BA/ZPM-LR-NT-D-BB Low Range ZPM – Zone Pressure Sensor in a BAPI-Box Enclosure Instruction Manual

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Product Information

Low Range ZPM – Zone Pressure Sensor

BAPI's ZPM is a zone pressure sensor designed for easy field installation. It comes in a BAPI-Box enclosure with an optional LCD display that helps with troubleshooting. The sensor has three LEDs that indicate whether the pressure is out of range low, in range or out of range high for the selected range. The sensor has customizable outputs, ranges, units, directionality, and response time that can be set in the field without powering the unit. The ZPM is available in a bidirectional plus/minus range or a unidirectional 0 to +1 range. The pressure units can be set to inches WC or Pascals, and the response time can be set to fast or slow.

The mounting orientation of the sensor should be with the pressure ports facing down. The sensor should be attached to its mounting surface with four self-tapping #10×3/4 sheet metal screws through the holes in the mounting feet. After Auto-Zeroing, the deadhead tubing should be removed, and the system tubing should be pushed onto the port nipple without creating any kinks or holes. The two cover latch screws must be installed to achieve an IP66 rating.

Product Usage Instructions

1. Select the desired output from the switch.
2. Select the desired range from the switch. If the unit is ordered with a Custom Range, then set the switch to R6.
3. Choose the desired directionality. If bidirectional, select a plus/minus range (-1 to +1). If unidirectional, select 0 to +1.
4. Select inches WC or Pascals as the pressure units from the switch.
5. Select fast or slow response time from the switch.
6. Mount the sensor on its surface with the four self-tapping screws and ensure that the pressure ports face down.
7. Install the two cover latch screws to achieve an IP66 rating.
8. After Auto-Zeroing, remove the deadhead tubing and push the system tubing onto the port nipple without creating any kinks or holes.
9. Terminate the wiring by twisting the stripped ends of each wire together before inserting them into the terminals. Gently tug on the wires after inserting them to verify a good connection.

Note: *Always follow the Auto-Zero procedure after changing settings.*

Identification and Overview

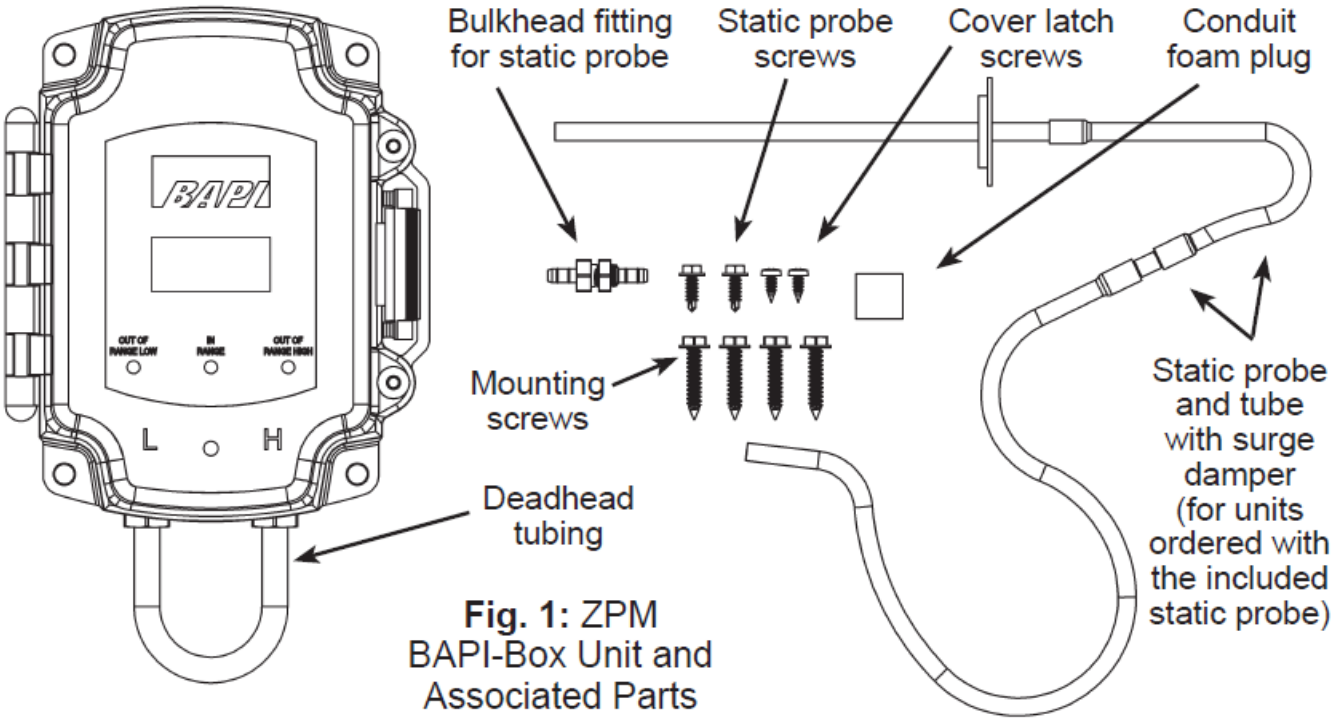

Fig. 1: ZPM BAPI-Box Unit and Associated Parts

BAPI's ZPM is designed for quick and easy field installation. The outputs, ranges, units, directionality, and response time are all easily set in the field without powering the unit. The optional LCD display helps with troubleshooting because it displays the actual pressure regardless of the selected pressure range. Three LEDs on the face of the unit indicate when the pressure is "Out of Range Low", "In Range" or "Out of Range High" for the selected range. The appropriate LED will flash when out of range.

Switch Setup – Outputs, Ranges, Units/Response

NOTE! Always follow the Auto-Zero procedure after changing settings.

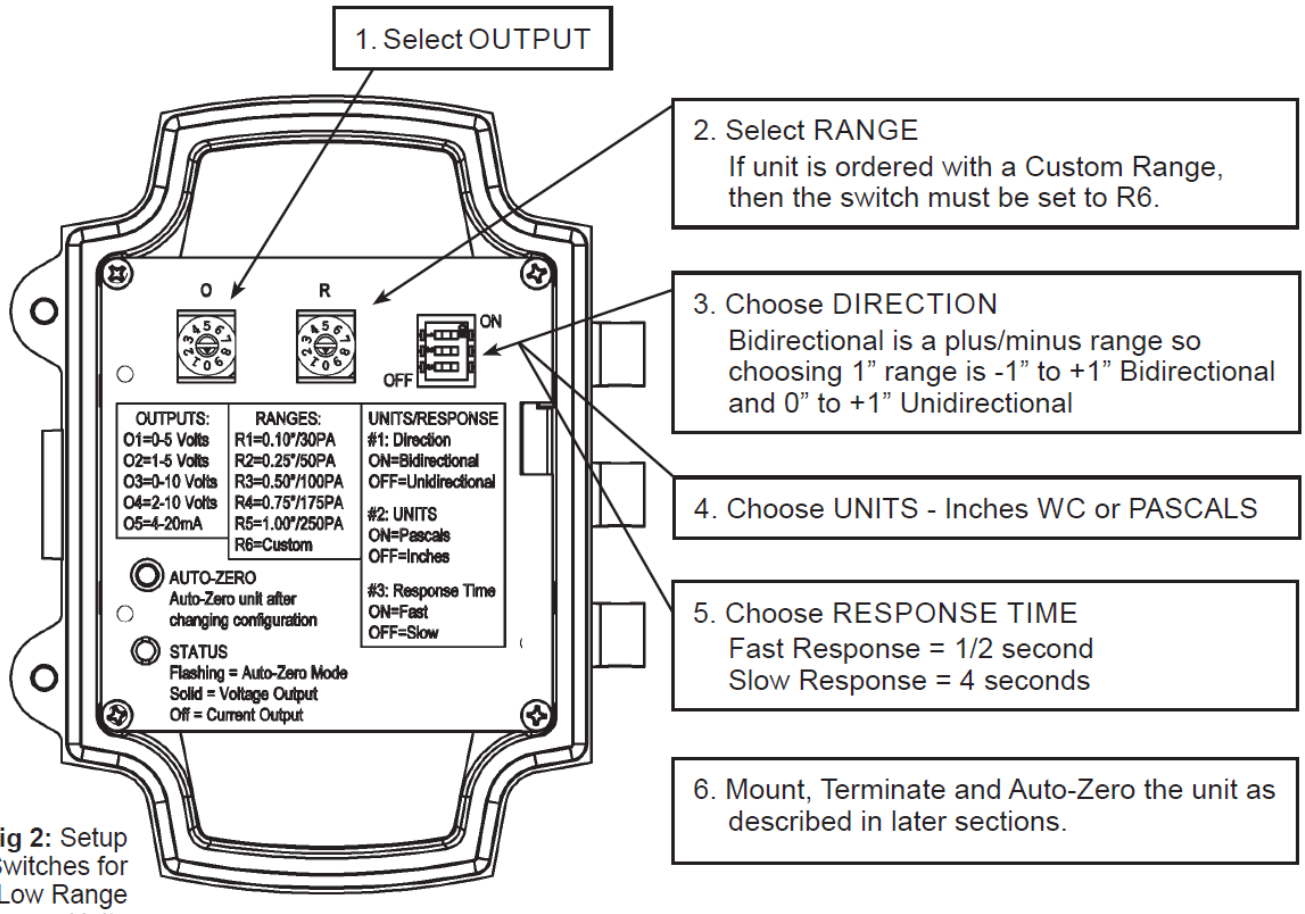

Fig 2: Setup Switches for Low Range Units

Mounting

Attach the unit to its mounting surface with the four self-tapping #10×3/4" sheet metal screws through the holes in the mounting feet. The preferred mounting orientation is with the pressure ports facing down. The two cover latch screws must be installed to achieve IP66 rating. After Auto-Zeroing, remove the deadhead tubing and push the system tubing onto the port nipple without creating any kinks or holes. See page 3 for an actual size mounting template for the unit.

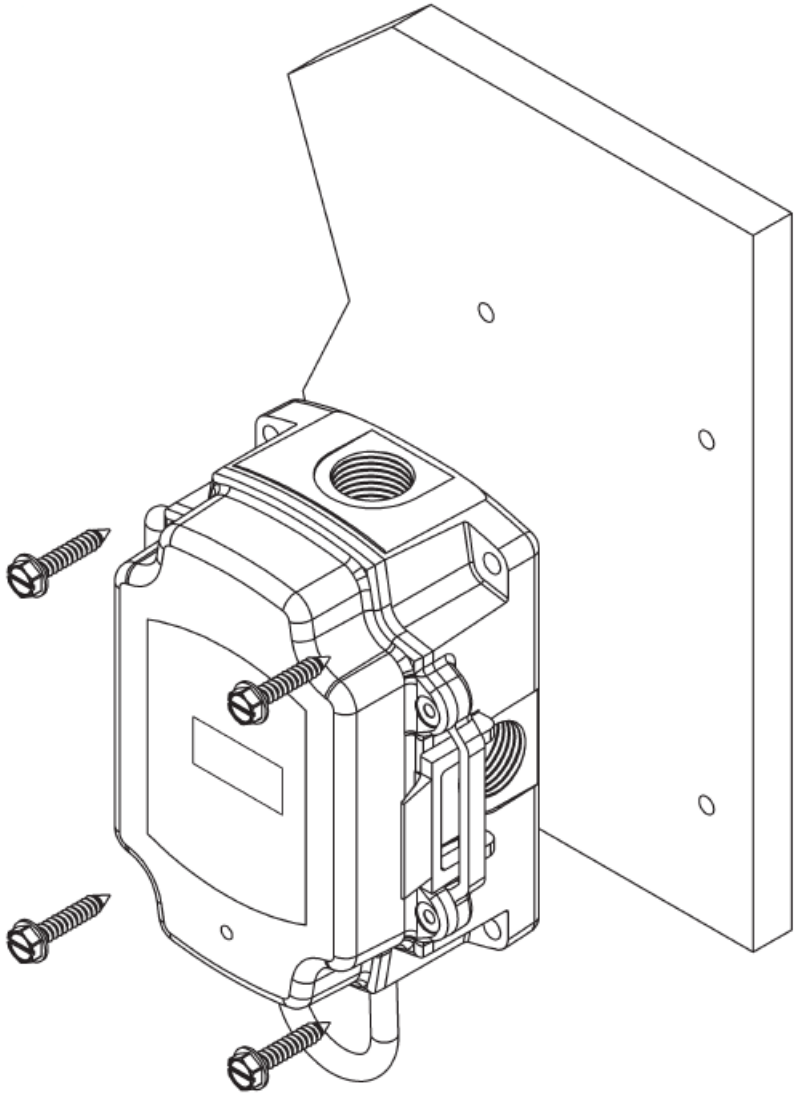

Fig. 3: ZPM BAPI-Box Mounting (for units without Attached Tube option)

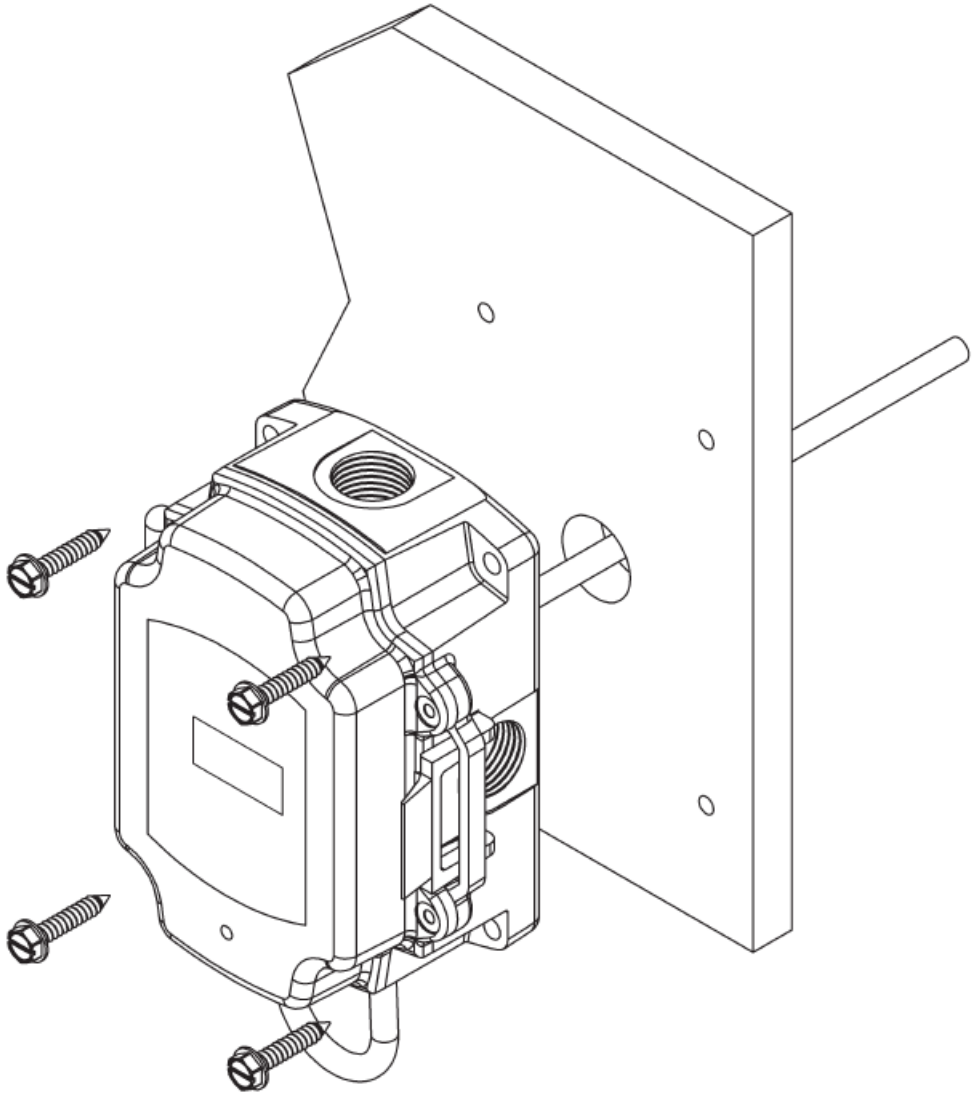

Fig. 4: ZPM BAPI-Box Mounting (for units with Attached Tube option)

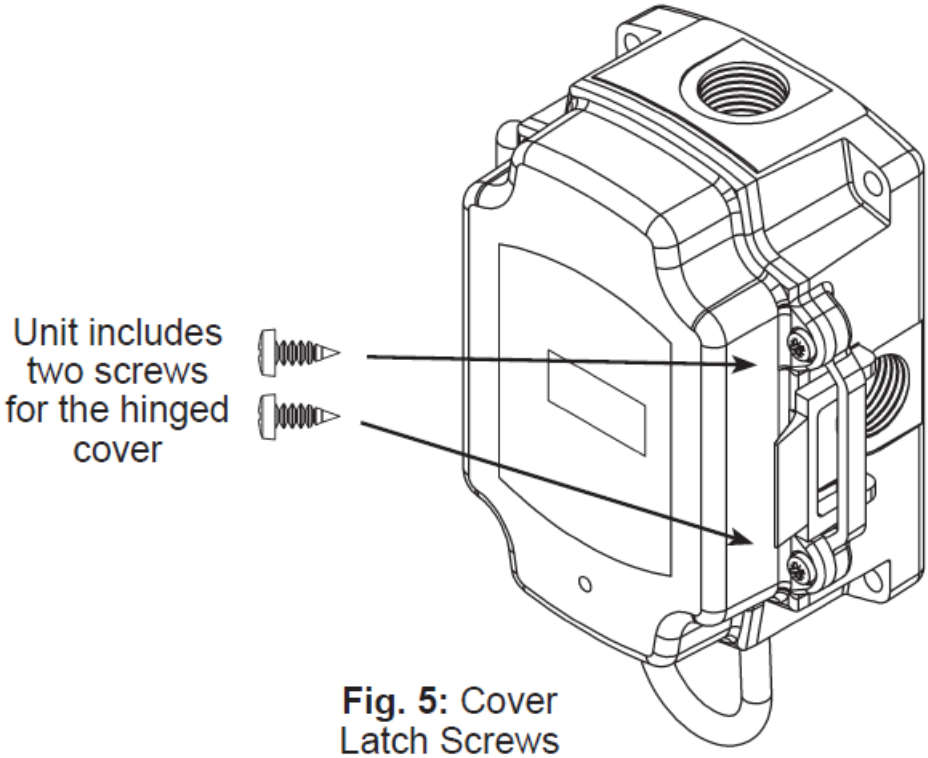

Fig. 5: Cover Latch Screws

Mounting Template

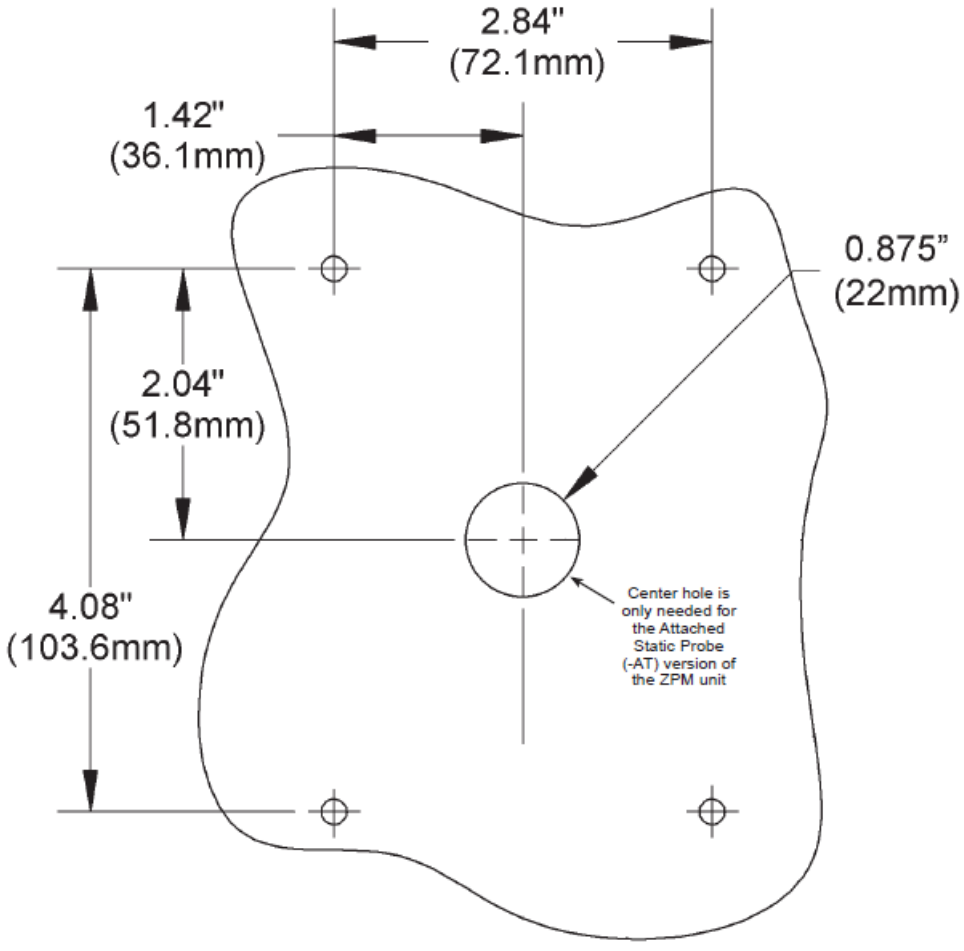

Fig. 6:
Mounting Hole Template - shown actual size
(BAPI recommends creating 5/32" (4mm) pilot holes for the #10x3/4" self-tapping mounting screws.)

Output Termination
BAPI 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.

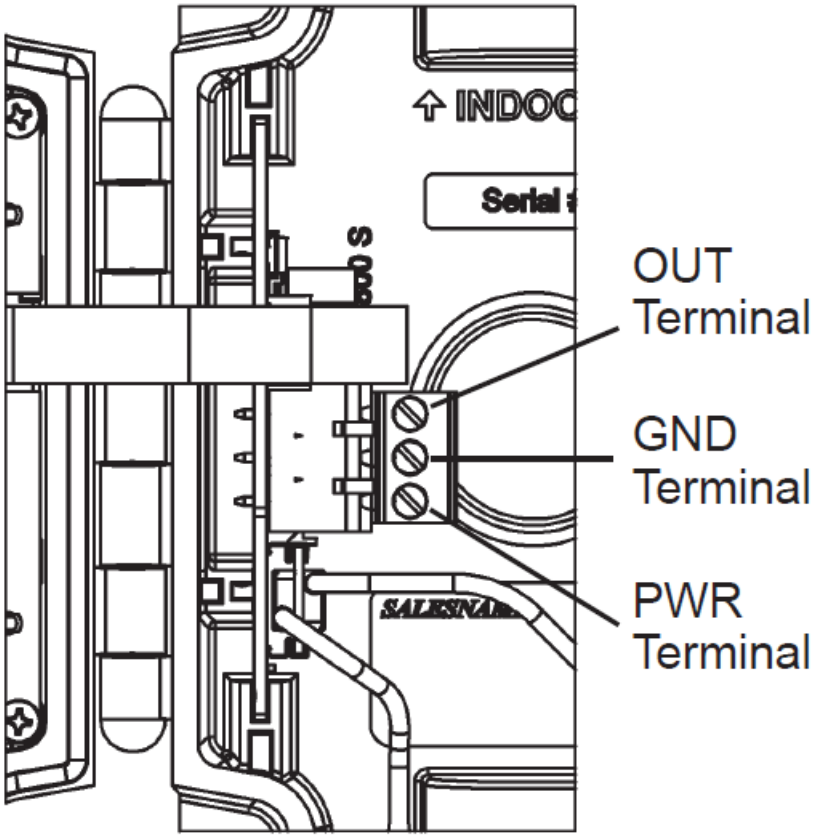

Fig. 7: ZPM Wiring Terminals

Table 1: ZPM Termination			
Output Signal	**PWR Terminal**	**GND Terminal**	**OUT Terminal**
4 to 20 mA	7 to 40 VDC	4 to 20 mA Signal To Con troller Analog Input	Not Used
0 to 5 or 1 to 5 VDC	7 to 40 VDC or 18 to 3 2 VAC	To Controller Ground	VDC Signal To Controller A nalog Input
0 to 10 or 2 to 10 VDC	13 to 40 VDC / 18 to 3 2 VAC	To Controller Ground	VDC Signal To Controller A nalog Input

Auto-Zero and Status LED Operation

AUTO-ZERO OPERATION
Auto-Zeroing must be done after the initial setup, changing mounting orientation or changing any settings. For most applications, perform an auto-zero whenever it appears that the sensor has drifted. For critical applications, the unit should be zeroed 2-3 times a year.

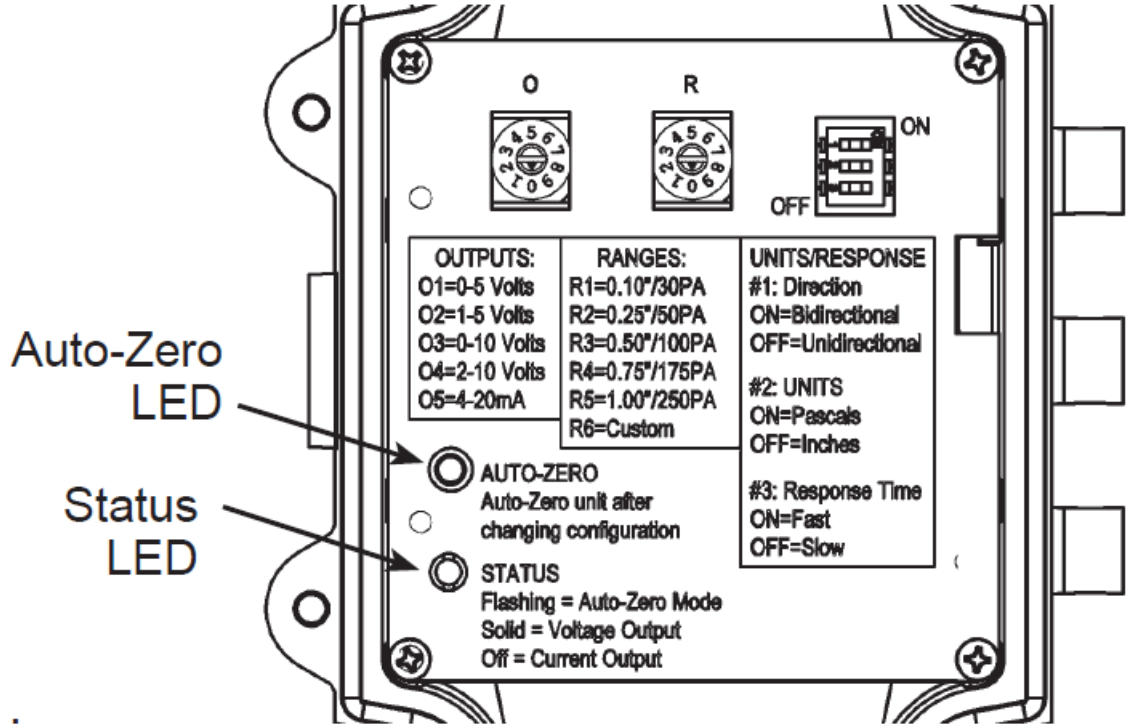

Fig 8: Auto-Zero and Status LEDs

1. Power must be on.
2. Detach system tubing and deadhead ports using the supplied tubing or other short length of tubing. Do not kink tubing.
3. Press and hold the Auto-Zero button for 1-2 seconds. The Status LED will stop flashing when completed.
4. Remove deadhead tubing and reattach system tubing.

AUTO-ZERO OPERATION (Units w/ Attached Tube)

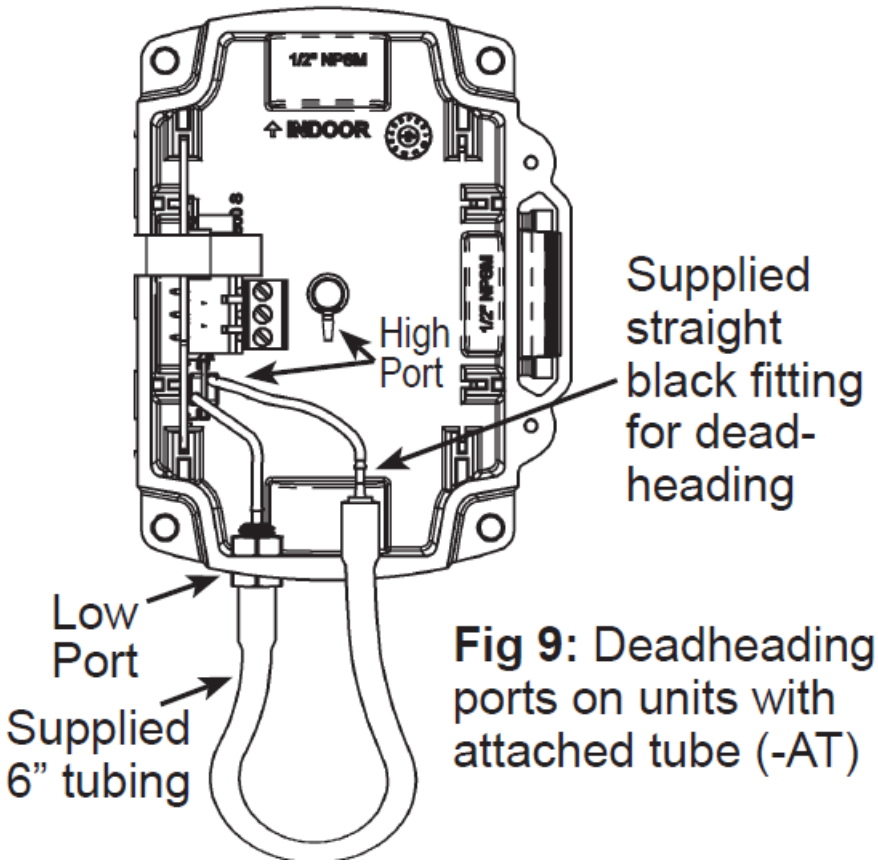

Fig 9: Deadheading ports on units with attached tube (-AT)

1. Power must be on.
2. Disconnect system tubing from the Low Pressure brass fitting and attach the supplied 6” deadhead tubing to the brass fitting.
3. Disconnect the short clear tubing from the 90° black Attached Tube fitting with your fingers (Fig. 9). A pliers may cut the tubing.
4. Connect the clear tubing to the supplied, straight black fitting on the 6” tubing (Fig. 9). Do not kink the tubing.
5. Press and hold the Auto-Zero button for 1-2 seconds. The Status LED will stop flashing when completed.
6. Disconnect the deadhead tubing and reattach the clear tubing and system tubing. Confirm that the clear tubing is pressed all of the way onto the fitting and that it is not kinked.

STATUS LED OPERATION

- **LED Off:** No power is applied or the unit is in 4 to 20 mA Mode
- **LED Solid (On):** LED is on when power is applied and a VDC 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 Flashing:** Auto-Zero. The LED will flash for about 20 seconds.

Typical Applications

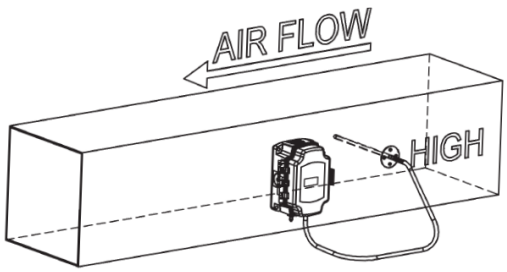

Fig. 10: Duct Static Pressure Monitoring
(ZPM Pressure Sensor mounted on the duct with a Static Pressure Probe in the duct.)

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

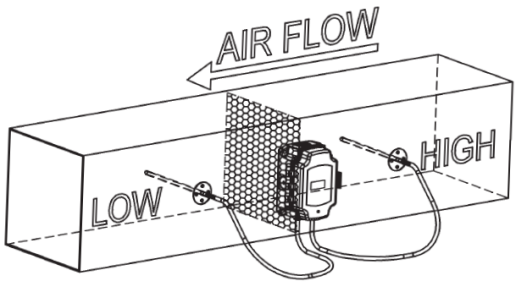

Fig. 11: Air Filter Pressure Drop Monitoring
(ZPM Pressure Sensor mounted on the duct with a Static Pressure Probe on either side of the filter in a duct.)

Diagnostics

POSSIBLE PROBLEMS:	**POSSIBLE SOLUTIONS:**
Status LED does not light	- Check power connections for proper power - Sensor is set to 4 to 20mA output
Status LED is flashing	- The unit is performing an auto-zero. Wait 20 seconds and check again.
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

Specifications

- **Power:**
  - 7 to 40 VDC (4 to 20 mA Output)
  - 7 to 40 VDC or 18 to 32 VAC (0 to 5 or 1 to 5 VDC Output)
  - 13 to 40 VDC or 18 to 32 VAC (0 to 10 or 2 to 10 VDC Output)
- **Power Consumption:**
  - 20 mA max, DC only at 4 to 20 mA Output
  - 5.2 mA max DC at 0 to 5 or 0 to 10 VDC Output
  - 0.12 VA max AC at 0 to 5 or 0 to 10 VDC Output
- **Load Resistance:**
  - 4 to 20 mA Output 850 Ω Maximum @ 24 VDC
  - 0 to 5 or 0 to 10 VDC Output 6KΩ Minimum
- **Accuracy:** ±0.25% FS at 72°F (22°C) for All Units
  - **Low Range:** Proof 270” WC (67 kPa)
- **Stability:** ±0.25% FS per year
- **Overpressure:** Proof 270” WC (67 kPa)
- **Media:** Clean, dry, non-corrosive gases
- **Compensated Temperature Range:** 32 to 122°F (0 to 50°C)
- **Environmental Operating Range:** -4 to 140°F (-20 to 60°C)
- **Storage Temperature:** -40 to 185°F (-40 to 85°C)
- **Humidity:** 0 to 95% RH, non-condensing
- **Wiring:**
  - 2 wires (4 to 20mA Current loop)

- 3 wires (AC or DC powered, VDC output)

- **Port Size:** 1/4” barb
- **Enclosure Material:** UV-resistant Polycarbonate, UL94, V-0
- **Enclosure Rating:** IP66, NEMA 4
- **Agency:**
  CE EN 61326-1:2013 EMC (Industrial Electromagnetic Environment), UL, RoHS

Selectable Low Ranges

Inches WC	Pascals
0 to 0.10	0 to 30
0 to 0.25	0 to 50
0 to 0.50	0 to 100
0 to 0.75	0 to 175
0 to 1.00	0 to 250
-0.10 to 0.10	-30 to 30
-0.25 to 0.25	-50 to 50
-0.50 to 0.50	-100 to 100
-0.75 to 0.75	-175 to 175
-1.00 to 1.00	-250 to 250

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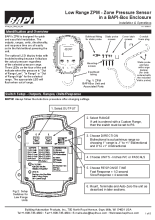
Documents / Resources

	BAPI BA/ZPM-LR-NT-D-BB Low Range ZPM - Zone Pressure Sensor in a BAPI-Box Enclosure [pdf] Instruction Manual BA ZPM-LR-NT-D-BB Low Range ZPM - Zone Pressure Sensor in a BAPI-Box Enclosure, ZPM - Zone Pressure Sensor in a BAPI-Box Enclosure, BAPI-Box Enclosure

References

- BAPI - Sensor Products for HVAC/R Duct and Room