PPS01P 19mm High Accuracy Oil Filled Pressure Element

Isolated piezoresistive OEM pressure sensor in a Ø19 mm 316L stainless steel housing



FEATURES

Pressure ranges from 0–1 psi to 0–10,000 psi (0–7 kPa to 0–70 MPa)
Gauge, absolute, and sealed gauge references
1.5 mA constant-current excitation · 6 Kovar pins or 4 wire leads
Silicone or fluorocarbon oil fill, isolated construction for broad media compatibility
Ø19 mm standard OEM format
All-316L stainless steel diaphragm and housing
Wide temperature compensation, -10 to 80 °C (14 to 176 °F)
Long-term stability ±0.1% FS/year
±0.15% FS typical non-linearity · response <1 ms

DESCRIPTION

The PPS01P is a silicon piezoresistive pressure element with isolated construction and temperature compensation. A high-reliability diffused silicon die is sealed in a Ø19 mm 316L stainless steel housing, and pressure is transferred to the die through an isolating diaphragm and oil fill.

Precision compensation gives a wide temperature range and zero-point calibration. A fluorocarbon oil fill is available for oxygen-rich service. Every element is inspected and tested on an automated production line for demanding OEM pressure applications.

APPLICATIONS

Industrial process control
Level measurement
Gas and liquid pressure measurement
Pressure gauges and calibrators
Hydraulic systems and pressure switches
HVAC systems
Aviation and navigation test equipment

MAXIMUM ENVIRONMENTAL RATINGS

Operating Temperature	**-40 to 125 °C · -40 to 257 °F**	Vibration	**10 gRMS, 20–2000 Hz**
Storage Temperature	**-40 to 125 °C · -40 to 257 °F**	Shock	**100 g, 11 ms**
Pressure Cycles	**≥10 million**	Wetted Materials	**316L SS · FKM**

Performance specifications

PARAMETER	MIN	TYP	MAX	UNITS	CONDITIONS
Non-linearity (BFSL) [1]	–	±0.15	±0.2	%FS	–
Repeatability	–	±0.03	±0.075	%FS	–
Hysteresis	–	±0.03	±0.075	%FS	–
Zero output	–	±1.0	±2.0	mV DC	–
Span, constant current [2]	70	–	–	mV DC	1.5 mA
Span, constant voltage [3]	5	–	25	mV/V	–
Zero thermal error [4]	–	±0.5	±1.0	%FS	@ 35 °C
Span thermal error	–	±0.5	±1.0	%FS	@ 35 °C
Compensated temperature	0	–	70	°C	≤35 kPa (5 psi)
Compensated temperature	-10	–	80	°C	>35 kPa (5 psi)
Long-term stability	–	±0.15	±0.20	%FS/yr	≤100 kPa (14.5 psi)
Long-term stability	–	±0.10	±0.15	%FS/yr	>100 kPa (14.5 psi)
Zero thermal hysteresis [5]	–	±0.2	–	%FS	≤100 kPa (14.5 psi)
Zero thermal hysteresis [5]	–	±0.15	–	%FS	>100 kPa (14.5 psi)
Insulation resistance [6]	250	–	–	MΩ	@ 250 V DC
Pressure cycle life	10	–	–	million	–
Operating temperature	-40	–	125	°C	-40 to 257 °F
Storage temperature	-40	–	125	°C	-40 to 257 °F

NOTES · ALL SPECIFICATIONS TESTED UNDER REFERENCE CONDITIONS

1) 35 kPa (5 psi) range: non-linearity ≤±0.3% FS. 2) Span = full-scale output − zero output. 7 kPa (1 psi) range: span ≥45 mV; 70 kPa (10 psi) range: span ≥60 mV. 3) 7 kPa (1 psi) range: span 3–6 mV/V. 4) 7 kPa (1 psi) range: zero thermal error ≤1.5% FS. 5) Within the compensated temperature range. 6) Tested at RH ≤65% and temperature ≤35 °C.

Electrical

PARAMETER	VALUE
Excitation, constant current	≤2.0 mA DC (1.5 mA typ.)
Excitation, constant voltage	Not offered
Input impedance (CC)	2–8 kΩ
Input impedance (CV)	–
Output impedance	3.5–6 kΩ
Common mode voltage	50% of input (typ.)
Response time (10–90%)	<1 ms

Reference test conditions

CONDITION	VALUE
Media temperature	35 ±1 °C (95 ±2 °F)
Ambient temperature	35 ±1 °C (95 ±2 °F)
Vibration	0.1 g (1 m/s²) max
Relative humidity	50 ±10 %RH
Ambient pressure	86–106 kPa
Excitation	1.5 ±0.0015 mA DC

Mechanical dimensions & electrical connection

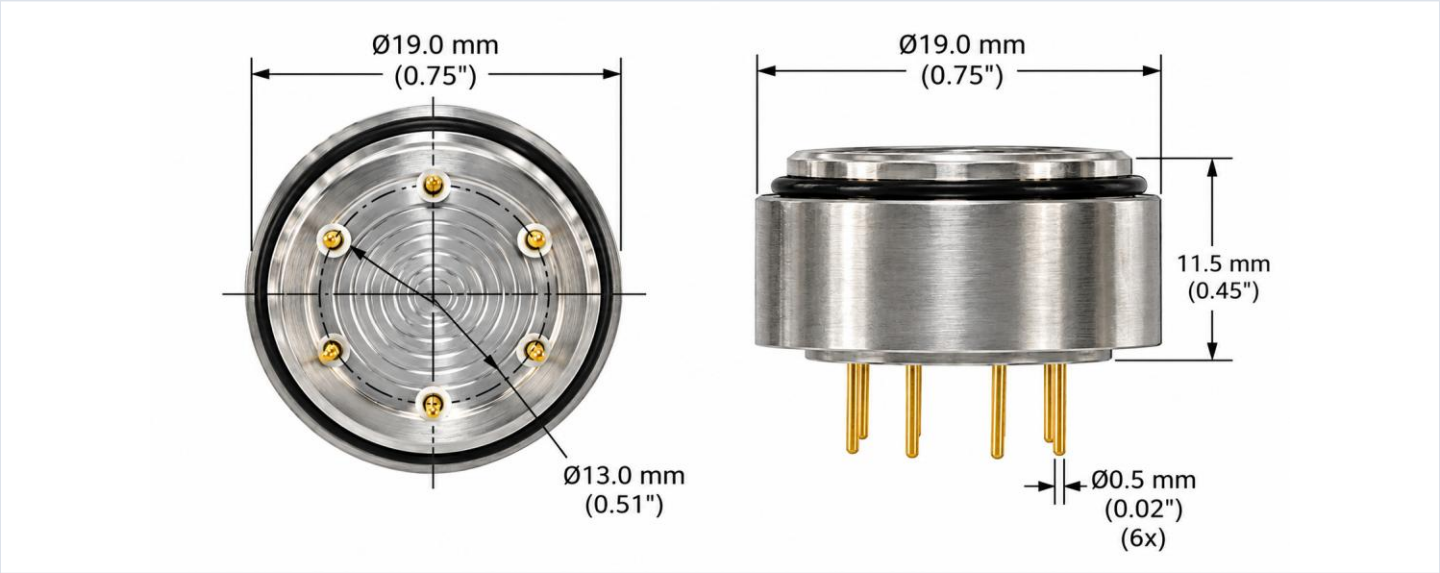


Fig. 1 — PPS01P outline, pressure face and side views. Ø19.0 × 11.5 mm (0.75 × 0.45 in). Dimensions in mm (in).

Construction

FEATURE	VALUE
Housing size	Ø19.0 × 11.5 mm (0.75 × 0.45 in)
Pin circle	Ø13.0 mm (0.51 in)
Installation bore	Ø19 +0.05/+0.02 mm
Diaphragm	316L stainless steel
Housing	316L stainless steel
Vent tube	304 stainless steel
Pins	Ø0.5 mm (0.02 in) gold-plated Kovar (K6)
Lead wires (W4)	100 mm silicone
O-ring	FKM
Oil fill	Silicone (std.) · fluorocarbon
Net weight	~16 g

Pin assignment

PIN	RANGES 10, 15, 3K, 5K, 10K	ALL OTHER RANGES
4	−OUT · Blue	+OUT · Red
5	−IN · Yellow	−IN · Yellow
8	+IN · Black	+IN · Black
9	+OUT · Red	−OUT · Blue

Wire colors apply to the 100 mm silicone lead option (W4).

INSTALLATION NOTES

Mount the element as a "suspended" construction so no direct force acts on its face, which can affect stability · Protect the isolating diaphragm and ceramic circuit board from damage · Media must be compatible with 316L stainless steel and FKM · The standard FKM O-ring is rated −20 to 250 °C; for lower temperatures or aggressive media, consult the factory.

±0.15%	10,000 psi	±0.1%	<1 ms
Typ. non-linearity FS	Max range (70 MPa)	FS/yr long-term stability	Response time

Ordering information — part-number configuration

PPS01P	–	100	G	2	S	–	K6	–	I
MODEL		RANGE	TYPE	COMP	PORT		ELECTRICAL		EXCITATION

CODE	METRIC FS	PSI	TYPE	OVERPR.	BURST
1	0–7 kPa	0–1.0	G	250%	600%
3	0–20 kPa	0–2.9	G	250%	600%
5	0–35 kPa	0–5.1	G, A	250%	600%
10	0–70 kPa	0–10.2	G, A	200%	500%
15	0–100 kPa	0–14.5	G, A	200%	500%
30	0–200 kPa	0–29	G, A	200%	500%
50	0–350 kPa	0–51	G, A	200%	500%
100	0–700 kPa	0–102	G, A	200%	500%
150	0–1 MPa	0–145	G, A	200%	500%
300	0–2 MPa	0–290	G, A	200%	500%
500	0–3.5 MPa	0–508	G, A, S	200%	500%
1K	0–7 MPa	0–1,015	S, A	200%	400%
1.5K	0–10 MPa	0–1,450	S, A	150%	300%
3K	0–20 MPa	0–2,900	S, A	150%	200%
5K	0–35 MPa	0–5,076	S, A	150%	200%
10K	0–70 MPa	0–10,153	S, A	150%	200%

CODE	PRESSURE TYPE
G	Gauge
A	Absolute
S	Sealed gauge

CODE	COMPENSATION
1	Uncompensated
2	Compensated

CODE	PORT
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

CODE	ELECTRICAL
K6	6 Kovar Pins
W4	4 Wire Leads

CODE	EXCITATION
I	1.5 mA Constant Current

EXAMPLE PART NUMBER

PPS01P-100G2S-K6-I → 0–100 psi (0–700 kPa) · gauge · compensated · no port · 6 Kovar pins · 1.5 mA

Overpressure and burst are % of full scale. Range codes are nominal psi; metric full-scale ratings govern (1 kPa = 0.01 bar = 0.145 psi). Specify FKM O-ring seal, potting (none or silicone RTV gel) and zero shift by description when ordering. Zero shift available: 3 to −5, −10 or −20 kPa; 5 to −10 or −20 kPa; 10 to −35, −50 or −70 kPa; 15–500 to −100 kPa.

Configure your pressure element

Ranges, references, compensation, and connection options matched to your application. Talk to an engineer to spec your part.

REQUEST A QUOTE
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