

How does an air curtain?

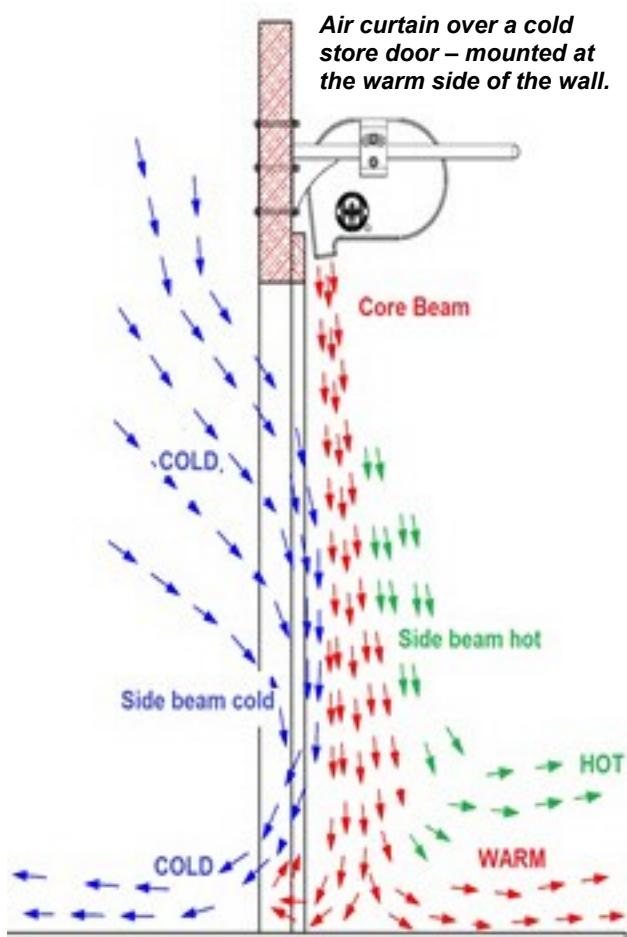
An air curtain system is a device that prevents an exchange of air through an open door. It consists of blowers with a blow-off nozzle. A door created by air.

With the blowers and a special rectifier a laminar, turbulence-free air jet above the door opening is produced which is blown at right angles to the inflowing or adjacent air.

Air curtains in conjunction with cold store doors and freezer doors are used to prevent cold air leakage at open cold store gates.

They are mounted on the warm side of the wall above the door.

The air in the freezer store is 20% heavier than the warm air in the ante room. So with open cold store doors the heavy cold air is flowing out through the lower part of the door opening. At the same time the moist and warm air of the anteroom penetrates through the upper part of the door opening in the cold store.



Thermography of airflow. You can see the mixing zones (yellow and light blue), which limit the optimal narrow airflow..



The task of the air curtain is to prevent at open cold store doors the outflow of cold air and the inflow of warm air. The air curtain is located on the warm side of the wall above the door opening. It sucks the warm air from the ante room and blows it to the ground. The air jet must be so strong that it reaches the ground.

The core beam rips the adjacent air - the warm air of the antechamber (side beam hot) and the cold air of the cold store or freezer room (side beam cold) with itself.

The core beam and the side-beams hit the ground and divide, so that the air of the core beam and the entrained air will remain where they came from.

The air of the side beam hot and the air of the core beam remain in the ante room, and the air of the side beam cold remains in the cold store.

It is important that the core beam is rectified, laminar and without turbulences.

Then the air of the side beams cannot mix with the core jet.

So the entrained air volumes of each remain separate and the air curtain can be fully effective.

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Air curtain technology

Adjustment of the air curtain.

The speed of the air can be controlled and the discharge angle of the blowout nozzle can be adjusted.

How to set the optimum air velocity?

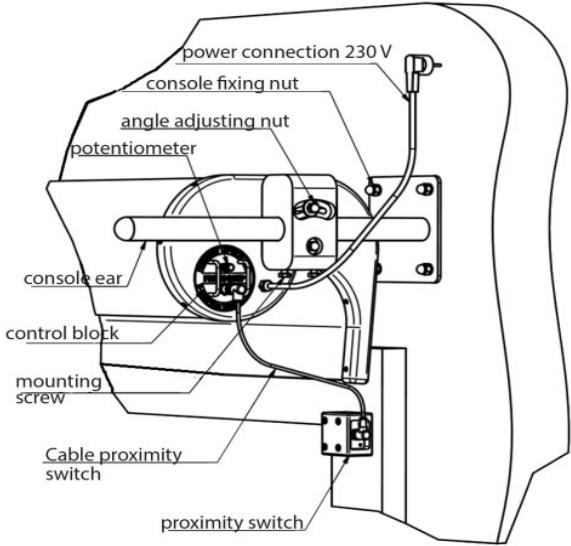
In the corporate sign on the right end cap of the air curtain you find the plug adapter for the proximity switch and the knob of the potentiometer. With this knob you can set the air velocity. The knob is secured, so that you can adjust it only by means of a screw-turner.

By turning this knob you can adjust the air speed continuously. The air flows at a maximum speed of about 15 m / sec from the nozzle.

The speed slows down the more the air flow approaches the ground. If the air velocity is too low, the air stream does not reach the ground.

If the air velocity is too high, the air impinges strongly on to the floor, resulting in disturbing turbulence.

The air flow must be regulated by turning the potentiometer in the way that it is just reaching the ground.



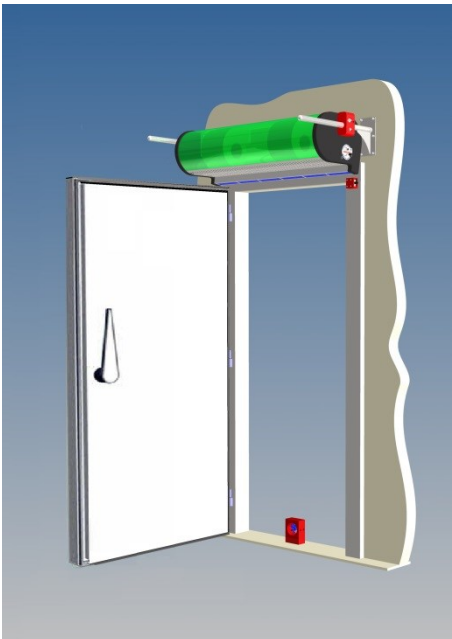
Why is the discharge angle adjustable?

The air flow of the air curtain widens the further it approaches the ground. To avoid that it blows into the doorway the entire system with the outlet nozzle can be pivoted so that the discharge angle of the air jet can be adjusted up to 20° to either side.

In the normal position it is blown at an angle of 8° away -from the door opening.

If the blow-out of the system is adjusted wrong, air is blown in or sucked out of the cold store. Then the air pressure changes in the cold store.

In short intervals, followed by pressure equalization, the windmill rotates clockwise or counterclockwise. To adjust the system optimally, the discharge angle must be changed until the windmill stops rotating.



How is the discharge angle of the blow-off nozzle adjusted?

The air curtain is pivotally mounted in the console. By carefully loosening a nut in the connection pads on the two end caps, the entire facility can be moved so that the blow-off nozzle can be infinitely pivoted approximately 20° inward or outward.

How do you control the function?

The included windmill is placed directly under the air flow. When the air curtain is switched off the wind turbine rotates. It is driven by the cold air streaming out through the door. When you turn on the air curtain and increase the air speed, you will see that the wind turbine will slow down and eventually stops.

Finally, the wind turbine stops. This is the proof that the air curtain is correctly adjusted.

Also in the most vulnerable area of the air flow - namely on the ground - there is no air exchange.