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HORD

HOSPITAL OPERATING ROOM DIFFUSERS

SERVICE & INSTALLATION MANUAL

Date: 05/04
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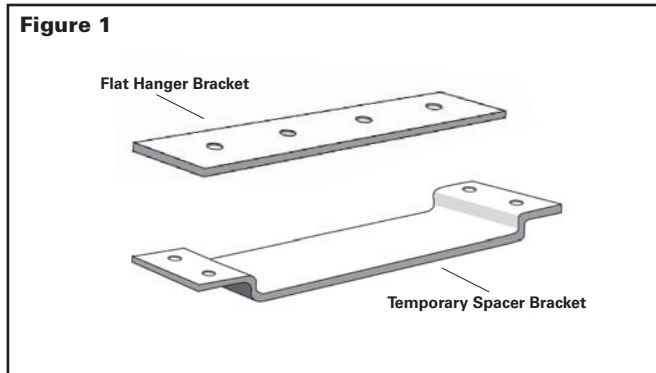
Installation Instructions

Prior to Installation:

Prior to installation, identify all sections of the Accuflow Air Curtain System based on the submittal drawings. Determine where each one is to be located in the ceiling using an accurate set of building plans.

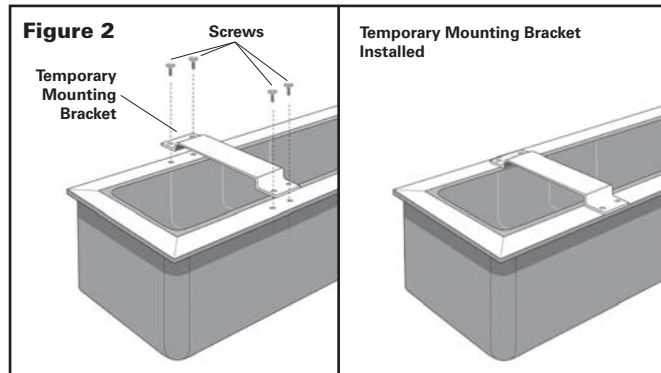
Accuflow Air Curtain System for Tbar Ceilings

1. Each HORD/HORDSS/HORDM/HORDMSS linear air curtain includes: **(Figure 1)**
 - a. Four plenums; if module length is greater than 144 inches (HORD/HORDSS) 96 inches (HORDM/HORDMSS) the plenum will be in at least two flanged sections.
 - b. Mounting frames
 - c. Four flanged elbows (continuous plenum style only)
 - d. Double slot diffuser faces with quick release fasteners
 - e. Perforated baffles, 1 per diffuser face
 - f. Stainless Steel dampers (typically factory installed)
 - g. Flat Hanger Brackets
 - h. Stainless steel spacer tubes
 - i. 1/4" ϕ threaded rods
 - j. 1/4"-20x3/4" bolts, nuts and washers
 - k. Temporary spacer brackets

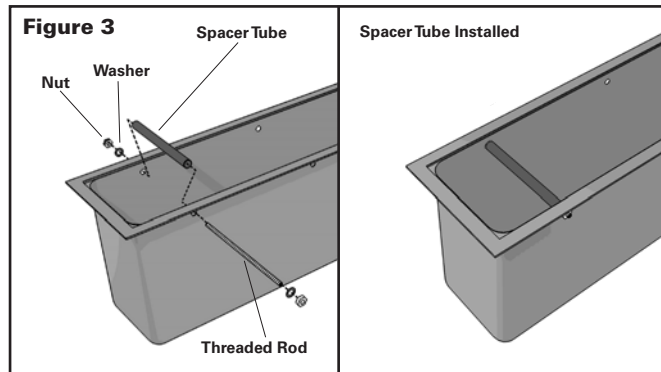


2. Install Temporary Spacer Brackets on the Mounting Frame

- a. Set the HORD plenum on the floor or a work bench, with the open end facing up.
- b. Locate the temporary spacer brackets (k) and mounting frames (b). If the slotted diffuser face (d) is installed in the mounting frame remove the face. On modules longer than 12 feet (3.7 meters) in length the mounting frame will be in multiple sections.
- c. On each mounting frame, or mounting frame section, place two temporary spacer brackets approximately 12 inches from each end. Each temporary spacer bracket has a raised center portion; this should rise up above the face of the mounting plate. Use the 1/4"-20 x 3/4" self tapping screws provided to attach the temporary spacer bracket to the face of the mounting frame. (Stainless steel modules come with pre-drilled pilot holes).



- d. Set the mounting frame over the open end of the plenum. (If the temporary spacer bracket has been installed correctly the plenum should extend slightly past the face of the mounting frame.) **(Figure 2)**



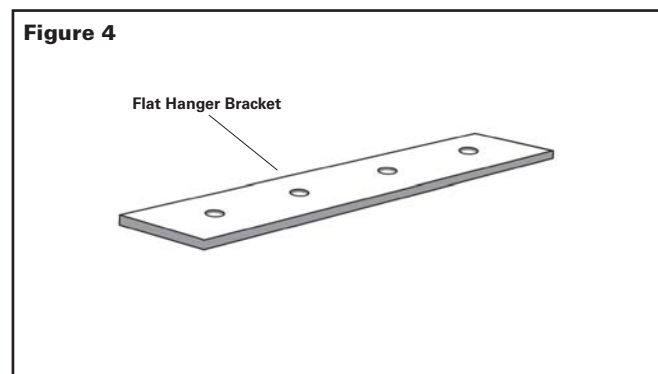
- e. Drill 1/4" ϕ holes through the pilot holes in stack of the mounting frame and into the plenum. Do this for the entire length of the plenum / mounting frame.
- f. Place one of the stainless steel tubes (h) inside the plenum to cover the screwed holes on both sides of the plenum. Insert a threaded rod (i) through the hole drilled in one side of the plenum, through the stainless steel tube and out the hole drilled in the opposite side of the plenum. The ends of the threaded rod should extend past the plenum and mounting frame on each side. Thread a washer and nut onto each end of the threaded rod and tighten. Repeat this step for each of the holes drilled in the plenum / mounting frame. **(Figure 3)**
- g. Remove the temporary spacer brackets. These are no longer required and may be discarded.

Note: Due to the differences among job sites, actual installation procedures will vary. The above procedures are intended to be used as a guide only. Contact Customer Service for assistance.

Installation Instructions

3. Install the Hanger Brackets.

- a. Layout the HORD air curtain plenums on the floor beneath the point where they are to be installed. Determine where the hanger rods, supplied by others, will be mounted to the structure in the ceiling space. NOTE: Whatever structural member the hanger rods are attached to must be able to support the weight of the air curtain.
 - i) When locating the hanger rods, the end most rods should be no more than 12 inches from the end of the HORD plenums.
 - ii) The remaining hanger brackets should be spaced a minimum of 24" and a maximum of 48" apart along the length of the plenum.
- b. Using a plumb line or a laser, project these hanger points down to the HORD plenums to accurately position the hanger brackets.
- c. Locate the hanger brackets (g). The hanger brackets are supplied with pre-drilled holes. **(Figure 4)**

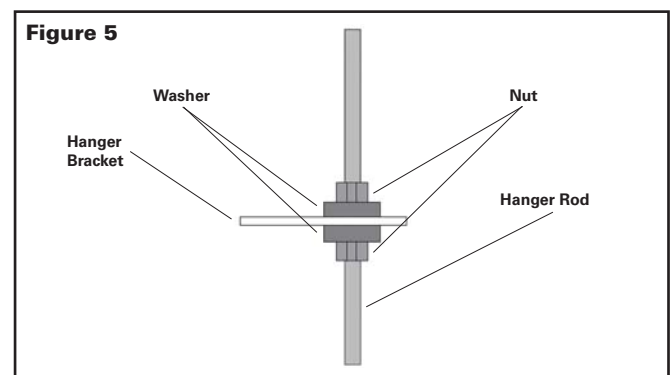


- d. Locate the hanger brackets along the length of the plenum at the points as determined in step 3a.
- e. Use the hanger brackets as a template and drill a 1/4" ϕ hole through the plenum, there will be two of these holes for each hanger bracket. It is recommended to drill from inside the plenum outwards, however if drilling from the outside, all burrs, sharp edges and debris must be thoroughly cleaned from the inside of the plenum prior to installation.
- f. Attach the brackets to the plenum using the 1/4"-20 x 3/4" hex bolts, nuts and lock washers provided. Install the bolts from the inside of the plenum so that only the bolt heads are inside the plenum. Repeat for each bracket.

4. Install Linear Slot Plenum in Ceiling

- a. The ceiling grid should be installed before installing the HORD / HORDSS system.
- b. Thread a nut onto each hanger rods installed in step 3a. (This nut is what the hanger bracket on the diffuser plenum will back up against.)

- c. If the HORD module is greater than 12 feet it will have shipped in multiple sections. These sections are assembled using a flanged connection. Apply a continuous bead of silicone sealant to the face of each flange then bolt the sections together using ten of the 1/4"-20x3/4" hex bolts, nuts and washers supplied. Tighten the nuts to seal the flange and minimize the chance of air leakage. Note: This step can be done on the floor prior to putting the sections in the ceiling space if preferred.
- d. Pass the plenum sections up through a large opening in the ceiling grid such as the openings for light fixtures.
- e. Put the hanger rods through the holes in the plenum hanger brackets; be sure to install a washer on the hanger rod above the hanger bracket. Install a second washer and nut on the threaded rod to hold the hanger bracket in place. **(Figure 5)**



- f. Adjust the nuts on the threaded rods to ensure the linear slot plenum is resting on the gasketed ceiling tee and level in the ceiling grid.
- g. Seal all penetrations through the plenum with silicone sealant. Please note the sealant must be applied only on the exterior surface of the plenum, DO NOT APPLY SEALANT ON THE PLENUM INTERIOR.
- h. Apply a bead of silicone between the mounting plate and the plenum on the room side to seal between these two pieces.

5. Install the Face(s) in the Mounting Frame

- a. Locate the diffuser face with the two slots and the perforated baffles.
- b. Set one perforated baffle over the stack of one face. Attach the perforated baffle to the stack using four self tapping screws, one in each corner. Repeat this for every face section.
- c. Carefully raise the HORD face section up to the plenum making sure that the slots are directed out away from the operating table. Secure in place using the quick release fasteners on the diffuser face.
- d. Repeat steps above for all remaining face sections.

Note: Due to the differences among job sites, actual installation procedures will vary. The above procedures are intended to be used as a guide only. Contact Customer Service for assistance.

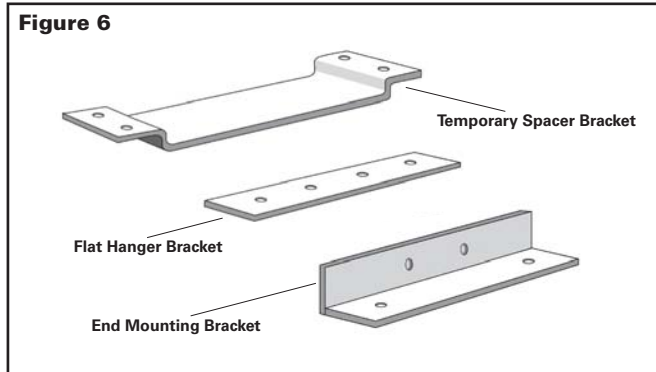
Installation Instructions

Prior to Installation:

Prior to installation, identify all sections of the Accuflow Air Curtain System based on the submittal drawings. Determine where each one is to be located in the ceiling using an accurate set of building plans.

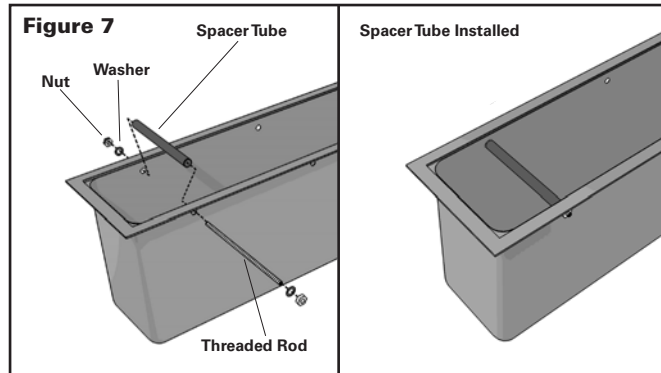
Accuflow Air Curtain System for Drywall Ceiling

1. Each HORD/HORDSS/HORDM/HORDMSS air curtain includes: (Figure 6)
 - a. Four plenums; if module length is greater than 144 inches (HORD/HORDSS) 96 inches (HORDM/HORDMSS) the plenum will be in at least two flanged sections.
 - b. Mounting frames
 - c. Four flanged elbows (continuous plenum style only)
 - d. Double slot diffuser faces with quick release fasteners
 - e. Perforated baffles, 1 per diffuser face
 - f. Stainless Steel dampers (typically factory installed)
 - g. End Mounting Brackets
 - h. 1/4"-20x3/4" bolts, nuts and washers
 - i. Temporary spacer brackets
 - j. Flat Hanger Brackets



2. Install Temporary Spacer Brackets on the Mounting Frame

- a. Set the HORD plenum on the floor or a work bench, with the open end facing up.
- b. Locate the temporary spacer brackets (i) and mounting frames (b). If the slotted diffuser face (d) is installed in the mounting frame remove the face. On modules longer than 12 feet (3.7 meters) in length the mounting frame will be in multiple sections.
- c. On each mounting frame, or mounting frame section, place two temporary spacer brackets approximately 12 inches from each end. Each temporary spacer bracket has a raised center portion; this should rise up above the face of the mounting plate. Use the 1/4"-20 x 3/4" self tapping screws provided to attach the temporary spacer bracket to the face of the mounting frame. (Stainless steel modules come with pre-drilled pilot holes)

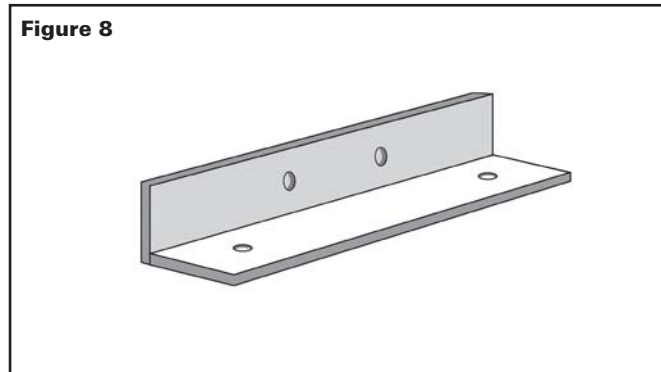


- d. Set the mounting frame over the open end of the plenum. (If the temporary spacer bracket has been installed correctly the plenum should extend slightly past the face of the mounting frame.) (Figure 7)

3. Install the Hanger Brackets.

a. Modular Plenum

- i) Layout the HORD air curtain plenums on the floor beneath the point where they are to be installed. Determine where the hanger rods will be mounted to the structure in the ceiling space.
- ii) Locate the end mounting brackets (g). These brackets are supplied with pre-drilled holes. (This is aluminum construction only, stainless steel HORDSS or HORDSSM systems are supplied with the mounting brackets spot welded in place in the factory.) (Figure 8)



- iii) (Aluminum Construction Only) Mount the end mounting brackets on each end of each plenum using the factory pre-drilled holes and the 1/4"-20 x 3/4" hex bolts, nuts and lock washers provided. Install the bolts from the inside of the plenum so that only the bolt heads are inside the plenum Repeat for each bracket.

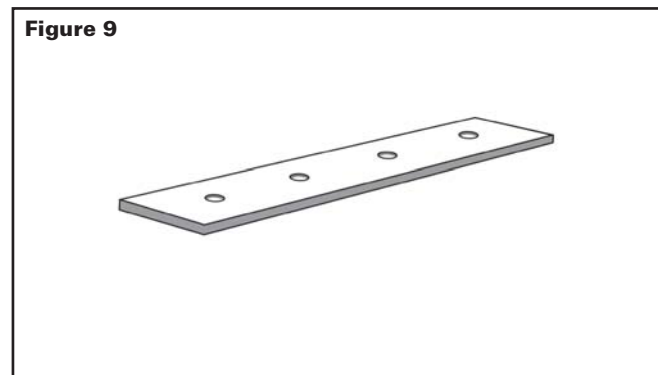
Note: Due to the differences among job sites, actual installation procedures will vary. The above procedures are intended to be used as a guide only. Contact Customer Service for assistance.

Installation Instructions

iv) Note that these end mounting angles should not be fully tightened onto the plenum until it has been centered, adjusted to the correct height and leveled. There is some vertical adjustment provided by slots in the end brackets.

b. Continuous Plenum

i) Locate the mounting brackets (j). These brackets are supplied with pre-drilled holes. **(Figure 9)**



ii) Locate the mounting brackets evenly spaced along the entire length of the plenum. The end most brackets should be no more than 12 inches from each end of the plenum. Space the other brackets evenly between these two brackets on the ends, however the maximum center line spacing between two adjacent hanger brackets must not exceed 48 inches. Coordinate the locations of the mounting brackets with the locations of the hanger wires in the ceiling plenum.

iii) Use the mounting brackets as a template and drill a $\frac{1}{4}$ " \varnothing hole through the plenum, there will be two of these holes for each hanger bracket. It is recommended to drill from inside the plenum outwards, however if drilling from the outside, all burs, sharp edges and debris must be thoroughly cleaned from the inside of the plenum prior to installation.

iv) Attach the brackets to the plenum using the $\frac{1}{4}$ "-20 x $\frac{3}{4}$ " hex bolts, nuts and lock washers provided. Install the bolts from the inside of the plenum so that only the bolt heads are inside the plenum. Repeat for each bracket.

4. Install Linear Slot Plenum in Ceiling

a. Modular Plenum

i) Mount a 1"x2" 16 GA galvanized channel (supplied and installed by others) along both long sides of each air curtain ceiling opening. The closed side of the channel must be flush with the edge of the ceiling opening.

ii) Using the mounting frame as a template, mark the locations of the quarter turn fasteners on the ceiling. Notch the ceiling at these locations to allow for the quarter turn fastener receptacles.

iii) If the HORD module is greater than 12 feet it will have shipped in multiple sections. These sections are assembled using a flanged connection. Apply a continuous bead of silicone sealant to the face of each flange then bolt the sections together using the $\frac{1}{4}$ "-20x $\frac{3}{4}$ " hex bolts, nuts

and washers supplied. Tighten the nuts to seal the flange and minimize the chance of air leakage. Note: This step can be done on the floor prior to putting the sections in the ceiling space if preferred.

iv) Carefully place the HORD plenum into the ceiling opening. The plenum should be supported by the two attached end mounting angles resting on the galvanized channel. Secure the mounting angles to the galvanized channel frame.

v) Install the diffuser mounting frame, with temporary spacer brackets installed, into the ceiling opening. Insure the lower face of the plenum rests on the temporary spacer brackets. Install sufficient blocking media between the mounting frame and plenum to keep plenum centered in mounting frame.

vi) Pull the mounting frame/plenum assembly up snug to the ceiling and tighten the end mounting angle bolts on both ends of the plenum.

vii) Secure the plenum to the mounting frame by drilling and installing the #8 x 1 $\frac{1}{4}$ " SMS screws provided, through the pilot holes provide in the plenum.

viii) Remove the temporary spacer brackets. These are no longer required and may be discarded.

ix) Locate the four elbow sections. These sections are attached to the plenums using a flanged connection. Apply a continuous bead of silicone sealant to the face of each flange then bolt the sections together using the $\frac{1}{4}$ "-20x $\frac{3}{4}$ " hex bolts, nuts and washers supplied. Tighten the nuts to seal the flange and minimize the chance of air leakage.

x) Seal all penetrations through the plenum with silicone sealant. Please note the sealant must be applied only on the exterior surface of the plenum, **DO NOT APPLY SEALANT ON THE PLENUM INTERIOR.**

xi) Apply a bead of silicone between the mounting plate and the plenum on the room side to seal between these two pieces.

b. Continuous Plenum

i) Mount a 1"x2" 16 GA galvanized channel (supplied and installed by others) along both long sides of each air curtain ceiling opening. The closed side of the channel must be flush with the edge of the ceiling opening.

ii) If the HORD module is greater than 12 feet it will have shipped in multiple sections. These sections are assembled using a flanged connection. Apply a continuous bead of silicone sealant to the face of each flange then bolt the sections together using the $\frac{1}{4}$ "-20x $\frac{3}{4}$ " hex bolts, nuts and washers supplied. Tighten the nuts to seal the flange and minimize the chance of air leakage. Note: This step can be done on the floor prior to putting the sections in the ceiling space if preferred.

iii) Carefully place the HORD plenum into the ceiling opening. The open end of the plenum should extend slightly below the underside of the ceiling no more than $\frac{1}{4}$ " The plenum should be temporarily supported from the structure by loosely connecting hanger wires from the structure to the mounting brackets. NOTE: Whatever structural member the hanger rods are attached to must be able to support the weight of the air curtain.

Note: Due to the differences among job sites, actual installation procedures will vary. The above procedures are intended to be used as a guide only. Contact Customer Service for assistance.

Installation Instructions

iv) Using the mounting frame as a template, mark the locations of the quarter turn fasteners on the ceiling. Notch the ceiling at these locations to allow for the quarter turn fastener receptacles.

v) Install the diffuser mounting frame, with temporary spacer brackets installed, into the ceiling opening. Insure the lower face of the plenum rests on the temporary spacer brackets. Install sufficient blocking media between the mounting frame and plenum to keep plenum centered in mounting frame.

vi) Pull the mounting frame/plenum assembly up snug to the ceiling.

vii) Secure the plenum to the mounting frame and galvanized channel by drilling and installing the #8 x 1 1/4" SMS screws provided, through the pilot holes provided in the plenum.

viii) Remove the temporary spacer brackets. These are no longer required and may be discarded.

ix) Locate the four elbow sections. These sections are attached to the plenums using a flanged connection. Apply a continuous bead of silicone sealant to the face of each flange then bolt the sections together using ten of the 1/4"-20x3/4" hex bolts, nuts and washers supplied. Tighten the nuts to seal the flange and minimize the chance of air leakage.

x) Seal all penetrations through the plenum with silicone sealant. Please note the sealant must be applied only on the exterior surface of the plenum, **DO NOT APPLY SEALANT ON THE PLENUM INTERIOR.**

xi) Apply a bead of silicone between the mounting plate and the plenum on the room side to seal between these two pieces.

5. Install the Face(s) in the Mounting Frame

- Locate the diffuser face with the two slots and the perforated baffles.
- Set one perforated baffle over the stack of one face. Attach the perforated baffle to the stack using four self tapping screws, one in each corner. Repeat this for every face section.
- Carefully raise the HORD face section up to the plenum making sure that the slots are directed out away from the operating table. Secure in place using the quick release fasteners on the diffuser face.
- Repeat steps above for all remaining face sections.

Balancing

- Verify the total supply air to the Accuflow Air Curtain System by performing a pitot tube traverse of the main supply duct. Once the total supply air volume is verified, the outlets must be balanced.
- The LFD laminar flow diffusers should be balanced first. Due to the low outlet velocities generated by the LFD face the most accurate means of air measurement is a flow hood.
- The remainder of the supply air should be evenly distributed in the linear slot air curtain. Main balancing should be done using duct mounted dampers located in the branch duct as close to the main duct as possible.
- By adjusting the dampers mounted in the inlets to the air curtain plenums equalize the airflow along all slots. Even distribution can be determined in several ways, two of which are as follows:
 - Traverse the air curtain face with a Velometer or Anemometer. Adjust the inlet dampers until each air curtain section has a relatively equal average velocity.
 - With a 1 ft x 4 ft or 1 ft x 5 ft flow hood, take readings along the length of each air curtain section. Divide each reading by the length of the hood to obtain cfm/ft and average for each air curtain section. Adjust the inlet dampers until each air curtain section has a relatively equal average cfm/ft.
 - After balancing is complete, the dampers in the air curtain inlets should be locked in position using the locknut provided and the damper blade marked for future reference. In addition, if there is an inlet damper on the laminar diffusers, the laminar diffuser damper position should be recorded in the event it is accidentally changed during cleaning.

Maintenance

Beyond regular cleaning and sterilizing as defined by the Owners there is no other periodic maintenance required for the HORD system as there are no moving parts.

Note: Due to the differences among job sites, actual installation procedures will vary. The above procedures are intended to be used as a guide only. Contact Customer Service for assistance.



PRICE
INDUSTRIES

2975 Shawnee Ridge Court
Suwanee, Georgia USA 30024
Ph: 770.623.8050 Fax: 770.623.6404



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1290 Barrow Industrial Parkway
Auburn, Georgia USA 30011



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999 North Thornton Road
Casa Grande, Arizona USA 85222-3809



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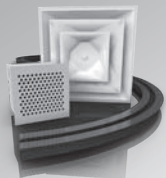
638 Raleigh Street
Winnipeg, Manitoba Canada R2K 3Z9
Ph: 204.669.4220 Fax: 204.663.2715

The founding principles of our company have never changed - business integrity, first class service and a commitment to people. Price manufacturing endeavors arose from our belief that we could supply superior products and services at a reasonable price. Our mission is to become the world-wide supplier of preference for air distribution products and services. You can rely on Price – our products and services – with confidence.

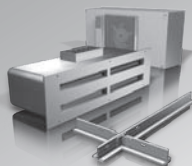
Warranty: The Company warrants and guarantees that all goods within this catalog that have been manufactured by the Company have been manufactured in accordance with the specifications published herein and will be free from defects in material and workmanship for a period of twelve (12) months from the date of Bill of Lading issued by the Company. The Company will replace defective product at its option, but will not be responsible for labor or material charges in replacing product or consequential damages. Any installation not conforming with the Company's specifications, manuals, bulletins or instructions or any misuse or any modification not authorized by the Company voids this warranty. This warranty is in lieu of all Provincial, State, and Federal statutory warranties and the conditions herein are in substitution and replacement of such warranties, statutory or otherwise.

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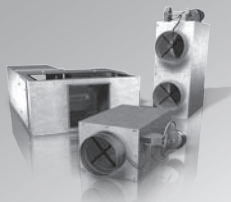
Grilles & Diffusers



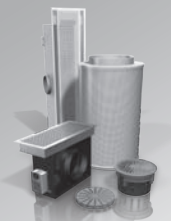
Critical Environments



Terminals



Sustainable Building



Noise Control

