

SERIES T

Differential Pressure Transmitters

DESCRIPTION

The Series T family of differential pressure transmitters measure low pressures and feature low power consumption and a variety of analog signal outputs. 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 Series T transmitters are an excellent choice for many HVAC, process and automation monitoring requirements. These transmitters monitor: filter differential pressures, fan static pressures, clean room pressures, variable air volume systems and velocity pressures. They have been used for bubbler level systems, leak detection and in medical and analytical instruments.

The transmitters are housed in a flame retardant, glass-reinforced polyphenylene oxide (NORYL™) case. Electrical connections are made by means of a 3/8" terminal strip with #6 screws.

The Series T includes four models: Model T10, Model T20, Model T30 and Model T40. These four models incorporate a variety of power and signal options.

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

T10	3-Wire DC Voltage In DC Voltage Out	T30	2-Wire DC Voltage In 4 - 20 mA Out
T20	4-Wire 24, 120, or 240 Vac In DC Voltage Out	T40	4-Wire 24, 120, 240 Vac In 4 - 20 mA Out

OPERATION

The pressure sensing element is a differential capacitance cell for pressure measurements ranging from 0.1 to 5 inches of water (25 Pa to 1.0 kPa), or piezoresistive (silicon) sensors for pressure measurements ranging from 5 inches of water to 30 psi (1.0 kPa to 200 kPa).

The capacitance cell is capable of sensing very low pressures, negative or differential. A very light weight, 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. This resistance change is converted to a voltage and amplified.



SPECIFICATIONS

General

Measures differential, gage pressure, or vacuum

Suitable for air or inert gases

Maximum safe momentary overpressure: see reference table A

Performance

Accuracy: $\pm 1\%$ of span (including non-linearity and hysteresis)

Calibration: (Traceable to N.I.S.T.)

Environmental

Operating temperature range: 0°C to 45°C (32°F to 115°F)

Storage temperature: -30°C to 70°C (-20°F to 160°F)

Effect of temperature

on zero: $\pm 0.05\%/^{\circ}\text{C}$

on span: $\pm 0.02\%/^{\circ}\text{C}$

Operating humidity range: 10% to 90% R.H. non-condensing

Shock resistance: 10G (11ms)

Vibration resistance: 5G to 50 Hz

Electrical Connections

Connections: External 3/8" terminal strip with #6 screws

Physical

Pressure port connections: 3/16" dia. suitable for:

1/8" I.D. Tygon™ or polyurethane tubing (3 - 4mm)

1/4" O.D. polyethylene tubing (6mm)

Integral filters at both ports

Dimensions: 3.00"W x 5.15"L x 1.40"H (76 x 131 x 36mm)

Material: Flame retardant, glass-reinforced polyphenylene oxide (NORYL™) case

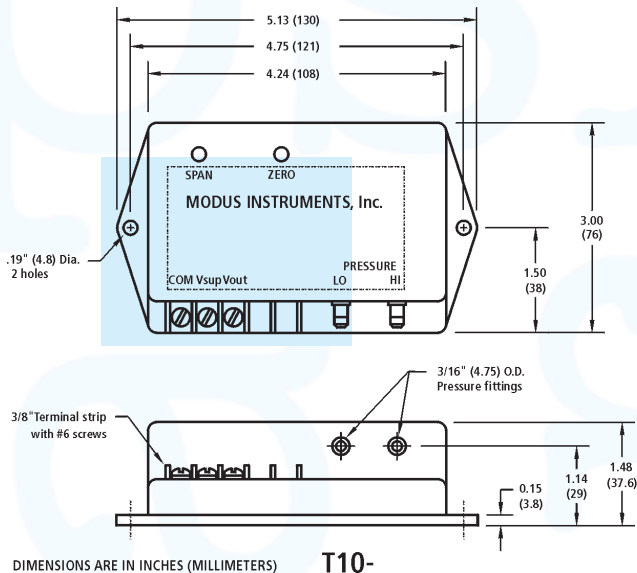
Weight: 0.42 lb max (190 g)

MODEL T10

DC Power Input/Voltage Output

Diagram shows area of detail.

Please see inset diagrams for wiring of each individual model below.



T10-

SPECIFICATIONS

Electrical

Supply Voltage: 11 to 32 Vdc (14.5 to 32 Vdc for 10 Volts output)

Protected against reversal of polarity

Supply Current: 10mA

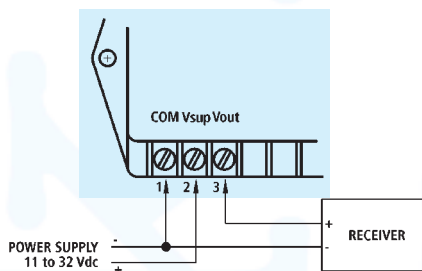
Output:

0 to 5 Volts, linear

0 to 10 Volts, linear

Sink or source 3.5mA

Protected against short circuit



Terminal 1 is common to both the DC power supply and the output signal.
Terminal 2 is positive DC supply voltage.
Terminal 3 is positive signal voltage.

ORDERING INFORMATION

Order Number (See Table below and Reference Table A on page 26)

T10 - PPP - V - O

EXAMPLE: T10 - 01E - 5 - A

PPP = Pressure Range	V = Voltage Output	O = Offset (See Note 1)
See Reference Table A	5 = 0 to 5 Volts X = 0 to 10 Volts	- = No offset A = 1/4 offset B = 1/2 offset

MODEL T20

AC Power Input/Voltage Output

SPECIFICATIONS

Electrical

Transformer isolation between power supply and output is 2500 Vrms

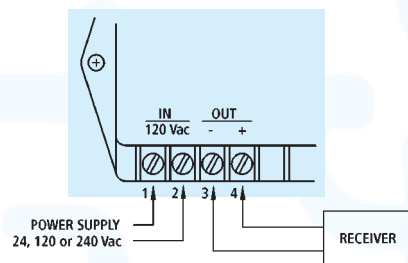
Output voltage:

0 to 5 Volts, or

0 to 10 Volts

Sink or source 3.5mA

Protected against short circuit



Terminals 1 and 2 are AC power input.
Terminals 3 and 4 are DC voltage output.

ORDERING INFORMATION

Order Number (See Table below and Reference Table A on page 26)

T20 - PPP - S - V - O

EXAMPLE: T20 - 07P - C - X - B

PPP = Pressure Range	S = Supply Voltage	V = Voltage Output	O = Offset (See Note 1)
See Table Reference A	C = 24 Vac D = 120 Vac E = 240 Vac	5 = 0 to 5 Volts X = 0 to 10 Volts	- = No offset A = 1/4 offset B = 1/2 offset

MODEL T30

Two Wire / 4-20mA Output

SPECIFICATIONS

Electrical

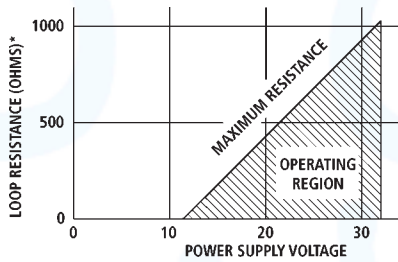
Supply Voltage: 11 to 32 Vdc

(See diagram below for maximum loop resistance)

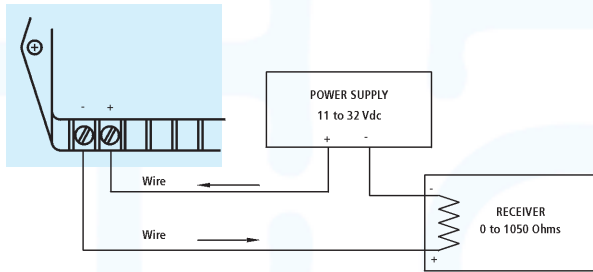
Protected against reversal of polarity

Output limited to approx. 3.85mA at low end of span and approx.

25mA at upper end of span



* Loop resistance = Wire res. + Receiver res.



ORDERING INFORMATION

Order Number (See Table below and Reference Table A on page 26)

T30 - PPP - O

EXAMPLE: T30 - 06E - B

PPP = Pressure Range	O = Offset (See Note 1)
See Reference Table A	-- = No offset A = 1/4 offset B = 1/2 offset

NOTES

Note 1:

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:

4mA (4 to 20mA range)

0V (0 to 5V range)

0V (0 to 10V range)

Pressure excursion: 0% to 100% of Range, see Table A

“A” **1/4 span offset.** At zero differential pressure the output signal is:

8mA (4 to 20mA range)

1.25V (0 to 5V range)

2.5V (0 to 10V range)

Pressure excursion: -33% to 100% of Range, see Table A

MODEL T40

AC Power Input / 4-20mA Output

SPECIFICATIONS

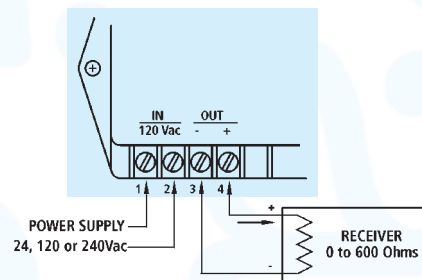
Electrical

Nominal Input Voltage	Power Consumption	Operating Voltage Range
24 Vac, 50/60Hz	1.5W	20 to 30 Vac
120 Vac, 50/60Hz	1.5W	100 to 140 Vac
240 Vac, 50/60Hz	1.5W	200 to 260 Vac

Transformer isolation between power supply and output is 2500 Vrms

Receiver resistance can be from 0 to 600 Ohms

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



Terminals 1 and 2 are AC power input.

Terminals 3 and 4 are 4-20mA current output.

ORDERING INFORMATION

Order Number (See Table below and Reference Table A on page 26)

T40 - PPP - S - O

EXAMPLE: T40 - 03M - E - B

PPP = Pressure Range	S = Supply Voltage	O = Offset (See Note 1)
See Reference Table A	C = 24 Vac D = 120 Vac E = 240 Vac	-- = No offset A = 1/4 offset B = 1/2 offset

“B” **1/2 span offset.** At zero differential pressure the output signal is:

12mA (4 to 20mA range)

2.5V (0 to 5V range)

5V (0 to 10V range)

Pressure excursion: -100% to 100% of Range see Table A

To order: determine the positive pressure range; from Table A find the corresponding pressure code, then add the required offset (none, A, or B).

For example, T30 05E A is a transmitter with a maximum range of 1" of H₂O at 20mA and a minimum range of -0.33" of H₂O at 4mA.

