MGF16BN Battery-Powered Digital Pressure Gauges

- **±0.25% Test Gauge Accuracy**
- **316L Stainless Steel Wetted Parts**
- **NEMA 4X**
- **Capture Minimum and Maximum Readings**
- **Push Button Zero**
- **Selectable Engineering Units**
- **Selectable Auto Shutoff Times**

The Meriam Instrument MGF16BN digital pressure gauge successfully addresses the modern demands of process pressure measurement. Pressure ranges are available to 5,000 PSIG at standard accuracy of ±0.25% of full scale and optional accuracy of ±0.1% of full scale. Compound gauges that can be used for positive pressure measurements and vacuum measurements are also available.

The display is a 4 digit LCD with 0.5" high numerals and a lower alphanumeric display for engineering units and to aid in set up. Each gauge includes up to 15 field selectable engineering units depending on the sensor range.

Other standard features include min/max capture, zeroing, pass code program lock-out, adjustable display shutoff time and field recalibration. The housing is ABS/polycarbonate and is NEMA 4X rated. Wetted components are 316L stainless steel for compatibility with many process fluids. Process connection is via a 1⁄4" MNPT 316L stainless steel fitting. The gauge is powered by two AA alkaline batteries.

Typical applications are instrumentation and control in the process industries, hydraulics, pneumatics, industrial gases, and OEMs.

ACCURACY
Standard: ±0.25% of full scale ±1 least significant digit
includes linearity, hysteresis, repeatability
Optional: -HA ±0.1% FS ±1 LSD
-NC NIST traceable test report and calibration data

DISPLAY
3 readings per second nominal display update rate
4 digit LCD, 0.5" H, 5 character 0.25" H alphanumeric lower display

CONTROLS & FUNCTIONS
Center button turns gauge on or off, zeros gauge, and cycles through min/max functions
▲ (Units) Increase settings, selection of engineering units
▼ (Time) Decrease settings, selection of auto shutoff times

CALIBRATION
Pass code protected calibration
Non-interactive zero, span, and linearity, ±10% of range

AUTOMATIC SHUTOFF
5 minute default
User selectable times ranging from 1 minute to 8 hours or front button on/off

POWER
2 AA alkaline batteries
Approximately 2000 hours battery life
Low battery symbol on display when batteries must be replaced

WEIGHT
Gauge: 9 ounces (approximately)
Shipping weight: 1 pound (approximately)

MATERIAL
ABS/polycarbonate NEMA 4X case, rear gasket, polycarbonate label

CONNECTION SIZE
1/4" NPT male, 316L SS

MATERIAL, MEDIA COMPATIBILITY
All wetted parts are 316L SS, compatible with most liquids and gases

OVERPRESSURE
3000 psig range: 5000 psig
5000 psig range: 7500 psig
All others: 2 x pressure range
112.5% FS out-of-range display: 1– – – or 1–.–.–.– depending on model

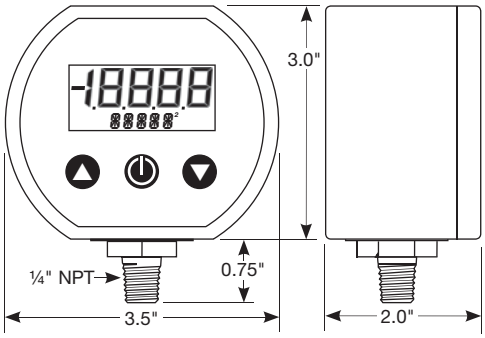
BURST PRESSURE
4 times sensor pressure rating, or 10,000 psi, whichever is less

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)

RANGES	±0.25% FS MODELS	±0.1% FS MODELS	SELECTABLE ENGINEERING UNITS
–30.0 inHg to 15.0 PSIG	**MGF16BN–30V15PSIG**		InHg/PSI, can be user reconfigured as a bipolar gauge with selectable units
–30.0 inHg to 100.0 PSIG	**MGF16BN–30V100PSIG**		InHg/PSI, can be user reconfigured as a bipolar gauge with selectable units
–30.0 inHg to 200.0 PSIG	**MGF16BN–30V200PSIG**		InHg/PSI, can be user reconfigured as a bipolar gauge with selectable units
0 - 5.000 PSIG	**MGF16BN5PSIG**	**MGF16BN5PSIG-HA**	PSIG, kPa, mbar, bar, atm, kg/cm², g/cm², cmH$_2$O, oz/in², ftH$_2$O, inH$_2$O, mmHg, torr, mmH$_2$O, inHg
0 - 15.00 PSIG	**MGF16BN15PSIG**	**MGF16BN15PSIG-HA**	PSIG, kPa, MPa, mbar, bar, atm, kg/cm², g/cm², cmH$_2$O, oz/in², ftH$_2$O, inH$_2$O, mmHg, torr, inHg
0 - 60.00 PSIG	**MGF16BN60PSIG**	**MGF16BN60PSIG-HA**	PSIG, kPa, MPa, mbar, bar, atm, kg/cm², g/cm², cmH$_2$O, oz/in², ftH$_2$O, inH$_2$O, mmHg, torr, inHg
0 - 100.0 PSIG	**MGF16BN100PSIG**	**MGF16BN100PSIG-HA**	PSIG, kPa, MPa, mbar, bar, atm, kg/cm², g/cm², cmH$_2$O, oz/in², ftH$_2$O, inH$_2$O, mmHg, torr, inHg
0 - 200.0 PSIG	**MGF16BN200PSIG**	**MGF16BN200PSIG-HA**	PSIG, kPa, MPa, bar, atm, kg/cm², oz/in², ftH$_2$O, inH$_2$O, inHg
0 - 300.0 PSIG	**MGF16BN300PSIG**	**MGF16BN300PSIG-HA**	PSIG, kPa, MPa, bar, atm, kg/cm², oz/in², ftH$_2$O, inHg
0 - 500.0 PSIG	**MGF16BN500PSIG**	**MGF16BN500PSIG-HA**	PSIG, kPa, MPa, bar, atm, kg/cm², ftH$_2$O, inHg
0 - 1000 PSIG	**MGF16BN1000PSIG**	**MGF16BN1000PSIG-HA**	PSIG, kPa, MPa, bar, atm, kg/cm², ftH$_2$O, inHg
0 - 2000 PSIG	**MGF16BN2000PSIG**	**MGF16BN2000PSIG-HA**	PSIG, MPa, bar, atm, kg/cm², ftH$_2$O, inHg
0 - 3000 PSIG	**MGF16BN3000PSIG**	**MGF16BN3000PSIG-HA**	PSIG, MPa, bar, atm, kg/cm², ftH$_2$O, inHg
0 - 5000 PSIG	**MGF16BN5000PSIG**	**MGF16BN5000PSIG-HA**	PSIG, MPa, bar, atm, kg/cm²
Optional for all Models	**NC**	**NC**	NIST traceability certificate with 5 test points and data

MGF16BN Instructions

DIMENSIONS



INSTALLATION PRECAUTIONS

- ✔ Read these instructions before installing the gauge. The configuration options may be easier to set up before the gauge is installed.
- ✔ Due to the hardness of 316 stainless steel, it is recommended that a thread sealant be used to ensure leak-free operation.
- ✔ Install or remove gauge using a wrench on the hex fitting only. Do not attempt to turn gauge by forcing the housing.
- ✔ Use fittings appropriate for the pressure range being used.
- ✔ Do not over-pressurize gauge. Do not apply vacuum to gauges not designed for vacuum operation. Check rear label for range.
- ✔ For contaminated media use an appropriate screen or filter to keep debris out of gauge port.
- ✔ NEVER insert objects into the gauge port or blow out with compressed air. Permanent damage will result to the sensor.

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 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 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.
5. Replace the back cover, including the rubber gasket.

RANGES AND SELECTABLE UNITS

The range code is part of the gauge model number and indicates the default range when the gauge is ordered. Consult factory with special requirements or non-standard engineering units.

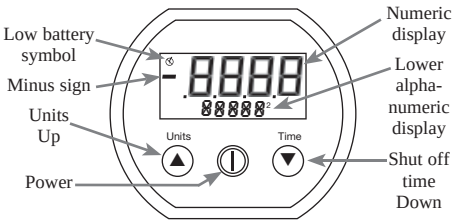
Engineering units may be changed to any of those listed in the model number table as follows.

Engineering unit conversions are calculated from the factory default unit to the newly selected units. For example, a 15 psig model can be changed to read 103.4 kPa.

5PSIG	±15PSIG
0 to 5.000 psig	–14.70 to 15.00 psig
0 to 10.18 inHg	–29.92 inHg to 15.00 psig
0 to 138.4 inH2O	–29.92 to 30.54 inHg
0 to 80.0 oz/in²	–406.9 to 415.2 inH2O
0 to 351.5 g/cm²	–240.0 to 240.0 oz/in²
0 to 258.6 mmHg	–1034 to 1055 g/cm²
0 to 258.6 torr	–760 to 776 mmHg
0 to 344.7 mbar	–760 to 776 torr
0 to .3447 bar	–1013 to 1034 mbar
0 to 351.5 cmH2O	–1.034 to 1.034 bar
0 to 3515 mmH2O	–1034 to 1055 cmH2O
0 to 11.53 ftH2O	–33.91 to 34.60 ftH2O
0 to 34.47 kPa	–101.4 to 103.4 kPa
0 to .3515 kg/cm²	–.1014 to .1034 MPa
0 to .3402 atm	–1.034 to 1.055 kg/cm²
	–1.000 to 1.021 atm

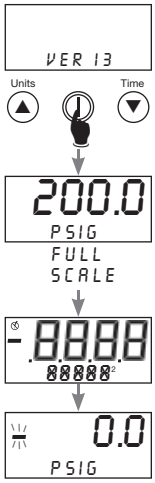
15PSIG	30PSIG
0 to 15.00 psig	0 to 30.00 psig
0 to 30.54 inHg	0 to 61.08 inHg
0 to 415.2 inH2O	0 to 830.4 inH2O
0 to 240.0 oz/in²	0 to 480.0 oz/in²
0 to 1055 g/cm²	0 to 2109 g/cm²
0 to 775.7 mmHg	0 to 1551 mmHg
0 to 775.7 torr	0 to 1551 torr
0 to 1034 mbar	0 to 2068 mbar
0 to 1034 bar	0 to 2.068 bar
0 to 1055 cmH2O	0 to 2109 cmH2O
0 to 34.60 ftH2O	0 to 69.20 ftH2O
0 to 103.4 kPa	0 to 206.8 kPa
0 to .1034 MPa	0 to .2068 MPa
0 to 1.055 kg/cm²	0 to 2.109 kg/cm²
0 to 1.021 atm	0 to 2.041 atm
60PSIG	**100PSIG**
0 to 60.00 psig	0 to 100.0 psig
0 to 122.2 inHg	0 to 203.6 inHg
0 to 1661 inH2O	0 to 2768 inH2O
0 to 960 oz/in2	0 to 1600 oz/in²
0 to 4218 g/cm²	0 to 7031 g/cm²
0 to 3103 mmHg	0 to 5171 mmHg
0 to 3103 torr	0 to 5171 torr
0 to 4137 mbar	0 to 6895 mbar
0 to 4.137 bar	0 to 6.895 bar
0 to 4219 cmH2O	0 to 7031 cmH2O
0 to 138.4 ftH2O	0 to 230.7 ftH2O
0 to 413.7 kPa	0 to 689.5 kPa
0 to .4137 MPa	0 to .6895 MPa
0 to 4.218 kg/cm²	0 to 7.031 kg/cm²
0 to 4.081 atm	0 to 6.805 atm
–15V100PSIG	**–15V200PSIG**
–14.7 to 100.0 psig	–14.7 to 200.0 psig
–29.9 inHg to 100.0 psig	–29.9 inHg to 200.0 psig
–29.9 to 203.6 inHg	–29.9 to 407.2 inHg
–406.9 to 2768 inH2O	–406.9 to 5500 inH2O
–235.2 to 1600 oz/in²	–235.2 to 3200 oz/in²
–760 to 5171 mmHg	–101 to 1379 kPa
–760 to 5171 torr	–.101 to 1.379 MPa
–101 to 689 kPa	–1.00 to 13.79 bar
–.101 to .689 MPa	–1.03 to 14.06 kg/cm²
–1.01 to 6.89 bar	–1.00 to 13.61 atm
–1.03 to 7.03 kg/cm²	–33.91 to 461.3 ftH2O
–1.00 to 6.80 atm	**300PSIG**
–33.91 to 230.7 ftH2O	0 to 300.0 psig
200PSIG	0 to 610.8 inHg
0 to 200.0 psig	0 to 4800 oz/in²
0 to 407.2 inHg	0 to 692.0 ftH2O
0 to 5536 inH2O	0 to 2068 kPa
0 to 3200 oz/in²	0 to 2.068 MPa
0 to 461.3 ftH2O	0 to 20.68 bar
0 to 1379 kPa	0 to 21.09 kg/cm²
0 to 1.379 MPa	0 to 20.41 atm
0 to 13.79 bar	**1000PSIG**
0 to 14.06 kg/cm²	0 to 1000 psig
0 to 13.61 atm	0 to 2036 inHg
500PSIG	0 to 2307 ftH2O
0 to 500.0 psig	0 to 6895 kPa
0 to 1018 inHg	0 to 6.895 MPa
0 to 1153 ftH2O	0 to 68.95 bar
0 to 3447 kPa	0 to 70.31 kg/cm²
0 to 3.447 MPa	0 to 68.05 atm
0 to 34.47 bar	**3000PSIG**
0 to 35.15 kg/cm²	0 to 3000 psig
0 to 35.02 atm	0 to 6108 inHg
2000PSIG	0 to 6920 ftH2O
0 to 2000 psig	0 to 20.68 MPa
0 to 4072 inHg	0 to 206.8 bar
0 to 4613 ftH2O	0 to 210.9 kg/cm²
0 to 13.79 MPa	0 to 204.1 atm
0 to 137.9 bar	**5000PSIG**
0 to 140.6 kg/cm²	0 to 5000 psig
0 to 136.1 atm	0 to 34.47 MPa
	0 to 344.7 bar
	0 to 351.5 kg/cm²
	0 to 340.2 atm

DISPLAY AND KEYPAD



POWER-UP AND NORMAL OPERATION

Your gauge is shipped ready to use. It was factory calibrated just prior to shipment with batteries installed. Please read these instructions and the installation precautions on previous page.



1. Press the center power button.
2. The firmware version is displayed.
3. The gauge pressure range and units that the gauge was originally ordered with are displayed.
4. If changed, the converted pressure range and units that the gauge was last set to are displayed.
5. All display segments are turned on for one second to test the display.
6. The actual pressure and units are displayed. The gauge is ready for use.

Occasional flashing of the minus sign is normal and indicates the gauge is at zero pressure.

The auto shutoff timer starts when the gauge is powered on and resets whenever any button is pressed, unless the gauge shutoff time was set to zero for on/off operation.

POWER-UP AND ZERO THE DISPLAY

The gauge port must be exposed to normal atmospheric pressure with no pressure or vacuum applied.

1. Press and hold the center power button.
2. The firmware version is displayed and then *0000* is displayed.
3. Release the button.
4. The gauge pressure range and units that the gauge was originally ordered with are displayed.
5. If changed, the converted pressure range and units that the gauge was last set to are displayed.
6. All display segments are turned on for one second to test the display.
7. The actual pressure and units are displayed. The gauge is now zeroed and ready for use.

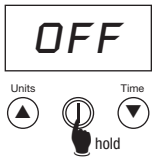
Occasional flashing of the minus sign is normal and indicates the gauge is at zero pressure.

The auto shutoff timer starts when the gauge is powered and resets whenever any button is pressed, unless the gauge shutoff time was set to zero for on/off operation.

The stored zero correction is erased when the gauge is shut off.

SHUT DOWN

To shut off the gauge manually at any time, press and hold the center power button until the display indicates *OFF* and then release. If min/max are enabled, the gauge will cycle through *HI* and *HI/LO/clr* these before displaying *OFF*.



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

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.

MGF16BN Configuration and Calibration Instructions

ERROR OR OUT-OF-RANGE INDICATIONS

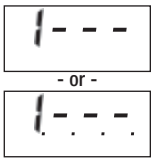
Attempting to zero the gauge with pressure greater than approximately 3% of full-scale pressure or vacuum applied will result in an error condition

The display will alternately indicate *Err 0* and the actual pressure.

The gauge must be powered down to reset the error condition.

If excessive vacuum is applied to a pressure-only gauge, the display will indicate *-Err* 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 *I – – –* or *I.–.–.–* will be displayed depending on model.



ENGINEERING UNIT SELECTION

The selected engineering unit is stored in non-volatile memory and will be retained even with the gauge off or batteries removed. The available engineering units depend on the sensor range, display resolution, and is limited to prevent unwanted reading instability.

With the gauge in the normal operating mode, press and hold the ▲ button until the lower units display starts blinking.

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 power button to save your selection and return to normal operation.

Standard psig units are mathematically converted to the newly selected engineering unit. When the gauge is powered up, the originally configured psig range is displayed and then the conversion with the selected engineering unit is displayed.

Compound (inHg/psig) gauges can be changed to display single-unit vacuum/pressure readings (±psig) when in the user configuration mode.

If no buttons are pressed the gauge will return to normal operating mode in approximately 15 seconds.

AUTO SHUTOFF TIME SELECTION

Auto shutoff time selection is done via the front buttons. The selected shut off time is stored in non-volatile memory and will be retained even with the gauge off or batteries removed.

With the gauge in the normal operating mode, press and hold the ▼ button.

Release the button when the auto shutoff time is displayed on the upper section.

The lower display segments will indicate *AST M* if the time displayed is in minutes, and *AST H* if it in hours.

An auto shutoff time of zero signifies that the auto shutoff feature is disabled. This setting requires using the center power button to shut the gauge off.

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

When the desired auto shutoff time is displayed, press and release the center button to save the selection and return to normal operation.

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 in the following sections to restore the custom time.

MINIMUM AND MAXIMUM READINGS

The gauge can be configured to capture minimum readings, maximum readings or both. If this feature has not already been configured, see the Configuration section.

If configured, minimum and/or maximum readings are stored and updated at the rate of 3 readings per second whenever the gauge is on.

The stored readings can be manually displayed and cleared if desired. The high and low memory is also cleared whenever the gauge shuts off.

Press and hold the center button for about 1 second until *HI* is displayed alternating with the units.

The maximum stored value is displayed.

The display will update with any new maximum readings.

The gauge may be left in this mode to continuously display maximum readings.

Press and hold the center button again for about 1 second until *LO* is displayed alternating with the units.

The minimum stored value is displayed.

The display will update with any new minimum readings.

The gauge may be left in this mode to continuously display minimum readings.

If the gauge is powered up before pressurization the stored minimum reading will typically be zero. To capture a new minimum pressure reading you must first expose the gauge to the normal system pressure and then either cycle the gauge power, or manually clear the stored Hi/Lo readings.

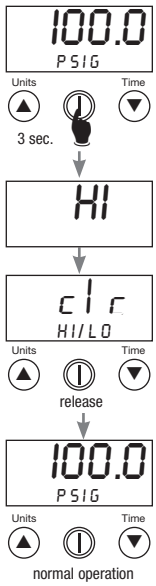
After *LO* is displayed, press and hold the center button again for about 1 second until *AP* (Applied Pressure) is displayed.

The high and low readings are kept in memory and the gauge returns to normal operation with the display indicating the current pressure.

Note that if the center power button is held for more than 4 seconds *OFF* will be displayed and the gauge will shut off.

CLEAR MAXIMUM/MINIMUM READINGS

Press and continue to hold the center button until the display indicates *clr HI/LO* (about 3 seconds total).



Then release the center button.

Both *HI* and *LO* values are cleared.

The gauge returns to the normal mode and displays the current pressure.

Note that if the center power button is held for more than 4 seconds *OFF* will be displayed and the gauge will shut off.

ENTER CONFIGURATION MODE

The gauge is designed to use a 4 digit pass code to enter the configuration modes. This is to prevent unauthorized changing of certain settings.

With the gauge off, press and hold the ▲ button.

Then press the center power button.

Release all buttons when the display indicates *CFG*. The gauge firmware version will also be displayed.

The gauge then goes through the normal power up sequence.

The display prompts for entry of the configuration pass code (*PASS*), with the first underscore blinking.

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 center power button without entering any pass code characters.

ENTER CONFIGURATION PASS CODE

Enter the pass code. 3510 is the factory default, but it is user-modifiable.

Use the ▲ or ▼ buttons to set the left-most digit to *3*.

Press and release the center button to index to the next position. The *3* will remain, and the second position will be blinking.

Use the ▲ or ▼ buttons to select *5*.

Press and release the center button to index to the next position. *3 5* will remain, and the third position will be blinking.

Use the ▲ or ▼ buttons to select *1*.

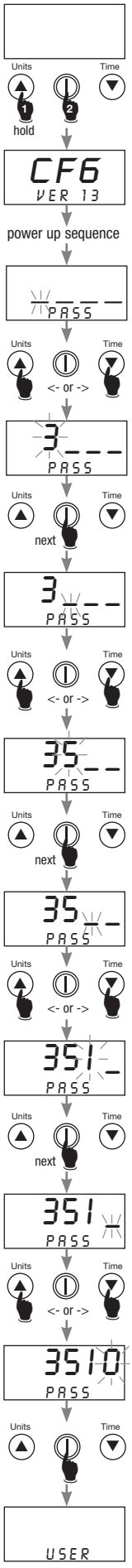
Press and release the center button to index to the next position. *3 5 1* will remain, and the fourth position will be blinking.

Use the ▲ or ▼ buttons to select *0*.

Press and release the center button to proceed with configuration procedures.

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

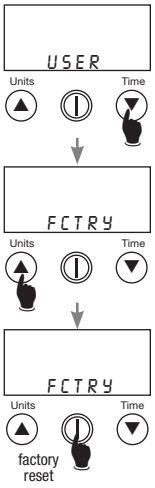
Continued on next page.



MGF16BN Configuration and Calibration

CONFIGURATION—USER OR FACTORY

Upon successful pass code entry, the upper display will be blank, and the lower section will display *USER*.



While in the configuration mode the auto shutoff timer is disabled.

Press and release the ▼ button if *USER* is not displayed. The lower display will then indicate *USER*.

With *USER* selected, the gauge configuration can be modified as described in the following section.

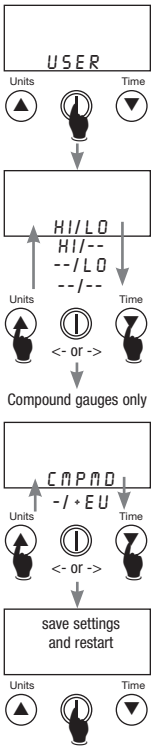
If Factory (*FCTRY*) is selected, the user configuration will be replaced by the configuration as it left the factory.

To select Factory, press and release the ▲ button. The lower display will then indicate *FCTRY*.

Press and release the center button to restore the factory configuration and restart the gauge.

USER CONFIGURATION

With *USER* selected, the gauge configuration can be modified as described below.



Press and release the center button to configure Max/Min (HI/LO) value capture.

Use the ▲ or ▼ buttons to select from the following.

HI/LO Both highest and lowest values will be captured.

HI/-- Only highest value measured will be captured.

--/LO Only lowest value measured will be captured.

--/-- Capture feature is disabled.

Press and release the center button to save setting and restart gauge. If gauge is a vacuum/pressure gauge the next configuration parameter will be displayed.

Press and release the center button to configure gauge type.

Use the ▲ or ▼ 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.

Press and release the center button to save the user configuration and restart the gauge.

PASS CODE CONFIGURATION

The factory default pass code of 3510 may be changed by using access code 1220 rather than the 3510 code described in the Enter Configuration Pass Code section.

With the gauge off, press and hold the ▲ button.

Then press the center button.

Release all buttons when the display indicates *CFG*.

The display initially indicates _ _ _ _ with the first underscore blinking, and with *PASS* on the character segments.

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 center button without entering any pass code characters.

Enter access code 1220

1. Use the ▲ and ▼ buttons to set the left-most digit to *1*.
2. Press and release the front button enter the next number.
3. Use the ▲ and ▼ buttons to select *2*.
4. Press and release the front button enter the next number..
5. Use the ▲ and ▼ buttons to select *2*.
6. Press and release the front button enter the next number.
7. Use the ▲ and ▼ buttons to select *0*.
8. With *1220* on the display press and release the center button to proceed.

Change access code

Once the correct access code has been entered, the display will indicate the existing user-defined pass code with *UDPCD* on the character segments.

1. Operate the ▲ and ▼ buttons to select the first character of the new pass code.
2. When the correct first character is being displayed, press and release the center button to proceed to the next pass code character.
3. Repeat above until the entire pass code is complete.
4. To exit the Pass Code Configuration mode, press and hold the center button.
5. Release the button when the display indicates ----to restart the gauge.
6. It is important to remember the new pass code. If the pass code is forgotten it will have to be returned to the factory to be reset.

CALIBRATION SETUP AND PREPARATION

Gauges are calibrated at the factory using equipment traceable to NIST. There is no need to calibrate the gauge before putting it into service.

Calibration should only be performed by qualified individuals using appropriate calibration standards and procedures. Calibration intervals depend on your quality control program requirements, although many customers calibrate annually.

The calibration system must be able to generate and measure pressure/vacuum over the full range of the gauge and should be at least four times more accurate than the gauge being calibrated.

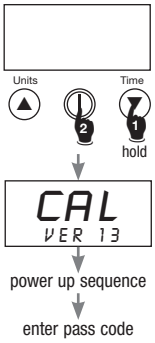
A vacuum pump able to produce a vacuum of 10 microns (0.01 torr or 10 millitorr) or lower is required for vacuum gauges. Warning: application of vacuum to non-vacuum models will result in damage to the sensor.

Allow the gauge to acclimate to ambient temperature for 20 minutes.

Install fresh batteries.

ENTERING CALIBRATION MODE

With the gauge off, press and hold the ▼ button. Then press the center 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 characters.

Before the gauge enters the Calibration Mode, the display initially indicates _ _ _ _ with the first underscore blinking, and with *PASS* on the lower display.

Enter the pass code (3510 factory default) as described in the Enter Configuration Pass Code section.

CALIBRATION MODE

The gauge enters and remains in the Calibration Mode until restarted manually or power is removed. Features not related to calibration are disabled and compound range models are set for the same engineering units for pressure and for vacuum.

The calibration may be performed in any of the available engineering units as well as percent (*PCT*).

For greatest accuracy, use the ▲ and ▼ buttons to select engineering units for calibration with highest resolution (highest number of display counts).

Press and release the center button when the appropriate engineering units are displayed. Suggested units are listed below.

Sensor	Suggested units for calibration
5 PSI	5.000 PSI
15 PSI	775.7 MMHG or TORR
30 PSI	61.08 INHG
50 PSI	50.00 PSI
60 PSI	60.00 PSI
100 PSI	7.031 KG/CM2
200 PSI	407.2 INHG
300 PSI	610.8 INHG
500 PSI	3447 KPA
1000 PSI	6895 KPA
2000 PSI	4613 FTH2O
3000 PSI	6920 FTH2O
5000 PSI	5000 PSI

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

Each time one of the ▲ or ▼ 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 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 buttons as previously described.

The gauge will automatically correlate the applied pressure to the appropriate calibration range and display prompts such as *ZERO*, *+MID*, and *SPAN*.

Gauge Reference Pressure Gauges

Apply zero pressure by venting the gauge port to atmosphere. The character display will alternate between *ZERO* and *CAL*. Adjust for a display indication of zero using the ▲ and ▼ buttons.

If you only want to re-zero the gauge and do not want to perform span or mid-point calibration, press and hold the center button to store the zero correction and restart the gauge, otherwise proceed as follows.

Apply full-scale pressure. The character display will alternate between *+SPAN* and *CAL*. Adjust for a display indication of full-scale pressure using the ▲ and ▼ buttons.

Apply 50% full-scale pressure. The character display will alternate between *+MID* and *CAL*. Adjust for a display indication equal to 50% of full-scale pressure using the ▲ and ▼ buttons.

Gauge Reference Vacuum Gauges

Apply zero pressure by venting the gauge port to atmosphere. The character display will alternate between *ZERO* and *CAL*. Adjust for a display indication of zero using the ▲ and ▼ buttons.

If you only want to re-zero the gauge and do not want to perform span or mid-point calibration, press and hold the center button to store the zero correction and restart the gauge, otherwise proceed as follows.

Apply full-scale vacuum. The character display will alternate between *+SPAN* and *CAL*. Adjust for a display indication of full-scale vacuum using the ▲ and ▼ buttons.

Apply 50% full-scale vacuum. The character display will alternate between *+MID* and *CAL*. Adjust for a display indication equal to 50% of full-scale vacuum using the ▲ and ▼ buttons.

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*. Adjust for a display indication of actual applied vacuum using the ▲ and ▼ buttons.

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*. Adjust for a display indication equal to 50% of full-scale vacuum using the ▲ and ▼ buttons.

Save Calibration

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.

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