


Precautions

- ✓ Read and understand all instruction sheet information. Contact us for help, instructions, or repairs.
- ✓ Batteries should be replaced when the low battery indicator comes to prevent unreliable readings. If gauge is used infrequently, remove batteries to prevent damage from leaky batteries. Inspect batteries at least annually.
- ✓ Gauges are not intended for permanent outdoor use. Protect from weather and excessive humidity. NEMA 4X models are suitable for temporary outdoor use and wash down areas.
- ✓ Install gauge so it is protected from impact damage.
- ✓ Media temperature and gauge ambient temperature must be within specified ranges.
- ✓ Use a screen or filter to avoid clogging gauge port when measuring contaminated media.
- ✓ Use thread sealant to ensure leak-free operation.
- ✓ Media being measured must be compatible with 316L SS.
- ✓ Avoid sensor damage! Sensor diaphragm is thin 316L SS foil. Never insert objects into the gauge port or blow out with compressed air.
- ✓ Avoid sensor damage! Hydraulic or liquid pumping systems must include a shock suppressor to protect gauge sensor from damaging pressure spikes or water hammer.
- ✓ Avoid sensor damage! Do not apply vacuum to non-vacuum gauges or hydraulic vacuum to any gauge.
- ⚠ Do not exceed pressure range indicated on gauge label.
- ⚠ Remove system pressure before removing or installing gauge.
- ⚠ Use fittings appropriate for the pressure range of the gauge.
- ⚠ Gauges are not for oxygen service. Accidental rupture of sensor diaphragm may cause silicone oil inside sensor to react with oxygen.
- ⚠ Only gauges marked as Intrinsically Safe can be used in hazardous locations or in the presence of flammable or explosive substances, or atmospheres.

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, which is 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

Types of Gauges

Gauge reference types read zero with the gauge port open. Bipolar ranges read positive pressure and vacuum in the same units, and zero with the gauge port open. 1000 psi and higher sensor are a sealed reference type. They read zero with the gauge port open are internally referenced to 14.7 psi and are functionally similar to gauge reference models. Absolute reference gauges read zero at full vacuum and atmospheric pressure with the gauge port open. Open port readings will vary continuously due to the effects of barometric pressure.

Operation, 3.5 Digit Models

Press the button on the front of the gauge to activate the display. The gauge can be shut off at any time by pressing the button again. The gauge will stay on for a period of time determined by the auto shutoff time. If the gauge was ordered without auto shutoff (-ON) it will stay on until the button is pressed or until the batteries are depleted. Display backlighting for BL models is on whenever the gauge is on. The backlighting will not be apparent under bright lighting conditions. Turn gauge off when not in use to conserve batteries.

Operation, 4 Digit Models

Press and hold the front button for approximately 1 second. The full-scale range is indicated, the display is tested, and the reading and units are displayed. The gauge may be zeroed at power-up. The temporary zero correction is erased when the gauge is shut off. Absolute reference gauges do not use the zero feature since they normally read atmospheric pressure. Expose the gauge port to normal atmospheric pressure. Press and hold the front button. The full-scale range is indicated and the display is tested. Continue to press the button until *0000* is displayed and then release the button. The gauge is now zeroed and ready for use.

Attempting to zero the gauge with pressure greater than approx. 3% of full-scale applied will result in an error condition, and the display will alternately indicate *Err0* and the actual measured pressure. The gauge must be powered down to reset the error condition. During normal operation, the pressure reading is 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 was ordered without an auto shutoff time (-ON option). 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 *|-|-|* or *|-.-.|* will be displayed depending on model.

BL model display backlighting can be turned on by momentarily pressing the button whenever the gauge is on. The backlight 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.

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

For gauges with auto shutoff, 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 was ordered without auto shutoff (-ON option) 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.

Battery Replacement

A low battery indication (either LOBAT or a symbol depending on the model) will be shown in the upper left corner of the display when the battery voltage falls sufficiently. Batteries should be replaced when the indicator comes to prevent unreliable readings.

WARNING: Batteries must be changed in a non-hazardous location only. Do not mix different batteries or fresh batteries with old. Replace both batteries with new ones at the same time.

1. Remove the 6 Phillips screws on the back of the gauge.
2. Remove battery holder or cover, depending on the model.
3. Remove batteries by lifting up the positive end of the battery (opposite the spring) taking care not to bend the spring.
4. Discard old batteries properly. See battery manufacturer's recommendations for disposal or recycling.
5. Install batteries with correct orientation. Insert the negative (flat) end of each battery first towards the battery holder spring.
6. Replace the holder and back cover, including the rubber gasket.

Calibration Preparation

Gauges are factory calibrated at approximately 23°C using NIST traceable calibration equipment. Calibration is not required before using the gauge. Calibration intervals depend on your quality standards, but annual re-calibration is customary. Calibration should only be performed by qualified individuals using appropriate calibration standards and procedures.

Calibration equipment is not required to zero gauge reference ranges. Absolute reference ranges may be zeroed with application of full vacuum.

Span calibration should only be performed using calibration standards that are at least four times more accurate than the gauge being calibrated.

The calibration system must be able to generate and measure pressure/vacuum over the full range of the gauge. A vacuum pump able to produce a vacuum of 100 microns (0.1 torr or 100 millitorr) or lower is required for vacuum and absolute gauges.

Install fresh batteries before calibrating battery-powered gauges. Allow the gauge to equalize to normal room temperature for approximately 20 minutes before calibration.

Calibration, 3.5 Digit Models

Remove the front covers to access the zero and span calibration potentiometers. F4B models use nylon cover screws.

Gauges may be re-zeroed without affecting the span calibration. For gauge reference models the gauge port must be open to the ambient. For absolute reference models full vacuum must be applied.

Adjust the zero control until the gauge reads zero with the minus (-) sign occasionally flashing.

Zero calibration must be done before span calibration. Using the appropriate pressure standards, record readings at three to five points over the range of gauge and adjust span control to minimize error and meet specifications.

Calibration, 4 Digit Models

Entering Calibration Mode

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

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

The full-scale pressure range and display test is shown, and then CAL is displayed to indicate that the calibration mode is enabled.

Release all buttons. The gauge enters and remains in the calibration mode until restarted manually or power is removed. Features not related to calibration are disabled. If the battery pack is unplugged or the power removed during calibration, settings will not be saved.

The display will indicate the current pressure reading, updating approximately 3 times per second.

Each press of the UP or DOWN button makes a small correction, which may not always be indicated on the display. Press and hold the button for one second or longer to make larger corrections. Adjust the gauge's display to match the calibrator's reading.

Gauge Reference Ranges (3 Points)

With the gauge port open to atmosphere, the character display will alternate between ZERO and CAL. Press the UP and DOWN buttons to obtain a display indication of zero.

Note: At this point you may re-zero the gauge without doing any other calibration. Press and hold the Power button until the display indicates *- - - -* then release the button to store the new zero in non-volatile memory and restart the gauge.

Apply full-scale pressure (or vacuum for vacuum gauges). 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 character display will alternate between +MID and CAL. Use the UP and DOWN buttons to obtain a display indication equal to 50% of full-scale pressure.

Absolute Reference Ranges (3 Points)

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

Bipolar (±) and Compound Ranges (4 or 5 Points)

With the gauge port open to atmosphere, 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 positive 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 positive pressure. The character display will alternate between +MID and CAL. Press the UP and DOWN buttons to obtain a display indication equal to 50% of full-scale pressure.

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

Gauges using a ±15 psig sensor have a -MID calibration point. Apply 50% of the full-scale vacuum range (for example, -7.4 psi for a ±15 psi gauge). The character display will alternate between -MID and CAL. Press the UP and DOWN buttons to obtain a display indication equal to 50% of full-scale vacuum.

Exit Calibration Mode and Verify Calibration

Exit the calibration mode and save the calibration data by pressing and holding the front button until the display indicates OFF.

Verify readings at 0%, 25%, 50%, 75%, and 100% of full scale. Replace the rear cover and screws, taking care not to pinch the battery leads between the case and the rear cover.

