Excellence Without Compromise

EWC® CONTROLS INC.

TECHNICAL BULLETIN

Model PRD & PRD- RD
Barometric By-Pass Damper

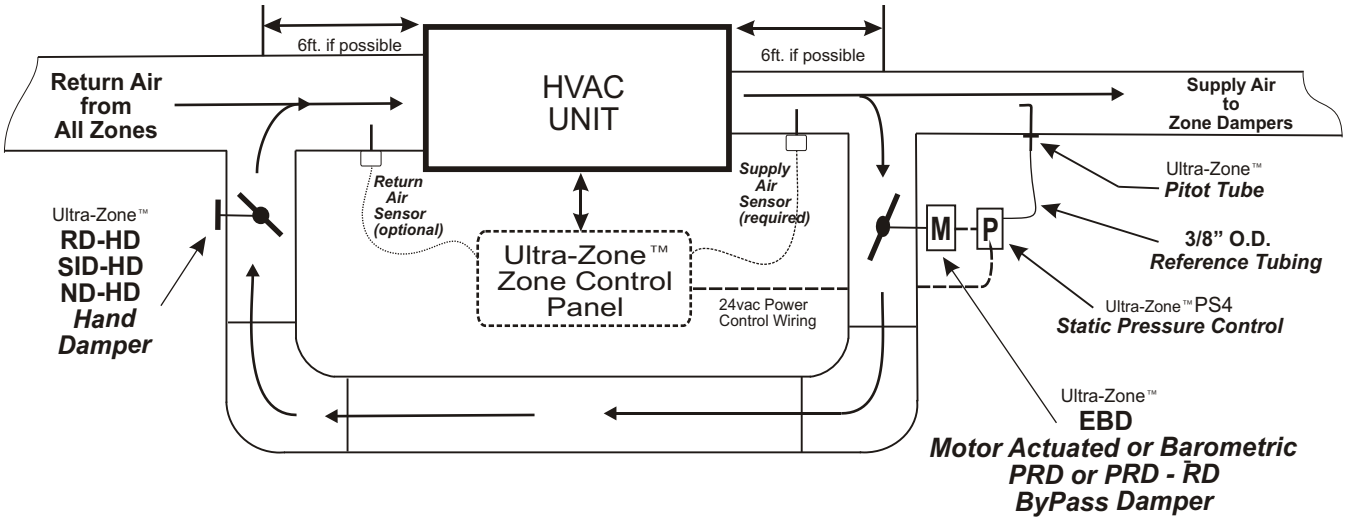
Leave this bulletin on the job site for future reference!

GENERAL DESCRIPTION

The model PRD & PRD-RD pressure regulating dampers are a single blade rectangular or round barometric damper assemblies with a counter balanced weighted arm. The barometric by-pass damper is an economical way to manage airflow when zone dampers close. Damper adjustment is achieved by off-setting the hex shaped arm, securing weight #1 towards the bottom of that arm and moving the extra weight(s) (optional) up or down the arm, until the correct bypass flow is achieved. See Page 2 for details. For field versatility, the hex shaped arm can be inserted into either side of the damper. Additional weights can be added if necessary.

The barometric by-pass damper is 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 can be installed downstream of the by-pass damper, which allows the installer to set sufficient differential pressure across the bypass duct, controlling how fast the by-pass air mixes with return air. See Application Note 090376A0169D.*

The PRD & PRD-RD are effective By-Pass solutions for any Constant Speed or Variable Speed Zoned HVAC system up to 4 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.

Use the Cfm tables provided below to size your by-pass damper using the guideline provided on the next page. Use the 1400Fpm column to achieve smaller bypass runs at higher velocities. Use the 900Fpm column if you have the space to accommodate a large bypass run at a nominal velocity.

MODEL #	SIZE	# WEIGHTS	BYPASS Cfm*	BYPASS Cfm*
PRD 12 x 8	12" x 8"	2	560 Cfm	850 Cfm
PRD 12 x 10	12" x 10"	2	700 Cfm	1100 Cfm
PRD 12 x 12	12" x 12"	2	825 Cfm	1300 Cfm
PRD 20 x 8	20" x 8"	2	900 Cfm	1300 Cfm
PRD 20 x 10	20" x 10"	2	1125 Cfm	1750 Cfm
PRD 20 x 12	20" x 12"	2	1375 Cfm	2000 Cfm
			* CFM @ 900Fpm (.15"wc friction loss)	* CFM @ 1400Fpm (.3"wc friction loss)

MODEL #	SIZE	# WEIGHTS	BYPASS Cfm*	BYPASS Cfm*
PRD-RD 8	8"	1	320 Cfm	500 Cfm
PRD-RD 10	10"	1	500 Cfm	750 Cfm
PRD-RD 12	12"	1	720 Cfm	1100 Cfm
PRD-RD 14	14"	2	950 Cfm	1400 Cfm
PRD-RD 16	16"	2	1250 Cfm	1900 Cfm
			* CFM @ 900Fpm (.15"wc friction loss)	* CFM @ 1400Fpm (.3"wc friction loss)

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BYPASS SIZING CALCULATIONS

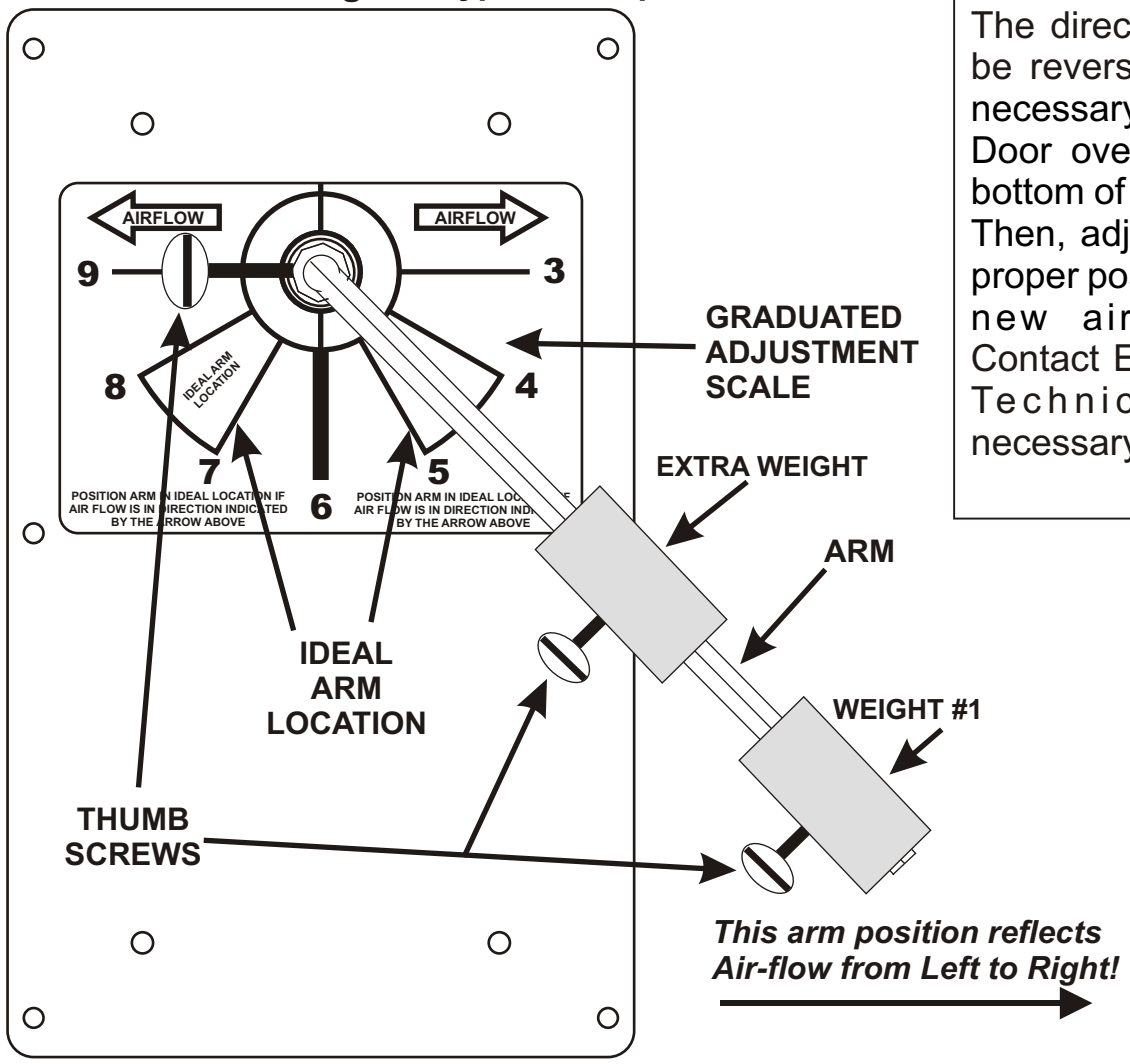
1. Start with the system's Total Cfm (2000Cfm) 3 zone system (Zone 1 = 750Cfm, Zone 2 = 750Cfm, Zone 3 = 500Cfm plus 4 open runs @ 50Cfm)
2. Calculate the Cfm for the smallest zone that can run by itself (500Cfm)
3. Calculate the Cfm for any non-dampered (open) duct runs (4 x 50Cfm = 200 Cfm)
4. Calculate Damper stop leakage (20%) on both inactive zones (750cfm x .20 = 150 x 2 = 300Cfm)
5. Subtract all values from total Cfm (2000 - 500 - 300 - 200 = 1000 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. By-pass velocity will increase on smaller bypass ducts. ***Regardless of the bypass size, consider installing a Restricting Hand Damper after the Bypass damper, in order to set sufficient differential pressure and control how fast the bypass air mixes with the return air. (See graphic on page 1)***

EXAMPLE:	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 Open Runs = 200 Cfm	-200 Cfm
		1000 Cfm
		1000 Cfm @1400Fpm = 12x10 PRD
		or
		1000 Cfm @ 900 Fpm = 20x10 PRD

BAROMETRIC BYPASS SET-UP PROCEDURE

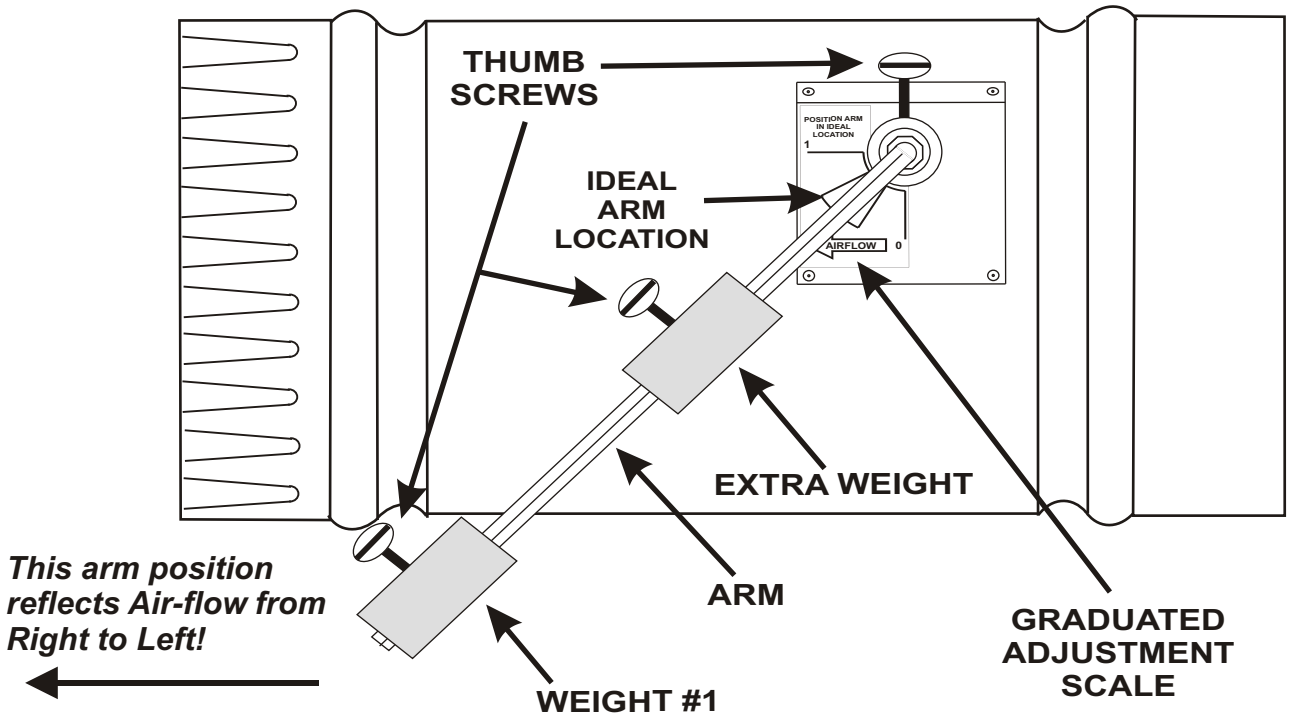
1. The bypass damper must be installed horizontal & level between the supply duct and the return duct.
2. Position the damper to open in the direction of airflow back to the return duct or into a conditioned area.
3. Place the duct connection on the return so that the bypass air has a minimum 6 feet 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 ½ way.*
4. Position the ARM in the "IDEAL ARM LOCATION" for the correct direction of air flow and tighten the thumb screw. (Refer to page 4)
5. Position the **Extra Weight (optional)** high up on the ARM and tighten the thumb screw. Position **Weight#1** towards the 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 damper & confirm that the by-pass damper is closed. If necessary, reposition the **Extra Weight or Weight #1** lower on the ARM until the damper closes completely. (It should be closed to the point where any additional force will start to open it) (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 to much Airflow or Noise? Proceed to **Step 9**.
   Is there Insufficient Airflow? Proceed to **Step 10**.
   Is the Airflow 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 #1** higher up on the arm, or if necessary, reposition the ARM closer towards "6 or 0" on the scale. (Depending on the model).
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 closer towards the "3 or 9" on the scale ((Depends on model. Refer to page 3&4) depending on direction of flow). If velocity still remains low for the smallest zone, to much air is being forced through the barometric damper. You can order additional weights or you should consider installing an Electronic By-Pass Damper (Model EBD).
11. ***Congratulations, your PRD By-Pass damper is now properly adjusted.***

Model PRD - Rectangular Bypass Damper



The direction of airflow can be reversed on the PRD if necessary, by pushing the Door over the stop on the bottom of the damper frame. Then, adjust the arm to the proper position based on the new airflow direction. Contact EWC Controls Inc., Technical support if necessary for further details.

Model PRD - RD Round Bypass Damper



ASSEMBLY OF PRD & PRD-RD BY-PASS 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 WEIGHT ON HEX ARM AND TIGHTEN THUMB SCREW TO SECURE IN PLACE.

7 - REFER TO PAGE 2 FOR SET-UP PROCEDURE.

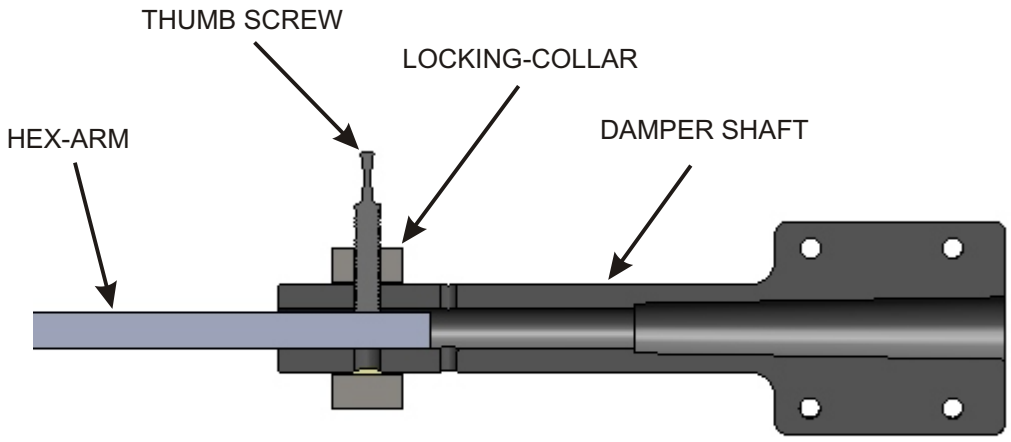


FIGURE 3 -- CUT AWAY VIEW OF ASSEMBLY

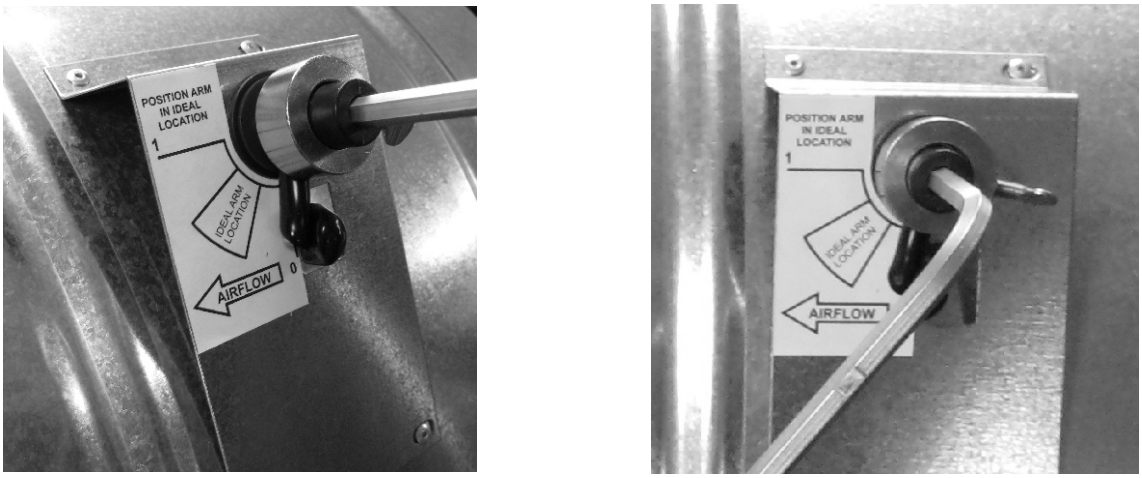


FIGURE 4 -- CLOSE-UP VIEWS OF ASSEMBLY