



## M7100

### Pressure Transducer

#### SPECIFICATIONS

- Performance standard on and off highway engine and vehicle OEMs
- Rugged for heavy equipment and outdoor use
- Designed specifically for high volume applications
- Stainless steel wetted surfaces
- Medium to high pressures
- UL Certified
- Gage

The M7100 pressure transducer from the Microfused 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 machined from a solid piece of 17-4 PH stainless steel. The standard version includes a 1/4 NPT pipe thread allowing a leak-proof, all metal sealed system. This automotive grade pressure transducer with stainless steel hermetic pressure ports and integral electrical connector can boast up to 10,000psi (700bar). The M7100 is UL certified and exceeds the latest industrial requirements including surge protection and is overvoltage protected in both positive and reverse polarity.

#### FEATURES

- Hermetic Pressure Ports
- Integral Electrical Connector
- Survives High Vibration
- $\pm 0.25\%$  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 |
|-------------|-------------|------|
| 0 to 150    | 0 to 010    | •    |
| 0 to 200    | 0 to 014    | •    |
| 0 to 300    | 0 to 020    | •    |
| 0 to 500    | 0 to 035    | •    |
| 0 to 01K    | 0 to 070    | •    |
| 0 to 1K5    | 0 to 100    | •    |
| 0 to 03K    | 0 to 200    | •    |
| 0 to 05K    | 0 to 350    | •    |
| 0 to 7K5    | 0 to 500    | •    |
| 0 to 10K    | 0 to 700    | •    |

## PERFORMANCE SPECIFICATIONS

Ambient Temperature: 25°C (unless otherwise specified);

| PARAMETERS  | MIN   |        | TYP | MAX   |        | UNITS      | NOTES |
|---|-------|--------|-----|-------|--------|------------|-------|
|   | Steel | Copper |     | Steel | Copper |            |       |
| Load Resistance   | 10    |        |     |       |        | KΩ         |       |
| Accuracy (combined linearity, hysteresis & repeatability) | -0.25 |        |     | 0.25  |        | %Span      | 1     |
| Total Error Band  | -1.0  | -2.5   |     | 1.0   | 2.5    | %Span      | 2     |
| Compensated Temperature                                   | -20   | -30    |     | +85   | 120    | °C         |       |
| Operating Temperature                                     | -40   |        |     | +125  |        | °C         | 3     |
| Storage Temperature                                       | -50   |        |     | +125  |        | °C         |       |
| Insulation Resistance (500V <sub>DC</sub> )               | 100   |        |     |       |        | MΩ         | 4     |
| Short Circuit Protected                                   |       |        | Yes |       |        |            |       |
| Output Noise @ 1kHz                                       |       |        | 10  |       |        | mV         |       |
| Long Term Stability                                       | -0.25 |        |     | 0.25  |        | %Span/Year |       |
| Frequency Response @ -3dB                                 |       |        | 1   |       |        | kHz        |       |

### 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.
- 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.
- Refer to pressure port Listing notes for installation recommendations.
- This product can be configured for custom OEM requirements. Contact Factory for different transfer function. See "Pressure Transfer Function" diagram.
- Maximum temperature range for product with standard cable is -20°C to 105°C.
- Do not apply torque to connector housing of transducer.
- To ensure proper environmental sealing and electrical connections when using a mating connector, follow the connector manufacturer's installation guidelines.

## ENVIRONMENTAL SPECIFICATIONS

Ambient Temperature: 25°C (unless otherwise specified)

| PARAMETERS           | MIN    |   | TYP | MAX             |        | UNITS  | NOTES |
|----------------------|--------|---|-----|-----------------|--------|--------|-------|
|                      | Steel  | Copper  |     | Steel           | Copper |        |       |
| Humidity (@40°C)     |        |   |     | 93              |        | %RH    |       |
| Pressure Overload    |        |   |     | 2X              |        | Rated  | 5     |
| Pressure Burst       |        |   |     | 5X              | 3X     | Rated  | 6     |
| Pressure Cycle       |        | 10M   |     |                 |        | Cycles |       |
| Media, Pressure Port | Steel  | Fluids compatible with 17-4PH Stainless Steel                       |     |                 |        |        |       |
|                      | Copper | Fluids compatible with Brass  |     |                 |        |        |       |
| Mechanical Vibration | Steel  | 20g, 10 ~ 2000Hz<br>MIL-STD-810C, Method 514.2, Curve L             |     |                 |        |        |       |
|                      | Copper | 10g peak, 55~2000Hz MIL-STD-202G, Method 204D, Test Condition C     |     |                 |        |        |       |
| Mechanical Shock     | Steel  | Half-Sine, Peak: 50g, 11ms<br>MIL-STD-202, Method 213B, Condition A |     |                 |        |        |       |
|                      | Copper | Half-Sine, Peak: 50g, 11ms MIL-STD-202G, Method 213B, Condition A   |     |                 |        |        |       |
| Package Protection   |        |   |     | IP67 (IEC60529) |        |        |       |

## AGENCY APPROVALS

|   |  |
|---|--|
| RoHS: RoHS 2 (Directive 2011/65/EU)                 |  |
| Industrial Control Equipment CSA 22.2 No. 14-10     |  |
| UL508 Certified                                     |  |
| EMC Performance Criteria: Output Change < ±1.5% FSO |  |
| ESD   | 8kV Contact/15kV Air; Discharge Rate >10s                    |
| IEC 61000-4-2                                       |  |
| EM Field  | 100V/m, 1kHz 80% Modulation, 80 ~ 1000MHz                    |
| IEC 61000-4-3                                       |  |
| Electrical Fast Transient                           | Level 2, 1kV each line, capacitance coupling                 |
| IEC 61000-4-4                                       |  |
| Surge   | Level 2, 42Ω Impedance, Figure 11 (L-L 500V, L-E 1kV)        |
| IEC 61000-4-5                                       |  |
| Conducted RF  | Level 2, 3V/130dB, 150kHz ~ 80MHz, 2s Dwell, Clamp Injection |
| IEC 61000-4-6                                       |  |
| Pulse Magnetic Field                                | Level 3, 100A/m, 10 second pulse interval                    |
| IEC 61000-4-9                                       |  |
| Emission  | Class B, 30dB @ 30-230MHz, 37dB @ 230 – 1000MHz              |
| IEC 55022   |  |

## PRESSURE PORT INFORMATION

| 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

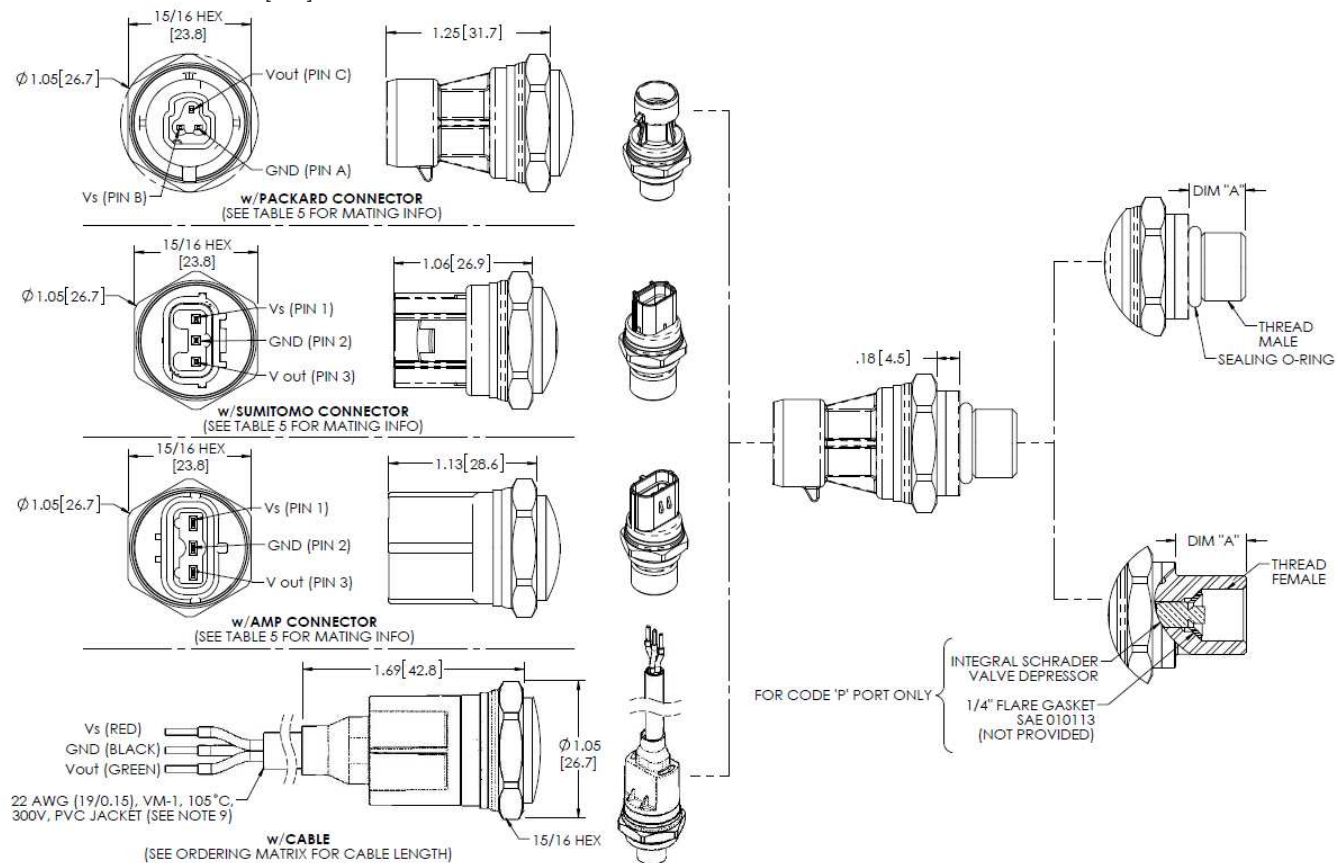
Transducers can be installed by either spanner or deep socket. Torque values provided are for reference: actual torque depends upon mating port material, surface finish, lubrication and sealing mechanism. Transducers calibration and/or zero may shift if part is over-torqued during installation. Check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

## CONNECTOR INFORMATION

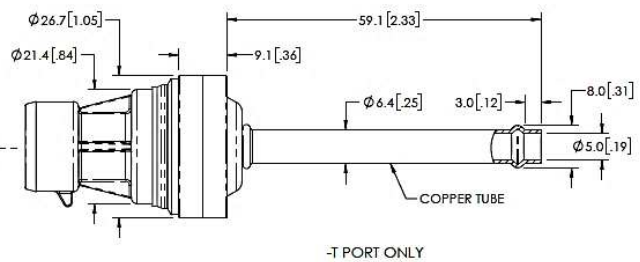
| Connector                          | Connector, Pin Plating    |  | Connector, Mating                                    |
|------------------------------------|---------------------------|--|--|
| Packard Metri-Pack 150 Series      | <i>powerandsignal.com</i> | 0.003 – 0.005 mm Sn                      | Housing P/N: 12065287<br>Terminals P/N: 12103881     |
| Sumitomo HV040 Series              | <i>sumitomokenki.com</i>  | 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>             | 0.0004 mm Au over<br>0.0013 mm Ni        | Housing P/N: 174357<br>Terminals P/N: 171630         |

## DIMENSIONS

Dimensions are in INCHES [mm]



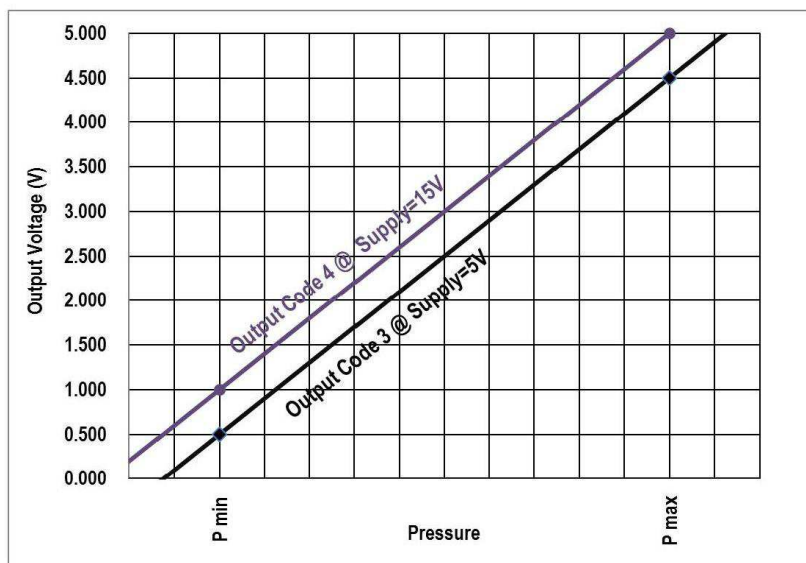
DIMENSIONS ARE IN mm [INCHES]



| CABLE WIRE # DESIGNATION |                  |
|--------------------------|------------------|
| WIRE COLOR               | FUNCTION         |
| RED                      | V <sub>s</sub>   |
| BLACK                    | GND              |
| GREEN                    | V <sub>out</sub> |

## CHARTS

**Pressure Transfer Function**



**Output Type vs. Supply**

| Output Type (Code)     | 3             | 4          |
|------------------------|---------------|------------|
| Supply Voltage         | 4.75 ~ 5.25V* | 8 ~ 32V    |
| Supply Current         | 4.0 ~ 10.0mA  |            |
| Output Voltage         | 0.5 ~ 4.5V*   | 1.0 ~ 5.0V |
| Reverse Voltage        | 16V           |            |
| Overvoltage Protection | 16V           | 32V        |

\* Output ratiometric to supply voltage

**Pressure Range**

| psi  | bar  |
|------|------|
| 150P | 010B |
| 200P | 014B |
| 300P | 020B |
| 500P | 035B |
| 01KP | 070B |
| 1K5P | 100B |
| 03KP | 200B |
| 05KP | 350B |
| 7K5P | 500B |
| 10KP | 700B |

**Pressure Range (Cu Tube)**

| psi  | bar  |
|------|------|
| 150P | 010B |
| 300P | 020B |
| 450P | 030B |
| 500P | 035B |
| 750P | 050B |

**Connection Type**

|   |                   |
|---|-------------------|
| 1 | Cable 2 feet      |
| 2 | Cable 4 feet      |
| 3 | Cable 10 feet     |
| 7 | AMP070 Connector  |
| 8 | HV040 Sumitomo    |
| 9 | Packard Connector |
| M | Cable 1 m         |
| N | Cable 2 m         |
| P | Cable 5 m         |
| R | Cable 10 m        |

## ORDERING INFORMATION

M71 3 M – 300 P G – I B 0000

| Output   |                |
|----------|----------------|
| Code     | Output Voltage |
| <b>3</b> | 0.5 – 4.5 V    |
| <b>4</b> | 1.0 – 5.0 V    |

| Cable/Connectors |                   |
|------------------|-------------------|
| <b>1</b>         | Cable, 2 feet     |
| <b>2</b>         | Cable, 4 feet     |
| <b>3</b>         | Cable, 10 feet    |
| <b>7</b>         | Amp Connector     |
| <b>8</b>         | HV040 Sumitomo    |
| <b>9</b>         | Packard Connector |
| <b>M</b>         | Cable 1 meter     |
| <b>N</b>         | Cable, 2 meter    |
| <b>P</b>         | Cable, 5 meter    |
| <b>R</b>         | Cable, 10 meter   |

| Pressure Range [psi] |      |
|----------------------|------|
| psi                  | bar  |
| 150P                 | 010B |
| 200P                 | 014B |
| 300P                 | 020B |
| 450P                 | 030B |
| 500P                 | 035B |
| 750P                 | 050B |
| 01KP                 | 070B |
| 1K5P                 | 100B |
| 03KP                 | 200B |
| 05KP                 | 350B |
| 7K5P                 | 500B |
| 10KP                 | 700B |

Options in **green** are for both Port Materials  
Options in **blue** are for Copper port only.  
Options in black are for 17-4PH St. Steel only

| Port Material |                        |
|---------------|------------------------|
| <b>0</b>      | 17-4PH Stainless Steel |
| <b>B</b>      | Copper, C12200*        |

Copper Tube Pressure Port (**T**) is available only with Copper Port Material, C12200 Option (**B**) and all **blue** or **green** options

| Pressure Port |  |
|---------------|--|
| Code          | Port   |
| <b>2</b>      | G1/4, BS5380, Male   |
| <b>4</b>      | 7/16-20 UNF, SAE J1926-2, Male, w/ O-ring  |
| <b>5</b>      | 1/4-18 NPT Male  |
| <b>6</b>      | 1/8-27 NPT Male  |
| <b>E</b>      | R1/4-19 Male   |
| <b>F</b>      | G1/4-19, BS5380, Female  |
| <b>P</b>      | 7/16-20 UNF Female w/ Integral Valve Depressor; 1/4 Flare Gasket SAE J513C, Copper |
| <b>Q</b>      | M10x1.0 ISO 6149-2, Male   |
| <b>S</b>      | M12x1.5, ISO 6149-2, Male  |
| <b>G</b>      | M14x1.5, ISO 6149-2, Male  |
| <b>U</b>      | G1/4, DIN 3852-E, Male   |
| <b>T</b>      | 1/4" OD Copper Tube*   |

### NORTH AMERICA

Measurement Specialties, Inc.,  
a TE Connectivity Company  
Phone: 1 800-522-6752  
Email: [customercare.frm1@te.com](mailto:customercare.frm1@te.com)

### EUROPE

Measurement Specialties (Europe), Ltd.,  
a TE Connectivity Company  
Phone: +31 73 624 6999  
Email: [customercare.lcsb@te.com](mailto:customercare.lcsb@te.com)

### ASIA

Measurement Specialties (China), Ltd.,  
a TE Connectivity Company  
Phone: +86 0400-820-6015  
Email: [customercare.shzn@te.com](mailto:customercare.shzn@te.com)

### [TE.com/sensorsolutions](http://TE.com/sensorsolutions)

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