

**Ranges and Resolution**

See table below. Resolution is fixed as indicated in table. Consult factory with special requirements or engineering units. For ranges greater than 2000, see F16L series.

abs: absolute reference normally reads atmospheric pressure and zero at full vacuum

vac: vacuum gauge, minus sign not used unless specified

3.00 psig	230 ftH <sub>2</sub> O	199.9 kPa abs
5.00 psig	480 ftH <sub>2</sub> O	199.9 kPa
15.00 psi abs	150.0 mmHg	400 kPa
15.00 psig vac	260 mmHg	700 kPa abs
±15.00 psig	760 mmHg abs	700 kPa
3.00-15.00 psig	760 mmHg vac	1500 kPa
15.00 psig	760 mmHg	1999 kPa
30.0 psi abs	1600 mmHg abs	3.50 MPa
30.0 psig	1600 mmHg	7.00 MPa
60.0 psig	760 torr abs	14.00 MPa
100.0 psi abs	1600 torr abs	19.99 MPa
100.0 psig	1999 mmH <sub>2</sub> O	35.0 MPa
199.9 psig	199.9 cmH <sub>2</sub> O	1000 g/cm <sup>2</sup> abs
300 psig	350 cmH <sub>2</sub> O	1000 g/cm <sup>2</sup>
500 psig	1000 cmH <sub>2</sub> O	1999 g/cm <sup>2</sup> abs
1000 psig	1999 cmH <sub>2</sub> O	1999 g/cm <sup>2</sup>
1999 psig	199.9 mbar	1.000 kg/cm <sup>2</sup> abs
6.00 inHg	350 mbar	1.000 kg/cm <sup>2</sup> vac
10.00 inHg	1000 mbar abs	±1.000 kg/cm <sup>2</sup>
30.0 inHg abs	1000 mbar vac	1.000 kg/cm <sup>2</sup>
30.0 inHg vac	±1000 mbar	1.999 kg/cm <sup>2</sup> abs
±30.0 inHg	1000 mbar	1.999 kg/cm <sup>2</sup>
30.0 inHg	1999 mbar abs	4.00 kg/cm <sup>2</sup>
60.0 inHg abs	1999 mbar	7.00 kg/cm <sup>2</sup> abs
60.0 inHg	1.000 bar abs	7.00 kg/cm <sup>2</sup>
120.0 inHg	1.000 bar vac	14.00 kg/cm <sup>2</sup>
199.9 inHg abs	±1.000 bar	19.99 kg/cm <sup>2</sup>
199.9 inHg	1.000 bar	35.0 kg/cm <sup>2</sup>
50.0 oz/in <sup>2</sup>	1.999 bar abs	70.0 kg/cm <sup>2</sup>
80.0 oz/in <sup>2</sup>	1.999 bar	140.0 kg/cm <sup>2</sup>
240 oz/in <sup>2</sup> abs	4.00 bar	199.9 kg/cm <sup>2</sup>
240 oz/in <sup>2</sup> vac	7.00 bar abs	350 kg/cm <sup>2</sup>
±240 oz/in <sup>2</sup>	7.00 bar	1.000 atm abs
240 oz/in <sup>2</sup>	14.00 bar	±1.000 atm
85.0 inH <sub>2</sub> O	19.99 bar	1.000 atm
140.0 inH <sub>2</sub> O	35.0 bar	4.00 atm
400 inH <sub>2</sub> O abs	70.0 bar	7.00 atm
400 inH <sub>2</sub> O vac	140.0 bar	14.00 atm
±400 inH <sub>2</sub> O	199.9 bar	19.99 atm
400 inH <sub>2</sub> O	350 bar	35.0 atm
850 inH <sub>2</sub> O	19.99 kPa	70.0 atm
7.00 ftH <sub>2</sub> O	35.0 kPa	135.0 atm
12.00 ftH <sub>2</sub> O	100.0 kPa abs	199.9 atm
35.0 ftH <sub>2</sub> O	100.0 kPa vac	340 atm
70.0 ftH <sub>2</sub> O	±100.0 kPa	
140.0 ftH <sub>2</sub> O	100.0 kPa	

**Accuracy**

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

**Display**

3.5 digit LCD, 0.5" digit height (indicates to 1999)  
 3 readings per second nominal display update rate

**Controls**

Non-interactive zero and span, ±10% range  
 Output test adjustment: 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

**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 output test level, independent of pressure input, to allow testing of system operation.

**Weight**

9 ounces (approx.), shipping wt. 1 pound (approx.)

**Housing**

Standard: Epoxy powder coated aluminum case and rear cover. ABS/polycarbonate bezel. Front and rear rubber gaskets. Polycarbonate label.

NEMA 4X: UV stabilized ABS/polycarbonate case and rear cover. Gasketed rear cover with six captive stainless steel screws. Polycarbonate label.

**Dimensions**

Standard: 3.38" W x 2.88" H x 1.65" D housing  
 NEMA 4X: 3.5" W x 3.0" H x 2.0" D housing  
 Add approximately 0.75" to height for pressure fitting  
 Add approx. 1" to depth for strain relief and wire clearance

**Connection and Material**

1/4" NPT male fitting  
 Sensor and all wetted parts are 316L stainless steel

**Under/Overpressure**

Ranges using 3000 psig sensor: 5000 psig  
 Ranges using 5000 psig sensor: 7500 psig  
 All others: 2 X pressure range  
 Vacuum: Gauge reference 15, 100, and 200 psi sensors only

**Burst Pressure**

4 X sensor pressure rating, or 10,000 psi, whichever is less

**Environmental**

Storage Temperature: -40 to 203°F (-40 to 95°C)  
 Operating Temperature: -4 to 185°F (-20 to 85°C)  
 Compensated Temperature: 32 to 158°F (0 to 70°C)

- ±0.25% Test Gauge Accuracy
- 316 Stainless Steel Wetted Parts
- 4-20 mA Analog Output
- Output Test Function



**How to Order**

Standard: DPG1000L  
 NEMA 4X: F4L  
 Range: See table  
 Units: See below for codes  
 Reference: G=gauge, A=absolute, VAC=vacuum  
 Options: See below

**Example: DPG1000L100PSIG-HA**

20, 200, 2000 ranges indicate 19.99, 199.9, 1999.  
 Minus sign not normally used with gauge reference vacuum ranges. If needed, please state on order "Minus sign required."

**Unit Ordering Codes**

psi = PSI  
 inHg = INHG  
 oz/in<sup>2</sup> = ZIN  
 inH<sub>2</sub>O = INH2O  
 ftH<sub>2</sub>O = FTH2O  
 mmHg = MMHG  
 torr = TORR  
 mmH<sub>2</sub>O = MMH2O  
 kg/cm<sup>2</sup> = KGCM  
 g/cm<sup>2</sup> = GCM  
 kPa = KPA  
 MPa = MPA  
 mbar = MBAR  
 bar = BAR  
 cmH<sub>2</sub>O = CMH2O  
 atm = ATM

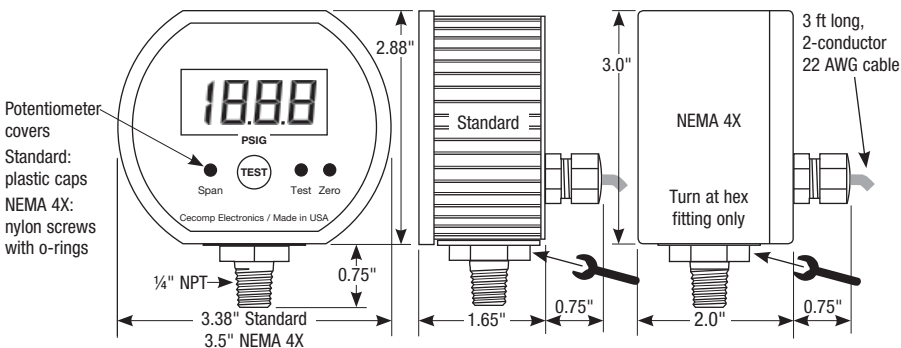
**Options**

-HA	High accuracy, ±0.1% FS ±1 LSD. Not available with 3 psi sensor, absolute, or vacuum ranges.
-PM	Panel mount, 4.1" x 4.1". Not for F4 models.
-ET	Extended temperature LCD (-40 to 85°C), includes CC.
-CC	Circuit board conformal coating for moisture resistance.

**Accessories**

CD	Calibration data; 5 test points and date
NC	NIST traceability documentation, 5 test points and date

**Dimensions**



## Types of Gauges

Gauge reference reads zero with the gauge port open.

Bipolar ranges read positive pressure and vacuum in the same units, and zero with the gauge port open.

Sealed reference reads zero with the gauge port open and is internally referenced to 14.7 psi. Used for 1000 psi and up. Functionally similar to gauge reference sensors.

Absolute reference reads atmospheric pressure with gauge port open and zero at full vacuum.

## Installation Precautions

- ✓ Read these instructions before installing the gauge.
- ✓ Use a pressure or vacuum range appropriate for the application. See gauge rear label for range.
- ✓ Gauges must only be operated in ambient temperature ranges within those stated in the specifications.
- ✓ Due to the hardness of 316 stainless steel, it is recommended that a thread sealant be used to ensure leak-free operation.
- ✓ Install or remove gauge using a wrench on the hex fitting only.
- ✓ For contaminated media use an appropriate screen or filter to keep debris out of gauge port.
- ✗ Do not attempt to turn by forcing the housing.
- ⚠ Use fittings appropriate for the pressure range of the gauge.
- ✗ Do not apply vacuum to gauges not designed for vacuum 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.

## Description

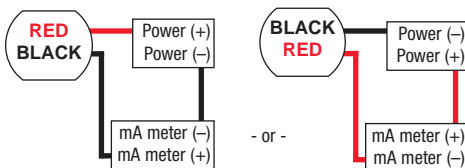
All operating power is supplied by the 4-20 mA current loop. The 2-wire connection allows the DPG1000L and F4L to be used as an indicating transmitter in any 4-20 mA current loop application or as a DC powered gauge.

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 button, when depressed, switches the display and output loop to a preset level determined by the setting of a Test potentiometer. This is useful for testing the 4-20 mA output signal without having to alter system pressure.

## Electrical Connection

Connection to the DPG1000L or F4L 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 and F4L will not operate with incorrect polarity.



If the 4-20 mA analog output is not required, the transmitter will function as a pressure gauge when connected to any 8 to 32 VDC power supply. Reversing the connections will not harm the gauge but the DPG1000L and F4L will not operate with incorrect polarity.



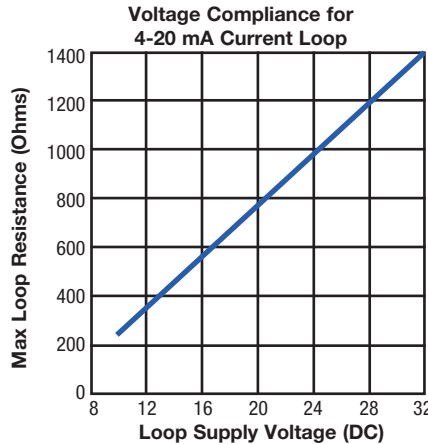
## Loop Voltage

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 and not exceed 32 VDC.

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:

$$V_{min} = 8V + (20mA \times \text{Total loop resistance})$$

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 and F4L 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.

### Gauge reference pressure ranges

4 mA = Zero or gauge port open to atmosphere  
20 mA = Span or full scale pressure

### Gauge reference vacuum ranges

4 mA = Zero or gauge port open to atmosphere  
20 mA = Span or full-scale vacuum

### Absolute reference ranges

4 mA = Zero or full-scale vacuum  
20 mA = Span or full scale pressure of the sensor used

Note that absolute gauges read atmospheric pressure with the gauge port open to atmosphere. Atmospheric pressure and thus the gauge reading, will vary continuously. For example a 15 psia sensor may read 14 psia depending on local barometric pressure and the effects of altitude.

## Test Function

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.

Cecomp maintains a constant effort to upgrade and improve its products. Specifications are subject to change without notice. Consult factory for your specific requirements.

## Calibration Preparation

Gauges are calibrated at the factory using equipment traceable to NIST. There is no need to calibrate the gauge before putting it into service.

Calibration should only be performed by qualified individuals using appropriate calibration standards and procedures. Gauges can be returned to factory for certified recalibration and repairs. NIST traceability is available.

Calibration intervals depend on your quality control program requirements and as-found data. Many customers calibrate their equipment annually.

The calibration equipment should be at least four times more accurate than the gauge being calibrated. The calibration system must be able to generate and measure pressure and/or vacuum over the full range of the gauge.

A vacuum pump able to produce a vacuum of 10 microns (0.01 torr or 10 millitorr) or lower is required for vacuum and absolute gauges. Warning: application of vacuum to non-vacuum models may result in irreparable damage to the sensor.

Use a stable DC power supply and an accurate mA meter for calibration of loop powered transmitters.

Allow the gauge to equalize to normal room temperature (about 20 minutes minimum) before calibration.

## Calibration

1. See rear label of gauge for pressure range.
2. Remove the covers on the Zero and Span controls on the front of the gauge.
3. Loop-powered gauges must be connected to 9-32 VDC during the calibration procedure. The supply voltage has negligible effects on the gauge calibration as long as it is within the stated voltage ranges. Over voltage may result in damage.
4. Internal Zero and Span potentiometers adjust the agreement between the display and the analog output. These normally do not need to be adjusted. If the output does need adjustment, remove the rear cover to access the potentiometers. See image below.
5. Zero for gauge reference pressure or vacuum gauges: With the gauge port open to atmosphere, adjust the Zero potentiometer for a display indication of zero. Output should be 4.0 milliamps.  
Zero for absolute reference gauges: Apply full vacuum to the gauge. Adjust the Zero potentiometer for a display indication of zero. Output should be 4.0 milliamps.
6. Span for gauge reference pressure gauges and absolute reference gauges: Apply full-scale pressure and adjust the Span potentiometer for a display indication equal to full-scale pressure. Output should be 20.0 milliamps.  
Span for gauge reference vacuum gauges: Apply full vacuum to the gauge. Adjust the Span potentiometer for a display indication equal to full-scale vacuum. Output should be 20.0 milliamps.
7. Verify pressure indications at 0%, 25%, 50%, 75%, and 100% of full scale and repeat calibration as needed to achieve best accuracy over desired operating range.
8. Replace the potentiometer covers, rear cover and screws, taking care not to pinch the wires between the case and the rear cover.

