

Cecomp High Performance Digital Pressure Gauges and Temperature Products



Falcon Pressure Gauges

- ❑ ±0.25% Test Gauge Accuracy
- ❑ 0-3 psi to 5000 psi Pressure
- ❑ Vacuum and Absolute Ranges
- ❑ 1/4" NPT 316 SS Wetted Parts
- ❑ **Digi-Pro⁴** NEMA 4X
- ❑ **Digi-Max** Min-Max-One Touch Zero[®]

Models

- ✓ Battery-Powered Portable
- ✓ Low Voltage AC/DC Powered
- ✓ Loop-Powered 2-Wire Indicating Transmitters
- ✓ Dual SPDT Alarms
- ✓ 0-2 V or 4-20 mA True Analog Output
- ✓ Dual SPDT Alarms Plus Retransmission Output

Features

- ✓ Fast Display Response: 3 Times/Second
- ✓ Pressure, Vacuum, Bipolar, or Compound Ranges
- ✓ Shock Resistant Rugged Design
- ✓ Bi-Color Alarm LEDs
- ✓ Output Test Function
- ✓ Easy Zero & Span Calibration

Options

- ✓ ±0.4% or ±0.1% Accuracy
- ✓ Backlit Display (Most Models)
- ✓ NEMA 4X Housing (Most Models)
- ✓ Most Engineering Units Available
- ✓ NIST Traceability
- ✓ Panel or Surface Mounting (Most Models)
- ✓ Protective Rubber Boot
- ✓ Hi/Lo, Hi/Hi, Lo/Lo, Normal or Reverse Alarms

Thermo Pro Temperature Transmitter

- ✓ 2-Wire Loop Powered Temperature Transmitter
- ✓ Local Digital Display
- ✓ Precision RTD
- ✓ Fits Standard Thermowells
- ✓ Output Test Function
- ✓ NEMA 4X Housing



Test



Measure



Monitor



Transmit



Alarm



www.cecomp.com

Cecomp Electronics

Digital Pressure Gauges & Instrumentation
Division of Absolute Process Instruments Inc.

1220 American Way
Libertyville, IL 60048

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Pressure Information

Common Pressure Conversions

Multiply From To	psi	inH ₂ O @ 39.2°F or 4°C	inH ₂ O @ 60°F or 15.6°C	inH ₂ O @ 68°F or 20°C	ftH ₂ O @ 39.2°F or 4°C	kPa	atm (std)	atm (metric)	bar	mbar	inHg @ 32°F	inHg @ 60°F	cmHg @ 0°C	Torr or mmHg @ 0°C	kg/cm ²	cmH ₂ O @ 4°C	oz/in ²
	psi	1	27.681	27.707	27.730	2.3067	6.8947	0.0681	0.07031	0.06895	68.947	2.0360	2.0416	5.1715	51.715	0.07031	70.307
inH ₂ O (39.2°F/4°C)	0.0361	1	1.0010	1.0018	0.0833	0.2491	0.00246	0.00254	0.00249	2.4908	0.0736	0.0738	0.1868	1.8683	0.00254	2.540	0.5780
inH ₂ O (60°F/15.6°C)	0.0361	0.9990	1	1.0008	0.0833	0.2488	0.00246	0.00254	0.00249	2.4884	0.0735	0.0737	0.1866	1.8664	0.00254	2.5375	0.5775
inH ₂ O (68°F/20°C)	0.0361	0.9982	0.9992	1	0.0832	0.2486	0.00246	0.00254	0.00249	2.4864	0.0734	0.0736	0.1865	1.8650	0.00254	2.5355	0.5770
ftH ₂ O (68°F/20°C)	0.4327	11.979	11.991	12.000	1	2.9837	0.02950	0.03048	0.02984	29.837	0.8811	0.8836	2.2380	22.380	0.03043	30.426	6.9240
kPa	0.1450	4.0147	4.0186	4.0219	0.3346	1	0.0099	0.01020	0.01	10	0.2953	0.2961	0.7501	7.5006	0.0102	10.197	2.3206
atm (std)	14.696	406.79	407.18	407.51	33.900	101.33	1	1.0332	1.0133	1013.25	29.921	30.003	76	760	1.0332	1033.23	235.14
atm (metric)	14.223	393.71	394.09	394.40	32.810	98.066	0.9678	1	0.9807	980.66	28.959	29.038	73.556	735.56	1	1000	227.57
bar	14.504	401.47	401.86	402.19	33.456	100	0.9869	1.0197	1	1000	29.530	29.611	75.006	750.06	1.0197	1019.72	232.06
mbar	0.0145	0.4015	0.4019	0.4022	0.0335	0.1	0.00099	0.00102	0.001	1	0.0295	0.02961	0.07501	0.7501	0.00102	1.0197	0.2321
inHg (32°F)	0.4912	13.596	13.608	13.619	1.1330	3.386	0.0334	0.03453	0.0339	33.864	1	1.0027	2.54	25.400	0.03453	34.532	7.8585
inHg (60°F)	0.4898	13.559	13.571	13.581	1.1299	3.3769	0.0333	0.03444	0.0338	33.772	0.9973	1	2.5331	25.331	0.03444	34.438	7.8371
cmHg (0°C)	0.1934	5.3525	5.3576	5.3620	0.4461	1.3332	0.0132	0.01360	0.01333	13.332	0.3937	0.3948	1	10	0.0136	13.595	3.0939
torr or mmHg (0°C)	0.01934	0.5353	0.5357	0.5362	0.0446	0.1333	0.0013	0.00136	0.00133	1.3332	0.0394	0.03948	0.1	1	0.00136	1.3595	0.3094
kg/cm ²	14.223	393.71	394.09	394.41	32.809	98.067	0.9678	1	0.9807	980.66	28.959	29.038	73.556	735.56	1	1000	227.57
cmH ₂ O (4°C)	0.0142	0.3937	0.3941	0.3944	0.0328	0.0981	0.00097	0.001	0.00098	0.9806	0.0290	0.02904	0.07355	0.7355	0.001	1	0.2276
oz/in ²	0.0625	1.7300	1.7316	1.7331	0.1442	0.4309	0.00425	0.00439	0.00431	4.3092	0.1273	0.1276	0.3232	3.2322	0.00439	4.3942	1

Typical gauge ranges when non-standard engineering units are ordered

PSI	Reference	InHg @ 0°C	InH ₂ O @ 20°C	Oz/ in ²	FtH ₂ O @ 20°C	kPa & MPa	mmHg torr*	mbar*	bar	g/ cm ²	kg/ cm ²	atm	cmH ₂ O @ 20°C	mmH ₂ O @ 20°C
3	G	6	85	50	7	20	150	200					200	1999
5	G	10	140	80	12	35	250	350					350	
15	G, A, VAC	30	400	240	35	100	760	1000	1	1000	1	1	1000	
30	G or A	60	850		70	200	1500	1999	2	1999	2	2	1999	
60	G	120			140	400			4		4	4		
100	G, A, VAC	200			250	700			7		7	7		
200	G, VAC				500	1500			15		15	20		
300	G					1999			20		20	20		
500	G					3.5 MPa			35		35	35		
1000	G**					7 MPa			70		70	70		
2000	G**					14 MPa			140		140	135		
3000	G**					20 MPa			200		200	200		
5000	G**					35 MPa			350		350	340		

* Absolute reference is generally used for vacuum applications with these units

** 14.7 psia sealed reference transducer

Approximate Altitude Correction Table for Barometers

At elevations above sea level, a local weather barometer reports higher readings than an absolute reference gauge. Barometer readings used in weather reports are corrected to sea level to eliminate the effects of altitude to allow consistent weather reporting.

Atmospheric pressure is constantly changing. This is not apparent on a mechanical gauge but if quite easy to see on a digital gauge. This occurs normally and does not indicate a problem with the gauge.

Use this table to correct your reading. For example, if you live at 1000 feet elevation and your absolute gauge reads 29.00, the current barometric pressure from the local weather report will be approximately 30.07 inches of mercury.

Note that these correction factors are approximate and assume normal room temperature and pressures near 29.92 inches of mercury. See the National Oceanic and Atmospheric Administration website (www.nws.noaa.gov) for more information.

Altitude (feet)	Adjustment (inches Hg) Absolute Gauge to Weather Report	Adjustment (inches Hg) Weather Report to Absolute Gauge
0	0.0	0.0
100	Add 0.11	Subtract 0.11
200	Add 0.22	Subtract 0.22
300	Add 0.32	Subtract 0.32
400	Add 0.43	Subtract 0.43
500	Add 0.54	Subtract 0.54
600	Add 0.65	Subtract 0.65
700	Add 0.75	Subtract 0.75
800	Add 0.82	Subtract 0.82
900	Add 0.96	Subtract 0.96
1000	Add 1.07	Subtract 1.07
2000	Add 2.11	Subtract 2.11
3000	Add 3.11	Subtract 3.11
4000	Add 4.08	Subtract 4.08
5000	Add 5.03	Subtract 5.03
6000	Add 5.95	Subtract 5.95
7000	Add 6.84	Subtract 6.84
8000	Add 7.70	Subtract 7.70
9000	Add 8.54	Subtract 8.54

www.cecomp.com

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

Specifications

Ranges and Resolution

See table below for ranges. Consult factory for other temperature ranges
Resolution, 0.1° for ranges below 199.9°, 1° for 200° and above

Accuracy (linearity, hysteresis, repeatability)

IEC-751 Class B 100 Ω RTD: ±0.3°C at 0°C, ±1.1°C at 150°C
Consult factory for other probe types or configurations

Display (update rate, type, size)

3 readings per second nominal display update rate, 3½ digit LCD, ½" digit height

Controls

Non-interactive zero and span, ±10% range
Test calibration level; 0-100% range

Loop Supply Voltage

Any DC supply/loop resistance that maintains 8 to 32 VDC at gauge terminals
Reverse polarity protected
3 ft long, 2-conductor 22 AWG cable
Order optional **9046-24-008** loop power supply to power 4-20 mA loop

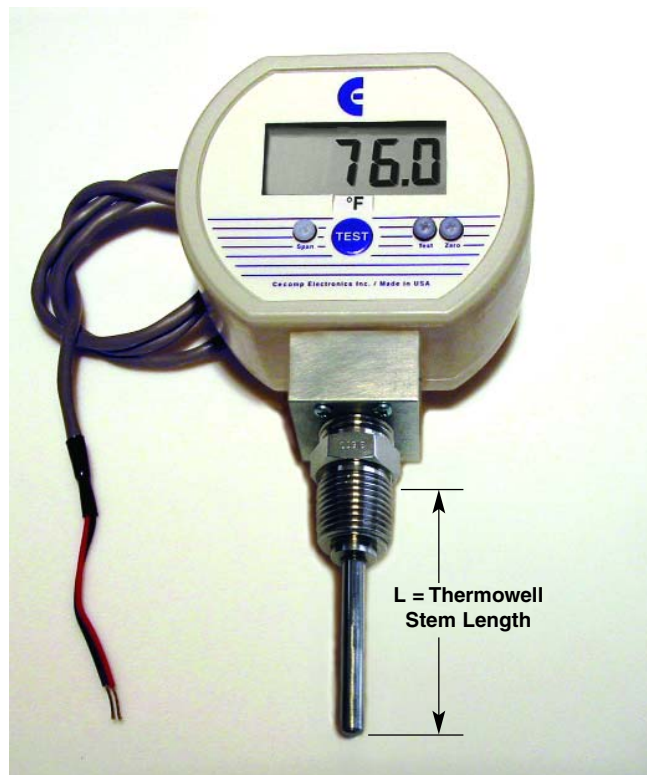
Loop Output Characteristics

4-20 mA output
See chart on back for loop voltage characteristics
If gauge terminal voltage falls below approx. 7.8 VDC erratic operation may occur

Test Function

Front panel TEST button, when held sets loop current and display to test calibration level, independent of temperature input, to allow testing of system operation.

- Precision Temperature Element
- NEMA 4X Housing
- Analog 4-20 mA Output
- 316 Stainless Steel Probe
- 1/2" NPT Fitting for Standard Thermowells



Mechanical Specifications

Housing Size

3.5" W x 3.0" H x 2.0" D (not including probe or cable strain relief)
Add approximately 1" to depth for strain relief and wire clearance

Weight (approximate)

Transmitter: Approx. 12 ounces
Shipping weight: Approx. 1 pound

Material and Color

ABS/Polycarbonate Housing. Gasketed rear cover, NEMA 4X
Light gray body, light gray/blue front

Connection and Probe Material

½" NPT male, 316 stainless steel. Consult factory other connections

Environmental Specifications

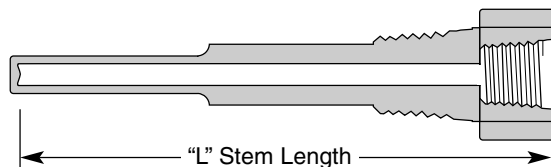
Storage Temperature -40 to 203°F (-40 to 95°C)
Operating Temperature -4 to 185°F (-20 to 85°C)

STANDARD RTD PROBES

Range	2.5"L x 1/2 NPT	4"L x 1/2 NPT	6"L x 1/2 NPT	9"L x 1/2 NPT	12"L x 1/2 NPT
0 to 100.0°F	F4LT2-100F	F4LT4-100F	F4LT6-100F	F4LT9-100F	F4LT12-100F
0 to 199.9°F	F4LT2-200F	F4LT4-200F	F4LT6-200F	F4LT9-200F	F4LT12-200F
0 to 300°F	F4LT2-300F	F4LT4-300F	F4LT6-300F	F4LT9-300F	F4LT12-300F
0 to 100.0°C	F4LT2-100C	F4LT4-100C	F4LT6-100C	F4LT9-100C	F4LT12-100C
0 to 150.0°C	F4LT2-150C	F4LT4-150C	F4LT6-150C	F4LT9-150C	F4LT12-150C

SPRING-LOADED RTD PROBES (MUST be Used with a Thermowell. Length = Thermowell "S", "L", "A" or Stem Length Dimension)

Range	2.5"L x 1/2 NPT	4"L x 1/2 NPT	6"L x 1/2 NPT	9"L x 1/2 NPT	12"L x 1/2 NPT
0 to 100.0°F	F4LT2S-100F	F4LT4S-100F	F4LT6S-100F	F4LT9S-100F	F4LT12S-100F
0 to 199.9°F	F4LT2S-200F	F4LT4S-200F	F4LT6S-200F	F4LT9S-200F	F4LT12S-200F
0 to 300°F	F4LT2S-300F	F4LT4S-300F	F4LT6S-300F	F4LT9S-300F	F4LT12S-300F
0 to 100.0°C	F4LT2S-100C	F4LT4S-100C	F4LT6S-100C	F4LT9S-100C	F4LT12S-100C
0 to 150.0°C	F4LT2S-150C	F4LT4S-150C	F4LT6S-150C	F4LT9S-150C	F4LT12S-150C



NOTE: Some thermowell manufacturers refer to stem length as dimension "A" or "S". It is NOT the same as thermowell insertion length.

Description

The **ThermoPro** series is an industrial temperature indicator with a digital temperature display and 4-20 mA retransmission in a rugged NEMA 4X housing. The 2-wire connection allows the **ThermoPro** to be used as a temperature display powered by a low-voltage DC source, or as a loop-powered 4-20 mA transmitter. All operating power is supplied by the 4-20 mA current loop.

The 316 stainless steel temperature probe with a 1/2" NPT fitting is available in either a fixed-length or a spring loaded design to fit standard industrial thermowells. A high accuracy 0.00385 alpha curve RTD element with a three-wire transitionless design is available. The temperature probe is replaceable.

The RTD temperature reading is linearized for both the digital display and the analog 4-20 mA output. Standard ranges are offered in both °F and °C. Contact factory for special ranges or probe versions.

The **ThermoPro** series NEMA 4X housing, when properly installed, is suitable for indoor or outdoor non-hazardous locations and provides a degree of protection against falling dirt, rain, sleet, snow, windblown dust, splashing water, hose-directed water, corrosion and ice formation.

The **ThermoPro** series features a TEST pushbutton which, when depressed, switches the display and output loop to a preset user-selectable level. 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 temperature.

Installation and Precautions

Install or remove using wrench on probe hex fitting only. Do not attempt to tighten by turning housing or any other part of the gauge.

The spring-loaded design is intended for use only with a thermowell. Use a thermowell appropriate for the process. A thermowell is required for pipelines with flowing material or pressurized applications. Consult thermowell manufacturer for proper thermowell selection with regard to material compatibility, pressure and flow rates.

The non-spring-loaded design can be used in non-pressurized applications or applications with no flow. Due to the hardness of 316 stainless steel, it is recommended that a thread sealant be used to ensure leak-free operation.

Electrical Connection

Connection to the **ThermoPro** 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 transmitter but it will not operate with incorrect polarity.

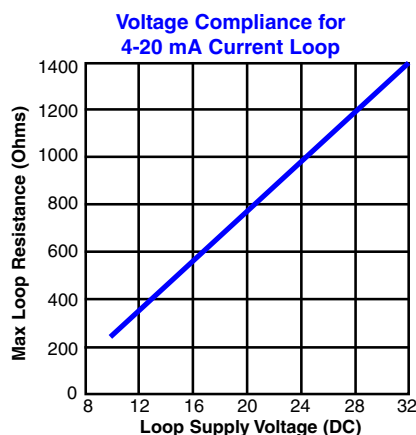
Loop Voltage

Select a loop power supply voltage and total loop resistance so that when the loop current is 20 mA, the transmitter will have at least 8 VDC at its terminals. For correct operation and to avoid erratic or erroneous readings, the terminal voltage must not fall below 8 VDC. Too large a loop resistance will cause the output to "limit" or saturate before reaching its full 20 mA output.

The **minimum** loop supply voltage may be calculated from the formula:

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

If the terminal voltage 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 **ThermoPro** series is designed for continuous operation. Warm-up time is negligible. The display will show the temperature and the loop current will be proportional to the system temperature.

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

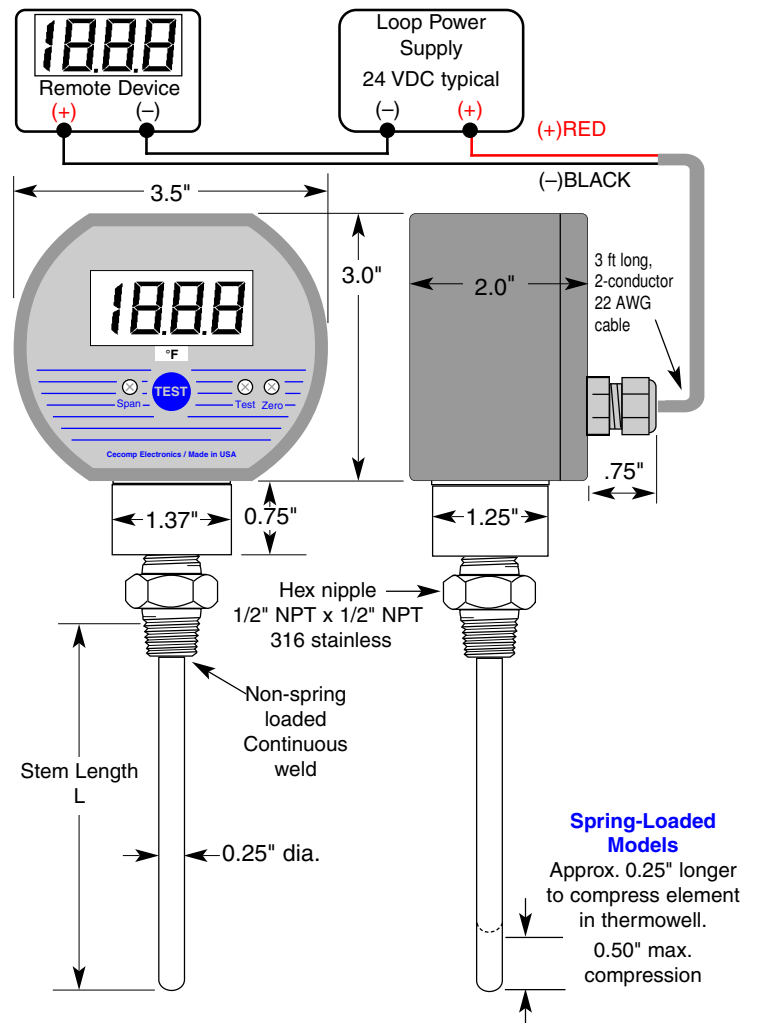
TEST Button

When the front-panel TEST button is held depressed, the display and loop current are switched, independent of the temperature, to a test level determined by the setting of the Test adjustment. To set the test output level, press and hold the front-panel TEST button and adjust the Test level to set the display and loop current. When the button is released, normal operation is resumed.

Calibration

The **ThermoPro** is factory set to your specifications and there is generally no need to alter calibration settings. If recalibration is necessary, refer to the instructions that came with the unit, consult factory, or refer to www.cecomp.com for calibration information.

Zero and Span calibration should only be attempted if the user has access to a temperature 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.



Electrical Specifications

Ranges and Resolution

Bold: Standard ranges, price adder for all others
abs: 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

-30.0 inHg/15.0 psig	120.0 inHg	1600 mmHg	35.0 bar	1.000 kg/cm ² abs
-30.0 inHg/100.0 psig	199.9 inHg abs	760 torr abs	70.0 bar	1.000 kg/cm ² vac
-30.0 inHg/199.9 psig	199.9 inHg	1600 torr abs	140.0 bar	±1.000 kg/cm ²
3.00 psig	50.0 oz/in ²	2100 mmH ₂ O	199.9 bar	1.000 kg/cm ²
5.00 psig	80.0 oz/in ²	3500 mmH ₂ O	350 bar	1.999 kg/cm ² abs
15.00 psi abs	240 oz/in ² abs	199.9 cmH ₂ O	19.99 kPa	1.999 kg/cm ²
15.00 psig vac	240 oz/in ² vac	350 cmH ₂ O	35.0 kPa	4.00 kg/cm ²
±15.00 psig	±240 oz/in ²	1000 cmH ₂ O	100.0 kPa abs	7.00 kg/cm ² abs
15.00 psig	240 oz/in ²	2100 cmH ₂ O	100.0 kPa vac	7.00 kg/cm ²
30.0 psi abs	85.0 inH ₂ O	199.9 mbar	±100.0 kPa	14.00 kg/cm ²
30.0 psig	140.0 inH ₂ O	350 mbar	100.0 kPa	19.99 kg/cm ²
60.0 psig	400 inH ₂ O abs	1000 mbar abs	199.9 kPa abs	35.0 kg/cm ²
100.0 psi abs	400 inH ₂ O vac	1000 mbar vac	199.9 kPa	70.0 kg/cm ²
100.0 psig	±400 inH ₂ O	±1000 mbar	400 kPa	140.0 kg/cm ²
199.9 psig	400 inH ₂ O	1000 mbar	700 kPa abs	199.9 kg/cm ²
300 psig	850 inH ₂ O	1999 mbar abs	700 kPa	350 kg/cm ²
500 psig	7.00 ftH ₂ O	1999 mbar	1500 kPa	1.000 atm abs
1000 psig	12.00 ftH ₂ O	4000 mbar	1999 kPa	±1.000 atm
1999 psig	35.0 ftH ₂ O	1.000 bar abs	3500 kPa	1.000 atm
3000 psig	70.0 ftH ₂ O	1.000 bar vac	5000 kPa	4.00 atm
5000 psig	140.0 ftH ₂ O	±1.000 bar	3.50 MPa	7.00 atm
6.00 inHg	230 ftH ₂ O	1.000 bar	7.00 MPa	14.00 atm
10.00 inHg	480 ftH ₂ O	1.999 bar abs	14.00 MPa	19.99 atm
30.0 inHg abs	150.0 mmHg	1.999 bar	19.99 MPa	35.0 atm
30.0 inHg vac	260 mmHg	4.00 bar	35.0 MPa	70.0 atm
±30.0 inHg	760 mmHg abs	7.00 bar abs	1000 g/cm ² abs	135.0 atm
30.0 inHg	760 mmHg vac	7.00 bar	1000 g/cm ²	199.9 atm
60.0 inHg abs	760 mmHg	14.00 bar	2100 g/cm ² abs	340 atm
60.0 inHg	1600 mmHg abs	19.99 bar	2100 g/cm ²	

Accuracy (linearity, hysteresis, repeatability)

Standard: ±0.25% of full scale ±1 least significant digit
 Optional: **-HA** ±0.1% FS ±1LSD (most ranges)
-4A ±0.4% FS ±1LSD
CD Factory calibration data
NC NIST traceable test report and calibration data

Display (update rate, type, size)

3 readings per second nominal display update rate
 Ranges up to 1999: 3½ digit LCD, 0.5" digit height
 3000 psi, 5000 psi, **-400** option: 4½ digit LCD, 0.5" digit height, lower display for engineering units

BBL models: Red LED backlight

Controls

B ranges up to 1999: Front pushbutton turns gauge on/off
BBL ranges up to 1999: Front pushbutton turns gauge & backlighting on/off
 Front calibration potentiometers, non-interactive zero and span, ±10% range

B, BBL ranges of 3000 psi, 5000 psi, **-400** option

Front button turns gauge on, starts auto shutoff timer, and provides zero function for gauge reference ranges

Internal calibration pushbuttons

BBL ranges of 3000 psi, 5000 psi or **-400** option

Press button to activate backlighting for one minute while gauge is on

Auto Shutoff (5 minutes standard)

Ranges up to 1999: Factory settable to 5, 10, 30 minutes, or on/off
 3000 psi, 5000 psi: Factory settable to any number of minutes or hours
-400 option: Factory settable to any number of minutes or hours

Batteries and Battery Life

Two AA alkaline
B ranges up to 1999: Approx. 2500 hours
B 3000 psi, 5000 psi, **-400** option: Approx. 2000 hours
BBL ranges up to 1999: Approx. 180 hours
BBL 3000 psi, 5000 psi, **-400** option: Approx. 150 to 1500 hrs depending on backlight usage

Low Battery Indication

Low battery symbol on display when batteries must be replaced

- ±0.25% Test Gauge Accuracy
- 316 Stainless Steel Wetted Parts
- Battery Life up to 2500 Hours
- Pressure, Vacuum, Absolute or Compound
- BBL Includes Backlit Display

DPG1000B100PSIG-5
0 to 100.0 psig range



DPG1000B5000PSIG-5
0 to 5000 psig range

Mechanical Specifications

Size

3.38" W x 2.88" H x 1.65" D housing
 Add approximately 0.75" to height for pressure fitting

Weight (approximate)

Gauge: 9 ounces
 Shipping weight: 1 pound

Material and Color

Extruded aluminum case, epoxy powder coated
 Polycarbonate cover, front and rear gaskets
 Light gray body, light gray/blue front

Pressure/Vacuum Connection and Material

¼" NPT male, 316 stainless steel

Media Compatibility

All wetted 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
 3000 psi, 5000 psi, **-400** option: 112.5% out-of-range display | - - - or | -.-.-
 All others 2x rated pressure minimum

Burst Pressure

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

Environmental Specifications

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)

Cecomp Electronics

Digital Pressure Gauges and Instrumentation

Division of Absolute Process Instruments Inc.

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www.cecomp.com



DPG1000B DPG1000BBL

Falcon Battery-Powered Digital Pressure Gauges

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.

Operation – Ranges up to 1999

Press the round button on the front of the gauge to activate the display. The gauge will stay on for a period of time determined by the auto-shutoff time. The gauge can be shut off at any time by pressing the button again. Display backlighting on **DPG1000BBL** models is on whenever the gauge is on. If the gauge was ordered without auto shutoff it will stay on until the button is pressed or until the batteries are depleted. Turn gauge off when not in use to conserve battery.

Operation – 3000 psi, 5000 psi Ranges and -400 Option

Press and hold the pushbutton for approx. 1 second. The full-scale range is indicated, display segments are tested, and the reading and units are displayed.

Power-Up With One-Touch Zero (Gauge reference models only)

1. Make absolutely certain no pressure is applied to the gauge. The gauge port should be exposed to normal atmospheric pressure. Note that the zeroing function may only be activated at power-up and the stored zero correction is erased when the gauge is shut off.
2. Press and hold the pushbutton.
3. The full-scale range is indicated and the display segments are tested.
4. Continue to press the pushbutton until **0 0 0 0** is displayed and then release the button. This indicates that the gauge has been zeroed.
5. The actual pressure is displayed.

Attempting to zero the gauge with pressure greater than approximately 3% of full-scale applied will result in an error condition, and the display will alternately indicate **E r r 0** and the actual measured pressure. The gauge must be powered down to reset the error condition.

Absolute reference gauges do not use the zero feature since they read atmospheric pressure under normal conditions.

Normal Operation

Following the start-up initialization, the display indicates the pressure reading updated approximately 3 times per second and the units. The auto shutoff timer starts when the gauge is powered up or whenever the button is pushed, unless the gauge was ordered without an auto shutoff time (-ON option).

If excessive vacuum is applied to a pressure-only gauge, the display will indicate **- E r r** until the vacuum is released. Applying vacuum to a gauge designed for pressure may damage the pressure sensor. If excessive pressure is applied (112.5% over range), an out-of-range indication of **l - - -** or **l -.-.-** will be displayed depending on model.

Display Backlighting (BBL models only)

Display backlighting can be turned on by momentarily pressing the button whenever the gauge is on. The backlighting will turn on for one minute and then automatically shut off. This also restarts the auto shutoff timer.

Shut-Down

To shut off the gauge manually at any time, press and hold the pushbutton until the display indicates **0 F F** (about 5 seconds) and then release.

For gauges with auto shutoff, the display indicates **0 F F** five seconds prior to auto shutoff. The pushbutton can be pressed to keep the gauge on. The auto shutoff and backlight (if equipped) timers are reset whenever the pushbutton is pressed and released.

If the gauge was ordered without auto shutoff (-ON option) it will stay on until manually shut off or until the batteries are depleted. Turn gauge off when not in use to conserve battery life.

Calibration

All Falcon gauges are factory calibrated on NIST traceable calibration equipment. No calibration is required before placing the gauge into service.

Ranges up to 1999: Remove the calibration potentiometer covers on the front of the unit to access the zero and span controls.

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.

Calibration (continued)

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.

3000 psi, 5000 psi ranges and -400 option – The calibration adjustments are internal on these models. The procedure is available from www.cecomp.com or by calling to request the "F16" calibration instructions.

Absolute Reference – These models display atmospheric pressure if the gauge port is open to the ambient. It is normal for the reading to constantly change in response to atmospheric pressure changes. Vacuum generation and atmospheric pressure measurement equipment for accurate calibration and thus these are more difficult to calibrate in the field.

Gauges can be returned to Cecomp Electronics for factory certified recalibration, repairs and refurbishment. NIST traceability is available. Gauges can also be recalibrated by any metrology lab with pressure calibration equipment at least four times more accurate than the gauge.

Battery Replacement

A low battery indication will be shown in the upper left-hand corner of the display when the battery voltage falls sufficiently. The battery should be replaced soon after the indicator comes on or unreliable readings may result.

Remove the 6 Phillips head screws on the back of the unit.

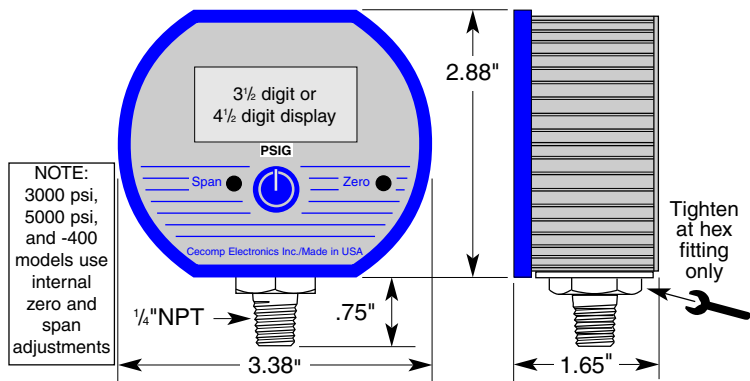
Carefully remove batteries from the holders by lifting up the positive end of the battery (opposite the spring). Take care not to bend or distort the battery retention springs.

DO NOT discard the old battery into fire, any other sources of extreme heat, or in any other hazardous manner. Please consult local authorities if there is any question about proper disposal.

Always replace both batteries at the same time with high quality alkaline batteries. Observe the polarity of the batteries when replacing them. The negative (flat) end of each battery should be inserted first, and should face the spring in the battery holder.

Replace the back cover, including the rubber sealing gasket.

Dimensions



Part Numbers

DPG1000B range units reference - shutoff

- B or BBL** →
- Range (see table) →
- Units (see table) →
- Reference (see table) →
- G=Gauge, A=Absolute, VAC=Vacuum**
- Auto shutoff time →
- 5** = 5 minutes
- 10** = 10 minutes
- 30** = 30 minutes
- ON** = on/off, no auto shutoff

Unit Abbreviations

- psi = PSI
- inHg = INHG
- oz/in² = ZIN
- inH₂O = INH2O
- ftH₂O = FTH2O
- mmHg = MMHG
- torr = TORR
- mmH₂O = MMH2O
- kg/cm² = KGCM
- g/cm² = GCM
- kPa = KPA
- MPa = MPA
- mbar = MBAR
- bar = BAR
- cmH₂O = CMH2O
- atm = ATM

Example: DPG1000B100PSIG-5 = Battery powered, 100.0 psig, 5 minute shutoff

www.cecomp.com

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

Electrical Specifications

Ranges and Resolution

Bold: Standard ranges, price adder for all others
abs: 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

-30.0 inHg/15.0 psig	120.0 inHg	1600 mmHg	35.0 bar	1.000 kg/cm ² abs
-30.0 inHg/100.0 psig	199.9 inHg abs	760 torr abs	70.0 bar	1.000 kg/cm ² vac
-30.0 inHg/199.9 psig	199.9 inHg	1600 torr abs	140.0 bar	±1.000 kg/cm ²
3.00 psig	50.0 oz/in ²	2100 mmH ₂ O	199.9 bar	1.000 kg/cm ²
5.00 psig	80.0 oz/in ²	3500 mmH ₂ O	350 bar	1.999 kg/cm ² abs
15.00 psi abs	240 oz/in ² abs	199.9 cmH ₂ O	19.99 kPa	1.999 kg/cm ²
15.00 psig vac	240 oz/in ² vac	350 cmH ₂ O	35.0 kPa	4.00 kg/cm ²
±15.00 psig	±240 oz/in ²	1000 cmH ₂ O	100.0 kPa abs	35.0 kg/cm ² abs
15.00 psig	240 oz/in ²	2100 cmH ₂ O	100.0 kPa vac	7.00 kg/cm ²
30.0 psi abs	85.0 inH ₂ O	199.9 mbar	±100.0 kPa	14.00 kg/cm ²
30.0 psig	140.0 inH ₂ O	350 mbar	100.0 kPa	19.99 kg/cm ²
60.0 psig	400 inH ₂ O abs	1000 mbar abs	199.9 kPa abs	35.0 kg/cm ² abs
100.0 psi abs	400 inH ₂ O vac	1000 mbar vac	199.9 kPa	70.0 kg/cm ²
100.0 psig	±400 inH ₂ O	±1000 mbar	400 kPa	140.0 kg/cm ²
199.9 psig	400 inH ₂ O	1000 mbar	700 kPa abs	199.9 kg/cm ²
300 psig	850 inH ₂ O	1999 mbar abs	700 kPa	350 kg/cm ²
500 psig	7.00 ftH ₂ O	1999 mbar	1500 kPa	1.000 atm abs
1000 psig	12.00 ftH ₂ O	4000 mbar	1999 kPa	±1.000 atm
1999 psig	35.0 ftH ₂ O	1.000 bar abs	3500 kPa	1.000 atm
3000 psig	70.0 ftH ₂ O	1.000 bar vac	5000 kPa	4.00 atm
5000 psig	140.0 ftH ₂ O	±1.000 bar	35.0 MPa	7.00 atm
6.00 inHg	230 ftH ₂ O	1.000 bar	7.00 MPa	14.00 atm
10.00 inHg	480 ftH ₂ O	1.999 bar abs	14.00 MPa	19.99 atm
30.0 inHg abs	150.0 mmHg	1.999 bar	19.99 MPa	35.0 atm
30.0 inHg vac	260 mmHg	4.00 bar	35.0 MPa	70.0 atm
±30.0 inHg	760 mmHg abs	7.00 bar abs	1000 g/cm ² abs	135.0 atm
30.0 inHg	760 mmHg vac	7.00 bar	1000 g/cm ²	199.9 atm
60.0 inHg abs	760 mmHg	14.00 bar	2100 g/cm ² abs	340 atm
60.0 inHg	1600 mmHg abs	19.99 bar	2100 g/cm ²	

Accuracy (linearity, hysteresis, repeatability)
 Standard: ±0.25% of full scale ±1 least significant digit
 Optional: **-HA** ±0.1% FS ±1LSD (most ranges)
-4A ±0.4% FS ±1LSD
CD Factory calibration data
NC NIST traceable test report and calibration data

Display (update rate, type, size)
 3 readings per second nominal display update rate
 Ranges up to 1999: 3½ digit LCD, 0.5" digit height
 3000 psi, 5000 psi, **-400** option: 4½ digit LCD, 0.5" digit height, lower display for engineering units

BBL models: Red LED backlight

Controls
B models, ranges up to 1999: Front pushbutton turns gauge on/off
BBL models, ranges up to 1999: Front pushbutton turns gauge & backlighting on/off
 Front calibration potentiometers, non-interactive zero and span, ±10% range
B & **BBL** models with 3000 psi, 5000 psi ranges, **-400** (4-digit display option)
 Front button turns gauge on, starts auto shutoff timer, and provides zero function for gauge reference ranges
 Internal calibration pushbuttons, non-interactive zero and span, ±10% range
BBL ranges 3000 psi, 5000 psi, **-400** (4-digit display option)
 Press button to activate backlighting for one minute while gauge is on

Auto Shutoff (5 minutes standard)
 Ranges up to 1999: Factory settable to 5, 10, 30 minutes, or on/off
 3000 psi, 5000 psi: Factory settable to any number of minutes or hours
-400 option: Factory settable to any number of minutes or hours

Batteries and Battery Life
 Two AA alkaline
B ranges up to 1999: Approx. 2500 hours
B 3000 psi, 5000 psi, **-400** option: Approx. 2000 hours
BBL ranges up to 1999: Approx. 180 hours
BBL 3000 psi, 5000 psi, **-400** option: Approx. 150 to 1500 hrs depending on backlight usage

Low Battery Indication
 Low battery symbol on display when batteries must be replaced

- ±0.25% Test Gauge Accuracy
- 316 Stainless Steel Wetted Parts
- Battery Life up to 2500 Hours
- Pressure, Vacuum, Absolute or Compound
- BBL Includes Backlit Display



Mechanical Specifications

Size
 3.5" W x 3.0" H x 2.0" D housing
 Add approximately 0.75" to height for pressure fitting

Weight (approximate)
 Gauge: 9 ounces
 Shipping weight: 1 pound

Housing
 NEMA 4X
 UV stabilized polycarbonate/ABS case, light gray color
 Clear polycarbonate window to protect display
 Gasketed rear cover, six captive stainless steel screws

Pressure/Vacuum Connection and Material
 ¼" NPT male, 316 stainless steel

Media Compatibility
 All wetted 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
 3000 psi, 5000 psi, **-400** option: 112.5% out-of-range display | - - - or | - - - -
 All others 2x rated pressure minimum

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

Environmental Specifications

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)

Cecomp Electronics
 Digital Pressure Gauges and Instrumentation
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 1220 American Way Phone: 800-942-0315
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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.

Operation – Ranges up to 1999

Press the round button on the front of the gauge to activate the display. The gauge will stay on for a period of time determined by the auto-shutoff time. The gauge can be shut off at any time by pressing the button again. Display backlighting on **DPG1000BBL** models is on whenever the gauge is on. If the gauge was ordered without auto shutoff it will stay on until the button is pressed or until the batteries are depleted. The display backlighting will not be apparent under bright lighting conditions. Turn gauge off when not in use to conserve battery.

Operation – 3000 psi, 5000 psi Ranges and -400 Option

Press and hold the pushbutton for approx. 1 second. The full-scale range is indicated, display segments are tested, and the reading and units are displayed.

Power-Up With One-Touch Zero (Gauge reference models only)

1. Make absolutely certain no pressure is applied to the gauge. The gauge port should be exposed to normal atmospheric pressure. Note that the zeroing function may only be activated at power-up and the stored zero correction is erased when the gauge is shut off.
2. Press and hold the pushbutton.
3. The full-scale range is indicated and the display segments are tested.
4. Continue to press the pushbutton until **0 0 0 0** is displayed and then release the button. This indicates that the gauge has been zeroed.
5. The actual pressure is displayed.

Attempting to zero the gauge with pressure greater than approximately 3% of full-scale applied will result in an error condition, and the display will alternately indicate **E r r 0** and the actual measured pressure. The gauge must be powered down to reset the error condition.

Absolute reference gauges do not use the zero feature since they read atmospheric pressure under normal conditions.

Normal Operation

Following the start-up initialization, the display indicates the pressure reading updated approximately 3 times per second. The auto shutoff timer starts when the gauge is powered up or whenever the button is pushed, unless the gauge was ordered without an auto shutoff time (-ON option).

If excessive vacuum is applied to a pressure-only gauge, the display will indicate **- E r r** until the vacuum is released. Applying vacuum to a gauge designed for pressure may damage the pressure sensor. If excessive pressure is applied (112.5% over range), an out-of-range indication of **1 - - -** or **1 -.-.-** will be displayed depending on model.

Display Backlighting (BBL models only)

Display backlighting can be turned on by momentarily pressing the button whenever the gauge is on. The backlighting will turn on for one minute and then automatically shut off. This also restarts the auto shutoff timer. The display backlighting will not be apparent under bright lighting conditions.

Shut-Down

To shut off the gauge manually at any time, press and hold the pushbutton until the display indicates **0 F F** (about 5 seconds) and then release.

For gauges with auto shutoff, the display indicates **0 F F** five seconds prior to auto shutoff. The pushbutton can be pressed to keep the gauge on. The auto shutoff and backlight (if equipped) timers are reset whenever the pushbutton is pressed and released.

If the gauge was ordered without auto shutoff (-ON option) it will stay on until manually shut off or until the batteries are depleted. Turn gauge off when not in use to conserve battery life.

Calibration

All Falcon gauges are factory calibrated on NIST traceable calibration equipment. No calibration is required before placing the gauge into service.

Ranges up to 1999: Remove the calibration potentiometer covers on the front of the unit to access the zero and span controls.

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.

Calibration (continued)

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.

3000 psi, 5000 psi Ranges and -400 Option – The calibration adjustments are internal on these models. The calibration instructions are available at www.cecomp.com.

Absolute Reference – These models display atmospheric pressure if the gauge port is open to the ambient. It is normal for the reading to constantly change in response to atmospheric pressure changes. Vacuum generation and atmospheric pressure measurement equipment for accurate calibration and thus these are more difficult to calibrate in the field.

Gauges can be returned to Cecomp Electronics for factory certified recalibration, repairs and refurbishment. NIST traceability is available. Gauges can also be recalibrated by any metrology lab with pressure calibration equipment at least four times more accurate than the gauge.

Battery Replacement

A low battery indication will be shown in the upper left-hand corner of the display when the battery voltage falls sufficiently. The battery should be replaced soon after the indicator comes on or unreliable readings may result.

Remove the 6 Phillips head screws on the back of the unit.

Carefully remove batteries from the holders by lifting up the positive end of the battery (opposite the spring). Take care not to bend or distort the battery retention springs.

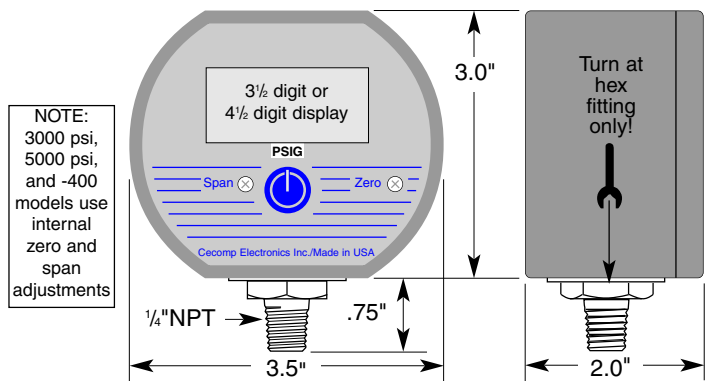
DO NOT discard the old battery into fire, any other sources of extreme heat, or in any other hazardous manner. Please consult local authorities if there is any question about proper disposal.

Always replace both batteries at the same time with high quality alkaline batteries.

Observe the polarity of the batteries when replacing them. The negative (flat) end of each battery should be inserted first, and should face the spring in the battery holder.

Replace the back cover, including the rubber sealing gasket.

Dimensions



Part Numbers

DPG1000B range units reference - shutoff

- B or BBL** →
- Range (see table)** →
- Units (see table)** →
- Reference (see table)** →
- G=Gauge, A=Absolute, VAC=Vacuum**
- Auto shutoff time** →
- 5 = 5 minutes**
- 10 = 10 minutes**
- 30 = 30 minutes**
- ON = on/off, no auto shutoff**

Unit Abbreviations

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

Example: DPG1000B100PSIG-5 = Battery powered, 100.0 psig, 5 minute shutoff

DiGi MAX® Battery-Powered Min/Max Pressure Gauges

F16B F16NB
F16BBL F16NBBL



- F16B** Battery Powered
- F16NB** NEMA 4X, Battery Powered
- F16BBL** Battery Powered, Backlit Display
- F16NBBL** NEMA 4X, Battery Powered, Backlit Display

Electrical Specifications

Ranges and Resolution

Bold: standard ranges, price adder for all others
abs: 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

-30.0 inHg/15.0 psig	120.0 inHg	1600 mmHg	35.00 bar	1.000 kg/cm ² abs
-30.0 inHg/100.0 psig	200.0 inHg abs	760.0 torr abs	70.00 bar	1.000 kg/cm ² vac
-30.0 inHg/200.0 psig	200.0 inHg	1600 torr abs	140.0 bar	±1.000 kg/cm ²
3.000 psig	50.00 oz/in ²	2100 mmH ₂ O	200.0 bar	1.000 kg/cm ²
5.000 psig	80.0 oz/in ²	3500 mmH ₂ O	350.0 bar	2.000 kg/cm ² abs
15.00 psi abs	240.0 oz/in ² abs	210.0 cmH ₂ O	20.00 kPa	2.000 kg/cm ²
15.00 psig vac	240.0 oz/in ² vac	350.0 cmH ₂ O	35.00 kPa	4.000 kg/cm ²
±15.00 psig	±240.0 oz/in ²	1000 cmH ₂ O	100.0 kPa abs	7.000 kg/cm ² abs
15.00 psig	240.0 oz/in ²	2100 cmH ₂ O	100.0 kPa vac	7.000 kg/cm ²
30.00 psi abs	85.0 inH ₂ O	200.0 mbar	±100.0 kPa	14.00 kg/cm ²
30.00 psig	140.0 inH ₂ O	350.0 mbar	100.0 kPa	20.00 kg/cm ²
60.00 psig	400.0 inH ₂ O abs	1000 mbar abs	200.0 kPa abs	35.00 kg/cm ²
100.0 psi abs	400.0 inH ₂ O vac	1000 mbar vac	200.0 kPa	70.00 kg/cm ²
100.0 psig	±400 inH ₂ O	±1000 mbar	400.0 kPa	140.0 kg/cm ²
200.0 psig	400.0 inH ₂ O	1000 mbar	700.0 kPa abs	200.0 kg/cm ²
300.0 psig	850 inH ₂ O	2000 mbar abs	700.0 kPa	350.0 kg/cm ²
500.0 psig	7.000 ftH ₂ O	2000 mbar	1500 kPa	1.000 atm abs
1000 psig	12.00 ftH ₂ O	4000 mbar	2000 kPa	±1.000 atm
2000 psig	35.00 ftH ₂ O	1.000 bar abs	3500 kPa	1.000 atm
3000 psig	70.00 ftH ₂ O	1.000 bar vac	5000 kPa	4.000 atm
5000 psig	140.0 ftH ₂ O	±1.000 bar	3.500 MPa	7.000 atm
6.000 inHg	230.0 ftH ₂ O	1.000 bar	7.000 MPa	14.00 atm
10.00 inHg	480.0 ftH ₂ O	2.000 bar abs	14.00 MPa	20.00 atm
30.00 inHg abs	150.0 mmHg	2.000 bar	20.00 MPa	35.00 atm
30.00 inHg vac	260.0 mmHg	4.000 bar	35.00 MPa	70.00 atm
±30.00 inHg	760.0 mmHg abs	7.000 bar abs	1000 g/cm ² abs	135.0 atm
30.00 inHg	760.0 mmHg vac	7.000 bar	1000 g/cm ²	200.0 atm
60.00 inHg abs	760.0 mmHg	14.00 bar	2100 g/cm ² abs	340.0 atm
60.00 inHg	1600 mmHg abs	20.00 bar	2100 g/cm ²	

Accuracy (linearity, hysteresis, repeatability)

Standard: ±0.25% of full scale ±1 least significant digit
 Optional:
-HA ±0.1% FS ±1LSD (most ranges)
-4A ±0.4% FS ±1LSD
CD Factory calibration data
NC NIST traceable test report and calibration data

Display (update rate, type, size)

3 readings per second nominal display update rate
 4½ digit LCD, 0.5" H, 5 character 0.25" H alphanumeric lower display
BBL models: Red LED backlight

Controls & Functions

Front pushbutton turns gauge on or off and cycles through functions
BBL: Press pushbutton to activate 1 minute backlighting when gauge is on

Function	Pushbutton	Prompt (Release Button)	Result
On	Press 1 sec	Gauge Range/Display Test	Actual Pressure
One Touch Zero	Press/hold	0000	Zeroed Actual Pressure
Hi Reading	Press/hold	HI	HI & max. reading
Lo Reading	Press/hold	LO	LO & min. reading
Exit Hi/Lo	Press/hold	RP	Actual Pressure
Clear Hi/Lo	Press/hold	HI / LO / RP \Rightarrow CLR	Actual Pressure
Clear Zero, Off	Press/hold	HI / LO / RP \Rightarrow CLR \Rightarrow OFF	Clear Zero, Gauge Off

Calibration

Internal calibration pushbuttons, non-interactive zero, span, & linearity, ±10% range

Auto Shutoff

5 minutes standard (-5), factory settable to on/off (-ON) or specified custom time

Batteries, Battery Life, Low Battery Indication

B: 2 AA alkaline, approx. 2000 hours
BBL: 2 AA alkaline, approx. 150 to 1500 hrs depending on backlight usage
 Low battery symbol on display when batteries must be replaced

DiGi Max-Reg TM Absolute Process Instruments, Inc. © Absolute Process Instruments, Inc. 09/05

- ±0.25% Test Gauge Accuracy
- 316 Stainless Steel Wetted Parts
- Capture Minimum and Maximum Readings
- One-Touch Zero™

F16B60PSIG-5
0 to 60.00 psig range



F16NB60PSIG-5
0 to 60.00 psig range NEMA 4X

Mechanical Specifications

Size

F16: 3.38" W x 2.88" H x 1.65" D housing
F16N: 3.5" W x 3.0" H x 2.0" D housing
 Add approximately 0.75" to height for pressure fitting

Weight (approximate)

Gauge: 9 ounces
 Shipping weight: 1 pound

Material & Color

F16: Extruded aluminum case, light gray epoxy powder coated, black ABS/ polycarbonate bezel (aluminum bezel optional), front and rear gaskets, black/gold label
F16N: Light gray ABS/polycarbonate NEMA 4X case, rear gasket, black/gold label

Pressure/Vacuum Connection Size, Material, Media Compatibility

¼" NPT male, all wetted 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: 2 x sensor pressure
 112.5% out-of-range display: | - - - or | - . - . - depending on model

Burst Pressure

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

Environmental Specifications

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)

Cecomp Electronics
 Digital Pressure Gauges and Instrumentation

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www.cecomp.com



F16B, F16NB F16BBL, F16NBBL

DiGi MAX[®] Battery-Powered Min/Max Pressure Gauges

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.

Power-Up

1. Press and hold the pushbutton for approximately 1 second.
2. The full-scale range is indicated and the display segments are tested.
3. The actual pressure and units are displayed.

Power-Up With One-Touch Zero (Gauge reference models only)

1. Be sure the gauge port is exposed to normal atmospheric pressure and no pressure is applied. The zeroing function is only activated at each power-up and the stored zero correction is erased when the gauge is shut off.
2. Press and hold the pushbutton.
3. The full-scale range is indicated and the display segments are tested.
4. Continue to press the pushbutton until **0 0 0 0** is displayed and then release the button. This indicates that the gauge has been zeroed.
5. The actual pressure is displayed.

Attempting to zero the gauge with pressure greater than approximately 3% of full-scale applied will result in an error condition, and the display will alternately indicate **E r r 0** and the actual measured pressure. The gauge must be powered down to reset the error condition.

Absolute reference gauges do not use the zero feature since they read atmospheric pressure under normal conditions.

Normal Operation

Following the start-up initialization, the display indicates the pressure reading updated approximately 3 times per second. The auto shutoff timer starts when the gauge is powered up or whenever the button is pushed, unless the gauge was ordered without an auto shutoff time (-ON option).

If excessive vacuum is applied to a pressure-only gauge, the display will indicate **- E r r** until the vacuum is released. Applying vacuum to a gauge designed for pressure may damage the pressure sensor. If excessive pressure is applied (112.5% over range), an out-of-range indication of **l - - -** or **l -.-.-** will be displayed depending on model.

Minimum and Maximum Readings

Minimum and maximum readings are continuously stored and updated whenever gauge is on. The stored readings can be manually cleared if desired. The **HI** and **LO** memory is also cleared whenever the gauge is off.

Press and hold the pushbutton for about 1 second until **HI** is displayed. The maximum stored value is displayed.

After **HI** is displayed, press and hold the pushbutton again for about 1 second until **LO** is displayed. The minimum stored value is displayed.

After **LO** is displayed, press and hold the pushbutton again for about 1 second until **RP** (Applied Pressure) is displayed. The **HI** and **LO** memory is not erased and the gauge returns to normal operation with the display indicating the current pressure.

Press and continue to hold the pushbutton until the display indicates **cl r HI/LO** (about 3 seconds total) and then release the pushbutton. Both **HI** and **LO** values are cleared and the gauge returns to the normal mode and displays the current pressure.

Display Backlighting (BBL models only)

Display backlighting can be turned on by momentarily pressing the button whenever the gauge is on. The backlighting will turn on for one minute and then automatically shut off. This also restarts the auto shutoff timer. The display backlighting will not be apparent under bright lighting conditions.

Shut-Down

To shut off the gauge manually at any time, press and hold the pushbutton until the display indicates **OFF** (about 5 seconds) and then release.

For gauges with auto shutoff, the display indicates **OFF** five seconds prior to auto shutoff. The pushbutton can be pressed to keep the gauge on. The auto shutoff and backlight (if equipped) timers are reset whenever the pushbutton is pressed and released.

If the gauge was ordered without auto shutoff (-ON option) it will stay on until manually shut off or until the batteries are depleted. Turn gauge off when not in use to conserve battery life.

Calibration

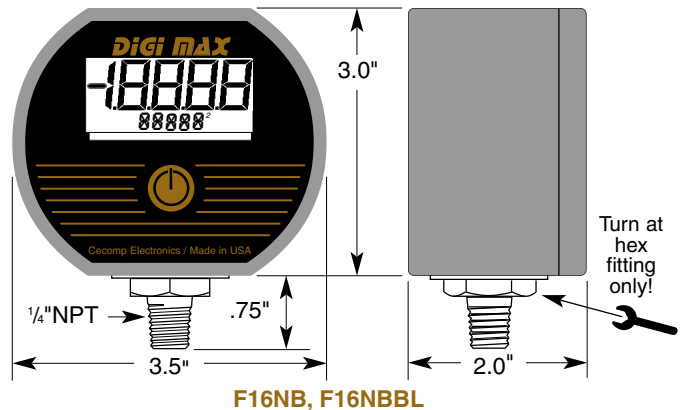
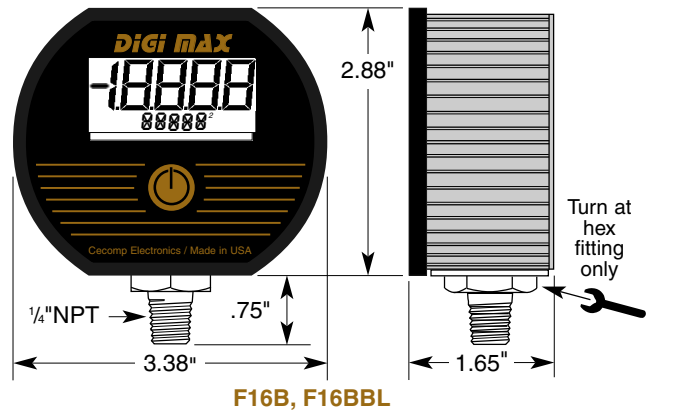
F16-series gauges use internal controls for calibration. The calibration instructions are available at www.cecomp.com. Gauges can be recalibrated by any metrology lab with pressure calibration equipment at least 4 times more accurate than the gauge. Gauges may also be returned for factory recalibration and refurbishment. NIST traceability is available.

Battery Replacement

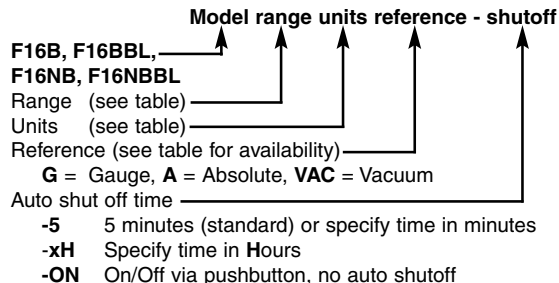
A low battery indication will be shown in the upper left-hand corner of the display when the battery voltage falls sufficiently. The battery should be replaced soon after the indicator comes on or unreliable readings may result.

1. Remove the 6 Phillips head screws on the back of the unit.
2. Remove batteries by lifting up the positive end of the battery (opposite the spring) taking care not to bend the battery holder spring.
3. Discard old batteries properly, DO NOT discard into fire, sources of extreme heat, or in any other hazardous manner.
4. Always replace both batteries at the same time with high quality alkaline batteries. Install batteries with correct orientation. The negative (flat) end of each battery should be inserted first facing the battery holder spring.
6. Replace the back cover, including the rubber sealing gasket.

Dimensions



Part Numbers



Unit Abbreviations

oz/in ²	= ZIN
inH ₂ O	= INH2O
ftH ₂ O	= FTH2O
mmH ₂ O	= MMH2O
kg/cm ²	= KGCM
g/cm ²	= GCM
cmH ₂ O	= CMH2O

Example: F16B100PSIG-10

F16, Battery powered, 100.0 psig, 10 minute shutoff

Falcon ARM Absolute Reference Manometers

ARM760B ARM760AD ARM760BBL ARM760ADBL



- $\pm 0.25\%$ Test Gauge Accuracy
- 316 Stainless Steel Wetted Parts
- 760 to 0 Torr Absolute
- Monitor Vacuum Systems and Pumps
- Eliminate Mercury Manometers!
- BBL Includes Backlit Display



Models

Model	Version	Power
ARM760AD	DC powered	115VAC/12VDC adapter
ARM760ADBL	DC powered, backlit display	115VAC/12VDC adapter
ARM760B	Battery-powered	2 AA batteries
ARM760BBL	Battery, backlit display	2 AA batteries

Range and Resolution

760 to 0 torr absolute, 1 torr resolution

Optional Units and Ranges

Visit www.cecomp.com or consult factory or for a complete list of models and ranges

Electrical Specifications

Display (type, size, update rate)

3½ digit LCD (3 digits are used for this range), 0.5" digit height
3 readings per second nominal display update rate

Controls and Location

Front On/Off pushbutton
Display zero/span, non-interactive, $\pm 10\%$ range
Front-accessible multiturn potentiometers

Accuracy (linearity, hysteresis, repeatability)

Standard: $\pm 0.25\%$ of full scale ± 1 least significant digit
Optional:
-HA $\pm 0.1\%$ FS ± 1 LSD (most ranges)
-4A $\pm 0.4\%$ FS ± 1 LSD
CD Factory calibration data
NC NIST traceable test report and calibration data

Power ARM760AD and ARM760ADBL

Includes 115VAC/12VDC wall mount power supply
Gauge will operate on any DC source of 9 to 32 VDC or any AC source of 8 to 24 VAC 50/60 Hz

ARM760AD power consumption approximately 5 mA

ARM760ADBL power consumption approximately 75 mA

Electrical Connection ARM760AD and ARM760ADBL

6 foot long, 2-conductor cable with female 3.5 mm socket
Power supply; 6 foot long, 2-conductor cable with male 3.5 mm plug

Power ARM760B and ARM760BBL

Includes 2 AA alkaline batteries

ARM760B battery life is approximately 2500 hours

ARM760BBL battery life is approximately 180 hours
30 minute auto shutoff

Environmental Specifications

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)



Mechanical Specifications

Size

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 (approximate)

Gauge: 9 ounces
Shipping weight: 1 pound

Material and Color

Extruded aluminum case, epoxy powder coated, light gray
Polycarbonate cover, blue, Polycarbonate front label
Front and rear gaskets

Pressure/Vacuum Connection and Material

¼" NPT male, 316 stainless steel

Media Compatibility

All wetted parts are 316 SS, Compatible with most liquids and gases

Overpressure

2x rated pressure minimum

Burst Pressure

4x rated pressure minimum

Cecomp Electronics

Digital Pressure Gauges and Instrumentation

Division of Absolute Process Instruments Inc.
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www.cecomp.com



ARM760B, ARM760BBL ARM760AD, ARM760ADBL

Falcon ARM Absolute Reference Manometers

Description

The **Falcon ARM760AD** and **ARM760ADBL** models are designed for applications where a continuous display of vacuum is required. This makes it ideal for monitoring vacuum systems and pumps.

The **Falcon ARM760B** and **ARM760BBL** models are designed for portable applications such as monitoring portable vacuum pumps or for vacuum packaging applications.

Installation and Precautions

Install or remove gauge using a wrench on the hex fitting only. Do not attempt to tighten by turning housing or any other part 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.

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 ARM760AD and ARM760ADBL

The **Falcon ARM760AD** and **ARM760ADBL** models include 6 feet of cable with a female connector and a 115VAC/12VDC adapter with 6 feet of cable with plug. After the gauge is installed, route the wires away from heat sources and moving equipment and connect the AC adapter's plug to the gauge cable connector. Lastly, plug the AC adapter into a 115 VAC outlet.

NEVER connect the gauge wires directly to 115 VAC or permanent damage not covered by warranty will result.

The **Falcon ARM760AD** and **ARM760ADBL** models can operate on any AC source of 8 to 24 VAC 50/60 Hz, or any DC source of 9 to 32 VDC. These models can be used with inexpensive unregulated low voltage AC or DC power sources. The type and magnitude of the supply voltage have negligible effects on the gauge calibration as long as it is within the voltage ranges stated above. No polarity needs to be observed when connecting a DC supply.

The only important consideration is to ensure that the gauge supply voltage does not fall below 8 VAC RMS if AC power is used, or 9 VDC if DC power is used. Operation with less than these values may cause erratic or erroneous readings.

If your application requires operation of several gauges from the same power supply, consult factory for wiring recommendations.

Operation ARM760AD and ARM760ADBL

If the gauge display is off, press the center button to power up the gauge.

If the gauge was in the power-on state when the power was disconnected, the gauge will automatically turn on when power is reapplied.

If the gauge was turned off using the push button and then the power was turned off, the gauge will not power up until the power is reapplied and the center button is pressed again.

Operation ARM760B and ARM760BBL

When the center button is pressed, the gauge will power up and be ready to use. The gauge will stay on for 30 minutes or until the button is pushed again.

To conserve battery life, turn gauge off when not needed. This is especially important with the **ARM760BBL** model with display backlighting. The display backlighting will not be apparent under bright lighting conditions.

Battery Replacement ARM760B and ARM760BBL

A low battery indication will be shown in the upper left-hand corner of the display when the battery voltage falls sufficiently. The battery should be replaced soon after the indicator comes on or unreliable readings may result.

Remove the 6 Phillips head screws on the back of the unit.

Carefully remove batteries from the holders by lifting up the positive end of the battery (opposite the spring). Take care not to bend or distort the battery retention springs.

DO NOT discard the old battery into fire, any other sources of extreme heat, or in any other hazardous manner. Please consult local authorities if there is any question about proper disposal.

Always replace both batteries at the same time with high quality alkaline batteries. Observe the polarity of the batteries when replacing them. The negative (flat) end of each battery should be inserted first, and should face the spring in the battery holder.

Replace the back cover, including the rubber sealing gasket.

Calibration

All Falcon gauges are factory calibrated on NIST traceable calibration equipment. No calibration is required before placing the gauge into service.

An absolute reference gauge will display atmospheric pressure if the gauge port is open to the ambient. It is normal for the reading to constantly change in response to atmospheric pressure changes.

Absolute reference gauges require vacuum generation and atmospheric pressure measurement equipment for accurate calibration and thus are more difficult to calibrate in the field. Calibration should only be attempted if the user has access to an absolute 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.

Calibration intervals depend on the severity of the application, the user's quality guidelines, and calibration history of the product as established by the user. For many applications a six month or an annual calibration interval may be found to be adequate.

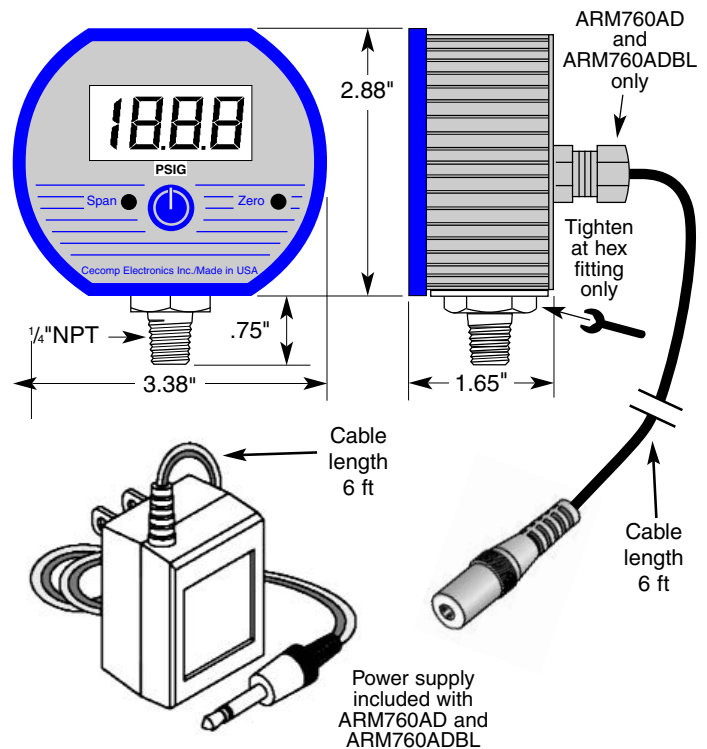
If recalibration is required, remove the calibration plugs from the front of the gauge to access the individual zero and span controls. Allow the gauge to adjust to ambient temperature if needed.

The gauge may be re-zeroed without affecting the span calibration. The gauge must be connected to a vacuum pump with the ability to maintain 0.1 torr absolute vacuum or less. 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 an absolute pressure reference of known accuracy. Zero calibration must be done before span calibration. Record readings at three or more points over the range of the gauge and adjust span control to minimize error over the range of the gauge.

Gauges may be returned to Cecomp Electronics for factory certified recalibration. NIST traceability is available.

Dimensions



Cecomp Electronics

Digital Pressure Gauges and Instrumentation

Division of Absolute Process Instruments Inc.
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www.cecomp.com

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



Electrical Specifications

Ranges and Resolution

Bold: standard ranges, price adder for all others
abs: 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

-30.0 inHg/15.0 psig	120.0 inHg	1600 mmHg	35.0 bar	1.000 kg/cm ² abs
-30.0 inHg/100.0 psig	199.9 inHg abs	760 torr abs	70.0 bar	1.000 kg/cm ² vac
-30.0 inHg/199.9 psig	199.9 inHg	1600 torr abs	140.0 bar	±1.000 kg/cm ²
3.00 psig	50.0 oz/in ²	2100 mmH ₂ O	199.9 bar	1.000 kg/cm ²
5.00 psig	80.0 oz/in ²	3500 mmH ₂ O	350 bar	1.999 kg/cm ² abs
15.00 psi abs	240 oz/in ² abs	199.9 cmH ₂ O	19.99 kPa	1.999 kg/cm ²
15.00 psig vac	240 oz/in ² vac	350 cmH ₂ O	35.0 kPa	4.00 kg/cm ²
±15.00 psig	±240 oz/in ²	1000 cmH ₂ O	100.0 kPa abs	7.00 kg/cm ² abs
15.00 psig	240 oz/in ²	2100 cmH ₂ O	100.0 kPa vac	7.00 kg/cm ²
30.0 psi abs	85.0 inH ₂ O	199.9 mbar	±100.0 kPa	14.00 kg/cm ²
30.0 psig	140.0 inH ₂ O	350 mbar	100.0 kPa	19.99 kg/cm ²
60.0 psig	400 inH ₂ O abs	1000 mbar abs	199.9 kPa abs	35.0 kg/cm ²
100.0 psi abs	400 inH ₂ O vac	1000 mbar vac	199.9 kPa	70.0 kg/cm ²
100.0 psig	±400 inH ₂ O	±1000 mbar	400 kPa	140.0 kg/cm ²
199.9 psig	400 inH ₂ O	1000 mbar	700 kPa abs	199.9 kg/cm ²
300 psig	850 inH ₂ O	1999 mbar abs	700 kPa	350 kg/cm ²
500 psig	7.00 ftH ₂ O	1999 mbar	1500 kPa	1.000 atm abs
1000 psig	12.00 ftH ₂ O	4000 mbar	1999 kPa	±1.000 atm
1999 psig	35.0 ftH ₂ O	1.000 bar abs	3500 kPa	1.000 atm
3000 psig	70.0 ftH ₂ O	1.000 bar vac	5000 kPa	4.00 atm
5000 psig	140.0 ftH ₂ O	±1.000 bar	3.50 MPa	7.00 atm
6.00 inHg	230 ftH ₂ O	1.000 bar	7.00 MPa	14.00 atm
10.00 inHg	480 ftH ₂ O	1.999 bar abs	14.00 MPa	19.99 atm
30.0 inHg abs	150.0 mmHg	1.999 bar	19.99 MPa	35.0 atm
30.0 inHg vac	260 mmHg	4.00 bar	35.0 MPa	70.0 atm
±30.0 inHg	760 mmHg abs	7.00 bar abs	1000 g/cm ² abs	135.0 atm
30.0 inHg	760 mmHg vac	7.00 bar	1000 g/cm ²	199.9 atm
60.0 inHg abs	760 mmHg	14.00 bar	2100 g/cm ² abs	340 atm
60.0 inHg	1600 mmHg abs	19.99 bar	2100 g/cm ²	

Accuracy (linearity, hysteresis, repeatability)

Standard: ±0.25% of full scale ±1 least significant digit
 Optional: **-HA** ±0.1% FS ±1LSD (most ranges)
-4A ±0.4% FS ±1LSD
CD Factory calibration data
NC NIST traceable test report and calibration data

Display (update rate, type, size)

3 readings per second nominal display update rate
 Ranges up to 1999: 3½ digit LCD, 0.5" digit height
 3000 psi, 5000 psi, **-400** option: 4½ digit LCD, 0.5" digit height
 Lower display for engineering units

ADBL: Red LED backlight on whenever gauge is on

Controls

Ranges up to 1999: Front pushbutton turns gauge on or off
 Front-accessible calibration potentiometers
 Non-interactive zero and span, ±10% range
 3000 psi, 5000 psi, **-400** option: Front on/off button cycles through functions,
 zeros display on gauge reference models
 Internal calibration pushbuttons

Power

8 to 24 VAC 50/60 Hz or 9 to 32 VDC
AD: approx 5 mA
ADBL: approx 80 mA
 3 ft long, 2-conductor 22 AWG cable
 All models are designed for continuous operation
 Order optional **WMPSK** 12 VDC wall mount power supply kit to operate on 115 VAC

Environmental Specifications

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
- Powered by 8-24 VAC or 9-32 VDC
- Pressure, Vacuum, Absolute or Compound
- ADBL Includes Backlit Display



Mechanical Specifications

Size

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 (approximate)

Gauge: 9 ounces
 Shipping weight: 1 pound

Material

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

Color

Light gray body, light gray/blue front

Pressure/Vacuum Connection and Material

¼" NPT male, 316 stainless steel

Media Compatibility

All wetted 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
 3000 psi, 5000 psi, **-400** option
 112.5% out-of-range display | - - - or | - . - . -
 All others 2x rated pressure minimum

Burst Pressure

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

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Division of Absolute Process Instruments Inc.
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 Libertyville, IL 60048 Fax: 800-949-7502

www.cecomp.com



Installation and Precautions

- Install or remove gauge using wrench on gauge 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.
- Use only with liquids or gases compatible with 316 stainless steel.
- 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.
- NEVER** connect the gauge wires directly to 115 VAC or permanent damage not covered by warranty will result.

Installation

The **DPG1000AD** and **DPG1000ADBL** can be powered by:
AC source: 8 to 24 VAC 50/60 Hz or DC source: 9 to 32 VDC

The type and magnitude of the supply voltage have negligible effects on the gauge calibration as long as it is within the voltage ranges stated above. No recalibration is needed, and no jumpers need to be moved to use either AC or DC power within the specified range. No polarity needs to be observed when connecting a DC supply. Therefore, they can be used with inexpensive unregulated low voltage AC or DC power sources in applications requiring a continuous pressure display.

After the gauge is installed, route the wires away from heat sources and moving equipment and connect the low-voltage power source to the gauge wires.

The only important consideration is to ensure that the gauge supply voltage does not fall below 8 VAC RMS if AC power is used, or 9 VDC if DC power is used. Operation with less than these values may cause erratic or erroneous readings. If your application requires operation of multiple gauges from the same power supply, consult the factory for wiring recommendations.

Operation – Ranges up to 1999

When a supply voltage is applied, the gauge will be ready to use. If the gauge display is off, press the center button to turn the gauge on. If the gauge is in the power-on state and the power is disconnected, the gauge will turn on when power is reapplied. The gauge can be left on continuously or turned off when not in use. **ADBL** model backlighting will be on whenever the gauge is on. The display backlighting will not be apparent under bright lighting conditions.

Operation – 3000 psi, 5000 psi Ranges and -400 Option

When the supply voltage is applied, the gauge will go through a power-up sequence. The full-scale range is indicated, display segments are tested, and then the reading and units are displayed. **ADBL** model backlighting will be on whenever the gauge is on. The display backlighting will not be apparent under bright lighting conditions.

One-Touch Zero Button (Gauge reference models only)

1. This feature corrects slight drift from zero due to temperature changes. Make absolutely certain no pressure is applied to the gauge. The gauge port should be exposed to normal atmospheric pressure.
2. With the gauge off, press and hold the pushbutton.
3. The full-scale range is indicated and the display segments are tested.
4. Continue to press the pushbutton until **0000** is displayed, and then release the button. This indicates that the gauge has been zeroed and a corrected zero reading is displayed until pressure/vacuum is applied.
5. If the button is released before **0000** is displayed, the stored zero correction is erased and the actual reading is displayed.

Attempting to zero the gauge with pressure greater than approximately 3% of full-scale applied will result in an error condition, and the display will alternately indicate **E r r 0** and the actual measured pressure. Repeat the One-Touch Zero procedure to correct the error condition.

Absolute reference gauges do not use the zero feature since they read atmospheric pressure under normal conditions.

Normal Operation

Following the start-up initialization, the display indicates the pressure reading updated approximately 3 times per second and the units.

If excessive vacuum is applied to a pressure-only gauge, the display will indicate **- E r r** until the vacuum is released. Applying vacuum to a gauge designed for pressure may damage the pressure sensor. If excessive pressure is applied (112.5% over range), an out-of-range indication of **1 - - -** or **1 - . - . -** will be displayed depending on model.

Calibration

All Falcon gauges are factory calibrated on NIST traceable calibration equipment. No calibration is required before placing the gauge into service.

Ranges up to 1999 – Remove the calibration potentiometer covers on the front of the unit to access the zero and span controls.

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.

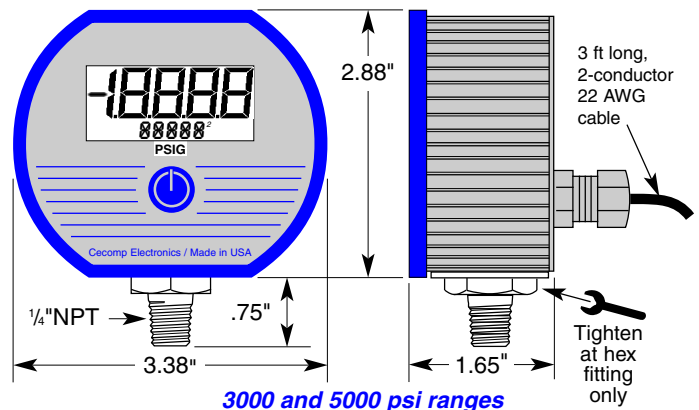
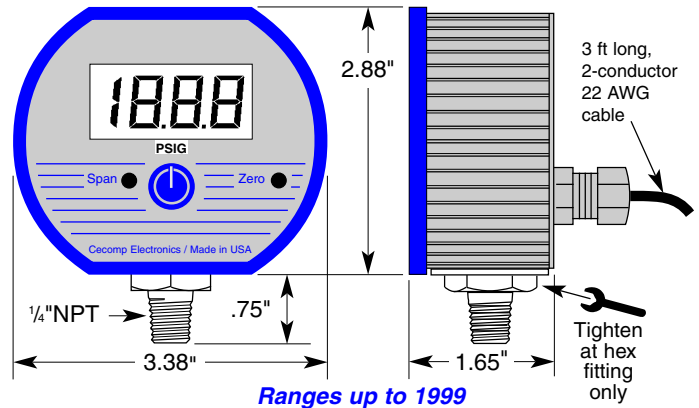
Span calibration should only be attempted if the user has access to a pressure reference of known accuracy. The quality of the calibration is only as good as the accuracy of the calibration equipment and ideally should be at least four times the gauge accuracy. Zero calibration must be done before span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

3000 psi, and 5000 psi Ranges: The calibration adjustments are internal on these models. The procedure is available from www.cecomp.com or by calling to request the "F16" calibration instructions.

Absolute Reference – These models display atmospheric pressure if the gauge port is open to the ambient. It is normal for the reading to constantly change in response to atmospheric pressure changes. These gauges require vacuum generation and atmospheric pressure measurement equipment for accurate calibration and thus are more difficult to calibrate in the field.

Gauges can be returned to Cecomp Electronics for factory certified recalibration, repairs and refurbishment. NIST traceability is available. Gauges can also be recalibrated by any metrology lab with pressure calibration equipment at least four times more accurate than the gauge.

Dimensions



Part Numbers

DPG1000AD or ADBL range units ref
Pressure/Vacuum Range (see table) →
Units (see table) →
G=Gauge, A=Absolute, VAC=Vacuum

Example: **DPG1000AD15PSIA** = DPG1000AD 15.00 PSI Absolute

Unit Abbreviations	inH ₂ O = INH2O	mmH ₂ O = MMH2O	g/cm ² = GCM
oz/in ² = ZIN	ftH ₂ O = FTH2O	kg/cm ² = KGCM	cmH ₂ O = CMH2O

Electrical Specifications

Ranges and Resolution

Bold: Standard ranges, price adder for all others
abs: 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

-30.0 inHg/15.0 psig	120.0 inHg	1600 mmHg	35.0 bar	1.000 kg/cm ² abs
-30.0 inHg/100.0 psig	199.9 inHg abs	760 torr abs	70.0 bar	1.000 kg/cm ² vac
-30.0 inHg/199.9 psig	199.9 inHg	1600 torr abs	140.0 bar	±1.000 kg/cm ²
3.00 psig	50.0 oz/in ²	2100 mmH ₂ O	199.9 bar	1.000 kg/cm ²
5.00 psig	80.0 oz/in ²	3500 mmH ₂ O	350 bar	1.999 kg/cm ² abs
15.00 psi abs	240 oz/in ² abs	199.9 cmH ₂ O	19.99 kPa	1.999 kg/cm ²
15.00 psig vac	240 oz/in ² vac	350 cmH ₂ O	35.0 kPa	4.00 kg/cm ²
±15.00 psig	±240 oz/in ²	1000 cmH ₂ O	100.0 kPa abs	7.00 kg/cm ² abs
15.00 psig	240 oz/in ²	2100 cmH ₂ O	100.0 kPa vac	7.00 kg/cm ²
30.0 psi abs	85.0 inH ₂ O	199.9 mbar	±100.0 kPa	14.00 kg/cm ²
30.0 psig	140.0 inH ₂ O	350 mbar	100.0 kPa	19.99 kg/cm ²
60.0 psig	400 inH ₂ O abs	1000 mbar abs	199.9 kPa abs	35.0 kg/cm ²
100.0 psi abs	400 inH ₂ O vac	1000 mbar vac	199.9 kPa	70.0 kg/cm ²
100.0 psig	±400 inH ₂ O	±1000 mbar	400 kPa	140.0 kg/cm ²
199.9 psig	400 inH ₂ O	1000 mbar	700 kPa abs	199.9 kg/cm ²
300 psig	850 inH ₂ O	1999 mbar abs	700 kPa	350 kg/cm ²
500 psig	7.00 ftH ₂ O	1999 mbar	1500 kPa	1.000 atm abs
1000 psig	12.00 ftH ₂ O	4000 mbar	1999 kPa	±1.000 atm
1999 psig	35.0 ftH ₂ O	1.000 bar abs	3500 kPa	1.000 atm
3000 psig	70.0 ftH ₂ O	1.000 bar vac	5000 kPa	4.00 atm
5000 psig	140.0 ftH ₂ O	±1.000 bar	3.50 MPa	7.00 atm
6.00 inHg	230 ftH ₂ O	1.000 bar	7.00 MPa	14.00 atm
10.00 inHg	480 ftH ₂ O	1.999 bar abs	14.00 MPa	19.99 atm
30.0 inHg abs	150.0 mmHg	1.999 bar	19.99 MPa	35.0 atm
30.0 inHg vac	260 mmHg	4.00 bar	35.0 MPa	70.0 atm
±30.0 inHg	760 mmHg abs	7.00 bar abs	1000 g/cm ² abs	135.0 atm
30.0 inHg	760 mmHg vac	7.00 bar	1000 g/cm ²	199.9 atm
60.0 inHg abs	760 mmHg	14.00 bar	2100 g/cm ² abs	340 atm
60.0 inHg	1600 mmHg abs	19.99 bar	2100 g/cm ²	

Accuracy (linearity, hysteresis, repeatability)

Standard: ±0.25% of full scale ±1 least significant digit
 Optional: **-HA** ±0.1% FS ±1LSD (most ranges)
-4A ±0.4% FS ±1LSD
CD Factory calibration data
NC NIST traceable test report and calibration data

Display (update rate, type, size)

3 readings per second nominal display update rate
 Ranges up to 1999: 3½ digit LCD, 0.5" digit height
 3000 psi, 5000 psi, **-400** option: 4½ digit LCD, 0.5" digit height, lower display for engineering units

ADBL: Red LED backlight on whenever gauge is on

Controls

Ranges up to 1999: Front pushbutton turns gauge on or off
 Front-accessible calibration potentiometers
 Non-interactive zero and span, ±10% range
 3000 psi, 5000 psi, **-400** option: Gauge is on whenever power is applied
 Front pushbutton One-Touch zero
 Internal calibration pushbuttons
 Non-interactive zero and span, ±10% range

Power

Any AC source 8 to 24 VAC 50/60 Hz or any DC source 9 to 32 VDC
F4AD series: Approximately 5 mA
F4ADBL series: Approximately 80 mA
 3 ft long, 2-conductor 22 AWG cable
 All models are designed for continuous operation
 Order optional **WMPSK** 12 VDC wall mount power supply kit to operate on 115 VAC

Environmental Specifications

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
- Powered by 8-24 VAC or 9-32 VDC
- Pressure, Vacuum, Absolute or Compound
- ADBL includes Backlit Display



Mechanical Specifications

Size

3.5" W x 3.0" H x 2.0" D housing
 Add approximately 0.75" to height for pressure fitting
 Add approximately 1" to depth for strain relief and wire clearance

Weight (approximate)

Gauge: 9 ounces
 Shipping weight: 1 pound

Housing

NEMA 4X
 UV stabilized polycarbonate/ABS case, light gray color
 Clear polycarbonate window to protect display
 Gasketed rear cover, six captive stainless steel screws

Pressure/Vacuum Connection and Material

¼" NPT male, 316 stainless steel

Media Compatibility

All wetted 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
 3000 psi, 5000 psi, **-400** option: 112.5% out-of-range display | - - - or | - - - -
 All others 2x rated pressure minimum

Burst Pressure

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

Cecomp Electronics

Digital Pressure Gauges and Instrumentation

Division of Absolute Process Instruments Inc.
 1220 American Way Phone: 800-942-0315
 Libertyville, IL 60048 Fax: 800-949-7502

www.cecomp.com

Installation and Precautions

- Install or remove gauge using wrench on gauge 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.
- Use only with liquids or gases compatible with 316 stainless steel.
- 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.
- NEVER** connect the gauge wires directly to 115 VAC or permanent damage not covered by warranty will result.

Installation

The **F4AD** and **F4ADBL** can be powered by:
AC source: 8 to 24 VAC 50/60 Hz or DC source: 9 to 32 VDC

The type and magnitude of the supply voltage have negligible effects on the gauge calibration as long as it is within the voltage ranges stated above. No recalibration is needed, and no jumpers need to be moved to use either AC or DC power within the specified range. No polarity needs to be observed when connecting a DC supply. Therefore, they can be used with inexpensive unregulated low voltage AC or DC power sources in applications requiring a continuous pressure display.

After the gauge is installed, route the wires away from heat sources and moving equipment and connect the low-voltage power source to the gauge cable.

The only important consideration is to ensure that the gauge supply voltage does not fall below 8 VAC RMS if AC power is used, or 9 VDC if DC power is used. Operation with less than these values may cause erratic or erroneous readings. If your application requires operation of multiple gauges from the same power supply, consult the factory for wiring recommendations.

Operation – Ranges up to 1999

When a supply voltage is applied, the gauge will be ready to use. If the gauge display is off, press the center button to turn the gauge on. If the gauge is in the power-on state and the power is disconnected, the gauge will turn on when power is reapplied. The gauge can be left on continuously or turned off when not in use. **ADBL** model backlighting will be on whenever the gauge is on. The display backlighting will not be apparent under bright lighting conditions.

Operation – 3000 psi, 5000 psi Ranges and -400 Option

When the supply voltage is applied, the gauge will go through a power-up sequence. The full-scale range is indicated, display segments are tested, and then the reading and units are displayed. **ADBL** model backlighting will be on whenever the gauge is on. The display backlighting will not be apparent under bright lighting conditions.

One-Touch Zero Button (Gauge reference models only)

- This feature corrects slight drift from zero due to temperature changes. Make absolutely certain no pressure is applied to the gauge. The gauge port should be exposed to normal atmospheric pressure.
- Press and hold the pushbutton.
- The full-scale range is indicated and the display segments are tested.
- Continue to press the pushbutton until **0000** is displayed and then release the button. This indicates that the gauge has been zeroed and a corrected zero reading is displayed until pressure/vacuum is applied.
- If the button is released before **0000** is displayed, the stored zero correction is erased and the actual reading is displayed.

Attempting to zero the gauge with pressure greater than approximately 3% of full-scale applied will result in an error condition, and the display will alternately indicate **E r r 0** and the actual measured pressure. Repeat the One-Touch Zero procedure to correct the error condition.

Absolute reference gauges do not use the zero feature since they read atmospheric pressure under normal conditions.

Normal Operation

Following the start-up initialization, the display indicates the pressure reading updated approximately 3 times per second.

If excessive vacuum is applied to a pressure-only gauge, the display will indicate **- E r r** until the vacuum is released. Applying vacuum to a gauge designed for pressure may damage the pressure sensor. If excessive pressure is applied (112.5% over range), an out-of-range indication of **l - - -** or **l -.-.-** will be displayed depending on model.

Calibration

All Falcon gauges are factory calibrated on NIST traceable calibration equipment. No calibration is required before placing the gauge into service.

Ranges up to 1999 – Remove the calibration potentiometer covers on the front of the unit to access the zero and span controls.

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.

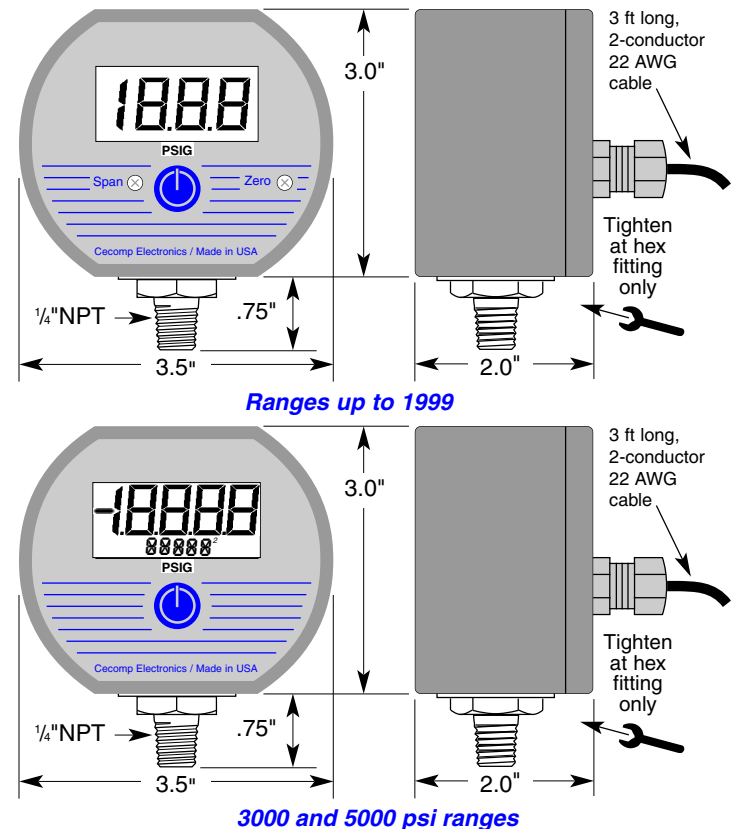
Span calibration should only be attempted if the user has access to a pressure reference of known accuracy. The quality of the calibration is only as good as the accuracy of the calibration equipment and ideally should be at least four times the gauge accuracy. Zero calibration must be done before span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

3000 psi, and 5000 psi Ranges: The calibration adjustments are internal on these models. The calibration instructions are available at www.cecomp.com.

Absolute Reference – These models display atmospheric pressure if the gauge port is open to the ambient. It is normal for the reading to constantly change in response to atmospheric pressure changes. These gauges require vacuum generation and atmospheric pressure measurement equipment for accurate calibration and thus are more difficult to calibrate in the field.

Gauges can be returned to Cecomp Electronics for factory certified recalibration, repairs and refurbishment. NIST traceability is available. Gauges can also be recalibrated by any metrology lab with pressure calibration equipment at least four times more accurate than the gauge.

Dimensions



Part Numbers

F4AD or F4ADBL range units ref
 Pressure/Vacuum Range (see table) →
 Units (see table) →
G=Gauge, A=Absolute, VAC=Vacuum

Example: **F4AD15PSIA** = F4AD 15.00 PSI Absolute

Unit Abbreviations	inH ₂ O = INH2O	mmH ₂ O = MMH2O	g/cm ² = GCM
oz/in ² = ZIN	ftH ₂ O = FTH2O	kg/cm ² = KGCM	cmH ₂ O = CMH2O

DiGi MAX® Low Voltage-Powered Min/Max Pressure Gauges

F16AD F16NAD
F16ADBL F16NADBL



- F16AD** AC/DC Powered
- F16NAD** NEMA 4X, AC/DC Powered
- F16ADBL** AC/DC Powered, Backlit Display
- F16NADBL** NEMA 4X, AC/DC Powered, Backlit Display

- ±0.25% Test Gauge Accuracy
- 316 Stainless Steel Wetted Parts
- Capture Minimum and Maximum Readings
- One-Touch Zero™

Electrical Specifications

Ranges and Resolution

Bold: standard ranges, price adder for all others
abs: 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

-30.0 inHg/15.0 psig	120.0 inHg	1600 mmHg	35.00 bar	1.000 kg/cm ² abs
-30.0 inHg/100.0 psig	200.0 inHg abs	760.0 torr abs	70.00 bar	1.000 kg/cm ² vac
-30.0 inHg/200.0 psig	200.0 inHg	1600 torr abs	140.0 bar	±1.000 kg/cm ²
3.000 psig	50.00 oz/in ²	2100 mmH ₂ O	200.0 bar	1.000 kg/cm ²
5.000 psig	80.0 oz/in ²	3500 mmH ₂ O	350.0 bar	2.000 kg/cm ² abs
15.00 psi abs	240.0 oz/in ² abs	210.0 cmH ₂ O	20.00 kPa	2.000 kg/cm ²
15.00 psig vac	240.0 oz/in ² vac	350.0 cmH ₂ O	35.00 kPa	4.000 kg/cm ²
±15.00 psig	±240.0 oz/in ²	1000 cmH ₂ O	100.0 kPa abs	7.000 kg/cm ² abs
15.00 psig	240.0 oz/in ²	2100 cmH ₂ O	100.0 kPa vac	7.000 kg/cm ²
30.00 psi abs	85.0 inH ₂ O	200.0 mbar	±100.0 kPa	14.00 kg/cm ²
30.00 psig	140.0 inH ₂ O	350.0 mbar	100.0 kPa	20.00 kg/cm ²
60.00 psig	400.0 inH ₂ O abs	1000 mbar abs	200.0 kPa abs	35.00 kg/cm ²
100.0 psi abs	400.0 inH ₂ O vac	1000 mbar vac	200.0 kPa	70.00 kg/cm ²
100.0 psig	±400 inH ₂ O	±1000 mbar	400.0 kPa	140.0 kg/cm ²
200.0 psig	400.0 inH ₂ O	1000 mbar	700.0 kPa abs	200.0 kg/cm ²
300.0 psig	850 inH ₂ O	2000 mbar abs	700.0 kPa	350.0 kg/cm ²
500.0 psig	7.000 ftH ₂ O	2000 mbar	1500 kPa	1.000 atm abs
1000 psig	12.00 ftH ₂ O	4000 mbar	2000 kPa	±1.000 atm
2000 psig	35.00 ftH ₂ O	1.000 bar abs	3500 kPa	1.000 atm
3000 psig	70.00 ftH ₂ O	1.000 bar vac	5000 kPa	4.000 atm
5000 psig	140.0 ftH ₂ O	±1.000 bar	3.500 MPa	7.000 atm
6.000 inHg	230.0 ftH ₂ O	1.000 bar	7.000 MPa	14.00 atm
10.00 inHg	480.0 ftH ₂ O	2.000 bar abs	14.00 MPa	20.00 atm
30.00 inHg abs	150.0 mmHg	2.000 bar	20.00 MPa	35.00 atm
30.00 inHg vac	260.0 mmHg	4.000 bar	35.00 MPa	70.00 atm
±30.00 inHg	760.0 mmHg abs	7.000 bar abs	1000 g/cm ² abs	135.0 atm
30.00 inHg	760.0 mmHg vac	7.000 bar	1000 g/cm ²	200.0 atm
60.00 inHg abs	760.0 mmHg	14.00 bar	2100 g/cm ² abs	340.0 atm
60.00 inHg	1600 mmHg abs	20.00 bar	2100 g/cm ²	

Accuracy (linearity, hysteresis, repeatability)

Standard: ±0.25% of full scale ±1 least significant digit
 Optional:
-HA ±0.1% FS ±1LSD (most ranges)
-4A ±0.4% FS ±1LSD
CD Factory calibration data
NC NIST traceable test report and calibration data

Display (update rate, type, size)

3 readings per second nominal display update rate
 4½ digit LCD, 0.5" H, 5 character 0.25" H alphanumeric lower display
ADBL models: Red LED backlight whenever power to gauge is on

Controls and Functions

Front pushbutton turns gauge on or off and cycles through functions

Function	Pushbutton	Prompt (Release Button)	Result
One Touch Zero	Press/hold	0000	Zeroed Actual Pressure
Hi Reading	Press/hold	HI	HI & max. reading
Lo Reading	Press/hold	LO	LO & min. reading
Exit Hi/Lo	Press/hold	AP	Actual Pressure
Clear Hi/Lo	Press/hold	HI / LO / AP \rightarrow CLR	Actual Pressure
Clear Hi/Lo/Zero	Press/hold	Full Scale Reading	Actual Pressure, not Zeroed

Calibration

Internal calibration pushbuttons
 Non-interactive zero, span, and linearity, ±10% range

Power

Any AC source of 8 to 24 VAC 50/60 Hz or any DC source of 9 to 32 VDC
AD: approx 5 mA
ADBL: approx 80 mA
 Order optional **WMPSK** 12 VDC wall mount power supply kit for 115 VAC operation
 All models are designed for continuous operation



F16AD60PSIG
0 to 60.00 psig range

F16NAD60PSIG
0 to 60.00 psig range
NEMA 4X

Mechanical Specifications

Size

F16: 3.38" W x 2.88" H x 1.65" D housing
F16N: 3.5" W x 3.0" H x 2.0" D housing
 Add approximately 0.75" to height for pressure fitting

Weight (approximate)

Gauge: 9 ounces
 Shipping weight: 1 pound

Material and Color

F16: Extruded aluminum case, light gray epoxy powder coated, black ABS/ polycarbonate bezel (aluminum bezel optional), front and rear gaskets, black/gold label
F16N: Light gray ABS/polycarbonate NEMA 4X case, rear gasket, black/gold label

Pressure/Vacuum Connection Size, Material, Media Compatibility

¼" NPT male, all wetted 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: 2 x sensor pressure
 112.5% out-of-range display: | - - - or | - . - . - depending on model

Burst Pressure

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

Environmental Specifications

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)

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F16AD, F16NAD F16ADBL, F16NADBL

DiGi MAX® Low Voltage-Powered Min/Max Pressure Gauges

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

NEVER connect the gauge wires directly to 115 VAC or permanent damage not covered by warranty will result.

Do not use a common 24 VAC transformer. These transformers can supply over 32 VAC unless they are loaded to 80% of rated capacity. Since the gauge current is only in the milliamp range, the overvoltage may result in damage not covered by warranty.

The **F16AD, F16NAD, F16ADBL, and F16NADBL** can be powered by

AC source: 8 to 24 VAC 50/60 Hz or DC source: 9 to 32 VDC

The type and magnitude of the supply voltage have negligible effects on the gauge calibration as long as it is within the voltage ranges stated above. No recalibration is needed, and no jumpers need to be moved to use either AC or DC power within the specified range. No polarity needs to be observed when connecting a DC supply. The gauges can be used with inexpensive unregulated low voltage AC or DC power sources in applications requiring a continuous pressure display.

After the gauge is installed, route the wires away from heat sources and moving equipment and connect the low voltage power supply to the gauge cable. Lastly connect the low voltage power supply to an appropriate power source.

Make sure that the gauge supply voltage does not fall below 8 VAC RMS if AC power is used, or 9 VDC if DC power is used. Operation with less than these values may cause erratic or erroneous readings.

If your application requires operation of multiple gauges from the same power supply, consult the factory for wiring recommendations.

Operation

When a supply voltage is applied, the gauge will display the gauge range, test all LCD segments, then display the actual pressure reading updated approximately 3 times per second along with the units.

If excessive vacuum is applied to a pressure-only gauge, the display will indicate **- E r r** until the vacuum is released. Applying vacuum to a gauge designed for pressure may damage the pressure sensor. If excessive pressure is applied (112.5% over range), an out-of-range indication of **l - - -** or **l - . - . -** will be displayed depending on model.

Display backlighting on **ADBL** models is on whenever the gauge has power. The display backlighting will not be apparent under bright lighting conditions.

One-Touch Zero – This applies only to gauge reference models. Absolute reference gauges do not use the zero feature since they read atmospheric pressure under normal conditions.

1. Be sure the gauge port is exposed to normal atmospheric pressure and no pressure is applied. The zeroing function is only activated by following this sequence and the stored zero correction is erased when the gauge power is removed.
2. Press and hold the pushbutton until **o o o o** is displayed and then release the button.
5. This indicates that the gauge has been zeroed and the actual pressure is then displayed with a small correction factor for the zero offset.

Attempting to zero the gauge with pressure greater than approximately 3% of full-scale applied will result in an error condition, and the display will alternately indicate **E r r 0** and the actual measured pressure. Follow the One-Touch Zero procedure again to correct the error condition.

Reset – To clear the stored zero correction and the min and max readings press and hold the pushbutton until the display indicates **cl r** for about 5 seconds total and then release. The gauge returns to the normal mode and displays the current reading.

Minimum and Maximum Readings

Minimum and maximum readings are continuously stored and updated whenever gauge is on. The stored readings can be manually cleared if desired. The **HI** and **LO** memory is also cleared whenever the gauge is off.

Press and hold the pushbutton for about 1 second until **HI** is displayed. The maximum stored value is displayed.

After **HI** is displayed, press and hold the pushbutton again for about 1 second until **LO** is displayed. The minimum stored value is displayed.

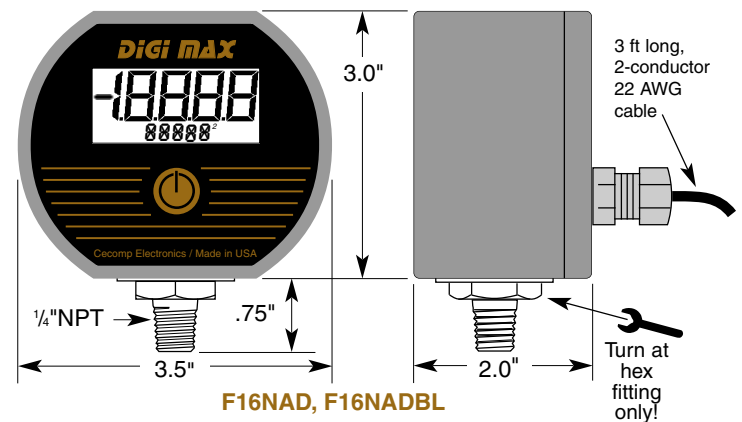
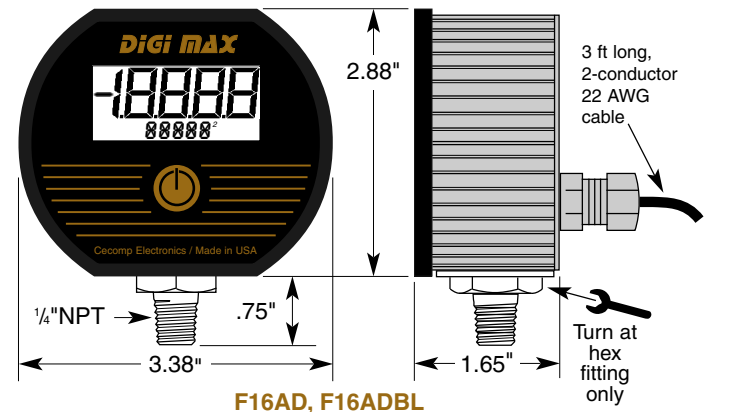
After **LO** is displayed, press and hold the pushbutton again for about 1 second until **AP** (Applied Pressure) is displayed. The **HI** and **LO** memory is not erased and the gauge returns to normal operation with the display indicating the current pressure.

Press and continue to hold the pushbutton until the display indicates **cl r HI LO** (about 3 seconds total) and then release the pushbutton. Both **HI** and **LO** values are cleared and the gauge returns to the normal mode and displays the current pressure.

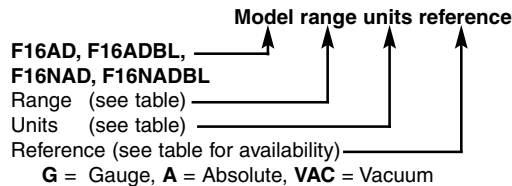
Calibration

F16-series gauges use internal controls for calibration. The calibration instructions are available at www.cecomp.com. Gauges can be recalibrated by any metrology lab with pressure calibration equipment at least 4 times more accurate than the gauge. Gauges may also be returned for factory recalibration and refurbishment. NIST traceability is available.

Dimensions



Part Numbers



Unit Abbreviations

oz/in ²	= ZIN
inH ₂ O	= INH2O
ftH ₂ O	= FTH2O
mmH ₂ O	= MMH2O
kg/cm ²	= KGCM
g/cm ²	= GCM
cmH ₂ O	= CMH2O

Example: F16AD100PSIG
F16AD, Low Voltage-Powered, 100.0 psig

Electrical Specifications

Ranges and Resolution

Bold: standard ranges, price adder for all others
abs: 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 other engineering units	120.0 inHg	1600 mmHg	35.0 bar	1.000 kg/cm ² abs
	199.9 inHg abs	760 torr abs	70.0 bar	1.000 kg/cm ² vac
	199.9 inHg	1600 torr abs	140.0 bar	±1.000 kg/cm ²
3.00 psig	50.0 oz/in ²	2100 mmH ₂ O	199.9 bar	1.000 kg/cm ²
5.00 psig	80.0 oz/in ²	3500 mmH ₂ O	350 bar	1.999 kg/cm ² abs
15.00 psi abs	240 oz/in ² abs	199.9 cmH ₂ O	19.99 kPa	1.999 kg/cm ²
15.00 psig vac	240 oz/in ² vac	350 cmH ₂ O	35.0 kPa	4.00 kg/cm ²
±15.00 psig	±240 oz/in ²	1000 cmH ₂ O	100.0 kPa abs	7.00 kg/cm ² abs
15.00 psig	240 oz/in ²	2100 cmH ₂ O	100.0 kPa vac	7.00 kg/cm ²
30.0 psi abs	85.0 inH ₂ O	199.9 mbar	±100.0 kPa	14.00 kg/cm ²
30.0 psig	140.0 inH ₂ O	350 mbar	100.0 kPa	19.99 kg/cm ²
60.0 psig	400 inH ₂ O abs	1000 mbar abs	199.9 kPa abs	35.0 kg/cm ²
100.0 psi abs	400 inH ₂ O vac	1000 mbar vac	199.9 kPa	70.0 kg/cm ²
100.0 psig	±400 inH ₂ O	±1000 mbar	400 kPa	140.0 kg/cm ²
199.9 psig	400 inH ₂ O	1000 mbar	700 kPa abs	199.9 kg/cm ²
300 psig	850 inH ₂ O	1999 mbar abs	700 kPa	350 kg/cm ²
500 psig	7.00 ftH ₂ O	1999 mbar	1500 kPa	1.000 atm abs
1000 psig	12.00 ftH ₂ O	4000 mbar	1999 kPa	±1.000 atm
1999 psig	35.0 ftH ₂ O	1.000 bar abs	3500 kPa	1.000 atm
3000 psig	70.0 ftH ₂ O	1.000 bar vac	5000 kPa	4.00 atm
5000 psig	140.0 ftH ₂ O	±1.000 bar	3.50 MPa	7.00 atm
6.00 inHg	230 ftH ₂ O	1.000 bar	7.00 MPa	14.00 atm
10.00 inHg	480 ftH ₂ O	1.999 bar abs	14.00 MPa	19.99 atm
30.0 inHg abs	150.0 mmHg	1.999 bar	19.99 MPa	35.0 atm
30.0 inHg vac	260 mmHg	4.00 bar	35.0 MPa	70.0 atm
±30.0 inHg	760 mmHg abs	7.00 bar abs	1000 g/cm ² abs	135.0 atm
30.0 inHg	760 mmHg vac	7.00 bar	1000 g/cm ²	199.9 atm
60.0 inHg abs	760 mmHg	14.00 bar	2100 g/cm ² abs	340 atm
60.0 inHg	1600 mmHg abs	19.99 bar	2100 g/cm ²	

Accuracy (linearity, hysteresis, repeatability)

Standard: ±0.25% of full scale ±1 least significant digit
 Optional: **-HA** ±0.1% FS ±1LSD (most ranges)
-4A ±0.4% FS ±1LSD
CD Factory calibration data
NC NIST traceable test report and calibration data

Display (update rate, type, size)

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 Specifications

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
- Analog 4-20 mA Output
- Pressure, Vacuum, or Absolute
- Output Test Function

DPG1000L200PSIG
199.9 psig range



DPG1000L5000PSIG
5000 psig range

Mechanical Specifications

Size

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 (approximate)

Gauge: 9 ounces
 Shipping weight: 1 pound

Material

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

Color

Light gray body, light gray/blue front

Pressure/Vacuum Connection and Material

¼" NPT male, 316 stainless steel

Media Compatibility

All wetted 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

Burst Pressure

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

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www.cecomp.com

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.

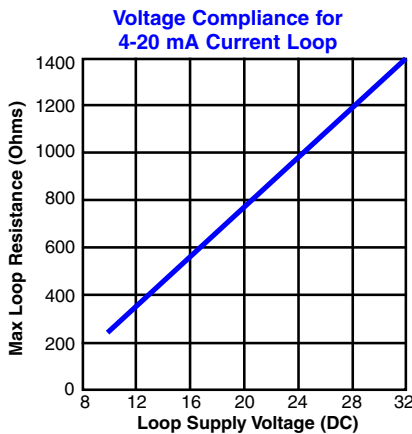
Loop Voltage

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:

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

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** 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.

Calibration

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

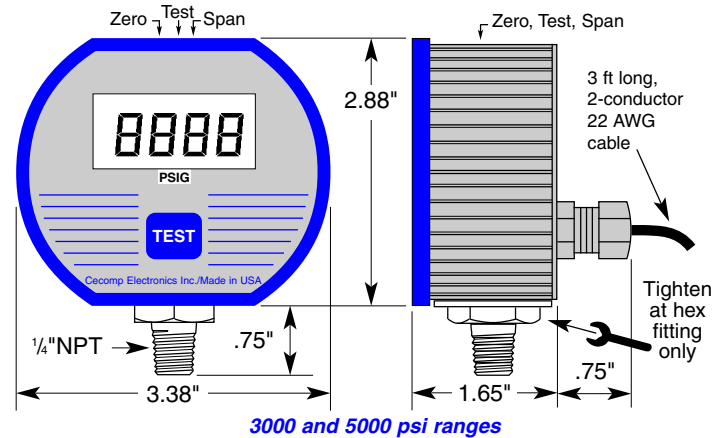
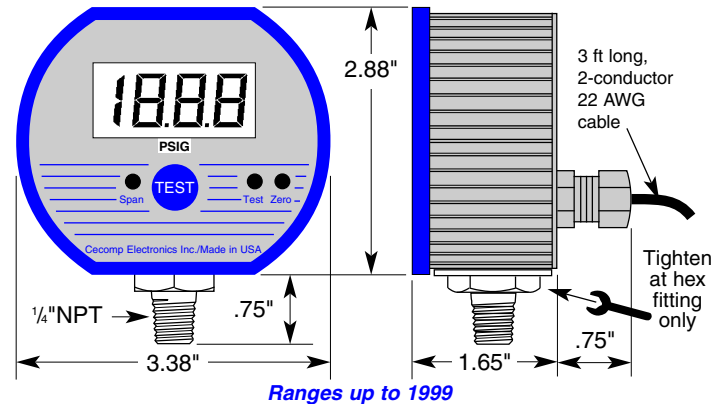
Gauge Reference – Units may be re-zeroed without affecting the span calibration. The gauge port must be open to the ambient with no pressure or vacuum applied. Adjust the Zero control until the gauge reads zero with the minus (-) sign occasionally flashing.

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

DPG1000L range units ref
Pressure/Vacuum Range (see table) →
Units (see table) →
G=Gauge, **A**=Absolute, **VAC**=Vacuum

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

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

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

Electrical Specifications

Ranges and Resolution

Bold: standard ranges, price adder for all others
abs: 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 other engineering units	120.0 inHg	1600 mmHg	35.0 bar	1.000 kg/cm ² abs
	199.9 inHg abs	760 torr abs	70.0 bar	1.000 kg/cm ² vac
	199.9 inHg	1600 torr abs	140.0 bar	±1.000 kg/cm ²
3.00 psig	50.0 oz/in ²	2100 mmH ₂ O	199.9 bar	1.000 kg/cm ²
5.00 psig	80.0 oz/in ²	3500 mmH ₂ O	350 bar	1.999 kg/cm ² abs
15.00 psi abs	240 oz/in ² abs	199.9 cmH ₂ O	19.99 kPa	1.999 kg/cm ²
15.00 psig vac	240 oz/in ² vac	350 cmH ₂ O	35.0 kPa	4.00 kg/cm ²
±15.00 psig	±240 oz/in ²	1000 cmH ₂ O	100.0 kPa abs	7.00 kg/cm ² abs
15.00 psig	240 oz/in ²	2100 cmH ₂ O	100.0 kPa vac	7.00 kg/cm ²
30.0 psi abs	85.0 inH ₂ O	199.9 mbar	±100.0 kPa	14.00 kg/cm ²
30.0 psig	140.0 inH ₂ O	350 mbar	100.0 kPa	19.99 kg/cm ²
60.0 psig	400 inH ₂ O abs	1000 mbar abs	199.9 kPa abs	35.0 kg/cm ²
100.0 psi abs	400 inH ₂ O vac	1000 mbar vac	199.9 kPa	70.0 kg/cm ²
100.0 psig	±400 inH ₂ O	±1000 mbar	400 kPa	140.0 kg/cm ²
199.9 psig	400 inH ₂ O	1000 mbar	700 kPa abs	199.9 kg/cm ²
300 psig	850 inH ₂ O	1999 mbar abs	700 kPa	350 kg/cm ²
500 psig	7.00 ftH ₂ O	1999 mbar	1500 kPa	1.000 atm abs
1000 psig	12.00 ftH ₂ O	4000 mbar	1999 kPa	±1.000 atm
1999 psig	35.0 ftH ₂ O	1.000 bar abs	3500 kPa	1.000 atm
3000 psig	70.0 ftH ₂ O	1.000 bar vac	5000 kPa	4.00 atm
5000 psig	140.0 ftH ₂ O	±1.000 bar	3.50 MPa	7.00 atm
6.00 inHg	230 ftH ₂ O	1.000 bar	7.00 MPa	14.00 atm
10.0 inHg	480 ftH ₂ O	1.999 bar abs	14.00 MPa	19.99 atm
30.0 inHg abs	150.0 mmHg	1.999 bar	19.99 MPa	35.0 atm
30.0 inHg vac	260 mmHg	4.00 bar	35.0 MPa	70.0 atm
±30.0 inHg	760 mmHg abs	7.00 bar abs	1000 g/cm ² abs	135.0 atm
30.0 inHg	760 mmHg vac	7.00 bar	1000 g/cm ²	199.9 atm
60.0 inHg abs	760 mmHg	14.00 bar	2100 g/cm ² abs	340 atm
60.0 inHg	1600 mmHg abs	19.99 bar	2100 g/cm ²	

Accuracy (linearity, hysteresis, repeatability)

Standard: ±0.25% of full scale ±1 least significant digit
-HA option: ±0.1% FS ±1LSD (most ranges)
-4A option: ±0.4% FS ±1LSD
NC: NIST traceable test report and data

Display (update rate, type, size)

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 Specifications

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
- Pressure, Vacuum, Absolute
- Output Test Function



F4L200PSIG with 199.9 psig range

Mechanical Specifications

Size

3.5" W x 3.0" H x 2.0" D housing
 Add approximately 0.75" to height for pressure fitting
 Add approximately 1" to depth for strain relief and wire clearance

Weight (approximate)

Gauge: 9 ounces
 Shipping weight: 1 pound

Housing

NEMA 4X
 UV stabilized polycarbonate/ABS case, light gray color
 Clear polycarbonate window to protect display
 Gasketed rear cover, six captive stainless steel screws

Pressure/Vacuum Connection and Material

¼" NPT male, 316 stainless steel

Media Compatibility

All wetted 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

Burst Pressure

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

 **Cecomp Electronics**
 Digital Pressure Gauges and Instrumentation

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Description

The **Falcon Digi Pro** series is a versatile family of industrial pressure and vacuum gauges featuring a rugged NEMA 4X case. This type of enclosure, when properly installed, is suitable for indoor or outdoor non-hazardous locations and provides a degree of protection against falling dirt, rain, sleet, snow, windblown dust, splashing water, hose-directed water, corrosion and ice formation.

The **F4L** is a two-wire 4-20 mA loop-powered pressure transmitter with indication. All operating power is supplied by the 4-20 mA current loop. The 2-wire connection allows the **F4L** to be used as a pressure transmitter in any 4-20 mA current loop application where local indication is desirable.

Installation and Precautions

Install or remove gauge using wrench on hex fitting only. Do not 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 **F4L** is made with the 2-wire cable at the gauge rear. Connect the loop positive (+) supply to the RED lead and the loop negative (-) supply to the BLACK lead. Reversing the connections will not harm the gauge but the **F4L** will not operate with incorrect polarity. **NEVER** connect the gauge wires to voltage greater than 32 VDC or damage not covered by warranty will result.

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:

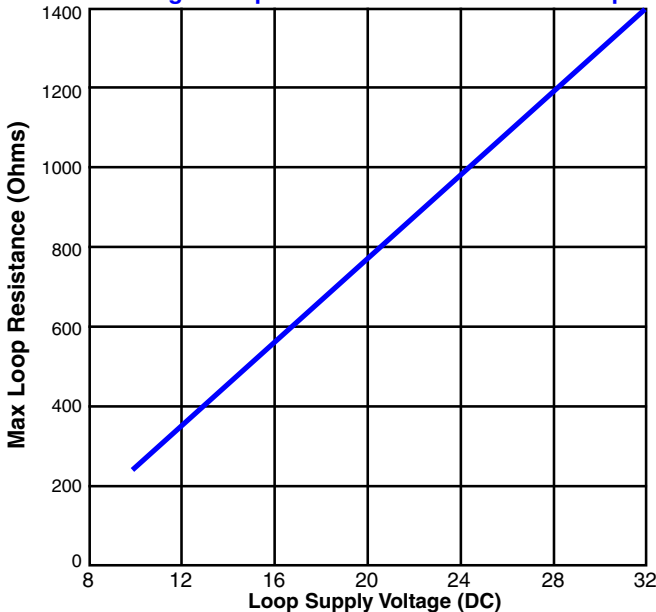
$$V_{\min} = 8V + (20\text{mA} \times \text{Total loop resistance})$$

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 **F4L** is designed for continuous operation. Warm-up time is negligible. The display indication and the loop current will be proportional to the system pressure/vacuum; 4 mA = Zero or low end, 20 mA = Span, full-scale or high end. 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 milliseconds.

Voltage Compliance for 4-20 mA Current Loop



TEST Button

The TEST pushbutton on the front of the gauge, when depressed, switches the display and output loop to a preset level determined by the setting of a 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

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

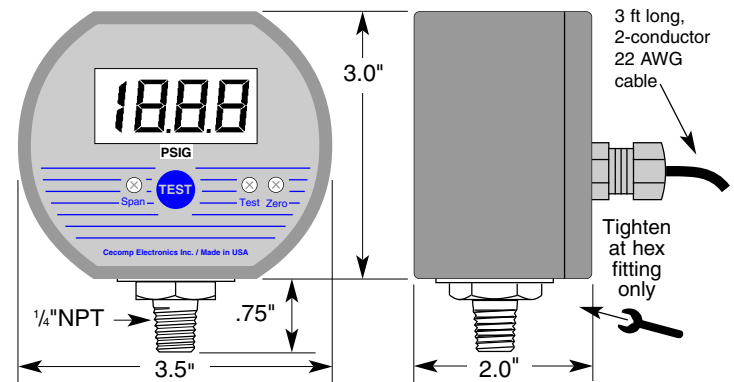
GAUGE reference units may be re-zeroed without affecting the span calibration. The gauge port must be open to the ambient with no pressure or vacuum applied. Adjust the Zero control until the gauge reads zero with the minus (-) sign occasionally flashing.

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 **F4L** 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

Model Range Units Ref-Options

Model → F4L
Range → See table on other side
Units → See table at right
Reference → See table on other side for availability
G=Gauge, A=Absolute, VAC=Vacuum
Options → See price list for available options

Unit Abbreviations

- psi = PSI
- inHg = INHG
- oz/in² = ZIN
- inH₂O = INH2O
- ftH₂O = FTH2O
- mmHg = MMHG
- torr = TORR
- mmH₂O = MMH2O
- kg/cm² = KGCM
- g/cm² = GCM
- kPa = KPA
- MPa = MPA
- mbar = MBAR
- bar = BAR
- cmH₂O = CMH2O
- atm = ATM

Example: F4L30INHGVAC = Falcon NEMA 4X, Loop powered, inches Hg vacuum

Electrical Specifications

Ranges and Resolution

Bold: Standard ranges, price adder for all others
abs: Absolute reference (atmospheric pressure to zero at full vacuum)
vac: Vacuum gauge, minus sign not used unless specified
DRBL (display backlighting) not available in 3000 and 5000 psi ranges
 Resolution is fixed as indicated in table below

Contact factory for other engineering units	120.0 inHg	1600 mmHg	35.0 bar	1.000 kg/cm ² abs
	199.9 inHg abs	760 torr abs	70.0 bar	1.000 kg/cm ² vac
	199.9 inHg	1600 torr abs	140.0 bar	±1.000 kg/cm ²
3.00 psig	50.0 oz/in ²	2100 mmH ₂ O	199.9 bar	1.000 kg/cm ²
5.00 psig	80.0 oz/in ²	3500 mmH ₂ O	350 bar	1.999 kg/cm ² abs
15.00 psi abs	240 oz/in ² abs	199.9 cmH ₂ O	19.99 kPa	1.999 kg/cm ²
15.00 psig vac	240 oz/in ² vac	350 cmH ₂ O	35.0 kPa	4.00 kg/cm ²
±15.00 psig	±240 oz/in ²	1000 cmH ₂ O	100.0 kPa abs	7.00 kg/cm ² abs
15.00 psig	240 oz/in ²	2100 cmH ₂ O	100.0 kPa vac	7.00 kg/cm ²
30.0 psi abs	85.0 inH ₂ O	199.9 mbar	±100.0 kPa	14.00 kg/cm ²
30.0 psig	140.0 inH ₂ O	350 mbar	100.0 kPa	19.99 kg/cm ²
60.0 psig	400 inH ₂ O abs	1000 mbar abs	199.9 kPa abs	35.0 kg/cm ²
100.0 psi abs	400 inH ₂ O vac	1000 mbar vac	199.9 kPa	70.0 kg/cm ²
100.0 psig	±400 inH ₂ O	±1000 mbar	400 kPa	140.0 kg/cm ²
199.9 psig	400 inH ₂ O	1000 mbar	700 kPa abs	199.9 kg/cm ²
300 psig	850 inH ₂ O	1999 mbar abs	700 kPa	350 kg/cm ²
500 psig	7.00 ftH ₂ O	1999 mbar	1500 kPa	1.000 atm abs
1000 psig	12.00 ftH ₂ O	4000 mbar	1999 kPa	±1.000 atm
1999 psig	35.0 ftH ₂ O	1.000 bar abs	3500 kPa	1.000 atm
3000 psig	70.0 ftH ₂ O	1.000 bar vac	5000 kPa	4.00 atm
5000 psig	140.0 ftH ₂ O	±1.000 bar	3.50 MPa	7.00 atm
6.00 inHg	230 ftH ₂ O	1.000 bar	7.00 MPa	14.00 atm
10.00 inHg	480 ftH ₂ O	1.999 bar abs	14.00 MPa	19.99 atm
30.0 inHg abs	150.0 mmHg	1.999 bar	19.99 MPa	35.0 atm
30.0 inHg vac	260 mmHg	4.00 bar	35.0 MPa	70.0 atm
±30.0 inHg	760 mmHg abs	7.00 bar abs	1000 g/cm ² abs	135.0 atm
30.0 inHg	760 mmHg vac	7.00 bar	1000 g/cm ²	199.9 atm
60.0 inHg abs	760 mmHg	14.00 bar	2100 g/cm ² abs	340 atm
60.0 inHg	1600 mmHg abs	19.99 bar	2100 g/cm ²	

Accuracy (linearity, hysteresis, repeatability)

Standard: ±0.25% of full scale ±1 least significant digit
Optional:
-HA ±0.1% FS ±1LSD (most ranges)
-4A ±0.4% FS ±1LSD
CD Factory calibration data
NC NIST traceable test report and calibration data

Display (update rate, type, size)

3 readings per second nominal display update rate
DR in ranges up to 1999: 3½ digit LCD, ½" digit height
DR in 3000 and 5000 psi ranges: 4 digit LCD, 0.4" digit height
DRBL ranges up to 1999: 3½ digit LCD, ½" digit height, red LED backlight

Controls

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

Retransmission Output

True analog output, 50 milliseconds typical response time.
-I option: Current output, 4-20 mA DC, Output drive (compliance) determined by power source. See graph.
-V option: Voltage output, 0-2 VDC into 5k Ohm or greater

Test Function

Holding front panel TEST button sets display and retransmission output to "test calibration" level, independent of pressure input to allow testing of system operation. Test level is set by multiturn potentiometer to any value from 0 to 100% of full scale.

Power

Any AC source of 8 to 24 VAC 50/60 Hz or any DC source of 9 to 32 VDC
DR: 30 mA maximum
DRBL: approximately 40 mA maximum
 3 ft long, 2-conductor 22 AWG cable
 All models are designed for continuous operation
 Order optional **WMPK** 12 VDC wall mount power supply kit to operate on 115 VAC

Environmental Specifications

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)

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- ±0.25% Test Gauge Accuracy
- 316 Stainless Steel Wetted Parts
- 4-20 mA or 0-2 V Analog Output
- 4-20 mA Models Power Current Loop
- DRBL Includes Backlit Display
- Output Test Function

DPG1000DR200PSIG
199.9 psig range



DPG1000DR5000PSIG
5000 psig range

Mechanical Specifications

Size

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 (approximate)

Gauge: 9 ounces
 Shipping weight: 1 pound

Material and Color

Extruded aluminum case, epoxy powder coated
 Polycarbonate cover. Front and rear gaskets
 Light gray body, light gray/blue front

Pressure/Vacuum Connection and Material

¼" NPT male, 316 stainless steel

Media Compatibility

All wetted 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

Burst Pressure

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

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DPG1000DR DPG1000DRBL

Falcon Low Voltage-Powered 4-Wire Indicating Pressure Transmitters

Installation and Precautions

Install or remove the 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

NEVER connect the gauge wires directly to 115 VAC or permanent damage not covered by warranty will result.

The **DPG1000DR** and **DPG1000DRBL** 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 magnitude of 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. Models with 4-20 mA output power the current loop. Use a power source with sufficient voltage to operate the current loop.

Connection is made with the 4-conductor cable at the gauge rear. This cable accommodates both the gauge power supply and retransmission output. This cable has one RED and one BLACK lead. If using a 9 to 32 VDC power source, connect the (+) supply to the RED lead and the (-) supply to the BLACK lead. If using a 8 to 24 VAC 50/60 Hz power source, connect to the RED and BLACK leads. When using low voltage AC power, there is of course, no polarity consideration.

The (+) retransmission output appears on the WHITE lead, and the (-) retransmission output appears on the GREEN lead. Use of the shield (drain) wire of the retransmission output 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 output is a continuous analog signal based on the transducer output rather than the display. This output is filtered to improve noise immunity and has a response time of about 50 milliseconds.

The power supply (-) lead is tied to the retransmission output ground. Therefore, if a DC supply is used, the power supply (-) lead should be considered common with regard to the retransmission output (-) connection.

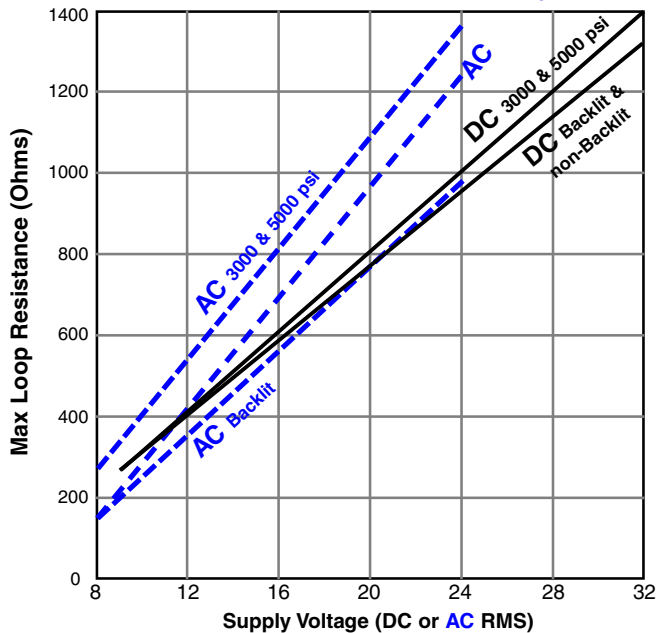
Using the Retransmission Output

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 at right for maximum loop resistance vs. gauge 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. Also, avoid large capacitive loads (greater than 1000 pF) such as those caused by long runs of shielded cable. For long retransmission runs, use the 4-20 mA output model instead.

Voltage Compliance for
4-20 mA Current Retransmission Output



Operation

The gauge is powered on whenever a supply voltage is applied. Warm-up time is negligible. In normal operation, the system pressure is displayed on the LCD and an output signal will be present. DPG1000DRBL model display backlighting will be on whenever power is on. The display backlighting will not be apparent under bright lighting conditions.

TEST Button

When the front-panel TEST button is held depressed, the display and retransmission 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 and any external device(s) connected to it 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 retransmitted output to the desired test level.

Calibration

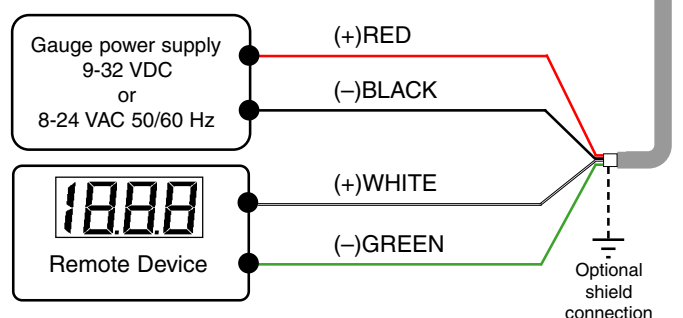
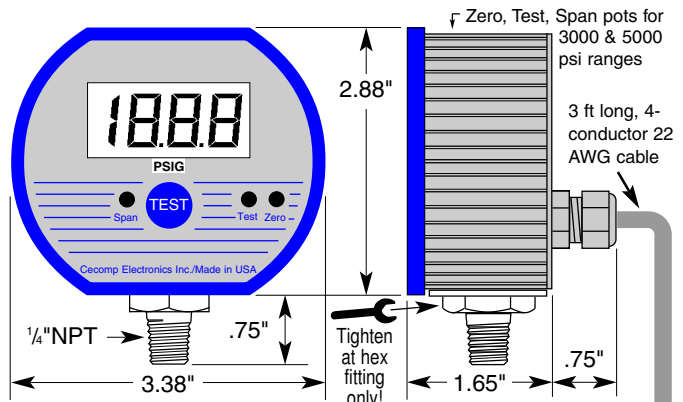
See gauge label for location of controls to adjust the zero and span of the display.

GAUGE reference units may be re-zeroed without affecting the span calibration. The gauge port must be open to the ambient with no pressure/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.

Internal potentiometers adjust the agreement between the displayed value and the analog output. These are set at the factory and should not normally be adjusted. If adjustment is required, consult factory. Accurate pressure generation and measurement and current measurement equipment are required to successfully complete this calibration.



Part Numbers

DPG1000DR or DPG1000DRBL range units ref - output

Pressure/Vacuum Range (see table) → Units (see table) → I = Current 4-20 mA
G=Gauge, A=Absolute, VAC=Vacuum → V = Voltage 0-2 V

Example: DPG1000DR100PSIG-I = DPG1000DR, 100.0 psig, Current (4-20 mA) output

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

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

Electrical Specifications

Ranges and Resolution

Bold: standard ranges, price adder for all others
abs: 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 other engineering units	199.9 inHg abs	1600 mmHg	70.0 bar	±1.000 kg/cm ²
	199.9 inHg	760 torr abs	140.0 bar	1.000 kg/cm ²
	50.0 oz/in ²	1600 torr abs	199.9 bar	1.999 kg/cm ² abs
3.00 psig	80.0 oz/in ²	1999 mmH ₂ O	350 bar	1.999 kg/cm ²
5.00 psig	240 oz/in ² abs	199.9 cmH ₂ O	19.99 kPa	4.00 kg/cm ²
15.00 psi abs	240 oz/in ² vac	350 cmH ₂ O	35.0 kPa	7.00 kg/cm ² abs
15.00 psig vac	±240 oz/in ²	1000 cmH ₂ O	100.0 kPa abs	7.00 kg/cm ²
±15.00 psig	240 oz/in ²	1999 cmH ₂ O	100.0 kPa vac	14.00 kg/cm ²
15.00 psig	85.0 inH ₂ O	199.9 mbar	±100.0 kPa	19.99 kg/cm ²
30.0 psi abs	140.0 inH ₂ O	350 mbar	100.0 kPa	35.0 kg/cm ²
30.0 psig	400 inH ₂ O abs	1000 mbar abs	199.9 kPa abs	70.0 kg/cm ²
60.0 psig	400 inH ₂ O vac	1000 mbar vac	199.9 kPa	140.0 kg/cm ²
100.0 psi abs	±400 inH ₂ O	±1000 mbar	400 kPa	199.9 kg/cm ²
100.0 psig	400 inH ₂ O	1000 mbar	700 kPa abs	350 kg/cm ²
199.9 psig	850 inH ₂ O	1999 mbar abs	700 kPa	1.000 atm abs
300 psig	7.00 ftH ₂ O	1999 mbar	1500 kPa	±1.000 atm
500 psig	12.00 ftH ₂ O	1.000 bar abs	1999 kPa	1.000 atm
1000 psig	35.0 ftH ₂ O	1.000 bar vac	3.50 MPa	4.00 atm
1999 psig	70.0 ftH ₂ O	±1.000 bar	7.00 MPa	7.00 atm
6.00 inHg	140.0 ftH ₂ O	1.000 bar	14.00 MPa	14.00 atm
10.00 inHg	230 ftH ₂ O	1.999 bar abs	19.99 MPa	19.99 atm
30.0 inHg abs	480 ftH ₂ O	1.999 bar	35.0 MPa	35.0 atm
30.0 inHg vac	150.0 mmHg	4.00 bar	1000 g/cm ² abs	70.0 atm
±30.0 inHg	260 mmHg	7.00 bar abs	1000 g/cm ²	135.0 atm
30.0 inHg	760 mmHg abs	7.00 bar	1999 g/cm ² abs	199.9 atm
60.0 inHg abs	760 mmHg vac	14.00 bar	1999 g/cm ²	340 atm
60.0 inHg	760 mmHg	19.99 bar	1.000 kg/cm ² abs	
120.0 inHg	1600 mmHg abs	35.0 bar	1.000 kg/cm ² vac	

Accuracy (linearity, hysteresis, repeatability)

Standard: ±0.25% of full scale ±1 least significant digit
 Optional: **-HA** ±0.1% FS ±1LSD (most ranges)
-4A ±0.4% FS ±1LSD
CD Factory calibration data
NC NIST traceable test report and calibration data

Display (update rate, type, size)

3 readings per second nominal display update rate
DR in ranges up to 1999: 3½ digit LCD, ½" digit height
DRBL ranges up to 1999: 3½ digit LCD, ½" digit height, red LED backlight

Controls

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

Retransmission Output

True analog output, 50 milliseconds typical response time.
-I model: Current output, 4-20 mA DC, output drive (compliance) determined by power source. See graph.
-V model: Voltage output, 0-2 VDC into 5 kΩ or greater

Test Function

Front panel TEST button, when depressed sets display and retransmission output to "test calibration" level, independent of pressure input to allow testing of system operation.
 Test level is set by top-accessible multiturn potentiometer to any value from 0 to 100% of full scale.

Power

Any AC source of 8 to 24 VAC 50/60 Hz or any DC source of 9 to 32 VDC
 30 mA maximum, 40 mA for DRBL model with backlighting
 3 ft long, 4-conductor 22 AWG shielded cable
 Order optional **WMPSK** 12 VDC wall mount power supply kit to operate on 115 VAC

Environmental Specifications

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
- Low-Voltage AC/DC-Powered
- 4-20 mA or 0-2 V Analog Output
- Output Test Function
- DRBL Includes Backlit Display



F4DR200PSIG
0 to 199.9 psig range

Mechanical Specifications

Size

3.5" W x 3.0" H x 2.0" D housing
 Add approximately 0.75" to height for pressure fitting
 Add approximately 1" to depth for strain relief and wire clearance

Weight (approximate)

Gauge: 9 ounces
 Shipping weight: 1 pound

Housing

NEMA 4X
 UV stabilized polycarbonate/ABS case, light gray color
 Clear polycarbonate window to protect display
 Gasketed rear cover, six captive stainless steel screws

Pressure/Vacuum Connection & Material

¼" NPT male, 316 stainless steel

Media Compatibility

All wetted 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

Burst Pressure

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

Cecomp Electronics

Digital Pressure Gauges and Instrumentation

Division of Absolute Process Instruments Inc.
 1220 American Way Phone: 800-942-0315
 Libertyville, IL 60048 Fax: 800-949-7502

www.cecomp.com

Installation and Precautions

Install or remove the 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

NEVER connect the gauge wires directly to 115 VAC or permanent damage not covered by warranty will result.

The **F4DR** and **F4DRBL** 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 magnitude of 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. Models with 4-20 mA output power the current loop. Use a power source with sufficient voltage to operate the current loop.

Connection is made with the 4-conductor cable at the gauge rear. This cable accommodates both the gauge power supply and retransmission output. This cable has one RED and one BLACK lead. If using a 9 to 32 VDC power source, connect the (+) supply to the RED lead and the (-) supply to the BLACK lead. If using a 8 to 24 VAC 50/60 Hz power source, connect to the RED and BLACK leads. When using low voltage AC power, there is of course, no polarity consideration.

The (+) retransmission output appears on the WHITE lead, and the (-) retransmission output appears on the GREEN lead. Use of the shield (drain) wire of the retransmission output 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 output is a continuous analog signal based on the transducer output rather than the display. This output is filtered to improve noise immunity and has a response time of about 50 milliseconds.

The power supply (-) lead is tied to the retransmission output ground. Therefore, if a DC supply is used, the power supply (-) lead should be considered common with regard to the retransmission output (-) connection.

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.

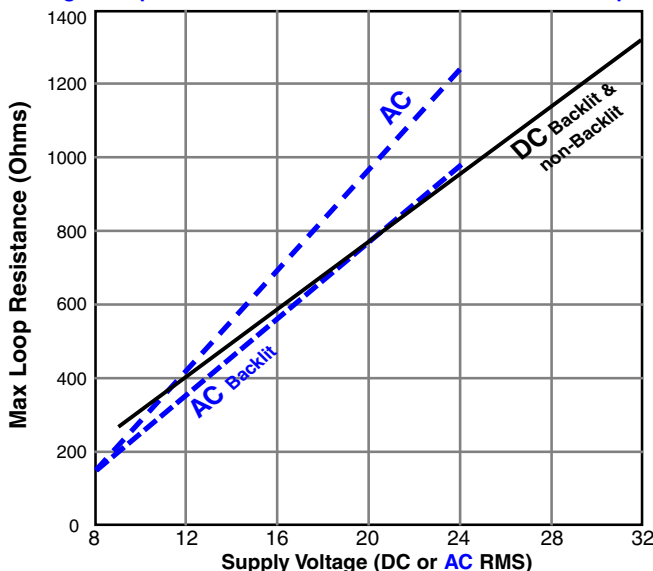
For 4-20 mA output models, be sure to observe the output compliance (voltage drive) capabilities of the gauge. The compliance, and therefore the maximum loop resistance the output can drive, is a function of the supply voltage to the gauge. Consult the graph below for maximum loop resistance vs. gauge 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. Also, avoid large capacitive loads (greater than 1000 pF) such as those caused by long runs of shielded cable. For long retransmission runs, use the 4-20 mA output model instead.

Operation

The gauge is powered on whenever a supply voltage is applied. Warm-up time is negligible. In normal operation, the system pressure is displayed on the gauge LCD and an output signal will be present. **F4DRBL** model display backlighting will be on whenever power is applied. The display backlighting will not be apparent under bright lighting conditions.

Voltage Compliance for 4-20 mA Current Retransmission Output



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

TEST Button

When the front-panel TEST button is held depressed, the display and retransmission 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 and any external device(s) connected to it 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 retransmission output to the desired test level.

Calibration

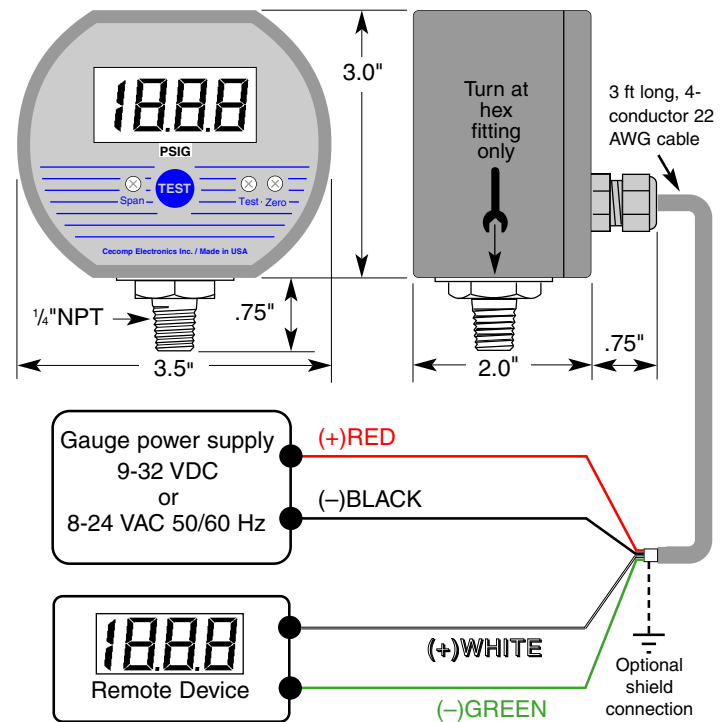
See gauge label for location of controls to adjust the zero and span of the display.

GUAGE reference units may be re-zeroed without affecting the span calibration. The gauge port must be open to the ambient with no pressure/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.

Internal potentiometers adjust the agreement between the displayed value and the analog output. These are set at the factory and should not normally be adjusted. If adjustment is required, consult factory. Accurate pressure generation and measurement and current measurement equipment are required to successfully complete this calibration.



Part Numbers

F4DR or F4DRBL range units ref - output

Pressure/Vacuum Range (see table) →

Units (see table) →

I = Current 4-20 mA

V = Voltage 0-2 V

G=Gauge, A=Absolute, VAC=Vacuum

Example: F4DR100PSIG-I = F4DR, 100.0 psig, Current (4-20 mA) output

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

Electrical Specifications

Ranges and Resolution

Bold: Standard ranges, price adder for all others
abs: 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 other engineering units	120.0 inHg	1600 mmHg	35.0 bar	1.000 kg/cm ² abs
	199.9 inHg abs	760 torr abs	70.0 bar	1.000 kg/cm ² vac
	199.9 inHg	1600 torr abs	140.0 bar	±1.000 kg/cm ²
3.00 psig	50.0 oz/in ²	2100 mmH ₂ O	199.9 bar	1.000 kg/cm ²
5.00 psig	80.0 oz/in ²	3500 mmH ₂ O	350 bar	1.999 kg/cm ² abs
15.00 psi abs	240 oz/in ² abs	199.9 cmH ₂ O	19.99 kPa	1.999 kg/cm ²
15.00 psig vac	240 oz/in ² vac	350 cmH ₂ O	35.0 kPa	4.00 kg/cm ²
±15.00 psig	±240 oz/in ²	1000 cmH ₂ O	100.0 kPa abs	7.00 kg/cm ² abs
15.00 psig	240 oz/in ²	2100 cmH ₂ O	100.0 kPa vac	7.00 kg/cm ²
30.0 psi abs	85.0 inH ₂ O	199.9 mbar	±100.0 kPa	14.00 kg/cm ²
30.0 psig	140.0 inH ₂ O	350 mbar	100.0 kPa	19.99 kg/cm ²
60.0 psig	400 inH ₂ O abs	1000 mbar abs	199.9 kPa abs	35.0 kg/cm ²
100.0 psi abs	400 inH ₂ O vac	1000 mbar vac	199.9 kPa	70.0 kg/cm ²
100.0 psig	±400 inH ₂ O	±1000 mbar	400 kPa	140.0 kg/cm ²
199.9 psig	400 inH ₂ O	1000 mbar	700 kPa abs	199.9 kg/cm ²
300 psig	850 inH ₂ O	1999 mbar abs	700 kPa	350 kg/cm ²
500 psig	7.00 ftH ₂ O	1999 mbar	1500 kPa	1.000 atm abs
1000 psig	12.00 ftH ₂ O	4000 mbar	1999 kPa	±1.000 atm
1999 psig	35.0 ftH ₂ O	1.000 bar abs	3500 kPa	1.000 atm
3000 psig	70.0 ftH ₂ O	1.000 bar vac	5000 kPa	4.00 atm
5000 psig	140.0 ftH ₂ O	±1.000 bar	3.50 MPa	7.00 atm
6.00 inHg	230 ftH ₂ O	1.000 bar	7.00 MPa	14.00 atm
10.00 inHg	480 ftH ₂ O	1.999 bar abs	14.00 MPa	19.99 atm
30.0 inHg abs	150.0 mmHg	1.999 bar	19.99 MPa	35.0 atm
30.0 inHg vac	260 mmHg	4.00 bar	35.0 MPa	70.0 atm
±30.0 inHg	760 mmHg abs	7.00 bar abs	1000 g/cm ² abs	135.0 atm
30.0 inHg	760 mmHg vac	7.00 bar	1000 g/cm ²	199.9 atm
60.0 inHg abs	760 mmHg	14.00 bar	2100 g/cm ² abs	340 atm
60.0 inHg	1600 mmHg abs	19.99 bar	2100 g/cm ²	

Accuracy (linearity, hysteresis, repeatability)

Standard: ±0.25% of full scale ±1 least significant digit
 Optional: **-HA** ±0.1% FS ±1LSD (most ranges)
-4A ±0.4% FS ±1LSD
CD Factory calibration data
NC NIST traceable test report and calibration data

Display (update rate, type, size)

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
 Setpoint 1 and Setpoint 2: 0-100% range

Alarm Deadband (hysteresis)

1% of full scale

Alarm Outputs

Dual form C (SPDT) relay contacts; 1A/24VDC, 0.5A/115VAC, non-inductive
 Setpoint 1 and Setpoint 2 settings via top-accessible multiturn potentiometers
 HI (SP1), LO (SP2) alarms normal action (failsafe) configuration standard
 3 ft long, 6-conductor 22 AWG cable
 Optional HI/HI, LO/LO, normal or reverse acting

Alarm Indicators

Bi-color (red/green) LEDs on front panel

Alarm Response Time

100 milliseconds typical

Test Function

Front panel TEST button, when depressed toggles SP1 and SP2 alarms to opposite states

Power

Any AC source of 8 to 24 VAC 50/60 Hz or any DC source of 9 to 32 VDC
 1.0 watt maximum, 3 ft long, 22 AWG cables
 Order optional **WMPSK** 12 VDC wall mount power supply kit to operate on 115 VAC

- ±0.25% Test Gauge Accuracy
- 316 Stainless Steel Wetted Parts
- Dual SPDT Alarms
- Bi-Color (Red/Green) Alarm LEDs
- Alarm Test Function



DPG1000ADA
100.0 psig range

Mechanical Specifications

Size

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 (approximate)

Gauge: 9 ounces
 Shipping weight: 1 pound

Material

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

Color

Light gray body, light gray/blue front

Pressure/Vacuum Connection and Material

¼" NPT male, 316 stainless steel

Media Compatibility

All wetted 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

Burst Pressure

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

Environmental Specifications

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)

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 Digital Pressure Gauges and Instrumentation

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DPG1000ADA

Falcon Digital Pressure Gauges with Dual Alarms

Description

The **DPG1000ADA** circuitry includes dual mechanical relay alarm outputs with fully adjustable setpoints in a standard HI/LO alarm configuration. The **DPG1000ADA** alarms are easy to set up and use. Bi-color LEDs on the front panel (green = normal, red = alarm) provide a visual indication of alarm status. Setpoint 1 and Setpoint 2 buttons allow viewing the setpoints on the gauge display without disrupting normal operation. To test system installation and operation, a front-panel TEST button, when pressed, toggles the alarm output status independent of system pressure.

Installation and Precautions

Install or remove gauge using wrench on hex fitting only. Do not turn using 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

NEVER connect the gauge power wires directly to 115 VAC or permanent damage not covered by warranty will result.

The **DPG1000ADA** can be powered by:

AC source: 8 to 24 VAC 50/60 Hz

DC source: 9 to 32 VDC

Connection to the **DPG1000ADA** is made with the two cables at the gauge rear. The smaller two-conductor cable with one RED and one BLACK lead is for the gauge power supply. However, since the **DPG1000ADA** will operate on either AC or DC power, there is no need to observe polarity; simply connect an AC supply of 8 to 24 VAC, 50/60 Hz, or a DC supply of 9 to 32 VDC to the two wires to activate the gauge. Never allow the gauge supply voltage fall below 8 VAC RMS if AC power is used, or 9 VDC if DC power is used. Operation with less than these values may cause erratic or erroneous readings or alarm operation.

The larger 6-conductor cable is for the alarm relay contact outputs. This cable's color code is as follows:

SETPOINT 1		SETPOINT 2	
Normally Closed (NC)	BLACK	Normally Closed (NC)	GREEN
Common (C)	RED	Common (C)	BROWN
Normally Open (NO)	WHITE	Normally Open (NO)	BLUE

Operation

The gauge is powered on whenever a supply voltage is applied. In normal operation, the system pressure is displayed on the gauge LCD. In addition, the **DPG1000ADA** circuitry compares the system pressure to two independent setpoint levels; Setpoint 1 and Setpoint 2. These setpoints are adjustable via top-accessible controls and may be viewed by pressing either the SP1 or SP2 buttons. Pressing SP1 or SP2 will switch the display to show, and allow adjusting of, the corresponding setpoint only, normal operation of the alarm outputs is not otherwise affected.

Alarm status is easily seen on the two alarm indicator LEDs in the corner of the SP1 and SP2 buttons. A GREEN indication is a "clear" or non-alarm condition. RED is an abnormal or alarm condition. If a particular setpoint is configured as a HI alarm, the **DPG1000ADA** will provide a RED alarm indication when the system pressure exceeds the setpoint.

If a particular setpoint is configured as a LO alarm, the **DPG1000ADA** will provide a RED alarm indication when the system pressure falls below the setpoint. Alarm configurations are set at the factory at time of manufacture and may be ordered as HI/LO, HI/HI, or LO/LO configurations.

For system setup, testing, and troubleshooting, the TEST button is provided. This button, when pressed, toggles the current state of the alarm outputs. Therefore, the alarm outputs may be "exercised" on demand without the need to vary the system pressure to test devices, annunciators, etc. connected to these outputs.

Using the Alarm Outputs

Normal (Fail-safe) vs. Reverse Action - With **Normal** or **Fail-safe** configuration (alarm options 1N, 2N, or 3N), the alarm output relays will be CLOSED (relay energized) for a clear or non-alarm condition and OPEN (relay not energized) for an alarm condition. This is primarily for users who desire an alarm condition should the gauge lose power. In the wiring diagrams, the normally closed and normally open designations refer to standard relay terminology; i.e., the relay contact status with the relay coil not energized.

Therefore, with the **Normal (Fail-safe)** configuration, in a green or non-alarm condition the relay will be energized so that continuity can be expected between the common and normally open leads. In a red or alarm condition, the relay will be open (not energized), so that continuity can be expected between the common and normally closed leads.

Users who do not want an alarm indication when the gauge power is off should specify **Reverse** action (alarm options 1R, 2R, or 3R). In this case, the relay will be open (not energized) in the non-alarm condition and closed for the alarm condition. In this case, continuity can be expected from common to normally closed in the green (non-alarm) condition and from common to normally open in the red (alarm) condition.

Understanding Deadband - The alarm circuit setpoints have built-in deadbands, also known as hysteresis, of 1% of span as standard. This means, for example, the deadband is approximately 1 psi in a 0 to 100 psi gauge.

This deadband serves to eliminate output oscillation or "chatter" in the process due to minor fluctuations in pressure. If, for example, the system pressure in a 0-100 psi system is 40.0 psi, and Setpoint 1 is set to 50.0 psi (HI alarm), the alarm indication will trip if the pressure exceeds 50.0 psi. After the HI alarm has tripped, pressing the SP1 button will show that the alarm indication will "release" at 1 psi lower (approximately 49 psi).

Contact Rating and Protection - The contacts of the alarm relays are rated at 1A/24VDC or 0.5A/115VAC. Using mechanical relay contacts above their rating, or with large inductive loads, will shorten their useful life. In circuits other than low-level switching or pilot duty, the user should consider whether external contact protection such as snubber networks or arc suppression networks are required to protect the contacts.

No internal fusing is included in the alarm contact circuits. The circuit external to the gauge alarm outputs should be fused by the user in applications where good design practice dictates.

Alarm Setpoints

Lift calibration label on the top of the unit to access individual controls to adjust Setpoint 1 and Setpoint 2. See gauge label for locations.

To adjust alarm Setpoint 1, press and hold the SP1 button. When holding the SP1 button, the display will show the current setting for Setpoint 1. Turn the top-accessible Setpoint 1 control. Repeat the procedure by pressing the SP2 button to adjust Setpoint 2.

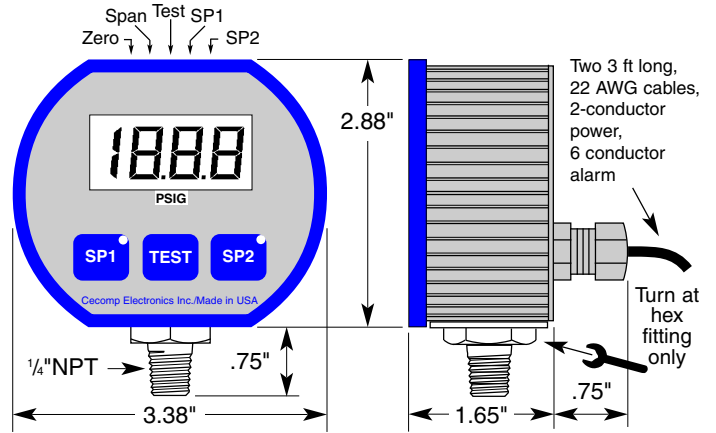
Calibration

Lift calibration label on the top of the unit to access 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.

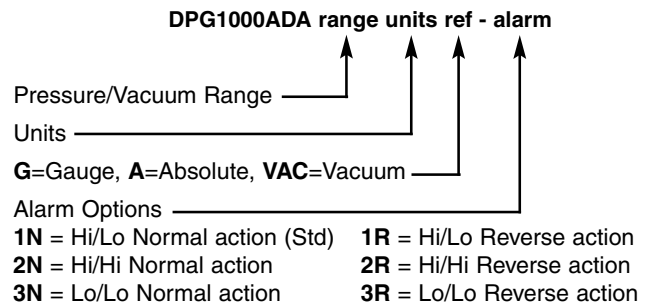
Span calibration should only be attempted if the user has access to a pressure reference of known accuracy. The quality of the calibration is only as good as the accuracy of the calibration equipment and ideally should be at least four times the gauge accuracy. Zero calibration must be done before span 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.



Cecomp Electronics maintains a constant effort to upgrade and improve its products, therefore specifications are subject to change.

MODEL DESIGNATION SYSTEM



Example: **DPG1000ADA500PSIG-1N** = DPG1000ADA 500 psig, HI/LO normal action alarms

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

Electrical Specifications

Ranges and Resolution

Bold: Standard ranges, price adder for all others
abs: 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 other engineering units	120.0 inHg	1600 mmHg	35.0 bar	1.000 kg/cm ² abs
	199.9 inHg abs	760 torr abs	70.0 bar	1.000 kg/cm ² vac
	199.9 inHg	1600 torr abs	140.0 bar	±1.000 kg/cm ²
3.00 psig	50.0 oz/in ²	2100 mmH ₂ O	199.9 bar	1.000 kg/cm ²
5.00 psig	80.0 oz/in ²	3500 mmH ₂ O	350 bar	1.999 kg/cm ² abs
15.00 psi abs	240 oz/in ² abs	199.9 cmH ₂ O	19.99 kPa	1.999 kg/cm ²
15.00 psig vac	240 oz/in ² vac	350 cmH ₂ O	35.0 kPa	4.00 kg/cm ²
±15.00 psig	±240 oz/in ²	1000 cmH ₂ O	100.0 kPa abs	7.00 kg/cm ² abs
15.00 psig	240 oz/in ²	2100 cmH ₂ O	100.0 kPa vac	7.00 kg/cm ²
30.0 psi abs	85.0 inH ₂ O	199.9 mbar	±100.0 kPa	14.00 kg/cm ²
30.0 psig	140.0 inH ₂ O	350 mbar	100.0 kPa	19.99 kg/cm ²
60.0 psig	400 inH ₂ O abs	1000 mbar abs	199.9 kPa abs	35.0 kg/cm ²
100.0 psi abs	400 inH ₂ O vac	1000 mbar vac	199.9 kPa	70.0 kg/cm ²
100.0 psig	±400 inH ₂ O	±1000 mbar	400 kPa	140.0 kg/cm ²
199.9 psig	400 inH ₂ O	1000 mbar	700 kPa abs	199.9 kg/cm ²
300 psig	850 inH ₂ O	1999 mbar abs	700 kPa	350 kg/cm ²
500 psig	7.00 ftH ₂ O	1999 mbar	1500 kPa	1.000 atm abs
1000 psig	12.00 ftH ₂ O	4000 mbar	1999 kPa	±1.000 atm
1999 psig	35.0 ftH ₂ O	1.000 bar abs	3500 kPa	1.000 atm
3000 psig	70.0 ftH ₂ O	1.000 bar vac	5000 kPa	4.00 atm
5000 psig	140.0 ftH ₂ O	±1.000 bar	3.50 MPa	7.00 atm
6.00 inHg	230 ftH ₂ O	1.000 bar	7.00 MPa	14.00 atm
10.00 inHg	480 ftH ₂ O	1.999 bar abs	14.00 MPa	19.99 atm
30.0 inHg abs	150.0 mmHg	1.999 bar	19.99 MPa	35.0 atm
30.0 inHg vac	260 mmHg	4.00 bar	35.0 MPa	70.0 atm
±30.0 inHg	760 mmHg abs	7.00 bar abs	1000 g/cm ² abs	135.0 atm
30.0 inHg	760 mmHg vac	7.00 bar	1000 g/cm ²	199.9 atm
60.0 inHg abs	760 mmHg	14.00 bar	2100 g/cm ² abs	340 atm
60.0 inHg	1600 mmHg abs	19.99 bar	2100 g/cm ²	

Accuracy (linearity, hysteresis, repeatability)

Standard: ±0.25% of full scale ±1 least significant digit
 Optional:
-HA ±0.1% FS ±1LSD (most ranges)
-4A ±0.4% FS ±1LSD
CD Factory calibration data
NC NIST traceable test report and calibration data

Display (update rate, type, size)

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
 Setpoint 1 and Setpoint 2: 0-100% range
 Retransmission zero/span: Internal potentiometers

Alarm Deadband (hysteresis)

1% of full scale

Alarm Outputs

Dual form C (SPDT) relay contacts; 1A/24VDC, 0.5A/115VAC, non-inductive
 Setpoint 1 and Setpoint 2 settings via top-accessible multiturn potentiometers
 HI (SP1), LO (SP2) alarms normal action (failsafe) configuration standard
 3 ft long, 6-conductor 22 AWG cable
 Optional HI/LO, normal or reverse acting

Alarm Indicators

Bi-color (red/green) LEDs on front panel

Alarm Response Time

100 milliseconds typical

Retransmission Output

True analog output, 50 milliseconds typical response time. 3 ft L, 22 AWG cable
-I option: Current output, 4-20mA DC. Output drive (compliance) determined by power source. See graph.
-V option: Voltage output, 0 to 2 VDC into 5K ohm or greater

Test Function

Front panel TEST button, when depressed toggles SP1 and SP2 alarms to opposite states, and sets display and retransmission output to user-set test level.

Power

Any AC source of 8 to 24 VAC 50/60 Hz or any DC source of 9 to 32 VDC
 1.0 watt maximum, 3 ft long, 22 AWG cables
 Order optional **WMPK** 12 VDC wall mount power supply kit to operate on 115 VAC

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- ±0.25% Test Gauge Accuracy
- 316 Stainless Steel Wetted Parts
- Dual SPDT Alarms
- 0-2 V or Powered 4-20 mA Analog Output
- Bi-Color (Red/Green) Alarm LEDs
- Output Test Function



DPG100DAR100PSIG-1N-I
100.0 psig range

Mechanical Specifications

Size

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 (approximate)

Gauge: 9 ounces
 Shipping weight: 1 pound

Material

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

Color

Light gray body, light gray/blue front

Pressure/Vacuum Connection and Material

¼" NPT male, 316 stainless steel

Media Compatibility

All wetted 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

Burst Pressure

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

Environmental Specifications

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)

 **Cecomp Electronics**
 Digital Pressure Gauges and Instrumentation

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DPG1000DAR

Falcon Digital Pressure Gauges with Dual Alarms and Analog Output

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 Connections

NEVER connect the gauge power wires directly to 115 VAC or permanent damage not covered by warranty will result.

The two-conductor cable at the gauge rear with the RED and BLACK leads is for the gauge power supply. Connect to 8 to 24 VAC, 50/60Hz or 9 to 32 VDC. The gauge will operate on either AC or DC power and there is no need to observe polarity. An unregulated power supply can be used. The supply voltage, when within the stated ranges, has negligible effect on the gauge calibration. Operation below 9 VDC or 8 VAC_{RMS} may cause erratic or erroneous readings or output.

The gauge is powered on whenever a supply voltage is applied. Warm-up time is negligible. In normal operation, the system pressure is displayed.

The color code for the 6-conductor alarm relay output cable is as follows.

SETPOINT 1		SETPOINT 2	
Normally Closed (NC)	BLACK	Normally Closed (NC)	GREEN
Common (C)	RED	Common (C)	BROWN
Normally Open (NO)	WHITE	Normally Open (NO)	BLUE

The shield (drain) wire is generally not needed for 4-20 mA current loops unless long cable lengths are used in electrically noisy environments.

Using the Retransmission Output

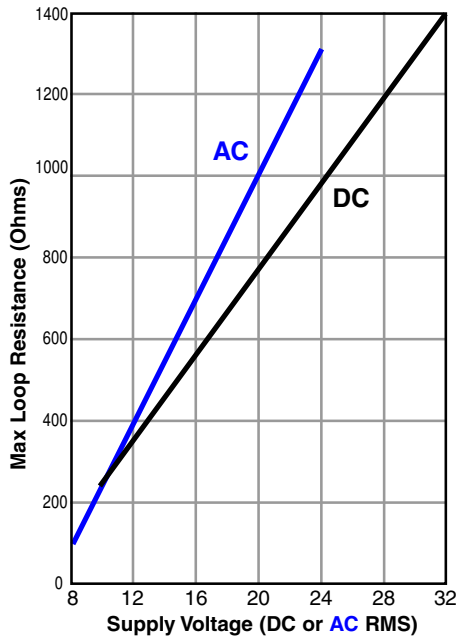
NEVER connect retransmission output wires together or to an external power source or permanent damage not covered by warranty will result.

The output is a continuous analog signal based on the transducer output rather than the display. It is filtered to improve noise immunity and has a response time of about 50 milliseconds. The power supply (-) lead is tied to the retransmission output ground. Therefore, if a DC supply is used, the power supply (-) lead should be considered common with regard to the retransmission output (-) connection.

With the 0-2 volt retransmission output models ("-V" option), do not allow the resistive load on the output to fall below 5K ohms. Also, avoid large capacitive loads (greater than 1000 pF) such as those caused by long runs of shielded cable. For long retransmission runs, use the 4-20 mA output model instead.

For 4-20 mA models ("-I" option) the compliance (voltage drive) capability of the gauge and the maximum loop resistance the output can drive is a function of the supply voltage to the gauge. The graph above shows the maximum loop resistance vs. gauge supply voltage. Too large a loop resistance will cause the gauge output to "limit" or saturate before reaching its full 20 mA output.

Voltage Compliance for 4-20 mA Current Retransmission Output



Alarm Operation

System pressure is compared to two independent setpoint levels; Setpoint 1 and Setpoint 2. Pressing the SP1 or SP2 buttons will switch the display to show, and allow adjusting of, the setpoint.

To adjust alarm Setpoint 1, press and hold the SP1 button. The current Setpoint 1 setting will be displayed. Turn the SP1 control to adjust. Press the SP2 button and turn the SP2 control to adjust Setpoint 2.

Alarm status is indicated on the two LEDs in the corner of the SP1 and SP2 buttons. GREEN is a "clear" or non-alarm condition; RED is an abnormal or alarm condition. For models with a HI alarm, the alarm LED will be RED if the system pressure exceeds the setpoint. For models with a LO alarm, the LED will be RED if the system pressure falls below the setpoint.

Alarm Action - The alarm configuration is set at time of manufacture. The 1N, 2N, or 3N configurations are Normal acting or "failsafe" and provide an alarm condition if the gauge loses power. The alarm relay will be CLOSED (energized) for a non-alarm (green LED) con-

dition with continuity between the "C" and "NO" leads. The relay will be OPEN (not energized) for an alarm (red LED) condition with continuity between the "C" and "NC" leads.

The 1R, 2R, or 3R configurations are Reverse acting and provide no alarm indication when the gauge power is off. The alarm relay will be OPEN (not energized) for a non-alarm (green LED) condition with continuity from "C" to "NC" leads. The alarm relay will be CLOSED (energized) for an alarm (red LED) condition with continuity between the "C" and "NO" leads.

Alarm Hysteresis - The built-in alarm hysteresis of 1% of span eliminates alarm chatter due to minor fluctuations in pressure. For example, this is approximately 1 psi in a 100 psi gauge. If the SP1 (HI alarm) is set to 50.0 psi, the alarm will trip above 50.0 psi. After the alarm has tripped, pressing the SP1 button will show approximately 49 psi, the pressure at which the alarm will release.

Contact Rating and Protection - The alarm relay contacts are rated at 1A/24VDC or 0.5A/115VAC. Using mechanical relay contacts above their rating, or with large inductive loads, will shorten their useful life. In circuits other than low-level switching or pilot duty, use external protection such as a snubber or an arc suppression network to protect the contacts. No internal fusing is included in the alarm contact circuits. The circuit external to the gauge alarm outputs should be fused by the user in applications as good design practice dictates.

TEST Button

The TEST button toggles the alarm output relays to their opposite state and also switches the display and retransmission output to a level determined by the setting of the Test potentiometer. This allows testing of the alarms and retransmission output independent of the system pressure.

To set the Test output level, press and hold the front panel TEST button and adjust the top-mounted Test potentiometer to set the retransmission output to the desired test level as indicated on the display.

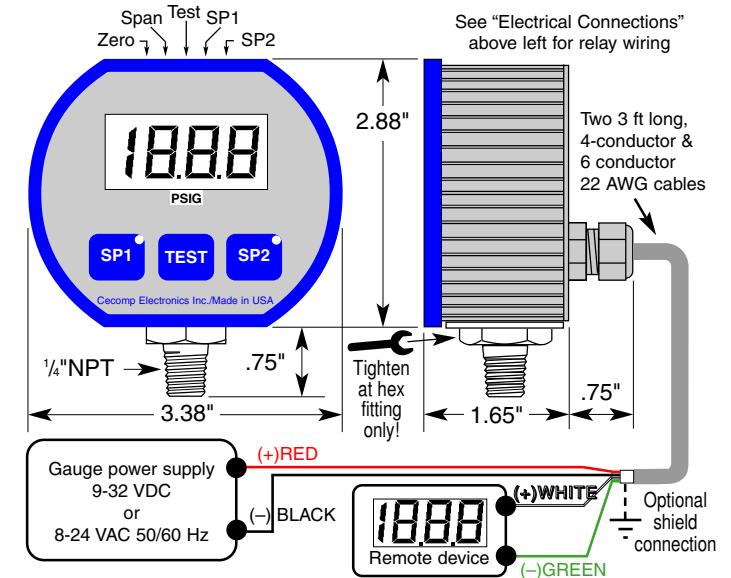
Calibration

Lift calibration label on the top of the unit to access 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 field calibrate. Gauges may be returned to Cecom for factory certified recalibration. NIST traceability is available.



Part Numbers

DPG1000DAR range units ref - alarm - output

Pressure/Vacuum Range Units G=Gauge, A=Absolute, VAC=Vacuum I = 4-20 mA V = 0-2 V

Alarm Options
1N = Hi/Lo Normal action (Std) 1R = Hi/Lo Reverse action
2N = Hi/Hi Normal action 2R = Hi/Hi Reverse action
3N = Lo/Lo Normal action 3R = Lo/Lo Reverse action

Example: DPG1000DAR15PSIG-1N-I = DPG1000DAR, 15.00 psig, HI/LO normal action alarm relays, 4-20 mA output

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



Gauge Range Selection

Ranges of mechanical gauges are traditionally chosen so the working range is in the middle of the scale. Digital gauges provide the best performance when used in the upper half of their range. For example, if your working pressure is from 400 to 500 psig, select a 500 psig digital gauge.

Cecomp's transducers are specified in psi. When non-standard engineering units are ordered, convert the range from psi to the units desired, and round off the number as shown in the table below. Other engineering units not shown below can generally be accommodated within the limitations of the available transducers and the 3½ digit or 4 digit displays.

Sensor Cavity Volume

Sensor cavity volume is approximately 0.01 to 0.02 cubic inches. The volume change over the range of the sensor is negligible.

Using the Alarm Outputs

Normal (Failsafe) vs. Reverse Action - With **Normal** or **Failsafe** configuration (alarm options 1N, 2N, or 3N), the alarm output relays will be **CLOSED** (relay energized) for a clear or non-alarm condition and **OPEN** (relay not energized) for an alarm condition. This is primarily for users who desire an alarm condition should the gauge lose power. In the wiring diagrams, the normally closed and normally open designations refer to standard relay terminology; i.e., the relay contact status with the relay coil not energized.

Therefore, with the **Normal (Failsafe)** configuration, in a green or non-alarm condition the relay will be energized so that continuity can be expected between the common and normally open leads. In a red or alarm condition, the relay will be open (not energized), so that continuity can be expected between the common and normally closed leads.

Users who do not want an alarm indication when the gauge power is off should specify **Reverse** action (alarm options 1R, 2R, or 3R). In this case, the relay will be open (not energized) in the non-alarm condition and closed for the alarm condition. In this case, continuity can be expected from common to normally closed in the green (non-alarm) condition and from common to normally open in the red (alarm) condition.

Understanding Deadband - The alarm circuit setpoints have built-in deadbands, also known as hysteresis, of 1% of span as standard. This means, for example, the deadband is approximately 1 psi in a 0 to 100 psi gauge.

This deadband serves to eliminate output oscillation or "chatter" in the process due to minor fluctuations in pressure. If, for example, the system pressure in a 0-100 psi system is 40.0 psi, and Setpoint 1 is set to 50.0 psi (HI alarm), the alarm indication will trip if the pressure exceeds 50.0 psi. After the HI alarm has tripped, pressing the SP1 button will show that the alarm indication will "release" at 1 psi lower (approximately 49 psi).

Contact Rating and Protection - The contacts of the alarm relays are rated at 1A/24VDC or 0.5A/115VAC. Using mechanical relay contacts above their rating, or with large inductive loads, will shorten their useful life. In circuits other than low-level switching or pilot duty, the user should consider whether external contact protection such as snubber networks or arc suppression networks are required to protect the contacts.

No internal fusing is included in the alarm contact circuits. The circuit external to the gauge alarm outputs should be fused by the user in applications where good design practice dictates.

Gauge Reference Options

Most gauges are **Gauge Reference** and are referenced to ambient pressure. This means that the gauge will read zero with no pressure applied and continue to read zero as atmospheric pressure changes. Gauges 1000 psi and over use sealed reference transducers that are referenced to a fixed value of 14.7 psia (normal atmospheric pressure). At these higher pressures, there is no noticeable difference in operation.

Absolute Reference gauges use high vacuum as a zero reference and thus will read atmospheric pressure with the gauge port open to ambient and zero at high vacuum. The gauge's reading will vary with barometric pressure and altitude. Absolute reference gauges are not available in ranges below 15 psi because the transducer will always be in an over range condition at normal atmospheric pressures. See price list for available absolute ranges.

Using the Retransmission Outputs

The retransmission outputs are driven by the transducer rather than the display and thus are true analog outputs. Outputs are filtered to improve noise immunity and have a response time of about 50 msec. The outputs are easy to use if a few system considerations are observed.

Voltage Retransmission

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

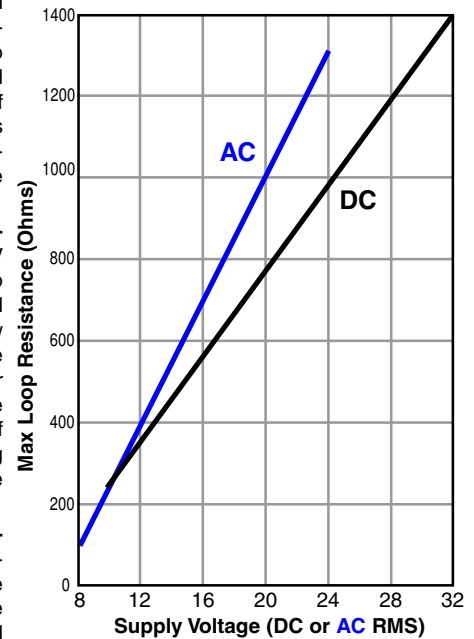
Current Retransmission

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. At right is a typical graph for maximum loop resistance vs. supply voltage. Too large a loop resistance will cause the gauge output to "limit" or saturate before reaching its full 20 mA output.

System Grounding with Retransmission

For gauges with retransmission, the power supply (-) lead is tied to the retransmission output ground. Therefore, if a DC supply is used, the power supply (-) lead should be considered common with the retransmission output (-) connection.

Typical Voltage Compliance for 4-20 mA Current Retransmission Output



Typical gauge ranges when non-standard engineering units are ordered

PSI	Reference	InHg @ 0°C	InH ₂ O @ 20°C	Oz/ in ²	FtH ₂ O @ 20°C	kPa & MPa	mmHg torr*	mbar*	bar	g/ cm ²	kg/ cm ²	atm	cmH ₂ O @ 20°C	mmH ₂ O @ 20°C
3	G	6	85	50	7	20	150	200					200	1999
5	G	10	140	80	12	35	250	350					350	
15	G, A, VAC	30	400	240	35	100	760	1000	1	1000	1	1	1000	
30	G or A	60	850		70	200	1500	1999	2	1999	2	2	1999	
60	G	120			140	400			4		4	4		
100	G, A, VAC	200			250	700			7		7	7		
200	G, VAC				500	1500			15		15	20		
300	G					1999			20		20	20		
500	G					3.5 MPa			35		35	35		
1000	G**					7 MPa			70		70	70		
2000	G**					14 MPa			140		140	135		
3000	G**					20 MPa			200		200	200		
5000	G**					35 MPa			350		350	340		

* Absolute reference is generally used for vacuum applications with these units

** 14.7 psia sealed reference transducer

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Digital Pressure Gauge Options and Accessories

CC - Conformal Coating

Conformal coating is a specialized silicone coating applied to the circuit boards during assembly. It enhances moisture resistance in high humidity applications. Please note that since this coating is applied before the circuit boards are completely assembled, it is not possible to retrofit this option.

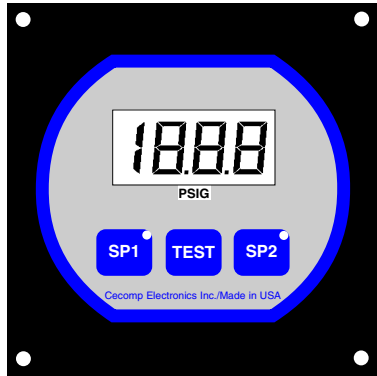
ET - Extended Operating Temperature Range

Standard LCD (Liquid Crystal Display) performance is normally in the range -4°F to 185°F (-20°C to 85°C). With the extended temperature option, a special wide temperature range display is used and operation of the display is maintained over a -40°F to 185°F (-40°C to 85°C) range. Conformal coating of the circuit boards is also included with this option since cold temperature applications may result in condensation.

PM - Panel Mount Option

Mount gauge in panel up to 3/16" thick. Can be used with opening size of 92 mm x 92 mm (1/4 DIN) or a 3 1/2" to 4" diameter circular opening. Black anodized aluminum finish panel measures 4.1" x 4.1" (104 mm x 104 mm). Panel is factory installed and must be ordered at time of gauge order.

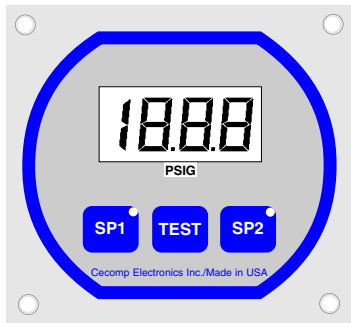
Not available with NEMA 4X housing. The design allows clearance for a customer-installed elbow or fittings. For safety reasons, use fittings appropriate for the system's maximum pressure.



PMS - Panel Mount Small Option

Mount gauge in panel up to 3/16" thick. Has with PEM nuts for mounting. Clear anodized aluminum finish. Panel measures 3.56" x 3.226". Panel is factory installed and must be ordered at time of gauge order.

Add -PMS to end of gauge part number. Not available with NEMA 4X housing. The design allows clearance for a customer-installed elbow or fittings. For safety reasons, use fittings appropriate for the system's maximum pressure.



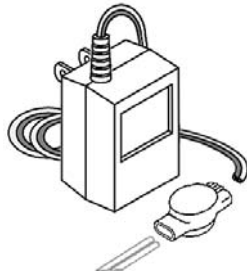
SM - Surface Mount Option

Mount battery powered gauge on any flat surface. 3 3/16" screw hole centers. Aluminum plate measures 3.75" x 1" x 0.080" thick and attaches to rear of gauge housing. Add -SM to end of gauge part number. Cannot be used with any gauge that has external power.



WMPSK - Wall Mount Power Supply Kit

The optional power supply kit includes a 115 VAC (50/60 Hz) wall-mount power supply with U.S. style 2-prong plug. Output is 12 VDC at 200 mA for gauges that accept DC power. Power supply is UL and CSA listed. The power supply's two-conductor wire is approximately 6 feet long and has plain wire ends. Included is a moisture resistant connector to allow easy hookup without having to strip wires. Simply use a pair of pliers to snap connector onto the wires.



HA - High Accuracy

A high accuracy transducer is selected and linearized to give ±0.1% FS ±1 LSD accuracy when this option is ordered. This makes the gauge ideal for use as a pressure standard or a rugged portable test gauge. See price list for available ranges and units or consult factory.

4A - ±0.4% Accuracy

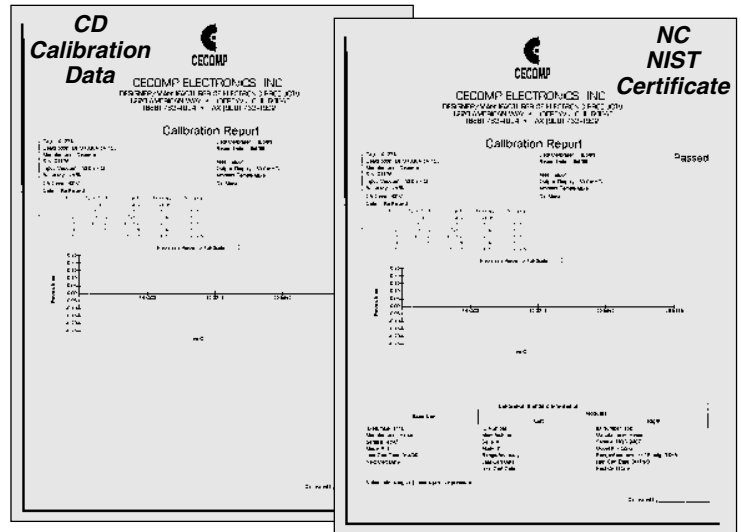
An economical choice when the standard ±0.25% accuracy is not required. The gauge is calibrated to ±0.4% FS ±1 LSD accuracy with this option.

400 - Optional 4 Digit Display

4 digit display gives added resolution in ranges such as 30.00 and 300.0. Also allows a true 2000 psi range. 5000 count maximum. DPG1000 only. Consult factory for applicable ranges and units.

CD - Calibration Data, NC - NIST Certificate

CD option includes data sheet with 5 test points at 0%, 25%, 50%, 75%, and 100% of range and date of the test. NIST traceability also includes NIST traceability report for the pressure standards used. For most applications, it is acceptable to recertify the gauge once per year.



RB - Rubber Boot

Protective rubber boot installs easily onto any Falcon digital gauge except NEMA 4X models. Ideal for heavy-duty portable applications. Helps to maintain appearance of housing. Molded rubber is resistant to hydraulic fluids. Bright orange color for easy visibility.

GP - Gauge Pouch

Protective gauge pouch holds one digital gauge. Ideal for field applications. Blue nylon with padding. Hook & loop closure and belt loop.

9046-24-008 Loop Power Supply

24 VDC 75 mA loop power supply, regulated output, with 8 pin octal base. LED power indicator. Use to power the current loop for a loop-powered gauge.



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How do I select the right pressure range?

It is traditional to choose a mechanical gauge with a pressure range that is twice the working pressure. This gives best accuracy since typical mechanical gauges are more accurate near the middle of their range. This also gives some protection against accidental overpressure or pressure spikes.

Digital pressure gauge accuracy is expressed as a percent of full scale, thus accuracy is best near the upper end of the gauge's range. It is best to select a digital gauge range that is just above your working pressure. For example, if you need to read at 180 psi, a 200 psi gauge would be your best choice. Our digital gauges can withstand 2 times their rated pressure without damage. This gives some protection against accidental overpressure or pressure spikes.

What is "gauge reference"?

Most gauges are referenced to ambient pressure which is called Gauge Reference. The readings are not affected by atmospheric pressure changes. This means that the gauge will read zero with no pressure applied and continue to read zero as atmospheric pressure changes.

Gauges 1000 psi and over use sealed reference transducers which are referenced to a fixed value of 14.7 psia (normal atmospheric pressure). At these higher pressures there is no noticeable difference in operation.

What is "absolute reference"?

Absolute Reference gauges use absolute vacuum as a zero reference and thus will read zero at high vacuum and atmospheric pressure with the gauge port open to ambient.

The gauge's reading will vary with barometric pressure and altitude. Since barometric pressure is constantly changing, the gauge's reading will continuously change when the gauge port is open to atmosphere, or if the system to which it is attached changes in volume or pressure with response to atmospheric pressure changes.

As vacuum is applied, the readings will decrease, eventually reaching zero when full vacuum is applied. Absolute reference gauges are not available in ranges below 15 psi because the transducer would always be in an over range condition at normal atmospheric pressures.

What do you mean by 3-1/2 and 4 digit displays?

A gauge's range and resolution is determined by the number of digits that can be shown on the display.

3-1/2 digit display range	up to 1999
3-3/4 digit display range	up to 3999
4 digit display range	up to 9999
4-1/2 digit display range	up to 19999

A gauge's range and resolution is determined by the number of digits that can be shown on the display. LCDs (Liquid Crystal Displays) used for digital readouts are available with various numbers of digits.

A display that reads up to 1999 also has decimal points that can also be used for lower ranges such as 19.99 or 199.9. Since the left most digit can only be a 1 or turned off, it is known as a "half digit". The other three digits can display anything from 0 through 9 and thus are called full or whole digits. Thus a 1999 display is known in the electronics industry as a 3-1/2 digit display. Although the term "half digit" to describe a 1 may not make sense, this description originated in the early days of digital displays and has been around ever since.

Higher ranges such as our 3000 and 5000 psi ranges require the use of a 4 digit display. This type of display has 4 full digits and can read to 9999.

What determines the ranges of the gauges you offer?

Ranges are determined by available transducer ranges, selected engineering units, and display digits. It is advantageous to specify ranges that maximize display counts over a given transducer range. Practical display resolution is limited by noise and thermal drift to avoid undesirable instability in the last digit.

For example, a 3-1/2 digit display can provide a maximum of 1999 divisions or counts. If a vacuum range were specified with this display in inches of Hg, it would give a 300 count range of 0-30.0 inHg vacuum.

If this same gauge were specified in psi, it would give a range of 0-15.00 psig vacuum, thus dividing the range into 1500 counts.

If we instead use a 4-digit display and specify mmHg, we would have a range of 0-760.0 mmHg, dividing the range into 7600 counts.

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How is accuracy calculated?

Accuracy calculations are based on the characteristics (linearity, hysteresis, repeatability) of the transducer and supporting electronics, range of the transducer, as well as the display resolution. It is expressed as a percent of full scale of the transducer plus the round-off error of the right most (least significant) digit. This round-off error has to do with the fact that the analog output of the pressure transducer needs to be rounded up or down when it is converted to a digital readout. This produces a 1 digit uncertainty in the right-most digit in the display which can not be ignored. Sometime the "±1 LSD" is left off of competitor's specifications, but it is safe to assume it should be there.

The accuracy statement is typically stated as ±0.25% FS ±1LSD. Another way of stating this would be ±(0.25% FS +1LSD).

For example, lets use a 100 psi gauge.

$$\pm 0.0025 \times 100 \text{psi} = \pm 0.25 \text{psi}$$

Since this range has a resolution of 0.1, we round the 0.25 error up to ±0.3. Then we add a last digit uncertainty of ±0.1 to get a calculated accuracy of ±0.4 psi. Our gauges are conservatively rated and generally are well within the stated accuracy limits.

What is the High Accuracy (±0.1%) option?

When a gauge is ordered with the -HA High Accuracy option, it is linearized and tested until it meets the high accuracy specification. See the gauge range table for ranges available with the -HA option.

Some engineering units with certain display resolutions don't give any advantage with the high accuracy option. For example, a 30 psi gauge with 0.1 resolution would have the same calculated accuracy in both ±0.25% FS ±1 LSD and ±0.1% FS ±1 LSD versions due to fact that error is rounded up (we can't ignore possible error). A gauge in this range would require a 4 digit display (0.01 resolution) to take advantage of the high accuracy specification. Such gauges can be ordered, but you should be aware that in some cases the added resolution may increase drift of the last digit.

The High Accuracy option is available for the analog output on any gauge with an analog output. For these gauges the high accuracy linearization specification applies only to the analog output.

What engineering units are available?

See the gauge range table for available ranges and engineering units. We can manufacture gauges with almost any scale, limited by available display digits and transducer ranges. There is an extra charge for units other than psig or inHg. We can even do tons of force if you supply us with the conversion factor.

Psig is by far the most popular general purpose scale in the US. Some industries prefer certain units. Inches H2O is common in HVAC. Torr Absolute is common for vacuum packaging and vacuum pumps. Inches Hg is popular for general purpose vacuum readings. Feet H2O is common for water tank level.

Why does NIST traceability calibration cost more?

A customer's quality standards often require a gauge to be traceable to NIST standards. It costs several thousand dollars per year to maintain NIST traceable instrumentation for each of the ranges we offer. Instrumentation must be sent in annually for recertification. This often requires duplicate equipment for each range so production is not interrupted.

Our calibration prices are comparable to other metrology labs. Our gauges are easy to calibrate and can be returned to us or any metrologist for recertification.

Can I use a Gauge Isolator with my Cecomp gauge?

Yes, you can use a gauge isolator with Cecomp gauges except for the older DPG500 series. Cecomp DPG1000, F4 and F16 series gauges have 316 stainless steel wetted parts, so often an isolator is not needed unless the media is incompatible with stainless steel. Chemical compatibility data is commonly available from online sources or the [Compass Corrosion Guide](#).

Please be aware that a gauge isolator can degrade the accuracy and sensitivity of any gauge it is attached to. Refer to the gauge isolator manufacturer's data for more information. Your local gauge distributor may be able to assist you with gauge isolator selection, installation, and service.

Please remove the isolator from any gauge you send to us for calibration or service. Cecomp is not equipped to install, service, or refill gauge isolators. Your local gauge distributor may also be able to recalibrate your Cecomp gauge.

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Cecomp Digital Pressure Gauge Ranges and Accuracy

Falcon Gauge Ranges		3½ Digit Display, DPG1000, ARM, F4 Series			4-Digit Display F16 Digi Max		
Pounds per Square Inch	Equivalent psi	Display Resolution	±0.25% ±1 LSD Accuracy	±0.1% ±1 LSD Accuracy	Display Resolution	±0.25% ±1 LSD Accuracy	±0.1% ±1 LSD Accuracy
-30INHG/15PSIG	±15.0	0.1	±0.2 psi	n/a	0.01	±0.09 psi	n/a
-30INHG/100PSIG	-15.0/100.0	0.1	±0.4 psi	n/a	0.1	±0.4 psi	n/a
-30INHG/200PSIG	-15.0/199.9	0.1	±0.7 psi	n/a	0.1	±0.7 psi	n/a
3PSIG	3.00	0.01	±0.02	n/a	0.001	±0.009	n/a
5PSIG	5.00	0.01	±0.03	±0.02	0.001	±0.014	±0.006
15PSIA	15.00 abs	0.01	±0.05	±0.03	0.01	±0.05	±0.03
15PSIGVAC	-15.00	0.01	±0.05	±0.03	0.01	±0.05	±0.03
±15PSIG	±15.00	0.01	±0.09	n/a	0.01	±0.09	n/a
15PSIG	15.00	0.01	±0.05	±0.03	0.01	±0.05	±0.03
30PSIA	30.0 abs	0.1	±0.2	n/a	0.01	±0.09	±0.04
30PSIG	30.0	0.1	±0.2	n/a	0.01	±0.09	±0.04
60PSIG	60.0	0.1	±0.3	±0.2	0.01	±0.16	±0.07
100PSIA	100.0 abs	0.1	±0.4	±0.2	0.1	±0.4	±0.2
100PSIG	100.0	0.1	±0.4	±0.2	0.1	±0.4	±0.2
200PSIG	200.0	0.1	±0.6	±0.3	0.1	±0.6	±0.3
300PSIG	300	1	±2	n/a	0.1	±0.9	±0.4
500PSIG	500	1	±3	±2	0.1	±1.4	±0.6
1000PSIG	1000	1	±4	±2	1	±4	±2
2000PSIG	2000	1	±6	±3	1	±6	±3
3000PSIG	3000	1	±9	±4	1	±9	±4
5000PSIG	5000	1	±14	±6	1	±14	±6
Inches Hg (Mercury @ 0°C)	Equivalent psi	Display Resolution	±0.25% ±1 LSD Accuracy	±0.1% ±1 LSD Accuracy	Display Resolution	±0.25% ±1 LSD Accuracy	±0.1% ±1 LSD Accuracy
6INHGG	2.95	0.01	±0.03	n/a	0.001	±0.017	n/a
10INHGG	4.91	0.01	±0.04	±0.03	0.01	±0.04	±0.03
30INHGA	14.73 abs	0.1	±0.2	n/a	0.01	±0.09	±0.05
30INHG VAC	-14.73	0.1	±0.2	n/a	0.1	±0.09	±0.05
±30INHGG	±14.73	0.1	±0.3	n/a	0.01	±0.17	n/a
30INHGG	14.73	0.1	±0.2	n/a	0.01	±0.09	±0.05
60INHGA	29.5 abs	0.1	±0.3	±0.2	0.01	±0.17	±0.08
60INHGG	29.5	0.1	±0.3	±0.2	0.01	±0.17	±0.08
120INHGG	58.9	0.1	±0.5	±0.3	0.1	±0.5	±0.3
200INHGA	98.2 abs	0.1	±0.7	±0.4	0.1	±0.7	±0.4
200INHGG	98.2	0.1	±0.7	±0.4	0.1	±0.7	±0.4
Inches H ₂ O (H ₂ O @ 20°C)	Equivalent psi	Display Resolution	±0.25% ±1 LSD Accuracy	±0.1% ±1 LSD Accuracy	Display Resolution	±0.25% ±1 LSD Accuracy	±0.1% ±1 LSD Accuracy
85INH2OG	3.07	0.1	±0.4	n/a	0.1	±0.4	n/a
140INH2OG	5.05	0.1	±0.5	±0.3	0.1	±0.5	±0.3
400INH2OA	14.42 abs	1	±3	±2	0.1	±1.2	±0.6
400INH2OVAC	-14.42	1	±3	±2	0.1	±1.2	±0.6
±400INH2OG	±14.42	1	±4	n/a	1	±4	n/a
400INH2OG	14.42	1	±3	±2	0.1	±1.2	±0.6
850INH2OG	30.7	1	±4	±2	1	±4	±2
Feet H ₂ O (H ₂ O @ 20°C)	Equivalent psi	Display Resolution	±0.25% ±1 LSD Accuracy	±0.1% ±1 LSD Accuracy	Display Resolution	±0.25% ±1 LSD Accuracy	±0.1% ±1 LSD Accuracy
7FTH2O	3.03	0.01	±0.03	n/a	0.001	±0.019	n/a
12FTH2O	5.20	0.01	±0.04	±0.03	0.01	±0.04	±0.03
35FTH2O	15.2	0.1	±0.2	n/a	0.01	±0.10	±0.05
70FTH2O	30.3	0.1	±0.3	±0.2	0.01	±0.19	±0.08
140FTH2O	60.7	0.1	±0.5	±0.3	0.1	±0.5	±0.3
230FTH2O	99.7	1	±2	n/a	0.1	±0.7	±0.4
480FTH2O	208	1	±3	±2	0.1	±1.3	±0.6

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Cecomp Digital Pressure Gauge Ranges and Accuracy



Falcon Gauge Ranges		3½ Digit Display, DPG1000, ARM, F4 Series			4-Digit Display F16 Digi Max		
Ounces per Square Inch	Equivalent psi	Display Resolution	±0.25% ±1 LSD Accuracy	±0.1% ±1 LSD Accuracy	Display Resolution	±0.25% ±1 LSD Accuracy	±0.1% ±1 LSD Accuracy
50ZING	3.13	0.1	±0.3	n/a	0.01	±0.14	n/a
80ZING	5.00	0.1	±0.3	±0.2	0.1	±0.3	±0.2
240ZING	15.0	1	±2	n/a	0.1	±0.7	±0.4
KiloPascals	Equivalent psi	Display Resolution	±0.25% ±1 LSD Accuracy	±0.1% ±1 LSD Accuracy	Display Resolution	±0.25% ±1 LSD Accuracy	±0.1% ±1 LSD Accuracy
20KPAG	2.90	0.01	±0.07	n/a	0.01	±0.07	n/a
35KPAG	5.08	0.1	±0.2	n/a	0.01	±0.10	±0.05
100KPAA	14.5 abs	0.1	±0.4	±0.3	0.1	±0.4	±0.3
100KPAVAC	-14.5	0.1	±0.4	±0.3	0.1	±0.4	±0.3
100KPAG	14.5	0.1	±0.4	±0.3	0.1	±0.4	±0.3
200KPAA	29.0 abs	0.1	±0.7	±0.4	0.1	±0.7	±0.4
200KPAG	29.0	0.1	±0.7	±0.4	0.1	±0.7	±0.4
400KPAG	58	1	±3	±2	0.1	±1.2	±0.6
700KPAA	102 abs	1	±3	±2	0.1	±1.9	±0.8
700KPAG	102	1	±3	±2	0.1	±1.9	±0.8
1500KPAG	218	1	±5	±3	1	±5	±3
2000KPAG	290	1	±7	±4	1	±7	±4
3500KPAG	508	n/a	n/a	n/a	1	±10	±5
7000KPAG	1015	n/a	n/a	n/a	1	±19	±8
MegaPascals	Equivalent psi	Display Resolution	±0.25% ±1 LSD Accuracy	±0.1% ±1 LSD Accuracy	Display Resolution	±0.25% ±1 LSD Accuracy	±0.1% ±1 LSD Accuracy
3.5MPAG	508	0.01	±0.02	n/a	0.001	±0.01	±0.005
7MPAG	1015	0.01	±0.03	±0.02	0.001	±0.019	±0.008
14MPAG	2031	0.01	±0.05	±0.03	0.01	±0.05	±0.03
20MPAG	2901	0.01	±0.07	±0.04	0.01	±0.07	±0.04
35MPAG	5076	0.1	±0.2	n/a	0.01	±0.10	±0.05
Millibars	Equivalent psi	Display Resolution	±0.25% ±1 LSD Accuracy	±0.1% ±1 LSD Accuracy	Display Resolution	±0.25% ±1 LSD Accuracy	±0.1% ±1 LSD Accuracy
200MBARG	2.90	0.1	±0.7	n/a	0.1	±0.7	n/a
350MBARG	5.08	1	±2	n/a	0.1	±1.0	±0.5
1000MBARA	14.5 abs	1	±4	±3	1	±4	±3
±1000MBARG	±14.5	1	±7	n/a	1	±7	n/a
1000MBARG	14.5	1	±4	±3	1	±4	±3
2000MBARA	29.0 abs	1	±7	±4	1	±7	±4
2000MBARG	29.0	1	±7	±4	1	±7	±4
4000MBARG	58.0	n/a	n/a	n/a	1	±12	±6
Bar	Equivalent psi	Display Resolution	±0.25% ±1 LSD Accuracy	±0.1% ±1 LSD Accuracy	Display Resolution	±0.25% ±1 LSD Accuracy	±0.1% ±1 LSD Accuracy
1BARA	14.50 abs	0.001	±0.004	±0.003	0.001	±0.004	±0.003
1BARG	14.50	0.001	±0.004	±0.003	0.001	±0.004	±0.003
2BARA	29.0 abs	0.001	±0.007	±0.004	0.001	±0.007	±0.004
2BARG	29.0	0.001	±0.007	±0.004	0.001	±0.007	±0.004
4BARG	58.0	0.01	±0.03	±0.02	0.001	±0.012	±0.006
7BARA	101.5 abs	0.01	±0.03	±0.02	0.001	±0.019	±0.008
7BARG	101.5	0.01	±0.03	±0.02	0.001	±0.019	±0.008
14BARG	203	0.01	±0.05	±0.03	0.01	±0.05	±0.03
20BARG	290	0.01	±0.07	±0.04	0.01	±0.07	±0.04
35BARG	508	0.1	±0.2	n/a	0.01	±0.10	±0.05
70BARG	1015	0.1	±0.3	±0.2	0.01	±0.19	±0.08
140BARG	2031	0.1	±0.5	±0.3	0.1	±0.5	±0.3
200BARG	2901	0.1	±0.7	±0.4	0.1	±0.7	±0.4
350BARG	5076	1	±2	n/a	0.1	±1.0	±0.5

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Pressure



Cecomp Digital Pressure Gauge Ranges and Accuracy

Falcon Gauge Ranges		3½ Digit Display, DPG1000, ARM, F4 Series			4-Digit Display F16 Digi Max		
Kilograms per cm ²	Equivalent psi	Display Resolution	±0.25% ±1 LSD Accuracy	±0.1% ±1 LSD Accuracy	Display Resolution	±0.25% ±1 LSD Accuracy	±0.1% ±1 LSD Accuracy
1KGCMMA	14.22 abs	0.001	±0.004	±0.003	0.001	±0.004	±0.003
±1KGCMG	±14.22	0.001	±0.007	n/a	0.001	±0.007	n/a
1KGCMG	14.22	0.001	±0.004	±0.003	0.001	±0.004	±0.003
2KGCMMA	28.4 abs	0.001	±0.007	±0.004	0.001	±0.007	±0.004
2KGCMG	28.4	0.001	±0.007	±0.004	0.001	±0.007	±0.004
4KGCMG	56.9	0.01	±0.03	±0.02	0.001	±0.012	±0.006
7KGCMMA	99.6 abs	0.01	±0.03	±0.02	0.001	±0.019	±0.009
7KGCMG	99.6	0.01	±0.03	±0.02	0.001	±0.019	±0.009
14KGCMG	199.1	0.01	±0.05	±0.03	0.01	±0.05	±0.03
20KGCMG	284	0.01	±0.07	±0.04	0.01	±0.07	±0.04
35KGCMG	498	0.1	±0.2	n/a	0.01	±0.10	±0.05
70KGCMG	996	0.1	±0.3	±0.2	0.01	±0.19	±0.09
140KGCMG	1991	0.1	±0.5	±0.3	0.1	±0.5	±0.3
200KGCMG	2845	0.1	±0.7	±0.4	0.1	±0.7	±0.4
350KGCMG	4978	1	±2	n/a	0.1	±1.0	±0.5
Grams per cm ²	Equivalent psi	Display Resolution	±0.25% ±1 LSD Accuracy	±0.1% ±1 LSD Accuracy	Display Resolution	±0.25% ±1 LSD Accuracy	±0.1% ±1 LSD Accuracy
1000GCMA	14.22 abs	1	±4	±3	1	±4	±3
1000GCMG	14.22	1	±4	±3	1	±4	±3
2100GCMA	29.9 abs	1	±7	±4	1	±7	±4
2100GCMG	29.9	1	±7	±4	1	±7	±4
mmHg or Torr (Mercury @ 0°C)	Equivalent psi	Display Resolution	±0.25% ±1 LSD Accuracy	±0.1% ±1 LSD Accuracy	Display Resolution	±0.25% ±1 LSD Accuracy	±0.1% ±1 LSD Accuracy
150MMHGG	2.90	0.1	±0.5	n/a	0.1	±0.5	n/a
260MMHGG	5.03	1	±2	n/a	0.1	±0.8	±0.4
760TORRA	14.7 abs	1	±3	±2	0.1	±2.1	±0.9
760MMHGA	14.7 abs	1	±3	±2	0.1	±2.1	±0.9
760MMHGvac	-14.7	1	±3	±2	0.1	±2.1	±0.9
760MMHGG	14.7	1	±3	±2	0.1	±2.1	±0.9
1600MMHGA	30.9 abs	1	±5	±3	1	±5	±3
1600MMHGG	30.9	1	±5	±3	1	±5	±3
cm H ₂ O (H ₂ O @ 20°C)	Equivalent psi	Display Resolution	±0.25% ±1 LSD Accuracy	±0.1% ±1 LSD Accuracy	Display Resolution	±0.25% ±1 LSD Accuracy	±0.1% ±1 LSD Accuracy
200CMH2OG	2.84	0.1	±0.7	n/a	0.1	±0.7	n/a
350CMH2OG	4.97	1	±2	n/a	0.1	±1.0	±0.5
1000CMH2OG	14.2	1	±4	±3	1	±4	±3
2100CMH2OG	29.8	1	±7	±4	1	±7	±4
mm H ₂ O (H ₂ O @ 20°C)	Equivalent psi	Display Resolution	±0.25% ±1 LSD Accuracy	±0.1% ±1 LSD Accuracy	Display Resolution	±0.25% ±1 LSD Accuracy	±0.1% ±1 LSD Accuracy
2100MMH2OG	2.98	1	±7	n/a	1	±7	n/a
3500MMH2OG	4.97	n/a	n/a	n/a	1	±10	±5
Atmospheres	Equivalent psi	Display Resolution	±0.25% ±1 LSD Accuracy	±0.1% ±1 LSD Accuracy	Display Resolution	±0.25% ±1 LSD Accuracy	±0.1% ±1 LSD Accuracy
1ATMG	14.70	0.001	±0.004	±0.003	0.001	±0.004	±0.003
2ATMG	29.39	0.01	±0.02	±0.02	0.001	±0.007	±0.004
4ATMG	58.8	0.01	±0.03	±0.02	0.001	±0.012	±0.006
7ATMG	102.9	0.01	±0.03	±0.02	0.001	±0.019	±0.008
14ATMG	206	0.01	±0.05	±0.03	0.01	±0.05	±0.03
20ATMG	294	0.01	±0.07	±0.04	0.01	±0.07	±0.04
35ATMG	514	0.1	±0.2	n/a	0.01	±0.10	±0.05
70ATMG	1029	0.1	±0.3	±0.2	0.01	±0.19	±0.08
135ATMG	1984	0.1	±0.5	±0.3	0.1	±0.5	±0.3
200ATMG	2939	0.1	±0.7	±0.4	0.1	±0.7	±0.4
340ATMG	4997	1	±2	n/a	0.1	±1.0	±0.5

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DPG1000B DPG1000BBL, F4B, F4BBL, ARM760B, ARM760BBL, DPG1000AD, DPG1000ADBL, F4AD, F4ADBL, ARM760AD, ARM760ADBL DPG1000ADA

Precautions (All Models)

Install or remove gauge using wrench on hex fitting only. Do not attempt to tighten or loosen by turning housing or any other part of the gauge.

Use fittings appropriate for the pressure range of the gauge as indicated on the rear label.

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.

These products do not contain user serviceable parts. Contact us for repairs, service, or refurbishment.

General Calibration Information

Calibration intervals depend entirely upon the customer's quality standards, thus the factory does not have a recommended calibration interval. Most industries check instrument calibration on an annual basis. Actual experience may suggest shorter or longer intervals based on severity of service and "as found" test results while the gauge is being serviced.

It is generally desirable to calibrate the gauge to read zero at zero pressure, and adjust the span to achieve best accuracy over the desired operating range. Span is usually adjusted for "best fit" to minimize errors at all test points. It is possible to adjust for best accuracy over a narrow pressure range, but be aware that the gauge accuracy specification is based on the entire transducer range.

The pressure sensor is designed to maintain specifications over its temperature compensated range, usually 0 to 70°C. Deviations in pressure sensor output occur as the gauge transducer operates in temperatures that are different than normal ambient. This is mainly due to thermal expansion/contraction of the piezoelectric sensing device. Temperature compensation circuitry built into the sensor automatically eliminates for most of the variance. For most applications the gauge should be adjusted at normal ambient temperatures of 20 to 25°C. It is acceptable to calibrate the gauge at the temperature at which it is to be used.

Preparation (All Models)

1. Calibration should only be performed by qualified individuals using appropriate calibration standards and procedures.
2. 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/vacuum over the full range of the gauge.
3. Allow the gauge to equalize to normal room temperature before calibration.



4. **Models with Top Potentiometers:** Remove label on top of gauge to expose opening with calibration potentiometers. This label may be reused many times if kept clean. See rear label of gauge for potentiometer identification.
5. **Models with Front Potentiometers:** Remove the black plastic caps to expose the calibration potentiometers.
6. **NEMA 4X Models with Front Potentiometers:** Unscrew nylon screws with o-rings to expose the calibration potentiometers.

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Battery-Powered Models

DPG1000B, DPG1000BBL, F4B, F4BBL, ARM760B, ARM760BBL

1. It is good practice to install fresh batteries before calibrating battery-powered gauges.
2. **Gauge reference gauges:** With the gauge port open to atmosphere, adjust the Zero potentiometer for a display indication of zero.

Absolute reference gauges (including ARM760B and ARM760BBL):

Apply full vacuum to the gauge. The vacuum pump must be able to produce a vacuum of 10 microns (0.01 torr or 10 millitorr) or lower. Adjust the Zero potentiometer for a display indication of zero.

3. Apply full-scale pressure and adjust the Span potentiometer for a display indication equal to full-scale pressure.
4. 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.

Low-Voltage Powered Models

DPG1000AD, DPG1000ADBL, F4AD, F4ADBL, ARM760AD, ARM760ADBL, DPG1000ADA

1. Low-voltage powered gauges must be connected to 8-24 VAC 50/60 Hz or 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.

NEVER connect gauge wires directly to 115 VAC or permanent damage not covered by warranty will result. Common 24 VAC transformers often supply over 32 VAC unless they are loaded to 80% of rated capacity. Over voltage may result in damage.

2. **Gauge reference gauges:** With the gauge port open to atmosphere, adjust the Zero potentiometer for a display indication of zero.

Absolute reference gauges (including ARM760AD and ARM760ADBL):

Apply full vacuum to the gauge. The vacuum pump must be able to produce a vacuum of 10 microns (0.01 torr or 10 millitorr) or lower. Adjust the Zero potentiometer for a display indication of zero.

3. Apply full-scale pressure and adjust the Span potentiometer for a display indication equal to full-scale pressure.
4. 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.



Digital Pressure Gauge Calibration Procedures

DPG1000B DPG1000BBL, F4B, F4BBL with Internal Potentiometers and 4 Digit display (3000 psi, 5000 psi, -400 option) F16 Series with Internal Potentiometers

Precautions

Install or remove gauge using wrench on hex fitting only. Do not attempt to tighten or loosen by turning housing or any other part of the gauge.

Use fittings appropriate for the pressure range of the gauge. The gauge range is indicated on the rear label and is indicated on the display during power-up.

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.

These products do not contain user serviceable parts. Contact us for repairs, service, or refurbishment.

Preparation

Calibration should only be performed by qualified individuals using appropriate calibration standards and procedures. The calibration equipment should be at least four times more accurate than the gauge being calibrated.

1. Remove the screws on the back of the unit and remove cover.
2. It is good practice to install fresh batteries before calibrating battery-powered gauges.
3. Allow the gauge to equalize to normal room temperature before calibration.

Calibration

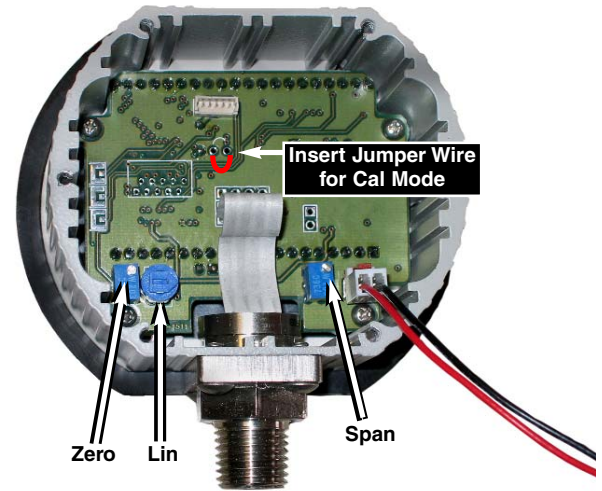
1. Note the locations of the calibration mode jumper points and the three calibration potentiometers. **IMPORTANT:** Do not adjust the calibration potentiometers unless the gauge is in the calibration mode.
2. To enter the calibration mode, place a jumper wire between the calibration mode jumper points as shown below.
3. Press the front pushbutton to power up the gauge. The display first indicates the gauge's full-scale pressure range, tests all display segments, and then indicates $\bar{C} R L$ to indicate that the gauge is in the calibration mode.
4. The display will then indicate the current pressure reading, updating approximately 3 times per second. The jumper can be removed at this time and the gauge will remain in the calibration mode until powered down manually.

While in the calibration mode, the auto shutoff timer is disabled, the One Touch Zero (gauge reference models only) is disabled, and the calibration potentiometers remain active. In normal operation, the calibration potentiometers are only read during initialization to conserve power.

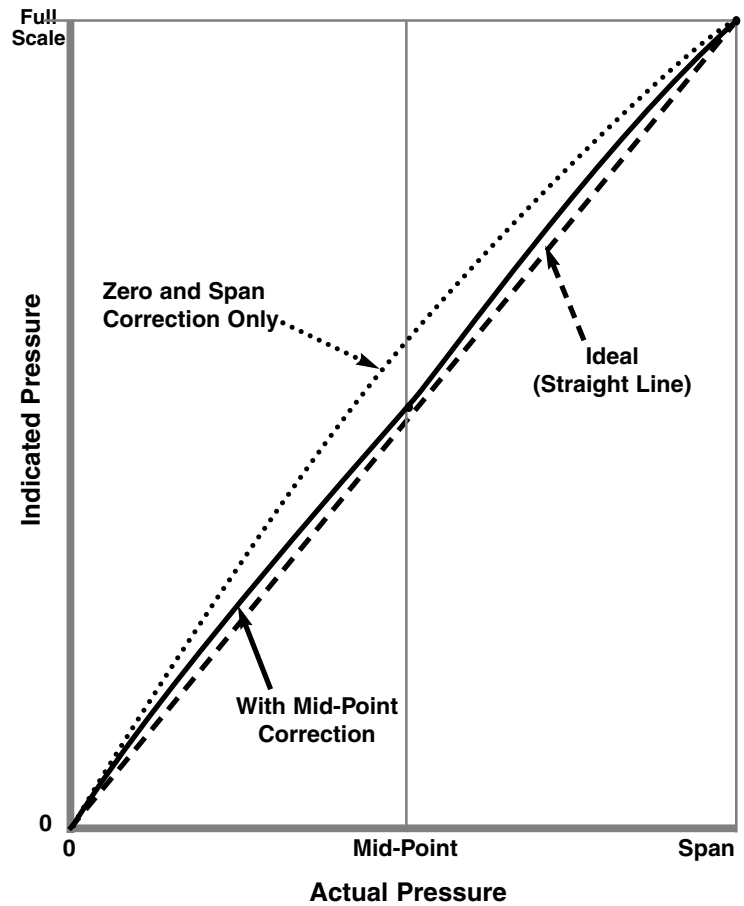
5. **Gauge reference gauges:** With the gauge port open to atmosphere, adjust the Zero potentiometer on the lower left hand side of the circuit board for a display indication of zero.

Absolute reference gauges: Apply full vacuum to the gauge. The vacuum pump must be able to produce a vacuum of 10 microns (0.01 torr or 10 millitorr) or lower. Adjust the Zero potentiometer on the lower left hand side of the circuit board for a display indication of zero.

6. Apply full-scale pressure and adjust the Span potentiometer on the lower right hand side of the circuit board for a display indication equal to full-scale pressure.
7. Apply 50% full-scale pressure and adjust the single-turn Linearization potentiometer (marked Lin on the circuit board) for a display indication equal to 50% of full-scale pressure.
8. Verify pressure indications at 0%, 25%, 50%, 75%, and 100% of full scale.
9. Remove the jumper between the calibration mode terminals following calibration. Failure to remove the jumper will greatly reduce battery life.
10. Replace the rear cover and screws.



Gauge Calibration with Mid-Point Linearization Correction



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Models with 2-Line Display (Pressure & Units) and Internal Pushbuttons

Precautions

Install or remove gauge using wrench on hex fitting only. Do not attempt to tighten or loosen by turning housing or any other part of the gauge.

Use fittings appropriate for the pressure range of the gauge. The gauge range is indicated on the rear label and is indicated on the display during power-up.

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.

These products do not contain user serviceable parts. Contact us for repairs, service, or refurbishment.

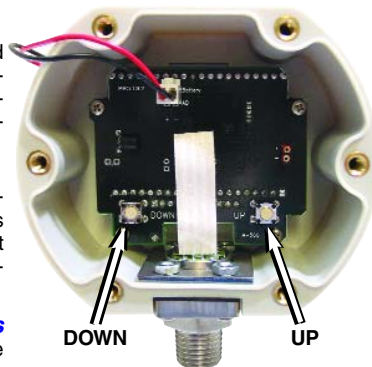


1. Preparation

- Calibration should only be performed by qualified individuals using appropriate calibration standards and procedures.
- The calibration equipment should be at least four times more accurate than the gauge being calibrated.
- Remove the screws on the back of the unit and remove cover.
- It is good practice to install fresh batteries before calibrating battery-powered gauges.
- Low-voltage powered gauges must be connected to 8-24 VAC 50/60 Hz or 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. **NEVER connect gauge wires directly to 115 VAC or permanent damage not covered by warranty will result.** Common 24 VAC transformers often supply over 32 VAC unless they are loaded to 80% of rated capacity. Over voltage may result in damage.
- Allow the gauge to equalize to normal room temperature before calibration.

2. Entering the Calibration Mode

- Note the locations of the two internal calibration pushbuttons marked UP and DOWN. These buttons are disabled unless the gauge is in calibration mode.
- Battery-powered gauges**
With the gauge off, press and hold the DOWN calibration button, and also press the front button to power up the gauge in calibration mode.
- Low-voltage powered gauges**
Press and hold the DOWN calibration button, and also press and hold the front button to reset the gauge and switch it into calibration mode.



3. Calibration Mode Functions

- The display first indicates the gauge's full-scale pressure range, tests all display segments, and then indicates CRL to indicate that the gauge is in the calibration mode. Release all pushbuttons.
- The display will then indicate the current pressure reading, updating approximately 3 times per second. The gauge will remain in the calibration mode until powered down or reset manually. While in the calibration mode, the shutoff timer, One Touch Zero (gauge reference models only), Min/Max (for applicable models) are all disabled, and the calibration pushbuttons are active.
- Each press of the UP or DOWN button makes a small correction, which may not always be indicated on the digital display. Press and hold the pushbutton for one second or longer to make larger continuous corrections. The display of the gauge being calibrated is adjusted to match the calibrator's setting or readout.
- If the battery pack is unplugged or the power removed during calibration, calibration settings will not be saved.

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4. Gauge Reference Gauges (3 Points)

- With the gauge port open to atmosphere, the character display will alternate between ZER0 and CRL . Press the UP and DOWN buttons to obtain a display indication of zero.
- Apply full-scale pressure. The character display will alternate between SPRN and CRL . Press the UP and DOWN buttons to obtain a display indication equal to full-scale pressure.
- Apply 50% of full-scale pressure. The character display will alternate between MID and CRL . Press the UP and DOWN buttons to obtain a display indication equal to 50% of full-scale pressure.

5. Absolute Reference Gauges (3 Points)

- Apply full vacuum to the gauge. The vacuum pump must be able to produce a vacuum of 10 microns (0.01 torr or 10 millitorr) or lower. The character display will alternate between ZER0 and CRL . Press the UP and DOWN buttons to obtain a display indication of zero.
- Apply full-scale pressure. The character display will alternate between SPRN and CRL . Press the UP and DOWN buttons to obtain a display indication equal to full-scale pressure.
- Apply 50% of full-scale pressure. The character display will alternate between MID and CRL . Press the UP and DOWN buttons to obtain a display indication equal to 50% of full-scale pressure.

6. Bipolar (\pm) and $-30\text{inHg}/15\text{psig}$ Compound Ranges (5 Points)

- With the gauge port open to atmosphere, the character display will alternate between ZER0 and CRL . Press the UP and DOWN buttons to obtain a display indication of zero.
- Apply full-scale positive pressure. The character display will alternate between SPRN and CRL . Press the UP and DOWN buttons to obtain a display indication equal to full-scale pressure.
- Apply 50% of full-scale positive pressure. The character display will alternate between MID and CRL . Press the UP and DOWN buttons to obtain a display indication equal to 50% of full-scale pressure.
- Apply full vacuum. The character display will alternate between SPRN and CRL . Press the UP and DOWN buttons to obtain a display indication equal to the full vacuum reading.
- Apply 50% of the full-scale vacuum range (for example, -7.4 psi for a ± 15 psi gauge). The character display will alternate between MID and CRL . Press the UP and DOWN buttons to obtain a display indication equal to 50% of full-scale vacuum.

7. $-30\text{inHg}/100\text{psig}$ and $-30\text{inHg}/200\text{psig}$ Compound (4 Points)

- With the gauge port open to atmosphere, the character display will alternate between ZER0 and CRL . Press the UP and DOWN buttons to obtain a display indication of zero.
- Apply full-scale positive pressure. The character display will alternate between SPRN and CRL . Press the UP and DOWN buttons to obtain a display indication equal to full-scale pressure.
- Apply 50% of full-scale positive pressure. The character display will alternate between MID and CRL . Press the UP and DOWN buttons to obtain a display indication equal to 50% of full-scale pressure.
- Apply full vacuum. The character display will alternate between SPRN and CRL . Press the UP and DOWN buttons to obtain a display indication equal to the full vacuum reading.

8. Exit Calibration Mode and Verify Calibration

- Battery-powered gauges:** Exit the calibration mode and save the calibration data by pressing and holding the front button until the display indicates OFF .
- Low-voltage powered gauges:** Exit the calibration mode and save the calibration data by pressing and holding the front button until the gauge resets and powers up normally.
- Verify pressure indications at 0%, 25%, 50%, 75%, and 100% of full scale.
- Replace the rear cover and screws, taking care not to pinch the power leads between the case and the rear cover.

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DPG1000L, F4L Loop Powered Models

Precautions (All Models)

Install or remove gauge using wrench on hex fitting only. Do not attempt to tighten or loosen by turning housing or any other part of the gauge.

Use fittings appropriate for the pressure range of the gauge as indicated on the rear label.

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.

These products do not contain user serviceable parts. Contact us for repairs, service, or refurbishment.

General Calibration Information

Calibration intervals depend entirely upon the customer's quality standards, thus the factory does not have a recommended calibration interval. Most industries check instrument calibration on an annual basis. Actual experience may suggest shorter or longer intervals based on severity of service and "as found" test results while the gauge is being serviced.

It is generally desirable to calibrate the gauge to read zero at zero pressure, and adjust the span to achieve best accuracy over the desired operating range. Span is usually adjusted for "best fit" to minimize errors at all test points. It is possible to adjust for best accuracy over a narrow pressure range, but be aware that the gauge accuracy specification is based on the entire transducer range.

The pressure sensor is designed to maintain specifications over its temperature compensated range, usually 0 to 70°C. Deviations in pressure sensor output occur as the gauge transducer operates in temperatures that are different than normal ambient. This is mainly due to thermal expansion/contraction of the piezoelectric sensing device. Temperature compensation circuitry built into the sensor automatically eliminates for most of the variance. For most applications the gauge should be adjusted at normal ambient temperatures of 20 to 25°C. It is acceptable to calibrate the gauge at the temperature at which it is to be used.

Preparation (All Models)

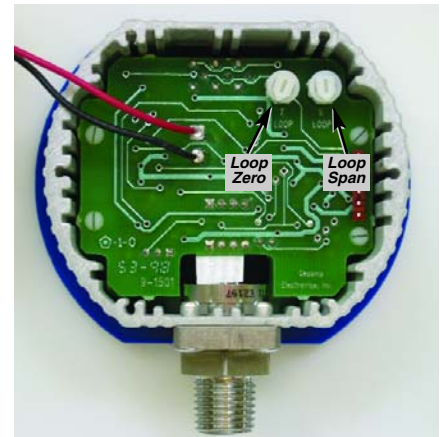
1. Calibration should only be performed by qualified individuals using appropriate calibration standards and procedures.
2. The calibration equipment should be at least four times more accurate than the gauge being calibrated. The calibration system must be able to generate and measure pressure/vacuum over the full range of the gauge.
3. Allow the gauge to equalize to normal room temperature before calibration.



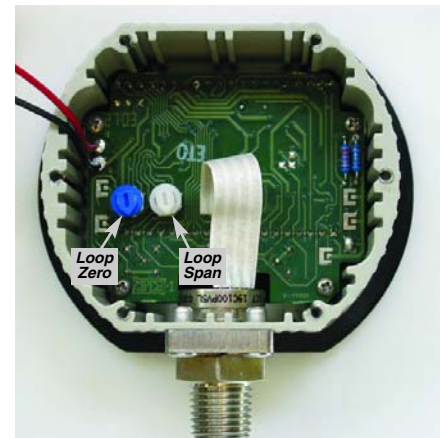
4. **Models with Top Potentiometers:** Remove label on top of gauge to expose opening with calibration potentiometers. This label may be reused many times if kept clean. See rear label of gauge for potentiometer identification.
5. **Models with Front Potentiometers:** Remove the black plastic caps or nylon screws to expose the calibration potentiometers.
6. **NEMA 4X Models with Front Potentiometers:** Unscrew nylon screws with o-rings to expose the calibration potentiometers.

Calibration

1. 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.
2. 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 photos below.
3. **Gauge reference gauges:** With the gauge port open to atmosphere, adjust the Zero potentiometer for a display indication of zero. Gauge output should be 4.0 milliamps.
Absolute reference gauges: Apply full vacuum to the gauge. The vacuum pump must be able to produce a vacuum of 10 microns (0.01 torr or 10 millitorr) or lower. Adjust the Zero potentiometer for a display indication of zero. Gauge output should be 4.0 milliamps.
4. Apply full-scale pressure and adjust the Span potentiometer for a display indication equal to full-scale pressure. Gauge output should be 20.0 milliamps.
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.



Loop-powered models with square TEST button



Loop-powered models with round TEST button

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

DPG1000AR, DPG1000DR, DPG1000DRBL, F4DR, F4DRBL, DPG1000AAR, DPG1000DAR

Precautions (All Models)

Install or remove gauge using wrench on hex fitting only. Do not attempt to tighten or loosen by turning housing or any other part of the gauge.

Use fittings appropriate for the pressure range of the gauge as indicated on the rear label.

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.

These products do not contain user serviceable parts. Contact us for repairs, service, or refurbishment.

General Calibration Information

Calibration intervals depend entirely upon the customer's quality standards, thus the factory does not have a recommended calibration interval. Most industries check instrument calibration on an annual basis. Actual experience may suggest shorter or longer intervals based on severity of service and "as found" test results while the gauge is being serviced.

It is generally desirable to calibrate the gauge to read zero at zero pressure, and adjust the span to achieve best accuracy over the desired operating range. Span is usually adjusted for "best fit" to minimize errors at all test points. It is possible to adjust for best accuracy over a narrow pressure range, but be aware that the gauge accuracy specification is based on the entire transducer range.

The pressure sensor is designed to maintain specifications over its temperature compensated range, usually 0 to 70°C. Deviations in pressure sensor output occur as the gauge transducer operates in temperatures that are different than normal ambient. This is mainly due to thermal expansion/contraction of the piezoelectric sensing device. Temperature compensation circuitry built into the sensor automatically eliminates for most of the variance. For most applications the gauge should be adjusted at normal ambient temperatures of 20 to 25°C. It is acceptable to calibrate the gauge at the temperature at which it is to be used.

Preparation (All Models)

1. Calibration should only be performed by qualified individuals using appropriate calibration standards and procedures.
2. 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/vacuum over the full range of the gauge.
3. Allow the gauge to equalize to normal room temperature before calibration.



Top Potentiometers

Front Potentiometers

Front Potentiometers NEMA 4X

4. **Models with Top Potentiometers:** Remove label on top of gauge to expose opening with calibration potentiometers. This label may be reused many times if kept clean. See rear label of gauge for potentiometer identification.
5. **Models with Front Potentiometers:** Remove the black plastic caps or nylon screws to expose the calibration potentiometers.
6. **NEMA 4X Models with Front Potentiometers:** Unscrew nylon screws with o-rings to expose the calibration potentiometers.

Calibration

1. Low-voltage powered gauges must be powered by 8-24 VAC 50/60 Hz or 9-32 VDC. Some older models such as the **AR** were specific for AC power. Always check the gauge rear label for correct power requirements. The supply voltage has negligible effects on the gauge calibration as long as it is within the stated voltage ranges.

NEVER connect gauge wires directly to 115 VAC or permanent damage not covered by warranty will result. Common 24 VAC transformers often supply over 32 VAC unless they are loaded to 80% of rated capacity. Over voltage may result in damage.

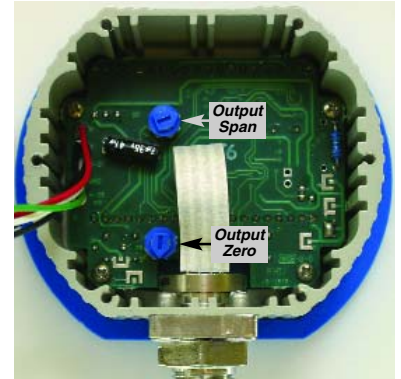
2. **Gauge reference gauges:** With the gauge port open to atmosphere, adjust the Zero potentiometer for a display indication of zero. Gauge output should be 4.0 milliamps (-I models) or 0 volts (-V models).

Absolute reference gauges: Apply full vacuum to the gauge. The vacuum pump must be able to produce a vacuum of 10 microns (0.01 torr or 10 millitorr) or lower. Adjust the Zero potentiometer for a display indication of zero. Gauge output should be 4.0 milliamps (-I models) or 0 volts (-V models).

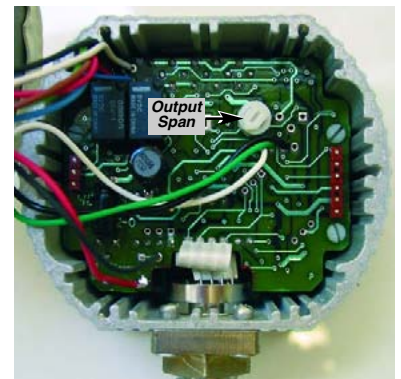
3. Apply full-scale pressure and adjust the Span potentiometer for a display indication equal to full-scale pressure. Gauge output should be 20.0 milliamps (-I models) or 2.0 volts (-V models).
4. Verify pressure indications at 0%, 25%, 50%, 75%, and 100% of full scale and repeat calibration as needed to achieve best accuracy.

Output Calibration

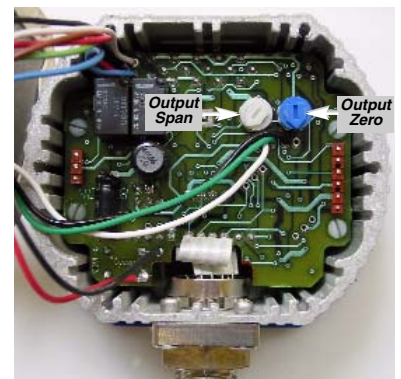
1. Internal potentiometer(s) adjust the agreement between the display and the output. These normally do not need to be adjusted. If the output does need adjustment, remove the rear cover to access the potentiometers. See photos to identify versions.
2. **DR models with single round TEST button:** The display should be calibrated before the output is adjusted. Adjust the output Span first and then adjust output Zero.
3. **Models with square front button(s) and Voltage (-V) output:** These models only have an output Span potentiometer. Adjust the output Span for 2.0 V output when the gauge is at full pressure.
4. **Models with square front button(s) and Current (-I) Output:** These models only have output Zero and Span potentiometers. Adjust the output Zero for 4 mA output when the gauge is at zero pressure. Adjust the output Span for 20.0 mA output when the gauge is at full pressure.
5. Verify output indications at 0% and 100% of full scale and repeat calibration as needed.



DR Model, Round TEST Button Version



AR, DR, AAR, DAR Models with Voltage Output



AR, DR, AAR, DAR Models with Current Output



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Purchasing Policy and Product Warranties

We at Absolute Process Instruments are dedicated to providing our customers with quality products at an economical price.

Terms

- ❖ VISA, MasterCard, American Express credit cards accepted
- ❖ Call 800-942-0315 to place your order
- ❖ Normal shipment via UPS Ground
- ❖ Other shipping methods are available upon request
- ❖ Prices F.O.B. Libertyville, IL, USA



To Open an Account with API

- ✓ Three credit references with their phone and fax numbers
- ✓ A bank reference with their phone and fax number
- ✓ Name and phone number of accounts payable supervisor
- ⓞ Fax info to 800-949-7502, allow 1-2 weeks for approval
- ☒ Payment due **Net 30** days from invoice date

Standard Delivery

Most products can be shipped in 2 to 10 business days after receipt of an order. Please call the factory with the quantity and model number if you require an exact lead time.

Rush Delivery

We will make every effort to accommodate rush orders at no extra charge, but in some cases, a non-refundable extra charge may be applied.

Some products can be shipped the same day under the following conditions:

It must be a standard stocked product. Call us for availability and to arrange delivery.

You must have an established account with us or use your credit card.

Order Early! The order must be received by API by 11:00 am Central time.

Modifications and Specials

Consult factory for availability of modifications or products for custom applications. Allow a 2-4 week lead time for modified products. Minimum quantities and non-refundable engineering charges may apply.

Warranty

Products manufactured or sold by Absolute Process Instruments Inc. (API Inc.) are warranted to be free from significant deviations in material and workmanship according to the product category below. During this time, and within the boundaries set forth in this warranty statement, API Inc. will, at its sole discretion, correct the product problem or replace the product.

API signal conditioners, isolators, transmitters, power supplies manufactured by API Inc.

Warranty: Lifetime

API-Camille Bauer products

Warranty: 3 years from date of purchase

RheinTacho speed monitors

Warranty: 1 year from date of purchase

API current switches, current transmitters, current transducers

Warranty: 3 years from date of purchase

API/Cecomp pressure/vacuum gauges, switches, transmitters

Warranty: 1 year from date of purchase

This warranty shall not apply to product problems resulting from:

- 1) Improper application, installation, incorrect wiring, or operation outside of the approved specifications of the product.
- 2) Accidents, power surges, power disruptions, power outages, static electricity, or improper voltages or currents.
- 3) Inadequate site maintenance or preparation by the buyer or user.
- 4) Abuse, misuse, or unauthorized modification.
- 5) Acts of God, weather and weather effects, lightning strike, floods, fire, earthquake, war, riots, military action, etc.

API Inc. products are not for use for, with, or in any medical devices or applications including, but not limited to, patient care, life support systems or medical research. API Inc. assumes no responsibility or liability for any loss or damages resulting from use of a API Inc. product in a medical or life support application. API Inc. products are not for use for, with, or in any hazardous environments.

This warranty is in lieu of all other warranties, expressed or implied, including but not limited to any implied warranty of merchantability, fitness, or adequacy for any particular purpose or use. API Inc. shall not be liable for any special, incidental, or consequential damages, whether in contract, tort, or otherwise. In no event shall API Inc. be liable for direct, indirect, special, incidental or consequential damages (including loss of profits or loss of time) resulting from the performance of an API Inc. product. In all cases, API Inc. liability will be limited to the original cost of the product in question.

API Inc. reserves the right to make improvements in design, construction, and appearance of products without notice. API Inc. may at its sole discretion discontinue support, warranty, or repair of products which it deems are obsolete or for which repair parts are no longer available.

No employee or agent of API Inc. has the authority to modify the terms of this warranty in any manner whatsoever without the express written permission of API Inc.

Return Policy and Authorization

Before returning any product, please obtain a Return Materials Authorization number (RMA#) by calling Customer Service at 800-942-0315 or emailing support@api-cecomp.net. Include the RMA# and information regarding the reason for the return with the returned product.

Shipping costs for returns must be prepaid by the customer. For your protection, items must be carefully packed to prevent damage in shipment and insured against possible damage or loss. API Inc. will not be responsible for damage resulting from careless or insufficient packing or loss in transit.

Cancellation and Restocking

A 20% restocking fee will be assessed on any cancelled order that has shipped or any product returned for credit. An RMA# must be obtained by the original purchaser before any product can be returned. Only new, unused products less than 6 months old may be returned. Installed, used, damaged, modified or customized products can not be returned for credit. Credit will be issued to the original purchaser after evaluation by API Inc.

Repairs

An RMA# must be obtained before any product can be returned. API Inc. will evaluate returned products at no charge. If API Inc. determines that the returned product is under warranty, it will repair the product or warranted parts thereof at no charge, or if unrepairable, replace it with the same or functionally equivalent product whenever possible. API Inc. will return the warranted product at its expense via a shipping method (carrier to be at sole discretion of API Inc.) equal to or faster than the method used by the customer.

Products or parts thereof not covered by warranty will be repaired or replaced at customer expense upon authorization by the customer. API Inc. will return the repaired product at customer expense via a shipping method (carrier to be at sole discretion of API Inc.) equal to or faster than the method used by the customer.