



# DPTW Series Differential Pressure Transmitters

## Overview



The ProSense DPTW differential pressure transmitter series is precision engineered for accurate differential or gauge pressure measurement. The wet-wet design uses a silicon based variable capacitance sensor with stainless steel media isolation diaphragms and silicone pressure transmission fluid making it compatible with a wide variety of liquids, gases, and steam applied to both pressure sensing ports. The DPTW series is ideal for industrial, commercial, and OEM process measurement applications including differential, positive, or negative pressures; hydrostatic liquid level in pressurized or open tanks; and flow measurement using primary differential pressure flow elements such as an annular pitot tube, orifice plate or venturi tube. The DPTW series is available in pressure measurement ranges from 4 inches water column up to 400 inches water column with static (line) proof pressure of 300 psig and can easily be rescaled to a different linear pressure range and units of measure using display pushbuttons. An integral square root function also allows for the display and output of flow in instantaneous flow rate units of measure such as gallons/minute or display of integrated flow volume in units such as gallons. The integral pressure port manifold has 1/4-inch NPT female process pressure connections and includes a built-in equalizing valve used to open both ports to the line pressure during installation to prevent sensor damage or calibration shift due to overpressure. The DPTW series is powered with nominal 24VDC power and provides a two-wire, 4-20mA output signal proportional to the measured pressure. The very compact design of the DPTW series is up to 8-times smaller than conventional style DP transmitters and features a rugged NEMA 4X (IP65) rated aluminum die cast housing and rotatable 6-digit LCD display with bright LED backlight.

## Features

- Wet-wet design ideal for liquid, gas, and steam measurement of differential, positive, or negative pressures, hydrostatic liquid level, and flow
- Integral pressure port manifold with 1/4 inch female process connections and built-in equalizing valve
- Digital filter function to dampen pulsations and provide a more stable output and display
- Key lock function to prevent unauthorized changes to configuration settings
- Bright backlit 6-digit LCD display
- Scaling function allows display to indicate user defined units of measure
- Internal "pushbutton" configurability allows quick range changes
- "Loop check" function allows unit to output 4-20 mA without applying pressure
- Square root extraction function for display and output of linear flow rate or display of integrated flow volume
- Up to 8X smaller than a conventional style DP transmitter
- Easily rotatable display, 90° increments
- Rugged NEMA 4X (IP65) aluminum die cast housing
- 3 year warranty



## Applications

- Pressurized and non-pressurized tank levels
- Flow measurement (liquid / gas / steam)
- Pollution monitoring equipment
- Filter monitoring
- Pressure across flue gas duct
- Furnace combustion airflow rate
- Pump speed control
- Valve pressure drop monitoring

## DPTW Series Differential Pressure Transmitter

| Part Number                     | Description                                | Measuring Range            | Output | Process Connection                  | Operating Voltage | Wt(lb) | Price    | Drawing Link               |
|---------------------------------|--------------------------------------------|----------------------------|--------|-------------------------------------|-------------------|--------|----------|----------------------------|
| <a href="#"><u>DPTW-4</u></a>   | ProSense differential pressure transmitter | 0 to 4in of water column   | 4-20mA | 1/4in female NPT process connection | 12-32 VDC         | 1.0 lb | \$897.00 | <a href="#"><u>PDF</u></a> |
| <a href="#"><u>DPTW-8</u></a>   |                                            | 0 to 8in of water column   |        |                                     |                   |        | \$897.00 | <a href="#"><u>PDF</u></a> |
| <a href="#"><u>DPTW-20</u></a>  |                                            | 0 to 20in of water column  |        |                                     |                   |        | \$897.00 | <a href="#"><u>PDF</u></a> |
| <a href="#"><u>DPTW-40</u></a>  |                                            | 0 to 40in of water column  |        |                                     |                   |        | \$897.00 | <a href="#"><u>PDF</u></a> |
| <a href="#"><u>DPTW-80</u></a>  |                                            | 0 to 80in of water column  |        |                                     |                   |        | \$897.00 | <a href="#"><u>PDF</u></a> |
| <a href="#"><u>DPTW-200</u></a> |                                            | 0 to 200in of water column |        |                                     |                   |        | \$897.00 | <a href="#"><u>PDF</u></a> |
| <a href="#"><u>DPTW-400</u></a> |                                            | 0 to 400in of water column |        |                                     |                   |        | \$897.00 | <a href="#"><u>PDF</u></a> |



# DPTW Series Differential Pressure Transmitters

| DPTW Series Specifications     |                                                                                                                                                                                                                                   |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Performance Specifications     |                                                                                                                                                                                                                                   |
| Reference Temperature          | 73°F (23°C)                                                                                                                                                                                                                       |
| Accuracy                       | ± 0.50% of span (URL*)<br>Includes the effects of linearity, hysteresis, and repeatability                                                                                                                                        |
| Display Accuracy               | ± 0.5% of span (URL) + 1 digit                                                                                                                                                                                                    |
| Stability                      | ± 0.25% of span (URL)/year                                                                                                                                                                                                        |
| Output Resolution              | 0.1% of span (URL)                                                                                                                                                                                                                |
| Temperature Effects            | Temperature Effects: (–10°C to 60°C) ± 0.03% FS/C°                                                                                                                                                                                |
| Memory                         | Permanently stored in EEPROM nonvolatile memory                                                                                                                                                                                   |
| Environmental Specifications   |                                                                                                                                                                                                                                   |
| Temperature Limits             | Storage: 5°F to 150°F (–15°C to 65°C)<br>Operating: 14°F to 140°F (–10°C to 60°C)<br>Medium: 14°F to 140°F (–10°C to 60°C)**<br>Compensated: 14°F to 140°F (–10°C to 60°C)                                                        |
| Functional Specifications      |                                                                                                                                                                                                                                   |
| Rangeability/Adjustment        | Zero –10% to 110% Span<br>Span –10% to 110% Span<br>(Accuracy and output resolution based upon full scale (URL) value)                                                                                                            |
| Unit of Measure                | inH <sub>2</sub> O (IWC) or User defined                                                                                                                                                                                          |
| Static (Line) Pressure         | Pressure Range: 4 inH <sub>2</sub> O to 400 inH <sub>2</sub> O<br>Proof: 300 psi<br>Burst: 800 psi                                                                                                                                |
| Single Side (Differential)     | Pressure Range: ≤ 8 inH <sub>2</sub> O<br>Proof: 30 psid<br>Burst: 130 psid<br><br>Pressure Range: ≥ 20 inH <sub>2</sub> O<br>Proof: 100 psid<br>Burst: 130 psid                                                                  |
| Static (Line) Pressure Effects | Pressure Range:      Effect:<br>≥ 20 inH <sub>2</sub> O            ± 0.3% Range/100 psi (URL)<br>8 inH <sub>2</sub> O                ± 0.7% Range/100 psi (URL)<br>4 inH <sub>2</sub> O                ± 1.5% Range/100 psi (URL) |
| Response Time                  | 100ms (when Filter Function set to 0)                                                                                                                                                                                             |
| Filter Function                | 0, 2, 4, 8, or 16 seconds                                                                                                                                                                                                         |
| Vibration                      | 5g's 150Hz                                                                                                                                                                                                                        |
| Shock Effect                   | 10g's 16ms                                                                                                                                                                                                                        |
| Electrical Specifications      |                                                                                                                                                                                                                                   |
| Output Signal                  | 4-20 mA (2 Wire)                                                                                                                                                                                                                  |
| Load Impedance                 | 545Ω @ 24VDC (refer to Load Limitations graph)                                                                                                                                                                                    |
| Supply Voltage                 | 12-32 Vdc                                                                                                                                                                                                                         |
| Insulation Resistance          | 50Vdc (>100 MΩ)                                                                                                                                                                                                                   |
| EMC Compliance                 | EMC Directive 2014/30/EU<br>EN 61326-1:2013<br>EN 61326-2-3:2013<br>(EMI Class A/EMS Table 2)                                                                                                                                     |

\* Upper Range Limit (URL)

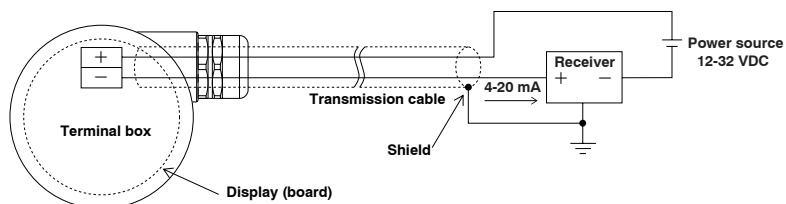
\*\* For steam or other higher temperature processes, ensure that the temperature at the DPTW process connections do not exceed the Medium Temperature Limits. For steam use longer sensing lines and/or a siphon (pigtail) and fill with water to lower the medium temperature to acceptable limits.



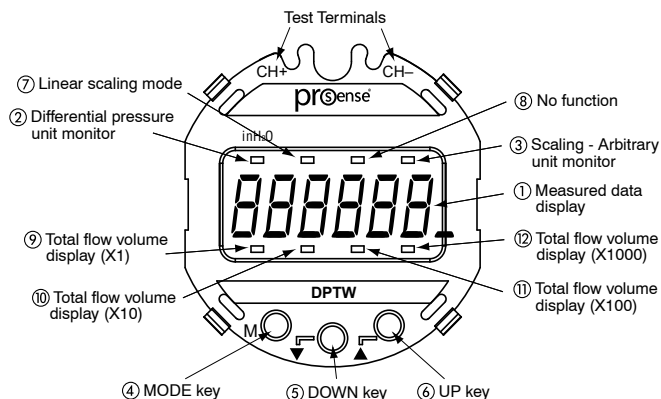
# DPTW Series Differential Pressure Transmitters

| DPTW Series Specifications   |                                                                                                                              |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| Physical Specifications      |                                                                                                                              |
| <b>Environmental Rating</b>  | IP65 / NEMA 4X                                                                                                               |
| <b>Mounting</b>              | Mounting bracket included                                                                                                    |
| <b>Process Connections</b>   | Manifold with 1/4 NPT Female ports and equalizing valve                                                                      |
| <b>Display</b>               | 6-digit LCD with LED backlight, 10mm character height                                                                        |
| <b>Display Update</b>        | 500ms                                                                                                                        |
| <b>Electrical Connection</b> | PG 13.5 Female Preinstalled Cable Gland (Cable diameters 0.35" to 0.47")<br>Terminal block: 14-22 AWG stranded or solid wire |
| Wetted Material              |                                                                                                                              |
| <b>Diaphragm</b>             | 316 SS, Viton® & Alumina Ceramic                                                                                             |
| <b>Process Connection</b>    | 316 SS                                                                                                                       |
| <b>Media Compatibility</b>   | Fluids and gases compatible with 316 SS, Viton® and Alumina Ceramic                                                          |
| Non-Wetted Material          |                                                                                                                              |
| <b>Enclosure</b>             | Aluminum, epoxy coated                                                                                                       |

## Wiring



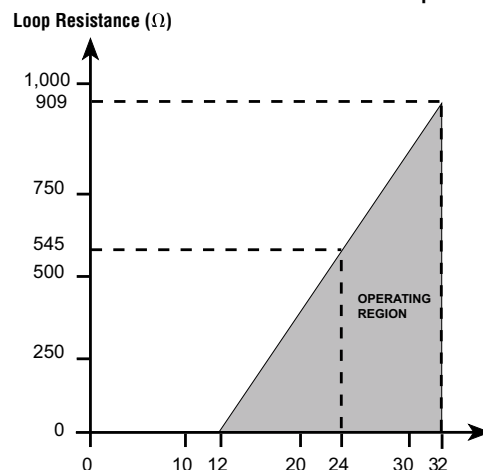
## Display and Keypad



| DESIGNATION                          | FUNCTION                                                                                                                           |
|--------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| ① Measured data display              | Differential pressure, linear scaling value are displayed.                                                                         |
| ② Differential pressure unit monitor | When this unit monitor is ON, the differential pressure (inH <sub>2</sub> O) is indicated on the measured data display.            |
| ③ Scaling; arbitrary unit monitor    | When this unit monitor is ON, the scaling value of an arbitrary unit (linear scaling), is indicated on the measured data display.  |
| ④ MODE key (M)                       | This key is used to switch the setting mode and the measurement mode and to change the setting item.                               |
| ⑤ DOWN key                           | This key is used to change (decrease) and select the set value.                                                                    |
| ⑥ UP key                             | This key is used to change (increase) and select the set value and to shift from the measurement mode to the zero adjustment mode. |

| DESIGNATION                      | FUNCTION                                                 |
|----------------------------------|----------------------------------------------------------|
| ⑦ Linear scaling mode            | Used to adjust zero/span values to 4-20mA output signal. |
| ⑧ No function                    | None                                                     |
| ⑨ to ⑫ Total flow volume display | Display multiplier, X1, X10, X100, X1000                 |

## Load Limitations 4–20mA Output



LOOP SUPPLY VOLTAGE

$$V_{min} = 12V + [0.022A \cdot (R_L)]$$

(Includes a 10% safety factor)

$$R_L = R_S + R_W$$

$$R_L = \text{Loop Resistance (ohms)}$$

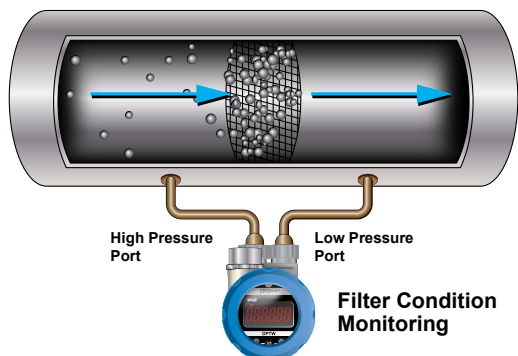
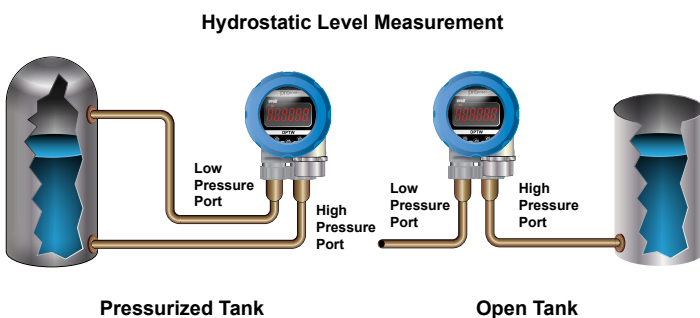
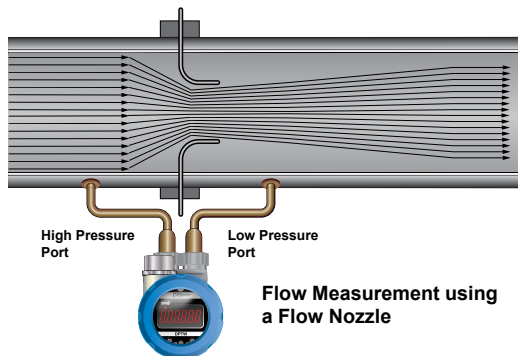
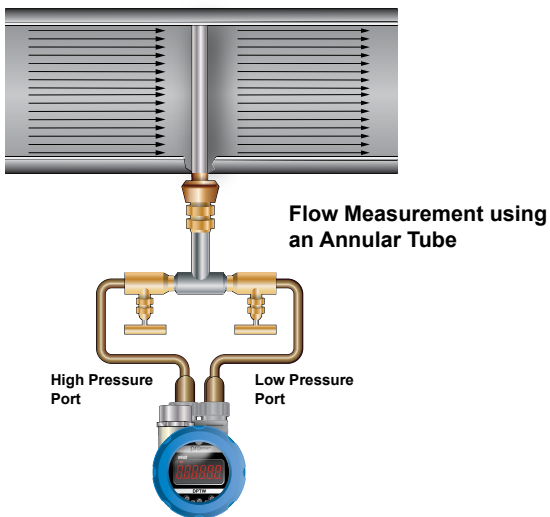
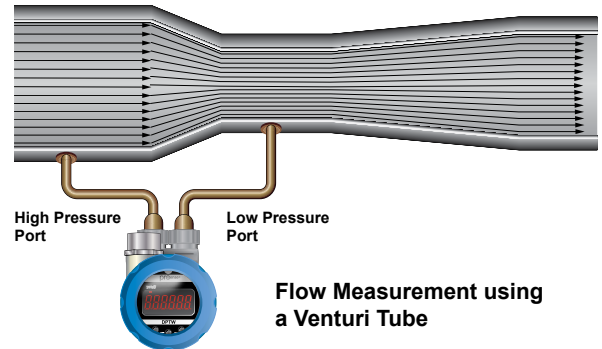
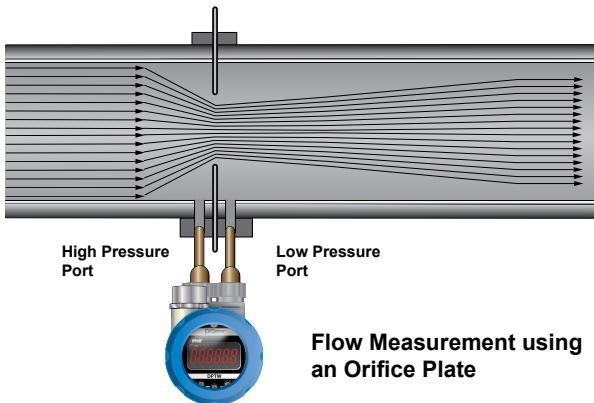
$$R_S = \text{Sense Resistance (ohms)}$$

$$R_W = \text{Wire Resistance (ohms)}$$



# DPTW Series Differential Pressure Transmitters

## Application Examples



Click on the thumbnail or go to <https://www.automationdirect.com/VID-PR-0006> for a short video on the DPTW ProSense Differential Pressure Transmitters

