

## U7100 Pressure Transducer



- Performance standard for on and off highway engine & vehicle OEMs
- Rugged for heavy equipment and outdoor use such as HVAC refrigeration systems
- Designed specifically for high volume applications
- Stainless steel wetted surfaces
- Low pressure ranges
- CE Approved
- UL Certified
- Gage, absolute, sealed gage

### DESCRIPTION

The U7100 pressure transducer from the UltraStable™ line of MEAS sets a new price performance standard for demanding engine and vehicle, and industrial applications. This transducer is suitable for measurement of liquid or gas pressure, even for difficult media such as contaminated water, steam and corrosive fluids. The transducer pressure cavity is constructed of 316L stainless steel and there are no internal o-rings or organics exposed to the pressure media. Having excellent durability, it is available with a variety of leak-proof, all metal pressure connections. The U7100 is an automotive grade pressure transducer with hermetic pressure ports and an integral electrical connector with standard pressure ranges from 0 to 30, up to 150psi (10Bar).

This pressure sensor exceeds the latest industrial CE requirements and includes automotive electronics requirements such as surge protection, as well as being overvoltage protected to 16Vdc in both positive and reverse polarity.

### FEATURES

- Hermetic Pressure Ports
- Integral Electrical Connector
- Survives High Vibration
- ±0.25% Accuracy
- Water Resistant 1M Immersion

### APPLICATIONS

- On and Off Highway Engines and Vehicles
- HVAC Refrigeration Controls
- Compressors
- Hydraulics
- Energy and Water Management

### STANDARD RANGES

| Range (psi) | Range (Bar) | Gage | Absolute | Sealed Gage |
|-------------|-------------|------|----------|-------------|
| 0 to 030    | 0 to 002    | •    | •        | •           |
| 0 to 050    | 0 to 3.5    | •    | •        | •           |
| 0 to 100    | 0 to 007    | •    | •        | •           |
| 0 to 150    | 0 to 010    | •    | •        | •           |

# U7100 Pressure Transducer

## PERFORMANCE SPECIFICATIONS

Ambient Temperature: 25°C (unless otherwise specified)

| PARAMETERS  | MIN   | TYP | MAX  | UNITS      | NOTES |
|---|-------|-----|------|------------|-------|
| Load Resistance   | 10    |     |      | kΩ         |       |
| Accuracy (combined linearity, hysteresis & repeatability) | -0.25 |     | 0.25 | %Span      | 1     |
| Total Error Band  | -1.0  |     | 1.0  | %Span      | 2     |
| Compensated Temperature                                   | -20   |     | +85  | °C         |       |
| Operating Temperature                                     | -40   |     | +125 | °C         | 3     |
| Storage Temperature                                       | -50   |     | +125 | °C         |       |
| Insulation Resistance (500Vdc)                            | 100   |     |      | MΩ         | 4     |
| Short Circuit Protected                                   |       | Yes |      |            |       |
| Output Noise @ 1kHz                                       |       | 10  |      | mV         |       |
| Response Time (10% to 90%)                                |       | 1.0 |      | ms         |       |
| Long Term Stability                                       | -0.25 |     | 0.25 | %Span/Year |       |

### Notes

- Best fit straight line.
- TEB includes all accuracy errors, thermal errors, span and zero tolerances over the compensated temperature range.
- Temperature range for product with standard cable is -20°C to +105°C.
- Between sensor body to any pins of connector.

## ENVIRONMENTAL SPECIFICATIONS

Ambient Temperature: 25°C (unless otherwise specified)

| PARAMETERS           | MIN | TYP   | MAX | UNITS  | NOTES |
|----------------------|-----|---|-----|--------|-------|
| Humidity (@40°C)     |     |   | 93  | %RH    |       |
| Pressure Overload    |     |   | 3X  | Rated  | 5     |
| Pressure Burst       |     |   | 4X  | Rated  | 6     |
| Pressure Cycle       | 10M |   |     | Cycles |       |
| Mechanical Vibration |     | 20g, 10 ~ 2000Hz<br>MIL-STD-810C, Method 514.2, Curve L             |     |        |       |
| Mechanical Shock     |     | Half-Sine, Peak: 50g, 11ms<br>MIL-STD-202, Method 213B, Condition A |     |        |       |
| Package Protection   |     | IP67 (IEC60529)   |     |        |       |

### Notes

- The maximum pressure that can be applied without changing the transducer's performance or accuracy.
- The maximum pressure that can be applied to a transducer without rupture of either the sensing element or transducer.

### Agency Approvals

RoHS: RoHS 2 (Directive 2011/65/EU)

UL 508 Certified: Industrial Control Equipment, CSA 22.2 No. 14-10

EMC Performance Criteria: Output Change < ±1.5% FSO

IEC61000-4-2 ESD: 8kV Contact / 15kV Air; Discharge Rate > 10s

IEC61000-4-3 EM Field: 100V/m, 1kHz 80% Modulation, 80 ~ 1000MHz

IEC61000-4-4 Electrical Fast Transient: Level 2, 1KV each line, Capacitance coupling

IEC61000-4-5 Surge: Level 2, 42Ω Impedance, Figure 11 (L-L 500V, L-E 1KV)

IEC61000-4-6 Conducted RF: Level 2, 3V/130dB, 150KHz ~ 80MHz, 2s Dwell, Clamp Injection

IEC61000-4-9 Pulse Magnetic Field: Level 3, 100A/m, 10 Second pulse interval

IEC55022 Emission: Class B, 30dB @ 30-230MHz, 37dB @ 230-1000MHz

# U7100 Pressure Transducer

| Pressure Port Options  | Dim A      | Tightening Torque (Nm) |
|--|------------|------------------------|
| 2 = G1/4, BS5380, Male   | .43 [11.0] | 30~35                  |
| 4 = 7-16-20 UNF, SAE J1926-2, Male, w/ O-Ring  | .36 [9.1]  | 18~20                  |
| 5 = 1/4-18 NPT Male  | .56 [14.2] | 2~3 T.F.F.T.           |
| 6 = 1/8-27 NPT Male  | .38 [9.7]  | 2~3 T.F.F.T.           |
| E = R1/4-19, Male  | .56 [14.2] | 2~3 T.F.F.T.           |
| F = G1/4-19, BS5380, Female  | .64 [16.3] | 30~35                  |
| P = 7/16-20UNF Female w/ Integral Valve Depressor;<br>1/4 Flare Gasket SAE J513C, Copper | .64 [16.3] | 15~16                  |
| Q = M10 x 1.0, ISO 6149-2, Male  | .37 [9.5]  | 15~16                  |
| S = M12 x 1.5, ISO 6149-2, Male  | .43 [11.0] | 28~30                  |
| G = M14 x 1.5, ISO 6149-2, Male  | .43 [11.0] | 30~35                  |
| U = G1/4, DIN 3852-E, Male   | .47 [12.0] | 30~35                  |

### Notes: Installation

\*T.F.F.T.: Turns From Finger Tight

Transducers can be installed by either spanner or deep socket. Torque values provided are for reference: actual torque depends upon mating port material, surface finish, lubrication and sealing mechanism. Transducers calibration and/or zero may shift if part is over-torqued during installation. Check for a zero shift after installing.

| Connector                          | Connector, Pin Plating   | Connector, Mating                                    |
|------------------------------------|--|--|
| Packard Metri-Pack 150 Series      | <i>powerandsignal.com</i><br>0.003 – 0.005 mm Sn                     | Housing P/N: 12065287<br>Terminals P/N: 12103881     |
| Sumitomo HV040 Series              | <i>sumitomokenki.com</i><br>0.003 mm Sn over<br>0.0005 – 0.001 mm Cu | Housing P/N: 6189-6907<br>Terminals P/N: 8100-3067/8 |
| AMP Econoseal-J Mark II 070 Series | <i>te.com</i><br>0.0004 mm Au over<br>0.0013 mm Ni                   | Housing P/N: 174357<br>Terminals P/N: 171630         |

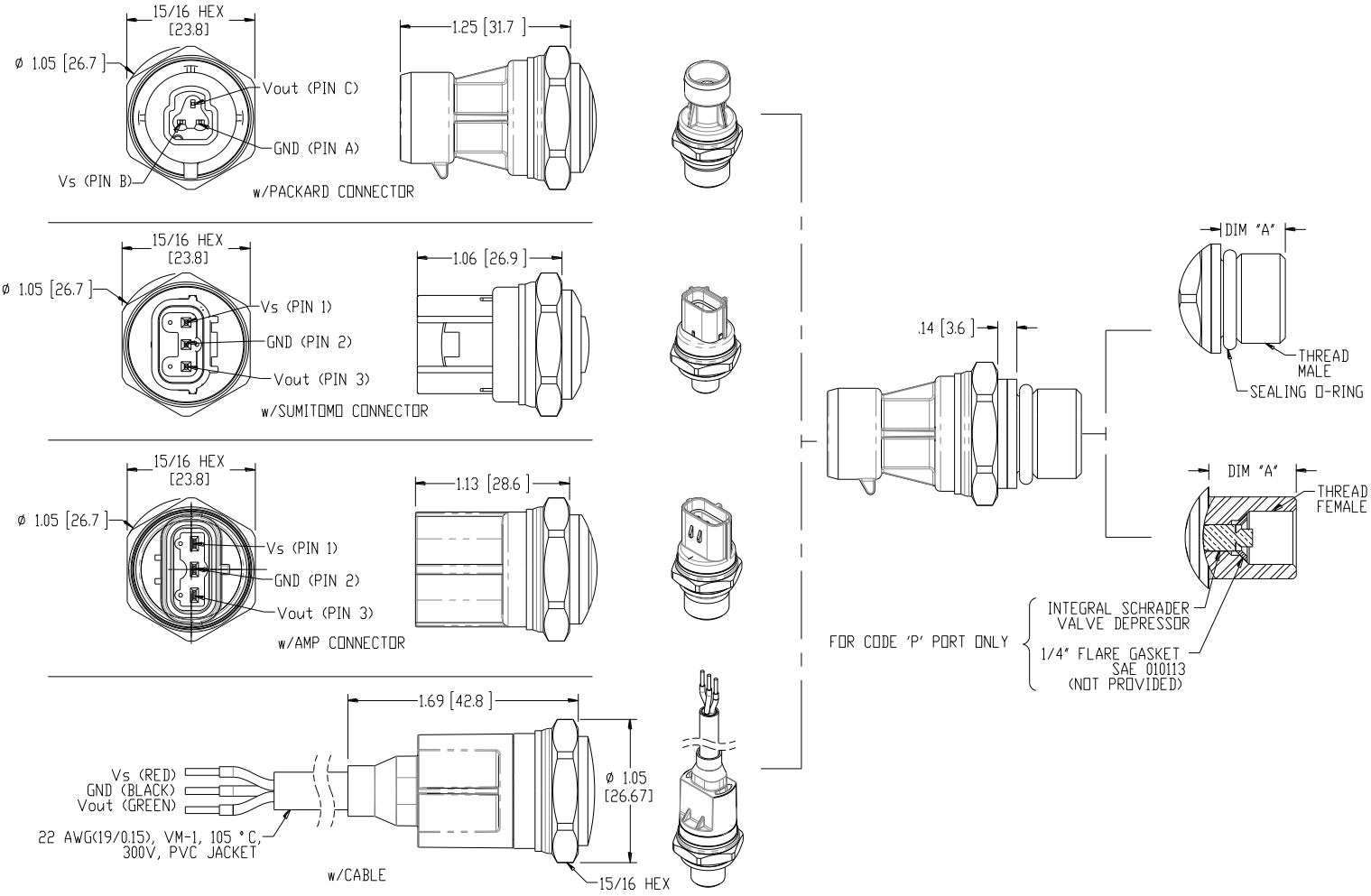
### Notes: Connector

Do not apply torque to the connector housing of transducer.

To ensure proper environmental sealing and electrical connection when using a mating connector, follow the manufacturer's installation guidelines.

# U7100 Pressure Transducer

## DIMENSIONS

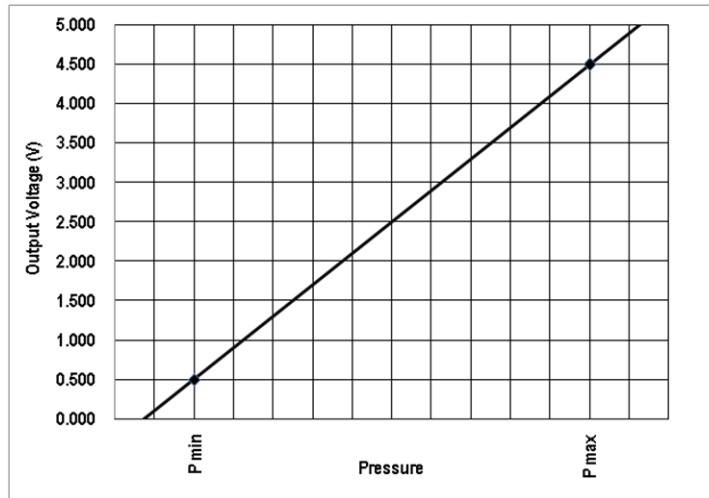


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## CHARTS

### Pressure Transfer Function

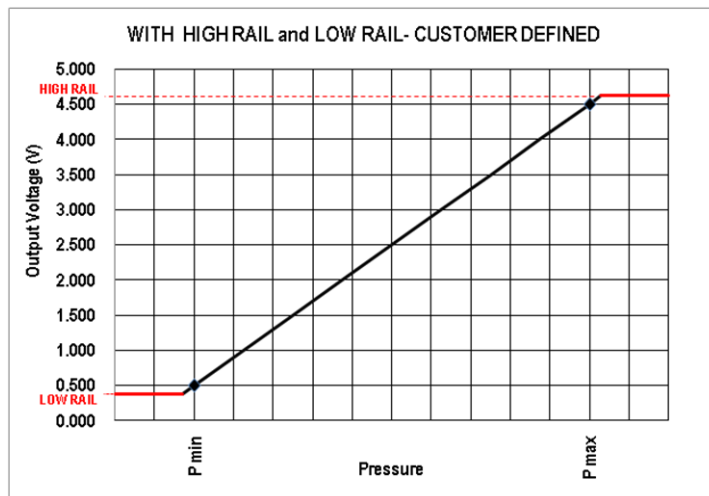
Supply = 5V



$$\text{Output Voltage} = \left[ \frac{0.8}{(P_{\text{max}} - P_{\text{min}})} \times (\text{Pressure applied} - P_{\text{min}}) + 0.1 \right] \times \text{Supply Voltage}$$

### OEM Custom Calibration

High/Low Rail values can be adjusted by circuit



#### Output Type Vs. Supply

|  |               |
|--|---------------|
| Output Type (Code)                     | 3             |
| Supply Voltage                         | 4.75 ~ 5.25V* |
| Supply Current                         | 4.0 ~ 10.0mA  |
| Output Voltage                         | 0.5 ~ 4.5V*   |
| Reverse Voltage                        | 16V           |
| Overvoltage Protection                 | 16V           |
| * Output Ratiometric to Supply Voltage |               |

# U7100 Pressure Transducer

## ORDERING INFORMATION

| U71   | 3                          | 8  | - | 100P                         | G                            | - | 2   | - | W  | 0000 |                 |
|-------|----------------------------|--|---|------------------------------|------------------------------|---|---|---|--|------|-----------------|
| Model | Output Type                | Connection Type  | - | Pressure Range               | Pressure Type                | - | Pressure Port                               | - | Port Material  |      |                 |
| U71   | 3 = 0.5 – 4.5V Ratiometric | 1 = Cable 2 ft<br>2 = Cable 4 ft<br>3 = Cable 10 ft<br>7 = AMP070 Connector<br>8 = Sumitomo HV040 Connector<br>9 = Packard Connector<br>D = M12 Connector<br>M = Cable 1 m<br>N = Cable 2 m<br>P = Cable 5 m<br>R = Cable 10 m | - | 030P<br>050P<br>100P<br>150P | 002B<br>3.5B<br>007B<br>010B | - | G = Gage<br>A = Absolute<br>S = Sealed Gage | - | 2 = G1/4, BS5380, Male<br>4 = 7/16-20 UNF, SAE J1926-2, Male, w/ O-Ring<br>5 = 1/4-18 NPT Male<br>6 = 1/8-27 NPT Male<br>E = R1/4-19, Male<br>F = G1/4-19, BS5380, Female<br>P = 7/16-20 UNF Female w/ Integral Valve Depressor; 1/4 Flare Gasket SAE J513C, Copper<br>Q = M10 x 1.0, ISO 6149-2, Male<br>S = M12 x 1.5, ISO 6149-2, Male<br>G = M14 x 1.5, ISO 6149-2 Male<br>U = G1/4, DIN 3852-E Male | -    | W = 316L ST STL |

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