Cecomp® Intrinsically Safe Digital Pressure Gauges w. Memory, Selectable Units — DPG2000B D4 M2, M4, M6, M8 Series

Agency Approval
Factory Mutual Approved Intrinsically Safe for Hazardous Locations
USA & Canada
IS Class I, Division 1, Groups A, B, C, D
T3C Ta = –40°C to 82°C; T4 Ta = –40°C to 66°C
CL I Zone 0 AEx/Ex ia IIC
T3 Ta = –40°C to 82°C; T4 Ta = –40°C to 66°C

Ranges and Resolution
See table below. Select range and default engineering unit.
Units may be changed to any listed under the same sensor range.
Resolution is fixed and limited to available display digits.

Display
3 readings per second nominal display update rate
4 digit LCD, 0.5" H and 5 character 0.25" H alphanumeric
BL: red LED backlight with ambient light sensor

Accuracy
Accuracy includes linearity, hysteresis, repeatability
Standard accuracy: ±0.25% of full scale ±1 least significant digit
HA accuracy option: ±0.1% FS ±1 LSD, see ranges for availability
Sensor hysteresis: ±0.015% FS, included in accuracy
Sensor repeatability: ±0.01% FS, included in accuracy

Memory Options
M2: Min/max readings
M4: 4 max. readings, MEM 1 ~ MEM 4, or LF, RF, RR, LR tires
M6: 6 max. readings, MEM 1 ~ MEM 6, or NLG 1, NLG 2, MLG 1, MLG 2, MLG 3, MLG 4 for aircraft landing gear
M8: 8 max. readings, MEM 1 ~ MEM 8

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 symbol on display when batteries need replacement

Auto Shutoff
Default 5 minutes, or as ordered
User selectable 1 minute to 8 hrs or on/off

Controls and Functions
3 button keypad powers gauge on/off, zeros display (gauge reference only), stores readings. Pass code protection for engineering units, auto shutoff time, memory functions, calibration. Internal lockout switch to disable setup and calibration.
BL: Keypress activates backlighting for 1 min. if low light detected

Calibration
Non-interactive zero, span, and linearity, ±10% of range

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
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
2 X pressure range for 3 psi to 2000 psi sensors
5000 psig for ranges using 3000 psig sensor
7500 psig for ranges using 5000 psig sensor
Over-range display 112.5% FS: *I – – –* or *I –.–.–.–*
Vacuum service: 15 psig, 15 psia, 30 psia, 100 psig, 100 psia, 200 psig
Under-range display (non-vacuum sensors): *–Err*
Burst: 4 X sensor pressure rating or 10,000 psi, whichever is less

Environmental

Storage temperature:	–40 to 203°F (–40 to 95°C)
Operating temperature:	–4 to 185°F (–20 to 85°C)
Compensated temperature:	32 to 158°F (0 to 70°C)

- *±0.25% Test Gauge Accuracy, ±0.1% Optional*
- *316L Stainless Steel Wetted Parts*
- *Keypad Selectable Units and Auto Shutoff Times*
- *Store Readings in Memory*

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Quick Link: cecomp.com/is

How to Specify	Type
DPG2000B *range* - **D4-M2** - *time - options*	Min/max memory
DPG2000BBL *range* - **D4-M2** - *time - options*	Min/max memory, backlit display
DPG2000B *range* - **D4-M4** - *time - options*	4 memory
DPG2000BBL *range* - **D4-M4** - *time - options*	4 memory, backlit display
DPG2000B *range* - **D4-M6** - *time - options*	6 memory
DPG2000BBL *range* - **D4-M6** - *time - options*	6 memory, backlit display
DPG2000B *range* - **D4-M8** - *time - options*	8 memory
DPG2000BBL *range* - **D4-M8** - *time - options*	8 memory, backlit display

Range—See table at left. Select a range code for default units. Please specify if vacuum gauge requires a minus sign.

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

G gauge reference pressure — VAC gauge reference vacuum
CPD inHg vac / psig pressure — A absolute reference

Time—auto shutoff time	
5	5 minutes. Default if not specified.
10	10 minutes
30	30 minutes
ON	No auto shutoff. On/off via front button.
xH	Custom shutoff time where x = up to 8 hours
Options—add to end of model number. See price list for details.	
HA	High accuracy, ±0.1% FS ±1 LSD. See range table.
PM	Panel mount, 4.1" x 4.1"
TP	Top port, gauge port on top of case
CD	Calibration data; 5 test points and date
NC	NIST traceability documentation, 5 points and date

TP Top gauge port. Primarily used with tire pressure applications. Shown with optional rubber boot.

Accessories—order separately

RB High visibility orange rubber boot protects gauge for portable applications.

GP Zippered nylon gauge pouch with carabiner belt clip. Fits any battery powered gauge including gauge with rubber boot.

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

CON14SS Quick connector to install or remove gauge without tools. 304 stainless steel, urethane seal.

Sensor Ranges and Engineering Units		* -HA option not available		Range codes are rounded off					
3 psig *	**Res**	**15 psig vac ***	**Res**	**30 psia**	**Res**	**–15V100psig ***	**Res**	**300 psig**	**Res**
3PSIG	.001	100KPAVAC	.1	2KGCMA	.001	100PSIVAC	.1	300PSIG	.1
6INHGG	.001	0.1MPAVAC	.0001	2ATMA	.001	100PSICPD	.1	610INHGG	.1
85INH2OG	.1	1BARVAC	.001	**30 psig**	**Res**	200INHGVAC	.1	4800ZING	1
50ZING	.01	1KGCMVAC	.01	30PSIG	.01	2770INH2OVAC	1	700FTH2O	.1
210GCMG	.1	1ATMVAC	.001	60INHGG	.01	1600ZINVAC	1	2000KPAG	1
150MMHGG	.1	**15 psig**	**Res**	850INH2OG	1	5200MMHGVAC	1	2MPAG	.001
150TORRG	.1	15PSIG	.01	480ZING	.1	5200TORRVAC	1	20BARG	.01
200MBARG	.1	30INHGG	.01	2100GCMG	1	700KPAVAC	1	20KGCMG	.01
200CMH2OG	.1	400INH2OG	.1	1600MMHGG	1	0.7MPAVAC	.001	20ATMG	.01
2000MMH2OG	1	240ZING	.1	1600TORRG	1	7BARVAC	.01	**500 psig**	**Res**
7FTH2O	.001	1000GCMG	1	2000MBARG	1	7KGCMVAC	.01	500PSIG	.1
20KPAG	.01	760MMHGG	.1	2100CMH2OG	1	7ATMVAC	.01	1020INHGG	1
5 psig *	**Res**	760TORRG	.1	70FTH2O	.01	**100 psig**	**Res**	1150FTH2O	1
5PSIG	.001	1000MBARG	1	200KPAG	.1	100PSIG	.1	3500KPAG	1
10INHGG	.01	1000CMH2OG	1	0.2MPAG	.0001	200INHGG	.1	3.5MPAG	.001
140INH2OG	.1	35FTH2O	.01	2BARG	.001	2770INH2OG	1	35BARG	.01
80ZING	.1	100KPAG	.1	2KGCMG	.001	1600ZING	1	35KGCMG	.01
350GCMG	.1	0.1MPAG	.0001	2ATMG	.001	7000GCMG	1	35ATMG	.01
260MMHGG	.1	1BARG	1	**60 psig**	**Res**	5200MMHGG	1	**1000 psig**	**Res**
260TORRG	.1	1KGCMG	1	60PSIG	.01	5200TORRG	1	1000PSIG	1
350MBARG	.1	1ATMG	1	120INHGG	.1	7000MBARG	1	2040INHGG	1
350CMH2OG	.1	**±15 psig ***	**Res**	1660INH2OG	1	7000CMH2OG	1	2300FTH2O	1
3500MMH2OG	1	±15PSIVAC	.01	960ZING	1	230FTH2O	.1	7000KPAG	1
12FTH2O	.01	15PSICPD	.01	4200GCMG	1	700KPAG	.1	7MPAG	.001
35KPAG	.01	±30INHGVAC	.01	3100MMHGG	1	0.7MPAG	.0001	70BARG	.01
15 psia	**Res**	±400INH2OVAC	1	3100TORRG	1	7BARG	.001	70KGCMG	.01
15PSIA	.01	±240ZINVAC	.1	4100MBARG	1	7KGCMG	.001	70ATMG	.01
30INHGA	.01	±1000GCMVAC	1	4200CMH2OG	1	7ATMG	.001	**2000 psig**	**Res**
400INH2OA	.1	±760MMHGVAC	1	140FTH2O	.1	**–15V200 psig ***	**Res**	2000PSIG	1
240ZINA	.1	±760TORRVAC	1	400KPAG	.1	200PSIVAC	.1	4070INHGG	1
1000GCMA	1	±1000MBARVAC	1	0.4MPAG	.0001	200PSICPD	.1	4600FTH2O	1
760MMHGA	.1	±1000CMH2OVAC	1	4BARG	.001	400INHGVAC	.1	14MPAG	.01
760TORRA	.1	±100KPAVAC	.1	4KGCMG	.001	5500INH2OVAC	1	140BARG	.1
1000MBARA	1	±0.1MPAVAC	.0001	4ATMG	.001	3200ZINVAC	1	140KGCMG	.1
1000CMH2OA	1	±1BARVAC	.001	**100 psia**	**Res**	1400KPAVAC	1	140ATMG	.1
100KPAA	.1	±1KGCMVAC	.001	100PSIA	.1	1.4MPAVAC	.001	**3000 psig**	**Res**
0.1MPAA	.0001	±1ATMVAC	.001	200INHGA	.1	14BARVAC	.01	3000PSIG	1
1BARA	.001	**30 psia**	**Res**	2770INH2OA	1	14KGCMVAC	.01	6100INHGG	1
1KGCMA	.001	30PSIA	.01	1600ZINA	1	14ATMVAC	.01	6900FTH2O	1
1ATMA	.001	60INHGA	.01	7000GCMA	1	**200 psig**	**Res**	20MPAG	.01
15 psig vac *	**Res**	850INH2OA	1	5200MMHGA	1	200PSIG	.1	200BARG	.1
15PSIVAC	.01	480ZINA	.1	5200TORRA	1	400INHGG	.1	200KGCMG	.1
30INHGVAC	.01	2100GCMA	1	7000MBARA	1	5500INH2OG	1	200ATMG	.1
400INH2OVAC	.1	1600MMHGA	1	7000CMH2OA	1	3200ZING	1	**5000 psig**	**Res**
240ZINVAC	.1	1600TORRA	1	700KPAA	.1	480FTH2O	.1	5000PSIG	1
1000GCMVAC	1	2000MBARA	1	0.7MPAA	.0001	1400KPAG	1	35MPAG	.01
760MMHGVAC	.1	2100CMH2OA	1	7BARA	.001	1.4MPAG	.001	350BARG	.1
760TORRVAC	.1	200KPAA	.1	7KGCMA	.001	14BARG	.01	350KGCMG	.1
1000MBARVAC	1	0.2MPAA	.0001	7ATMA	.001	14KGCMG	.01	340ATMG	.1
1000CMH2OVAC	1	2BARA	.001			14ATMG	.01		

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

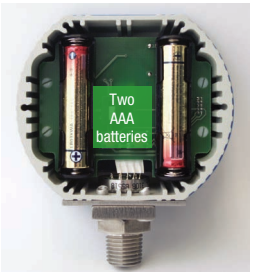
- ✔ The non-metallic cover of the pressure gauge is considered to constitute an electrostatic discharge hazard. Clean only with a damp cloth.
- ✔ Batteries must be replaced when the low battery indication comes on to prevent unreliable readings.
- ✔ WARNING: Replace batteries with approved type in non-hazardous 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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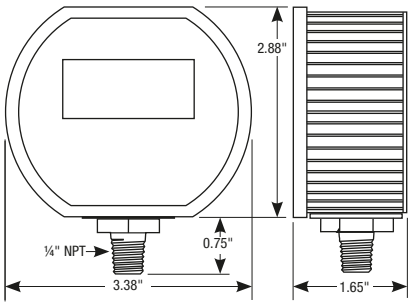
Dimensions



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.

Compound ranges read vacuum in inHg, positive pressure in psig, 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

Power-Up

Press and hold the center power button for approximately 1 second.

The display is tested, the full-scale range is indicated, and the display segments are briefly shown again.

The actual pressure and units are displayed. The gauge is ready for use.

Operation—continued

Zero the Display

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

Be sure the gauge port is exposed to normal atmospheric pressure and no pressure is applied. The zeroing function is only used at power-up and the zero correction is erased when the gauge is shut off.

Press Zero/Clear button until *0000* is displayed and then release the button. The gauge in now zeroed.

Attempting to zero the gauge with greater than approximately 3% of full-scale pressure or vacuum will result in an error indication of *Err 0* alternately displayed with the reading. Press the Zero/Clear button to reset the error condition.

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 and restarts whenever a button is pushed. Gauges configured as on/off must be shut off using the power button.

If excessive vacuum is applied to a pressure-only gauge, the display will indicate *-Err* until the vacuum is released.

Applying vacuum to a pressure-only gauge may damage the sensor. Excessive pressure (112.5% over range), will cause an out-of-range indication of *I – – – –* or *I.–.–.–* depending on model.

Display Backlighting (BL Option Only)

Display backlighting will operate when a button is pressed or held provided the front light sensor detects low ambient light levels.

Display backlighting will turn on for one minute and then shut off.

Backlighting may not be apparent under some lighting conditions.

Operation—continued

Memory

M2 displays captured minimum and maximum readings. Min and/or max may be turned off in user configuration.

M4 displays MEM 1, MEM 2, MEM 3, MEM 4. For tire pressure they may be set up to read RF, RR, LR, LF in any order.

M6 displays MEM 1, MEM 2, MEM 3, MEM 4, MEM 5, MEM 6. For 6-tire aircraft it may be set up to read NLG 1, NLG 2, MLG 1, MLG 2 MLG 3, MLG4 in any order.

M8 displays MEM 1 up to MEM 8. M8 labels are not configurable, but 2 to 8 memory locations can be enabled in setup.

Press and release the Memory button to view memory locations.

To store a reading, briefly press the center button while the desired memory location is displayed. The gauge is in the peak hold mode when the readings are captured.

To clear a respective memory location, press Zero/Clear button and release when *c l r* is displayed .

Press and release the center button to return to normal operation.

Shut-Down

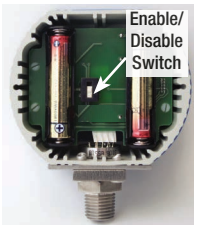
To shut off the gauge manually at any time, press and hold the center button until the display indicates *OFF* (about 5 seconds).

When an auto shutoff timer is used, the display indicates *OFF* five seconds prior to shutoff. Press any button to keep the gauge on.

The auto shutoff and backlight (if equipped) timers are reset whenever a button is pressed and released.

If the gauge set up without auto shutoff (on/off operation) it will stay on until manually shut off or until the batteries are depleted. Turn gauge off when not in use to conserve batteries.

User Configuration



Configuration must only be done in a non-hazardous area.

Remove the 6 Phillips screws on the back of the unit and remove the rear cover.

Move the switch on the circuit board to the ENABLE position.

The front keypad ▲ UP and ▼ DOWN buttons are used to increment settings up or down.

User Configuration Access

With the gauge off, press and hold the ▲ UP button. Then press the center power button. Release all buttons when the display indicates *CFG* and the program version. Then the full-scale range is indicated and the display is tested.

The display then indicates _ _ _ _ with the first underscore blinking, with *CFGPC* (configuration pass code) on the lower display.

Note: The gauge will automatically revert to normal operation if no buttons are pressed for approximately 15 seconds. To cancel and return to normal operation, press and release the front button without entering any pass code characters.

User Configuration Pass Code Entry

The factory default is 3510, but this may be changed by the user under the Pass Code Configuration section. If an incorrect pass code is entered, the gauge will return to the start of the pass code entry sequence.

1. Use the ▲ UP or ▼ DOWN buttons to set the first digit to 3.
2. Press and release the front button to move to the next position. The 3 will remain, and the second position will be blinking.
3. Use the ▲ UP or ▼ DOWN buttons to select 5.
4. Press and release the front button to index to the next position. 35 will remain, and the third position will be blinking.
5. Use the ▲ UP or ▼ DOWN buttons to select 1.
6. Press and release the front button to index to the next position. 351 will remain, and the fourth position will be blinking.
7. Use the ▲ UP or ▼ DOWN buttons to select 0.
8. Press and release the front center button to proceed.

Factory/User Configuration

This gives the choice of resetting the gauge features to the factory settings or continuing with user configuration.

The upper display section will be blank, and the lower section will display either *USER_* or *FCTRY*.

If *FCTRY* is selected, the existing user configuration will be replaced by the original factory configuration.

To select *FCTRY*, press and release the ▲ UP button.

With *FCTRY* displayed press and release the front button to restore the factory configuration and restart the gauge.

If *USER_* is selected, the user configuration can be modified as described in the following steps.

To select *USER_*, press and release the ▼ DOWN button.

The lower display will indicate.

With *USER_* displayed press and release the front center button to continue.

The configuration parameters vary depending on the model. Go to the appropriate section for your gauge.

Configuration

Gauge Type Configuration

This will only appear with 15, 100, or 200 psig ranges that were originally ordered as compound gauges.

Use the ▲ and ▼ buttons to select from the following:

-/+EU	Vacuum is indicated as negative pressure in the selected engineering units
CMPND	Vacuum is negative INHG, pressure is PSIG

When the desired configuration is displayed, press and release the center button to save your selection and move to the next parameter.

Units Selection

The upper display will be blank with the engineering units in the lower display.

Use the ▲ and ▼ buttons to navigate through the list of engineering units. Available engineering units depend on the sensor range.

When the desired units are displayed, press and release the center button to save your selection and move to the next parameter.

Auto Shutoff Time

The auto shutoff time is displayed on the upper display. The lower display will indicate *AST M* if the time displayed is in minutes or *AST H* if it is in hours.

Use the ▲ and ▼ buttons to select 0 (manual shutoff), 1, 2, 5, 10, 15, 20 or 30 minutes, or 1, 2, 4, or 8 hours.

A setting of zero disables the auto shutoff timer. This requires using the center power button to shut the gauge off.

If the gauge was ordered with a custom shutoff time it will become unavailable if the time is changed. Reset the gauge to the original factory configuration as described previously to restore the custom time.

When the desired shutoff time is displayed, press and release the center button to save your selection and move to the next parameter.

Max/Min Memory Configuration M2 Versions

Use the ▲ and ▼ buttons to select from the following:

MX/MN	Both highest and lowest values will be captured
MX/--	Only highest value will be captured
--/MN	Only lowest value will be captured
--/--	Capture feature is disabled

Press and release the center button to move to the next parameter.

The upper display section will indicate *c l r* .

Use the ▲ and ▼ buttons to select from the following:

AUTO	Automatically clear max. and min. values when the gauge is powered off
MAN	Manually clear max. and min. values

Press and release the center button to move to the next parameter.

Memory Configuration M4 Version

The M4 version allows recording up to four readings. While in the memory mode the peak reading is captured.

The number 1 is shown on the upper display. The lower display will indicate the label for memory 1.

Use the ▲ and ▼ buttons to select the desired label: *MEM 1*, *LR* (left rear), *RR* (right rear), *RF* (right front), or *LF* (left front).

Each of the memory locations may be renamed as desired in any sequence. Care should be taken to avoid duplicates or omissions.

When the desired label for memory 1 is displayed, press the center button. Repeat the steps for the other memory locations.

When the desired label for memory 4 is displayed, press and release the center button to save the user configuration and restart the gauge.

Configuration—continued

Memory Configuration M6 Version

The M6 version allows recording up to six readings. While in the memory mode the peak reading is captured.

The number 1 is shown on the upper display. The lower display will indicate the label for memory 1.

Use the ▲ and ▼ buttons to select the desired label: The six memory locations named MEM 1 through MEM 6 may be renamed as follows for aircraft landing gear applications.

NLG 1	Nose landing gear tire 1
NLG 2	Nose landing gear tire 2
MLG 1	Main landing gear tire 1
MLG 2	Main landing gear tire 2
MLG 3	Main landing gear tire 3
MLG 4	Main landing gear tire 4

Each of the memory locations may be renamed as desired in any sequence. Care should be taken to avoid duplicates or omissions.

When the desired label for memory 1 is displayed, press and release the center button. Repeat the steps for the other memory locations.

When the desired label for memory 6 is displayed, press and release the center button to save the user configuration and restart the gauge.

M8 Version

The M8 version allows recording of up to eight pressure readings. While in the memory mode the peak reading is captured.

The eight memory locations named MEM 1 through MEM 8. Use the ▲ and ▼ buttons to either enable or disable the memory locations. The labels are factory set and no user configuration is required.

Save and Exit User Configuration

After the last parameter is configured and the gauge has restarted, move the switch on the circuit board to the DISABLE position and replace the rear cover including the rubber gasket. The gauge is ready for use with the new configuration.

Calibration Preparation

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

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 model identification and range.

Remove the 6 Phillips screws on the back of the unit and remove the rear cover.

Move the switch on the circuit board to the ENABLE position.

Use the front keypad buttons ▲ as UP and ▼ as DOWN.

Entering Calibration Mode

With the gauge off, press and hold the ▼ DOWN button, then press the center power button.

Release all buttons when the display indicates *CAL*.

The display begins by indicating the full-scale positive pressure rating of the gauge in the engineering units as configured by the factory, and then shows all display segments.

Before the gauge enters the calibration mode, the display initially indicates _ _ _ _ with the first underscore blinking, with *CALPC* (calibration pass code) on the lower display.

Note: The gauge will automatically revert to normal operation if no buttons are operated for approximately 15 seconds. To cancel and return to normal operation, press and release the power button without entering any pass code characters.

Enter the pass code as described in the User Configuration Pass Code Entry section. The default is 3510, but this is user changeable.

Calibration Mode

The gauge remains in the calibration mode until restarted manually or power is removed. Features not related to calibration are disabled.

The calibration may be performed in any of the available engineering units as well as percent (PCT). Compound range models are set for the same engineering units for pressure and for vacuum.

For greatest calibration accuracy, use the ▲ UP and ▼ DOWN buttons to select engineering units with highest number of display counts.

Press and release the center power button when the desired engineering units are displayed.

Calibration—continued

Sensor	Suggested units for calibration
3 PSI	3.000 PSI
5 PSI	5.000 PSI
15 PSI	775.7 MMHG (TORR)
30 PSI	69.20 FTH2O
60 PSI	60.00 PSI
100 PSI	7.031 KG/CM2
200 PSI	407.2 INHG
300 PSI	610.8 INHG
500 PSI	500.0 PSI
1000 PSI	70.31 KG/CM2
3000 PSI	6108 INHG
5000 PSI	5000 PSI
Any	100.00 PCT (percent)

The display will then indicate the currently applied pressure in the engineering units selected for calibration.

▲ UP and ▼ DOWN Button Operation

Each time one of the up or down buttons is pressed and released quickly, a small change is made to the digitized pressure signal. It may take more than one of these small changes to result in a single digit change on the display.

To make larger changes, press and hold the appropriate up or down button. After about one second, the display will begin to change continuously. Release the button to stop. Then make fine adjustments by pressing and quickly releasing the appropriate button.

Gauge Reference Pressure Gauges

Apply zero pressure by venting the gauge port to atmosphere. The character display will alternate between *ZERO* and *CAL*.

Press the ▲ UP and ▼ DOWN buttons to obtain a zero indication on the gauge display.

Apply full-scale pressure. The character display will alternate between *+SPAN* and *CAL*.

Press the ▲ UP and ▼ DOWN buttons to match the gauge display to the full-scale pressure reading on the calibrator.

Apply 50% full-scale pressure. The character display will alternate between *+MID* and *CAL*.

Press the ▲ UP and ▼ DOWN buttons to match the gauge display to the 50% of full-scale pressure on the calibrator.

Gauge Reference Vacuum Gauges

Apply zero pressure by venting the gauge port to atmosphere. The character display will alternate between *ZERO* and *CAL*.

Press the ▲ UP and ▼ DOWN buttons to obtain a zero indication on the gauge display.

Apply full-scale vacuum. The character display will alternate between *+SPAN* and *CAL*.

Press the ▲ UP and ▼ DOWN buttons to match the gauge display to the full-scale vacuum indication on the calibrator.

Apply 50% full-scale vacuum. The character display will alternate between *+MID* and *CAL*.

Press the ▲ UP and ▼ DOWN buttons to match the gauge display to the 50% of full-scale vacuum indication on the calibrator.

Absolute Reference Gauges

Apply full vacuum. The character display will alternate between *ZERO* and *CAL*.

Press the ▲ UP and ▼ DOWN buttons until the display indicates zero.

Apply full-scale pressure. The character display will alternate between *+SPAN* and *CAL*.

Press the ▲ UP and ▼ DOWN buttons to match the gauge display to the full-scale pressure reading on the calibrator.

Apply 50% of full-scale pressure. The lower display will alternate between *+MID* and *CAL*.

Press the ▲ UP and ▼ DOWN buttons to match the gauge display to the 50% of full-scale reading on the calibrator.

Compound and Bipolar Gauges

In addition to the steps described above for pressure gauges, apply full-scale vacuum. The character display will alternate between *-SPAN* and *CAL*.

Calibration—continued

Press the ▲ UP and ▼ DOWN buttons to match the gauge display to the full-scale vacuum reading on the calibrator.

For bipolar (±) and –30.00inHg/+15.00psig compound range models only, apply 50% full-scale vacuum. The character display will alternate between *-MID* and *CAL*.

Press the ▲ UP and ▼ DOWN buttons to match the gauge display to the 50% of full-scale vacuum on the calibrator.

Save Calibration

Once the adjustments are complete, press and hold the center button until the display indicates - - - - then release the button to store the calibration parameters in non-volatile memory and restart the gauge.

Verify the pressure indications at 0%, 25%, 50%, 75% and 100% of full scale.

Move the switch on the circuit board to the DISABLE position.

Replace the back cover, including the rubber gasket.

User Pass Code

User-defined pass code configuration allows changing of the factory 3510 pass code to new value for configuration and calibration.

Configuration must only be done in a non-hazardous area.

Remove the rear 6 Phillips screws and remove the rear cover.

Move the switch on the circuit board to the ENABLE position.

Single button versions have internal UP and DOWN buttons located on the circuit board.

Three button versions use the front keypad ▲ as UP and ▼ as DOWN. Operation of both versions is the same except for the location of the buttons.

View Or Change User Configuration Pass Code

With the unit off, press and hold the ▲ UP button, then press the power button. Release all buttons when the display indicates *CFG*.

View Or Change User Calibration Pass Code

With the unit off, press and hold the ▼ DOWN button, then press the power button. Release all buttons when *CAL* is shown.

Enter Access Code 1220

Before the unit enters the view or change pass code mode, the display initially indicates _ _ _ _ with the first underscore blinking, and with *CFGPC* or *CALPC* on the character display.

Note: The gauge will automatically revert to normal operation if no buttons are operated for approximately 15 seconds.

To cancel and return to normal operation, press and release the POWER button without entering any pass code characters.

Use the ▲ UP and ▼ DOWN, and center buttons to enter the 1220 pass code.

Press and release the power button to proceed.

Note: If an incorrect access code was entered, the gauge will return to the start of the access code entry sequence.

Once the access code has been entered correctly, the display will indicate the existing user-defined pass code with either *CFGPC* or *CALPC* on the character display.

1. Press the ▲ UP or ▼ DOWN button to select the first character of the new pass code.
2. When the desired first character is displayed, press and release the center power button to move to the next character.
3. Repeat above until the entire pass code is complete.
4. To exit, press and hold the center power button. Release the button when the display indicates - - - - to restart the gauge.
5. Move the switch on the circuit board to the DISABLE position.
6. Replace the back cover, including the rubber gasket.