Cecomp Intrinsically Safe Digital Pressure Gauges — DPG2000B Series

Agency Approval
Factory Mutual Approved Intrinsically Safe for Hazardous Locations USA & Canada

Class I, Division 1, Groups A, B, C, D
T3C Ta = –40 to 82°C; T4 Ta = –40 to 66°C,
CL I Zone 0 AEx/Ex ia IIC T3 Ta = –40 to 82°C; T4 Ta = –40 to 66°C

Ranges and Resolution
See table below. Engineering units are factory set.
Consult factory for special engineering units

Resolution is fixed and limited to available display digits
Ranges listed as 20, 200, or 2000 display 19.99, 199.9, or 1999.

See DPG2000B series with D4 option for ranges with increased resolution

Accuracy
Includes linearity, hysteresis, repeatability
±0.25% of full scale ±1 least significant digit

HA option: ±0.1% of full scale ±1 least significant digit
*Not available with 3 psi, vac-press., absolute, vacuum, or ranges with insufficient resolution
See range table below for availability

Display
3 readings per second nominal display update rate
3.5 digit (1999) LCD, 0.5" H digits
BL models: Red LED display backlight

Batteries
Two 1.5 V AAA (Panasonic LR03) alkaline cells
B: Approx. 1000 hours
BL: Approx. 150 to 1000 hours depending on backlight usage
Low battery indication: "LOBAT" on display

Auto Shutoff
Factory set for 5, 10, or 30 minutes

Controls
Front button turns gauge on and starts auto shutoff timer

BL models: Front button turns gauge on and starts auto shutoff timer. Hold front button to operate backlight.

Calibration
Non-interactive zero and span pots, ±10% of range
Top-mounted potentiometers covered with reusable label.

Weight
9 ounces (approx.)
Shipping wt. 1 pound (approx.)

Housing Materials and Circuit Board Protection
Epoxy powder coated aluminum case, rear cover, and bezel. Front and rear rubber gaskets, polycarbonate label.

Includes stainless steel stiffener plate to reinforce sensor area.

Conformal coating on circuit boards for moisture resistance.

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

Overpressure, Burst, Vacuum Service
3000 psig sensor: 5000 psig overpressure
5000 psig sensor: 7500 psig overpressure
All others: 2 X pressure range overpressure
Burst pressure: 4 X sensor pressure rating, or 10,000 psi, whichever is less
Vacuum service: 15 psig, ±15 psig, 100 psig, 200 psig, 15 psia, 30 psia, 100 psia

Temperature Ranges
Compensated: 32 to 158°F (0 to 70°C)
Storage: –40 to 203°F (–40 to 95°C)
Operating: –40 to 180°F (–40 to 82°C)

- *±0.25% Test Gauge Accuracy*
- *316L Stainless Steel Sensor*
- *All Metal Housing*

FM C US APPROVED

MADE IN USA

Quick Link
cecomp.com/is

Ranges and Resolution — * -HA option not available

psig vacuum	Res	inHg pressure	Res	ftH2O pressure	Res	mbar vac-press.	Res	kPa pressure	Res	kg/cm² vac-press.	Res
15PSIVAC*	0.01	400INHGG	1	230FTH2OG*	1	±1000MBARVAC*	1	20KPAG*	0.01	±1KGCMVAC*	0.001
psi absolute	Res	600INHGG	1	480FTH2OG	1	mbar pressure	Res	35KPAG*	0.1	7KGCMVAC*	0.01
15PSIA	0.01	1000INHGG	1	700FTH2OG	1	200MBARG*	0.1	100KPAG	0.1	14KGCMVAC*	0.01
30PSIA	0.1	2000INHGG	1	1150FTH2OG	1	350MBARG*	1	200KPAG	0.1	kg/cm² pressure	Res
100PSIA	0.1	oz/in² vacuum	Res	Torr absolute	Res	1000MBARG	1	400KPAG	1	1KGCMG	0.001
psig vac-press.	Res	240ZINVAC*	1	760TORRA	1	2000MBARG	1	700KPAG	1	2KGCMG	0.001
±15PSIVAC*	0.1	oz/in² absolute	Res	1600TORRA	1	bar vacuum	Res	1400KPAG	1	4KGCMG	0.01
100PSIVAC*	0.1	240ZINA	1	mmHg vacuum	Res	1BARVAC*	0.001	2000KPAG	1	7KGCMG	0.01
200PSIVAC*	0.1	480ZINA	1	760MMHGVAC*	1	bar absolute	Res	MPa vac-press.	Res	14KGCMG	0.01
psig pressure	Res	1600ZINA	1	mmHg absolute	Res	1BARA	0.001	0.7MPAVAC*	0.001	20KGCMG	0.01
3PSIG*	0.01	oz/in² vac-press.	Res	760MMHGA	1	2BARA	0.001	1.4MPAVAC*	0.001	35KGCMG*	0.1
5PSIG*	0.01	±240ZINVAC*	1	1600MMHGA	1	7BARA	0.01	MPa pressure	Res	70KGCMG	0.1
15PSIG	0.01	1600ZINVAC*	1	mmHg vac-press.	Res	bar vac-press.	Res	0.7MPAG	0.001	140KGCMG	0.1
30PSIG*	0.1	oz/in² pressure	Res	±760MMHGVAC*	1	±1BARVAC*	0.001	1.4MPAG	0.001	200KGCMG	0.1
60PSIG	0.1	50ZING*	0.1	mmHg pressure	Res	7BARVAC*	0.01	2MPAG	0.001	350KGCMG*	1
100PSIG	0.1	80ZING*	0.1	150MMHGG*	0.1	14BARVAC*	0.01	3.5MPAG	0.01	atm vacuum	Res
200PSIG	0.1	240ZING*	1	260MMHGG*	1	bar pressure	Res	7MPAG	0.01	1ATMVAC*	0.001
300PSIG*	1	480ZING	1	760MMHGG	1	1BARG	0.001	14MPAG	0.01	atm absolute	Res
500PSIG	1	960ZING	1	1600MMHGG	1	2BARG	0.001	20MPAG	0.01	1ATMA	0.001
1000PSIG	1	1600ZING	1	mmH2O pressure	Res	4BARG	0.01	35MPAG	0.1	2ATMA	0.001
2000PSIG	1	inH2O vacuum	Res	2000MMH2OG*	1	7BARG	0.01	g/cm² vacuum	Res	7ATMA	0.01
inHg vacuum	Res	400INH2OVAC*	1	cmH2O vacuum	Res	14BARG	0.01	1000GCMVAC*	1	atm vac-press.	Res
30INHGVAC*	0.1	inH2O absolute	Res	1000CMH2OVAC*	1	20BARG	0.01	g/cm² absolute	Res	±1ATMVAC*	0.001
inHg absolute	Res	400INH2OA	1	cmH2O absolute	Res	35BARG*	0.1	1000GCMA*	1	7ATMVAC*	0.01
30INHGA	0.1	850INH2OA	1	1000CMH2OA	1	70BARG	0.1	2000GCMA*	1	14ATMVAC*	0.01
60INHGA	0.1	inH2O vac-press.	Res	2000CMH2OA	1	140BARG	0.1	g/cm² vac-press.	Res	atm pressure	Res
200INHGA	0.1	±400INH2OVAC*	1	cmH2O vac-press.	Res	200BARG	0.1	±1000GCMVAC*	1	1ATMG	0.001
inHg vac-press.	Res	inH2O pressure	Res	±1000CMH2OVAC*	1	350BARG*	1	g/cm² pressure	Res	2ATMG	0.001
±30INHGVAC*	0.1	85INH2OG*	0.1	cmH2O pressure	Res	kPa vacuum	Res	200GCMG*	0.1	4ATMG	0.01
200INHGVAC*	0.1	140INH2OG*	0.1	200CMH2OG*	0.1	100KPAVAC*	0.1	350GCMG*	1	7ATMG	0.01
400INHGVAC*	1	400INH2OG	1	350CMH2OG*	1	kPa absolute	Res	1000GCMG	1	14ATMG	0.01
inHg pressure	Res	850INH2OG	1	1000CMH2OG	1	100KPAA	0.1	2000GCMG	1	20ATMG	0.01
6INHGG*	0.01	ftH2O pressure	Res	2000CMH2OG	1	200KPAA	0.1	kg/cm² vacuum	Res	34ATMG*	0.1
10INHGG*	0.01	7FTH2OG*	0.01	mbar vacuum	Res	700KPAA	1	1KGCMVAC*	0.001	70ATMG	0.1
30INHGG*	0.1	12FTH2OG*	0.01	1000MBARVAC*	1	kPa vac-press.	Res	kg/cm² absolute	Res	140ATMG	0.1
60INHGG	0.1	35FTH2OG*	0.1	mbar absolute	Res	±100KPAVAC*	0.1	1KGCMA	0.001	200ATMG	0.1
120INHGG	0.1	70FTH2OG	0.1	1000MBARA	1	700KPAVAC*	1	2KGCMA	0.001	340ATMG*	1
200INHGG	0.1	140FTH2OG	0.1	2000MBARA	1	1400KPAVAC*	1	7KGCMA	0.01		

How to Specify	Type
DPG2000B *range* **–5** *options*	5 minute shutoff
DPG2000B *range* **–10** *options*	10 minute shutoff
DPG2000B *range* **–30** *options*	30 minute shutoff
DPG2000BBL *range* **–5** *options*	5 minute shutoff, backlit display
DPG2000BBL *range* **–10** *options*	10 minute shutoff, backlit display
DPG2000BBL *range* **–30** *options*	30 minute shutoff, backlit display

Range—see table at left

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

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

Range codes listed as 2, 20, 200, or 2000 display 1.999, 19.99, 199.9, or 1999 respectively.

For ranges requiring 4 digits including 3000 and 5000 psi, see DPG2000B D4 series.

If vacuum gauge requires a minus sign, please specify.

The listed ranges are rounded off.

Options—add to end of model number	
HA	High accuracy, ±0.1% FS ±1 LSD. Not available with 3 psi, 5 psi, bipolar, or vacuum sensors. See table at left for availability.
TP	Top port, gauge port on top of case
PM	Panel mount flange, 4.1" x 4.1"
Accessories—order separately	
RB	Protective rubber boot Highly recommended for all aircraft applications.
NC	5 point NIST traceability certificate, test data and date
CD	5 point factory calibration report, test data and date

RB Rubber Boot

TP top port option with RB Rubber Boot

Example: **DPG2000BBL300PSIG-5**
Battery powered, backlit display, 0-300 psig, 5 minute auto shutoff,
Note: Model number on gauge may vary from part number ordered.

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Instructions — DPG2000B Series

Precautions

Approved Locations

The DPG2000B series is approved for use in the following Hazardous Locations.

IS Class I Div 1 Gp ABCD
T3C Ta = –40ºC to 82ºC; T4 Ta = –40ºC to 66ºC.

CL I Zone 0 AEx/Ex ia IIC
T3 Ta = –40ºC to 82ºC; T4 Ta = –40ºC to 66ºC

Installation

- ✔ Read these instructions before installing the gauge. Configuration may be easier before the gauge is installed. Contact the factory for assistance.
- ✔ Installation instructions must be strictly followed in compliance with Intrinsic Safety National Standard NEC 504 or ANSI/ISA RP 12.6 and the National Electrical Code.
- ✔ Outdoor or wash down applications require a NEMA 4X gauge or installation in a NEMA 4X housing.
- ✔ Use fittings appropriate for the pressure range of the gauge.
- ✔ Due to the hardness of stainless steel, it is recommended that a thread sealant be used to ensure leak-free operation.
- ✔ For contaminated media use an appropriate screen or filter to keep debris out of gauge port.
- ✔ Avoid permanent sensor damage! NEVER insert objects into gauge port or blow out with compressed air.
- ✔ Remove system pressures before removing or installing gauge.
- ✔ Install or remove gauge using a wrench on the hex fitting only. Do not attempt to turn by forcing the housing.

Operation

- ✔ Use within the pressure range indicated on gauge label.
- ✔ Avoid permanent sensor damage! Do not apply vacuum to gauges not designated for vacuum operation.
- ✔ Use only with media compatible with 316L stainless steel.
- ⚠ Gauges are not for oxygen service. Accidental rupture of sensor diaphragm may cause silicone oil inside sensor to react with oxygen.
- ✔ The DPG2000B series gauges must only be operated in specified ambient temperature ranges.

Maintenance

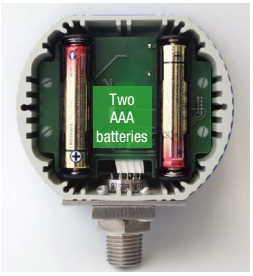
- ✔ The non-metallic cover of the pressure gauge is considered to constitute an electrostatic discharge hazard. Clean only with a damp cloth.
- ✔ Batteries must be replaced when the low battery indication comes on to prevent unreliable readings.
- ✔ WARNING: Replace batteries with approved type in non-hazardous locations only.
- ✔ Approved batteries are two Panasonic LR03 1.5 V AAA alkaline cells. Replace both batteries at the same time.
- ☒ WARNING: Substitution of batteries may impair intrinsic safety. Improper voltages will damage the gauge.
- ✔ WARNING: Substitution of components may impair intrinsic safety. Do not modify the gauge.
- ✔ These products do not contain user-serviceable parts except for batteries. Contact factory for repairs, service, or refurbishment.

Battery Replacement

A low battery indication (either LOBAT or a ⊘ symbol depending on the model) will be shown in the upper left-hand corner of the display when the battery voltage falls sufficiently. The batteries should be replaced when the indicator comes on or unreliable readings may result.

WARNING: Replace batteries with approved type in non-hazardous locations only. Replace batteries with two Panasonic LR03 1.5 V AAA alkaline cells.

Replace both batteries with new ones at the same time. Do not mix different types of batteries. Substitution of components may impair intrinsic safety.



1. Remove the 6 Phillips 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 spring.
3. Discard old batteries properly, do not discard into fire, sources of extreme heat, or in any hazardous manner.
4. Install batteries with correct orientation. The negative (flat) end of each battery should be inserted first facing the battery holder spring.
5. Replace the back cover, including the rubber gasket.

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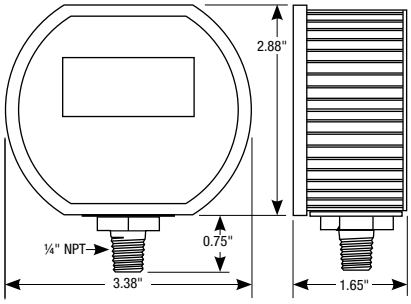
Dimensions



Types of Gauges

Gauge reference reads zero with the gauge port open.

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

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

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

Operation

Press the button on the front of the gauge to activate the display. The pressure readings are then displayed and updated approximately 3 times per second.

The gauge will stay on for a period of time determined by the auto shutoff time. After this time the gauge will automatically shut off to conserve battery life.

Display Backlighting (BL models only)

Display backlighting can be turned on by pressing and holding the front button. When the button is released the display backlighting turns off. Frequent use of the display backlight shortens battery life.

Calibration Preparation

Calibration must only be done in a non-hazardous area. See Installation and Precautions above.

Gauges are calibrated at the factory using equipment traceable to NIST. There is no need to calibrate the gauge prior to use.

Calibration should only be performed by qualified individuals using appropriate calibration standards and procedures.

Contact factory if assistance is required. Gauges can be returned to factory for certified calibration and repairs. NIST traceability is available.

Calibration intervals depend on your quality control program requirements. Many customers use an annual calibration cycle.

The calibration equipment should be at least four times more accurate than the gauge being calibrated.

The calibration system must be able to generate and measure pressure and/or vacuum over the full range of the gauge.

A vacuum pump able to produce a vacuum of 100 microns (0.1 torr or 100 millitorr) or lower is required for vacuum and absolute gauges.

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

It is good practice to install fresh batteries before calibration.

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

Calibration

See calibration preparation section. See rear label of gauge for potentiometer identification model identification and range and pressure range.

Remove calibration label to expose opening with calibration potentiometers. This label may be reused many times if kept clean.

Zero calibration should be done before span calibration.

Zero for gauge reference ranges

With the pressure port open to the ambient, adjust the Zero control until the gauge reads zero, with the "–" sign occasionally flashing.

Zero for absolute reference gauges

Apply full vacuum to the gauge. Adjust the Zero potentiometer for a display indication of zero.

Span for gauge reference pressure gauges and absolute reference gauges

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

Span for gauge reference vacuum gauges

Apply full vacuum to the gauge. Adjust the span potentiometer to match the gauge display to the vacuum indication of the calibrator.

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.

Replace the calibration label.

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