PPT86 Rugged High Temp (150 °C), High Pressure (30K PSI), Shock-Vibe Analog Transducer

Sputtered thin-film · all-welded SS316L · 70 to 30,000 PSI · to 150 °C



150 °C **30K PSI** **IP67** **ALL-WELDED**

FEATURES

- 70 to 30,000 PSI pressure ranges
- -40 to 150 °C operating temperature
- All-welded SS316L — no O-rings, oil fill or adhesives in the media path
- Rugged construction for shock and vibration
- ±0.5% FS total error band · ±0.2% FS linearity
- 0.5–4.5 V, 0–5 V, 0–10 V or 4–20 mA output
- 9/16-18 UNF-3A metal-to-metal seal port option
- Flying leads, M12 or welded 6-pin bayonet connector

DESCRIPTION

The PPT86 is a rugged analog pressure transducer for high-temperature, high-pressure and high-vibration environments — oil and gas, aerospace, defense and heavy industrial hydraulics. A sputtered thin-film strain-gauge bridge is deposited directly on a stainless steel diaphragm, with no oil fill or bonded die.

Connector, housing and port are welded into a single SS316L assembly, and 150 °C-rated electronics, wire and potting extend operation to 150 °C. Choose the output, port and electrical connection that fit your system. Contact us for custom designs.

APPLICATIONS

- Oil & gas
- Mil/Aero
- Hydraulic systems
- Automotive & engine test
- Industrial automation
- Off-highway equipment

MAXIMUM ENVIRONMENTAL RATINGS

Operating Temperature	**-40 to 150 °C**	Proof Pressure	**2× full scale**
Pressure Range	**70 to 30,000 PSI**	Ingress Protection	**IP67**

Operational characteristics

V+ = 5 V (supply option 1), V– = 0 V, T = 25 °C unless noted

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS
Supply voltage — option 1	V_{DD}	4.75	5.0	5.25	VDC
Supply voltage — option 2	V_S	9	—	32	VDC
Output — options 0 / 1 / 4	—	0.5–4.5 V ratiometric / 0–5 V / 0–10 V			—
Output — option 2	I_{OUT}	4	—	20	mA
Total error band	TEB	−0.5	—	0.5	%FS
Linearity (BFSL)	NL	−0.2	—	0.2	%FS
Hysteresis	—	—	0.05	0.08	%FS
Repeatability	±%FS	−0.05	—	0.05	%FS
Temperature error	—	—	0.75	1.0	%FS
Operating temperature	T_{OP}	−40	—	150	°C
Pressure range	—	70	—	30,000	PSI
Proof pressure	—	2× full scale			—
Environmental rating	—	IP67			—

NOTES

Output option 0 is ratiometric to supply and requires supply option 1. Contact us for shock and vibration qualification data.

Electrical connections

WIRE · PIN	VOLTAGE OUTPUT	4–20 MA
Red · A	VDD	Supply +
Black · C	GND	Supply −
White · E	Output	—

Pin letters apply to the welded 6-pin bayonet receptacle.

Mating connector

Bayonet receptacle	SpaceCraft SCPC1H-10-6P
Mating cable	PPT8X-CBL-M10 (specify length)
Alternatives	M12 connector or flying leads

Pin configuration

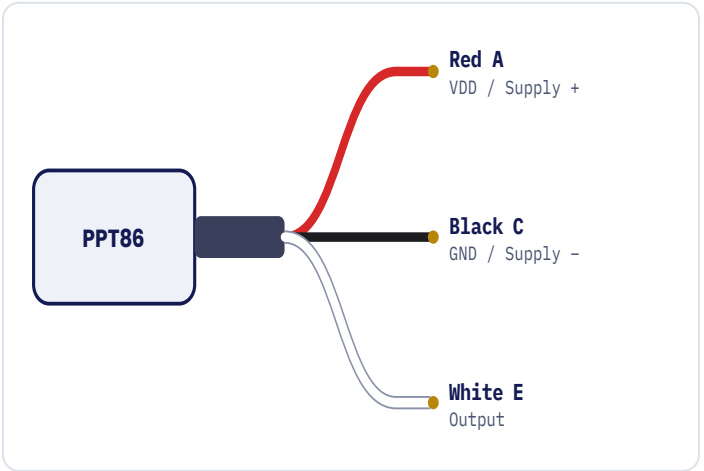


Fig. 1 — 6-pin bayonet receptacle, pins A, C and E.

Application information

Package

One-piece SS316L assembly: Ø0.93" housing with the connector, housing and pressure port welded together. 150 °C-rated wire and high-temperature epoxy throughout.

Construction

A sputtered thin-film strain-gauge bridge on a stainless diaphragm, welded to the port. With no oil fill or bonded die, it is inherently resistant to temperature, pressure spikes, shock and vibration.

Pressure ports

1/4"-18 NPT, 1/8"-27 NPT and 7/16-20 UNF are standard. A 9/16-18 UNF-3A metal-to-metal (cone) seal is offered for high-pressure service; other fittings for OEM customers.

Media

Hydraulic fluid, fuel, oil, water, gas and other media compatible with stainless steel, including some corrosive media and salt water.

Pressure ranges

Standard ranges are 500, 1,000, 3,000, 5,000, 10,000 and 15,000 PSI gauge. Ranges from 70 PSI to 30,000 PSI and absolute references on request.

Marking

Laser marked with logo, part number and MMYYSSSS date / serial code.

30K PSI	150 °C	±0.5%	IP67
Max range	Max operating temp	Total error band FS	Environmental rating

Analog output

The PPT86 delivers a conditioned analog signal proportional to applied pressure. Voltage options use three wires; the 4–20 mA option is a two-wire loop.

Option 0 — ratiometric (V_{DD} = 5 V)

$$V_{OUT} = 0.5\ V + 4.0\ V \times P / P_{FS}$$

Option 2 — 4–20 mA

$$I_{OUT} = 4\ mA + 16\ mA \times P / P_{FS}$$

P_{FS} is the full-scale range from the part number.

Typical output

% OF FS	500 PSI	15K PSI	OPT. 0	OPT. 2
0%	0	0	0.50 V	4.0 mA
25%	125	3,750	1.50 V	8.0 mA
50%	250	7,500	2.50 V	12.0 mA
75%	375	11,250	3.50 V	16.0 mA
100%	500	15,000	4.50 V	20.0 mA

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

Hookup

WIRE / PIN · FUNCTION	CONNECT TO
Red (A) · VDD	Supply + (5 V or 9–32 V)
Black (C) · GND	Supply – / loop return
White (E) · OUT	ADC or meter input

DESIGN NOTES

Use 150 °C-rated mating cable where the connector sees full operating temperature. Route signal leads away from ignition and switched loads.

Mechanical dimensions — inches [mm]

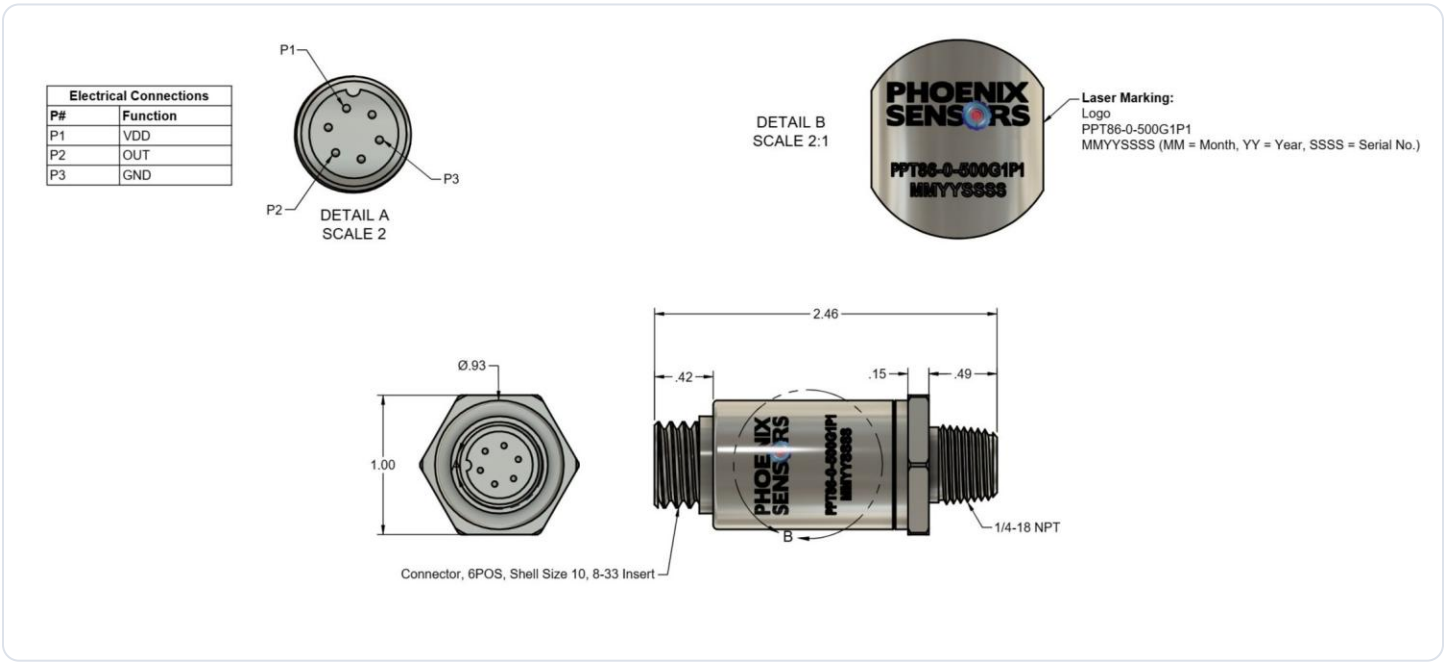


Fig. 2 — PPT86 outline, 1/4-18 NPT with 6-pin connector, shell size 10 (drawing PPT86-0-500G1P1 rev A).

Key dimensions

FEATURE	VALUE
Housing diameter	Ø0.93 [23.6]
Hex	1.00 [25.4]
Overall length, 1/4-18 NPT	2.46 [62.5]
Thread length, 1/4-18 NPT	0.49 [12.4]
Overall length, 9/16-18 UNF-3A	2.45 [62.2]

Construction

Housing / port	SS316L, welded
Connector	SCPC1H-10-6P · M12 · leads
Marking	Laser: P/N, MMYYSSSS

Ordering information — part-number configuration

PPT86	–	0	–	500	G	1	1	P	–	–	1FT
MODEL		OUTPUT		RANGE	TYPE	PORT	SUPPLY	IP	ELECTRICAL		CABLE

OUTPUT	
0	0.5–4.5 V ratio.
1	0–5 V
2	4–20 mA
4	0–10 V

RANGE (PSI)	
70…30K	e.g. 500, 1K, 3K, 5K, 10K, 15K, 30K

TYPE	
G	Gauge
A	Absolute

PORT	
1	1/4" NPT male
2	1/8" NPT male
3	7/16-20 UNF
5	9/16-18 UNF-3A

SUPPLY	
1	4.75–5.25 VDC
2	9–32 VDC

IP RATING	
P	IP67

ELECTRICAL	
—	Flying leads
1	M12
2	6-pin bayonet

CABLE	
1FT…	Lead length

Omit the electrical code for flying leads; omit the cable length for connector versions.

EXAMPLES

PPT86-0-500G11P-1FT → 0.5–4.5 V · 0–500 PSI gauge · 1/4" NPT · 5 V · IP67 · 1 ft flying leads

PPT86-2-15KG52P2 → 4–20 mA · 0–15,000 PSI gauge · 9/16-18 UNF · 9–32 V · IP67 · bayonet

Configure your PPT86

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

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, however, 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.