PX274, PX275, PX277, PX278 Series

Low Pressure Sensors

INSTRUCTION SHEET

M2759/0915

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CE RoHS

For Additional Information See PX274/275/277/278 Data Sheet

SPECIFICATIONS

Accuracy*: ±1% FS

Overpressure: 10 PSID

Supply Voltage: 12-40 VDC, 12-35 VAC (VDC output units only)

Supply Current: VDC Units - 10 mA max., mA Units - 20 mA max

Enclosure: 18 Ga C. R. Steel NEMA 4 (IP-65) or Panel Mount Chassis

Finish: Baked on enamel-PMS2GR88B

EMC Conformance: EN 55022, 55024, 61000-3-3, 61000-4-2, 3, 4, 5, 6 & 11

Compensated Temp Range: 25°F-150°F (-4°C-65°C)

T. C. Error: ±.0.0125%/°F (02%/°C)

Operating Temp Range: 0°F-175°F (-18°C-80°C)

Media Compatibility: Clean dry air or any inert gas

Environmental: 10-90%RH Non-Condensing

Termination: Unpluggable screw terminal block

Wire Size: 12 Ga max.

Load Impedance: 1.6K ohms max. at 40 VDC (mA output units)
1K ohms min. (VDC output units)

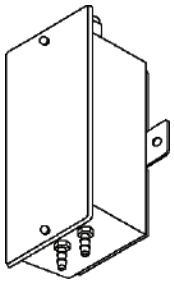
Weight: Enclosure - 1.0 lbs. (.45 kg) **Panel Mount -** 0.5 lbs. (.25 kg)

ORDERING INFORMATION

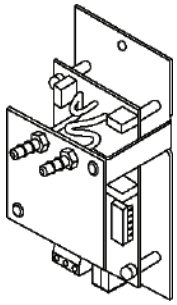
PACKAGING	RANGE		OUTPUT
274 (enclosure)	**R1 ("wc)**	0 TO 0.10 / -0.05 TO +0.05	**mA** (4-20 mA 2-wire)
275 (panel mount)	**R2 ("wc)**	0 TO 1.0 / 0 TO 0.5 / 0 TO 0.25 / -0.5 TO +0.5 / -0.25 TO +0.25 / -0.125 TO +0.125	**VDC** (0-5 VDC or 0-10 VDC field selectable)
	R3 ("wc)	0 TO 5.0 / 0 TO 2.5 / 0 TO 1.25 / -2.5 TO +2.5 / -1.25 TO +1.25 / -0.625 TO +0.625	
	R4 ("wc)	0 TO 30 / 0 TO 15 / 0 TO 7.5 / -15.0 TO +15.0 / -7.5 TO +7.5 / -3.75 TO + 3.75	
	R5 (pa)	0 TO 25 / -12.5 TO +12.5	
	R6 (pa)	0 TO 250 / 0 TO 125 / 0 TO 62.5 / -125 TO +125 / -62.5 TO +62.5 / -31.25 TO +31.25	
	R7 (pa)	0 TO 1250 / 0 TO 625 / 0 TO 312.5 / -625 TO +625 / -312.5 TO +312.5 / -156.25 TO +156.25	
	R8 (pa)	0 TO 7500 / 0 TO 3750 / 0 TO 1875 / -3750 TO +3750 / -1875 TO +1875 / -937.5 TO +937.5	

INSTALLATION

Inspection - Inspect the package for damage. If damaged, notify the appropriate carrier immediately. If undamaged, open the package and inspect the device for obvious damage. Return damaged products.



Enclosure Mount Transducer



Panel Mount Transducer

Requirements

- Tools (not provided)
  - Digital Volt-ohm Meter (DVM)
  - Appropriate screwdriver for mounting screws
  - Appropriate drill and drill bit for mounting screws
- Appropriate accessories
- Two #8 self-tapping mounting screws (*not provided*)
- Training: **Installer must be a qualified, experienced technician**

Warning:

- Disconnect power supply before installation to prevent electrical shock and equipment damage.
- Make all connections in accordance with the job wiring diagram and in accordance with national and local electrical codes. Use copper conductors only.

Caution:

- Use electrostatic discharge precautions (e.g., use of wrist straps) during installation and wiring to prevent equipment damage.
- Avoid locations where severe shock or vibration, excessive moisture or corrosive fumes are present. NEMA Type 4 housings are intended for outdoor use primarily to provide a degree of protection against wind-blown dust, rain, and hose-directed water.
- Do not exceed ratings of the device.

Caution:

- Condensate or moisture must not enter pressure sensor ports

Mounting

The PX-274/275 must be mounted as indicated by the arrows on the enclosure. Refer to **Figure 7** for mounting dimensions.

1. Remove the transducer cover using a Phillips head screwdriver.
2. Select the mounting location.
3. Mount transducer on a vertical surface with two #8 self-tapping screws (not provided).
4. Transducer must be mounted above the pressure pick-up or a J-Loop must be incorporated in the tubing to function as a condensate trap.
5. Pull wires through bottom of enclosure and make necessary connections.
6. Replace cover and make pneumatic connections.

Wiring

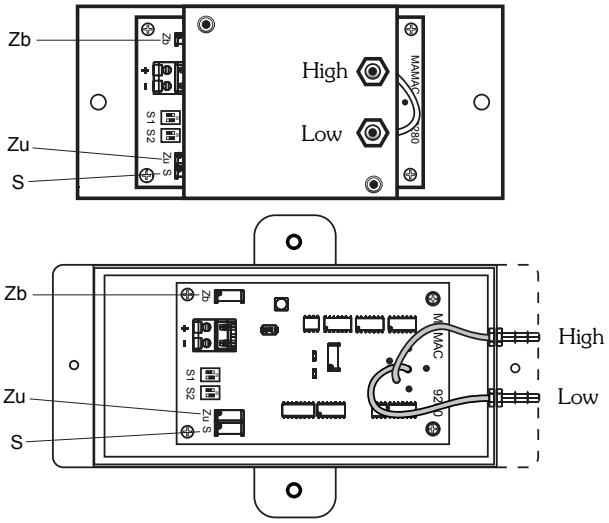
Use maximum 12 AWG wire for wiring terminals. Use flexible 1/4" O.D. 5/32" I.D. tubing for the high and low pressure connections. Refer to **Figures 1, 2, 3**, & **4** for wiring information and **Figures 5** & **6** for switch designations.

(Wiring Instructions continued on pages 2 and 3.)

PX274/275/277/278 Series
LOW PRESSURE SENSORS

Wiring PX274/275/277/278 Units with mA Output

PX274/275/277/278 Low Pressure Transducer with mA output



PX274/275/277/278 pressure transducers with 4-20 mA output are powered with a12-40 VDC supply.

The following describes the proper wiring of these pressure transducers with mA output:

1. Remove the terminal block by carefully pulling it off the circuit board.
2. Locate the [+] and [-] terminal markings on the board.
3. Attach the supply voltage to the [+] lead.
4. Connect the 4-20 mA output ([-] terminal) to the controller's input terminal.
5. Ensure that the power supply common is attached to the common bus of the controller.
6. Re-insert the terminal block to the circuit board and apply power to the unit.
7. Check for the appropriate output signal using a DVM set on DC milliamps connected in series with the [-] terminal.

TYPICAL APPLICATIONS (wiring diagrams)

Figure 1 and **Figure 2** illustrate typical wiring diagrams for the mA output low pressure transducer.

***Figure 1** - Wiring for mA Low Pressure Transducers with an External DC Power Supply*

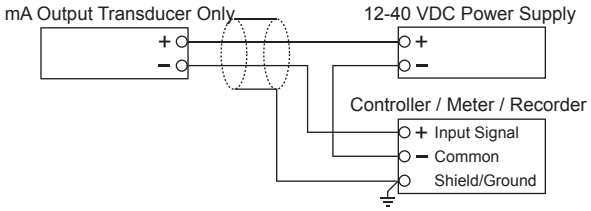
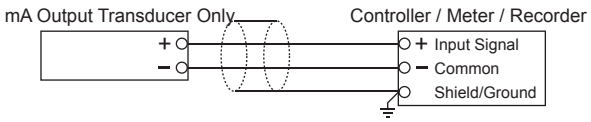
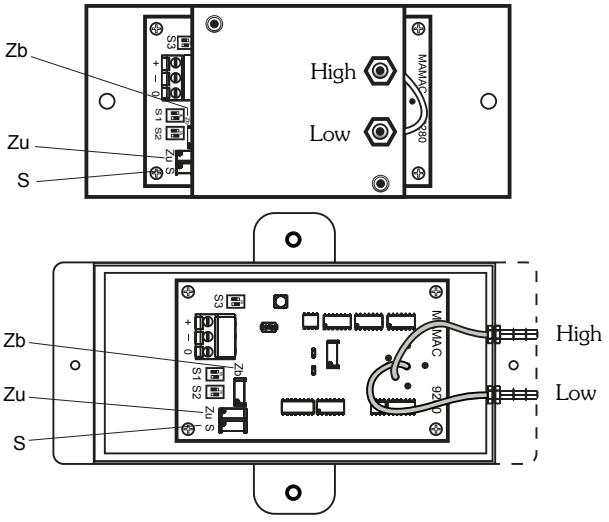


***Figure 2** - Wiring for mA Output Transducers where the Controller or Meter has an Internal DC Power Supply*



WWiring PX274/275/277/278 Units with VDC Output

PX274/275/277/278 Low Pressure Transducer with VDC output



PX274/275/277/278 pressure transducers with VDC output are field selectable 0-5 VDC or 0-10 VDC output and can be powered with either a 12-40 VDC or 12-35 VAC.

The following describes the proper wiring of these pressure transducers with VDC output:

1. Remove the terminal block by carefully pulling it off the circuit board.
2. Locate the [+], [-] and [O] terminal markings on the board.
3. Attach the power wires to the [+] and [-] terminals. The [-] terminal is also the negative terminal.
4. Connect the [O] terminal, which is the positive VDC output terminal, to the controller's input terminal.
5. Re-insert the terminal block to the circuit board and apply power to the unit.
6. Check the appropriate VDC output using a voltmeter set on DC volts across the [O] and [-] terminals.

TYPICAL APPLICATIONS (wiring diagrams)

Figure 3 and **Figure 4** illustrate typical wiring diagrams for the VDC output low pressure transducer.

***Figure 3** - Wiring for VDC Low Pressure Transducers When Applied with External AC Supply*

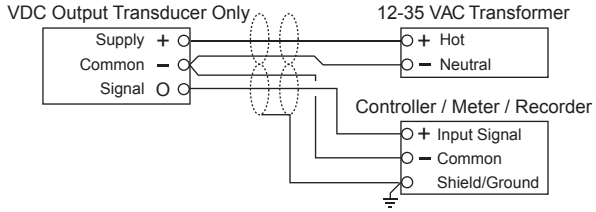
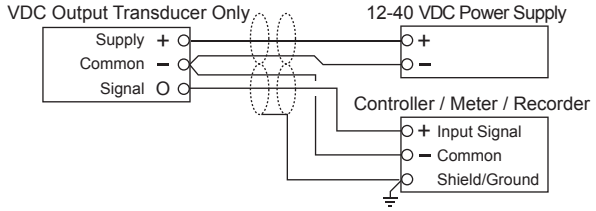
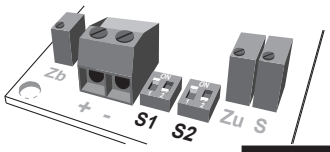


***Figure 4** - Wiring for VDC Low Pressure Transducers When Applied with External DC Power Supply*



Caution: If you are using grounded AC, the hot wire must be on the [+] terminal. Also, if you are using a controller without built-in isolation, use an isolation transformer to supply the PX-274/275.
Caution: This product contains a half-wave rectifier power supply and must not be powered off transformers used to power other devices utilizing non-isolated full-wave rectifier power supplies.
Caution: When multiple PX274/275/277/278 units are powered from the same transformer, damage will result unless all 24G power leads are connected to the same power lead on all devices. It is mandatory that correct phasing be maintained when powering more than one device from a single transducer.

Figure 5 *- Switch Selections for Low Pressure Transducers with mA Outputs*



mA Output

Range Configuration: Uni-Directional **Switch 1 (S1)**

		Factory Sealed
R1/R5	0 - 0.10 "wc / 25 pa	
R2/R6	0 - 1.0 "wc / 250 pa (default)	
	0 - 0.5 "wc / 125 pa	
	0 - 0.25 "wc / 62.5 pa	
R3/R7	0 - 5.0 "wc / 1250 pa (default)	
	0 - 2.5 "wc / 625 pa	
	0 - 1.25 "wc / 312.5 pa	
R4/R8	0 - 30.0 "wc / 7500 pa (default)	
	0 - 15.0 "wc / 3750 pa	
	0 - 7.5 "wc / 1875 pa	

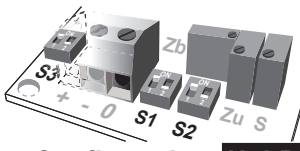
Range Configuration: Bi-Directional **Switch 1 (S1)**

		Factory Sealed
R1/R5	+/- 0.05 "wc / 12.5 pa	
R2/R6	+/- 0.5 "wc / 125 pa (default)	
	+/- 0.25 "wc / 62.5 pa	
	+/- 0.125 "wc / 31.25 pa	
R3/R7	+/- 2.5 "wc / 625 pa (default)	
	+/- 1.25 "wc / 312.5 pa	
	+/- .625 "wc / 156.25 pa	
R4/R8	+/- 15.0 "wc / 3750 pa (default)	
	+/- 7.5 "wc / 1875 pa	
	+/- 3.75 "wc / 937.5 pa	

Output Configuration: **Switch 2 (S2)**

Uni-directional (default)	
Bi-directional	

Figure 6 *- Switch Selections for Low Pressure Transducers with VDC Outputs*



VDC Output

Range Configuration: Uni-Directional **Switch 1 (S1)**

		Factory Sealed
R1/R5	0 - 0.10 "wc / 25 pa	
R2/R6	0 - 1.0 "wc / 250 pa (default)	
	0 - 0.5 "wc / 125 pa	
	0 - 0.25 "wc / 62.5 pa	
R3/R7	0 - 5.0 "wc / 1250 pa (default)	
	0 - 2.5 "wc / 625 pa	
	0 - 1.25 "wc / 312.5 pa	
R4/R8	0 - 30.0 "wc / 7500 pa (default)	
	0 - 15.0 "wc / 3750 pa	
	0 - 7.5 "wc / 1875 pa	

Output Configuration: **Switch 2 (S2)**

Uni-directional (default)	
Bi-directional	

Range Configuration: Bi-Directional **Switch 1 (S1)**

		Factory Sealed
R1/R5	+/- 0.05 "wc / 12.5 pa	
R2/R6	+/- 0.5 "wc / 125 pa (default)	
	+/- 0.25 "wc / 62.5 pa	
	+/- 0.125 "wc / 31.25 pa	
R3/R7	+/- 2.5 "wc / 625 pa (default)	
	+/- 1.25 "wc / 312.5 pa	
	+/- .625 "wc / 156.25 pa	
R4/R8	+/- 15.0 "wc / 3750 pa (default)	
	+/- 7.5 "wc / 1875 pa	
	+/- 3.75 "wc / 937.5 pa	

Output Configuration: **Switch 3 (S3)**

0 - 10 (default)	
0 - 5 VDC	

PX274/275/277/278 Series
LOW PRESSURE SENSORS

CHECKOUT

1. Verify that the unit is mounted in the correct position.
2. Verify appropriate input signal and supply voltage.

⚠ ***Caution:*** Never connect 120 VAC to these transducers. Never connect AC voltage to a unit intended for DC supply.

3. Verify appropriate configuration range.

Transducer Operation

This is a rough functional check only.

1. Adjust the pressure to obtain maximum output signal for appropriate range.
2. Output should be 20 mA or 5 or 10 VDC.
3. Adjust the pressure to obtain minimum output signal.
4. Output should be 4 mA or 0 VDC.

NOTE: *The PX274/275/277/278 is a highly accurate device. For applications requiring a high degree of accuracy, the use of laboratory quality meters and gauges are recommended.*

CALIBRATION All units are factory calibrated to meet or exceed published specifications. If field adjustment is necessary, follow the instructions below.

Calibration of PX274/275/277/278 mA Units

1. Connect terminals [+] and [-] to the appropriate power source.
2. Connect the DVM in series on the [-] terminal.
3. Apply low pressure to the unit. If configured for uni-direction, adjust Zu trimmer to achieve desired low output. If configured for bi-direction, adjust Zb trimmer to achieve desired low output.
4. Apply high pressure to the unit and adjust span trimmer [S] to obtain the desired high output pressure.
5. Repeat steps 3 and 4 until desired calibration is achieved.

Calibration of PX274/275/277/278 VDC Units

1. Connect terminals [+] and [-] to the appropriate power source. The [-] terminal is also the negative output terminal.
2. Connect the DVM on DC volts across [O] and [-] terminal.
3. Apply low pressure to the unit. If configured for uni-direction, adjust Zu trimmer to achieve desired low output. If configured for bi-direction, adjust Zb trimmer to achieve desired low output.
4. Apply high pressure to the unit and adjust span trimmer [S] to obtain the desired high output pressure.
5. Repeat steps 3 and 4 until desired calibration is achieved.

MAINTENANCE Regular maintenance of the total system is recommended to assure sustained optimum performance.

FIELD REPAIR None. Replace with a functional unit.

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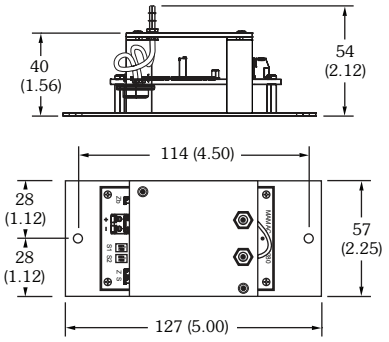
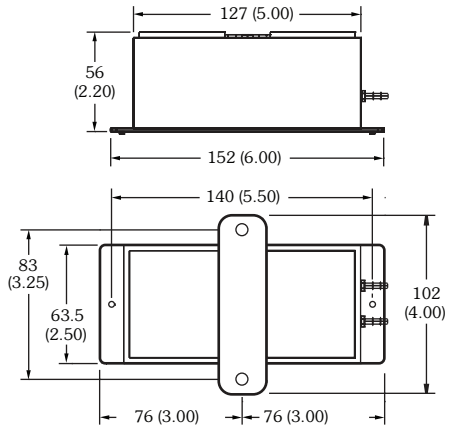
Figure 7 *- PX274/275/277/278 Low Pressure Transducer Dimensions shown in millimeters and (inches)*



Enclosure



For Technical / Application Assistance call your nearest office

WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanshipfor a period of **13 months** from date of puchase. OMEGA's WARRANTY adds an additional one (1) month graceperiod 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.

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