#38592 – 1/9/19

Overview

The Zone Pressure Multi-Sensor (Part #NSB-ZPM-SR-ST-D) is the most flexible pressure sensor on the market. Output, range, units, directionality, and response time are quickly set in the field with no tools, no power, and no small components.

The LCD display helps with troubleshooting because it displays the actual differential pressure over the entire operational range regardless of which pressure range is selected for output to the system controller. Three LEDs on the face of the unit indicate when the pressure is “Out of Range Low”, “In Range”, or “Out of Range High”.

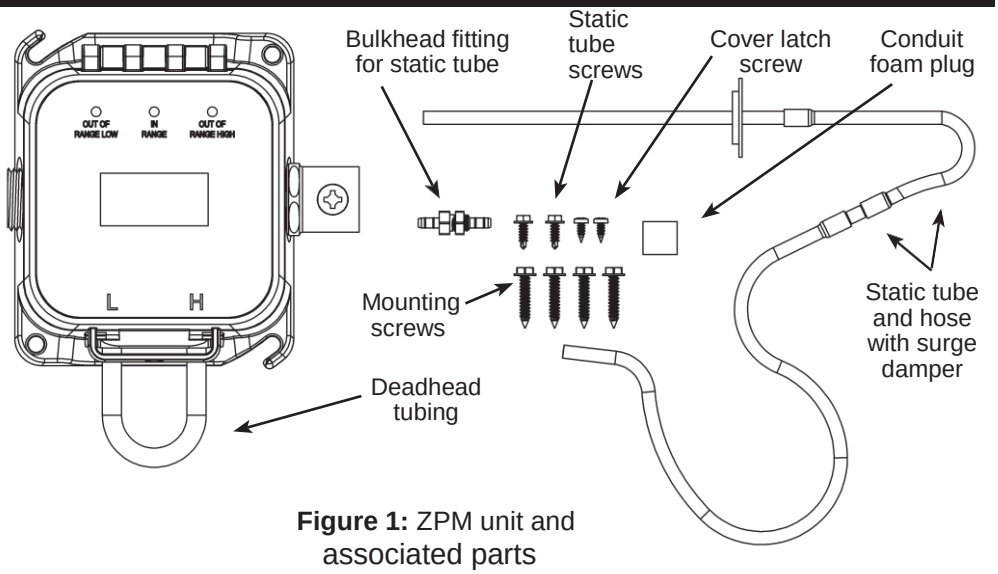


Figure 1: ZPM unit and associated parts

Specifications

Power:
7 to 40 VDC for 4 to 20 mA Output
7 to 40 VDC or 18 to 32 VAC for 0 to 5 or 1 to 5 V Output
13 to 40 VDC or 18 to 32 VAC for 0 to 10 or 2 to 10 V Output

Power Consumption:
20 mA max, DC only at 4 to 20 mA Output
4.9 mA max DC at 0 to 5 VDC or 0 to 10 VDC Output
0.12 VA max AC at 0 to 5 VDC or 0 to 10 VDC Output

Load Resistance:
4 to 20 mA Output 850 Ω Maximum @ 24 VDC
0 to 5 V or 0 to 10 V output 6K to 10KΩ minimum

Accuracy for Standard Pressure Ranges at 72°F:
±0.25% of range

Stability: ±0.25% F.S. per year

Port Size: 1/4” tubing (1/8” to 3/16” I.D.)

Environmental Operating Range: -4 to 140°F (-20 to 60°C)

Storage Temperature: -40 to 203°F (-40 to 95°C)

Temperature Error Standard Range:
0.01% FS/°F (0.02% FS/°C)
(±1.0” W.C @-4 to 140ºF (-20 to 60°C)

Overpressure:
Proof: 300.1 WC (10.83 PSI)
Burst: 512.6 WC (18.5 PSI)

Wiring:
2 wires (4 to 20mA Current loop)*
3 wires (AC or DC powered, Voltage out)*

Humidity: 0 to 95% RH, non-condensing

Port Size: 1/4” tubing (1/8” to 3/16” I.D.)

Encl. Material: UV-resistant Polycarb., UL94, V-0

Enclosure Rating: IP44, NEMA 2

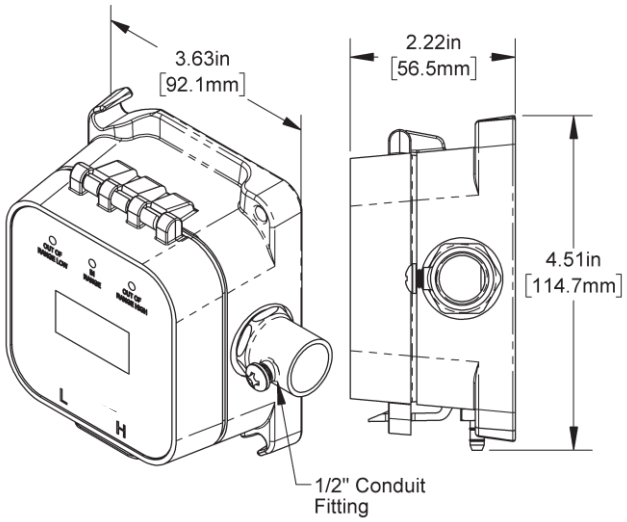


Figure 2: ZPM Dimensions

Selectable Standard Ranges

Inches WC	Pascals
0 to 1.00	0 to 250
0 to 2.00	0 to 300
0 to 2.50	0 to 500
0 to 3.00	0 to 1,000
0 to 5.00	0 to 1,250
-1.00 to 1.00	-250 to 250
-2.00 to 2.00	-300 to 300
-2.50 to 2.50	-500 to 500
-3.00 to 3.00	-1,000 to 1,000
-5.00 to 5.00	-1,250 to 1,250

Specifications subject to change without notice.

#38592 – 1/9/19

Switch Setup - Outputs, Ranges, Units/Response

Do not have power applied to unit when changing settings. After changing settings, apply power and Auto-Zero the unit in its orientation of operation.

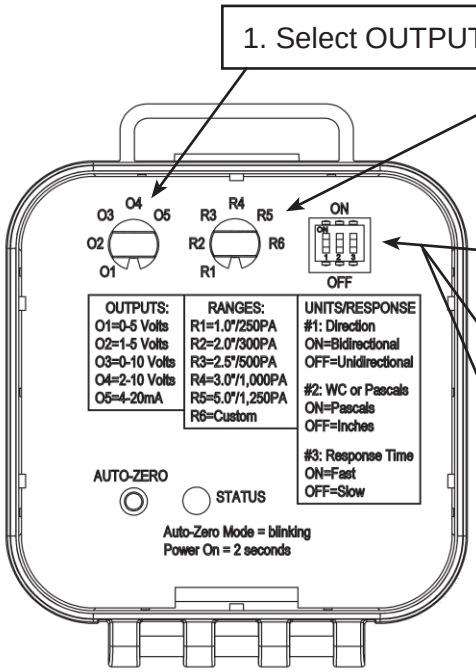


Figure 2: Setup Switches for Standard Range Units

1. Select OUTPUT

2. Select RANGE
   If unit is ordered with a Custom Range, then the switch must be set to R6.

3. Choose DIRECTION
   Bidirectional is a plus/minus range so choosing 5" range is -5" to +5" Bidirectional and 0" to +5" Unidirectional

4. Choose UNITS - Inches WC or PASCALS

5. Choose RESPONSE TIME
   Fast Response = 1/2 second
   Slow Response = 4 seconds

6. Mount, Terminate and Auto-Zero the unit as described in later sections. Attach the deadhead tubing to the ports during Auto-Zeroing

Mounting

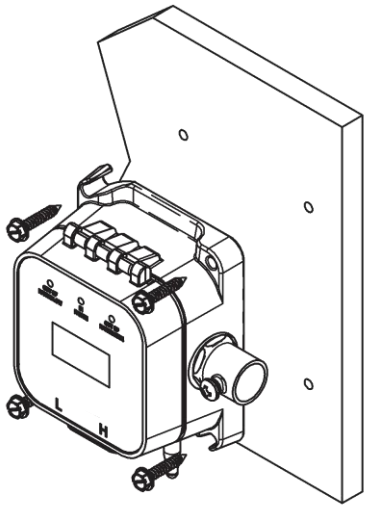
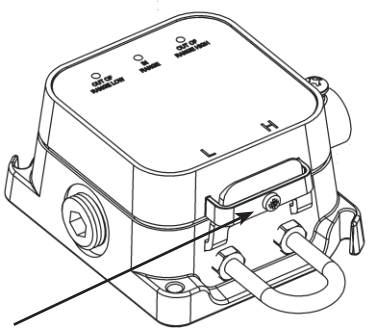


Figure 3: ZPM Mounting

Attach the unit to its mounting surface with four self-tapping #10x3/4” sheet metal screws through the holes in the mounting feet. The preferred mounting orientation is with the pressure ports facing down.

Remove the deadhead tubing and push the system tubing onto the port nipple without creating any kinks or holes.



A locking screw can be inserted into the hole in the cover latch to prevent unintentional cover openings.

Figure 4: Cover Latch Screw

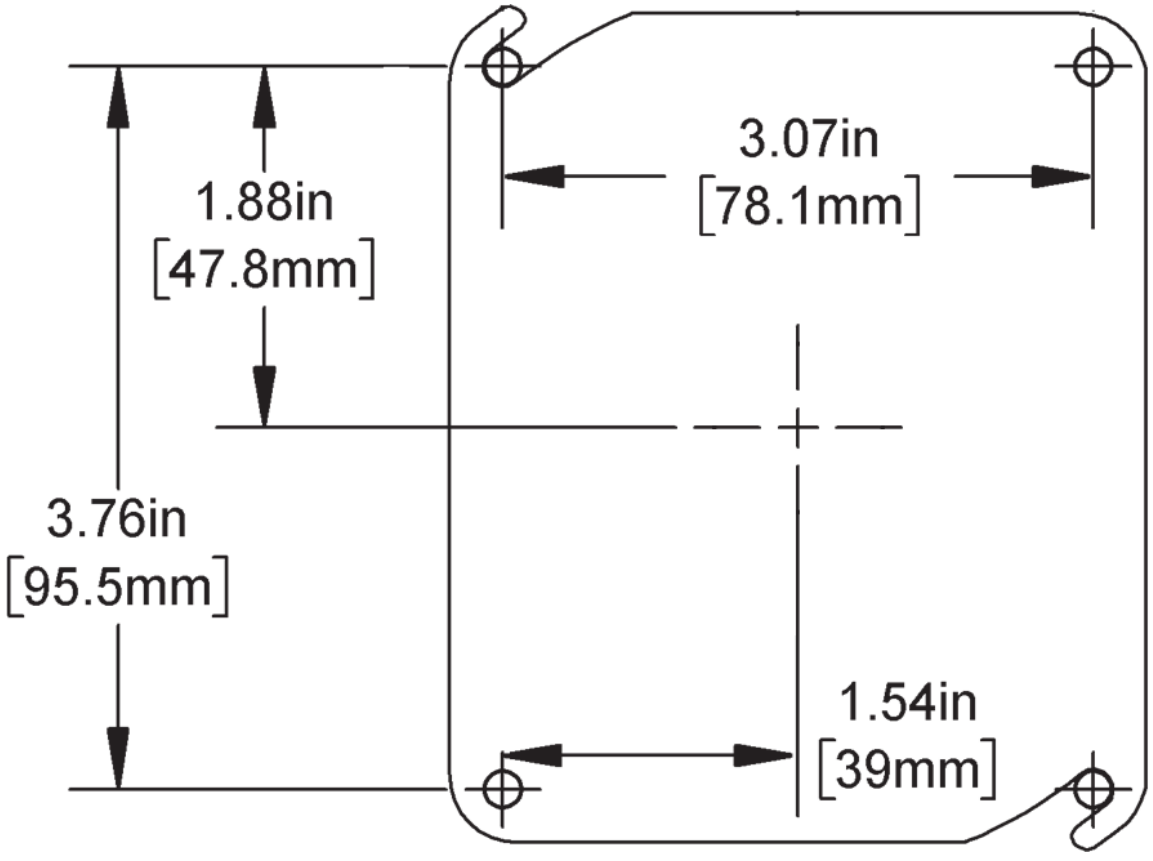


Figure 5: Mounting Hole Template - shown actual size

(Automated Logic® recommends creating 5/32” pilot holes for the #10x3/4” self-tapping mounting screws.)

Output Termination

Automated Logic® recommends wiring the product with power disconnected. Proper supply voltage, polarity and wiring connections are important to a successful installation. Not observing these recommendations may damage the product and void the warranty.

To ensure that all wires are properly terminated, twist the stripped ends of each wire together before inserting into the terminals. Gently tug on the wire after inserting into the terminal to verify a good connection.

Table 1: ZPM Termination

Output Signal	PWR Terminal	GND/4-20 Terminal	Vout Terminal
4 to 20 mA	7 to 40 VDC	4 to 20 mA Signal To Controller Analog Input	Not Used
0 to 5 or 1 to 5 VDC	7 to 40 VDC or 18 to 32 VAC	To Controller Ground	VDC Signal To Controller Analog Input
0 to 10 or 2 to 10 VDC	13 to 40 VDC or 18 to 32 VAC	To Controller Ground	VDC Signal To Controller Analog Input

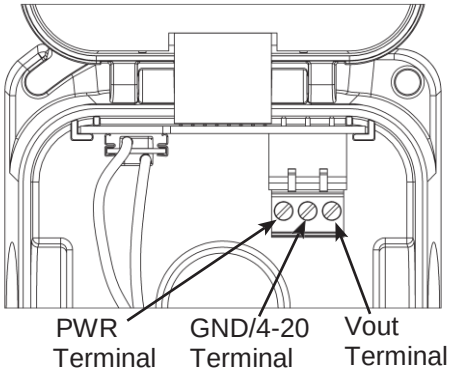


Figure 6: ZPM Wiring Terminals

Auto-Zero Operation

Auto-Zeroing must be done after the initial setup and after any changing of settings.

1. Make sure power is applied
2. Deadhead ports
4. Press the Auto-Zero button for 2 seconds (LED blinks)
5. Remove deadhead after LED stops blinking
6. Attach system tubing

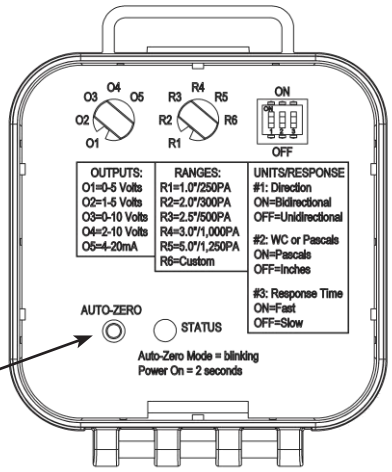


Figure 7: Auto-Zero Button

Status LED Operation

LED Off: No power is applied or the unit is in 4 to 20 mA Mode

LED On: LED is on when power is applied and voltage output is selected. When 4 to 20 mA output is selected, the light is on for 2 seconds at power up then goes off.

LED Blinking Fast: Auto-Zero or Error Mode

LED Blinking Slow: The pressure measurement is above or below the selected pressure range. Note: When the reading is above or below the selected pressure range, the LCD on the face of the unit will alternate between showing the actual reading and showing “err”.

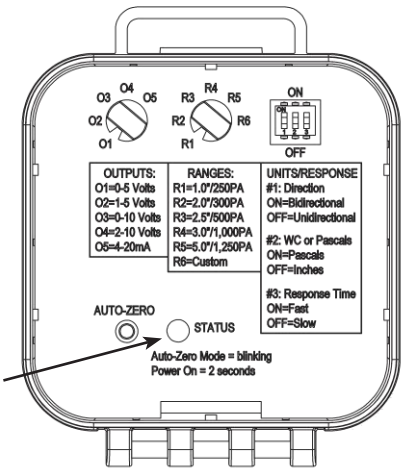


Figure 8: Status LED on the inside of the cover

Specifications subject to change without notice.

Typical Applications

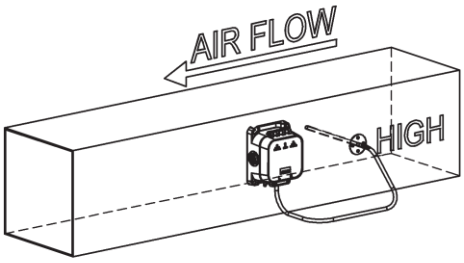


Figure 9: Duct Static Pressure Monitoring (ZPM Pressure Sensor mounted on the duct with a Static Pressure Probe in the duct.)

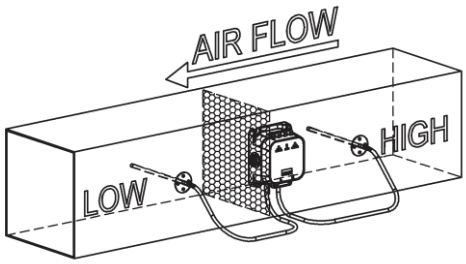


Figure 10: Air Filter Pressure Drop Monitoring (ZPM Pressure Sensor mounted on the duct with a Static Pressure Probe on either side of the filter in a duct.)

NOTE: Best practice is to form a drip loop in the tubing to prevent condensation from reaching the ZPM.

Troubleshooting

POSSIBLE PROBLEMS:	**POSSIBLE SOLUTIONS:**
LED does not light	- Check power connections for proper power
LED is blinking fast (1/2 second on, 1/2 second off)	- The unit may be performing an auto-zero. Wait 10 seconds and check again. - Sensor is in an Error Mode. Cycle power.
Display is alternating between a number and “err”	- The measurement is out of selected range.
Output stuck (high or low)	- Remove pressure from ports and perform auto-zero procedure
Output not tracking pressure properly	- Check rotary switch for proper pressure range selection - Check rotary switch for proper output range selection