

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: $1500 \pm 300 \Omega$

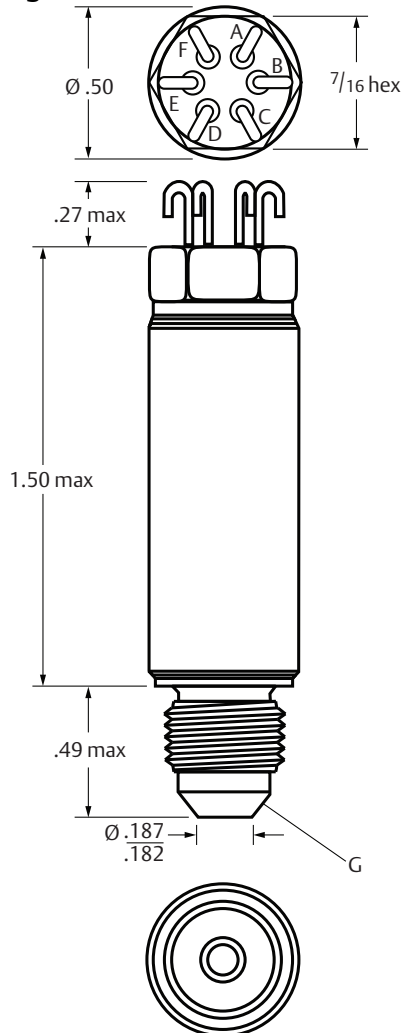
Output resistance: $1500 \pm 150 \Omega$

Insulation resistance: All conductors together to case, 100 G Ω 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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