

# proSense™ PTD25 Series Pressure Transmitters

Automation Direct



## Features

The pressure sensor detects the system pressure and converts it into an analog output signal.

- Ceramic sensing element provides high burst/overpressure protection
- Output options: 4-20 mA or 0-10 V
- Analog output via 4-pin Micro DC connector
- Flexible film circuit results in excellent shock and vibration resistance
- Robust stainless steel housing

## Agency Approvals

- cULus File number E320431
- CE
- RoHS



**NOTE: CHECK THE CHEMICAL COMPATIBILITY OF THE SENSOR'S WETTED PARTS WITH THE MEDIUM TO BE MEASURED. FOR GASEOUS MEDIA, LIMIT THE PROCESS PRESSURE TO 363 PSI (25 BAR) MAXIMUM.**

## ProSense Series Pressure Transmitters

| Part Number      | Description  | Pcs/Pkg | Wt(lb) | Cable Assemblies  |
|------------------|--|---------|--------|---|
| PTD25-10-VH      | Vacuum transmitter, 10 to 0 V output, -14.5 to 0 psi range vacuum, 1/4" NPT male port  | 1       | 0.48   | CD12L-0B-020-A0<br>CD12L-0B-020-C0<br>CD12M-0B-070-A1<br>CD12M-0B-070-C1<br><br>(order separately - see page 18-64 for specs) |
| PTD25-10-0100WCH | Pressure transmitter, 0 to 10 V output, 0 to 100 inches wc* range, 1/4" NPT male port  | 1       | 0.48   |   |
| PTD25-10-0015H   | Pressure transmitter, 0 to 10 V output, 0 to 15 psi range, 1/4" NPT male port          | 1       | 0.48   |   |
| PTD25-10-0030H   | Pressure transmitter, 0 to 10 V output, 0 to 30 psi range, 1/4" NPT male port          | 1       | 0.48   |   |
| PTD25-10-0100H   | Pressure transmitter, 0 to 10 V output, 0 to 100 psi range, 1/4" NPT male port         | 1       | 0.48   |   |
| PTD25-10-0200H   | Pressure transmitter, 0 to 10 V output, 0 to 200 psi range, 1/4" NPT male port         | 1       | 0.48   |   |
| PTD25-10-0500H   | Pressure transmitter, 0 to 10 V output, 0 to 500 psi range, 1/4" NPT male port         | 1       | 0.48   |   |
| PTD25-10-1000H   | Pressure transmitter, 0 to 10 V output, 0 to 1000 psi range, 1/4" NPT male port        | 1       | 0.48   |   |
| PTD25-10-3000H   | Pressure transmitter, 0 to 10 V output, 0 to 3000 psi range, 1/4" NPT male port        | 1       | 0.48   |   |
| PTD25-20-VH      | Vacuum transmitter, 20 to 4 mA output, -14.5 to 0 psi range vacuum, 1/4" NPT male port | 1       | 0.48   |   |
| PTD25-20-0100WCH | Pressure transmitter, 4 to 20mA output, 0 to 100 inches wc* range, 1/4" NPT male port  | 1       | 0.48   |   |
| PTD25-20-0015H   | Pressure transmitter, 4 to 20 mA output, 0 to 15 psi range, 1/4" NPT male port         | 1       | 0.48   |   |
| PTD25-20-0030H   | Pressure transmitter, 4 to 20 mA output, 0 to 30 psi range, 1/4" NPT male port         | 1       | 0.48   |   |
| PTD25-20-0100H   | Pressure transmitter, 4 to 20 mA output, 0 to 100 psi range, 1/4" NPT male port        | 1       | 0.48   |   |
| PTD25-20-0200H   | Pressure transmitter, 4 to 20 mA output, 0 to 200 psi range, 1/4" NPT male port        | 1       | 0.48   |   |
| PTD25-20-0500H   | Pressure transmitter, 4 to 20 mA output, 0 to 500 psi range, 1/4" NPT male port        | 1       | 0.48   |   |
| PTD25-20-1000H   | Pressure transmitter, 4 to 20 mA output, 0 to 1000 psi range, 1/4" NPT male port       | 1       | 0.48   |   |
| PTD25-20-3000H   | Pressure transmitter, 4 to 20 mA output, 0 to 3000 psi range, 1/4" NPT male port       | 1       | 0.48   |   |

## ProSense PTD25 Series General Specifications

\*wc = water column

|                                  |  |
|----------------------------------|--|
| <b>Housing Material</b>          | Stainless steel (316S12); FPM (Viton); PA; EPDM/X (Santoprene)     |
| <b>Materials (wetted parts)</b>  | Stainless steel (303S22); ceramics; FPM (Viton)                    |
| <b>Operating Temperature</b>     | -13 to 176°F (-25 to 80°C)   |
| <b>Medium Temperature</b>        | -13 to 194°F (-25 to 90°C)   |
| <b>Storage Temperature</b>       | -40 to 212°F (-40 to 100°C)  |
| <b>Protection</b>                | IP 68 / IP 69K (Units with pressure range 1000 PSI and higher)     |
| <b>Protection</b>                | IP 65 (Units with pressure range 500 PSI and lower)                |
| <b>Protection Class</b>          | III  |
| <b>Accuracy</b>                  | < ± 0.75% of full range  |
| <b>Repeatability</b>             | < ± 0.15% of full range  |
| <b>Insulation Resistance</b>     | > 100 MΩ: (500 V DC)   |
| <b>Shock Resistance</b>          | 50g (DIN / IEC 68-2-27, 11ms)                                      |
| <b>Vibration Resistance</b>      | 20g (DIN / IEC 68-2-6, 10 - 2000 Hz)                               |
| <b>EMC (PTD25-10-xxxxx)</b>      |  |
| <b>EN 61000-4-2 ESD</b>          | 4 kV/8 kV AD   |
| <b>EN 61000-4-3 HF Radiated</b>  | 30 V/m   |
| <b>EN 61000-4-4 Burst</b>        | 2 kV   |
| <b>EN 61000-4-6 HF Conducted</b> | 10 V   |
| <b>EMC (PTD25-20-xxxxx)</b>      |  |
| <b>EN 61000-4-2 ESD</b>          | 4 kV/8 kV AD   |
| <b>EN 61000-4-3 HF Radiated</b>  | 30 V/m   |
| <b>EN 61000-4-4 Burst</b>        | 2 kV   |
| <b>EN 61000-4-6 HF Conducted</b> | 10 V   |
| <b>Radiation of Interference</b> | 2004/104/EC / CISPR25, according to the road vehicle guideline     |
| <b>Noise Immunity</b>            | 2004/104/EC / ISO 11452-2, according to the road vehicle guideline |
| <b>HF Conducted</b>              | 100 V/m  |
| <b>Pulse Resistance</b>          | According to ISO7637-2: Severity level 3                           |

PLC Overview

DL05/06 PLC

DL105 PLC

DL205 PLC

DL305 PLC

DL405 PLC

Field I/O

Software

C-more HMIs

Other HMI

AC Drives

Motors

Steppers/Servos

Motor Controls

Proximity Sensors

Photo Sensors

Limit Switches

Encoders

Current Sensors

Pushbuttons/Lights

Process

Relays/Timers

Comm.

TB's & Wiring

Power

Circuit Protection

Enclosures

Appendix

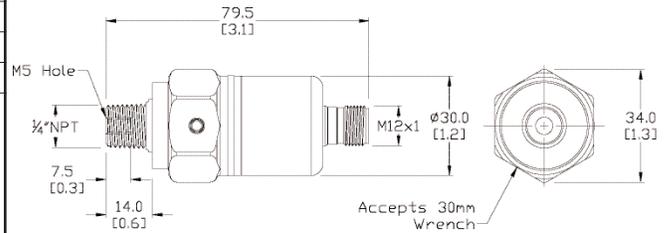
Part Index

| ProSense PTD25 Series Technical Specifications                                       |  |
|--|--|
| Technical Specifications PTD25-10-xxxx   |  |
| Operating Voltage PTD25-10-xxxx  | 16 to 32 VDC <sup>1</sup>  |
| Current Consumption  | < 18 mA  |
| Analog Output  | 0 to 10 V (min/max 0 to 10.5V)   |
| Minimum Load   | 2000 Ω   |
| Step Response Time Analog Output   | 3 ms   |
| Technical Specifications PTD25-20-xxxx   |  |
| Operating Voltage PTD25-20-xxxx  | 9.6 to 32 VDC  |
| Analog Output  | 4 to 20 mA (min/max 3.85 to 22 mA)   |
| Maximum Load   | [(supply voltage - 9.6) x 50]Ω. For example:<br>[(24 VDC - 9.6) x 50] = 720Ω |
| Step Response Time Analog Output   | 3 ms   |
| Characteristics Deviation (in % of full range)*                                      |  |
| PTD25-xx-3000H   | < ± 0.35 (BFSL) / < ± 0.75 (FR)  |
| PTD25-xx-1000H   | < ± 0.35 (BFSL) / < ± 0.75 (FR)  |
| PTD25-xx-0500H   | < ± 0.35 (BFSL) / < ± 0.75 (FR)  |
| PTD25-xx-0200H   | < ± 0.35 (BFSL) / < ± 0.75 (FR)  |
| PTD25-xx-0100H   | < ± 0.35 (BFSL) / < ± 0.75 (FR)  |
| PTD25-xx-0030H   | < ± 0.35 (BFSL) / < ± 0.75 (FR)  |
| PTD25-xx-0015H   | < ± 0.25 (BFSL) / < ± 0.5 (FR)   |
| PTD25-xx-0100WCH   | < ± 0.35 (BFSL) / < ± 0.75 (FR)  |
| PTD25-xx-VH  | < ± 0.25 (BFSL) / < ± 0.5 (FR)   |
| Repeatability (in % of full range)   |  |
| PTD25-xx-3000H   | < 0.15   |
| PTD25-xx-1000H   | < 0.15   |
| PTD25-xx-0500H   | < 0.15   |
| PTD25-xx-0200H   | < 0.15   |
| PTD25-xx-0100H   | < 0.15   |
| PTD25-xx-0030H   | < 0.15   |
| PTD25-xx-0015H   | < 0.1  |
| PTD25-xx-0100WCH   | < 0.15   |
| PTD25-xx-VH  | < 0.1  |
| Temperature Coefficients (TEMPCO)<br>Greatest TEMPCO of the zero point of full range |  |
| PTD25-xx-3000H   | Temperature range 0 to 80°C (-13 to 176°F) [in % of full range/10°C(50°F)]   |
| PTD25-xx-1000H   | 0.2 / 0.3  |
| PTD25-xx-0500H   | 0.2 / 0.3  |
| PTD25-xx-0200H   | 0.15 / 0.2   |
| PTD25-xx-0100H   | 0.15 / 0.2   |
| PTD25-xx-0030H   | 0.2 / 0.3  |
| PTD25-xx-0015H   | 0.15 / 0.2   |
| PTD25-xx-0100WCH   | 0.2 / 0.3  |
| PTD25-xx-VH  | 0.15 / 0.2   |
| <sup>1)</sup> per EN50178, SELV, PELV  |  |
| *Note: BFSL = Best Fit Straight Line / FR = Full Range                               |  |

| Applications<br>(Type of Pressure: Relative Pressure, Liquids and Gases) |                     |                               |                    |
|--|---------------------|-------------------------------|--------------------|
| Part Number  | Measuring Range     | Permissible Overload Pressure | Bursting Pressure  |
|  | PSI                 | PSI                           | PSI                |
| PTD25-10-3000H<br>PTD25-20-3000H   | 0 to 3000           | 5800                          | 12300              |
| PTD25-10-1000H<br>PTD25-20-1000H   | 0 to 1000           | 4350                          | 9400               |
| PTD25-10-0500H<br>PTD25-20-0500H   | 0 to 500            | 2175                          | 5075               |
| PTD25-10-0200H<br>PTD25-20-0200H   | 0 to 200            | 1087                          | 2175               |
| PTD25-10-0100H<br>PTD25-20-0100H   | 0 to 100            | 1087                          | 2175               |
| PTD25-10-0030H<br>PTD25-20-0030H   | 0 to 30             | 290                           | 725                |
| PTD25-10-0015H<br>PTD25-20-0015H   | 0 to 15             | 145                           | 450                |
| PTD25-10-VH<br>PTD25-20-VH   | -14.5 to 0 (vacuum) | 145                           | 450                |
|  | inH <sub>2</sub> O  | inH <sub>2</sub> O            | inH <sub>2</sub> O |
| PTD25-10-0100WCH<br>PTD25-20-0100WCH                                     | 0 to 100            | 4015                          | 12043              |

inH<sub>2</sub>O = Inches of Water (represents Water Column)

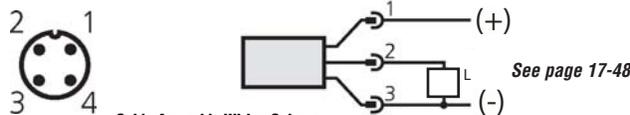
## Dimensions



Note: tightening torque 25 Nm (18.4 lb-ft)

Dimensions shown mm [inches]

## PTD25-10 Wiring Diagrams



Cable Assembly Wiring Colors:  
Pin 1 - Brown  
Pin 2 - White  
Pin 3 - Blue  
Pin 4 - Black

Note: wiring colors are based on AutomationDirect CD12L and CD12M 4-pole cable assemblies.

## PTD25-20 Wiring Diagrams



Cable Assembly Wiring Colors:  
Pin 1 - Brown  
Pin 2 - White  
Pin 3 - Blue  
Pin 4 - Black

See page 17-48



**WARNING! AVOID STATIC AND DYNAMIC OVERPRESSURE EXCEEDING THE GIVEN OVERLOAD PRESSURE. EXCEEDING THE BURSTING PRESSURE FOR EVEN A SHORT TIME CAN CAUSE DESTRUCTION OF THE UNIT AND POSSIBLE INJURIES!**

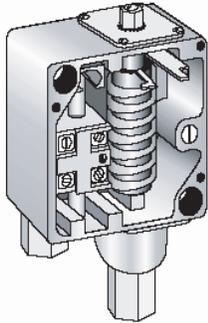
## Pressure Units Conversion Chart

| Pressure Conversion Table: Multiplication Factors |                              |                            |                            |                            |                              |                            |                           |                           |                          |                          |
|---|------------------------------|----------------------------|----------------------------|----------------------------|------------------------------|----------------------------|---------------------------|---------------------------|--------------------------|--------------------------|
| Desired Units                                     | Known Units                  |                            |                            |                            |                              |                            |                           |                           |                          |                          |
|   |                              | Atmos                      | Bars                       | In of Hg (0°C)             | In of H <sub>2</sub> O (4°C) | K grams/meter <sup>2</sup> | Lb/in <sup>2</sup> (psi)  | Lb/ft <sup>2</sup>        | mm of Hg torr            | Pascals                  |
|   | Atmos                        | 1                          | 9.86923 x 10 <sup>-1</sup> | 3.34207 x 10 <sup>-2</sup> | 2.458 x 10 <sup>-3</sup>     | 9.678 x 10 <sup>-5</sup>   | 0.068046                  | 4.7254 x 10 <sup>-4</sup> | 1.316 x 10 <sup>-3</sup> | 9.869 x 10 <sup>-6</sup> |
|   | Bars                         | 1.01325                    | 1                          | 3.3864 x 10 <sup>-2</sup>  | 2.491 x 10 <sup>-3</sup>     | 9.8067 x 10 <sup>-5</sup>  | 6.8948 x 10 <sup>-2</sup> | 4.788 x 10 <sup>-4</sup>  | 1.333 x 10 <sup>-3</sup> | 10 <sup>-5</sup>         |
|   | In of Hg (0°C)               | 29.9213                    | 29.53                      | 1                          | 7.355 x 10 <sup>-2</sup>     | 2.896 x 10 <sup>-3</sup>   | 2.036                     | 0.014139                  | 3.937 x 10 <sup>-2</sup> | 2.953 x 10 <sup>-4</sup> |
|   | In of H <sub>2</sub> O (4°C) | 406.8                      | 401.46                     | 13.60                      | 1                            | 3.937 x 10 <sup>-2</sup>   | 27.68                     | 0.1922                    | 0.5354                   | 4.014 x 10 <sup>-3</sup> |
|   | K grams/meter <sup>2</sup>   | 1.033227 x 10 <sup>4</sup> | 1.0197 x 10 <sup>4</sup>   | 345.3                      | 25.40                        | 1                          | 7.0306 x 10 <sup>2</sup>  | 4.882                     | 13.59                    | 1.019 x 10 <sup>-1</sup> |
|   | Lb/in <sup>2</sup> (psi)     | 14.695595                  | 14.504                     | 0.4912                     | 3.6126 x 10 <sup>-2</sup>    | 1.423 x 10 <sup>-3</sup>   | 1                         | 6.9444 x 10 <sup>-3</sup> | 1.934 x 10 <sup>-2</sup> | 1.450 x 10 <sup>-4</sup> |
|   | Lb/ft <sup>2</sup>           | 2116.22                    | 2088.5                     | 70.726                     | 5.202                        | 0.2048                     | 144.0                     | 1                         | 2.7844                   | 2.089 x 10 <sup>-2</sup> |
|   | mm of Hg torr                | 760                        | 750.06                     | 25.400                     | 1.868                        | 7.3558 x 10 <sup>-2</sup>  | 51.715                    | 0.35913                   | 1                        | 7.502 x 10 <sup>-3</sup> |
| Pascals   | 1.01325 x 10 <sup>5</sup>    | 1 x 10 <sup>5</sup>        | 3.386 x 10 <sup>3</sup>    | 2.491 x 10 <sup>2</sup>    | 9.8067                       | 6.8948 x 10 <sup>3</sup>   | 4.788 x 10 <sup>1</sup>   | 1.333 x 10 <sup>2</sup>   | 1                        |                          |

*Example: To convert from 50 psi to "In of H<sub>2</sub>O", (50 psi) (27.68) = 1384 In of H<sub>2</sub>O*

# proSense™ Pressure Sensors (Transmitters and switches)

## Overview



**Problem**  
Mechanical pressure switches with pistons and springs that wear



**Solution**  
Electronic pressure switches with no moving parts

ProSense pressure sensors are designed to monitor system pressure in hydraulic and pneumatic applications. Vacuum sensors provide an accurate readout of increases and decreases in vacuum systems. With no moving parts such as pistons or springs that can stick or break, ProSense pressure and vacuum sensors are a solid-state solution to mechanical switches. These sensors are smaller and easier to install than traditional mechanical pressure switches. This is due to flexible film circuitry that enables the system components to be mounted on flexible film rather than a rigid circuit board. The film is then rolled and placed inside a compact, stainless steel housing. ProSense offers pressure sensing solutions using capacitive sensing technology and strain gauge technology. The capacitive sensing technology sensors incorporate the same ceramic pressure measuring cell sensing technology found in high accuracy pressure transmitters. These sensors have a quick disconnect M12 connector with 4 pins and use the AutomationDirect M12 cables.

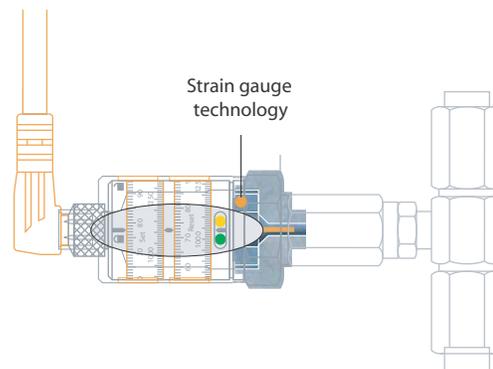
## Pressure and Vacuum Transmitters

The compact PTD Series pressure and vacuum transmitters provide an analog output for reliable pressure indication. The transmitters offer quick installation and easy setup. Pressure transmitter ranges up to 3000 psi are available with output options of 4 to 20 mA or 0 to 10 Volts. Vacuum-style transmitters offer 20 to 4mA or 10 to 0 Volt outputs from -14.5 to 0 psi.



## Pressure Switches using Strain Gauge Technology

The PSD series electronic pressure switch is an ideal alternative to mechanical piston pressure switches. The PSD sensor features a gas-tight measuring cell that reliably detects gas and liquid pressure. The switch withstands aggressive media and detects pressure ranges up to 5800 psi (400 bar). The use of thick-film strain gauge technology results in a one-piece welded measuring cell capable of over 50 million switching cycles. The strain gauge and the measuring diaphragm detect the strain created by pressure changes through a Wheatstone bridge. The strain is proportional to the applied pressure. Mechanical adjustment dials rotate quickly to establish the setpoint and reset point. The sensor is adjustable without system pressure and supply voltage and does not require calibration. The sensor's high accuracy and long-term stability ensure the setpoint does not drift.

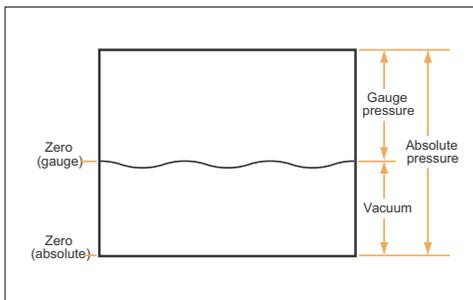


- PLC Overview
- DL05/06 PLC
- DL105 PLC
- DL205 PLC
- DL305 PLC
- DL405 PLC
- Field I/O
- Software
- C-more HMIs
- Other HMI
- AC Drives
- Motors
- Steppers/ Servos
- Motor Controls
- Proximity Sensors
- Photo Sensors
- Limit Switches
- Encoders
- Current Sensors**
- Pushbuttons/ Lights
- Process
- Relays/ Timers
- Comm.
- TB's & Wiring
- Power
- Circuit Protection
- Enclosures
- Appendix
- Part Index

# proSense™ Pressure Sensors

## Absolute, Gauge and Vacuum Scales

Atmospheric pressure is the air pressure exerted upon the earth. It is approximately 14.7 psi at sea level and decreases as elevation increases. The gauge pressure scale uses atmospheric pressure as the zero point and extends in the positive direction. ProSense pressure sensors use the gauge pressure scale. Models rated to 400 psi (25 bar) or less have a vent that allows the zero point to change as atmospheric pressure changes. This allows the sensor to stay within the accuracy specifications. Models rated above 400 psi (25 bar) are sealed to local atmospheric pressure at the



manufacturing site when they are assembled. The pressure ranges for these models are large enough that changes in atmospheric pressure will not affect the accuracy specifications. The vacuum scale ranges from absolute zero pressure to atmospheric pressure. The absolute zero pressure point, which is also called total vacuum, represents a total lack of pressure. ProSense vacuum sensors require the switch setpoint to always be at a higher pressure (lower vacuum) than the resetpoint. The absolute pressure scale also uses the absolute zero pressure point as its base line or zero point. Its range extends through the vacuum scale into positive pressure. **AutomationDirect does not offer pressure sensors that measure absolute or differential pressure.**

## Adjustable Hysteresis (pressure switches only)

Hysteresis is the difference between the setpoint and the reset point. The setpoint and reset point can be established individually at almost any value within the operating range, as long as the minimum hysteresis value of the sensor is met (the minimum hysteresis value is normally 2% of the operating range). For

example, a normally open switch with a setpoint of 70% of range and a reset point of 20% of range has a hysteresis of 50% of the range. The setpoint and the reset point are set using the two rings on the switch.

The example below shows a hysteresis mode, normally open and normally closed sensor with SP = 70%, RP = 20%.

