

- ±0.25% Test Gauge Accuracy
- 316L Stainless Steel Wetted Parts
- 1.5" or 2.0" Tri-Clamp®

- Easy One Button Operation
- Selectable Units
- Store Minimum and Maximum Readings

- Food Processing
- Dairy and Breweries
- Pharmaceutical

**Specifications**

**Ranges and Resolution**

See table below for standard ranges and units  
See table on next page for available engineering units  
Resolution is fixed for each engineering unit

**Accuracy**

Accuracy includes linearity, hysteresis, repeatability  
Accuracy: ±0.25% of full scale ±1 least significant digit  
Sensor hysteresis: ±0.015% FS, included in accuracy  
Sensor repeatability: ±0.01% FS, included in accuracy

**Display**

3 readings per second nominal display update rate  
4 digit LCD, 0.5" H and 5 character 0.25" H alphanumeric  
Red LED backlight active for 1 minute

**Batteries, Battery Life, Low Battery Indication**

2 AA alkaline  
Up to 1500 hours depending on backlight usage  
Low battery symbol on display

**Auto Shutoff**

User selectable 1 minute to 8 hours or front button on/off  
Factory default 5 minutes, unless other time is specified

**Controls and Functions**

Front button: on/off, view/clear min/max memory  
Hold at power-on to zero gauge reference models

**Memory**

Minimum and/or maximum readings stored in memory  
Readings cleared or stored at shutoff  
User configurable.

**Setup and Calibration**

Pass code protected internal buttons for setup and calibration  
Non-interactive zero, span, and linearity, ±10% of range

**Sanitary Seal**

3-A certified Tri-Clamp flush diaphragm sanitary seal  
NEOBEE® M-20 fill  
All 316L stainless steel construction  
Optional electropolish passivation

**Weight (approximate)**

1.5" gauge: 2 lbs shipping: 3 lbs  
2.0" gauge: 2.5 lbs shipping: 3.5 lbs

**Housing and Materials**

NEMA 4X ABS/polycarbonate case, polycarb. label, rear gasket  
Conformal coating on circuit boards for moisture resistance.

**Maximum Working Pressure**

1.5": 2 X pressure range or 600 psi, whichever is less  
2.0": 2 X pressure range or 550 psi for 300 psi sensor  
Maximum pressure dependent on type of clamping device  
112.5% FS out-of-range display: |---- or |-----

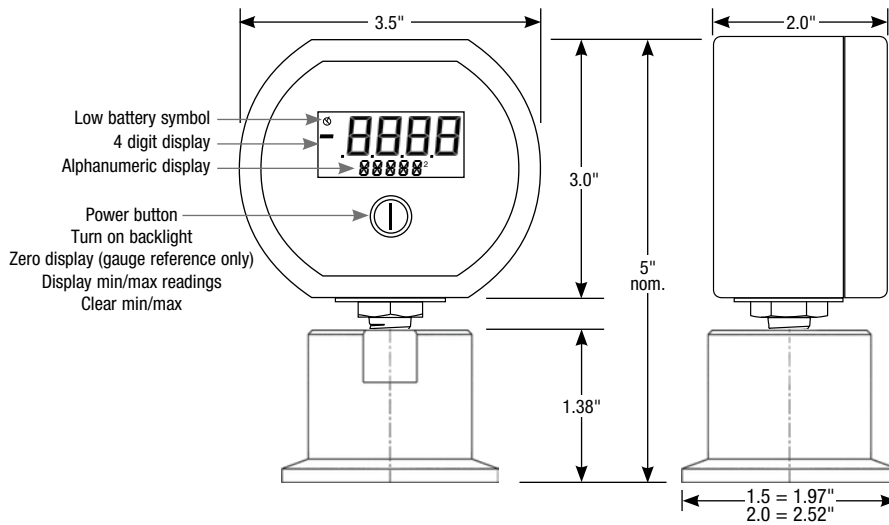
**Environmental**

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)  
Thermal effect due to fill: Up to 1.2 psi from 0 to 70°C  
Positional effect: Up to 0.14 psi

Quick Link: [cecomp.com/san](http://cecomp.com/san)



NEMA 4X Housing



| Default Range and Units<br>See next page for additional units | Vacuum Service | 1" or 1.5" Tri-Clamp | Max. psi* | 2" Tri-Clamp       | Max. psi* |
|---|----------------|----------------------|-----------|--------------------|-----------|
| -14.70 to 15.00 psig  | Yes            | DSGB115N±15PSIG      | 30 psig   | DSGB120N±15PSIG    | 30 psig   |
| -29.9 inHg to 15.0 psig                                       | Yes            | DSGB115N30V15PSIG    | 30 psig   | DSGB120N30V15PSIG  | 30 psig   |
| 15.00 to 0 psi absolute                                       | Yes            | DSGB115N15PSIA       | 30 psig   | DSGB120N15PSIA     | 30 psig   |
| 0 to 14.70 psig vacuum  | Yes            | DSGB115N15PSIGVAC    | 30 psig   | DSGB120N15PSIGVAC  | 30 psig   |
| 0 to 15.00 psig   | Yes            | DSGB115N15PSIG       | 30 psig   | DSGB120N15PSIG     | 30 psig   |
| 30.00 to 0 psi absolute                                       | Yes            | DSGB115N30PSIA       | 60 psig   | DSGB120N30PSIA     | 60 psig   |
| 0 to 30.00 psig   | No             | DSGB115N30PSIG       | 60 psig   | DSGB120N30PSIG     | 60 psig   |
| 0 to 60.00 psig   | No             | DSGB115N60PSIG       | 120 psig  | DSGB120N60PSIG     | 120 psig  |
| 100.0 to 0 psi absolute                                       | Yes            | DSGB115N100PSIA      | 200 psig  | DSGB120N100PSIA    | 200 psig  |
| -29.9 inHg to 100.0 psig                                      | Yes            | DSGB115N30V100PSIG   | 200 psig  | DSGB120N30V100PSIG | 200 psig  |
| 0 to 100.0 psig   | Yes            | DSGB115N100PSIG      | 200 psig  | DSGB120N100PSIG    | 200 psig  |
| -29.9 inHg to 200.0 psig                                      | Yes            | DSGB115N30V200PSIG   | 400 psig  | DSGB120N30V200PSIG | 400 psig  |
| 0 to 200.0 psig   | Yes            | DSGB115N200PSIG      | 400 psig  | DSGB120N200PSIG    | 400 psig  |
| 0 to 300.0 psig   | No             | DSGB115N300PSIG      | 600 psig  | DSGB120N300PSIG    | 550 psig  |

| Option—add to end of model number         |  |
|---|--|
| -E  | Electropolished sanitary fitting   |
| Calibration certificates—order separately |  |
| CD  | Calibration data, 5 test points, test date                               |
| NC  | NIST certificate with traceability documentation, 5 test points and date |

\*Maximum pressure dependent on type of clamping device

NEOBEE—Reg TM Stepan Specialty Products, LLC  
Tri-Clamp—Reg TM Alfa Laval Inc.

Ranges and Selectable Units

Range Codes

The range code in the gauge model number indicates the default range when the gauge is ordered. Any listed engineering unit may be ordered as the default.

Selectable Ranges

Engineering units may be changed to any of those listed in the same group as shown in the table below.

Conversion


Engineering unit conversions are calculated from the factory default unit to the newly selected units.

| Range Codes  | Selectable Units                  | Range Codes    | Selectable Units                       | Range Codes | Selectable Units                       | Range Codes     | Selectable Units                  |
|--------------|-----------------------------------|----------------|--|-------------|--|-----------------|-----------------------------------|
| 15PSIA       | 15.00 to 0 psia                   | ±15PSIG        | -15.00 to 15.00 psig                   | 60PSIG      | 0 to 60.00 psig                        | -15V100PSIG     | -15.0 to 100.0 psig               |
| 30INHGA      | 30.00 to 0 inHg abs               | -30INHG/15PSIG | -30.00 inHg to 15.00 psig              | 120INHGG    | 0 to 120.0 inHg                        | -30INHG/100PSIG | -30.0 inHg to 100.0 psig          |
| 400INH2OA    | 400.0 to 0 inH2O abs              | ±30INHGG       | -30.00 to 30.00 inHg                   | 1660INH2OG  | 0 to 1660 inH2O                        | -30V200INHGG    | -30.0 to 200.0 inHg               |
| 240ZINA      | 240.0 to 0 oz/in <sup>2</sup> abs | ±400INH2OG     | -400 to 400 inH2O                      | 960ZING     | 0 to 960 oz/in <sup>2</sup>            | -400V2770INH2OG | -400 to 2770 inH2O                |
| 1000GCGMA    | 1000 to 0 g/cm <sup>2</sup> abs   | ±240ZING       | -240.0 to 240.0 oz/in <sup>2</sup>     | 4200GCMG    | 0 to 4200 g/cm <sup>2</sup>            | 240V1600ZING    | -240 to 1600 oz/in <sup>2</sup>   |
| 760MMHGA     | 760.0 to 0 mmHg abs               | ±1000GCMG      | -1000 to 1000 g/cm <sup>2</sup>        | 3100MMHGG   | 0 to 3100 mmHg                         | 760V5200MMHGG   | -760 to 5200 mmHg                 |
| 760TORRA     | 760.0 to 0 torr abs               | ±760MMHGG      | -760 to 760 mmHg                       | 3100TORRR   | 0 to 3100 torr                         | 760V5200TORRR   | -760 to 5200 torr                 |
| 1000MBARA    | 1000 to 0 mbar abs                | ±760TORRR      | -760 to 760 torr                       | 4100MBARG   | 0 to 4100 mbar                         | -100V700KPAG    | -100 to 700 kPa                   |
| 1000CMH2OA   | 1000 to 0 cmH2O abs               | ±1000MBAR      | -1000 to 1000 mbar                     | 4200CMH2OG  | 0 to 4200 cmH2O                        | -0.1V0.7MPAG    | -0.100 to .700 MPa                |
| 100KPAA      | 100.0 to 0 kPa abs                | ±1000CMH2OG    | -1000 to 1000 cmH2O                    | 140FTH2O    | 0 to 140.0 ftH2O                       | -1V7BARG        | -1.00 to 7.00 bar                 |
| 0.1MPAA      | .1000 to 0 MPa abs                | ±100KPAG       | -100.0 to 100.0 kPa                    | 400KPAG     | 0 to 400.0 kPa                         | -1V7KCGMG       | -1.00 to 7.00 kg/cm <sup>2</sup>  |
| 1BARA        | 1.000 to 0 bar abs                | ±0.1MPAG       | -1.000 to 1.000 MPa                    | 0.4MPAG     | 0 to 4.000 MPa                         | -1V7ATMG        | -1.00 to 7.00 atm                 |
| 1KGCMA       | 1.000 to 0 kg/cm <sup>2</sup> abs | ±1BARG         | -1.000 to 1.000 bar                    | 4BARG       | 0 to 4.000 bar                         |                 |                                   |
| 1ATMA        | 1.000 to 0 atm abs                | ±1KGCMG        | -1.000 to 1.000 kg/cm <sup>2</sup>     | 4KCGMG      | 0 to 4.000 kg/cm <sup>2</sup>          |                 |                                   |
|              |                                   | ±1ATMG         | -1.000 to 1.000 atm                    | 4ATMG       | 0 to 4.000 atm                         |                 |                                   |
| Range Codes  | Selectable Units                  | Range Codes    | Selectable Units                       | Range Codes | Selectable Units                       | Range Codes     | Selectable Units                  |
| 15PSIVAC     | 0 to 15.00 psig vac               | 30PSIA         | 30.00 to 0 psia                        | 100PSIA     | 100.0 to 0 psia                        | -15V200PSIG     | -15.0 to 200.0 psig               |
| 30INHGVAC    | 0 to 30.00 inHg vac               | 60INHGA        | 60.00 to 0 inHg abs                    | 200INHGA    | 200.0 to 0 inHg abs                    | -30INHG/200PSIG | -30.0 inHg to 200.0 psig          |
| 400INH2OVAC  | 0 to 400 inH2O vac                | 850INH2OA      | 850 to 0 inH2O abs                     | 2770INH2OA  | 2770 to 0 inH2O abs                    | -30V400INHGG    | -30.0 to 400.0 inHg               |
| 240ZINVAC    | 0 to 240.0 oz/in <sup>2</sup> vac | 480ZINA        | 480.0 to 0 oz/in <sup>2</sup> abs      | 1600ZINA    | 1600 to 0 oz/in <sup>2</sup> abs       | 400V5500INH2OG  | -400 to 5500 inH2O                |
| 1000GCMVAC   | 0 to 1000 g/cm <sup>2</sup> vac   | 2100GCGMA      | 2100 to 0 g/cm <sup>2</sup> abs        | 7000GCGMA   | 7000 to 0 g/cm <sup>2</sup> abs        | 240V3200ZING    | -240 to 3200 oz/in <sup>2</sup>   |
| 760MMHGVAC   | 0 to 760.0 mmHg vac               | 1600MMHGA      | 1600 to 0 mmHg abs                     | 5200MMHGA   | 5200 to 0 mmHg abs                     | -100V1400KPAG   | -100 to 1400 kPa                  |
| 760TORRVAC   | 0 to 760.0 torr vac               | 1600TORRA      | 1600 to 0 torr abs                     | 5200TORRA   | 5200 to 0 torr abs                     | -0.1V1.4MPAG    | -0.100 to 1.400 MPa               |
| 1000MBARVAC  | 0 to 10000 mbar vac               | 2000MBARA      | 2000 to 0 mbar abs                     | 7000MBARA   | 7000 to 0 mbar abs                     | -1V14BARG       | -1.00 to 14.00 bar                |
| 1000CMH2OVAC | 0 to 10000 cmH2O vac              | 2100CMH2OA     | 2100 to 0 cmH2O abs                    | 7000CMH2OA  | 7000 to 0 cmH2O abs                    | -1V14KCGMG      | -1.00 to 14.00 kg/cm <sup>2</sup> |
| 100KPAVAC    | 0 to 100.0 kPa vac                | 200KPAA        | 200.0 to 0 kPa abs                     | 700KPAA     | 700.0 to 0 kPa abs                     | -1V 14ATMG      | -1.00 to 14.00 atm                |
| 0.1MPAVAC    | 0 to .1000 MPa vac                | 0.2MPAA        | 0 to .2000 to 0 MPa abs                | 0.7MPAA     | 0 to .7000 to 0 MPa abs                |                 |                                   |
| 1BARVAC      | 0 to 1.000 bar vac                | 2BARA          | 0 to 2.000 to 0 bar abs                | 7BARA       | 0 to 7.000 to 0 bar abs                |                 |                                   |
| 1KGCMVAC     | 0 to 35.00 kg/cm <sup>2</sup> vac | 2KGCMA         | 0 to 2.000 to 0 kg/cm <sup>2</sup> abs | 7KGCMA      | 0 to 7.000 to 0 kg/cm <sup>2</sup> abs |                 |                                   |
| 1ATMVAC      | 0 to 1.000 atm vac                | 2ATMA          | 0 to 2.000 to 0 atm abs                | 7ATMA       | 0 to 7.000 to 0 atm abs                |                 |                                   |
| Range Codes  | Selectable Units                  | Range Codes    | Selectable Units                       | Range Codes | Selectable Units                       | Range Codes     | Selectable Units                  |
| 15PSIG       | 0 to 15.00 psig                   | 30PSIG         | 0 to 30.00 psig                        | 100PSIG     | 0 to 100.0 psig                        | 200PSIG         | 0 to 200.0 psig                   |
| 30INHGG      | 0 to 30.00 inHg                   | 60INHGG        | 0 to 60.00 inHg                        | 200INHGG    | 0 to 200.0 inHg                        | 400INHGG        | 0 to 400.0 inHg                   |
| 400INH2OG    | 0 to 400.0 inH2O                  | 850INH2OG      | 0 to 850 inH2O                         | 2770INH2OG  | 0 to 2770 inH2O                        | 5500INH2OG      | 0 to 5500 inH2O                   |
| 240ZING      | 0 to 240.0 oz/in <sup>2</sup>     | 480ZING        | 0 to 480.0 oz/in <sup>2</sup>          | 1600ZING    | 0 to 1600 oz/in <sup>2</sup>           | 3200ZING        | 0 to 3200 oz/in <sup>2</sup>      |
| 1000GCMG     | 0 to 1000 g/cm <sup>2</sup>       | 2100GCMG       | 0 to 2100 g/cm <sup>2</sup>            | 7000GCMG    | 0 to 7000 g/cm <sup>2</sup>            | 480FTH2O        | 0 to 480.0 ftH2O                  |
| 760MMHGG     | 0 to 760.0 mmHg                   | 1600MMHGG      | 0 to 1600 mmHg                         | 5200MMHGG   | 0 to 5200 mmHg                         | 1400KPAG        | 0 to 1400 kPa                     |
| 760TORRR     | 0 to 760.0 torr                   | 1600TORRR      | 0 to 1600 torr                         | 5200TORRR   | 0 to 5200 torr                         | 1.4MPAG         | 0 to 1.400 MPa                    |
| 1000MBARG    | 0 to 1000 mbar                    | 2000MBARG      | 0 to 2000 mbar                         | 7000MBARG   | 0 to 7000 mbar                         | 14BARG          | 0 to 14.00 bar                    |
| 1000CMH2OG   | 0 to 1000 cmH2O                   | 2100CMH2OG     | 0 to 2100 cmH2O                        | 7000CMH2OG  | 0 to 7000 cmH2O                        | 14KCGMG         | 0 to 14.00 kg/cm <sup>2</sup>     |
| 35FTH2O      | 0 to 35.00 ftH2O                  | 70FTH2O        | 0 to 70.00 ftH2O                       | 230FTH2O    | 0 to 230.0 ftH2O                       | 14ATMG          | 0 to 14.00 atm                    |
| 100KPAG      | 0 to 100.0 kPa                    | 200KPAG        | 0 to 200.0 kPa                         | 700KPAG     | 0 to 700.0 kPa                         |                 |                                   |
| 0.1MPAG      | 0 to .1000 MPa                    | 0.2MPAG        | 0 to .2000 MPa                         | 0.7MPAG     | 0 to .7000 MPa                         |                 |                                   |
| 1BARG        | 0 to 1000 bar                     | 2BARG          | 0 to 2.000 bar                         | 7BARG       | 0 to 7.000 bar                         |                 |                                   |
| 1KGCIMG      | 0 to 1000 kg/cm <sup>2</sup>      | 2KGCIMG        | 0 to 2.000 kg/cm <sup>2</sup>          | 7KGCIMG     | 0 to 7.000 kg/cm <sup>2</sup>          |                 |                                   |
| 1ATMG        | 0 to 1000 atm                     | 2ATMG          | 0 to 2.000 atm                         | 7ATMG       | 0 to 7.000 atm                         |                 |                                   |

Installation Precautions

- ✓ Read these instructions before using the gauge. Configuration may be easier before installation. Contact the factory for assistance.
- ✓ These products do not contain user-serviceable parts. Contact us for repairs, service, or refurbishment.
- ✓ Gauges must be operated within specified ambient temperature ranges.
- ✓ Use a pressure or vacuum range appropriate for the application.
- ✓ Use clamp appropriate for the pressure range of the gauge.
- ✓ Remove system pressures before removing or installing gauge.
- ✓ Good design practice dictates that positive displacement liquid pumps include protection devices to prevent sensor damage from pressure spikes, acceleration head, and vacuum extremes.
- ✗ Avoid permanent sensor damage! Do not apply vacuum to non-vacuum gauges or hydraulic vacuum to any gauges.
- ✗ Avoid permanent damage! NEVER touch surface of diaphragm.
- ⚠ Gauges are not for oxygen service. Accidental rupture of sensor diaphragm may cause oil inside seal to react with oxygen.


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

 **WARNING:** This product can expose you to chemicals including nickel and chromium, which are known to the State of California to cause cancer or birth defects or other reproductive harm. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

Types of Gauges

Gauge reference models read zero with the gauge open. Bipolar ranges read positive pressure and vacuum in the same units, and zero with the gauge port open. Absolute reference gauges read atmospheric pressure with the gauge port open and zero at full vacuum. With the gauge port open to atmosphere, it is normal for readings to fluctuate due to continuously changing barometric pressure.

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 batteries should be replaced soon after the indicator comes on or unreliable readings may result. 

1. Remove the 6 Phillips screws on the back of the unit.
2. Remove the battery retainer. 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.
5. Install batteries with correct orientation. Incorrect polarity will damage the gauge. The negative (flat) end of each battery should be inserted first facing the battery holder spring.
6. Replace battery retainer and back cover, including the rubber gasket and reinstall the six screws.

Operation

| Function               | Button             | Prompt (Release Button)  |
|------------------------|--------------------|--|
| On                     | Press for 1 second | Display test > default units > selected units FULL SCALE > display test > actual reading           |
| Zero (gauge ref. only) | Press and hold     | Display test > o o o o > default units > selected units FULL SCALE > display test > actual reading |
| Hi reading             | Press/hold         | MAX > max. reading & units   |
| Lo reading             | Press/hold         | MIN > min. reading & units   |
| Exit Hi/Lo             | Press/hold         | *** > actual reading   |
| Clear Hi/Lo            | Press/hold         | MAX > CLR MAX/MIN > actual reading   |
| Clear, off             | Press/hold         | MAX > CLR MAX/MIN > OFF  |

Power-Up

Press and hold the front button for approximately 1 second. The display is tested, the default full-scale range is indicated, the full-scale range in the selected units are indicated, the display is tested again, then the actual pressure and units are displayed.

Power-Up With Zero

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 activated at each power-up and the stored zero correction is erased when the gauge is shut off.

Press and hold the front button. The display is tested and then oooo is displayed. The gauge is now zeroed. Release the button and the full-scale range in the selected units are indicated, the display is tested again, then the actual pressure and units are displayed.

## Operation—continued

Attempting to zero the gauge with pressure greater than approximately 3% of full-scale pressure or vacuum applied will result in an error condition, and the display will alternately indicate Err 0 and the actual measured pressure. The gauge must be powered down 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 or whenever the button is pushed, unless the gauge shutoff time was set to zero for on/off operation.

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 1 --- or 1.-- will be displayed depending on model.

### Display Backlighting

Display backlighting can be turned on by momentarily pressing the front 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.

### Minimum and Maximum Readings

Gauges are normally configured with minimum and maximum capture functions enabled. One or both can be disabled in the Advanced Configuration mode.

Minimum and maximum readings are continuously stored and updated whenever the gauge is on. The stored readings can be manually cleared if desired. The MAX and MIN memory is also cleared whenever the gauge is off unless configured to save the readings.

Press and hold the button for about 1 second until MAX is displayed alternating with the units. The maximum reading will be continuously updated. The gauge may be left in this mode.

After MAX is displayed, press and hold the button for about 1 second until MIN is displayed alternating with the units. The minimum reading will be continuously updated. The gauge may be left in this mode. If excessive vacuum is applied to a pressure-only gauge while in this mode, the display will indicate -Err until the MAX/MIN readings are cleared.

After MIN is displayed, press and hold the button again for about 1 second until \* \* \* \* is displayed. The MAX and MIN memory is not erased and the gauge returns to normal operation with the display indicating the current reading.

Press and continue to hold the button until the display indicates CLR MX/MIN (about 3 seconds total) and then release the button. Both maximum and minimum values are cleared and the gauge returns to the normal mode and displays the current pressure.

### Shut-Down

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

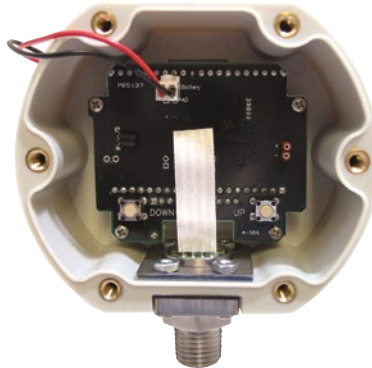
When an auto shutoff timer is used, the display indicates OFF five seconds prior to auto shutoff. The button can be pressed to keep the gauge on. The auto shutoff and backlight (if equipped) timers are reset whenever the button is pressed and released.

If the gauge is 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 battery life.

## Basic Configuration

### Accessing the Internal Buttons

1. Remove the 6 Phillips screws on the back of the unit.
2. Lift up the battery holder.
3. Move the battery holder to the side.
4. Locate the two internal buttons located near the lower right and left corners of the circuit board.



### Auto Shutoff Time Selection

Auto shutoff time selection is done via the internal buttons to help prevent accidental or unauthorized changes. The selected shut off time is stored in non-volatile memory and will be retained even with the battery off or batteries removed.

Remove the rear cover to gain access to the two internal buttons located near the lower right and left corners of the circuit board.

With the gauge powered up, press and hold the DOWN button.

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

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

An auto shutoff time of 0 signifies that the auto shutoff feature is disabled and the front button turns the gauge on and off.

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

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

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

Replace the battery holder assembly and rear cover taking care not to pinch the power wires between the cover and the case.

### Engineering Unit Selection

Engineering unit selection (except compound ranges) is done via internal buttons to help prevent accidental or unauthorized changes. 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 and display resolution.

Compound (inHg/PSIG) gauges must be changed to display single-unit vacuum/pressure readings in the Advanced Configuration mode before different engineering units can be selected.

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

Powered the gauge up by holding the front button for 1 second.

Press and hold the internal UP button.

Release the button when the engineering units begin to flash.

Use the UP and DOWN buttons to scroll through the list of engineering units available for the pressure range of the sensor.

When the desired units are displayed, press and release the front button to save the selection and return to normal operation.

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

Replace the battery holder assembly and rear cover taking care not to pinch the power wires between the cover and the case.

## Advanced Configuration

Advanced configuration requires a pass code for access and allows more features to be configured.

Remove the rear cover to gain access to the buttons located near the lower right and left corners of the circuit board.

With the gauge off, press and hold the UP button. Then press the front 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, and with CFGPC (configuration pass code) 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 front button without entering any pass code characters.

### Pass Code Entry

The factory default is 3510, but this may be changed by the user under the Pass Code Configuration section.

1. Use the UP or DOWN buttons to set the left-most 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 button to proceed with configuration procedures.

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

### Factory/User Configuration

The upper display section will be blank, and the lower section will display either USER\_ or FCTRY.

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 USER\_.

Press and release the front button to continue.

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.

The lower display will indicate FCTRY.

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

### Max/Min Configuration

Use the UP and DOWN 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 front button to move to the next parameter.

### Max/Min Memory

The upper display section will indicate clr.

Use the UP and DOWN 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 front button to move to the next parameter.

### Gauge Type Configuration

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

Use the UP and DOWN buttons to select from the following:

- /FEU Vacuum is indicated as negative pressure in the selected engineering units
- CMPND Vacuum is negative INHG, pressure is PSIG. This setting will disable engineering unit selection.

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

Replace the rear cover taking care not to pinch the power wires between the cover and the case.

## Calibration Preparation

Gauges are calibrated at the factory using equipment traceable to NIST. Gauges are calibrated in an upright position at normal ambient temperatures (approx. 20°C). There is no need to calibrate the gauge before putting it into service unless the process temperature and gauge position deviate from normal.

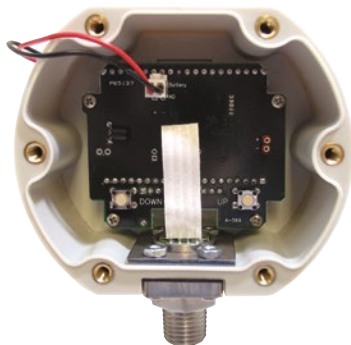
Calibration should only be performed by qualified individuals using appropriate calibration standards and procedures. Calibration intervals depend on your quality control program requirements, although many customers calibrate annually.

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 100 microns (0.1 torr or 100 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 the calibration temperature for at least 60 minutes. Calibrate the gauge at the same temperature as the process with the gauge oriented in the same position.

Install fresh batteries before calibration.



## Calibration

### Entering Calibration Mode

With the gauge off, press and hold the DOWN button. Then press the front 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.

Before the gauge enters the Calibration Mode, the display initially indicates \_\_\_\_ with the first underscore blinking, and 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 front button without entering any pass code characters.

### Enter the User-Modifiable Pass Code

The factory default is 3510, but this is user changeable.

1. Use the UP or DOWN buttons to set the left-most 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 button to proceed with configuration procedures.

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

### 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 UP and DOWN buttons to select engineering units for calibration with highest resolution (highest number of display counts). Press and release the front button when the appropriate engineering units are

## Calibration—continued

displayed. Suggested units are listed below.

| Sensor  | Suggested units for calibration |
|---------|---------------------------------|
| 15 PSI  | 775.7 MMHG (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                      |
| 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 calibration 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 calibration 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 calibration buttons as previously described.

### 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 UP and the DOWN buttons.

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

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

### Absolute Reference Gauges

Apply full vacuum to the gauge. The character display will alternate between ZERO and CAL. Press the UP and DOWN buttons to obtain a display indication of zero.

Apply full-scale pressure. The character display will alternate between +SPAN and CAL. Press the UP and DOWN buttons to obtain a display indication equal to full-scale pressure.

Apply 50% of full-scale pressure. The lower display will alternate between +MID and CAL. Press the UP and DOWN buttons to obtain an indication equal to 50% of full-scale pressure.

### 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 UP and the DOWN 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 UP and the DOWN buttons.

### Save Calibration

Once the adjustments are complete, press and hold the front 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.

Replace the rear cover taking care not to pinch the wires between the cover and the case.

## User-Defined Pass Code Configuration

Remove the rear cover to access the buttons located near the lower right and left corners of the circuit board.

### View Or Change User Configuration Pass Code

With the unit off, press and hold the UP button, then press the front 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 front button.

Release all buttons when the display indicates CAL.

### 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 front button without entering any pass code characters.

1. Use the UP and DOWN buttons to set the left-most digit to 1.
2. Press and release the front button to move to the next position. The 1 will remain, and the second position will be blinking.
3. Use the UP and DOWN buttons to select 2.
4. Press and release the front button to index to the next position. 12 will remain, and the third position will be blinking.
5. Use the UP and DOWN buttons to select 2.
6. Press and release the front button to move to the next position. 1 2 2 will remain, and the fourth position will be blinking.
7. Use the UP and DOWN buttons to select 0.
8. Press and release the front 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 CFGPC or CALPC on the character segments.

1. Operate the UP or DOWN button to select the first character of the new pass code.
2. When the correct first character is being displayed, press and release the front button to proceed to the next pass code character.
3. Repeat above until the entire pass code is complete.
4. To exit, press and hold the front button. Release the button when the display indicates ---- to restart the gauge.
5. Replace the rear cover taking care not to pinch the power wires between the cover and the case.