

ULTRA-ZONE™

Forced Air Zone Controls

SUBMITTAL SHEET

Model EBD

Electronic By-Pass Damper

EBD Specifications:

- PS4 Pressure Switch Set point Range** - .08"- 1.2" W.C.
- Sensing Element** - Silicone diaphragm.
- PS4 Pressure Connectors** - ¼"OD plastic fitting x2.
- Pitot Tubes** - Included x2. **Pressure Tubing** - Included 16'.
- Power** - 24vac @ 3.0va / 1.5w, required.
- Wiring** - Pressure switch is factory wired to damper motor. Route 24vac into PS4 and connect as shown below.
- Contacts**- SPDT contacts rated for 1.5amp @ 250vac.
- Enclosure** - Polystyrene with ½" LT conduit opening.
- Enclosure Rating** - IP54
- PS4 (Dwyer ADPS) Listings** - CE, RoHS
- Mounting** - The PS4 pressure switch is factory mounted to the damper frame or shell. The pressure switch must be oriented with pressure connectors pointing straight down, regardless of the position of the bypass damper. **For guidance on pressure switch position and orientation, refer to page 3.**

How the Bypass System Works:

As the individual zone dampers open and close, the system static pressure will fluctuate. In order to maintain the design static pressure on the the HVAC duct system during zoned operation, a bypass system with a reliable motorized damper, controlled by a differential pressure sensing switch should be installed. The pressure switch monitors the duct static pressure and floats (modulates) the damper motor, to maintain the design static pressure value. The bypass damper will modulate to hold the factory set-point of .5"wc or whatever set-point the installer chooses, within the available range.

Description of Bypass Dampers:

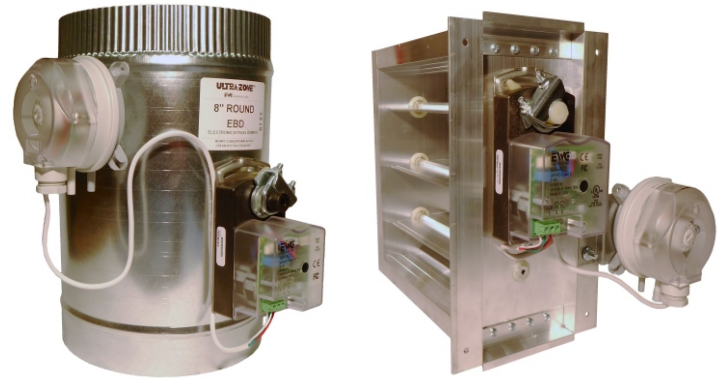
ROUND BYPASS DAMPERS are fabricated from 24 gauge galvanized steel. The rolled shells are furnished with one straight (female) end and one crimped (male) end with stiffening beads for rigidity. Round EBD bypass dampers are equipped with low leakage blade seals.

***Specify model EBD - 8", 10", 12", 14", 16", 18", 20"**

RECTANGULAR BYPASS DAMPERS are fabricated from mill finished, extruded 080" aluminum, and a low leakage parallel blade design.

***Specify model EBD - 12x8, 12x10, 12x12, 20x8, 20x10, 20x12, etc.**

***Custom sizes are available, call for details.**

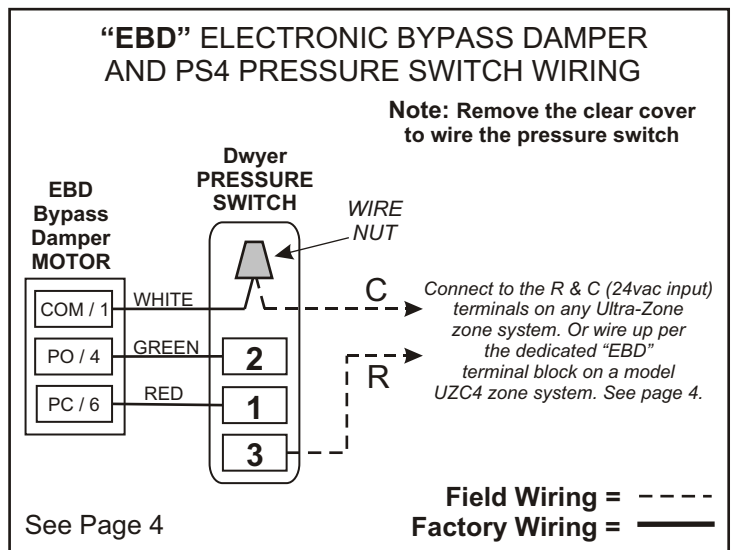


Description of the PS4 Static Pressure Control:

The Dwyer static pressure control is a heavy duty air pressure switch, with a sensitive diaphragm. An integrated SPDT dry switch and a dual scale (in WC & Pascal) set-point adjustment knob are included. An IP 54 rating insures moderate levels of moisture or dust will not harm the PS4.

The Electronic Bypass design includes either the Model MA-AC1 or MA-ND5 Motor Actuator with Open & Closed LED indicators for Medium Duty applications, or a rugged LM-24(no LED's)Belimo Motor Actuator for Heavy Duty applications!

All Ultra-Zone EBD models are designed for long life and easy installation.



385 Hwy. 33
Englishtown, NJ 07726
Ph: 800-446-3110
Fx: 732-446-5362

P/N 090377A0061 REV. Q 10.11.22

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SUBMITTAL FORM

SUBMITTED BY: _____
 JOB: _____
 ARCHITECT: _____
 ENGINEER: _____
 CONTRACTOR: _____
 LOCATION: _____

Installing the EBD Bypass Damper:

The pitot tubes, reference tubing, and mounting hardware are included with the EBD. **Make sure you have removed these items from the shipping box before you throw the box away!**

The bypass damper should be installed with the bypass air routed back into the return air plenum or above the ceiling if used as an open (common) return. See Application Note #090376A0169 for bypass design guidance.

Mount both pitot tubes within 2 feet of the air handler on the center line of a straight section on the Supply & Return duct plenums. Keep the return pitot tube clean by mounting the return pitot tube after the return air filter.

Connect the supplied 1/4"ID tubing to each pitot tube and the pressure switch P1 & P2 ports. Be sure to avoid kinks.



Supply port (P1 positive pressure) →
Return port (P2 negative pressure) → Cable Entryway (24vac)

Adjusting the PS4 Static Pressure Switch:

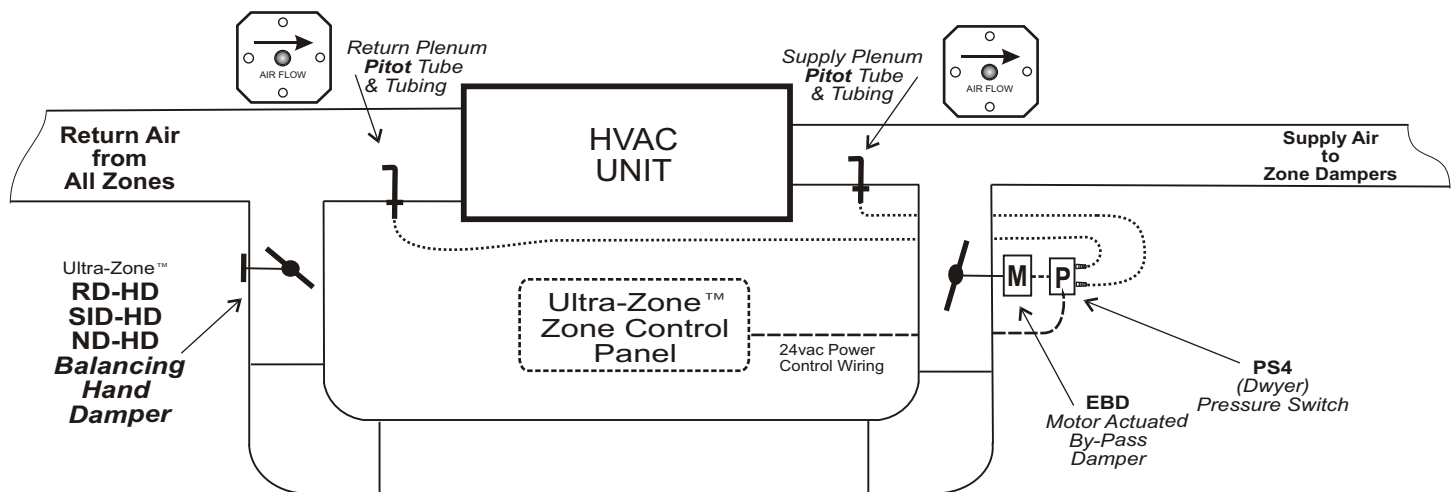
Before adjusting the pressure switch, the installer should confirm the following:

- (1) The pitots & tubing are connected to the PS4 switch.
- (2) The HVAC System is running at full capacity (CFM).
- (3) The Air Filter is new or clean.
- (4) The EBD bypass is powered with 24vac. See page 4.
- (5) The zone dampers are operating properly.
- (6) All zones are active and all dampers are fully open.

Adjustment Procedure:

With the air handler running at high speed & full CFM, turn the static pressure adjustment dial to the static pressure set-point you require. (Factory setting is .5" W.C.) The EBD bypass damper should be fully closed when all zone dampers are open. If the EBD is partially open, adjust the set point for a higher value, until the EBD is fully closed. Then, satisfy one or more thermostats, in order to close off one or more zone dampers. Observe the EBD bypass damper as the pressure control senses the increased air pressure and modulates the bypass damper, to maintain the static pressure set-point you have selected.

EWC Controls Recommended Bypass Duct Configuration



Note: This drawing of the bypass damper static pressure control and related duct work is intended to serve as a guide. Your actual duct configuration may differ and that's OK, so long as all components are installed correctly.

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To ensure proper operation, make sure the PS4 pressure switch is always oriented straight up (level and plumb) with the P1 & P2 ports pointing straight down, regardless of the installed damper position.

If the round bypass damper is installed *horizontally*, there should be no need to adjust the PS4 pressure switch position.

If the round bypass damper is installed *vertically*, the position of the pressure switch *must* be field adjusted.

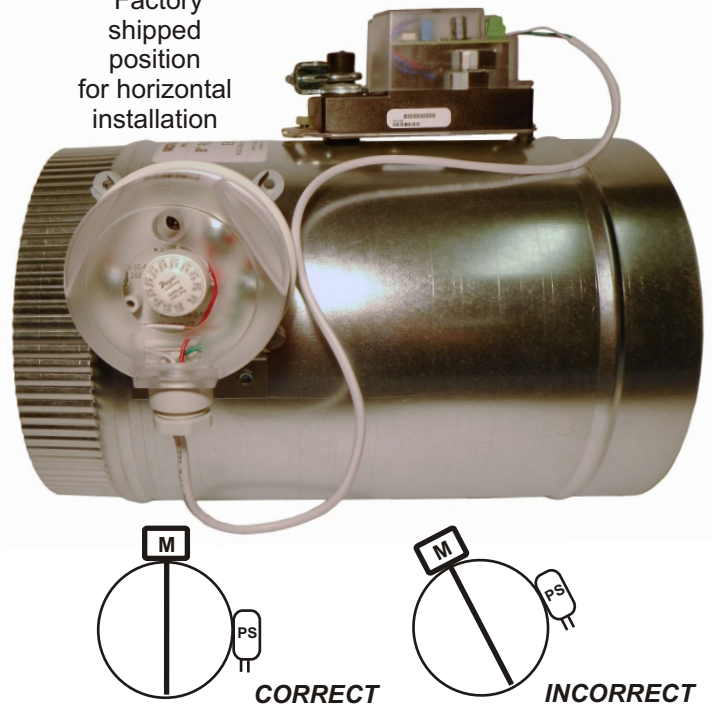
Remove the 1/4" screws holding the PS4 to the EBD shell. Remove all 3 phillips screws holding the PS4 to the mounting plate. Rotate the PS4 90 degrees and re-install all 3 phillips screws. Re-install the mounting plate to the EBD shell.

There is plenty of slack in the factory cable to handle the position adjustment.

For rectangular EBD's mounted into the bottom of the duct rather than the side of the duct, remove the entire Bracket/PS4 assembly from the damper frame and mount it directly to the side of the duct, using your own self-tapping screws.

Make sure the assembly is level and plumb. Depending on the situation, it may be necessary to extend/splice the factory cable.

Factory shipped position for horizontal installation



Field adjusted position for vertical installation



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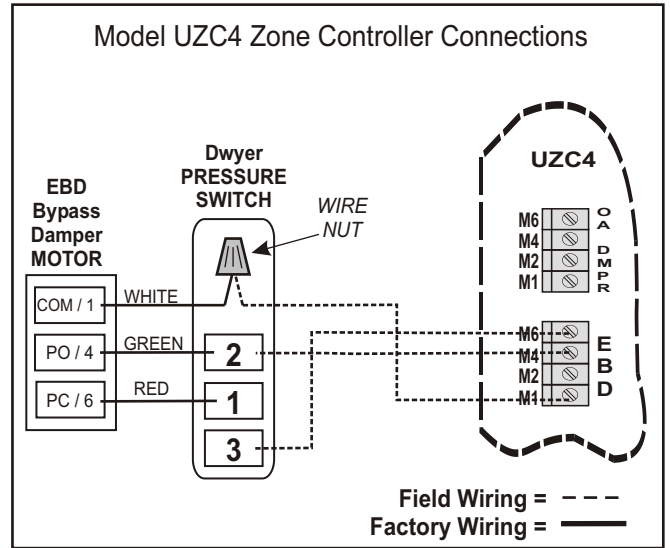
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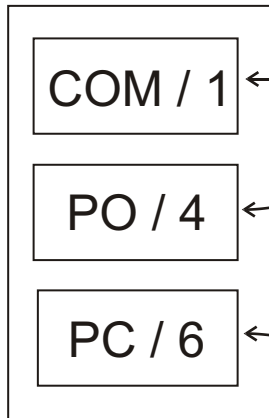
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If you have a model UZC4 zone controller, connect the EBD directly to the dedicated terminal block as shown on the right. Connect M6 to terminal 3 and M4 to terminal 2 (on top of the green factory wire). M1 wire nuts directly to the white factory wire.

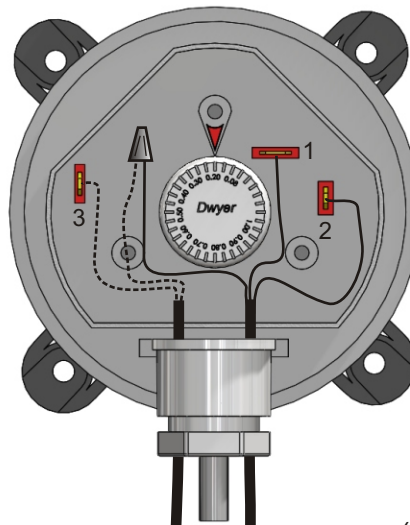
For all other zone controllers, connect the 24vac hot (R) wire to terminal 3 and wire nut the 24vac common (C) wire directly to the white factory wire.



EBD Bypass Damper MOTOR



Factory Cable (pre-wired) from PS4 to the EBD Motor Actuator
(White = Com/1)
(Green = PO/4)
(Red = PC/6)



Field Cable from 24vac power to the PS4

(R = Connect to Terminal 3)
(C = Wire nut to factory white)

Connect to the R & C (24vac input) terminals on any Ultra-Zone zone system **or** connect directly to the 24vac R & C terminals in the Air Handler or Furnace.

Field Wiring = - - -
Factory Wiring = ———