

Paine™ 310-38-520 Series Pressure Transducer

High Precision, HP/HT, +218 °C, 0–35,000 PSIA (0–2,413 BAR)



The Paine 310-38-520 High Pressure and Temperature Transducer is a high pressure and high temperature sensor that provides real-time measurements in corrosive environments. This high precision transducer offers a mV/V nominal output with a total error band of $\pm 0.02\%$ of Full Scale (F.S). Engineered with a compact, all-welded, sealed construction, this rugged device is well suited for downhole and drilling oil and gas pressure and temperature monitoring as well as other industrial applications.

Solutions

- Pressure and temperature measurement
- 1/2-in. diameter package
- All-welded, sealed construction
- Harsh/extreme environment ready
- Wide operating pressure range

Potential applications

- Oil and gas exploration and production
- MWD, PWD, and LWD tools
- Wellhead and pump station monitoring
- Geothermal and power generation
- OEM and end-user applications

Features

- **Total error band:** ±0.02% of F.S. sensitivity
- **Output:** mV/V
- **Operating temperature:** -40 to +425 °F (-40 to +218 °C)
- **Pressure range:** 0–5,000 to 0–35,000 PSIA (345 to 2,413 BAR)
- **External case pressure:** Up to 20,000 PSI (1,378 BAR)
- **Media compatibility:** Compatible with alloy UNS NO7718 solution annealed and aged to a minimum hardness of 40HRC. Alloy 718.
- **Pressure fitting:** Per MS33656-E3

Specifications

Calibration: Calibration certificates are supplied with each unit and available online.

Performance

Full Scale (F.S.) sensitivity: 2.6 mV/V nominal at 75 °F (23 °C)

Total Error Band (Non-Linearity, Hysteresis & Thermal Effects): Shall not be greater than ± 0.02% of the F.S. sensitivity as compared to the serial number specific polynomial model P (T, mV) for all input pressures and temperatures over the calibrated range.

Output at zero pressure over the calibrated temperature range: 0 ± 2.0% F.S.

Platinum resistance temperature detector (RTD): 0 °C, 1000 Ω ± .06% Ω to IEC 751, Class A, Alpha = .00385 nominal

Un-compensated: This sensor is not hardware compensated for temperature effects on signal. Each sensor is provided with coefficients to load into your electronics for temperature and non-linearity compensation.

Environmental

Environmental: Error due to combined effect of shock, vibration, and acceleration shall be less than 0.01% of F.S. per G, 20 G maximum.

Operating temperature range: -40 to +425 °F (-40 to +218 °C)

Calibrated temperature range: +75 to +350 °F (+23 to +176 °C)

Pressure media: Any compatible with alloy UNS NO7718 solution annealed and aged to a minimum hardness of 40HRC.

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Mechanical

Pressure range: Contact factory for additional pressure ranges. 310-35-520-08 is calibrated to 30,000 PSIA (2068 BAR).

Table 1. Pressure Table

Standard part number	Pressure range PSIA (BAR)	Proof pressure PSIA (BAR)	Burst pressure PSIA (BAR)	Replaceable seal part number
310-38-520-01	0-5,000 (0-344)	7,500 (517)	10,000 (684)	247-99-250-01
310-38-520-02	0-10,000 (0-689)	15,000 (1,034)	20,000 (1,378)	247-99-250-01
310-38-520-03	0-15,000 (0-1,034)	18,750 (1,292)	22,500 (1,551)	247-99-250-01
310-38-520-04	0-20,000 (0-1,378)	25,000 (1,723)	30,000 (2,068)	247-99-250-01
310-38-520-05	0-22,500 (0-1,551)	28,125 (1,939)	30,000 (2,068)	247-99-250-01
310-38-520-06	0-25,000 (0-1,723)	31,325 (2,159)	33,000 (2,275)	247-99-250-01
310-38-520-07	0-30,000 (0-2,068)	37,500 (2,585)	40,000 (2,757)	247-99-250-02
310-38-520-08	0-35,000 (0-2,413)	40,000 (2,757)	48,000 (3,309)	247-99-250-02

External Case Pressure: Up to 20,000 PSI (1,378 BAR)

Pressure fitting: Per MS33656-E3

Installation information: Mount on port using annealed Alloy 600 Replaceable Seal (provided). Thermal coefficient of the mounting expansion should not exceed 8.3×10^{-6} in/in °F for operation above 100 °C.

Recommended installation torque: 125 to 150 in-lb
(14 to 17 N-m)

Weight: 2.0 oz maximum

Electrical

Excitation: 1–20 VDC (10 VDC nominal)

Input resistance: $1500 \pm 300 \Omega$

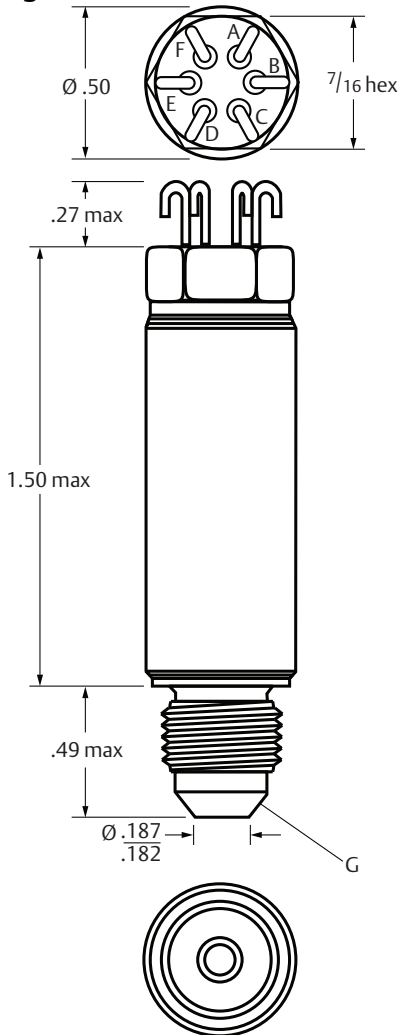
Output resistance: $1500 \pm 150 \Omega$

Insulation resistance: All conductors together to case, 100 GΩ minimum at 50 VDC and at +77 °F (25 °C)

Electrical connections: High temperature solderable connections

Dimensional Drawings

Figure 1. Paine 310-38-520 Series



Connections	
PIN	Function
A	+ Excitation
B	+ Signal
C	- Signal
D	- Excitation
E	R.T.D.
F	R.T.D.

A-F. See connections table.
G. Fitting end per MS33656-E3 except Port ID
Dimensions are inches.

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