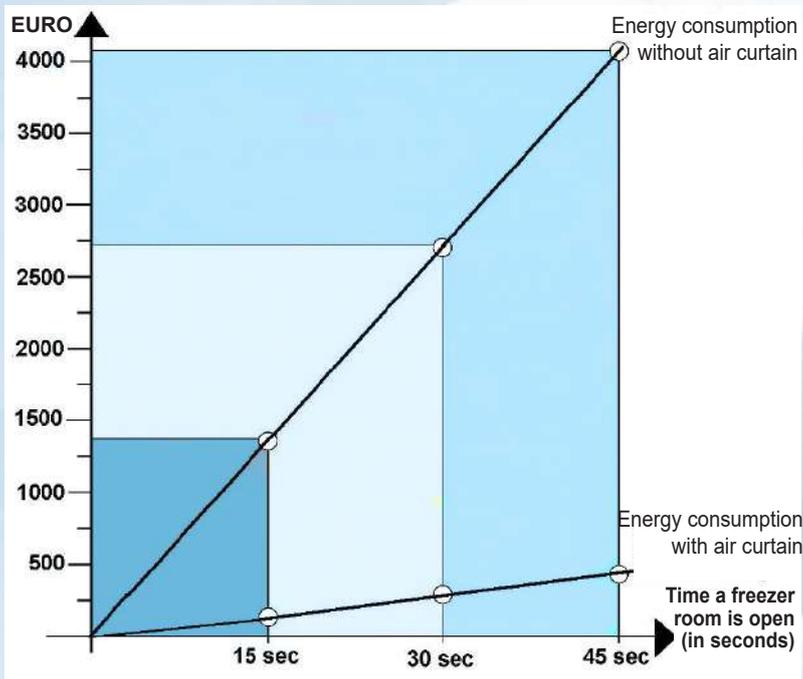
If more than one bucket of condensed water is produced daily at the evaporator of your freezer room, you should consider the purchase of an air curtain.



Side bulkheads made of soft PVC strips prevent lateral warm air intake. Absolutely recommended!

Annual energy costs caused by an open freezer door of 200 x 250 cm - if not protected by an air curtain

Based on the assumption of 240 working days and 30 openings per day with open times of 15, 30 or 45 seconds each time.





This is a FRIGOVENT B-500 HB horizontal blowing air curtain. It consists of two units that blow against each other and seals a door opening of 300x500cm (width x height). Usually, narrow gates only require a one blowing system air curtain which blows against a baffle wall. However, we choose this solution for particularly high gates or in case there is a lack of space above the gate.

Three models of the TOP series

We produce FRIGOVENT air curtains as three different models in the „TOP“ series. All the models have the same blower technology. However, they are equipped with different blowing nozzles in order to meet all individual, structural requirements.

Model 1 NORM: Angled construction.

This is the normal model which is suitable for low ceilings or in case only a small space is available above the gate. This air curtain is pivoted and can be used with almost every gate.

Model 2 FLAT: Flat construction.

The flat design is ideal where space is limited or where the angled design interferes with forklift traffic. In addition, it can be used with trace heating in freezer rooms.

Prerequisite: Sufficient space above the doors.

Model 3 HB: Horizontally blowing.

This model is used for particularly high doors or when there is no space above the gates.



Model 1 NORM (A-200)



Model 2 FLAT (RA-200)



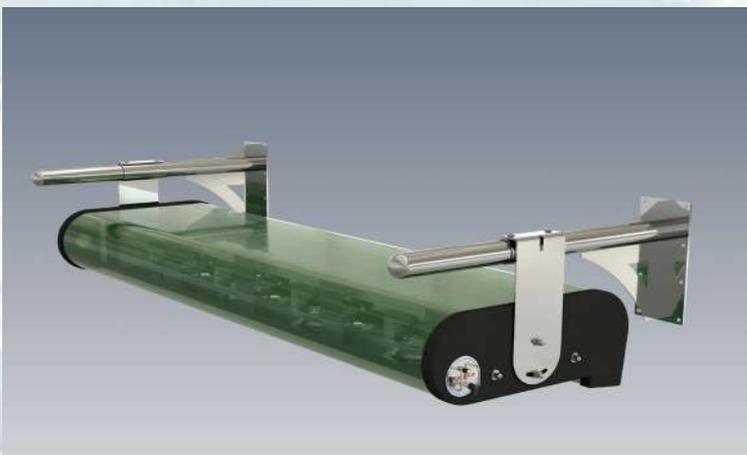
Model 3 HB (B-500-2-HB)



Back wall mounting Standard construction

This FRIGOVENT air curtain is mounted on the warm side above the door opening with the help of two stainless steel consoles.

This is the standard mounting option.



Back wall mounting with consoles for a reduction of the overall width

This FRIGOVENT air curtain is mounted above the door opening on the wall with the help of two stainless steel consoles.

These consoles take up less space in the width but require more space in the overall height.



Ceiling mounting Construction under the ceiling

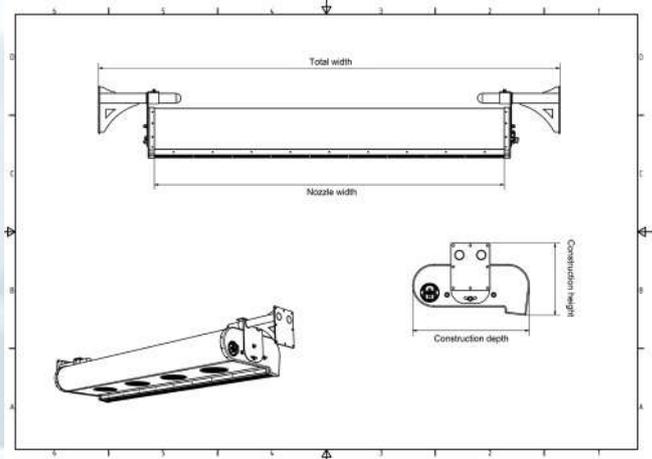
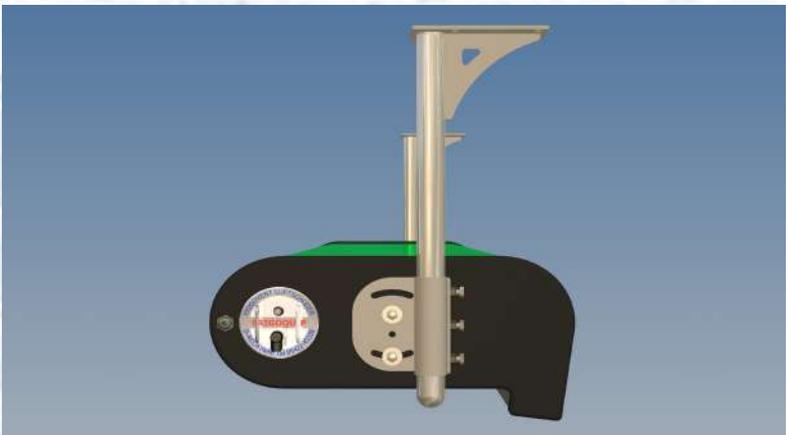
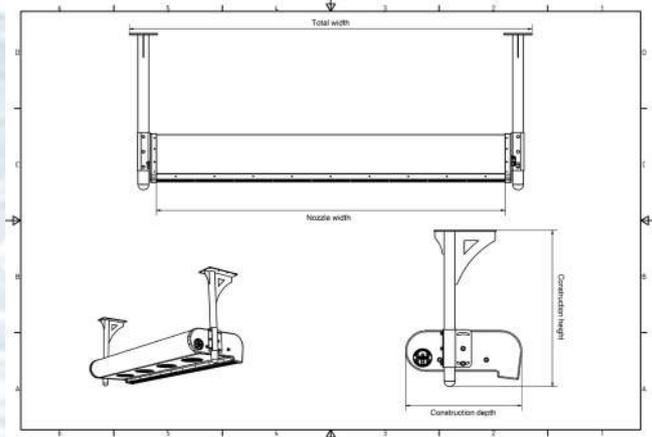
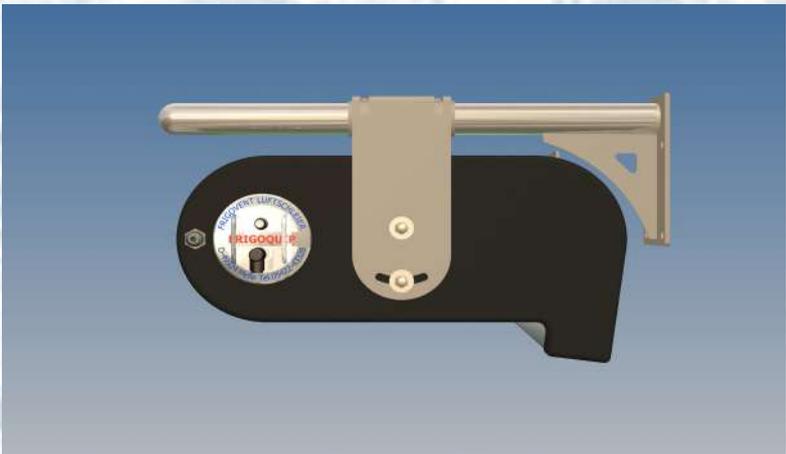
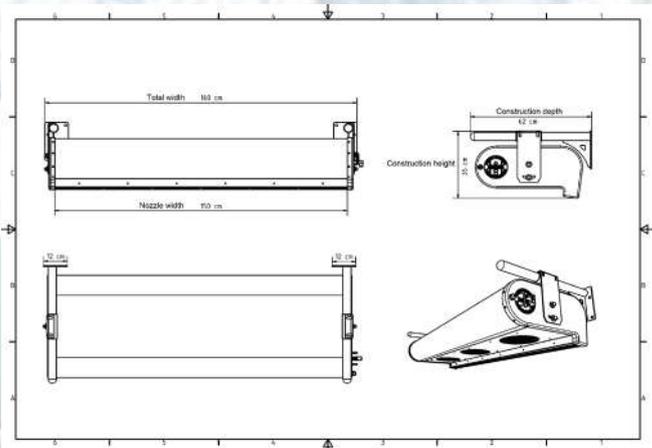
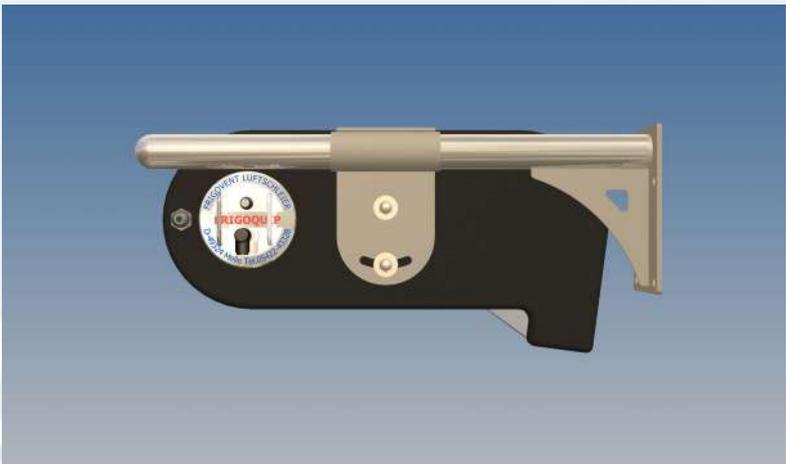
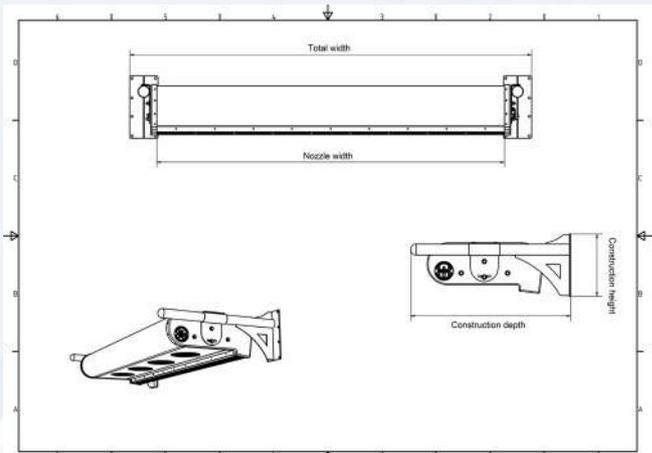
This FRIGOVENT air curtain is mounted above the door opening under the ceiling with the help of two stainless steel consoles.



Assembly between walls Mounting on both side walls

This FRIGOVENT air curtain is mounted in front of the door opening in between the side walls with the help of two stainless steel consoles.

This mounting option is often used in corridors to prevent cold air losses.



Technical Data		FRIGOVENT		Type F and		Type G	
TYPE	Blowers	Weight of FRIGOVENT Type F		FRIGOVENT Typ F		FRIGOVENT Typ G	
nozzle width		FRIGOVENT Type G is 10% heavier		with EC-radial blowers suitable for a clear door opening of		with EC-radial blowers suitable for a clear door opening of	
cm	units	with kg	packing without kg	Voltage 230/1N~/50 air power nominal adsorption m ³ /h KW		Voltage 400/3N~/50 air power nominal adsorption m ³ /h KW	
FRIGOVENT				Type F		Type G	
75	1	49	29	1.000	0,150	1.750	0,275
100	2	55	32	2.000	0,150	3.500	0,550
125	2	66	40	2.000	0,300	3.500	0,550
150	3	72	43	3.000	0,300	5.250	0,825
175	3	83	51	3.000	0,450	5.250	0,825
200	4	89	54	4.000	0,450	7.000	1,100
225	4	95	57	4.000	0,450	7.000	1,100
250	5	106	65	5.000	0,600	8.750	1,375
275	5	112	68	5.000	0,600	8.750	1,375
300	6	123	76	6.000	0,750	10.500	1,650
325	6	129	79	6.000	0,750	10.500	1,650
350	7	134	81	7.000	0,750	12.250	1,925
375	7	145	89	7.000	0,900	12.250	1,925
400	8	151	92	8.000	0,900	14.000	2,200
425	8	162	100	8.000	1,050	14.000	2,200
450	9	168	103	9.000	1,050	15.750	2,475
475	9	174	106	9.000	1,050	15.750	2,475
500	10	185	114	10.000	1,200	17.500	2,750
525	10	191	117	10.000	1,200	17.500	2,750
550	11	202	125	11.000	1,350	19.250	3,025
575	11	208	128	11.000	1,350	19.250	3,025
600	12	214	131	12.000	1,350	21.000	3,300

OPTIONAL

Power off switch with control lamp instead of proximity switch for continuous operation of the air curtain.

Special consoles for reducing the overall width of the air curtain, for mounting under the ceiling or for attachment to the side walls.

Side bulkheads made of soft PVC strips to avoid lateral warm air intake.

Separate chrome-nickel steel control box with speed regulator and power off switch instead of integrated switch.

Housing out of chrome-nickel steel: matt finish surface instead of aluminium-plastic composite material (white).

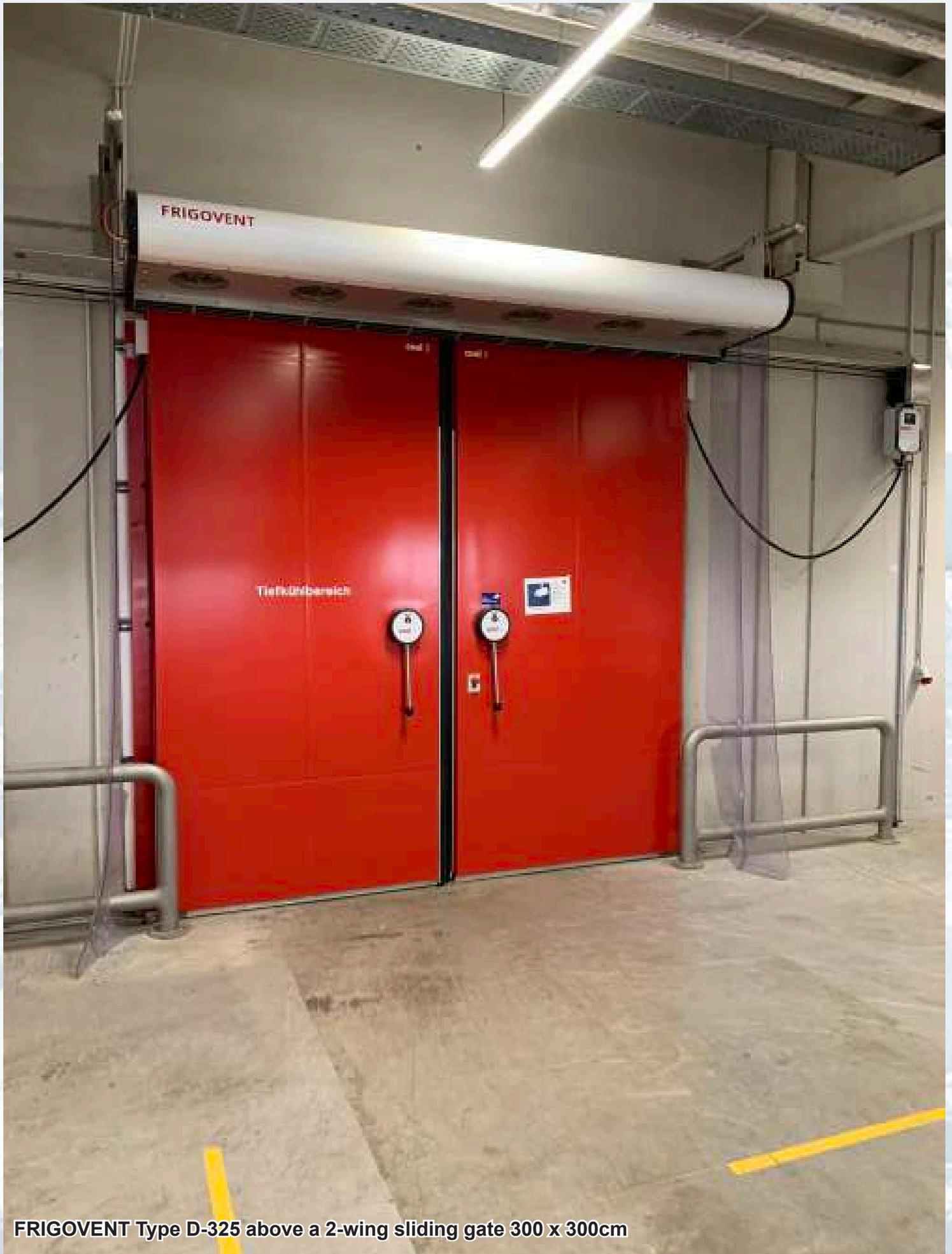
Technical Data		FRIGOVENT		Type A		and		Type B	
TYPE	Blowers	Weight of FRIGOVENT Type A		FRIGOVENT Type A with EC-Centrifugal Blowers suitable for clear door openings of		FRIGOVENT Type B with EC-Centrifugal Blowers suitable for clear door openings of			
Nozzle Width		FRIGOVENT Type B is 10% heavier		Cold room doors up to 300cm Freezer doors up to 250cm depending from windload		Cold room doors up to 350cm Freezer doors up to 300cm depending from windload			
cm	units A B	with kg	packing without kg	air power m³/h	nominal adsorption KW	air power m³/h	nominal adsorption KW		
FRIGOVENT				Type A		Type B			
75	1 2	59	39	1.000	0,15	2.000	0,30		
100	2 3	70	45	2.000	0,30	3.000	0,45		
125	2 3	80	50	2.000	0,30	3.000	0,45		
150	3 4	92	57	3.000	0,45	4.000	0,60		
175	3 5	102	62	3.000	0,45	5.000	0,75		
200	4 6	113	68	4.000	0,60	6.000	0,90		
225	4 6	123	73	4.000	0,60	6.000	0,90		
250	5 7	135	80	5.000	0,75	7.000	1,05		
275	5 8	145	85	5.000	0,75	8.000	1,20		
300	6 9	157	92	6.000	0,90	9.000	1,35		
325	6 9	167	97	6.000	0,90	9.000	1,35		
350	7 10	178	103	7.000	1,05	10.000	1,50		
375	7 11	188	108	7.000	1,05	11.000	1,65		
400	8 12	200	115	8.000	1,20	12.000	1,80		
425	8 12	210	120	8.000	1,20	12.000	1,80		
450	9 13	221	126	9.000	1,35	13.000	1,95		
475	9 14	231	131	9.000	1,35	14.000	2,10		
500	10 15	243	138	10.000	1,50	15.000	2,25		
525	10 15	253	143	10.000	1,50	15.000	2,25		
550	11 16	265	150	11.000	1,65	16.000	2,40		
575	11 17	275	155	11.000	1,65	17.000	2,55		
600	12 18	285	161	12.000	1,80	18.000	2,70		
OPTIONAL									
All systems available for 110 Volt and 60/50 Hz + side bulkheads made of soft PVC strips to avoid lateral warm air intake (in stock).									
Power off switch + control lamp instead of proximity switch for continuous operation. Housing: Matt finish surface or circular cut.									
Special consoles for reducing the overall width of the air curtain, for mounting under the ceiling or for attachment to the side walls.									
Separate chrome-nickel steel control box with speed regulator and power off switch instead of integrated switch.									
Air curtain designed for use inside a freezer room with special equipment or DUPLEX air curtains: inside and outside (2 units).									
Horizontal blowing air curtain with impact protection housing, top cover and baffle wall.									

Technical Data		FRIGOVENT		Type C		and		Type D	
TYPE	Blowers	Weight of FRIGOVENT Type C		FRIGOVENT Type C with EC-Centrifugal Blowers suitable for clear door openings of		FRIGOVENT Type D with EC-Centrifugal Blowers suitable for clear door openings of			
Nozzle Width		FRIGOVENT Type D is 10% heavier		Cold room doors up to 400cm Freezer doors up to 350cm depending from windload		Cold room doors up to 450cm Freezer doors up to 400cm depending from windload			
cm	units	with	packing without kg kg	air power m³/h	nominal adsorption KW	air power m³/h	nominal adsorption KW		

FRIGOVENT				Type C		Type D	
75	1	112	87	2.000	0,200	2.500	0,350
100	2	126	96	4.000	0,400	5.000	0,700
125	2	136	101	4.000	0,400	5.000	0,700
150	3	149	109	6.000	0,600	7.500	1,050
175	3	159	114	6.000	0,600	7.500	1,050
200	4	173	123	8.000	0,800	10.000	1,400
225	4	183	128	8.000	0,800	10.000	1,400
250	5	197	137	10.000	1,000	12.500	1,750
275	5	207	142	10.000	1,000	12.500	1,750
300	6	221	151	12.000	1,200	15.000	2,100
325	6	231	156	12.000	1,200	15.000	2,100
350	7	245	165	14.000	1,400	17.500	2,450
375	7	255	170	14.000	1,400	17.500	2,450
400	8	268	178	16.000	1,600	20.000	2,800
425	8	278	183	16.000	1,600	20.000	2,800
450	9	292	192	18.000	1,800	22.500	3,150
475	9	302	197	18.000	1,800	22.500	3,150
500	10	316	206	20.000	2,000	25.000	3,500
525	10	326	211	20.000	2,000	25.000	3,500
550	11	340	220	22.000	2,200	27.500	3,850
575	11	350	225	22.000	2,200	27.500	3,850
600	12	364	234	24.000	2,400	30.000	4,200

OPTIONAL
All systems available for 110 Volt and 60/50 Hz (in stock).
Power off switch with control lamp instead of proximity switch for continuous operation of the air curtain.
Special consoles for reducing the overall width of the air curtain, for mounting under the ceiling or for attachment to the side walls.
Side bulkheads made of soft PVC strips to avoid lateral warm air intake.
Separate chrome-nickel steel control box with speed regulator and power off switch instead of integrated switch.
Horizontal blowing air curtain with impact protection housing, top cover and baffle wall.
Housing out of chrome-nickel steel: matt finish surface instead of aluminium-plastic composite material (white).

Technical Data		FRIGOVENT		Type E		and		Type X	
Type	Blowers	Weight of FRIGOVENT Type E		FRIGOVENT Type E with EC-Centrifugal Blowers suitable for clear door openings of		FRIGOVENT Type X with EC-Centrifugal Blowers suitable for clear door openings of			
Nozzle Width		FRIGOVENT Type X is 10% heavier		Cold room doors up to 500cm Freezer doors up to 450cm depending from windload		Cold room doors up to 550cm Freezer doors up to 500cm depending from windload			
cm	units		packing	230 Volt-1Ph.- 50/60 Hz. from Type E-300 400V-3 Ph.		230 Volt-1Ph.- 50/60 Hz. from Type X-300 400V-3Ph.			
		with kg	without kg	air power m³/h	nominal adsorption KW	air power m³/h	nominal adsorption KW		
FRIGOVENT				Type E		Type X			
75	1	133	103	3.000	0,40	3.500	0,45		
100	2	148	113	6.000	0,80	7.000	0,90		
125	2	158	118	6.000	0,80	7.000	0,90		
150	3	172	127	9.000	1,20	10.500	1,35		
175	3	182	132	9.000	1,20	10.500	1,35		
200	4	197	142	12.000	1,60	14.000	1,80		
225	4	207	147	12.000	1,60	14.000	1,80		
250	5	222	157	15.000	2,00	17.500	2,25		
275	5	232	162	15.000	2,00	17.500	2,25		
300	6	247	172	18.000	2,40	21.000	2,70		
325	6	257	177	18.000	2,40	21.000	2,70		
350	7	272	187	21.000	2,80	25.500	3,15		
375	7	282	192	21.000	2,80	24.500	3,15		
400	8	296	201	24.000	3,20	28.000	3,60		
425	8	306	206	24.000	3,20	28.000	3,60		
450	9	321	216	27.000	3,60	31.500	4,05		
475	9	331	221	27.000	3,60	31.500	4,05		
500	10	346	231	30.000	4,00	35.000	4,50		
525	10	356	236	30.000	4,00	35.000	4,50		
550	11	371	246	33.000	4,40	38.500	4,95		
575	11	381	251	33.000	4,40	38.500	4,95		
600	12	396	261	36.000	4,80	42.000	5,40		
OPTIONAL									
All systems available for 110 Volt and 60/50 Hz (in stock).									
Side bulkheads made of soft PVC strips to avoid lateral warm air intake.									
Power off switch with control lamp instead of proximity switch for continuous operation of the air curtain.									
Special consoles for reducing the overall width of the air curtain, for mounting under the ceiling or for attachment to the side walls.									
Separate chrome-nickel steel control box with speed regulator and power off switch instead of integrated switch.									
Housing out of chrome-nickel steel: matt finish surface instead of aluminium-plastic composite material (white).									



FRIGOVENT Type D-325 above a 2-wing sliding gate 300 x 300cm

FRIGOVENT - TECHNICAL FEATURES

1. All blowers are equipped with electronically commutated infinitely adjustable EC motors which comply with all requirements of the latest EU legislation. It only takes 2 seconds after a door has opened for the air curtain to boot. Compared to commercial AC motors, EC motors are much more efficient. Here are some advantages of blowers with EC motors:
 - a) Up to 50% lower power consumption.
 - b) Extremely long span life due to design.
 - c) Considerably silent operating noise and no phase angle humming.
 - d) Operation with direct current 48 Volt.
 - e) Safe: Due to extra low voltage, no electrical accidents are possible.
2. We are manufacturing cantilevered air curtains up to a construction length of 8 meters in a single piece. They are mounted on consoles which can be attached to both sides of the door opening. This allows us to install the air curtain far enough away from the door opening which ensures that lifting gates or sectional doors can move and work seamlessly.
3. The entire air curtain can be swivelled. This way, the setting of the air flow's right angle is easy to manage and there is no need to redirect it. Thus, the air flow is free of turbulence and able to perform at its best.
4. All FRIGOVENT air curtains can also be installed inside a freezer room at a temperature up to -40°C . For this purpose, the devices are equipped with a special electrical system and a self-regulating trace heating.
5. We only use stainless materials in the production of our air curtains. The consoles are made of chrome-nickel steel and the housing of a sound-insulated composite material and polyethylene. The surfaces consists of aluminium or optionally, chrome-nickel steel can be used. Outlet nozzles and intake grilles, the housing of the TOP series blowers and all screws are made of stainless steel. The impellers are either solid plastic or aluminum. Large-sized parts, such as the caps or the end plates of the horizontal blowing air curtains, are milled from solid plastic blocks.
6. Smaller systems are supplied with a plug for a power connection of 230 volts. Large systems are delivered with a separate control box for a power connection to 400 Volt 3 Ph. For safety reasons, all systems run with an extra low voltage of 48 Volt direct current. For this purpose, the power is rectified and converted in the system. The supplied proximity switches are waterproof IP 65 and are operated with 24 Volt.



FRIGOVENT Type C-350 above a high-speed door 300 x 300cm

FRIGOVENT - Accessories

- a) UVC disinfection modules and cold plasma generators. This accessory makes the blown out air stream sterile and electrically charged. This way, that adjacent air layers and near objects are disinfected.
- b) Enclosures for the entire system sideways and upwards. This accessory improves the operating mode.
- c) Separate control boxes enable the control of the air curtain from any location.
- d) HEPA filters and control lamps for filter exchange.
- e) Soft PVC side bulkheads prevent lateral warm air intake.
- f) Tandem version: One air curtain on each side, outside and inside, above the door opening for an optimal air sealing. Recommended for long open hours.
- g) Horizontally blowing air curtains. Recommended when there is no space above the door. These air curtains are designed to blow against a baffle wall or alternatively in form of two air curtains that blow against each other.
- h) Housing which consists of a very stable, soundproof sandwich material with a polyethylene core and painted aluminum surfaces. Standard color is white. Available in other colors. Entire housing material also available in chrome-nickel steel.
- i) Self-regulating trace heating in case air curtain is installed **inside a freezer room**.

FRIGOQUIP product range:

FRIGOVENT	Air curtains for refrigerator and freezer room doors.
THERMOVENT	Air curtains for service doors and factory gates.
HALLOVENT	Air curtains for airports, warehouses and hotels.
FRIGOALARM	Emergency alarm for cold storage and freezer rooms.
FRIGOFLEX	Swing doors and strip curtains.v
DISINFECTOR	Air disinfection systems for schools, restaurants, sports facilities, meeting rooms and supermarkets.



FRIGOVENT Type G-325 above a double-wing freezer door 300 x 300cm

How does an air curtain work?

An air curtain is a device that prevents an air exchange through an open door. It consists of a blower with a blow-out nozzle like a door made of air.

There are also synonyms and other terms like air gate, air wall, air barrier and air bulkhead. However, the system of all of these devices work the same.

FRIGOVENT air curtains aim to prevent cold air losses when freezer doors are open. Thus, they are installed on the outside of the refrigerator or freezer room above the door. When doors are open, cold air flows out of freezer room while warm air enters.

Our mission is to prevent that exchange of air.

The blowers and a special rectifier are used to create a laminar, turbulence-free air stream which reaches from above the door opening to the floor at a right angle. The airflow must be strong enough to reach the ground. It is the main air stream which entrains the contiguous secondary streams, the cold air of the cold room and the warm air of the lobby.

As soon as the core stream and the entrained air hit the floor, they split.

As a result, the core stream and the entrained warm air of the lobby remain in the lobby while the entrained cold air of the cold room remains in the cold room.

It is important that the core beam is rectified, laminar and turbulence-free. Otherwise, the main and secondary air streams will blend. As long as the different air streams are divided, the air curtain can unfold its full effect.

Adjustment of the air curtain

The blowing speed of all our air curtains is infinitely configurable. The max. air flow speed is approximately 15 m/sec. It becomes slower the closer it approaches the ground.

If the air speed is too low, the air stream will not reach the floor.

If the air speed is too high, it will hit the floor too hard, causing disturbing turbulences.

To optimize the blow-out angle, we made sure that our air curtains are pivotable. By loosening a cap nut in the connecting blocks, the air curtain can be easily moved by 10° in- and outwards.

How to perform the function check?

The supplied windmill must be placed directly underneath the air stream.

With no air curtain in use, the windmill will rotate due to the outflowing, cold air.

When the air curtain is activated and the air speed increased, the windmill will slow down until it finally stops.

A still standing windmill is proof for a correct adjustment as it means that even in the weakest part of the air stream, namely on the ground, there is no more exchange of air.



FRIGOQUIP Entrance



FRIGOQUIP Loading zone



FRIGOQUIP GmbH

FRIGOQUIP

Air Curtain Technology

Denkmalsweg 1
D-49324 Melle
GERMANY

Phone: +49 5422 709 1945
Fax: +49 5422 709 1947

Email: info@frigoquip.de
www.frigovent.de

