

Ranges and Resolution

Use range codes below to build model number. Engineering units and resolution are factory set. 20, 200, 2000 ranges display 19.99, 199.9, 1999 respectively. See F16L for more ranges, resolution, high accuracy options.

PSI	Res	inHg	Res	mbar	Res
3PSIG	0.01	6INHGG	0.01	200MBARG	0.1
5PSIG	0.01	10INHGG	0.01	350MBARG	1
15PSIA	0.01	30INHGA	0.1	1000MBARA	1
15PSIVAC	0.01	30INHGVAC	0.1	1000MBARVAC	1
15PSIG	0.01	30INHGG	0.1	1000MBARG	1
3-15PSIG	0.01	60INHGA	0.1	2000MBARA	1
30PSIA	0.1	60INHGG	0.1	2000MBARG	1
30PSIG	0.1	120INHGG	0.1	bar	Res
60PSIG	0.1	200INHGA	0.1	1BARA	0.001
100PSIA	0.1	200INHGG	0.1	1BARVAC	0.001
100PSIG	0.1	400INHGG	1	1BARG	0.001
200PSIG	0.1	600INHGG	1	2BARA	0.001
300PSIG	1	1000INHGG	1	2BARG	0.001
500PSIG	1	2000INHGG	1	4BARG	0.01
1000PSIG	1	Torr	Res	7BARA	0.01
2000PSIG	1	760TORRA	1	7BARG	0.01
oz/in2	Res	760TORRAC	1	14BARG	0.01
48ZING	0.1	1600TORRA	1	20BARG	0.01
50ZING	0.1	mmHg	Res	35BARG	0.1
80ZING	0.1	150MMHGG	0.1	70BARG	0.1
240ZINA	1	260MMHGG	1	140BARG	0.1
235ZINVAC	1	760MMHGA	1	200BARG	0.1
240ZING	1	760MMHGVAC	1	350BARG	1
480ZINA	1	760MMHGG	1	MPa	Res
480ZING	1	1600MMHGA	1	1.4MPAGVAC	0.001
960ZING	1	1600MMHGG	1	1.4MPAG	0.001
1600ZING	1	kPa	Res	2MPAG	0.001
inH2O	Res	20KPAG	0.01	3.5MPAG	0.01
85INH20G	0.1	35KPAG	0.1	7MPAG	0.01
140INH20G	0.1	100KPAA	0.1	14MPAG	0.01
400INH20A	1	100KPAVAC	0.1	20MPAG	0.01
400INH20VAC	1	100KPAG	0.1	35MPAG	0.1
400INH20G	1	200KPAA	0.1	g/cm2	Res
850INH20A	1	200KPAG	0.1	200GCMG	0.1
850INH20G	1	400KPAG	1	350GCMG	1
1700INH20G	1	700KPAA	1	1000GCMG	1
ftH2O	Res	700KPAG	1	1000GCMVAC	1
7FTH2O	0.01	1400KPAG	1	1000GCMG	1
12FTH2O	0.01	2000KPAG	1	2000GCMG	1
35FTH2O	0.1	atm	Res	2000GCMG	1
70FTH2O	0.1	1ATMA	0.001	kg/cm2	Res
140FTH2O	0.1	1ATMVAC	0.001	1KGCMG	0.001
200FTH2O	0.1	1ATMG	0.001	1KGCMVAC	0.001
230FTH2O	1	2ATMA	0.001	1KGCMG	0.001
460FTH2O	1	2ATMG	0.001	2KGCMG	0.001
700FTH2O	1	4ATMG	0.01	2KGCMG	0.001
1150FTH2O	1	7ATMA	0.01	4KGCMG	0.01
mmH2O	Res	7ATMG	0.01	7KGCMG	0.01
2000MMH20G	1	14ATMG	0.01	7KGCMG	0.01
cmH2O	Res	20ATMG	0.01	14KGCMG	0.01
200CMH20G	0.1	34ATMG	0.1	20KGCMG	0.01
350CMH20G	1	70ATMG	0.1	35KGCMG	0.1
1000CMH20A	1	136ATMG	0.1	70KGCMG	0.1
1000CMH20VAC	1	140ATMG	1.1	140KGCMG	0.1
1000CMH20G	1	200ATMG	0.1	200KGCMG	0.1
2000CMH20A	1	340ATMG	1	350KGCMG	1
2000CMH20G	1				

Accuracy

Accuracy includes linearity, hysteresis, repeatability
Accuracy: ±0.25% of full scale ±1 least significant digit
Sensor hysteresis: ±0.015% FS, included in accuracy
Sensor repeatability: ±0.01% FS, included in accuracy

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. Reverse polarity protected.
3 ft long, 2-wire 22 AWG cable, stripped and tinned wire ends

Output Characteristics

True analog output, 50 millisecond typical response time
Gauge terminal voltage must be above 8 VDC at all times

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

DPG1000L: NEMA 2 gray coated extruded aluminum case, ABS/polycarbonate bezel, front and rear gaskets, polycarbonate label.
F4L: NEMA 4X UV stabilized ABS/polycarbonate case, polycarbonate display window, polycarbonate front label, rear gasket, six stainless steel cover screws. Not intended for permanent outdoor installations.

Connection and Material

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

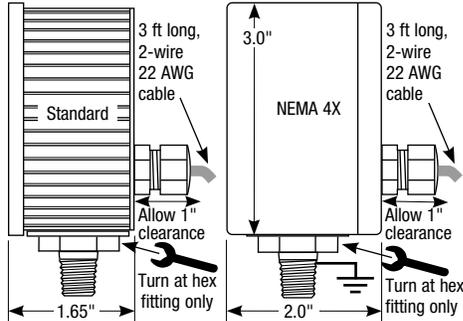
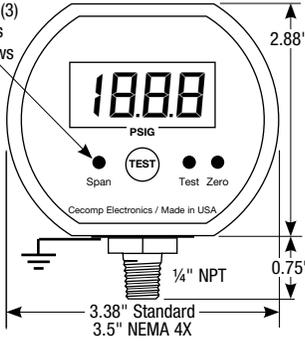
Overpressure, Burst, Vacuum

Ranges using 3000 psig sensor: 5000 psig
Ranges using 5000 psig sensor: 7500 psig
All others: 2 X pressure range
Sensor burst: 4 X sensor pressure rating, or 10,000 psi, whichever is less
Vacuum service: 15 psia, ±15 psig, 15 psig, 30 psia, 100 psig, 100 psia, 200 psig sensors

Environmental Temperatures

Storage temperature: -40 to 203°F (-40 to 95°C)
Operating temperature: -4 to 180°F (-20 to 82°C)
Sensor compensated range: 32 to 158°F (0 to 70°C)

Potentiometer covers (3)
Standard: plastic caps
NEMA 4X: nylon screws with o-rings
Non-metallic system installations require connecting gauge sensor to earth ground to avoid static electricity damage to gauge. Attach ground wire using a ring terminal and a #2 x 1/4" long sheet metal screw driven into sensor rivet head.



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



DPG1000L

Quick Link
cecomp.com/loop



NEMA 4X Housing

F4L

How to Specify	Type
DPG1000L range - options	Standard housing
F4L range - options	NEMA 4X housing

Range Codes: See table at left
psi = PSI Torr = TORR mbar = MBAR
inHg = INHG mmH₂O = MMH2O bar = BAR
oz/in² = ZIN kg/cm² = KGCM cmH₂O = CMH2O
inH₂O = INH2O g/cm² = GCM atm = ATM
ftH₂O = FTH2O kPa = KPA
mmHg = MMHG MPa = MPA

G = gauge reference pressure
VAC = gauge reference vacuum
A = absolute reference

If vacuum gauge requires a minus sign, please specify. Range codes listed as 2, 20, 200, or 2000 display 1.999, 19.99, 199.9, or 1999 respectively.

Options: add to end of model number. Factory installed only. See cecomp.com/accessories for details.

PM	Panel mount, 4.1" x 4.1", n/a NEMA 4X
CC	Moisture resistant circuit board conformal coating

Calibration Certificate: add to end of model number

NC	NIST traceability documentation, 5 points and date
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Accessory: Order separately

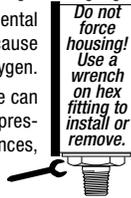
SCR14SS Filter Screen

Filter screen fitting keeps debris out of gauge sensor. Use for food vacuum packaging applications. 303 SS body, 100 micron 304 SS screen.



Precautions

- ✓ Read and understand all instruction sheet information. Contact us for help, instructions, or repairs.
- ✓ **Use specified power only.** Improper voltages will damage the gauge. NEVER connect the gauge power wires directly to an electrical outlet or permanent damage will result.
- ✓ Gauges are not intended for permanent outdoor use. Protect from weather and excessive humidity. NEMA 4X models are available for temporary outdoor use and wash down areas.
- ✓ Install gauge so it is protected from impact damage.
- ✓ Media temperature and gauge ambient temperature must be within specified ranges.
- ✓ Use a screen or filter to avoid clogging gauge port when measuring contaminated media.
- ✓ Use thread sealant to ensure leak-free operation.
- ✓ Media being measured must be compatible with 316L SS.
- ✓ Avoid sensor damage! Sensor diaphragm is thin 316L SS foil. Never insert objects into the gauge port or blow out with compressed air.
- ✓ Avoid sensor damage! Hydraulic or liquid pumping systems must include a shock suppressor to protect gauge sensor from damaging pressure spikes or water hammer.
- ✓ Avoid sensor damage! Do not apply vacuum to non-vacuum gauges or hydraulic vacuum to any gauge.
- ⚠ Do not exceed pressure range indicated on gauge label.
- ⚠ Remove system pressure before removing or installing gauge.
- ⚠ Use fittings appropriate for the pressure range of the gauge.
- ⚠ Gauges are not for oxygen service. Accidental rupture of sensor diaphragm may cause silicone oil inside sensor to react with oxygen.
- ⚠ Only gauges marked as Intrinsically Safe can be used in hazardous locations or in the presence of flammable or explosive substances, or atmospheres.



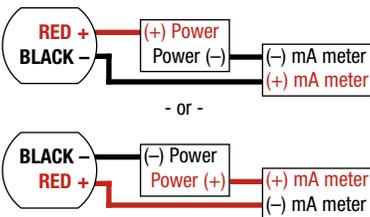
Cecomp maintains a constant effort to upgrade and improve its products. Specifications are subject to change without notice. See cecomp.com for latest product information. Consult factory for your specific requirements.

Types of Gauges

Gauge reference types read zero with the gauge port open. 500 psi and higher sensor are a sealed reference type. They read zero with the gauge port open are internally referenced to 14.7 psi. Functionally similar to gauge reference sensors. Absolute reference gauges read zero at full vacuum and atmospheric pressure with the gauge port open. With an open gauge port the readings will vary continuously due to the effects of barometric pressure.

Electrical Connections

Connection to the DPG1000L or F4L is made with the 2-wire cable at the gauge rear. Reversing the connections will not harm the gauge, but it will not operate with incorrect polarity. See the wiring examples below for connecting to a 4-20 mA current loop.



If the 4-20 mA analog output is not required, the transmitter will function as a low voltage powered pressure gauge when connected to any 8 to 32 VDC power supply. Connect the loop (+) supply to the RED lead and the loop (-) supply to the BLACK lead.



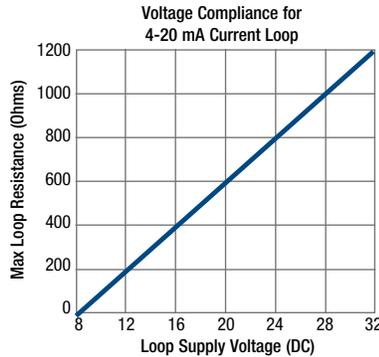
Loop Voltage

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 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.



Test Function

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.

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.

Operation

The DPG1000L and F4L are designed for continuous operation. Warm-up time is negligible. The display will show the system pressure or vacuum, and the loop current will be proportional to the system pressure/vacuum.

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 TEST button may be used at any time to temporarily set the 4-20 mA output signal to the test value without having to alter system pressure.

Gauge Type	Full vacuum	"0" on display	Full pressure
Gauge reference pressure	n/a	4 mA	20 mA
Gauge reference vacuum	20 mA	4 mA	n/a
Absolute reference	4 mA	4 mA	20 mA

Calibration Preparation

Gauges are factory calibrated at approximately 23°C using NIST traceable calibration equipment. Calibration is not required before using the gauge.

Calibration intervals depend on your quality standards, but annual re-calibration is customary. Calibration should be performed by qualified individuals using appropriate calibration standards and procedures.

Gauges may be returned to the factory for recalibration and repairs. NIST traceability is available.

The calibration equipment should be at least four times more accurate than the gauge being calibrated and 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 100 microns (0.1 torr or 100 millitorr) or lower is required for vacuum and absolute gauges.

Warning: Never apply vacuum to gauge not designated for vacuum service. Permanent sensor damage may result.

Loop-powered gauges must be connected to 9-32 VDC during the calibration procedure. See "Loop Voltage" at left to ensure the supply voltage is sufficient to drive the 4-20 mA output over its entire range. Over voltage may cause damage.

Use an accurate mA meter to measure 4-20 mA output.

Allow the gauge to equalize to normal room temperature for at least 20 minutes before calibration.

For an as-found report, record readings at three to five points over the range of gauge.

For DPG1000L models remove the black front potentiometer covers to access the zero and span calibration potentiometers. F4L models use white nylon screws with an o-ring to protect the potentiometers. These must be removed first to access the zero and span calibration potentiometers.

Calibration

1. See the rear label of gauge for the range.
2. Internal Zero and Span potentiometers adjust the agreement between the display and the analog output. These normally do not need to be adjusted. The special 3-15 psig range does not have an internal loop zero adjustment. If the output does need adjustment, remove the rear cover to access the potentiometer(s). See image below.
3. Zero calibration must be done before span calibration. If desired, gauge can be zeroed without doing span calibration.

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 with the minus (-) sign occasionally flashing.

Output should be 4.0 mA. If not, adjust the rear internal Loop Zero potentiometer (except for 3-15 psig models).

Zero for absolute reference gauges: Apply full vacuum to the gauge. Adjust the Zero potentiometer to match the gauge's display to your calibrator's absolute vacuum reading. It may be zero or close to it depending on the ability of the vacuum pump. At zero, the output should be 4.0 mA. If not, adjust the rear internal Loop Zero potentiometer.

4. **Span for all gauges:** A setting that is 75% of full scale vacuum or pressure (depending on gauge type) works well to minimize mid-range non-linearity. Adjust the Span potentiometer to match the gauge's display to your calibrator's reading. At 75% of full scale, output should be 16.0 mA. If not, adjust the rear internal Loop Span potentiometer.
5. **Output Calibration for 3-15 psig models:** The Loop Span pot affects both the 3 psig (4 mA) and the 15 psig (20 mA) points. It has a greater effect on the 20 mA point and a lesser effect on the 4 mA point. The Loop Span pot is adjusted to get the best fit at those two points.
5. 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.
6. Replace the potentiometer covers, rear cover and screws.

