

BYPASS RELIEF RINGS FOR VAV DIFFUSERS

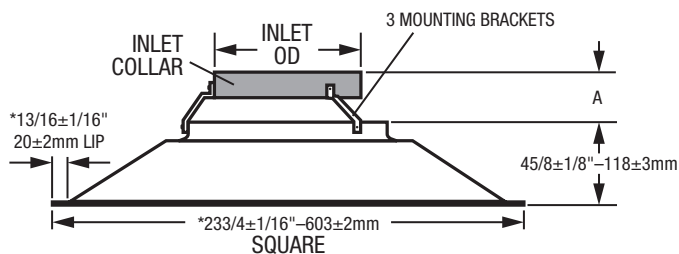
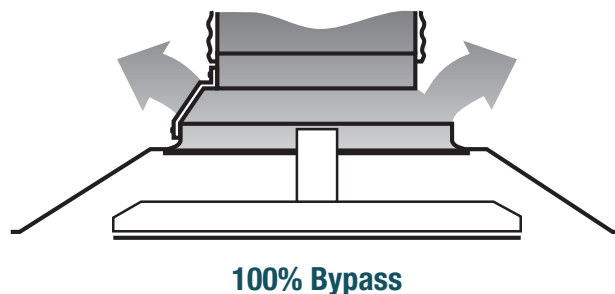
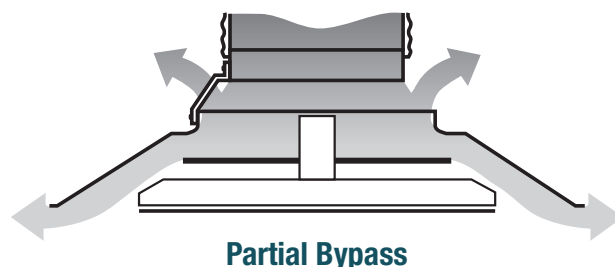
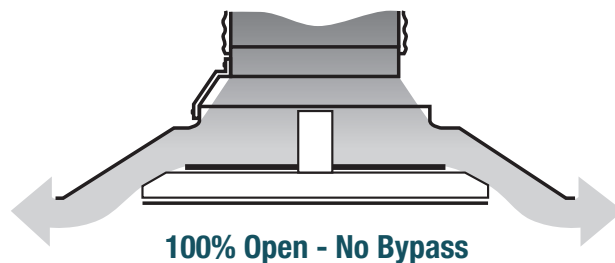
Bypass Relief Rings are used to bypass supply air into the ceiling plenum when VAV diffusers turn down. The purpose of the bypass is to limit diffuser noise by limiting inlet static pressure. A VAV diffuser with a bypass Relief Ring has a constant volume air flow to it and, therefore, also over the balancing damper. This results in a constant pressure drop over the balancing damper which, in turn, limits the static pressure at the diffuser at both full flow and turn down.

Because supply air is bypassed into the ceiling plenum, Relief Rings cannot be used with a ducted return. They also require a four-way blow pattern as three-, two- or one-way patterns upset the bypass.

Relief Rings are available in three nominal inlet sizes of 6 in./150mm, 8 in./200mm and 10 in./250mm. There is no 12 in./300mm inlet Relief Ring.

HOW THEY WORK

VAV diffusers can be factory- or field-fitted with a Relief Ring, which is a smaller inlet collar mounted above the original diffuser neck. The supply duct is connected to the smaller inlet collar. The open space between the inlet collar and the original neck is used to bypass air into the ceiling plenum when the VAV diffuser closes. With the VAV diffuser open at the zero-bypass point, the geometry is such that the rated amount of air flows into the room and no air is bypassed. As the VAV diffuser closes, less air enters the room and more air is bypassed. With the VAV diffuser fully closed, except for normal leakage all air is bypassed into the ceiling plenum.



*595±2mm Square with 16±2mm lip available
— specify 595mm square

Dimensions

Size	Inlet OD	A
R6	5 7/8 in. / 150mm	4 1/5 in. / 107mm
R8	7 7/8 in. / 200mm	4 1/3 in. / 110mm
R10	9 7/8 in. / 250mm	4 1/2 in. / 114mm

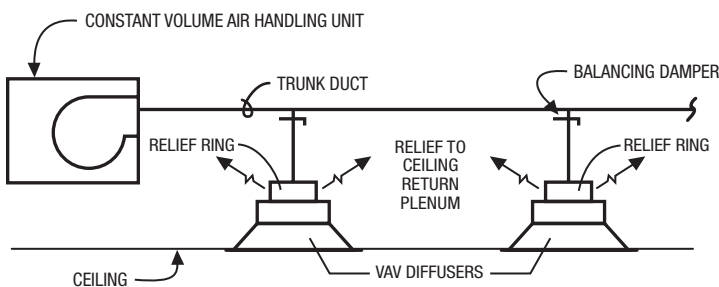
APPLICATION AND INSTALLATION

Select Relief Rings using the standard performance guide for the appropriate model. Use the same inlet size as the Relief Ring inlet. The geometry of the Price Relief Ring is designed for the same air volumes at the same static pressure shown in the performance guide. When Relief Rings are used, throws may be as low as 90% of the throw shown in the performance guide and NC may be 2db higher. Inlet height also increases by 4 1/5 in. / 107mm to 4 1/2 in. / 114mm.

Only use Relief Rings with ceiling plenum returns. Do not use them with ducted returns. Use only four-way blow patterns.

Do not use three-, two- or one-way blow patterns. Proper return air design is important to achieve a negative plenum pressure relative to the room. Otherwise the radiant effect of the ceiling and leakage through the ceiling could result in poor control of the room temperature.

Install the duct no lower than the shoulder on the Relief Ring bracket. Do not install the duct below the bottom of the inlet collar. A manual balancing damper should be installed at the takeoff for each VAV diffuser. Use this balancing damper to adjust for design air flow from the VAV diffuser. See System Balancing.

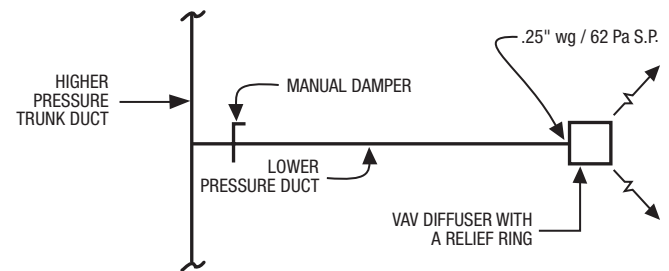


RELIEF RINGS ON HIGHER PRESSURE TRUNK DUCT

Relief Rings can be used when there is a need to supply air to VAV diffusers from a medium pressure duct system, and the use of a modulating zone damper is not justified because of cost or other reasons.

VAV diffusers with relief rings receive a constant volume of air from the higher-pressure duct. The VAV diffusers supply air to the conditioned space and/or relieve air through the Relief Rings. This is a pressure-dependent system. If pressure in the higher-pressure duct changes, flow through the lower-pressure duct will change.

Sound attenuation should be considered when taking pressure drops higher than 1 in. wg / 240 Pa. over the manual balancing damper to counteract both radiated and duct-borne noise.



SYSTEM BALANCING

VAV systems are balanced for design air volume at maximum air flow, and systems using VAV diffusers are no exception. When all the VAV diffusers are set for maximum air flow by fully opening them, the system is a constant air volume system and is balanced as a constant volume system. Balancing dampers are best located at the takeoff before the runout to the VAV diffuser.

1. Prepare system for balancing. Make necessary checks for diversity, fan capacities, fan rotation, minimum outside air requirements and duct leaks. Set outside air control damper for minimum air and return air control damper for maximum air.

2. Open VAV diffusers.

- a. Model VPD

NOTE: When field fitting Relief Rings to VPD diffusers, the maximum flow stops must be changed before balancing. See instructions with the field installation kit.

Locate the side of the VPD diffuser with the thermostat and the balancing lever. Push the balancing lever to the right and up.

- b. Model VBD

Open the appearance panel. Do not disconnect the spring. Use temporary balancing spacers made of plastic supplied with the diffuser to hold the blades open the proper distance for balancing.

Thickness of the spacer will depend on the size of the Relief Ring used. See Table. Close the appearance panel.

Relief Ring	R6	R8	R10
Nominal Duct Size	6 in. / 150mm	8 in. / 200mm	10 in. / 250mm
Thickness - Correct Dimension Blade Opening When Balancing	3/8 in. / 9.5mm	5/8 in. / 16mm	7/8 in. / 22mm

- c. Model PPD

Using the T-stat or BACnet Explorer, change the Cool Max damper position setting to 75%. Enable damper override and set it to Cool Max.

3. Start fans, adjust system for 100% air flow and make system checks. (Measure static pressure across filters and coils and at sensor for static pressure controller. Measure supply, return and branch duct air flow.)
4. Measure air flow from each VAV diffuser and adjust the damper at the duct takeoff to obtain maximum design air flow. Air flow measurement is done with a direct-reading diffuser balancing hood. In either case, static pressure is measured with all plaques in place. This is because the plaque affects pressure drop through the diffuser.
5. Return VAV diffusers to operating condition.
 - a. Model VPD
Pull the balancing lever down until it latches.
 - b. Model VBD
Open the appearance panel, remove the balancing spacers and close the appearance panel.
 - c. Model PPD
Disable the damper override. Change the Cool Max setting back to 100%.
6. Return the remainder of the system to operating condition.