

PPS45 Miniature Board Mount Pressure Sensor

Wet/wet mV bridge — a drop-in alternative to the Honeywell 26PC — with an amplified 0.5–4.5 V option



GAUGE / DIFFERENTIAL

WET / WET

MV OR 0.5–4.5 V

FEATURES

- Pressure ranges from 1 PSI to 250 PSI
- Gauge and differential — wet/wet, liquids on both ports
- mV bridge output: 10 mV/V typical span, ± 1 mV zero offset
- Optional amplified, compensated 0.5–4.5 V output
- Total error band $\pm 1.5\%$ FS
- Wide supply range: 2.5 to 16 VDC (mV version)
- Operating temperature -20 to 85 °C
- Through-hole DIP or SMD J-clip leads; single or dual ports
- Footprint-compatible alternative to the Honeywell 26PC series

DESCRIPTION

The PPS45 is a small, cost-effective board-mount pressure sensor for precision measurement where space is limited. A piezoresistive micromachined die forms a Wheatstone bridge of four active piezoresistors. Applied pressure changes their resistance, producing a millivolt output proportional to the input pressure.

The PPS45 handles wet or dry media on both ports, making it a direct replacement for the Honeywell 26PC series. Where a ready-to-use signal is preferred, an amplified version adds an on-board 14-bit compensation ASIC and a 0.5–4.5 V output.

APPLICATIONS

- Medical equipment & fluid analyzers
- Flow meters
- HVAC
- Pneumatic controls
- Gas chromatography
- Aviation
- Process equipment

MAXIMUM ENVIRONMENTAL RATINGS

Operating Temperature	-20 to 85 °C • -4–185 °F	Proof Pressure	2.5× full scale
Storage Temperature	-40 to 85 °C • -40–185 °F	Burst Pressure	4× full scale
Compensated Temperature	0 to 50 °C (mV)	Pressure Range	1 to 250 PSI

Specifications — mV bridge output (M)

$V_s = 5.0$ VDC, 25 °C unless otherwise noted.

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS
Supply voltage	V_s	2.5	5.0	16	VDC
Full-scale span (Note 1)	V_{FS}	—	10	—	mV/V
Full-scale span at 5 V	—	—	50	—	mV
Full-scale span at 10 V	—	97	100	103	mV
Zero pressure offset	V_{OS}	-1	—	1	mV
Total error band (Note 2)	TEB	-1.5	—	1.5	%FS
Response time	t_r	—	10	—	ms
Compensated temperature	—	0	—	50	°C
Operating temperature	T_{OP}	-20	—	85	°C
Pressure range	—	1	—	250	PSI

1) Span is ratiometric to supply. 2) Includes non-linearity, hysteresis and thermal effects over the compensated range.

Electrical connections — mV (M)

PIN	FUNCTION
1	V_s (+) · supply
2	Output (-)
3	Output (+)
4	GND

WIRING NOTE

Read pins 3 and 2 differentially. Output (+) rises above Output (-) as pressure on the high-side port increases.

Bridge circuit

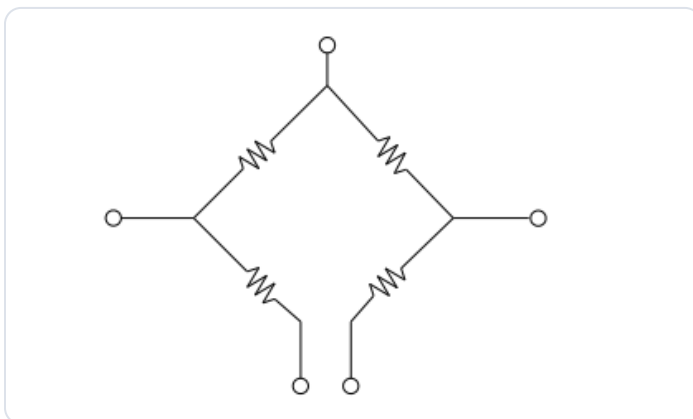


Fig. 1 — Four active piezoresistors form the Wheatstone bridge.

Package, media & installation

Package

A compact, glass-filled PPS plastic housing on an FR4 carrier with through-hole DIP or SMD J-clip leads. Single-port (gauge) and dual-port (differential) versions are available, plus several port styles.

Pressure ports

Barbed ports accept standard flexible tubing. On dual-port parts the high-side port is marked on the outline drawing.

Wetted parts

Silicon, RTV, epoxy, conformal coating, and glass-filled PPS / PPA plastic.

26PC replacement

The PPS45 matches the footprint and mV output behavior of the Honeywell 26PC series. Confirm the pinout and port style against your existing layout when changing over.

Construction

A backside-pressurized silicon die is glued to the carrier, and its die and wire bonds are protected with a conformal coating. A low-stress die attach and factory stabilization of every sensor improve stability over time and temperature.

Media

Wet/wet: liquids and gases are allowed on both ports, provided they are compatible with the wetted materials. Verify compatibility for corrosive media.

Pressure ranges

Standard ranges from 1 PSI to 250 PSI, gauge or differential. Custom ranges and absolute versions are available for OEM customers.

Decoupling

Place a 0.1 μ F ceramic capacitor between supply and GND, close to the sensor. On mV versions, keep the output traces short and routed as a pair.



250

Max range PSI

±1.5%

Total error band

Wet/wet

Both ports

2.5–16 V

mV supply range

Specifications — amplified output (A)

$V_{DD} = 5\text{ V}$, 25 °C unless otherwise noted.

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS
Supply voltage (Note 1)	V_{DD}	3.0	5.0	5.2	V
Supply current	I_{DD}	70	120	2,500	µA
Output (ratiometric)	V_{OUT}	0.5	—	4.5	V
Resolution	—	14-bit · 0.01% FS			counts
Total error band (0–60 °C)	TEB	–1.5	—	1.5	%FS
Non-linearity (BFSL)	NL	–0.25	—	0.25	%FS
Response time	t_R	1	2	20	ms
Compensated temperature	—	0	—	60	°C

1) 5 V standard; 3 V supply option.

Pin connections — amplified (A)

PIN	FUNCTION
2	V_{DD} · positive supply
4	GND
3	V_{OUT} · 0.5–4.5 V
1, 5–8	No connection

Conditioning the mV output (M)

The mV version is unamplified. Read $\pm OUT$ differentially with an instrumentation amplifier or a differential-input ADC, and calibrate zero and span in the host. Span is ratiometric to supply — at 5 V, expect about 50 mV full scale.

Transfer function

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

Ratiometric: power the sensor and the host ADC from the same reference and supply variation cancels. Minimum load 10 kΩ.

$$V_{out} \approx V_{OS} + (10\text{ mV/V} \times V_S) \times (P / P_{FS})$$

Mechanical dimensions – inches

Through-hole mount – DIP

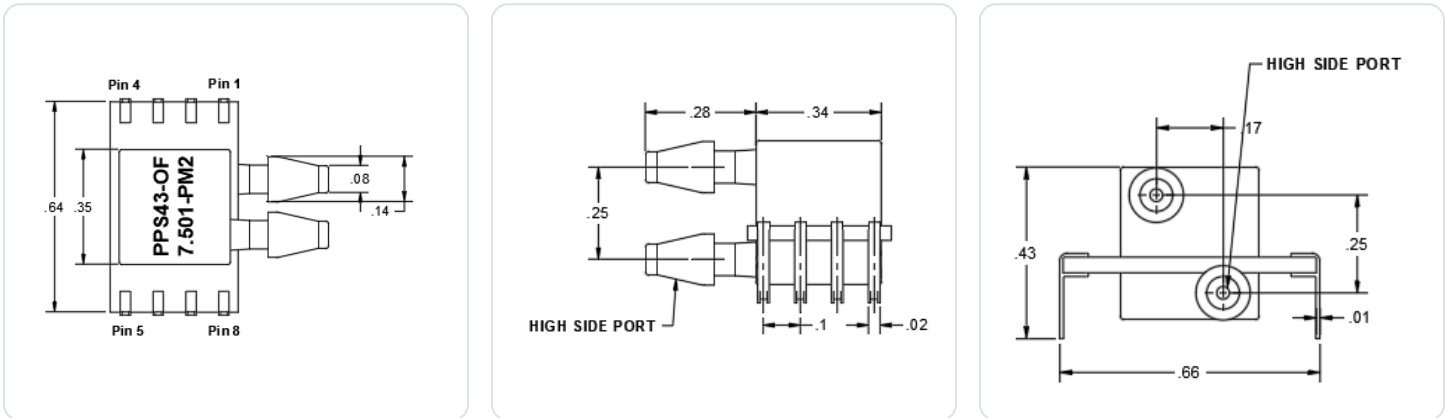


Fig. 2 – DIP package: top, side and end views.

Surface mount – J-clips

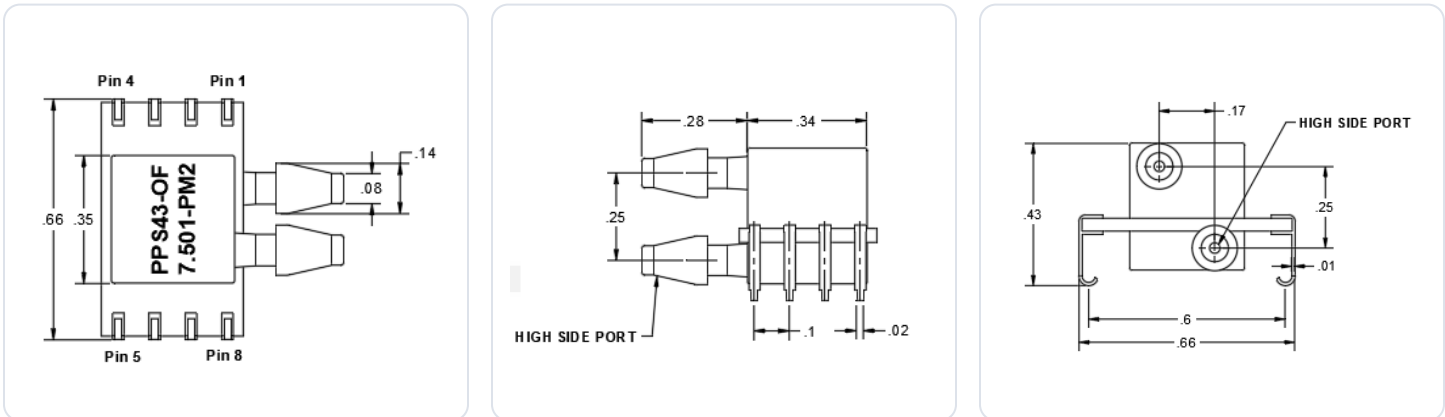


Fig. 3 – SMD J-clip package: top, side and end views.

FEATURE	DETAIL
Housing	Glass-filled PPS
Leads	DIP (through-hole) or SMD J-clip
Ports	Single (gauge) or dual (differential), barbed
Media	Wet/wet

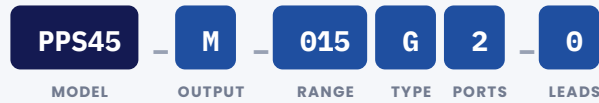
TOLERANCES (INCHES)

$X \pm 0.25 \cdot X.X \pm 0.15$

$X.XX \pm 0.010 \cdot X.XXX \pm 0.005$

The high-side port is marked on the side view. Support tubing so it does not load the barbs.

Ordering information — part-number configuration



Model	Output	Range (PSI)	Type	Ports	Leads
PPS45	M = mV bridge A = 0.5–4.5 V, 5 V B = 0.5–4.5 V, 3 V	3-digit PSI 001 = 1 PSI 015 = 15 PSI 250 = 250 PSI	G = Gauge D = Differential A = Absolute	1 = Single port 2 = Dual port 3 = Custom	0 = DIP 1 = SMD J-clip

EXAMPLE PART NUMBERS

PPS45-M-015G1-0 → mV bridge · 0–15 PSI gauge · single port · DIP

PPS45-M-005D2-0 → mV bridge · 0–5 PSI differential · dual port · DIP

PPS45-A-030G1-1 → 0.5–4.5 V at 5 V · 0–30 PSI gauge · single port · SMD J-clip

SPECIFY WITH YOUR ORDER

Custom pressure range · 26PC part number to cross-reference · Custom port style · Ribbon cable or connector termination · Media-specific coating.

Configure your PPS45

Custom ranges, ports and terminations for OEM volumes. Talk to an engineer about replacing your 26PC.

REQUEST A QUOTE

sales@phoenixsensors.com
(480) 462-1810

Notice: Phoenix Sensors LLC reserves the right to make changes to the product contained in this publication. Phoenix Sensors LLC assumes no responsibility for the use of any circuits described herein, conveys no license under any patent or other right, and makes no representation that the circuits are free of patent infringement. While the information in this publication has been checked, no responsibility is assumed for inaccuracies. Phoenix Sensors LLC does not recommend the use of any of its products in life-support applications where the failure or malfunction of the product can reasonably be expected to cause failure of a life-support system or to significantly affect its safety or effectiveness. Products are not authorized for use in such applications.