



SERIES IDPT | INDUSTRIAL DIFFERENTIAL PRESSURE TRANSMITTER



BENEFITS/FEATURES

- Supports critical applications due to 0.25% accuracy on most ranges
- Maintains process quality with a stable accuracy
- Allows for use in critical processes with pressure ranges as low as 0.25 in w.c.
- Ensures a long service life in heavy industrial processes with the robust stainless steel housing

APPLICATIONS

- Semiconductor
- Pharmaceutical
- Laboratories
- Fume hoods
- HVAC pressure
- Critical measurement
- High purity

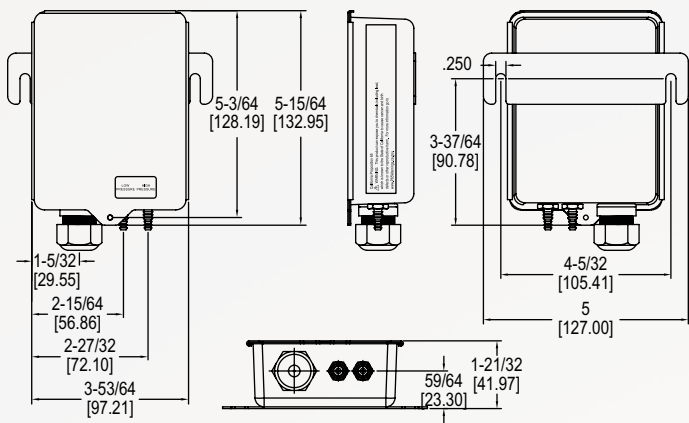
DESCRIPTION

The **Series IDPT Industrial Differential Pressure Transmitter** features a rugged, water resistant housing and highly stable accuracy for a long service life in most industrial applications. This pressure transmitter utilizes a capacitive pressure sensor on ranges 0 to 0.25 in w.c. to 0 to 1 in w.c. and a piezo sensor on ranges 0 to 2.5 in w.c. to 0 to 10 in w.c., both of which offer accuracy options of 0.25% or 0.5% full-scale. The cap cell allows the IDPT to maintain critical processes in industrial applications. The series offers a 4-20 mA 2-wire version for a loop powered current output as well as a 0-5 V/0-10 V selectable voltage output version.

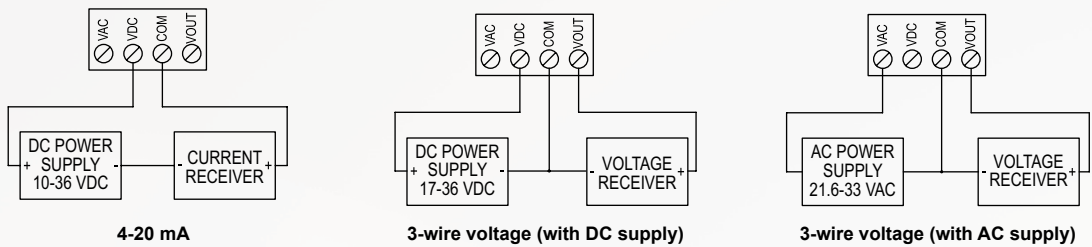
SPECIFICATIONS

Service	Clean, dry, compatible gases.
Wetted Materials	Consult factory.
Accuracy	±0.5% FS standard, ±0.25% FS high accuracy.
Stability	±0.5% FS per year.
Temperature Limits	-4 to 158°F (-20 to 70°C); Storage: -22 to 176°F (-30 to 80°C).
Compensated Temperature Range	36 to 135°F (2 to 57°C).
Pressure Limits	2 psi max.
Thermal Effects	≤ 1 in w.c.: ±0.015% FS/°F; > 1 in w.c.: ±0.025% FS/°F.
Power Requirements	10-35 VDC (2-wire), 17-36 VDC isolated 21.6-33 VAC (3-wire).
Output Signal	4-20 mA DC, 2-wire; 0-5 VDC/0-10 VDC selectable, 3-wire.
Zero and Span Adjustments	Push-buttons accessible by removing the housing cover.
Response Time	250 ms.
Loop Resistance	0-1045 Ω, $V_{min}=12V+[(.22A)(RI)]$ (2-wire); Min. load resistance 1 kΩ (3-wire).
Electrical Connection	Screw terminals.
Process Connection	Barbed SS for 3/16\" ID tubing.
Enclosure Rating	NEMA 2 (IP11).
Mounting Orientation	Pressure sensor measurement is unaffected by orientation.
Weight	≤ 1 in w.c.: 0.94 lb (0.43 kg); > 1 in w.c.: 1.08 lb (0.49 kg).
Compliance	CE.

DIMENSIONS



WIRING DIAGRAM



HOW TO ORDER

Use the **bold** characters from the chart below to construct a product code.

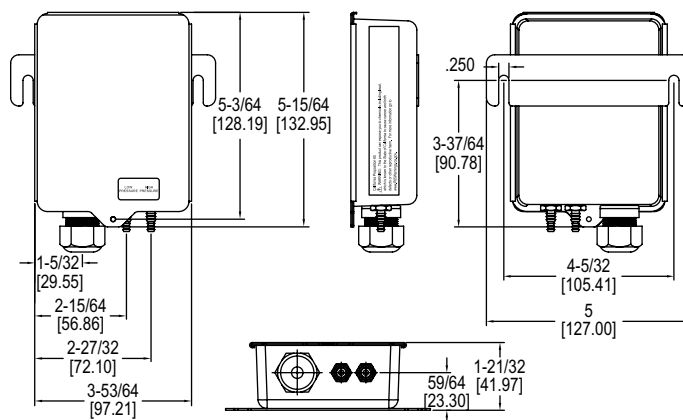
	IDPT	-1	2	U	-IN	-FC	
SERIES	IDPT: Industrial differential pressure transmitter						
ACCURACY	-1: ±0.25% FS -2: ±0.5% FS						
RANGE	2: 0 to 0.25 in w.c. (60 Pa) 3: 0 to 0.50 in w.c. (125 Pa) 4: 0 to 1.0 in w.c. (250 Pa) 5: 0 to 2.5 in w.c. (600 Pa) 6: 0 to 5 in w.c. (1250 Pa) 7: 0 to 10 in w.c. (2500 Pa)						
OPTIONS	-FC: Factory calibration -NIST: NIST calibration -SF: Silicone free						
UNITS	-IN: Inches of water column -PA: Pascals						
DIRECTION	U: Unidirectional B: Bidirectional						





Series IDPT Industrial Differential Pressure Transmitter

Specifications - Installation and Operating Instructions



The **Series IDPT Industrial Differential Pressure Transmitter** features a rugged, water resistant housing and highly stable accuracy for a long service life in most industrial applications. This pressure transmitter utilizes a capacitive pressure sensor on ranges 0 to 0.25 in w.c. to 0 to 1 in w.c. and a piezo sensor on ranges 0 to 2.5 in w.c. to 0 to 10 in w.c., both of which offer accuracy options of 0.25% or 0.5% full-scale. The cap cell allows the IDPT to maintain critical processes in industrial applications. The series offers a 4-20 mA 2-wire version for a loop powered current output as well as a 0-5 V/0-10 V selectable voltage output version.

INSTALLATION

Surface Mounting:

Mount the transmitter on a vertical surface. The pressure sensor measurement is unaffected by orientation, but it is recommended the unit be mounted with the connections facing down to prevent moisture from entering either the pressure ports or the electrical cable entry. Attach the mounting bracket to a flat surface using #6-32 pan head sheet metal screws. Do not over tighten.

SPECIFICATIONS

Service: Clean, dry, compatible gases.

Wetted Materials: Consult factory.

Accuracy: $\pm 0.5\%$ FS standard, $\pm 0.25\%$ FS high accuracy.

Stability: $\pm 0.5\%$ FS per year.

Temperature Limits: -4 to 158°F (-20 to 70°C); Storage: -22 to 176°F (-30 to 80°C).

Compensated Temperature Range: 36 to 135°F (2 to 57°C).

Pressure Limits: 2 psi max.

Thermal Effects: ≤ 1 in w.c.: $\pm 0.015\%$ FS/°F; > 1 in w.c.: $\pm 0.025\%$ FS/°F.

Power Requirements: 10-35 VDC (2-wire), 17-36 VDC isolated 21.6-33 VAC (3-wire).

Output Signal: 4-20 mA DC, 2-wire; 0-5 VDC/0-10 VDC selectable, 3-wire.

Zero and Span Adjustments: Push-buttons accessible by removing the housing cover.

Response Time: 250 ms.

Loop Resistance: 0-1045 Ω , $V_{min}=12V+[(.22A)(RI)]$ (2-wire); Min. load resistance 1 k Ω (3-wire).

Electrical Connection: Screw terminals.

Process Connection: Barbed SS for 3/16" ID tubing.

Enclosure Rating: NEMA 2 (IP11).

Mounting Orientation: Pressure sensor measurement is unaffected by orientation.

Weight: ≤ 1 in w.c.: 0.94 lb (0.43 kg); > 1 in w.c.: 1.08 lb (0.49 kg).

Compliance: CE.

ELECTRICAL

The IDPT transmitter utilizes a **2-wire 4-20 mA Current Output**, or a **3-wire 0-5 V/ 0-10 V Voltage Output**. It is also capable of **Simultaneous Current and Voltage Output**. The power and signals interconnect via a removable European-style four conductor terminal block.

2-Wire 4-20 mA Current Output

CAUTION DO NOT EXCEED SPECIFIED SUPPLY VOLTAGE RATINGS. PERMANENT DAMAGE NOT COVERED BY WARRANTY WILL RESULT. SIMULTANEOUS OUTPUTS ARE NOT DESIGNED FOR AC VOLTAGE OPERATION.

The connections to the transmitter are made through terminals VDC and COM on the terminal block as shown in Figure 1. The terminal block is removable and each of the terminals are labeled next to the terminal block on the circuit board. Polarity is indicated by VDC and COM. See Figure 1.

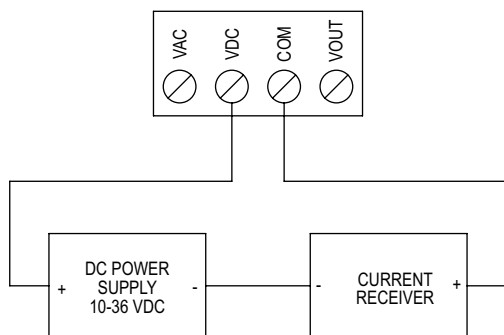


Figure 1

The maximum receiver load resistance (R_L) for a given power supply voltage (V_{ps}) is defined by the formula:

$$R_L = \frac{V_{ps} - 10.0}{20 \text{ mA DC}}$$

Shielded 2-wire cable is recommended for control loop wiring. Ground the shield at the power supply end only.

The receiver may be connected to either the negative or positive side of the loop, whichever is most convenient. Should polarity of the transmitter or receiver be inadvertently reversed, the loop will not function properly but no damage will be done to the transmitter.

The maximum length of connecting wire between the transmitter and the receiver is a function of wire size and receiver resistance. That portion of the total current loop resistance represented by the resistance of the connecting wires themselves should not exceed 10% of the receiver resistance. For extremely long runs (over 1,000 feet), it is desirable to select receivers with lower resistances in order to keep the size and cost of the connecting leads as low as possible. In installations where the connecting run is no more than 100 feet, you can use a connecting lead wire as small as No. 22 ga.

3-Wire 0-10 V and 0-5 V Voltage Output

CAUTION DO NOT EXCEED SPECIFIED SUPPLY VOLTAGE RATINGS. PERMANENT DAMAGE NOT COVERED BY WARRANTY WILL RESULT.

The terminal block is removable and each of the terminals are labeled next to the terminal block on the circuit board. Positive polarity is indicated by VOUT. AC/DC selection is made via the terminal block. If the polarity of the transmitter is inadvertently reversed, the unit will not function properly, but no damage will be done to the transmitter.

Selection of using a DC or AC power supply is made via the terminal block.

See Figure 2 for DC wiring.

See Figure 3 for AC wiring.

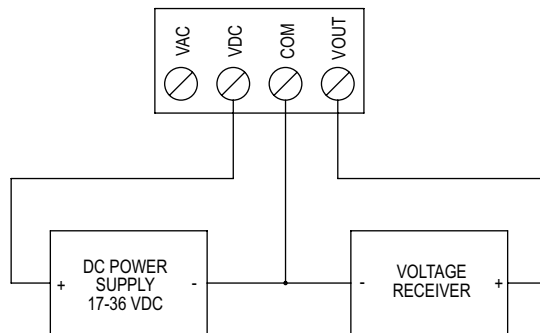


Figure 2: DC wiring

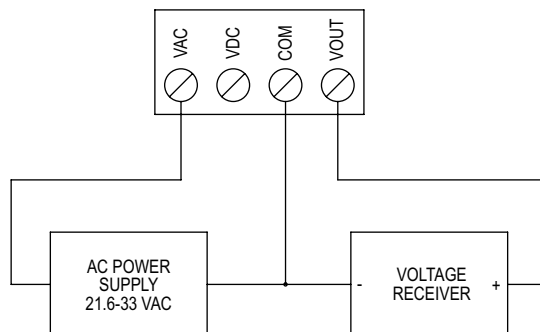


Figure 3: AC wiring

The minimum receiver load is 1 kΩ. The resistance due to the wire should be low compared to the receiver load resistance. While the voltage at the terminal block remains unchanged with a 10 mA current flow, resistive losses in the wiring do cause errors in the voltage delivered to the receiver. For a 1% accurate gage, the resistance of the wires should be less than 0.1% of the value of the receiver load resistance. This will keep the error caused by the current flow below 0.1%.

The output across VOUT and COM will be either 0-5 V, 0-10 V depending on the DIP switch setting. See **DIP Switch Settings Section** for more information.

Simultaneous Current and Voltage Output

CAUTION DO NOT EXCEED SPECIFIED SUPPLY VOLTAGE RATINGS. PERMANENT DAMAGE NOT COVERED BY WARRANTY WILL RESULT. SIMULTANEOUS OUTPUTS ARE NOT DESIGNED FOR AC VOLTAGE OPERATION.

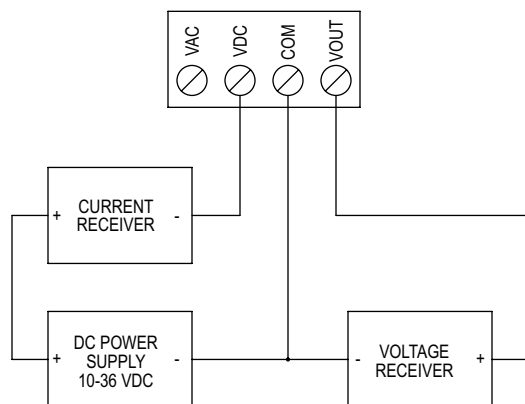


Figure 4: Simultaneous current and voltage output wiring

The terminal block is removable and each of the terminals is labeled underneath the terminal block on the circuit board. Positive polarity is indicated by VOUT. The VDC terminal and a DC power supply must be used for simultaneous current and voltage output. The voltage output and the power supply must have separate wire leads that are only joined at terminal 2 of the transmitter. Additional error may occur for the voltage output if a single wire is used or if the wires are joined at the power supply or receiver.

For the current output, the maximum allowable loop resistance (wiring + receiver resistance) is dependent on the power supply. The maximum loop voltage drop must not reduce the transmitter voltage below 17 V. The maximum loop resistance (R_{MAX}) for a given power supply voltage (V_{PS}) can be calculated using the following equation:

$$R_{MAX} = \frac{(V_{PS} - 17.0)}{20 \text{ mA DC}}$$

The equation uses 17.0 instead of 10.0 as seen in the equation earlier with Figure 1. This represents the minimum voltage supply which is higher on the simultaneous output configuration due to the requirements of the voltage outputs.

Shielded 4-wire cable is recommended for control loop wiring. Ground the shield at the power supply end only. Should the polarity of the transmitter or receiver be inadvertently reversed, the unit will not function properly, but no damage will be done to the transmitter.

For voltage outputs, the minimum receiver load is 1 k Ω . The resistance due to the wire should be low compared to the receiver load resistance. While the voltage at the terminal block remains unchanged with a 10 mA current flow, resistive losses in the wiring do cause errors in the voltage delivered to the receiver. For a 1% accurate gage, the resistance of the wires should be less than 0.1% of the value of the receiver load resistance. This will keep the error caused by the current flow below 0.1%.

The output across VOUT and COM will be either 0-5 V or 0-10 V depending on the DIP switch setting. See **DIP Switch Settings Section** for more information.

Power Supply

Refer to the following tables for the required supply rating.

Current Output	
Supply Voltage	10-36 VDC
Loop Resistance	0-1050 Ω

Voltage Output	
Supply Voltage	17-36 VDC
	21.6 to 33 VAC isolated
Minimum Output Load Resistance	1000 Ω

DIP SWITCH SETTINGS

DIP switch settings are marked directly on the PCBA as shown in Figure 5. Switches are factory-set, based on the order configuration. You can also use a small screwdriver or pen to change the position of the switches.

NOTICE

Figure 5 is a depiction of a 5 in w.c. pressure board. Other pressure boards, while similar, will vary from the below.

WARNING

There are no hazardous voltages if supplied power is within the specified range. However, it is a good idea to shut control systems down while changing DIP switches to prevent erratic control system behavior.



Figure 5: 5 in w.c. pressure board

Key To DIP Switch Settings

Switches are numbered 1 and 2 beginning on the left.

DIP Switch 1 - Voltage Output Range

Voltage output range can be either 0-10 V or 0-5 V depending on the position of DIP Switch 4.

- When the switch is in the OFF position, the output will be 0-10 V.
- When the switch is in the ON position, the output will be 0-5 V.

DIP Switch 2 - Response Time Selection

DIP Switch 6 toggles to select the desired response time.

- When the switch is in the OFF position, the transmitter response time will be instantaneous.
- When the switch is in the ON position, the response time will be 3 seconds.

CALIBRATION

There is a 3 second delay from the time the zero or span calibration buttons are released until the time that the change in calibration takes place. This delay is used to prevent stress related offsets on the lower ranges.

Zero Calibration

The zero calibration can be set by applying zero pressure to both of the pressure ports and pressing the zero button for 3 seconds.

Span Calibration

NOTICE

For a positive span, apply pressure to the positive "+" port.

The span calibration function allows the pressure value to be adjusted so that the currently applied pressure is the maximum configured pressure. This will in turn set the maximum analog output at the set pressure. It is recommended that the ZERO function be applied before performing a span. Apply the maximum desired pressure to the device, press and hold span for 3 seconds. The span function will be processed 3 seconds after the span button is released.