



OPERATION AND PERFORMANCE

HOW FAR BEYOND THE EDGE OF THE HOUSING DOES THE AIR SPREAD AND WHAT IS THE DEPTH?

The air leaves the discharge nozzle at very high velocities. The air spread and depth of “air wall” created varies between models. A general rule of thumb is: for units with 1HP motor(s) or less, the air spread is up to 3 inches and the depth of the wall of air created is about 18 inches, measured 6 feet from the nozzle. For units with motor(s) larger than 1HP, the air spread is up to 6 inches and the depth of the wall of air is about 24 inches, measured 6 feet from the nozzle.

WHAT COULD THE CAUSE BE IF AIR LEAVING THE NOZZLE DOES NOT SEEM TO HAVE MUCH VELOCITY?

Possible causes for low air outlet velocities are:

- A. Incorrect rotation of the fans. This usually occurs with three phase motors. If this is the problem, two wires to the control panel need to be reversed for correct rotation.
- B. If air directional vanes at air outlet nozzle are turned beyond a definite limit, they will restrict the airflow.
- C. Fan blades need cleaning.

WHY DO MARS AIR CURTAINS HAVE ADJUSTABLE LOUVERS AT THE AIR INTAKE?

Adjustable louvers are used to obtain optimum operating efficiency. When used over refrigeration doors, the louvers can be adjusted to regulate the velocity and volume of air at the air outlet. This is important in order to form an air barrier and balance the cold air inside the refrigerated box with the warm outside air. The louvers should be set so the air barely hits the floor. The colder the air, the stronger and stiffer the barrier should be. When used as a barrier to insects, louvers should be set at the maximum open position for full volume of air.

WHEN ADJUSTABLE VELOCITY CONTROL LOUVERS ARE COMPLETELY CLOSED, WILL THE MOTOR BE STARVED FOR AIR AND THEREFORE OVERLOAD?

No, on the contrary, the motor will be working under a lighter load. When the louvers are closed, there is less air to load the fan blades, thus allowing them to operate “free wheeling”. The amperage draw of the motor drops significantly.

WHY DO MARS AIR CURTAINS HAVE ADJUSTABLE AIR DIRECTIONAL VANES AT THE AIR OUTLET?

The air directional vanes in the discharge nozzle can be positioned inward or outward. This design feature provides the capability to compensate for drafts, wind loads and necessary adjustments to effectively repel

flying insects, dust, fumes, odors and other windborne contaminants. If the air curtain is mounted internally in a building for environmental separation (i.e. separating a manufacturing area from a clean work area) or over a refrigerated room door for temperature control, the directional vanes should be pointed straight down.

WHAT HAPPENS TO THE AIR WHEN IT HITS THE GROUND?

As the air reaches the floor, it will divide, sending the air inward and outward simultaneously and causing a draft both ways at the floor line. When using an air curtain for insect and dust control, the directional vanes in the air outlet nozzle should be directed outward not only to repel the insects and dust, but to also allow the least amount of air to come inward when hitting the floor.

If mounted on the outside of the doorway and used for the purpose of holding in air conditioning when the door is open, the directional vanes should be slanted slightly outward. Mounted on the inside of a cooler, the vanes should be turned slightly into the refrigerated room.

It is important to remember that when an air curtain is used for refrigeration or climate control, it is absolutely necessary to adjust the velocity control so to the airstream gently hits the floor with the least amount of disturbance. Hitting the floor too hard will cause a vacuum reaction, thus pulling the air out of the protected room and defeating the intended function of the air curtain and causes icing on the floor.

ARE THERE ANY SITUATIONS THAT COULD CAUSE AIR CURTAINS TO OPERATE POORLY OR NOT AT ALL?

Yes. There are three applications to be avoided.

Air curtains will not perform satisfactorily if there is an exhaust fan in operation causing a negative pressure within the building. The curtain of air will be strongest near the nozzle and weakest at the floor. Since air entering the building always seeks the least line of resistance, it will flow into the building a few feet from the floor at the door opening.

A wind tunnel effect will prevent air curtains from operating properly. A wind tunnel effect occurs when there are two open doors, one on each side of the building.

If an air curtain is mounted on the outside of a building and it is not being used to prevent the entrance of cold air, it will not perform properly. If mounted outside, cold air coming down will hit the floor, bringing cold air into the building. It must be mounted on the inside of a heated room.

SHOULD THE CUSTOMER USE A THERMAL OVERLOAD PROTECTION SWITCH IN THE ELECTRICAL CIRCUIT?

Not necessarily. All motors used in Mars air curtains are equipped with an automatic thermal overload switch in the windings of the motor for protection against burnout. If for any reason the motor is overheating, the motor will automatically stop.

Possible causes for overheating are:

- A. Wrong voltage being fed to the motor. Too low a voltage. Phases unbalanced in three phase motors.
- B. Excessive vibration in fans caused by debris caught in the vanes.
- C. Motor dirty, air cannot get to motor housing for proper cooling.
- D. Wiring hookup not properly followed, or wire too light a gauge from electrical panel to air curtain.

ARE VARIABLE SPEED MOTORS REQUIRED ON AIR CURTAINS?

The ability to adjust the outlet air flow is highly desirable. It significantly aids in the air curtain's performance by allowing compensation for varying field conditions. All Mars air curtains have this feature. Most provide it through the adjustable air intake louver; some feature variable or multi-fixed speed motors; others through internal volume dampers in the air curtain's discharge nozzle, and certain models contain a combination of the above. Please consult factory for specific model offerings. Note: The EHV and EHH models do not feature any form of air velocity control. These models are for flying insect control only and require maximum outlet airflow.

IF A WAREHOUSE OR COMMERCIAL BUILDING IS HEATED, WHAT ARE THE ADVANTAGES OF INSTALLING AN AIR CURTAIN?

Heat rises and tends to stratify. The air curtain will cause the air to circulate, eliminating the stratification. This action helps to reduce heating costs. The directing of a space heater toward the air curtain intake, if practical, will assist this action and minimize any cold drafts by bringing the warm air down to floor level with sufficient velocity and at the same time, will prevent cold air from entering the building, thus saving on energy.

CAN AIR CURTAINS BE USED TO HOLD IN EXTREME HEAT INSIDE INDUSTRIAL CONVEYOR OVENS?

Yes, as long as the air curtain is mounted on the outside of the oven. The smaller the opening, the more effective the installation as the percent of heat loss is held to a minimum.

CAN A MARS AIR CURTAIN BE OVER A BLAST FREEZER?

Yes. Use the same models as you would over a regular freezer.

WHAT TYPE OF MAINTENANCE DOES THE MARS AIR CURTAIN REQUIRE?

All motors have lifetime lubricated sealed ball bearings, making greasing or oiling unnecessary. Blowing or wiping dust off the fans and motors whenever it is visible is advisable to ensure maximum performance.

DO MARS AIR CURTAINS MEET OSHA REQUIREMENTS?

The sound level produced by all Mars air curtains is below what OSHA considers injurious, making approval unnecessary.