Cecomp® 2-Wire Loop Powered Digital Pressure Transmitters — DPG1000L, F4L

Ranges and Resolution
See table below for popular ranges. Consult factory for special engineering units. Resolution is fixed as indicated. See our F16L series for ranges greater than 2000 or if more display resolution is required.

† -HA option is for output only and not supported by display
‡ -HA option not available

PSI	Res	inH_2O	Res	mmH_2O	Res
3PSIG‡	.01	85INH2OG‡	.1	2000MMH2OG‡	1
5PSIG‡	.01	140INH2OG‡	.1	**cmH_2O**	**Res**
15PSIA	.01	400INH2OA	1	200CMH2OG‡	.1
15PSIVAC‡	.01	400INH2OVAC‡	1	350CMH2OG‡	1
±15PSIG‡	.1	±400INH2OG‡	1	1000CMH2OA	1
15PSIG	.01	400INH2OG	1	1000CMH2OVAC‡	1
30PSIA	.1	850INH2OA	1	±1000CMH2OG‡	1
30PSIG†	.1	850INH2OG	1	1000CMH2OG	1
60PSIG	.1	**ftH_2O**	**Res**	2000CMH2OA	1
100PSIA	.1	7FTH2O‡	.01	2000CMH2OG	1
100PSIG	.1	12FTH2O‡	.01	**kPa**	**Res**
200PSIG	.1	35FTH2O†	.1	20KPAG‡	.01
300PSIG†	1	70FTH2O	.1	35KPAG‡	.1
500PSIG	1	140FTH2O	.1	100KPAA	.1
1000PSIG	1	230FTH2O†	1	100KPAVAC‡	.1
2000PSIG	1	480FTH2O	1	±100KPAG‡	.1
oz/in^2	**Res**	700FTH2O	1	100KPAG	.1
50ZING‡	.1	1150FTH2O	1	200KPAA	.1
80ZING‡	.1	**mmHg**	**Res**	200KPAG	.1
240ZINA	1	150MMHGG‡	.1	400KPAG	1
240ZINVAC‡	1	260MMHGG‡	1	700KPAA	1
±240ZING‡	1	760MMHGA	1	700KPAG	1
240ZING†	1	760MMHGVAC‡	1	1400KPAG	1
480ZINA	1	±760MMHGG‡	1	2000KPAG	1
480ZING	1	760MMHGG	1	**MPa**	**Res**
inHg	**Res**	1600MMHGA	1	1.4MPAG	.001
6INHGG‡	.01	1600MMHGG	1	2MPAG	.001
10INHGG‡	.01	**Torr**	**Res**	3.5MPAG†	.01
30INHGA	.1	760TORRA	1	7MPAG	.01
30INHGVAC‡	.1	760TORRVAC‡	1	14MPAG	.01
±30INHGG‡	.1	1600TORRA	1	20MPAG	.01
30INHGG†	.1	**mbar**	**Res**	35MPAG†	.1
60INHGA	.1	200MBARG‡	.1	**g/cm^2**	**Res**
60INHGG	.1	350MBARG‡	1	200GCMG‡	.1
120INHGG	.1	1000MBARA	1	350GCMG‡	1
200INHGA	.1	1000MBARVAC‡	1	1000GCMA	1
200INHGG	.1	±1000MBARG‡	1	1000GCMVAC‡	1
400INHGG	1	1000MBARG	1	±1000GCMG‡	1
600INHGG	1	2000MBARA	1	1000GCMG	1
1000INHGG	1	2000MBARG	1	2000GCMA	1
2000INHGG	1	**bar**	**Res**	2000GCMG	1
atm	**Res**	1BARA	.001	**kg/cm^2**	**Res**
1ATMA	.001	1BARVAC‡	.001	1KGCMA	.001
1ATMVAC‡	.001	±1BARG‡	.001	1KGCMVAC‡	.001
±1ATMG‡	.001	1BARG	.001	±1KGCMG‡	.001
1ATMG	.001	2BARA	.001	1KGCMG	.001
2ATMA	.001	2BARG	.001	2KGCMA	.001
2ATMG	.001	4BARG	.01	2KGCMG	.001
4ATMG	.01	7BARA	.01	4KGCMG	.01
7ATMA	.01	7BARG	.01	7KGCMA	.01
7ATMG	.01	14BARG	.01	7KGCMG	.01
14ATMG	.01	20BARG	.01	14KGCMG	.01
20ATMG	.01	35BARG†	.1	20KGCMG	.01
34ATMG†	.1	70BARG	.1	35KGCMG†	.1
70ATMG	.1	140BARG	.1	70KGCMG	.1
140ATMG	.1	200BARG	.1	140KGCMG	.1
200ATMG	.1	350BARG†	1	200KGCMG	.1
340ATMG†	1			350KGCMG†	1

Accuracy
Accuracy includes linearity, hysteresis, repeatability
Standrd accuracy: ±0.25% of full scale ±1 least significant digit
HA accuracy option: ±0.1% FS ±1 LSD, see ranges for availability
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
Gauge is reverse polarity protected
3 ft long, 2-conductor 22 AWG cable with stripped and tinned wire ends

Output Characteristics
True analog output, 50 millisecond typical response time
For proper operation gauge terminal voltage must be above 7.8 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
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

Overpressure
Ranges using 3000 psig sensor: 5000 psig
Ranges using 5000 psig sensor: 7500 psig
All others: 2 X pressure range
Vacuum service: 15 psia, ±15 psig, 15 psig, 30 psia, 100 psig, 100 psia, 200 psig sensors

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*

MADE IN USA

DPG1000L

Quick Link
cecomp.com/loop

NEMA 4X Housing

F4L

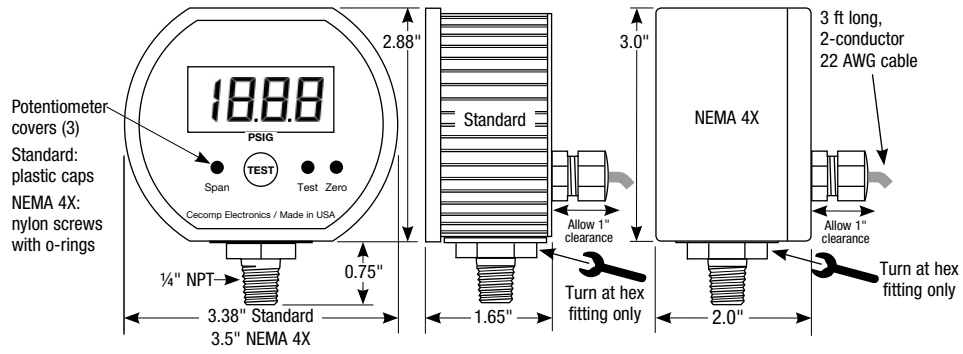
How to Specify	Type
DPG1000L *range - options*	Standard housing
F4L *range - options*	NEMA 4X housing

Range—see table at left

psi = PSI	torr = TORR	mbar = MBAR
inHg = INHG	mmH_2O = MMH2O	bar = BAR
oz/in^2 = ZIN	kg/cm^2 = KGCM	cmH_2O = CMH2O
inH_2O = INH2O	g/cm^2 = GCM	atm = ATM
ftH_2O = FTH2O	kPa = KPA	
mmHg = MMHG	MPa = MPA	

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

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	
HA	High accuracy, ±0.1% FS ±1 LSD. See table at left for availability.
PM	Panel mount, 4.1" x 4.1", n/a NEMA 4X
CC	Moisture resistant circuit board conformal coating
CD	Calibration data; 5 test points and date
NC	NIST traceability documentation, 5 points and date

SCR14SS
Filter screen fitting keeps debris out of gauge sensor. Use for food vacuum packaging applications. 303 SS body, 100 micron 304 SS screen.

1220 American Way Libertyville, IL 60048
800-942-0315
cecomp.com

Precautions

- ✔ Read these instructions before using the gauge. Configuration may be easier before installation. Contact the factory for assistance.
- ✔ These products do not contain user-serviceable parts. Contact us for repairs, service, or refurbishment.
- ✔ Gauges must be operated within specified ambient temperature ranges.
- ✔ Outdoor or wash down applications require a NEMA 4X gauge or installation in a NEMA 4X housing.
- ✔ Use a pressure or vacuum range appropriate for the application.
- ✔ Use fittings appropriate for the pressure range of the gauge.
- ✔ Due to the hardness of 316 stainless steel, it is recommended that a thread sealant be used to ensure leak-free operation.
- ✔ For contaminated media use an appropriate screen or filter to keep debris out of gauge port.
- ✔ Remove system pressures before removing or installing gauge.
- ✔ Install or remove gauge using a wrench on the hex fitting only. Do not attempt to turn gauge by forcing the housing.
- ✔ Good design practice dictates that positive displacement liquid pumps include protection devices to prevent sensor damage from pressure spikes, acceleration head, and vacuum extremes.
- ☒ Avoid permanent sensor damage! Do not apply vacuum to non-vacuum gauges or hydraulic vacuum to any gauges.
- ☒ Avoid permanent sensor damage! NEVER insert objects into gauge port or blow out with compressed air.
- ⚠ Gauges are not for oxygen service. Accidental rupture of sensor diaphragm may cause silicone oil inside sensor to react with oxygen.
- ☒ NEVER connect the gauge wires directly to 115 VAC or permanent damage will result.

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.

WARNING: This product can expose you to chemicals including lead, nickel and chromium, which are known to the State of California to cause cancer or birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov

Types of Gauges

Gauge reference types read zero with the gauge port open.

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

1000 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.

Operation

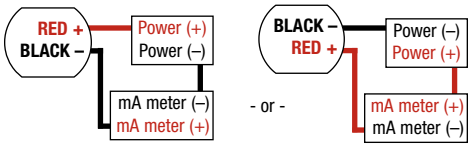
All operating power is supplied by the 4-20 mA current loop. The 2-wire connection allows the DPG1000L and F4L to be used as an indicating transmitter in any 4-20 mA current loop application or as a DC powered gauge.

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. Reversing the connections will not harm the gauge but the DPG1000L and F4L 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.

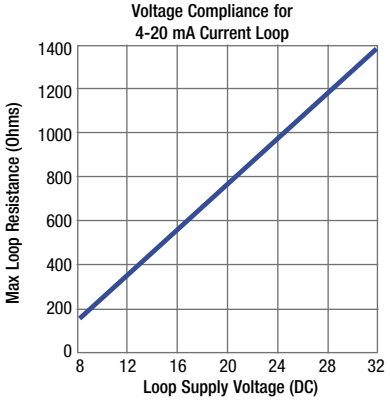
Loop Voltage

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:

Vmin = 8V + (20mA x 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 are 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.

Sensor	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
Bipolar ±	4 mA	12 mA	20 mA

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.

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 100 microns (0.1 torr or 100 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.