

PPT71 Low Profile Low Pressure Sensor with O-Ring Seal

Miniature 0.5–4.5 V ratiometric pressure transducer · 10 to 100 PSI sealed gauge



SEALED GAUGE

O-RING SEAL

0.5–4.5 V

DESCRIPTION

The PPT71 is among the smallest pressure transducers on the market, with a wide operating temperature range for the most demanding applications. Phoenix Sensors' patented temperature compensation delivers strong performance across -40 to 125 °C.

A piezoresistive silicon sensor in a stainless steel package gives long-term stability and $\pm 0.15\%$ FS linearity. The O-ring face seal and two-hole flange let OEMs mount the sensor directly against a manifold or housing. Contact us for custom designs.

FEATURES

- -40 to 125 °C operating temperature
- $\pm 0.15\%$ FS non-linearity (BFSL)
- $\pm 1.5\%$ FS total error band
- Analog 0.5–4.5 V output, ratiometric to supply
- 2.8 to 5.5 V supply, <3 mA supply current
- 10, 30, 50 and 100 PSI sealed gauge ranges
- Low-profile 0.55 in body with O-ring face seal
- Two-hole flange mount, 1.25 in centers
- Integrated 3-pin Molex connector
- Media: liquid, air & gas

APPLICATIONS

- Mil / Aero
- Industrial automation
- Automotive engine
- Compressors
- Pneumatics

MAXIMUM ENVIRONMENTAL RATINGS

Operating Temperature	-40 to 125 °C · -40-257 °F
Storage Temperature	-55 to 150 °C · -67-302 °F

Pressure Range	10 to 100 PSI sealed gauge
Max Over Pressure	See range table, page 6

Operational characteristics

$V_+ = 5\text{ V}$, $V_- = 0\text{ V}$, $T = 25\text{ °C}$ unless noted

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS
Supply voltage	V_{DD}	2.8	5.0	5.5	V
Supply current	I_{DD}	—	—	<3	mA
Operating temperature	T_{OP}	-40	—	125	°C
Storage temperature	T_{ST}	-55	—	150	°C
Output voltage (note 1)	V_{OUT}	0.5	—	4.5	V
Total error band (note 2)	TEB	-1.5	±0.75	1.5	%FS
Non-linearity (note 3)	NL	-0.15	—	0.15	%FS
Response time	t_R	5	25	200	ms
Pressure range	—	10	—	100	PSI
Max over pressure	—	Per range — see page 6			PSI

NOTES

1) Analog output is ratiometric to the supply voltage. 2) Total error band includes non-linearity, hysteresis, repeatability and thermal effects; measured from -20 °C to 85 °C. 3) Best straight line (BFSL).

Electrical connections

PIN #	ACTION
1	SUPPLY+
2	SUPPLY-
3	OUTPUT

Mating connector

Molex housing	43645-0308
Molex terminals	43030-0003 (×3)

Connector · pin 1 location

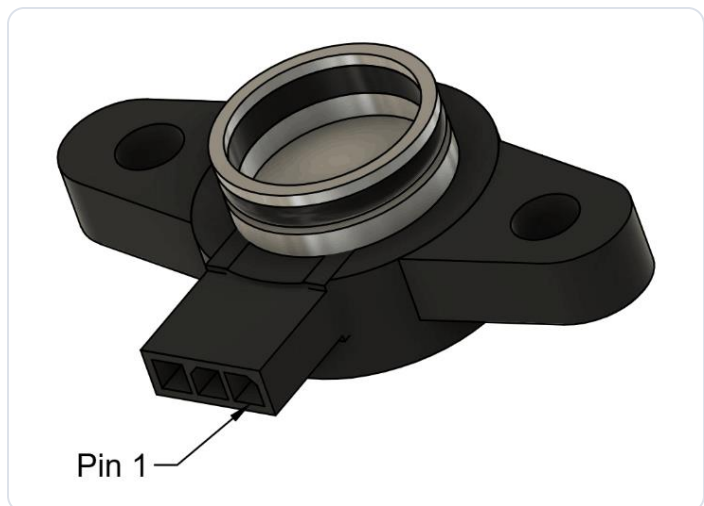


Fig. 1 — Integrated 3-pin connector. Pin 1 (SUPPLY+) as marked.

Application information

Package

A compact, low-profile package only 0.55 in tall, with a stainless steel (SS316L) pressure port. Stainless steel is highly resistant to corrosion and rust, and the simple two-piece design suits high-volume OEM manufacturing.

Mounting

Two Ø0.19 in mounting holes on 1.25 in centers clamp the sensor flange against the mating surface and compress the O-ring. The integrated 3-pin connector exits from the side of the body.

Media

The pressure port is tolerant of most media, including oil, air, gas, salt water and some corrosive media. Verify compatibility with the wetted materials for aggressive media.

Pressure ranges

Standard sealed gauge ranges are 10, 30, 50 and 100 PSI. Custom pressure ranges are available for OEM customers.

Pressure port & seal

The Ø0.625 in pressure port seals against the mating surface with an O-ring, so no threaded fitting is needed. Other port and seal configurations are available for OEM customers.

Stability

The silicon MEMS die has a Pyrex base, is mounted to a ceramic substrate and is sealed into the stainless steel housing. Flexible die-attach materials reduce mechanical stress for greater stability over time and temperature. Every sensor is factory stabilized.

Wetted parts

Stainless steel, Viton and silicon.

Temperature compensation

Phoenix Sensors' patented temperature compensation keeps the output within the total error band across a wide temperature range, without external correction in the host.

±0.15%

Non-linearity FS

0.55 in

Body height

125 °C

Max operating temp

<3 mA

Supply current

Analog output

The PPT71 provides a conditioned, temperature-compensated analog voltage on pin 3. The output is ratiometric: it spans 10% to 90% of the supply voltage, which is 0.5–4.5 V at a 5 V supply. Reading the output with an ADC referenced to the same supply cancels supply variation.

Transfer function

$$V_{OUT} = V_{DD} \times (0.1 + 0.8 \times P / P_{FS})$$

P is applied gauge pressure and P_{FS} is the full-scale range of the part (10, 30, 50 or 100 PSI).

Pressure from output

$$P = P_{FS} \times (V_{OUT} / V_{DD} - 0.1) / 0.8$$

Typical output at $V_{DD} = 5\text{ V}$

% OF FS	10 PSI	100 PSI	V_{OUT}
0%	0	0	0.50 V
25%	2.5	25	1.50 V
50%	5	50	2.50 V
75%	7.5	75	3.50 V
100%	10	100	4.50 V

Ideal values; actual output is within the total error band.

Output vs. supply voltage

SUPPLY V_{DD}	ZERO (0% FS)	FULL SCALE (100% FS)	SPAN
5.0 V (typical)	0.50 V	4.50 V	4.00 V
3.3 V	0.33 V	2.97 V	2.64 V
2.8 V (minimum)	0.28 V	2.52 V	2.24 V

Hookup

PIN # · ACTION	CONNECT TO
1 · SUPPLY+	Supply + (2.8–5.5 V)
2 · SUPPLY-	Supply - / ground
3 · OUTPUT	ADC or meter input

DESIGN NOTES

Reference the ADC to the sensor supply for a ratiometric reading. If the ADC uses a separate fixed reference, measure V_{DD} and apply the transfer function above.

Mechanical dimensions — inches

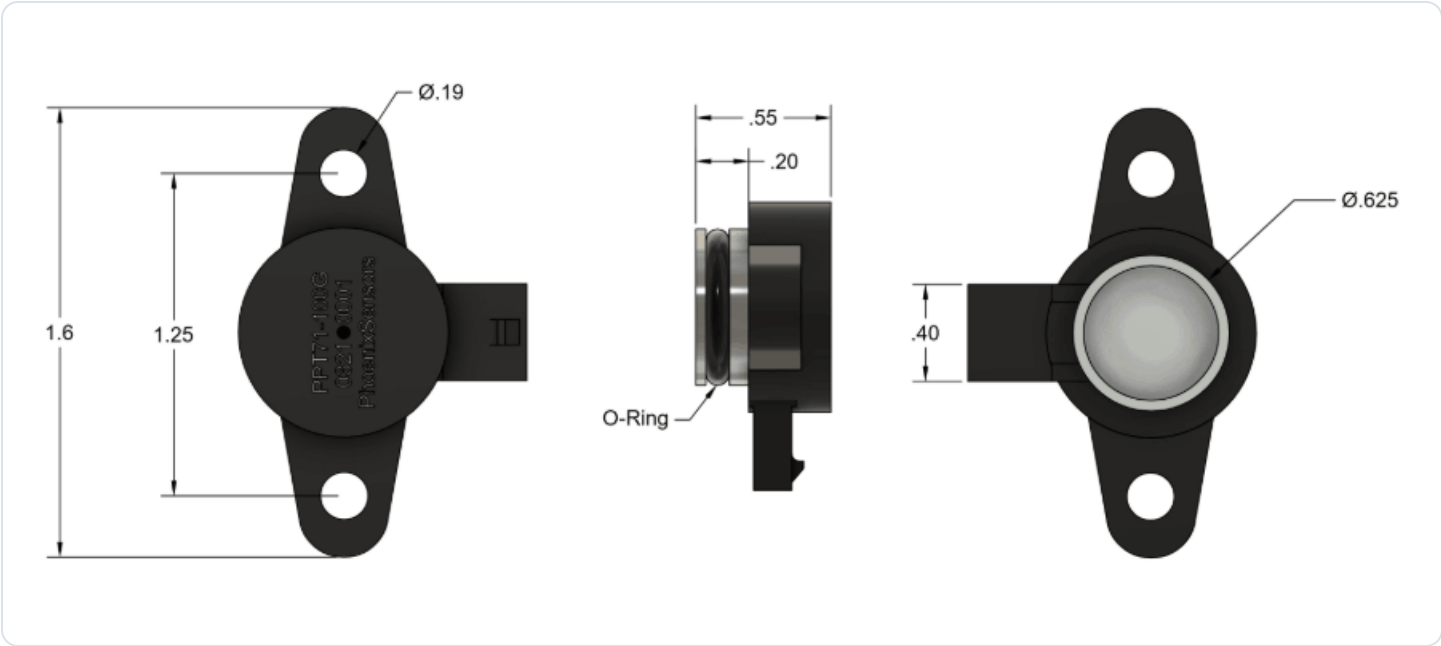


Fig. 2 — Top, side and port views. Drawing PPT71-0-XXS.

Key dimensions

FEATURE	INCHES
Overall length (flange)	1.6
Mounting hole centers	1.25
Mounting hole diameter	Ø 0.19
Pressure port diameter	Ø 0.625
Overall height	0.55
Port / O-ring protrusion	0.20
Connector height	0.40

Construction

Pressure port	Stainless steel, O-ring face seal
O-ring	Viton
Connector	Integrated 3-pin; mates with Molex 43645-0308
Marking	Part number, date code (WWYY) + serial

TOLERANCES (INCHES)

X ± 0.25 · X.X ± 0.15
X.XX ± 0.010 · X.XXX ± 0.005

Ordering information — part-number configuration

PPT71

0

100

S

MODEL

OUTPUT

RANGE

TYPE

Standard part numbers

PART NUMBER	RANGE (PSI)	TYPE	MAX OVER PRESSURE (PSI)
PPT71-0-10S	10	Sealed gauge	30
PPT71-0-30S	30	Sealed gauge	90
PPT71-0-50S	50	Sealed gauge	150
PPT71-0-100S	100	Sealed gauge	250

Code fields

FIELD	CODE
Model	PPT71
Output	0 = 0.5–4.5 V
Pressure range	10, 30, 50, 100 (PSI)
Type	S = Sealed gauge

EXAMPLE

PPT71-0-30S → 0.5–4.5 V output • 0–30 PSI • sealed gauge • O-ring seal

Configure your PPT71

Custom ranges, ports and seals 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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