

1 YEAR
WARRANTY

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PX5XX/PXM5XX and FMM/CFMM Pressure Transducer Families Hazardous Location Installation Guide



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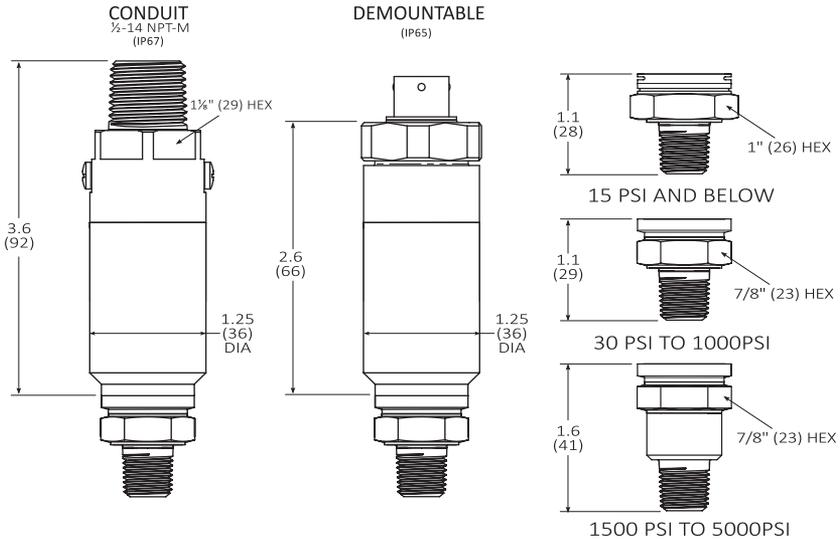
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1. GENERAL:

Misuse of product by exceeding specifications for pressure, temperature, & vibration or exposure to excessive pressure pulsation or corrosion can result in a failure possibly causing injury or damage.

Consult Omega Engineering Inc. before installing if there are any questions or concerns.

PX509 Typical Dimensions and Construction*



*Dimensions and details may vary depending on model specifications

2. OVERPRESSURE:

Pressure transients in excess of the rated overpressure capability of the transducer may cause irreversible electrical and/or mechanical damage to the pressure measuring and containing elements.

A sudden change in the fluid velocity within the pipe system can create what is called a **fluid hammer**; a fluid hammer is defined as an extreme and swift change in pressure. The usual cause of these fluid velocity changes is the rapid closing or opening of valves or sudden starting or stopping of pumps such as during a power failure. These pressure transients can destroy any pressure transducer.

The use of snubbers and/or surge vessels can protect the transducers from the damaging effects of fluid hammer and surges pressure transients.

Freezing of pressure media while in contact with the transducer can develop extreme pressure events. If situations are predicted where possible freezing can occur, be sure to mount transducer in vertical position with electrical termination upward and drain system before hard freezing occurs.

Some symptoms of overpressure damage are:

- Pressure transducer exhibits an output at zero pressure (large zero offset).
- Pressure transducer output remains constant regardless of pressure.
- In severe cases, there will be no output.

3. STATIC ELECTRICAL CHARGES:

Discharge of static electrical energy may damage any electrical device. Take these steps to avoid damage to the transducer:

- Operator/installer should follow the proper ESD (electrostatic discharge) protection procedures before handling the pressure transducer.
- Ground the body of the transducer **BEFORE** making any electrical connections
- When disconnecting, remove the ground **LAST!**

Note: *The shield and drain wire in the cable (if supplied) is not connected to the transducer body, and is not a suitable ground.*

4. HAZARDOUS AREA SPECIFIC GUIDELINES

- 1) Do not open unit when energized.
- 2) Do not disconnect equipment unless area is known to be non-hazardous.

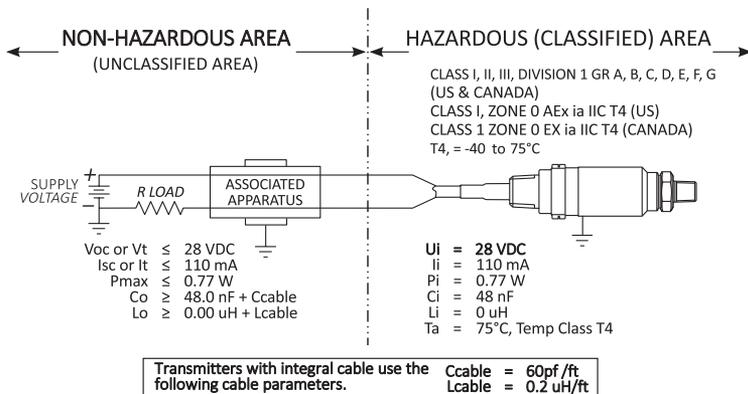
**5. FM Installation Guidelines: INTRINSICALLY SAFE
INSTALLATION FOR FM:**

**INTRINSICALLY SAFE CLASS I, II, III, DIVISION 1 GR A, B, C, D, E, F, G
CLASS I, ZONE 0 AEx ia IIC (US): CLASS I, ZONE 0 Ex ia IIC (CANADA)**

NOTES:

- 1) BARRIER MUST BE NRTL APPROVED AND INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
- 2) CLASS I, DIVISION 1, CLASS 1, ZONE 1 WIRING PRACTICES PERMITTED BY THE NEC (NFPA 70) AND CEC PART 1(C22.1).
- 3) MAXIMUM SAFE AREA VOLTAGE = 250 V.
- 4) INSTALL USING WIRE RATED AT LEAST 5 DEG C GREATER THAN MAXIMUM AMBIENT TEMPERATURE.
- 5) REFERENCE OMEGA Engineering DOCUMENT A031432.
- 6) SPECIAL CONDITION OF USE- The ingress protection of all customer connectors must match the requirements of the site where the transmitter is to be installed. If hose down cleaning is required the connector hardware must be rated IPx5; alternately, if dust protection is required, IP6x are required. Lower levels of ingress protection may cause a reduction in classification for the entire transmitter, and the customer's process control engineer must properly account for this.

The equipment may present a risk of electrostatic sparking. Cleaning should only be performed with a damp cloth.



**6. FM Installation Guidelines: NON-INCENDIVE
INSTALLATION FOR FM:**

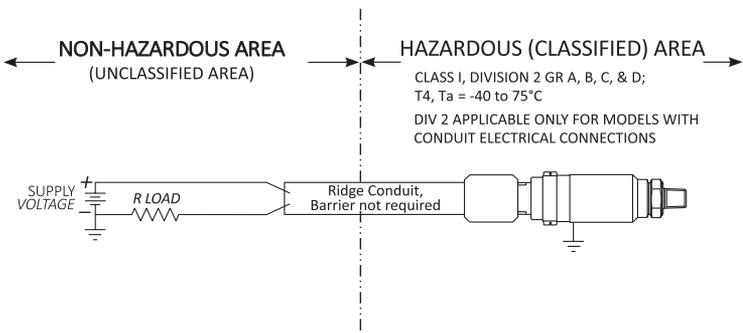
NON-INCENDIVE CLASS I DIVISION 2 GR A, B, C, D

Div 2 applicable only for models with conduit electrical connections.

NOTES:

- 1) RIGID CONDUIT, ASSOCIATED APPARATUS (BARRIER) IS NOT REQUIRED.
- 2) CLASS I, DIV 2, CLASS I, ZONE 2 WIRING PRACTICES PERMITTED BY THE NEC (NFPA 70) AND CEC PART 1 (C22.1).
- 3) REFERENCE OMEGA Engineering DOCUMENT A031432.

Associated apparatus and non-incendive associated field wiring apparatus parameters	Conditions that must be satisfied	Intrinsically safe and non-incendive field wiring apparatus parameters
V_{oc} or U_o	\leq	V_{MAX} or U_i
I_{sc} or I_o	\leq	I_{MAX} or I_i
P_o	\leq	P_i
C_a or C_o	\geq	C_i
L_a or L_o	\geq	L_i
L_A/R_A or L_o/R_o	\geq	L_i/R_L



7. Installation

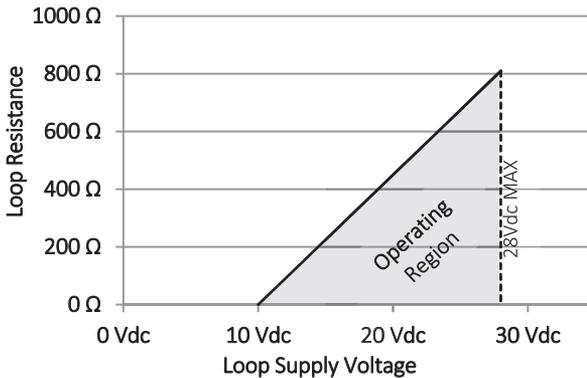
When installing the transducer, tighten by applying wrench to the hex flats located just above the pressure fitting. DO NOT tighten by using a pipe wrench on the housing. NPT pressure fittings require Teflon® tape or an equivalent sealant applied to the threads before installing.

For best results, it is good practice to mount the transducer where there is minimum vibration. To reduce noise susceptibility, avoid running the transducer's cable in conduit that contains high current AC power cables, and avoid routing cable near inductive equipment if possible.

For transducers with cable terminations, connect the drain wire to the ground terminal on the read out device or measuring instrument. If that is not an option connect the drain wire to the ground or negative terminal of the power supply.

8. Power Supply

Loop Supply Voltage vs. Loop Resistance

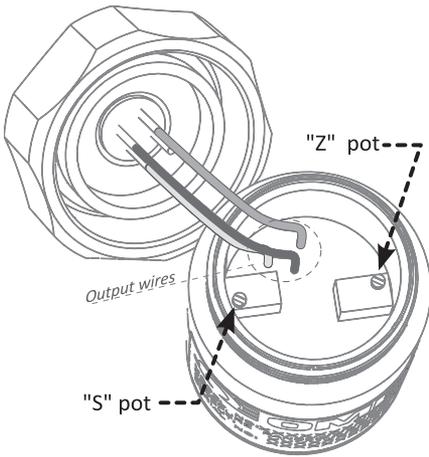


$$\begin{aligned} V_{min} &= 10V_{dc} + (.022A \times RL) \text{ (includes a 10\% safety factor)} \\ RL &= RS + RW \\ RL &= \text{Loop Resistance (ohms)} \\ RS &= \text{Sense Resistance (ohms)} \\ RW &= \text{Wire Resistance (ohms)} \end{aligned}$$

9. Zero and Span Adjustment

Instructions below apply to the particular configurations noted. While zero adjustment is not normally necessary, it may be desirable to trim out any offset in the system.

Using a small trim pot tool, you can adjust zero $\pm 10\%$ of full scale and span $\pm 10\%$ of full scale.

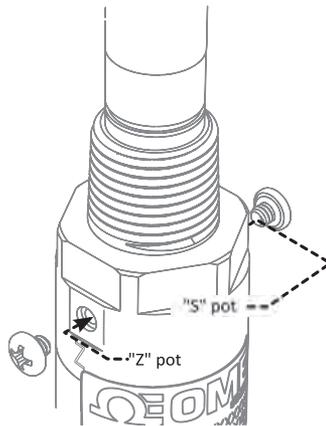


For Demountable Backend Transmitters:

Access to "Z" and "S" pots is via the top (electrical termination end) of the unit. To gain access to the pots, remove the black threaded cap. With the output wiring away from you, the "Z" (Zero Trim) pot will be to the right and the "S" (Span Trim) pot will be to the left.

For Welded body and Conduit Transmitters (with pots):

O-ring sealed screws on the side of the body protect the trim pots. A stamped "Z" or "S" indicates the identity of the trim pot. To gain access a trim pot, remove the screw on the side of the body.



10. Recalibration Instructions:

Proper calibration requires a pressure standard three to five times more accurate than the accuracy of the transducer.

1. Apply 0% full-scale pressure.
2. Adjust the output using the zero adjustment trim pot.
3. Apply 100% full-scale pressure.
4. Adjust the output using the span adjustment trim pot.
5. Repeat steps 1 through 4 as necessary.

HAZARDOUS AREA CERTIFICATIONS

Intrinsically Safe (applies to 4-20mA) FM:

Intrinsic Safety: Class I, II and III Div.1, Groups A, B, C, D, E, F, G T4

Class I, Zone 0 AEx ia IIC

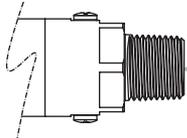
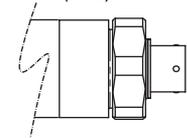
Class I, Zone 0 Ex ia IIC (Canada)

per entity requirements see Omega Engineering drawing # A031432.

Non-Incendive: Class I, Div 2, Groups A, B, C, D

Div 2 applicable only for models with conduit electrical connections, no barriers needed per Omega Engineering drawing # A031432

11. Output Wiring Codes

	PART NUMBER CODE	ELECTRICAL TERMINATION DESCRIPTION
CONDUIT (IP67) 	09C	CABLE BLACK: SUPPLY(-) WHITE: CUT GREEN: CASE RED: SUPPLY(+) .7 (19)
	09CW	SUBMERSIBLE CABLE BLACK: SUPPLY(-) WHITE: CUT GREEN: CASE RED: SUPPLY(+) 1.9 (48)
DEMOUNTABLE (IP65) 	09	CABLE BLACK: SUPPLY(-) WHITE: CUT GREEN: CASE RED: SUPPLY(+) .6 (15)
	19	MINI-DIN, DIN 43650-C PIN 2: SUPPLY(-) PIN 3: NC PIN 1: SUPPLY(+) PIN 4: CASE .4 (10)
	29	BENDIX, SHELL SIZE 8 PIN F: NC PIN E: CASE PIN D: NC PIN A: SUPPLY(+) PIN B: SUPPLY(-) PIN C: NC .5 (13)
	39	LARGE-DIN, DIN 43650-A PIN 2: SUPPLY(-) PIN 3: NC PIN 1: SUPPLY(+) PIN 4: CASE .5 (12)
	49	GLASS TO METAL SEAL PINS SHORT PINS PIN 1: SUPPLY(+) PIN 2: SUPPLY(-) PIN 3: NC PIN 4: CASE .2 (6)
	59	M12 KEY PIN 2: SUPPLY(-) PIN 3: NC PIN 1: SUPPLY(+) PIN 4: CASE .4 (10)

WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **13 months** from date of purchase. OMEGA's WARRANTY adds an additional one (1) month grace period to the normal **one (1) year product warranty** to cover handling and shipping time. This ensures that OMEGA's customers receive maximum coverage on each product.

If the unit malfunctions, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective, it will be repaired or replaced at no charge. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of having been damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components in which wear is not warranted, include but are not limited to contact points, fuses, and triacs.

OMEGA is pleased to offer suggestions on the use of its various products. However, OMEGA neither assumes responsibility for any omissions or errors nor assumes liability for any damages that result from the use of its products in accordance with information provided by OMEGA, either verbal or written. OMEGA warrants only that the parts manufactured by the company will be as specified and free of defects. OMEGA MAKES NO OTHER WARRANTIES OR REPRESENTATIONS OF ANY KIND WHATSOEVER, EXPRESSED OR IMPLIED, EXCEPT THAT OF TITLE, AND ALL IMPLIED WARRANTIES INCLUDING ANY WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED. LIMITATION OF LIABILITY: The remedies of purchaser set forth herein are exclusive, and the total liability of OMEGA with respect to this order, whether based on contract, warranty, negligence, indemnification, strict liability or otherwise, shall not exceed the purchase price of the component upon which liability is based. In no event shall OMEGA be liable for consequential, incidental or special damages.

CONDITIONS: Equipment sold by OMEGA is not intended to be used, nor shall it be used: (1) as a "Basic Component" under 10 CFR 21 (NRC), used in or with any nuclear installation or activity; or (2) in medical applications or used on humans. Should any Product(s) be used in or with any nuclear installation or activity, medical application, used on humans, or misused in any way, OMEGA assumes no responsibility as set forth in our basic WARRANTY/DISCLAIMER language, and, additionally, purchaser will indemnify OMEGA and hold OMEGA harmless from any liability or damage whatsoever arising out of the use of the Product(s) in such a manner.

RETURN REQUESTS/INQUIRIES

Direct all warranty and repair requests/inquiries to the OMEGA Customer Service Department. BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OMEGA'S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence.

The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR **WARRANTY** RETURNS, please have the following information available BEFORE contacting OMEGA:

1. Purchase Order number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

FOR **NON-WARRANTY** REPAIRS, consult OMEGA for current repair charges. Have the following information available BEFORE contacting OMEGA:

1. Purchase Order number to cover the COST of the repair,
2. Model and serial number of the product, and
3. Repair instructions and/or specific problems relative to the product.

OMEGA's policy is to make running changes, not model changes, whenever an improvement is possible. This affords our customers the latest in technology and engineering.

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