Loop-Powered Pressure Transmitter

DPG1000L

Electrical Specifications

Ranges and Resolution

| ab  | absolute reference (atmospheric pressure to zero at full vacuum) |
| vac | vacuum gauge, minus sign not used unless specified |

| Resolution is fixed as indicated in table below |

| Contact factory for engineering units not listed |

| 120.0 inHg | 1600 mHg | 35.0 bar | 1.000 kg/cm² abs |
| 199.9 inHg ab | 780 torr abs | 70.0 bar | 1.000 kg/cm² vac |
| 199.9 inHg | 1600 torr abs | 140.0 bar | ±1.000 kg/cm² ab |
| 3.00 psig | 50.0 oz/in² | 2100 mmHg | 199.9 bar | 1.000 kg/cm² ab |
| 5.00 psig | 80.0 oz/in² | 3500 mmHg | 350 bar | 1.999 kg/cm² ab |
| 15.00 psi ab | 240 oz/in² ab | 199.9 mbar | 19.99 kPa | 1.999 kg/cm² ab |
| 15.00 psi vac | 240 oz/in² vac | 350 mHg | 7.00 kPa | 1.000 kg/cm² ab |
| ±15.00 psi vac | ±240 oz/in² vac | 1000 cmHg | 100.0 kPa abs | 7.00 kg/cm² abs |
| 15.00 psi | 240 oz/in² | 2100 mmHg | 100.0 kPa vac | 7.00 kg/cm² vac |
| 30.0 psi abs | 140.0 inHg | 350 mbar | 100.0 kPa | 19.99 kg/cm² |
| 60.0 psi | 400 inHg vac | 1000 mbar abs | 199.9 kPa | 35.0 kg/cm² |
| 100.0 psi ab | 400 inHg | 1000 mbar | 199.9 kPa abs | 35.0 kg/cm² |
| 100.0 psi | 400 inHg | ±2400 oz/in² | 10000 cmHg | 140.0 kg/cm² |
| 199.9 psi | 400 inHg | 1000 mbar | 199.9 kPa abs | 35.0 kg/cm² |
| 300 psi | 850 inHg | 1995 mbar abs | 700 kPa | 35.0 kg/cm² |
| 500 psi | 700 inHg | 1999 mbar | 1500 kPa | 7.00 atm |
| 1000 psi | 1200 inHg | 4000 mbar | 1999 kPa | ±1.000 atm |
| 1999 psi | 3050 inHg | 10000 mbar | 3500 kPa | ±1.000 atm |
| 3000 psi | 3050 inHg | 10000 mbar | 5000 kPa | ±1.000 atm |
| 5000 psi | 3050 inHg | ±11000 mbar | 3500 kPa | ±1.000 atm |
| 6000 psi | 5050 inHg | 15000 mbar | 7000 kPa | ±1.000 atm |
| 10000 psi | 3050 inHg | 30500 mbar | 19999 kPa | ±1.000 atm |

Accuracy (linearity, hysteresis, repeatability)

Standard: ±0.25% of full scale ±1 least significant digit
Optional: -HA ±0.1% FS ±1LSD (most ranges)
    CD Factory calibration data
    NC NIST traceable test report and calibration data

Display

3 readings per second nominal display update rate
Ranges up to 1999: 3½ digit LCD, ½ digit height
3000 and 5000 psi ranges: 4 digit LCD, 0.4” digit height

Controls

Non-interactive zero and span, ±10% range
Test calibration level: 0-100% range
Retransmission zero and span: Internal potentiometers

Loop Supply Voltage

Any DC supply/loop resistance that maintains 8 to 32 VDC at gauge terminals
Gauge is reverse polarity protected
3 ft long, 2-conductor 22 AWG cable
Order optional 9046-24-008 loop power supply

Low Loop Indication

Below approximately 7.8 VDC
Ranges up to 1999: None
3000 and 5000 psi ranges: All decimal points flash

Output Characteristics

True analog output, 50 millisecond typical response time
If gauge terminal voltage falls below approx. 7.8 VDC erratic operation may occur

Test Function

Front panel TEST button, when depressed sets loop current and display to test calibration level, independent of pressure input, to allow testing of system operation.
Test Cal level is set by multiturn potentiometer to any value from 0 to 100% of FSO.

Environmental

Storage Temperature: -40 to 200°F (-40 to 95°C)
Operating Temperature: -4 to 185°F (-20 to 85°F)
Compensated Temperature: 32 to 158°F (0 to 70°C)

Pressure/Vacuum Connection and Material

¼” NPT male, 316 stainless steel

Material

Extruded aluminum case, epoxy powder coated
Polycarbonate cover. Front and rear gaskets

Color

Light gray body, light gray/blue front

Safety

Burst Pressure

4x rated pressure minimum or 10,000 psi, whichever is less

±0.25% Test Gauge Accuracy
316 Stainless Steel Wetted Parts
Pressure, Vacuum, or Absolute
Analog 4-20 mA Output
Output Test Function

Pressure

3.38” W x 2.88” H x 1.65” D housing
Add approximately 0.75” to height for pressure fitting
Add approximately 1” to depth for strain relief and wire clearance

Weight

Gauge: 9 ounces (approx)
Shipping weight: 1 pound (approx)

Material

Extruded aluminum case, epoxy powder coated
Polycarbonate cover. Front and rear gaskets

Color

Metal parts are 316 SS
Compatible with most liquids and gases

Overpressure

3000 psig range and metric equivalents: 5000 psig
5000 psig range and metric equivalents: 7500 psig
All others 2x rated pressure minimum

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DESCRIPTION
All operating power for the DPG1000L gauge is supplied by the 4-20 mA current loop. The 2-wire connection allows the DPG1000L to be used as a digital indicating transmitter in any 4-20 mA current loop application. The output is a continuous analog signal based on the transducer output rather than the display. The output is filtered to improve noise immunity and has a response time of about 50 msec. The temperature compensated piezoresistive transducer features 316 stainless steel wetted parts.

The TEST pushbutton, when depressed, switches the display and output loop to a preset level determined by the setting of a Test potentiometer.

INSTALLATION AND PRECAUTIONS
Install or remove gauge using wrench on hex fitting only. Do not attempt to tighten by turning housing or any other part of the gauge. Use fittings appropriate for the pressure range of the gauge. Do not apply vacuum to gauges not designed for vacuum operation. Due to the hardness of 316 stainless steel, it is recommended that a thread sealant be used to ensure leak-free operation.

NEVER insert objects into the gauge port or blow out with compressed air. Permanent damage not covered by warranty will result to the sensor.

ELECTRICAL CONNECTION
Connection to the DPG1000L is made with the 2-wire cable at the gauge rear. Connect the loop (+) supply to the RED lead and the loop (-) supply to the BLACK lead. Reversing the connections will not harm the gauge but the DPG1000L will not operate with incorrect polarity.

LOOP VOLTAGE
Select a loop power supply voltage and total loop resistance so that when the loop current is 20 mA, the gauge will have at least 8 VDC at its terminals. For correct operation and to avoid erratic or erroneous readings, the gauge terminal voltage must not fall below 8 VDC. Too large a loop resistance will cause the gauge output to “limit” or saturate before reaching its full 20 mA output. The minimum loop supply voltage may be calculated from the formula:

\[ V_{\text{min}} = 6V + (20mA \times \text{Total loop resistance}) \]

If the terminal voltage of the gauge falls below about 7.8 VDC, erratic operation may occur. This is an indication that the loop supply/resistance may not allow adequate headroom for reliable operation. This should never occur in normal use. If it does, examine the loop supply/resistance.

OPERATION
The DPG1000L is designed for continuous operation. Warm-up time is negligible. The display will show the system pressure or vacuum, and the loop current also will be proportional to the system pressure/vacuum:

- 4 mA = Zero or low end
- 20 mA = Span, full-scale or high end.

TEST BUTTON
When the front-panel TEST button is held depressed, the display and loop current are switched, independent of the system pressure, to a test level determined by the setting of the Test potentiometer. This test mode will allow setup and testing of the current loop by switching to this test level whenever desired without having to alter the system pressure.

To set the test output level, see gauge label for location of Test potentiometer. Press and hold the front-panel TEST button and adjust the Test potentiometer to set the display and loop current to the desired test level.

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CALIBRATION
See gauge label for location of individual controls to adjust the zero and span of the display.

Gauge Reference – Units may be re-zeroed without affecting the span calibration. The gauge port must be open to the ambient with no pressure or vacuum applied. Adjust the Zero control until the gauge reads zero with the minus (–) sign occasionally flashing.

Span calibration should only be attempted if the user has access to a pressure reference of known accuracy. The quality of the calibration is only as good as the accuracy of the calibration equipment and ideally should be at least four times the gauge accuracy. Zero calibration must be done before span calibration. Record readings at three to five points over the range of gauge and adjust span control to minimize error and meet specifications.

Absolute Reference – Gauges require vacuum generation and atmospheric pressure measurement equipment for accurate calibration and thus are more difficult to calibrate in the field. Gauges may be returned to Cecomp Electronics for factory certified recalibration. NIST traceability is available.

The DPG1000L has internal controls to adjust the agreement between the displayed value and the 4-20 mA loop current. These are set at the factory and should not normally be adjusted. If adjustment is necessary, consult factory. Accurate pressure generation and measurement and current measurement equipment are required to successfully complete this calibration.

DIMENSIONS

PART NUMBERS

Example: DPG1000L15PSIA = DPG1000, Loop powered, 15.00 PSI Absolute

<table>
<thead>
<tr>
<th>Unit Abbreviations</th>
<th>psi</th>
<th>kPa</th>
<th>lb/in²</th>
<th>m2/H2O</th>
<th>mmHg</th>
<th>bar</th>
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Cecomp maintains a constant effort to upgrade and improve its products. Specifications are subject to change without notice. Consult factory for your specific requirements.