Cecomp Battery Powered Digital Pressure Gauges with Selectable Units & Multi-Memory

**F20B, F20BN**

- ±0.25% Test Gauge Accuracy
- 316 Stainless Steel Wetted Parts
- Selectable Units

### Specifications

#### Ranges and Resolution
See table below for popular ranges and units
See page 2 table for available ranges and engineering units
Resolution is fixed for each engineering unit

#### Accuracy
Includes linearity, hysteresis, repeatability
Standard: ±0.25% of full scale ±1 least significant digit
- HA: ±0.1% FS ±1 LSD (see below for availability)

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

#### Batteries, Battery Life, Low Battery Indication
B: 2 AA alkaline, approx. 2000 hours
BL: 2 AA alkaline, approx. 150 to 1500 hours depending on backlight usage
Low battery symbol on display

#### Controls & Functions
Three front buttons turn gauge on or off, zeros gauge reference gauges, and cycles through functions
BL: Front button activates backlighting for 1 minute

#### Memory
- **M4**: 4 memory, user settable to 1, 2, 3, 4 or four wheel designations: LF, RF, LR, RR
- **M6**: Six memory, user settable to 1, 2, 3, 4, 5, 6 or aircraft tire designations: NLG 1, NLG 2, MLG 1, MLG 2, MLG 3, MLG 4

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

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

### How to Order

**Step 1: Model**
Select standard housing or NEMA 4X
Select standard display or display backlighting

**Step 2: Range**
Specify pressure range and units.
See table on other side for complete listing of available ranges and engineering units

**Step 3: Memory**
- **M4**: Four memory, user settable to 1, 2, 3, 4 or 4-wheel designations: LF, RF, LR, RR
- **M6**: Six memory, user settable to 1, 2, 3, 4, 5, 6 or aircraft tire designations: NLG 1, NLG 2, MLG 1, MLG 2, MLG 3, MLG 4

**Step 4: Options—add to end of model number**
- **MC**: Metal front cover. Machined aluminum, epoxy powder coated. Synthetic oil resistant. Not available with NEMA 4X models.
- **CS**: Case stiffener strengthens case bottom for tire pressure applications.
- **CC**: Conformal coating on circuit board for moisture resistance. Recommended for outdoor applications.
- **TP**: Top port, gauge port on top of case. Used primarily for tire pressure applications. Not available with NEMA 4X models.
- **HA**: High accuracy, ±0.1% FS ±1 LSD. Not available with vacuum, compound, bipolar, absolute, or 3 psi sensors.
- **PM**: Panel mount, 4.1" x 4.1". Not available with NEMA 4X models.
- **SM**: Surface mount plate. Battery gauges only. Not available with NEMA 4X models.

### Weight
- **Gauge**: 9 ounces (approximately)
- **Shipping**: 1 pound (approximately)

### Material
- **F20B**: Extruded aluminum case, epoxy powder coated, ABS/polycarbonate bezel, front and rear gaskets, polycarbonate label
- **F208**: Optional -MC aluminum bezel
- **F20BN**: ABS/polycarbonate NEMA 4X case, rear gasket, polycarbonate label

### Connection, Material, Media Compatibility
1/4" NPT male fitting, 316L stainless steel
All wetted parts are 316L stainless steel
Compatible with most liquids and gases

### Overpressure
3000 psig range: 5000 psig
5000 psig range: 7500 psig
All others: 2 X pressure range

### 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)

### Model Features

<table>
<thead>
<tr>
<th>Model</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>F20B</td>
<td>Standard housing</td>
</tr>
<tr>
<td>F208BL</td>
<td>Standard housing, backlight display</td>
</tr>
<tr>
<td>F20BN</td>
<td>NEMA 4X housing</td>
</tr>
<tr>
<td>F208BNL</td>
<td>NEMA 4X housing, backlight display</td>
</tr>
</tbody>
</table>

### Selectable Engineering Units

| Selectable Engineering Units. See table on next page for additional ranges. |
|-----------------------------|-------------------------------|
| 3PSIG                       | 0.3000 PSIG                  |
| 5PSIG                       | 0.5000 PSIG                  |
| 15PSIG                      | 0.1500 PSIG                  |
| 30PSIG                      | 0.3000 PSIG                  |
| 60PSIG                      | 0.6000 PSIG                  |
| 100PSIG                     | 1.0000 PSIG                  |
| 200PSIG                     | 2.0000 PSIG                  |
| 300PSIG                     | 3.0000 PSIG                  |
| 500PSIG                     | 5.0000 PSIG                  |
| 1000PSIG                    | 10.0000 PSIG                 |
| 2000PSIG                    | 20.0000 PSIG                 |
| 3000PSIG                    | 30.0000 PSIG                 |
| 5000PSIG                    | 50.0000 PSIG                 |

### Optional Bezel
- **MC**: aluminum bezel
- **CS**: metal bezel
- **CM**: composite bezel

### Accessories
- **RB**: protective rubber boot
- **CD**: calibration data, 4 test points, test date
- **NC**: NIST certificate with traceability documentation, 5 test points and date

### Examples
- Typical stock car tire pressure gauge: F208BL300PSIG-M6-CC-CS-RB
- Typical aircraft tire pressure gauge: F208BL300PSIG-M4-CC-CS-RB
- Typical aircraft strut pressure gauge: F208BL300PSIG-M4-CC-CS-RB

### Additional Info
- **TP**: top port option with RB rubber boot
- **F20B**: standard housing, backlit display
- **F208BL**: standard housing, backlight display

### Additional Specifications
- **F20B**: 0.75" standard, 3.0" NEMA 4X
- **F208BL**: 3.38" standard, 3.5" NEMA 4X
- **F20BN**: 3.38" standard, 3.5" NEMA 4X

### Contact Information
- **Phone**: 1-800-942-0315
- **Fax**: 1-800-949-7502
- **Website**: cecomp.com
- **Email**: sales@cecomp.com
- **Address**: 222 22nd Ave., Suite 130, Libertyville, IL 60048
### 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 316L 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.**
- **For contaminated media use an appropriate screen or filter to keep debris out of gauge port.**

### 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 batteries by lifting up the positive end of the battery (opposite the spring) taking care not to bend the battery holder spring.
2. Discard old batteries properly, do not discard into fire, sources of extreme heat, or in any hazardous manner.
3. Replace the battery holder spring.

### Ranges and Selectable Units

#### Range Codes

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 engineering units.

#### Engineering Units

- **Select the Engineering Units** of the gauge before installation. By default, engineering units are set to "abs" (absolute) before installation.

#### Conversion of Engineering Units

Engineering unit conversions are calculated from the factory default unit to the newly selected units. The ranges listed as Selectable Units are approximate only.

### Table of Selectable Ranges

<table>
<thead>
<tr>
<th>Range Codes</th>
<th>Selectable Units</th>
<th>Selectable Ranges</th>
<th>Selectable Units</th>
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</thead>
<tbody>
<tr>
<td>3PSIG</td>
<td>0 to 3.00 psig</td>
<td>3PSIG</td>
<td>0 to 3.00 psig</td>
</tr>
<tr>
<td>6INHGG</td>
<td>0 to 6.00 inHg</td>
<td>6INHGG</td>
<td>0 to 6.00 inHg</td>
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<tr>
<td>85INH2OG</td>
<td>0 to 85.00 inH2O</td>
<td>85INH2OG</td>
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<td>7FTH2O</td>
<td>0 to 7.000 ftH2O</td>
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<td>0 to 70.000 psig</td>
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<tr>
<td>4R00PSIG</td>
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<td>4R00PSIG</td>
<td>0 to 400.00 psig</td>
</tr>
<tr>
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<td>0 to 500.00 psig</td>
<td>5R00PSIG</td>
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<td>800PSIG</td>
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</tr>
</tbody>
</table>

### Examples

- **Cases where the gauge model number includes a range code:**
  - **F20B 3PSIG**
  - **F20BN 3PSIG**

- **Selectable engineering units (abs, g, inH2O, inHg, kPa, mmHg, oz/in2, psig, psia, torr, bar, MPa, inHg, inHg abs, inH2O abs, bar abs, MPa abs, inH2O vac, bar vac, MPa vac).**

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For a comprehensive list of engineering units, refer to the table above.
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. Press and hold the Power button for approximately 1 second. The display is tested. The full-scale range is indicated.

The full-scale range is indicated.

Occasional flashing of the minus sign with zero pressure/vacuum is normal. 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 Power 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. Press the 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 battery life.

Display Backlighting (BL Models Only)
Display backlighting can be turned on by momentarily pressing the Power 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.

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 is in the normal operating mode. The gauge port must be exposed to normal atmospheric pressure with no pressure or vacuum applied. Press and hold the Zero/Clear button. Continue to press the Zero/Clear button until 0000 is displayed. Release the button. The gauge in zeroed.

Occasional flashing of the minus sign with zero pressure/vacuum is normal. The stored zero correction is erased when the gauge is shut off.

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 pressure 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.

Enter Gauge 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 settings.

Release all buttons when the display indicates CFG. The gauge firmware version is also displayed.

Press the Power button to continue with configuration.

Enter Configuration Pass Code
Enter the pass code. 3510 is the factory default, but it is user-modifiable. Use the ▲ or ▼ buttons to select the left-most digit to 3.

Press and release the Power 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 Power button to index to the next position. The 3 5 1 will remain, and the third position will be blinking.

Use the ▲ or ▼ buttons to select 1. Press and release the Power button to index to the next position. The 3 5 1 1 will remain, and the fourth position will be blinking.

Use the ▲ or ▼ buttons to select 0. Press and release the Power 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.

Gauge Configuration—User or Factory
Upon successful pass code entry, the upper display will be blank, and the lower section will display USER.

With User selected, the gauge configuration can be modified as described in the following sections.

If Factory (FACTRY) 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 indicate FACTRY.

Press and release the Power button to continue with configuration.

Engineering Unit Selection
With the gauge in the user configuration mode, 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 Power button to save your selection and move to the next parameter.

Auto ShutOff Time Selection
The auto shutoff time is displayed on the upper display. The lower display will indicate RST M if the time displayed is in minutes or RST 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 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. The gauge reverts to the original factory configuration as described previously to restore the custom time.

When the desired length of time is displayed, press and release the Power button to save your selection and move to the next parameter.

Memory Label Selection—M4 Versions
The M4 version allows recording pressure readings of up to four vehicles. 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, LA (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 duplication or omission of a position.

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

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

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**Instructions**

**Memory Label Selection—M6 Versions**

The M6 version allows recording pressure readings of up to six trees. While in the view mode the peak reading is captured.

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 duplication or omission of a position.

After auto shutoff time selection, the number 1 is displayed on the upper display. The lower display will indicate the label for memory 1.

Use the ▲ and ▼ buttons to select MEM 1, NLG 1, NLG 2, MLG 1, MLG 2, MLG 3, or MLG 4.

When the desired label for memory 1 is displayed, press and release the Power button.

Repeat the steps for the other memory locations.

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

**Using the Memory**

With the gauge powered up and in the normal operating mode, press and release the Memory button to sequence through the memory locations.

When the Memory button is pressed the gauge is in the peak hold mode. A new higher reading will replace an existing reading, but a pressure reading lower then the one displayed will not be saved.

When desired memory location is displayed, take the pressure reading. The peak reading will be captured.

Remove the gauge from the pressure source and press the memory button for the next location.

Repeat until all readings are taken.

The readings will be saved even if the gauge is shut off.

Press and release the Power button to exit the memory mode and return to live pressure readings.

**Clear a Memory Location**

Before clearing a memory location, make sure the gauge has no pressure applied.

Press and hold the Zero/Clear button.

Release the button when the character display returns to the auto shut off time.

The reading for the memory location described is displayed.

Zero/Clear Memory

**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 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.

Before the unit enters the Calibration Mode, the display initially indicates _ _ _ _ with the first underscore blinking, and with CALPC (calibration pass code) on the lower display.

Enter the 3510 pass code as described in the 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 Power button when the appropriate engineering units are displayed. Suggested units are listed below.

Sensor | Suggested units for calibration
--- | ---
PSI | 5 PSI, 50 PSI
KPA | 15 PSI, 75.7 MMHG or TORR
MNHG | 30 PSI, 61.08 INHG
MCI | 50 PSI, 50.00 PSI
MMHG | 60 PSI, 60.00 PSI
KPA | 100 PSI, 703.1 KPA
INHG | 200 PSI, 407.2 INHG
MNHG | 300 PSI, 610.8 MNHG
MPA | 500 PSI, 3447 KPA
MPA | 1000 PSI, 6895 KPA
MPA | 2000 PSI, 4613 FTH2O
MPA | 3000 PSI, 6920 FTH2O
MPA | 5000 PSI, 5000 PSI

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

**▲ and ▼ Button Operation**

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.

**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.

Apply 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.

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.

**Absolute Reference Gauges**

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

Apply full-scale pressure. The character display will alternate between +SPAN and CAL Adjust for a display indication equal to 50% 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.

**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 +30.00kigin/+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 Power 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.

**User-Defined Pass Code Configuration**

The factory default pass code 3510 may be changed to a different value for configuration and/or calibration.

**Configuration Pass Code**

With the unit off, press and hold the ▲ button to view and/or change the user configuration pass code. Then press the Power button. Release all buttons when the display indicates CFG.

**Calibration Pass Code**

With the unit off, press and hold the ▼ button to view and/or change the user calibration pass code. Then press the Power button. Release all buttons when the display indicates CAL.

**Change Pass Code Mode**

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

Note: The unit will automatically revert to normal operation if no button is 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 access code 1220:

Use the ▲ and ▼ buttons to set the left-most digit to 1.

Press and release the Power button to index to the next position. The 1 will remain, and the second position will be blinking.

Use the ▲ and ▼ buttons to select 2.

Press and release the Power button to index to the next position. The 2 will remain, and the third position will be blinking.

Use the ▲ and ▼ buttons to select 2.

Press and release the Power button to index to the next position. The 2 will remain, and the fourth position will be blinking.

Use the ▲ and ▼ buttons to select 0.

Press and release the Power button to proceed.

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

**Change Pass Code**

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

Press the ▲ or ▼ button to select the first character of the new pass code.

When the correct first character is being displayed, press and release the Power button to proceed to the next pass code character.

Repeat above until the entire pass code is complete.

To exit the User Defined Pass Code change mode, press and hold the Power button.

Release the button when the display indicates _ _ _ _ to restart the gauge.