

Modus M Series

General Eastern Differential Pressure Transmitters

The Modus M Series family of differential pressure transmitters measure low pressures, and feature a variety of analog signal outputs with low power consumption. A wide selection of standard pressure ranges and electrical ratings is available. These transmitters feature no moving parts to wear out, reliable long term stability, and are virtually position insensitive. The Modus M Series transmitters are typically used for monitoring cleanroom pressures, HVAC, velocity pressures, bubbler level systems, and leak detection; as well as filter differential, draft, fume hood, and other low pressure applications.

The transmitters are housed in a compact heavy duty, gasketed, cast aluminum enclosure designed to Type 4/IP 65. The die cast aluminum enclosure incorporates a recessed neoprene gasket to prevent ingress of moisture or dust. Wall mounting holes are enclosed in the cast aluminum box and concealed by the cover. The wall mounting holes and the cover attaching screws are outside the gasketed area. Access to the terminals is made through knockouts on the front of the box. A choice of two knockouts and three hole sizes is available to accommodate



usage of 1/2 in (12.70 mm) conduit and metric sizes PG11 and PG13.

Pluggable terminal block connectors are provided with captive wire protection and captive terminal screws.

The Modus M Series includes two models:

M30 Series

- Two-wire
- DC Voltage In
- 4 to 20 mA out

M40 Series

- Four-wire
- 24, 120, or 240 VAC In
- 4 to 20 mA Out

The span or zero adjustment is performed with a 20 turn potentiometer for fine resolution.

The Modus M Series transmitters comply with the European requirements of EMC Directive 2004/108/EC, LVD 2006/95/EC and PED 97/23/EC.



Operation

The pressure sensing element is a differential capacitance cell for pressure measurements ranging from 0.1 in to 5 in (3.04 mm to 127 mm) of water (25 kPa to 1.0 kPa), or piezoresistive (silicon) sensors for pressure measurements ranging from 5 in (127 mm) of water to 10 in (1.0 kPa to 2.5 kPa).

The capacitance cell is capable of sensing very low, negative or differential pressures.

A very lightweight, responsive diaphragm within the cell deflects a small amount when a small pressure is applied. This deflection results in a change in capacitance which is then detected and amplified electronically.

The piezoresistive sensor is a solid state device designed in a Wheatstone bridge configuration. When pressure is applied to the device, the resistance of the bridge changes by a small amount. The output of the bridge is ratiometric to the supply voltage, and a small change in resistance is detected as a change in output voltage.

M Series Specifications

Performance

Accuracy

±1% of Span (including non-linearity and hysteresis)

Calibration

Traceable to National Institute of Standards and Technology (NIST)

Environmental

Operating Temperature Range

32°F to 115°F (0°C to 45°C)

Storage Temperature

-20°F to 160°F (-30°C to 70°C)

Effect of Temperature on Zero

±0.05%/°C

Effect of Temperature on Span

±0.02%/°C

Operating Humidity Range

10% to 90% RH, non-condensing

Shock Resistance

10 G (11 ms)

Vibration Resistance

5 G to 50 Hz

Electrical Connectors

Polarized Euro-plug/connectors.

Connections

Pluggable terminal block for wire, 14 to 26 AWG

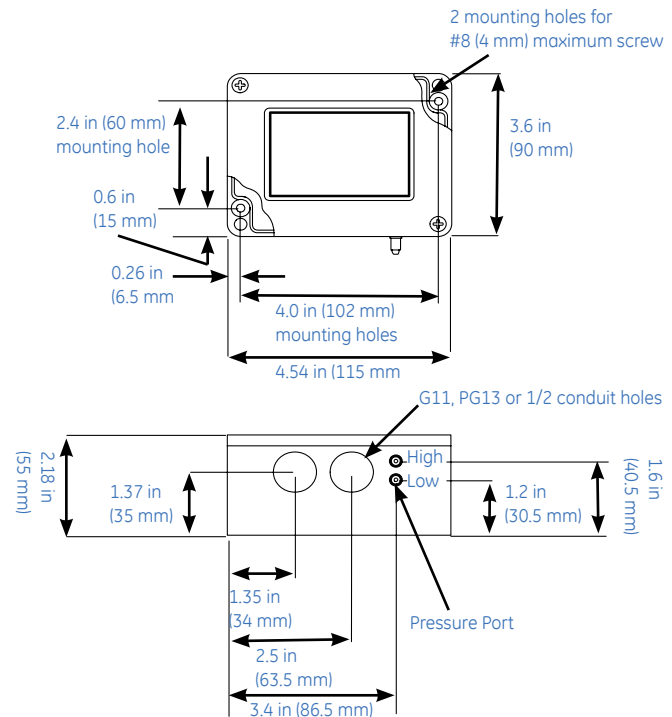
Material

Glass filled polyester

Physical

Dimensions

3.56 in x 4.54 in x 2.18 in (90 mm x 115 mm x 55 mm)



Material

Aluminum alloy #A380

Cover Screws

M4 stainless steel, non-magnetic

Finish

Black epoxy paint

Knockout

Choice of 2 holes. Knockout hole sizes 1/2 in (12.70 mm) conduit, PG11 or PG13. Cable glands not included.

Pressure Port Connection

3/16 in (4.57 mm) diameter

Suitable for:

- 1/8 in (3.04 mm) ID Tygon™ or polyurethane tubing 0.11 in to 0.15 in (3 mm to 4 mm)
- 1/4 in (6.35 mm) OD polyethylene tubing 0.23 in (6 mm)

Weight

1.27 lb (576 g) maximum

Integral filters at both ports. Measures differential, gage pressure or vacuum. Suitable for air or inert gases.

Standard Pressure Ranges

US Units

Pressure Code Pressure Range Maximum Safe
Momentary
Overpressure

03E	0 to 0.300 in H2O	-
04E	0 to 0.500 in H2O	-
05E	0 to 1.00 in H2O	-
06E	0 to 2.00 in H2O	20 inH2O
07E	0 to 3.00 in H2O	-
08E	0 to 5.00 in H2O	-

Metric Units, Millimeters of Water

Pressure Code Pressure Range Maximum Safe
Momentary
Overpressure

03M	0 to 7.50 mm H2O	-
04M	0 to 10.00 mm H2O	-
05M	0 to 25.0 mm H2O	-
06M	0 to 50.0 mm H2O	500 mm
07M	0 to 75.0 mm H2O	-
08M	0 to 100 mm H2O	-

Metric Units, Pascal
Pressure Code Pressure Range Maximum Safe
Momentary
Overpressure

03P	0 to 75.0 Pa	-
04P	0 to 100.0 Pa	-
05P	0 to 250 Pa	-
06P	0 to 500 Pa	5 kPa
07P	0 to 750 Pa	-
08P	0 to 1.00 kPa	-

M30 Specifications

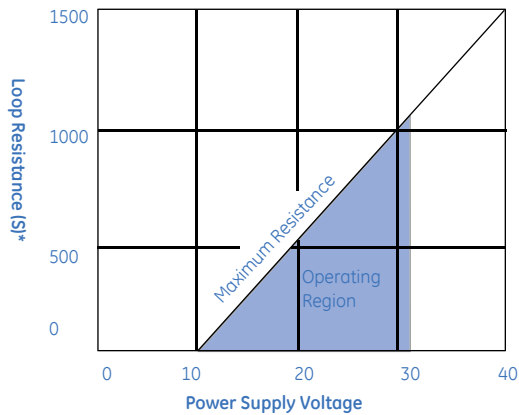
Two-wire, 4 to 20 mA output

Electrical

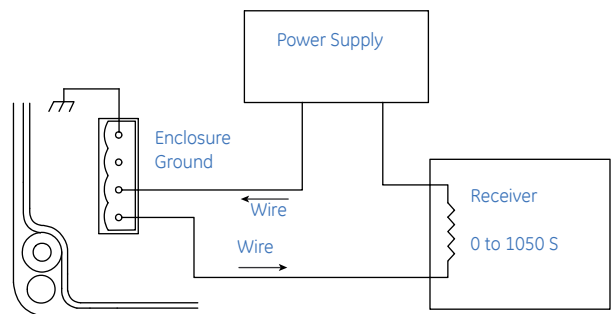
Supply Voltage

11 to 32 VDC (see diagram below for maximum loop resistance)

Protected against reversal of polarity. Output limited to approximately 3.85 mA at low end of span and approximately 27 mA at upper end of span.



*Loop resistance = wire resistance + receiver resistance



Modus M30 Series schematic diagram

Ordering Information

M30	Code	Input Pressure (IP)		Offset (O)*		Knockout Quantity (KQ)		Knockout Size (KS)	
	X	See standard pressure ranges tables on page 4							
		Code		Code		Code		Code	
		A		1/4 offset		1	One hole	R	1/2 in (12.7 mm) conduit
		B		1/2 offset		2	Two holes	S	PG 11
		0		none				T	PG 13
M30 -	-	-	-	-	-	-	-	-	Typical model number.

*If the measured differential pressure is expected to go from positive to negative, a transmitter with offset (elevated zero) should be ordered.

Three options are available:
"0" **No offset.** At zero differential pressure, the output signal is:
4 mA (4 to 20 mA range)

Pressure excursion
0% to 100% of range, see standard pressure ranges tables on page 4
"A" **1/4 span offset.** At zero differential pressure, the output signal is:
• 8 mA (4 to 20 mA range)

Pressure excursion
-33% to 100% of range, see standard pressure ranges tables on page 4
"B" **1/2 span offset.** At zero differential pressure, the output signal is:
• 12 mA (4 to 20 mA range)

Pressure excursion
-100% to 100% of range, see standard pressure ranges tables on page 4.
To order: Determine the positive pressure range. From standard pressure ranges table on page 4, find the corresponding pressure code. Add the required offset (none, A, or B).
For example, M30 05E A__ is a transmitter with a maximum range of 1 in of H₂O at 20 mA and a minimum range of -0.33 in of H₂O at 4 mA.

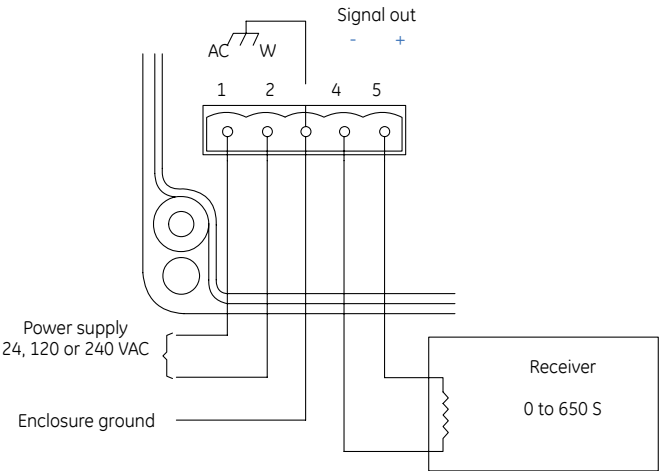
M40 Series Specifications

AC power input, 4 to 20 mA output

Electrical

Nominal Input Voltage	Power Consumption	Operating Voltage Range
24 VAC	1.5 W	20 to 32 VAC
120 VAC	1.5 W	90 to 140 VAC
240 VAC	1.5 W	180 to 260 VAC

Isolation between power supply and output is 2500 Vrms. Receiver resistance can be from 0 to 650 W. Output limited to approximately 27 mA at the upper end of span.



Modus M40 Series schematic diagram

Ordering Information

M40

Code	Input Pressure (IP)
X	See standard pressure ranges tables on page 4
Code	Power Supply (PS)
C	24 VAC
D	120 VAC
E	240 VAC
Code	Offset (O)*
0	No offset
A	1/4 offset
B	1/2 offset
Code	Knockout Quantity (KQ)
1	One hole
2	Two holes
Code	Knockout Size (KS)
R	1/2 in conduit
S	PG11
T	PG13

M40 - - - - - Typical model number.

**If the measured differential pressure is expected to go from positive to negative,, a transmitter with offset (elevated zero) should be ordered.*

Three options are available:

"0" No offset. At zero differential pressure, the output signal is:
4 mA (4 to 20 mA range)

Pressure excursion

0% to 100% of range, see standard pressure ranges tables on page 4

"A" 1/4 span offset. At zero differential pressure, the output signal is:
8 mA (4 to 20 mA range)

Pressure excursion

-33% to 100% of Range see standard pressure ranges tables on page 4

"B" 1/2 span offset. At zero differential pressure, the output signal is:
12 mA (4 to 20 mA range)

Pressure excursion

-100% to 100% of range, see standard pressure ranges tables on page 4

To order: Determine the positive pressure range. From standard pressure ranges table on page 4, find the corresponding pressure code. Add the required offset (none, A, or B).

For example, M30 05E A__ is a transmitter with a maximum range of 1 in of H₂O at 20 mA and a minimum range of -0.33 in of H₂O at 4 mA.



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920-293E