

GE Sensing

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 Type4/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 have been tested by an accredited laboratory and comply with the European requirements of Council Directive 89/336/EEC.

Modus M Series General Eastern Differential Pressure Transmitters

Modus M Series is a General Eastern product. General Eastern has joined other GE high-technology sensing businesses under a new name—GE Industrial, Sensing.



GE Sensing

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 30 psi (2.06 bar) (1.0 kPa to 200 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% R.H., non-condensing

Shock Resistance

10 G (11 ms)

Vibration Resistance

5 G to 50 Hz

Electrical Connectors

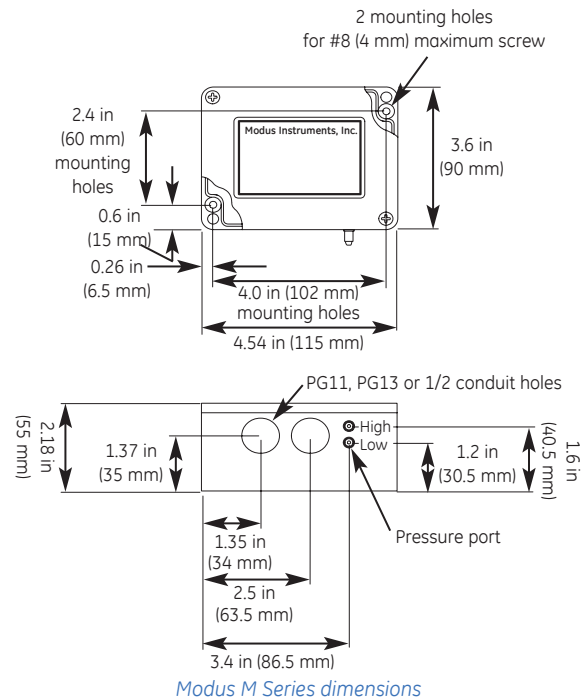
Polarized Euro-plug/connectors.

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.

M Series Specifications

Standard Pressure Ranges

US Units

Pressure Code	Pressure Range	Maximum Safe Momentary Overpressure
01E	0 to 0.100 in H ₂ O	-
02E	0 to 0.200 in H ₂ O	5 in H ₂ O
03E	0 to 0.300 in H ₂ O	-
04E	0 to 0.500 in H ₂ O	-
05E	0 to 1.00 in H ₂ O	-
06E	0 to 2.00 in H ₂ O	20 inH ₂ O
07E	0 to 3.00 in H ₂ O	-
08E	0 to 5.00 in H ₂ O	-
09E	0 to 10.0 in H ₂ O	5 psid
11E	0 to 20.0 in H ₂ O	-
12E	0 to 30.0 in H ₂ O	-
13E	0 to 50.0 in H ₂ O	-
14E	0 to 100 in H ₂ O	15 psid
15E	0 to 1.00 psid	-
16E	0 to 2.00 psid	-
17E	0 to 3.00 psid	-
18E	0 to 5.00 psid	-
19E	0 to 15.0 psid	30 psid
20E	0 to 30.0 psid	60 psid

Metric Units, Millimeters of Water

Pressure Code	Pressure Range	Maximum Safe Momentary Overpressure
01M	0 to 2.50 mm H ₂ O	-
02M	0 to 5.00 mm H ₂ O	125 mm
03M	0 to 7.50 mm H ₂ O	-
04M	0 to 10.00 mm H ₂ O	-
05M	0 to 25.0 mm H ₂ O	-
06M	0 to 50.0 mm H ₂ O	500 mm
07M	0 to 75.0 mm H ₂ O	-
08M	0 to 100 mm H ₂ O	-
09M	0 to 250 mm H ₂ O	3.5 m
11M	0 to 500 mm H ₂ O	-
12M	0 to 750 mm H ₂ O	-
13M	0 to 1.00 m H ₂ O	-
14M	0 to 2.5 m H ₂ O	10 m
15M	0 to 5.0 m H ₂ O	-
16M	0 to 10.0 m H ₂ O	20 m
17M	0 to 20.0 m H ₂ O	40 m

Metric Units, Pascal

Pressure Code	Pressure Range	Maximum Safe Momentary Overpressure
01P	0 to 25.0 Pa	-
02P	0 to 50.0 Pa	1.25 kPa
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	-
09P	0 to 2.50 kPa	35 kPa
11P	0 to 5.00 kPa	-
12P	0 to 7.50 kPa	-
13P	0 to 10.0 kPa	-
14P	0 to 25.0 kPa	100 kPa
15P	0 to 50.0 kPa	-
16P	0 to 100 kPa	200 kPa
17P	0 to 200 kPa	400 kPa

M30 Series Specifications

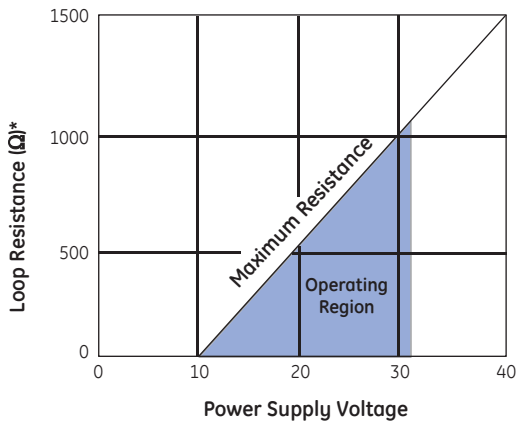
Two-wire, 4 to 20 mA output

Electrical

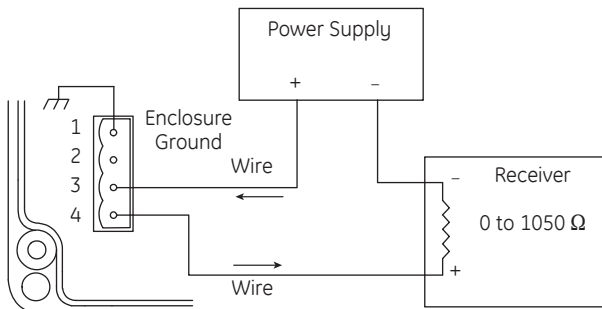
Supply Voltage

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	Offset (O)*	Code	Input Pressure (IP)	Code	Knockout Quantity (KQ)	Code	Knockout Size (KS)
	A	1/4 offset						
	B	1/2 offset						
			X	See standard pressure ranges tables on page 4				
					2	Two holes		
							R	1/2 in (12.7 mm) conduit
							S	PG 11
							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:

"-" **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)
- 1.25 V (0 to 5 V range)
- 2.5 V (0 to 10 V 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)
- 2.5 V (0 to 5 V range)
- 5 V (0 to 10 V 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.

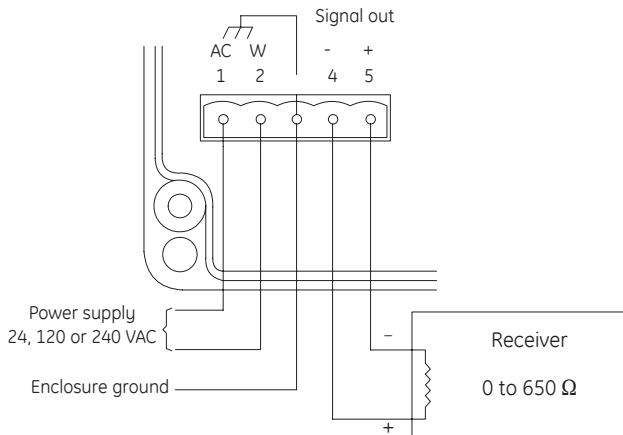
M40 Series Specifications

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 Ω . Output limited to approximately 27 mA at the upper end of span.



Modus M40 Series schematic diagram

Ordering Information

M40	Code	Input Pressure (IP)	Code	Power Supply (PS)	Code	Signal Output (SO)	Code	Offset (O)*	Code	Knockout Quantity (KQ)	Code	Knockout Size (KS)
	X	See standard pressure ranges tables on page 4		C	24 VAC	5	0 to 5 V	-		2		
				D	120 VAC	X	0 to 10 V	A			R	1/2 in conduit
				E	240 VAC			B			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:

"-" **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)
- 1.25 V (0 to 5 V range)
- 2.5 V (0 to 10 V 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)
- 2.5 V (0 to 5 V range)
- 5 V (0 to 10 V 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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