

Ranges and Resolution

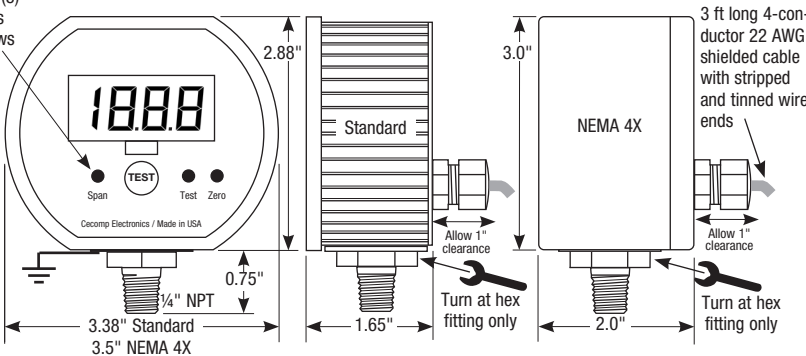
See table below for popular ranges. Consult factory for special engineering units. Resolution is fixed as indicated. See our F16DR series for ranges greater than 2000 or if more display resolution is required.

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

PSI	Res	inHg	Res	mmH ₂ O	Res
3PSIG [†]	.01	6INHG [‡]	.01	2000MMH ₂ O [‡]	1
5PSIG [†]	.01	10INHG [‡]	.01	cmH ₂ O	Res
15PSIA	.01	30INHG [‡]	.1	200CMH ₂ O [‡]	.1
15PSIVAC [†]	.01	30INHG [‡] VAC [†]	.1	350CMH ₂ O [‡]	1
±15PSIG [†]	.1	±30INHG [‡]	.1	1000CMH ₂ O	1
3-15PSIG [†]	.01	30INHG [‡]	.1	1000CMH ₂ O [‡] VAC [†]	1
15PSIG	.01	60INHG [‡]	.1	±1000CMH ₂ O [‡]	1
30PSIA [†]	.1	60INHG [‡]	.1	1000CMH ₂ O	1
30PSIG [†]	.1	120INHG [‡]	.1	2000CMH ₂ O [‡]	1
60PSIG	.1	200INHG [‡]	.1	2000CMH ₂ O	1
100PSIA	.1	200INHG [‡]	.1	g/cm ²	Res
100PSIG	.1	400INHG [‡]	1	200GCMG [‡]	.1
200PSIG	.1	600INHG [‡]	1	350GCMG [‡]	1
300PSIG [†]	1	1000INHG [‡]	1	1000GCMG	1
500PSIG	1	2000INHG [‡]	1	1000GCMVAC [†]	1
1000PSIG	1	mbar	Res	±1000GCMG [‡]	1
2000PSIG	1	200MBARG [†]	.1	1000GCMG	1
oz/in ²	Res	350MBARG [†]	1	2000GCMG [‡]	1
50ZING [†]	.1	1000MBARA	1	2000GCMG	1
80ZING [†]	.1	1000MBARVAC [†]	1	kg/cm ²	Res
240ZINA	1	±1000MBARG [†]	1	1KGCMG	.001
240ZINVAC [†]	1	1000MBARG	1	1KGCMVAC [†]	.001
±240ZING [†]	1	2000MBARA [†]	1	±1KGCMG [‡]	.001
240ZING [†]	1	2000MBARG	1	1KGCMG	.001
480ZINA [†]	1	bar	Res	2KGCMG [‡]	.001
480ZING	1	1BARA	.001	2KGCMG	.001
inH ₂ O	Res	1BARVAC [†]	.001	4KGCMG	.01
85INH ₂ O [‡]	.1	±1BARG [†]	.001	7KGCMG	.01
140INH ₂ O [‡]	.1	1BARG	.001	7KGCMG	.01
400INH ₂ O	1	2BARA [†]	.001	14KGCMG	.01
400INH ₂ O [‡]	1	2BARG	.001	20KGCMG	.01
±400INH ₂ O [‡]	1	4BARG	.01	35KGCMG [†]	.1
400INH ₂ O	1	7BARA	.01	70KGCMG	.1
850INH ₂ O [‡]	1	7BARG	.01	140KGCMG	.1
850INH ₂ O	1	14BARG	.01	200KGCMG	.1
ftH ₂ O	Res	20BARG	.01	350KGCMG [†]	1
7FTH ₂ O [†]	.01	35BARG [†]	.1	kPa	Res
12FTH ₂ O [†]	.01	70BARG	.1	20KPAG [†]	.01
35FTH ₂ O [†]	.1	140BARG	.1	35KPAG [†]	.1
70FTH ₂ O	.1	200BARG	.1	100KPAA	.1
140FTH ₂ O	.1	350BARG [†]	.1	100KPAVAC [†]	.1
230FTH ₂ O [†]	1	atm	Res	±100KPAG [†]	.1
480FTH ₂ O	1	1ATMA	.001	100KPAG	.1
700FTH ₂ O	1	1ATMVAC [†]	.001	200KPAA [†]	.1
1150FTH ₂ O	1	±1ATMG [‡]	.001	200KPAG	.1
mmHg	Res	1ATMG	.001	400KPAG	1
150MMHG [‡]	.1	2ATMA [†]	.001	700KPAA	1
260MMHG [‡]	1	2ATMG	.001	700KPAG	1
760MMHGA	1	4ATMG	.01	1400KPAG	1
760MMHG [‡] VAC [†]	1	7ATMA	.01	2000KPAG	1
±760MMHG [‡]	1	7ATMG	.01	MPa	Res
760MMHG	1	14ATMG	.01	1.4MPAG	.001
1600MMHGA [†]	1	20ATMG	.01	2MPAG	.001
1600MMHG	1	34ATMG [†]	.1	3.5MPAG [†]	.01
Torr	Res	70ATMG	.1	7MPAG	.01
760TORRA	1	140ATMG	.1	14MPAG	.01
760TORRVAC [†]	1	200ATMG	.1	20MPAG	.01
1600TORRA [†]	1	340ATMG [†]	1	35MPAG [†]	.1

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.



Accuracy

Accuracy includes linearity, hysteresis, repeatability
Standard 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
DRBL: Red LED backlight

Controls

Non-interactive zero and span, ±10% range
Output test adjustment: 0-100% range
Retransmission zero and span: Internal potentiometers

Output Characteristics

True analog output, 50 millisecond typical response time
-I version: Current output, 4-20 mA DC, output drive (compliance) determined by power source. See graph on other side.
-V version: Voltage output, 0-2 VDC into 5k ohm or greater. Output is 0-1-2 V with ±15 psi sensor.

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.

Power

8-24 VAC 50/60 Hz or 9-32 VDC
Use with WMPSK 115 VAC/12 VDC power supply
Gauge is on whenever power is applied
Designed for continuous operation
DR: 30 mA maximum
DRBL: Approximately 40 mA maximum

Weight

9.5 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 2.
NEMA 4X: UV stabilized ABS/polycarbonate case, polycarbonate display window, polycarbonate front label, rear gasket, six stainless steel cover screws. NEMA 4X not intended for permanent outdoor installations.

Connection, Material, Media Compatibility

1/4" NPT male fitting, 316L stainless steel
All wetted parts are 316L stainless steel
Compatible with most liquids and gases

Overpressure

2 X pressure range for 3 psi to 2000 psi sensors
5000 psig for ranges using 3000 psig sensor
7500 psig for ranges using 5000 psig sensor
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 Temperatures

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

- ±0.25% Test Gauge Accuracy
- 316 Stainless Steel Wetted Parts
- Low Voltage Powered
- 4-20 mA or 0-2 V Analog Output
- Output Test Function



Standard Housing	Output	Display
DPG1000DR range - I - options	4-20 mA	Standard
DPG1000DR range - V - options	0-2 V	Standard
DPG1000DRBL range - I - options	4-20 mA	Backlit
DPG1000DRBL range - V - options	0-2 V	Backlit
NEMA 4X Housing	Output	Type
F4DR range - I - options	4-20 mA	Standard
F4DR range - V - options	0-2 V	Standard
F4DRBL range - I - options	4-20 mA	Backlit
F4DRBL range - V - options	0-2 V	Backlit

Range—see table at left

psi = PSI	torr = TORR	mbar = MBAR
inHg = INHG	mmH ₂ O = MMH ₂ O	bar = BAR
oz/in ² = ZIN	kg/cm ² = KGCM	cmH ₂ O = CMH ₂ O
inH ₂ O = INH ₂ O	g/cm ² = GCM	kPa = KPA
ftH ₂ O = FTH ₂ O	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. Factory installed only. See cecomp.com/accessories for details.

HA	High accuracy, ±0.1% FS ±1 LSD
PM	Panel mount, 4.1" x 4.1", n/a NEMA 4X
CC	Moisture resistant circuit board conformal coating
Calibration Cert. Option —add to end of model number	
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.



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 suitable 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.

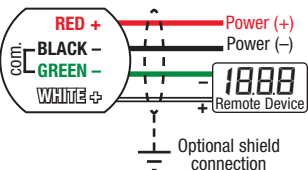
WARNING: This product can expose you to chemicals including nickel which is known to the State of California to cause cancer or birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov

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 and are functionally similar to gauge reference models. Absolute reference gauges read zero at full vacuum and atmospheric pressure with the gauge port open. Open port readings will vary continuously due to the effects of barometric pressure.

Electrical Connections

These models can be powered by any 9 to 32 VDC or 8 to 24 VAC 50/60 Hz power source. An inexpensive unregulated low voltage source can be used. The supply voltage has negligible effect on the gauge calibration as long as it is within the stated voltage ranges. Do not allow the gauge supply voltage fall below 9 VDC or 8 VAC_{RMS}. Operation below these values may cause erratic or erroneous readings or output. 4-20 mA output version power the current loop. Use a power source with sufficient voltage to operate the current loop. The four conductor cable at the gauge rear accommodates both the gauge power supply and retransmission output. Connect power as shown. When using low voltage AC power, either polarity may be used. Use the correct polarity with a DC supply. Connect the retransmission output as shown. Use of the shield (drain) wire is optional. It is not generally needed for 4-20 mA current loops unless very long cable lengths are used in electrically noisy environments. The power supply (-) is tied to the retransmission output ground. Therefore, if a DC supply is used, the power supply (-) should be considered common with the retransmission output (-) connection. If the analog output is not being used, protect the output wires to prevent a short circuit.

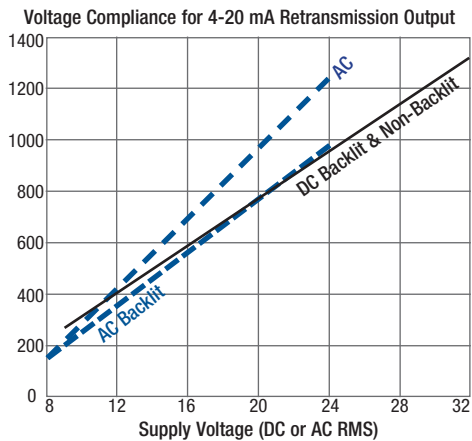


Using the Retransmission Output

NEVER connect retransmission output wires together or to an external power source or permanent damage not covered by warranty will result. For 4-20 mA output models, be sure to observe the output compliance (voltage drive) capabilities of the gauge. The compliance, and therefore the maximum loop resistance the output can drive, is a function of the supply voltage to the gauge.

Consult the graph shown below for maximum loop resistance vs. power supply voltage. Too large a loop resistance will cause the gauge output to "limit" or saturate before reaching its full 20 mA output.

When using the 0-2 volt retransmission output, do not allow the resistive load on the output to fall below 5K ohms. Avoid large capacitive loads (greater than 1000 pF) such as those caused by long runs of shielded cable. For long cable runs, use a 4-20 mA output model.



Operation

The DPG100DR and F4DR are designed for continuous operation. The gauge is powered on whenever a supply voltage is applied. Warm-up time is negligible. During normal operation the system pressure is displayed on the LCD and the output signal corresponds to the pressure. DPG100DRBL and F4DRBL display backlighting are on whenever the power is on. The display backlighting will not be apparent under bright lighting conditions.

Output Ranges

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. Characteristics of the output types are listed below. Values are factory set. Note that -15 psi, -100 kPa, etc. are not achievable, but prevents running out of range at whatever full vacuum is reached.

Range Type	Output Option	Full vacuum	"0" on display	Full pressure
Gauge ref. pressure	-I	n/a	4 mA	20 mA
Gauge ref. vacuum	-I	20 mA	4 mA	n/a
Absolute reference	-I	4 mA	4 mA	20 mA
Bipolar ±	-I	4 mA	12 mA	20 mA
Gauge ref. pressure	-V	n/a	0 V	2 V
Gauge ref. vacuum	-V	2 V	0 V	n/a
Absolute reference	-V	0 V	0 V	2 V
Bipolar ±	-V	0 V	1 V	2 V

Test Function

When the front-panel TEST button is held depressed, the display and analog output 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 output 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. Remove the Test potentiometer cover. Press and hold the front-panel TEST button and adjust the Test potentiometer to set the display and output to the desired test level.

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 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.

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.

Use a stable DC power supply and an accurate mA meter for calibration of 4-20 mA transmitters and an accurate volt meter for calibration of voltage transmitters.

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

Calibration

1. See rear label of gauge for range.
2. Remove the covers on the Zero and Span controls on the front of the gauge. Zero calibration must be done before span calibration. If desired, gauges can be zeroed without doing span calibration.
3. Connect gauge to a 9-32 VDC or 8-24 VAC 50/60 Hz power source. The magnitude of the supply voltage has negligible effect on the gauge calibration as long as it is within the stated voltage ranges. Over voltage may result in damage.
4. **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 milliamps for mA output models or 0 volts for voltage output models.

Zero for absolute reference gauges: Apply full vacuum to the gauge. Adjust the Zero potentiometer for a display indication of zero with the minus (-) sign occasionally flashing. Output should be 4.0 milliamps for mA output models or 0 volts for 0-2 volt output models.

Zero for bipolar gauges: Apply full vacuum to the gauge. Adjust the Zero potentiometer for a display indication of full vacuum. Output should be 4.0 milliamps for mA output models or 0 volts for 0-2 volt output models.

Span for gauge reference pressure, absolute reference, and bipolar 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 for mA output models or 2 volts for voltage output models.

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 for mA output models or 2 volts for voltage output models.

6. 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.
7. Internal Zero and Span potentiometers adjust the analog output to agree with display. 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. Adjust output Span and then Zero after gauge calibration is complete.
8. Replace the potentiometer covers, rear cover and screws, taking care not to pinch the wires between the case and the rear cover.

