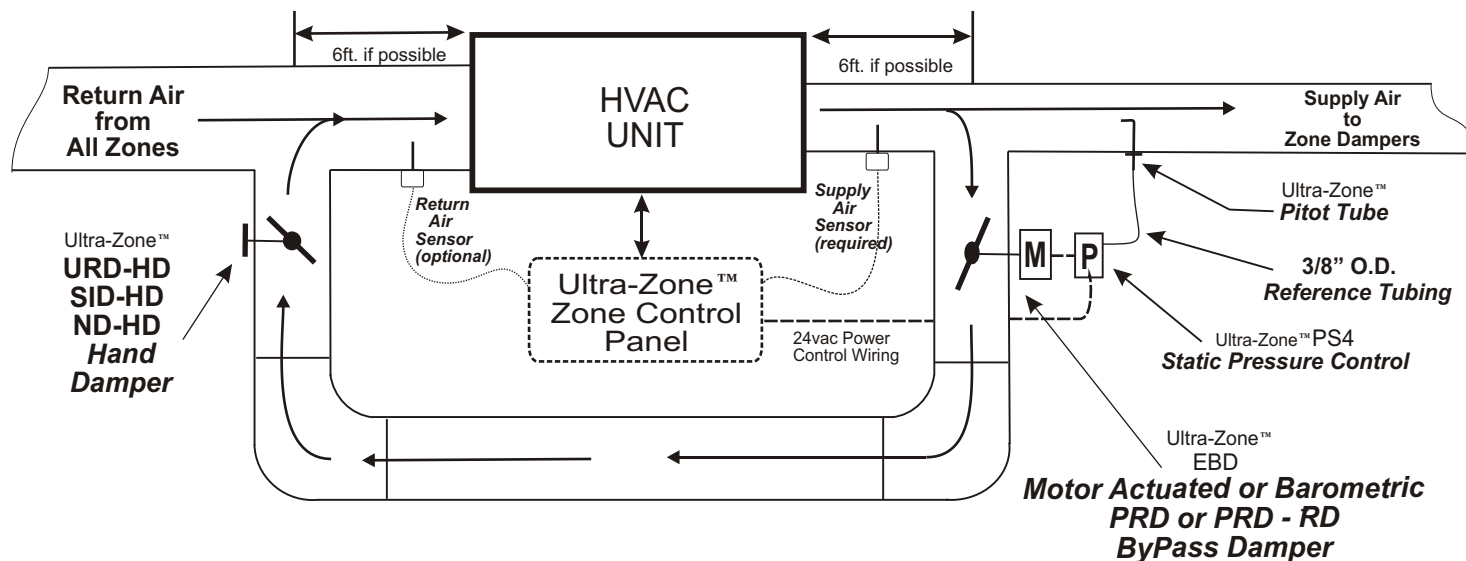


### GENERAL DESCRIPTION

The model PRD - RD pressure regulating damper is a single blade round barometric damper with a counter balanced weighted arm. The PRD - RD is an economical way of bypassing excess air when zone dampers close. Damper adjustment is achieved by off-setting the hex shaped arm, secure 1 or 2 weights at the very bottom of that arm and moving the Extra Weight up or down the arm until the correct bypass flow is achieved. See Page 2 for details. The hex shaped arm on the PRD - RD can be inserted into either side of the damper for added versatility.

The PRD - RD is normally installed in the duct-work to regulate excess air pressure and volume. The damper can be mounted to relieve pressure by returning the air back to the return air duct or by dumping it into a non-critical conditioned area. *A restricting hand damper should always be installed downstream of the PRD-RD, which allows a differential pressure setting. See Application Note 090376A0169D.*

The PRD - RD is an effective By-Pass solution for any Constant Speed or Variable Speed Zoned HVAC system up to 5 ton capacity.



**Note:** This drawing of the Bypass damper, Hand Damper, Static Pressure control and Related duct work is intended to serve only as a guide. Your actual duct work layout and components may differ. Use the graphic as a guide when planning or designing a Zone system regardless of the Equipment type, Duct layout and Airflow configuration.

MODEL #	SIZE	LENGTH	# WEIGHTS	BYPASS CFM*
PRD - RD8	8"	9.75"	2	320 CFM
PRD - RD10	10"	11.75"	2	500 CFM
PRD - RD12	12"	13.62"	2	720 CFM
PRD - RD14	14"	15.62"	3	950 CFM
PRD - RD16	16"	19.98"	3	1250 CFM

\* CFM value at 900fpm

## BYPASS SIZING CALCULATIONS

1. Start with the system's Total Cfm (2000Cfm) 3 zone system (Zone 1 = 750Cfm, Zone 2 = 750Cfm, Zone 3 = 500Cfm plus 4 wild runs @ 50Cfm)
2. Calculate the Cfm for the smallest zone that can run by itself (500Cfm)
3. Calculate the Cfm for any non-dampered (wild) duct runs ( $4 \times 50\text{Cfm} = 200 \text{ Cfm}$ )
4. Calculate Damper stop leakage (20%) on both inactive zones ( $750\text{cfm} \times .20 = 150 \times 2 = 300\text{Cfm}$ )
5. Subtract all values from total Cfm ( $2000 - 500 - 300 - 200 = 1000 \text{ Cfm}$  bypass flow)
6. The left over amount is the bypass Cfm. Refer the bypass Cfm to the chart on Page 1, match to the closest size. If you don't have enough room for that size, then go down one size only. Beware that Bypass velocity will increase on smaller bypass ducts. The By-Pass damper and duct can also be sized on a Duct Calculator (1000 Cfm @ 900 Fpm). *Regardless of the bypass size, make sure to install a restricting Hand Damper after the Bypass damper in order to control how fast the bypass air mixes with the return air. (See graphic on page 1)*

<b>EXAMPLE:</b>	5 ton system @ 400 Cfm Per ton = 2000 Cfm	2000 Cfm
	Subtract Smallest Zone = 500 Cfm	-500 Cfm
	Subtract Damper Stop Leakage = 300 Cfm	-300 Cfm
	Subtract Wild Zones = 200 Cfm	<u>-200 Cfm</u>
		1000 Cfm
		<b>1000 Cfm @ 900 Fpm = 14" PRD-RD</b>

## BAROMETRIC BYPASS SET-UP PROCEDURE

1. The PRD - RD must be installed horizontal & level between the supply duct and the return duct.
2. Position PRD - RD to open in the direction of your airflow back to the return duct or into a conditioned area.
3. Make the PRD - RD connection on the return so that the bypass air has a minimum 6 feet of return duct before it enters the air handler, if space permits. *If a Restricting hand damper is installed, it should have been setup already. If not, refer to Application note 090376A0169D. Otherwise, close the hand damper 1/2 way.*
4. Position ARM in the "IDEAL ARM LOCATION" for the direction of your air flow and tighten the thumb screw. (Refer to page 4)
5. Position the **Extra Weight** high up on the ARM and tighten the thumb screw. Position **Weight#1** (and #2 if available) at the very bottom of the arm and tighten the thumb screw. (Refer to page 3)
6. Energize **ALL** Zones to operate the unit with the Fan running on the Highest speed. (Usually a Cooling demand, 2nd stage if applicable)
7. Return to the PRD - RD & confirm that the bypass damper is closed. If necessary, reposition the **Extra Weight** lower on the ARM until the PRD - RD closes completely. (It should be closed to the point where any additional force will open the PRD - RD) (Refer to page 3)
8. Turn off all Zones but the Smallest Zone & Wait about 45 seconds.  
Monitor the airflow for the Smallest Zone. Is there Excess Velocity or Noise? Proceed to **Step 9**.  
Is there Insufficient Velocity? Proceed to **Step 10**.  
Is the Velocity Acceptable? Proceed to **Step 11**.
9. **Excess Velocity:** Reposition the **Extra Weight** higher up on the ARM until the velocity in the smallest zone has subsided to an acceptable level. If the velocity remains high, reposition **Weight #1or2** higher up on the arm, or if necessary, reposition the ARM towards '0' on the scale. (Refer to page 3 & 4)
10. **Insufficient Velocity:** Reposition the **Extra Weight** lower on the ARM until the velocity is at an acceptable level. If the velocity remains low, reposition the ARM towards the '1' on the scale. If velocity still remains low for the Smallest zone, too much air is being forced through the PRD - RD. An Electronic ByPass Damper (Model EBD) should be considered.
11. Congratulations, your PRD - RD By-Pass damper is now properly adjusted.

Model PRD - RD Round Bypass Damper

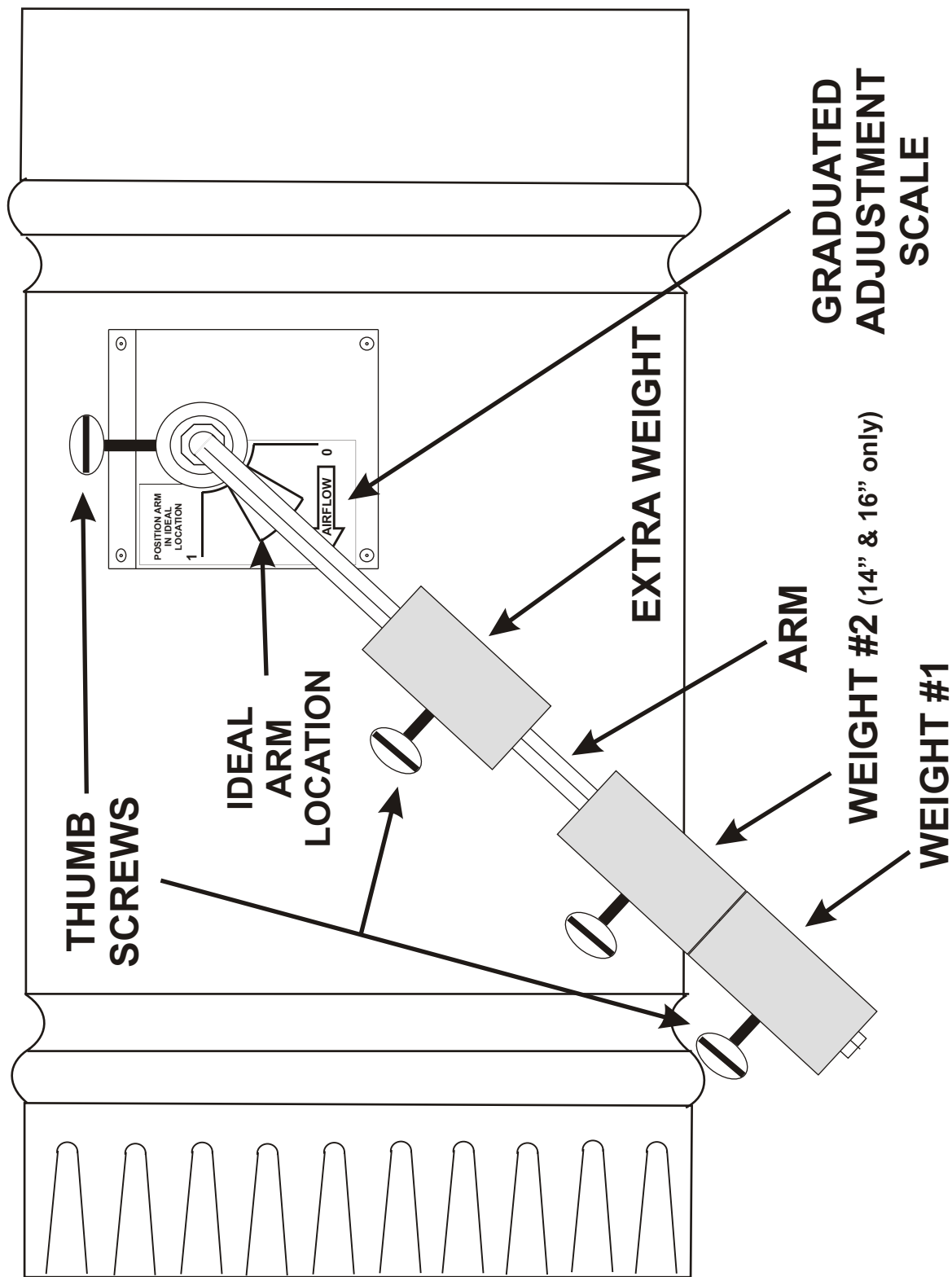


FIGURE 2

# BAROMETRIC BYPASS DAMPER

## ASSEMBLY OF PRD & PRD - RD BYPASS DAMPER

- 1 - INSTALL BY-PASS DAMPER PER INSTRUCTIONS ON PAGE 2.
- 2 - SLIDE LOCKING-COLLAR OVER DAMPER SHAFT.
- 3 - INSERT HEX ARM INTO DAMPER SHAFT.
- 4 - ALIGN LOCKING-COLLAR THUMB SCREW WITH ONE OF THE 4 HOLES ON THE DAMPER SHAFT WHILE HOLDING ARM AT THE DESIRED ANGLE.
- 5 - TIGHTEN THUMB SCREW TO SECURE HEX ARM IN PLACE.
- 6 - POSITION WEIGHTS ON HEX ARM AND TIGHTEN THUMB SCREW TO SECURE IN PLACE.
- 7 - REFER TO PAGE 2 FOR SET-UP PROCEDURE.

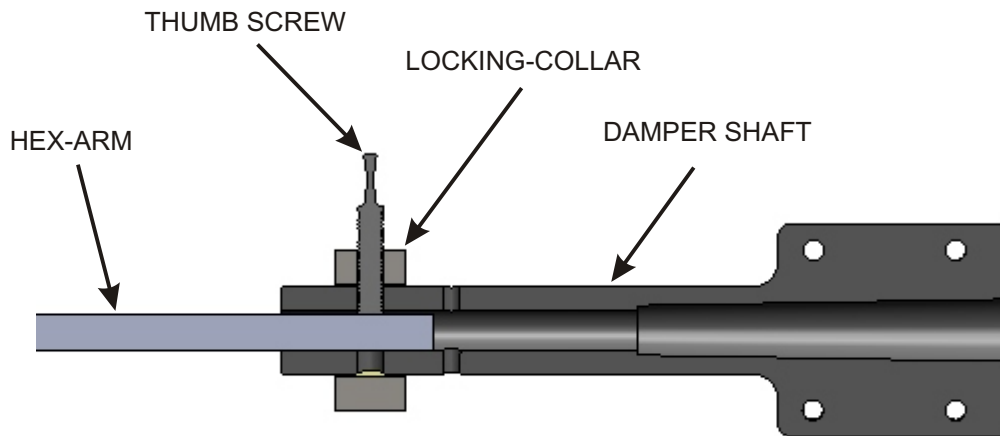


FIGURE 3 -- CUT AWAY VIEW OF ASSEMBLY

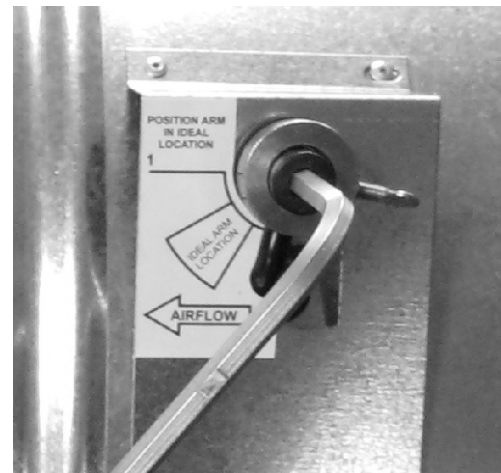


FIGURE 4 -- CLOSE-UP VIEWS OF ASSEMBLY