PPS02T Titanium Pressure Sensor Element — Ø12 mm

Media-isolated piezoresistive sensing for harsh and corrosive environments



FEATURES

- Titanium housing and diaphragm on all wetted metal
- Silicon piezoresistive MEMS die, isolated by silicone oil
- Nonlinearity ±0.2% FS typical (BFSL)
- Pressure ranges from 500 to 10,000 PSI, sealed gauge
- Constant-current (1.5 mA) or constant-voltage (10 V) excitation
- Operating temperature -40 °C to +125 °C
- Rated to 100 g shock and 20 g vibration
- Compact Ø12 mm body · 6 Kovar pins or 4 wire leads
- Uncompensated or temperature-compensated versions

DESCRIPTION

The PPS02T is a media-isolated titanium pressure sensor element for high-accuracy measurement in harsh or corrosive environments. Its titanium housing and diaphragm give high strength for their weight, strong corrosion resistance and long-term stability from -40 °C to 125 °C.

A piezoresistive MEMS sensing die sits in silicone oil behind the titanium diaphragm, so it never touches the process media. The compact 12 mm body integrates directly into OEM assemblies. Custom configurations are available on request.

APPLICATIONS

- Process control systems
- Pressure calibration instruments
- Refrigeration equipment and HVAC control
- Hydraulic systems and valves
- Level measurement
- Biomedical instruments
- Ships and navigation
- Aircraft and avionics systems
- Weaponry

MAXIMUM ENVIRONMENTAL RATINGS

Operating Temperature	**-40 to 125 °C · -40–257 °F**	Proof Pressure	**1.5× full scale**
Storage Temperature	**-40 to 125 °C · -40–257 °F**	Burst Pressure	**2× full scale**
Compensated Temperature	**-10 to 70 °C · 14–158 °F**	Vibration	**20 g (20–5,000 Hz)**
Service Life	**1 × 10⁶ cycles**	Shock	**100 g (10 ms)**

Electrical & performance specifications

PARAMETER	CONDITION	MIN	TYP	MAX	UNITS
Excitation — constant current	Iexc	—	1.5	—	mA
Excitation — constant voltage	Vexc	—	10	—	VDC
Input impedance	Constant current	2.0	—	5.0	kΩ
Input impedance	Constant voltage	3	—	18	kΩ
Full-scale output	1.5 mA	60	90	150	mV
Full-scale output	10 V	80	100	120	mV
Zero offset output	Vzero	−2	±1	+2	mV
Nonlinearity (BFSL)	Note 1	−0.3	±0.2	+0.3	%FS
Hysteresis	—	−0.05	±0.03	+0.05	%FS
Repeatability	—	−0.05	±0.03	+0.05	%FS
Zero temperature drift	Note 2	−1.5	±0.75	+1.5	%FS
Sensitivity temperature drift	Note 2	−1.5	±1.0	+1.5	%FS
Thermal hysteresis	Note 3	−0.075	±0.05	+0.075	%FS
Long-term stability	—	−0.3	±0.2	+0.3	%FS/yr
Response time	Up to 90% FS	—	—	1	ms
Insulation resistance	@ 250 VDC	200	—	—	MΩ
Operating temperature	—	−40	—	125	°C
Compensated temperature	—	−10	—	70	°C
Pressure range (sealed gauge)	—	500	—	10,000	PSI

Notes: (1) Least-squares best-fit straight line. (2) Across the compensated range of −10 to 70 °C, referenced to 30 °C. (3) Measured on return to the 30 °C reference point after high- and low-temperature exposure.

Electrical connections

PIN	FUNCTION
P1	−IN (excitation −)
P2	+OUT (signal +)
P3	NC (no connection)
P4	+IN (excitation +)
P5	−OUT (signal −)
P6	−IN (excitation −)

WIRING NOTES

P1 and P6 are both −IN; connect either one. Leave P3 unconnected. Pinout shown for the Kovar pin version (K6); the wire-lead version (W4) brings out +IN, −IN, +OUT and −OUT only. Follow the pin assignment exactly, because incorrect wiring can damage the element.

Pin configuration

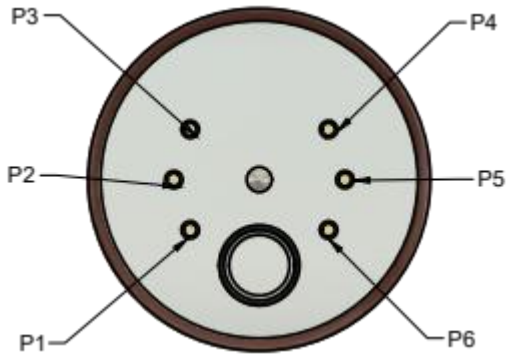


Fig. 1 — Pin layout viewed from the pin side. Gold-plated pins.

Package, media & installation

Package

The PPS02T has a titanium housing and diaphragm for corrosion resistance, biocompatibility and high strength for its weight. The 12 mm body keeps the element compact for OEM integration.

Stability

Precise factory calibration gives excellent long-term stability, low hysteresis and consistent output across a wide operating temperature range.

Pressure connections

Supplied as a standalone element with an O-ring face seal for direct integration, or with a standard pressure port: 1/4"-18 NPT, 1/8"-27 NPT, 7/16"-20 UNF, 9/16"-18 UNF (AN) or 1/4" BSPP. Custom ports are available on request.

Media

Compatible with liquids and gases that don't react with titanium, including hydraulic fluids, refrigerants, saltwater and other corrosive media.

Wetted parts

The titanium diaphragm and housing are the only wetted metals. The element seals with a fluorine rubber (FKM) O-ring. The internal fill is high-purity silicone oil, chosen for thermal stability and media isolation.

Pressure ranges

Available from 500 to 10,000 PSI in sealed gauge. Standard ranges run from 500 to 5,000 PSI. Custom ranges are available for OEM customers.

Excitation

1.5 mA constant-current excitation (code I) is standard and recommended. 10 V constant-voltage excitation (code V) is also available. The element outputs a millivolt bridge signal that needs external amplification and conditioning.

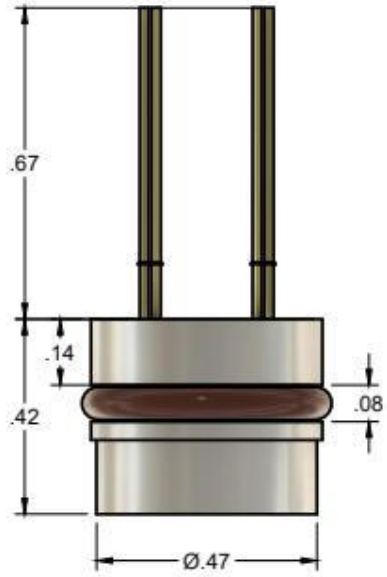
Handling

Never touch the diaphragm with hard objects. Keep system overpressure below the rated proof pressure (1.5× FS), because exceeding it shortens service life or damages the element.

±0.2%	10,000	≤1 ms	Ø12 mm
Typ. nonlinearity FS	Max range PSI	Response time	Titanium body

Mechanical dimensions — inches

Sensor only



Ported versions

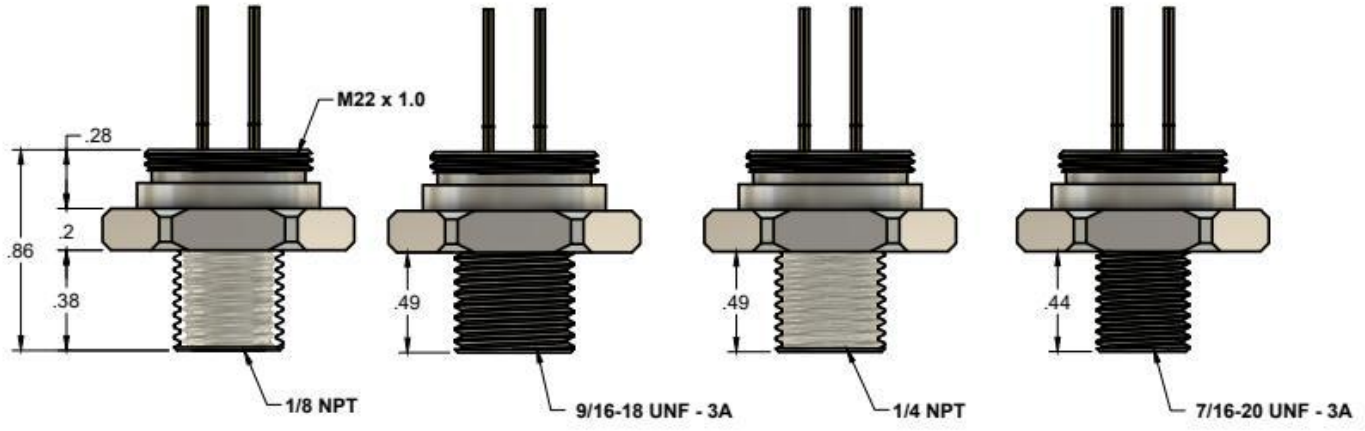


Fig. 2 — Sensor only (top); 1/8"-27 NPT, 9/16"-18 UNF, 1/4"-18 NPT and 7/16"-20 UNF ported versions with M22 × 1.0 mounting thread (bottom).

FEATURE	DETAIL
Housing	Titanium
Diaphragm	Titanium
Fill fluid	Silicone oil
O-ring	Fluorine rubber (FKM)
Electrical	6 gold-plated Kovar pins (K6) or 4 wire leads (W4)
Body diameter	Ø12 mm (Ø0.47 in)

NOTES

1) Dimensions in inches. Tolerances: X.X ±0.15 · X.XX ±0.010 · X.XXX ±0.005.

2) The sensor-only version seals on an O-ring. Do not seal on the diaphragm face.

3) Never touch the diaphragm with hard objects.

4) Contact the factory for custom ports and fittings.

Ordering information — part-number configuration

PPS02T	_	5K	S	2	1	_	K6	_	I
MODEL		RANGE	TYPE	COMP	PORT		ELECTRICAL		EXCITATION

Model	Range (XX)	Type (Y)	Compensation (C)	Port (P)	Electrical (E)	Excitation (X)
PPS02T Ø12 mm, Titanium	500 = 500 PSI 10K = 10,000 PSI	S = Sealed Gauge	1 = Uncompensated 2 = Compensated	S = Sensor Only (No Port) 1 = 1/4"-18 NPT 2 = 1/8"-27 NPT 3 = 7/16"-20 UNF 4 = 9/16"-18 UNF AN 5 = 1/4"-19 BSP C = Custom	K6 = 6 Kovar Pins W4 = 4 Wire Leads	I = 1.5 mA Constant Current V = 10 V Constant Voltage

EXAMPLE PART NUMBERS

PPS02T-5KS21-K6-I → 0–5,000 PSI · sealed gauge · compensated · 1/4" NPT · 6 Kovar pins · 1.5 mA

PPS02T-1KS2S-W4-V → 0–1,000 PSI · sealed gauge · compensated · sensor only · 4 wire leads · 10 V

SPECIFY WITH YOUR ORDER

Custom pressure range · Custom port or fitting · Alternate O-ring material for aggressive media.

Configure your titanium sensor element

Custom ranges, ports and compensation are available for OEM volumes. Talk to an engineer to spec your part.

REQUEST A QUOTE
sales@phoenixsensors.com
(480) 462-1810

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