

By-Pass Eliminator 24™ Model BPE24

For use with 24V Power Open/Power Closed Damper Motors and Control Panels Only

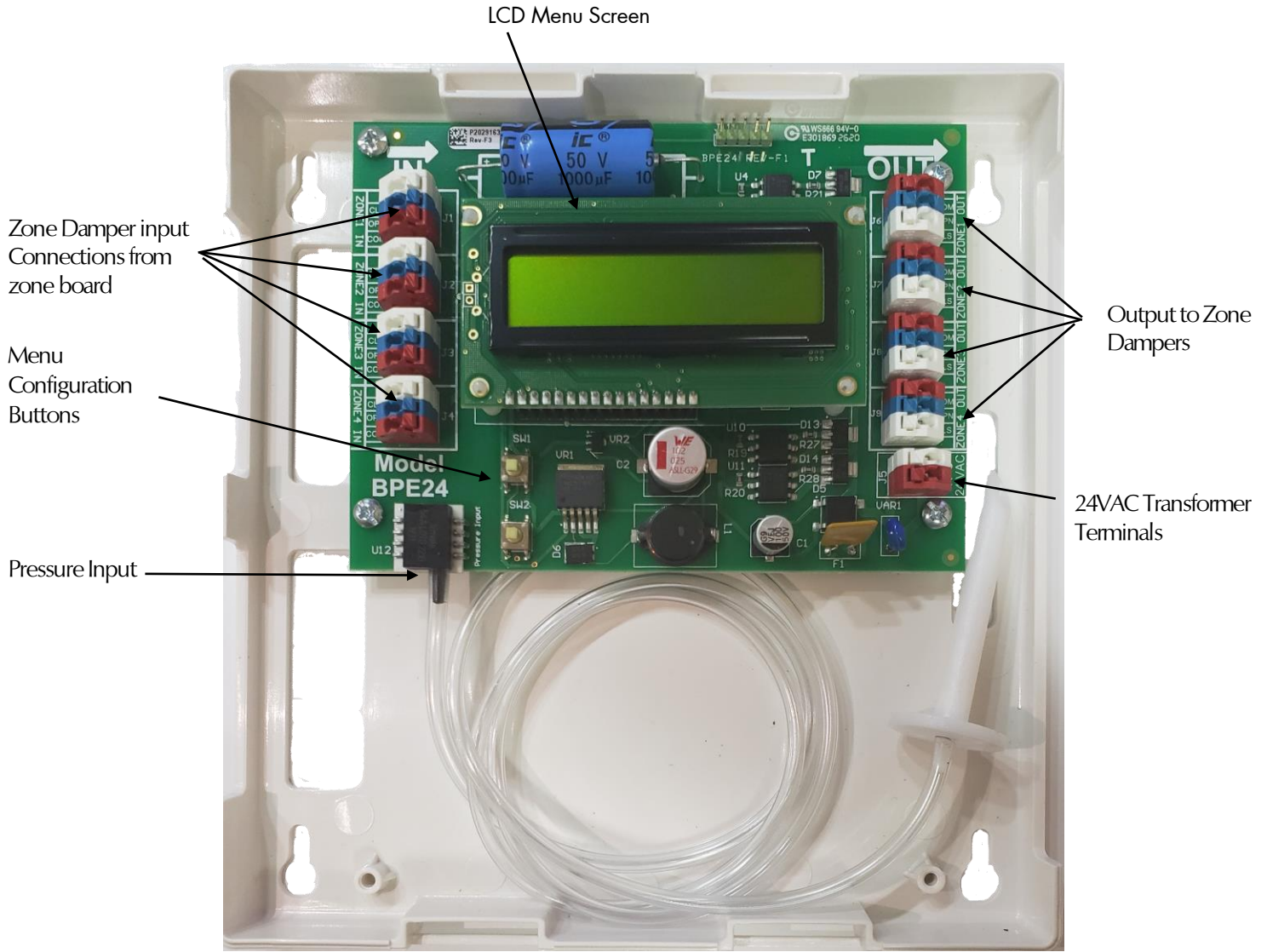


Installation and Operating Instructions

ZONEFIRST®
Controlling Your Comfort Room by Room



Control Panel Features



The Bypass Eliminator 24™ (Model BPE24) Control is an interface between a ZONEFIRST Zone Control Panel and its zone dampers. The BPE24 is used to eliminate the need for a traditional separate by-pass duct and damper directed back into the return duct. The BPE24 can **ONLY** be used with 24V Power Open/Power Closed Dampers and control panels.

The BPE24 uses an air sensor in the duct system on the supply side and before all zone dampers so it can monitor the systems static pressure, whenever the blower is running. The zone dampers are now wired directly into the BPE24 and not the zone control panel. The BPE24 has 4 zone inputs where the damper outputs of the zone control panel will plug-in on the BPE24. The zone control panel controls the zone dampers through the BPE24.

The BPE24 will, on an increase in static pressure in the duct system, modulate the closed dampers to gradually open to

relieve the air pressure back below the high set-point. When this occurs the zone dampers will stop.

INSTALLATION

The BPE24 can be mounted against flush surface and should be located within 10' of where the pressure sensor tube is placed in the duct. Ideally if mounted next to the zone control panel this will minimize the length of wires for the interconnection of the panels for the zone dampers.

It is recommended that the panel be mounted to a wall or return plenum and NOT on the furnace or plenum where it will be in contact with the high heating temperatures. The panel can be located in an attic space or in an enclosed cabinet of a rooftop unit, provided the panel is enclosed and not in direct exposure to the elements.

The cover easily removes from the case by pulling firmly and separating the cover from the case exposing the circuit

board. There are 4 key-hole mounting points in each corner of the case. The case has openings in the rear of the case as well as the side for all wiring. Wiring can come from the back as well as the side in order to make a neat installation.

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The BPE24 includes 10 feet of pressure tubing (which can be cut down to size).

OPERATION

The BPE24 controls up to 4 zones on a single HVAC unit. When the BPE24 gets a signal from the Zone Controller that a zone damper is to be powered open it immediately opens the corresponding zone damper(s) on the output terminals. Anytime the BPE24's pressure sensor detects the pressure in the supply plenum is higher than the Upper Limit Set Point it will modulate the closed zone dampers open to relieve the excess pressure into those zones. As these dampers modulate open the air pressure should drop below the high set-point and the zone dampers stop. When the BPE24's pressure sensor is below than the Lower Limit Set Point it will close the zone dampers. Once the pressure has equalized to higher than the Lower Limit set point and lower than the Upper Limit set point the BPE24 will signal the dampers to stay in their current position.

IMPORTANT: When the dampers are being modulated or signaled to stop the LEDs on the zone dampers may not be illuminated. This is completely normal and the LEDs will only illuminate when the damper is fully open (green) or fully closed (red).

Upper Limit

The Upper Limit is adjustable from 0.25"WC to 2"WC. This is the limit that once exceeded all dampers in the closed zones will begin to modulate open. To enter the Upper Limit menu from the main status display press SW1 and using SW1 and SW2 you can raise or lower the Upper Limit. Once you have finished setting the upper limit the menu will automatically exit after 5 seconds back to the main screen.

Lower Limit

The Lower Limit is adjustable from 0.15"WC to 1.90"WC. This is the limit that once the pressure drops below it all dampers in the closed off zones will begin to modulate closed. To enter the Lower Limit menu from the main status display press SW2 and using SW1 and SW2 you can raise or lower the Lower Limit. Once you have finished setting the lower limit the menu will automatically exit after 5 seconds back to the main screen.

Dead Band

There is a minimum 0.10"WC dead band between the upper and lower limits that insures there is a sufficient

pressure range that can be maintained for the dampers to modulate properly without constantly opening and closing to maintain pressure.

Sensor Calibration

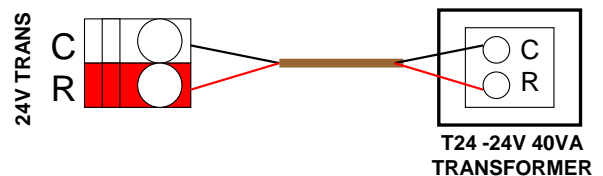
The pressure sensor is factory calibrated but due to the differences in elevation it may be a good idea to calibrate the pressure sensor in the location it is installed. The important thing to note is that if the sensor is calibrated with the HVAC unit running or in a windy environment it can lead to a bad calibration measurement.

To calibrate the pressure sensor press and hold both SW1 and SW2 if the unit does not immediately show the "Calibrating Please Wait" try pressing the upper button first then the lower button while still holding the top button. As soon as the calibration message appears release the buttons and calibration only takes approximately 6 seconds from there.

Display

The LCD Display will display the status of the zones OP (open), CL (closed), or a number from 01 to 99 to indicate what percent the zones that were in the closed position were modulated open in order to relieve the excess air from the ductwork. If a zone is available for modulation that means that the Zone control board is sending a close signal to the BPE24. In the upper right hand corner the display will read P in with the pressure reading being displayed just below it.

Transformer – A 24 Volt AC, 40VA Transformer is recommended to power the BPE24 and can be the same transformer powering the zone control panel.



PRESSURE SENSOR

The BPE24 pressure sensor is a very sensitive device, never blow into the sensor with your mouth as the amount of pressure that the human body can produce far exceeds the limitations of the sensor and it can be damaged that way. If there is a need to test the sensor simply fold the pressure tube on itself and squeeze as this will create a gentler pressure increase on the sensor

TROUBLESHOOTING

The BPE24 is a very simple control to troubleshoot, especially with the LCD Display. The only other device needed is a simple Volt/Ohm meter.

Almost all problems can be traced to an external component or wiring to the BPE24. While the BPE24 has been designed to operate under extreme voltage conditions and is fuse protected, like any computer the micro-processor can hang up and not operate properly.

Turn off the power to the panel for several seconds until the LCD goes out, and then turn the power back on to see if the panel resets. In many instances this resolves the problem.

The first check is for 24VAC Power to the panel. When there is power the LCD will be lit. If not check the transformer and the power supply to it.

Zone(s) Not Closing

If a zone is not closing and there is an active HVAC call it may be that there is an excessive amount of air being bypassed into the zone. End all HVAC calls and using the damper test button on the Main Controller you can check to see if the dampers are properly cycling.

Damper Motor Checkout Procedure

To check out the dampers, the panel supplies 24VAC to the COM and OPEN when the damper is to be open and 24VAC to COM and CLOSE when the damper is to be CLOSED. When any zone is calling and its Green LED is ON, there is 24VAC across COM and OPEN. The only time

a damper will close is when another zone is calling and its zone is not calling. In this instance there will be 24VAC between COM and CLOSE.



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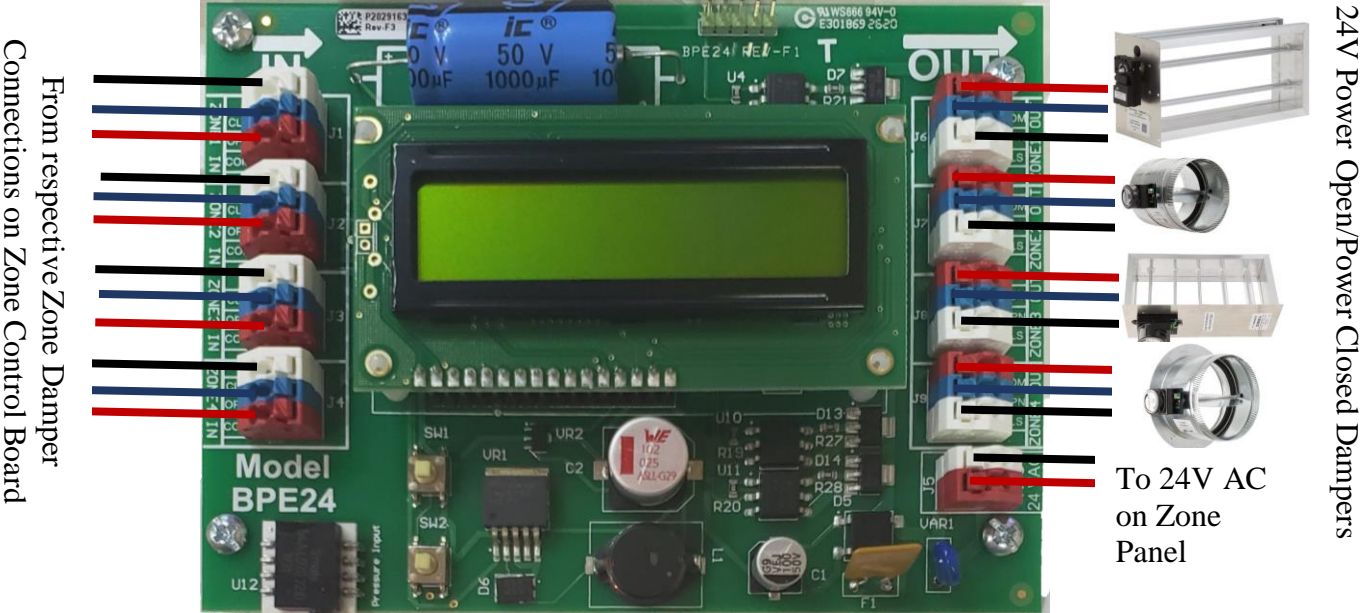
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Bypass Eliminator 24™ Wiring Diagram



NOTE: If there is a Specific zone that should not be used to relieve air, wire zone damper directly to zone panel.