- ±0.25% Test Gauge Accuracy, ±0.1% Optional
- 316L Stainless Steel Wetted Parts
- User Configurable Min/Max, Units, Shutoff Time

MADE IN USA

F16B

F16BN
NEMA 4X

Quick Link: cecomp.com/bat

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

Accuracy
Accuracy includes linearity, hysteresis, repeatability
Standard accuracy: ±0.25% of full scale ±1 least significant digit
HA accuracy option: ±0.1% FS ±1 LSD, see range table
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
BL: Optional LED display backlight

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

Controls and Functions
Front button turns gauge on or off, zeros gauge reference gauges,
and cycles through MAX/MIN functions
Internal buttons for engineering unit selection, auto shutoff time
Internal buttons passcode protected for MAX/MIN setup, calibration, backlight function (if equipped)

Maximum and Minimum Memory
Minimum and maximum readings stored 3 times per second
Front button cycles through MIN, MAX, clear
Configurable for MIN only, MAX only, MAX/MIN, or none
Configure to clear or retain MAX/MIN values at power off

Calibration
Passcode 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

Weight
Gauge: 9 ounces , shipping: 1 pound (approximately)

Housing
F16B: Extruded aluminum case, epoxy powder coated. ABS/ poly-carbonate bezel (aluminum with MC option). Polycarbonate label. Front & rear rubber gaskets. NEMA 2 (IP51).
F16BN: UV stabilized ABS/polycarbonate case. Polycarbonate window & front label. Rear gasket & stainless steel cover screws. NEMA 4X, not intended for permanent outdoor installations.

Connection and Material
1/4" NPT male fitting, all wetted parts are 316L stainless steel

Overpressure, Burst, Vacuum
Ranges using 3000 psig sensor: 5000 psig
Ranges using 5000 psig sensor: 7500 psig
All other ranges: 2 X pressure range
4 X sensor burst pressure rating, or 10,000 psi, whichever is less
Over-range display at 112.5% full scale: 1– – – or I –.–.–.–
Under-range display (non-vacuum sensors): –Err
Vacuum service: 15 psia, ±15 psig, 15 psig, 30 psia, 100 psig, 100 psia, 200 psig sensors

Environmental Temperatures
Storage temperature: –40 to 203°F (–40 to 95°C)
Operating temperature: –4 to 185°F (–20 to 85°C)
Sensor compensated range: 32 to 158°F (0 to 70°C)

Sensor Ranges and Engineering Units ‡ -HA option not available Range codes are rounded off

3 psig ‡	Res	15 psig vac	Res	30 psia	Res	–15V100psig	Res	300 psig	Res
3PSIG	.001	100KPAVAC	.1	2KGCMA	.001	–15V100PSIG	.1	300PSIG	.1
6INHGG	.001	0.1MPAVAC	.0001	2ATMA	.001	–30INHG/100PSIG	.1	610INHGG	.1
85INH2OG	.1	1BARVAC	.001	**30 psig**	**Res**	–30V200INHGG	.1	4800ZING	1
50ZING	.01	1KGCMVAC	.001	30PSIG	.01	–400V2770INH2OG	1	700FTH2O	.1
210GCMG	.1	1ATMVAC	.001	60INHGG	.01	–240V1600ZING	1	2000KPAG	1
150MMHGG	.1	**15 psig**	**Res**	850INH2OG	1	–760V5200MMHGG	1	2MPAG	.001
150TORRG	.1	15PSIG	.01	480ZING	.1	–760V5200TORRG	1	20BARG	.01
200MBARG	.1	30INHGG	.01	2100GCMG	1	–100V700KPAG	1	20KGCMG	.01
200CMH2OG	.1	400INH2OG	.1	1600MMHGG	1	–0.1V0.7MPAG	.001	20ATMG	.01
2000MMH2OG	1	240ZING	.1	1600TORRG	1	–1V7BARG	.01	**500 psig**	**Res**
7FTH2O	.001	1000GCMG	1	2000MBARG	1	–1V7KGCMG	.01	500PSIG	.1
20KPAG	.01	760MMHGG	1	2100CMH2OG	1	–1V7ATMG	.01	1020INHGG	1
5 psig ‡	**Res**	760TORRG	.1	70FTH2O	.01	**100 psig**	**Res**	1150FTH2O	1
5PSIG	.001	1000MBARG	1	200KPAG	.1	100PSIG	.1	3500KPAG	1
10INHGG	.01	1000CMH2OG	1	0.2MPAG	.0001	200INHGG	.1	3.5MPAG	.001
140INH2OG	.1	35FTH2O	.01	2BARG	.001	2770INH2OG	1	35BARG	.01
80ZING	.1	100KPAG	.1	2KGCMG	.001	1600ZING	1	35KGCMG	.01
350GCMG	.1	0.1MPAG	.0001	2ATMG	.001	7000GCMG	1	35ATMG	.01
260MMHGG	.1	1BARG	.001	**60 psig**	**Res**	5200MMHGG	1	**1000 psig**	**Res**
260TORRG	.1	1KGCMG	.001	60PSIG	.01	5200TORRG	1	1000PSIG	1
350MBARG	.1	1ATMG	.001	120INHGG	.1	7000MBARG	1	2040INHGG	1
350CMH2OG	.1	**±15 psig**	**Res**	1660INHGG	1	7000CMH2OG	1	2300FTH2O	1
3500MMH2OG	1	±15PSIG	.01	960ZING	1	230FTH2O	.1	7000KPAG	1
12FTH2O	.01	–30INHG/15PSIG	.01	4200GCMG	1	700KPAG	.1	7MPAG	.0001
35KPAG	.01	±30INHGG	.01	3100MMHGG	1	0.7MPAG	.0001	70BARG	.01
15 psia	**Res**	±400INH2OG	1	3100TORRG	1	7BARG	.001	70KGCMG	.01
15PSIA	.01	±240ZING	.1	4100MBARG	1	7KGCMG	.001	70ATMG	.01
30INHGA	.01	±760MMHGG	1	4200CMH2OG	1	7ATMG	.001	**2000 psig**	**Res**
400INH2OA	.1	±760TORRG	1	140FTH2O	.1	–15V200 psig	Res	2000PSIG	1
240ZINA	.1	±1000GCMG	1	400KPAG	.1	–15V200PSIG	.1	4070INHGG	1
1000GCMA	1	±1000MBARG	1	0.4MPAG	.0001	–30INHG/200PSIG	.1	4600FTH2O	1
760MMHGA	.1	±1000CMH2OG	1	4BARG	.001	–30V400INHGG	1	14MPAG	.01
760TORRA	.1	±100KPAG	.1	4KGCMG	.001	–400V5500INH2OG	1	140BARG	.1
1000MBARA	1	±0.1MPAG	.0001	4ATMG	.001	–240V3200ZING	1	140KGCMG	.1
1000CMH2OA	1	±1BARG	.001	**100 psia**	**Res**	–100V1400KPAG	1	140ATMG	.1
100KPAA	.1	±1KGCMG	.001	100PSIA	.1	–0.1V1.4MPAG	.001	**3000 psig**	**Res**
0.1MPAA	.0001	±1ATMG	.001	200INHGA	.1	2770INH2OG	1	3000PSIG	1
1BARA	.001	**30 psia**	**Res**	2770INH2OA	1	–1V14BARG	.01	6100INHGG	1
1KGCMA	.001	30PSIA	.01	1600ZINA	1	–1V14KGCMG	.01	6900FTH2O	1
1ATMA	.001	60INHGA	.01	7000GCMA	1	–1V 14ATMG	.01	20MPAG	.01
15 psig vac	**Res**	850INH2OA	1	5200MMHGA	1	**200 psig**	**Res**	200BARG	.1
15PSIVAC	.01	480ZINA	.1	5200TORRA	1	200PSIG	.1	200KGCMG	.1
30INHGVAC	.01	2100GCMA	1	7000MBARA	1	400INHGG	.1	200ATMG	.1
400INH2OVAC	.1	1600MMHGA	1	7000CMH2OA	1	5500INH2OG	1	**5000 psig**	**Res**
240ZINVAC	.1	1600TORRA	1	700KPAA	.1	3200ZING	1	5000PSIG	1
1000GCMVAC	1	2000MBARA	1	0.7MPAA	.0001	480FTH2O	.1	35MPAG	.01
760MMHGVAC	.1	2100CMH2OA	1	7BARA	.001	1400KPAG	1	350BARG	.1
760TORRVAC	.1	200KPAA	.1	7KGCMA	.001	1.4MPAG	.001	350KGCMG	.1
1000MBARVAC	1	0.2MPAA	.0001	7ATMA	.001	14BARG	.01	340ATMG	.1
1000CMH2OVAC	1	2BARA	.001			14KGCMG	.01		
						14ATMG	.01		

How to Specify

How to Specify	Type
F16B range - time - options	Standard housing
F16BBL range - time - options	Std. housing, backlit display
F16BN range - time - options	NEMA 4X housing
F16BNBL range - time - options	NEMA 4X, backlit display

Range—See table at left. Select a range code for default units. Some range codes are rounded off. See conversions on next page.

psi = PSI	torr = TORR	mbar = MBAR
inHg = INHG	mmh2O = MMH2O	bar = BAR
oz/in² = ZIN	kg/cm² = KGCM	cmH2O = CMH2O
inH2O = INH2O	g/cm² = GCM	atm = ATM
ftH2O = FTH2O	kPa = KPA	
mmHg = MMHG	MPa = MPA	

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

Time—Auto shutoff time (user re-configurable)

-1	1 minute	**-15**	15 minutes	**-1H**	1 hour
-2	2 minutes	**-20**	20 minutes	**-2H**	2 hours
-5	5 minutes	**-30**	30 minutes	**-4H**	4 hours
-10	10 minutes	**-ON**	On/off button	**-8H**	8 hours

Options—Add to end of model number. Factory installed only. See cecomp.com/accessories for details.

-HA	High accuracy, ±0.1% FS ±1 LSD. See range table for availability
-MC	Metal front cover instead of plastic, n/a NEMA 4X
-FP	Sealed housing and -CC for food processing applications. NEMA 4X with absolute reference ranges only.
-CC	Moisture resistant circuit board conformal coating
-CS	Case bottom stiffener plate, n/a NEMA 4X
-TP	Top port, gauge port on top of case, n/a NEMA 4X
-PM	Panel mount, 4.1" x 4.1", factory installed, n/a NEMA 4X
-SM	Surface mount plate, n/a NEMA 4X

Calibration Cert. Option—add to end of model number

-NC	NIST traceability documentation, 5 points and date

TP
Top gauge port. Primarily used with tire pressure applications. Not available with NEMA 4X models.

Accessories—order separately

RB
High visibility orange rubber boot protects gauge for portable applications. Not for NEMA 4X models.

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

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

Types of Gauges

Gauge reference sensors always read zero with an open gauge port. Ranges 1000 psi and higher use a 14.7 psi sealed reference sensor. They are functionally similar to gauge reference sensors.

Bipolar sensors read positive pressure and vacuum in the same units, and zero with the gauge port open.

Compound ranges read inHg for vacuum and psig for pressure.

Absolute reference gauges read zero at full vacuum. With an open gauge port, their readings will vary due to continuously changing barometric pressure.

psi	Compound	inHg	torr	mmHg	inH$_2$O	ftH$_2$O	oz/in^2	mmH$_2$O	cmH$_2$O	g/cm^2	kg/cm^2	atm	mbar	bar	kPa	MPa
0 to 14.70 psig vac	n/a	29.92 vac	760.0 vac	760.0 vac	406.8 vac	33.90 vac	235.1 vac	n/a	1034 vac	1033 vac	1.033 vac	1.000 vac	1013 vac	1.013 vac	101.3 vac	.1013 vac
−14.70 to 15.00 psig	−29.92 inHg to 15.00 psi	−760 to 30.54	−760 to 776	−760 to 776	−407 to 415	−33.90 to 34.61	−235.1 to 240.0	n/a	−1034 to 1055	−1033 to 1055	−1.033 to 1.055	−1.000 to 1.021	−1013 to 1034	−1.013 to 1.034	−101.3 to 103.4	−.1013 to .1034
−14.7 to 100.0 psig	−29.9 inHg to 100.0 psi	−29.9 to 203.6	−760 to 5171	−760 to 5171	−407 to 2768	−33.9 to 230.7	−235 to 1600	n/a	−1034 to 7031	−1033 to 7031	−1.033 to 7.031	−1.000 to 6.805	−1013 to 6895	−1.013 to 6.895	−101.3 to 689.5	−.1013 to .6895
−14.7 to 200.0 psig	−29.9 inHg to 200.0 psi	−29.9 to 407.2	n/a	n/a	−407 to 5536	−33.9 to 461.4	−235 to 3200	n/a	n/a	n/a	−1.03 to 14.06	−1.00 to 13.61	n/a	−1.01 to 13.79	−101 to 1379	−.101 to 1.379
0 to 3.000 psig	n/a	6.108	155.1	155.1	83.0	6.921	48.00	2109	210.9	210.9	.2109	.2041	206.8	.2068	20.68	n/a
0 to 5.000 psig	n/a	10.18	258.6	258.6	138.4	11.54	80.0	3515	351.5	351.5	.3515	.3402	344.7	.3447	34.47	n/a
0 to 15.00 psig	n/a	30.54	775.7	775.7	415.2	34.61	240.0	n/a	1055	1055	1.055	1.021	1034	1.034	103.4	.1034
0 to 30.00 psig	n/a	61.08	1552	1552	830	69.21	480.0	n/a	2109	2109	2.109	2.041	2068	2.068	206.8	.2068
0 to 60.00 psig	n/a	122.2	3103	3103	1661	138.4	960	n/a	4218	4218	4.218	4.083	4137	4.137	413.7	.4137
0 to 100.0 psig	n/a	203.6	5171	5171	2768	230.7	1600	n/a	7031	7031	7.031	6.805	6895	6.895	689.5	.6895
0 to 200.0 psig	n/a	407.2	n/a	n/a	5536	461.3	3200	n/a	n/a	n/a	14.06	13.61	n/a	13.79	1379	1.379
0 to 300.0 psig	n/a	610.8	n/a	n/a	n/a	692.0	4800	n/a	n/a	n/a	21.09	20.41	n/a	20.68	2068	2.068
0 to 500.0 psig	n/a	1018	n/a	n/a	n/a	1153	n/a	n/a	n/a	n/a	35.15	34.02	n/a	34.47	3447	3.447
0 to 1000 psig	n/a	2036	n/a	n/a	n/a	2307	n/a	n/a	n/a	n/a	70.31	68.05	n/a	68.95	6895	6.895
0 to 2000 psig	n/a	4072	n/a	n/a	n/a	4614	n/a	n/a	n/a	n/a	140.6	136.1	n/a	137.9	n/a	13.79
0 to 3000 psig	n/a	6108	n/a	n/a	n/a	6921	n/a	n/a	n/a	n/a	210.9	204.1	n/a	206.8	n/a	20.68
0 to 5000 psig	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	351.5	340.2	n/a	344.7	n/a	34.47
15.00 to 0 psi abs	n/a	30.54 abs	775.7 abs	775.7 abs	415.1 abs	34.61 abs	240.0 abs	n/a	1055 abs	1055 abs	1.055 abs	1.021 abs	1034 abs	1.034 abs	103.4 abs	.1034 abs
30.00 to 0 psi abs	n/a	61.08 abs	1552 abs	1552 abs	830 abs	69.21 abs	480.0 abs	n/a	2109 abs	2109 abs	2.109 abs	2.041 abs	2068 abs	2.068 abs	206.8 abs	.2068 abs
100.0 to 0 psi abs	n/a	203.6 abs	5172 abs	5172 abs	2767 abs	230.7 abs	1600 abs	n/a	7031 abs	7031 abs	7.031 abs	6.805 abs	6895 abs	6.895 abs	689.5 abs	.6895 abs

Precautions

✔ Read and understand all instruction sheet information. Contact us for help, assistance, 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 in case of battery leakage. Inspect batteries at least annually.

✔ Gauges are not intended for permanent outdoor use. Protect from weather and excessive humidity. NEMA 4X models are available for temporary outdoor use and wash down areas.

✔ Install gauge so it is protected from impact damage.

✔ Use thread sealant to ensure leak-free operation.

✔ Use fittings appropriate for the pressure range of the gauge.

✔ Media being measured must be compatible with 316L SS.

✔ 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.

⚠ 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.

⚠ 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.

Do not force housing! Use a wrench on hex fitting to install or remove.

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.

2.88" 3.0" Low battery voltage indicator Standard NEMA 4X Cecomp Electronics / Made in USA ¼" NPT 0.75" 3.38" Standard 3.5" NEMA 4X 1.65" 2.0" Turn at hex fitting only
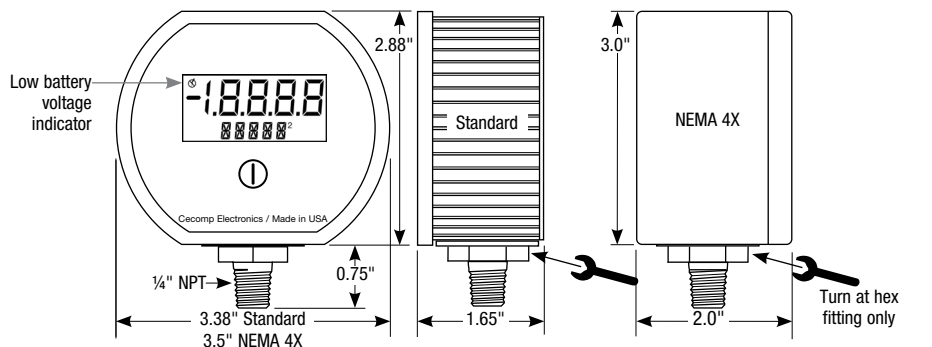
Power-Up

Your gauge is ready for use. Batteries are installed and it has been factory calibrated on NIST traceable equipment.

Press and hold the power button for approx. 1 second. After power-up initialization, the full-scale range in the factory default units is indicated. If the units were changed by the user, the full scale range in the selected units is then displayed.

The display test is briefly shown.

The actual pressure and units are displayed. The gauge is ready for use and readings are updated approximately 3 times per second.

Occasional flashing of the minus sign is normal for gauge reference models and indicates the gauge is at zero pressure. Absolute gauges normally read atmospheric pressure and zero at full vacuum.

Display Backlighting (F16BBL, F16BNBL)

In user configuration, the backlight can be set for

AUTO: On for 1 minute (factory default)

ON: On whenever the gauge is on

OFF: Disabled, to increase battery life

AUTO mode will turn on the backlighting for 1 minute when the gauge is powered up. It can be turned on at any time by momentarily pressing the power button whenever the gauge is on. This also restarts the auto shutoff timer.

The display backlighting may not be apparent under bright lighting conditions or with weak batteries.

Zero Display at Power Up (Gauge Reference Only)

The gauge port must be open to normal atmospheric pressure. Absolute reference gauges do not use the zero feature.

With the power off, press and hold the power button until oooo is displayed.

Release the button. When the start up sequence is complete, zero pressure and the units are displayed. The gauge in now zeroed.

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

If ErrO occurs make sure all pressure is removed and press the power button to restart the gauge.

Gauge Off hold Start Up oooo release FS Range Display Test 0.0 PSIG
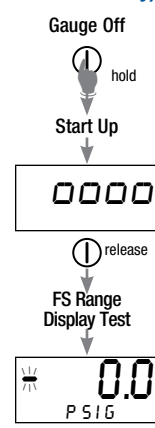
Shutoff

The auto shutoff timer starts at power up and restarts if the power button is pressed. In user configuration auto shutoff can be set for a variety of times or disabled.

If on/off operation is selected, the gauge will stay on until manually shut off or when the batteries are depleted. Turn gauge off when not in use.

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

To shut the gauge off manually, press and hold the power button until OFF is displayed and then release the button. The gauge shuts off.
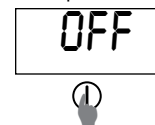
Minimum and Maximum Readings

The default configuration is with minimum and maximum capture enabled. One or both can be disabled in Advanced Configuration.

MIN and MAX readings are continuously updated and stored whenever the gauge is on. The stored readings can be manually cleared if desired. The 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 displayed and updated. The gauge may be left in MAX mode if desired.

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 displayed and updated. The gauge may be left in MIN mode if desired.

If excessive vacuum is applied to a pressure-only gauge, $-Err$ will be stored until the memory is cleared.

After MIN is displayed, press and hold the button for about 1 second until ***** is displayed. The MAX and MIN memory is not erased and the gauge returns to normal operation.

Clear a Memory Location

Press and continue to hold the button until the display indicates $cLr\ MX/MN$ (about 3 seconds total) and then release the button.

Both MAX and MIN values will be cleared and then the gauge will return to the normal operating mode.

For many applications it may be desirable to bring the system up to normal pressure and then clear the minimum or maximum values.

With a gauge reference models, if no pressure is applied the value will return to zero. If pressure is applied the new pressure reading will be stored in memory.

Absolute reference models will store the current atmospheric pressure reading if the gauge port is open to atmosphere.

Function	Button	Prompt (Release Button)
Hi reading	Press/hold	MAX > maximum reading & units
Lo reading	Press/hold	MIN > minimum reading & units
Exit Hi/Lo	Press/hold	***** > live reading
Clear Hi/Lo	Press/hold	MAX > $CLr\ MX/MN$ > live reading
Clear, Off	Press/hold	MAX > $CLr\ MX/MN$ > OFF

Error or Out-of-Range Indications

Attempting to zero the gauge with reading greater than approximately 3% of full-scale pressure or vacuum will result in an error condition. The display will alternately indicate $Err\ 0$ and the reading. Press the power button to reset the error condition.
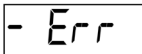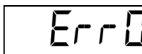
If excessive vacuum is applied to a pressure-only gauge, the display will indicate $-Err$ until the vacuum is released. Applying vacuum to a pressure-only gauge can damage the pressure sensor.
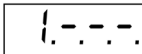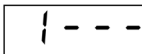
If 112.5% over range pressure is applied, an out-of-range indication of 1 – – – or 1.–.–.– will be displayed depending on model.

Internal Configuration Button Access

Internal configuration buttons are used to change engineering units and shutoff time. Advanced configuration and calibration also use the internal buttons and are passcode protected. This makes the gauge more tamper-resistant.

1. Remove the 6 screws on the back of the gauge.
2. Leave the wires connected. Standard housing: remove the battery holder and the battery cradle under it.
3. The front button along with the two internal buttons on the circuit board are used for configuration and calibration. Both internal buttons can easily be finger operated with the front of the gauge facing the user.

Note: For shutoff time, engineering unit selection, and passcode entry the gauge will automatically revert to normal operation if no buttons are operated for approximately 15 seconds.

Internal Configuration Button Access

Std. Housing: Remove the battery holder

DOWN   UP   A–566
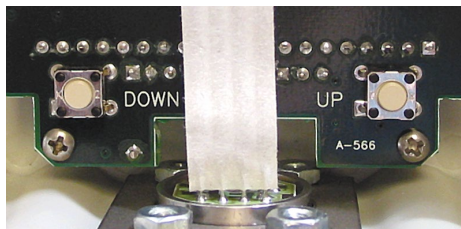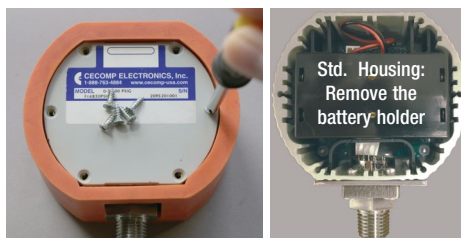
Auto Shutoff Time Selection

Auto shutoff time selection is done via the internal 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 powered up, press and hold the DOWN button.

Release the button when the auto shutoff time is displayed.

The upper display will show the shutoff time and the lower display will indicate AST M for minutes, AST H for hours, or AST for no auto shutoff.

Use the UP and DOWN buttons to select
AST: 0 (no auto shutoff, use front button for on/off)
AST M: 1, 2, 5, 10, 15, 20, or 30 minutes
AST H: 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.

Engineering Unit Selection

Engineering unit selection is done via the internal buttons. 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/PSI) gauges must be changed to display single-unit vacuum/pressure readings in the Advanced Configuration mode before different engineering units can be selected.

Power 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.

The default engineering units are mathematically converted to the newly selected engineering unit. After the factory default engineering unit has been changed and the gauge is powered up, the original range is displayed and then the range with the new engineering unit is displayed.

Advanced Configuration

This uses the internal configuration buttons and a passcode to allow more features to be configured.

Make sure the gauge is off.

Press and hold the UP button, then press the front button.

Release all buttons when the display indicates CFG and firmware version.

Gauge Off

UP   1. hold   2. press

CFG
v 14H

Start Up

– – – –
$CFGPC$

After the startup sequence, the display indicates _ _ _ _ with the first underscore blinking, and with CFGPC (configuration passcode) on the character display

To cancel and return to normal operation, press and release the front button without entering any passcode characters.
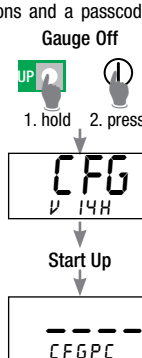
Passcode Entry

The factory default code is 3510, but it may be changed by the user under the Passcode 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.

– – – –
$CFGPC$

UP   DOWN
Move to next character
Press when done

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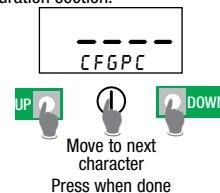
If an incorrect passcode is entered, the gauge will return to the start of the passcode entry sequence.

The shutoff timer is disabled and the gauge will stay in the configuration mode until the unit is powered down or batteries removed.

Gauge Configuration—User or Factory

The lower display will indicate USER. If USER is selected, the user configuration can be modified as described in the following steps. Press and release the power button to continue.

To restore the gauge to factory default settings, press the UP button. The lower display will indicate FCTRY. Pressing and releasing the power button when FCTRY is displayed will restore the factory configuration. The gauge will save the configuration and shut off. This does not affect calibration settings.

Max/Min Configuration

Use the UP or 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 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   Save the MAX and MIN values when the gauge is powered off. They must be cleared manually.

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 vacuum/pressure or compound (INHG/PSIG, CPD) gauges.

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

-/+EU   Vacuum is indicated as negative (–) pressure. The next step will allow you to select the engineering units.

CMPND Vacuum is negative INHG and pressure is PSI. These will be the engineering units.

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

Display Backlight Operation Selection (Optional)

If equipped with optional backlighting, the upper display will indicate bL. Use the UP and DOWN buttons to select the following.

AUTO: Backlight enabled for 1 minute
ON: Backlight on when gauge is on (shortens battery life)
OFF: Disabled, to increase battery life

When the desired setting is displayed, press and release the power button. The gauge will save the configuration and shut off.

Finishing Configuration

For gauges with the standard metal housing replace the battery cradle and the battery holder with the batteries facing down.

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

Battery Replacement

The low battery indicator will be shown in the upper left corner of the display when the batteries are near the end of their life. A dim display backlight (if equipped) also indicates the batteries are near the end of their life. The batteries should be replaced to maintain reliable operation.
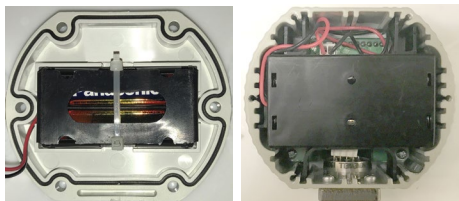
NEMA 4X Housing   Standard Housing

1. Remove the 6 screws on the back of the unit.
2. NEMA 4X models: Cut the battery holder wire tie (if equipped) and remove the battery cover.
   Standard housing: Lift up the battery holder.
3. Remove batteries by lifting up the positive end of the battery (opposite the spring) taking care not to bend the battery holder spring.
4. Discard old batteries properly, do not discard into fire, sources of extreme heat, or in any hazardous manner.
5. Always replace both batteries at the same time with high quality alkaline batteries.
6. 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.
7. Install battery holder or cover as shown. Replace the wire tie if equipped. Replace the back cover, including the rubber gasket, and reinstall the six screws.

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.

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 and absolute gauges.

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

Remove the 6 screws, open the rear cover. For gauges with the standard housing, remove the battery pack and cradle to access the internal buttons. Leave the battery pack connected.

Install fresh batteries.

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 shows the full-scale positive pressure range of the gauge in the engineering units as configured by the factory and then tests the display.

Then the display indicates _ _ _ _ with the first underscore blinking, and with CALPC (calibration passcode) on the lower display.

Enter the 3510 passcode as described in the Passcode Entry section.

If no buttons are pressed, the gauge returns to normal operating mode after 15 seconds.

Calibration Mode

The gauge 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 precision use the UP and DOWN buttons to select calibration engineering units with highest number of display counts.

Press and release the front button when the appropriate engineering units are displayed. Suggested units are shown below.

Sensor	Suggested units for calibration
3 PSI	6.920 FTH2O
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	4614 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.

UP and DOWN Button Operation

Each time one of the UP or DOWN buttons is pressed and released quickly, a small change is made to the digitized pressure signal. It may take more than one button press to make a change on the display.

To make larger changes, press and hold the appropriate button. After about one second, the display will begin to change rapidly. Release the button to stop. Make fine adjustments by pressing and quickly releasing the buttons.

Gauge Reference Pressure Gauges

Apply zero pressure by venting the gauge port to atmosphere. The character display will alternate between ZERO and CAL. Use the UP and DOWN buttons to adjust the display to zero.

Note: At this point you may re-zero the gauge without doing any other calibration. Press and hold the front 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. The character display will alternate between +SPAN and CAL. Use the UP and DOWN buttons to adjust the display to match the calibrator reading.

Apply 50% full-scale pressure. The character display will alternate between +MID and CAL. Use the UP and DOWN buttons to adjust the display to match the calibrator reading.

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 readings at 0%, 25%, 50%, 75% and 100% of full scale.

Gauge Reference Vacuum Gauges

Apply zero pressure by venting the gauge port to atmosphere. The character display will alternate between ZERO and CAL. Use the UP and DOWN buttons to adjust the display to zero.

Note: At this point you may re-zero the gauge without doing any other calibration. Press and hold the front 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 vacuum. The character display will alternate between +SPAN and CAL. Use the UP and DOWN buttons to adjust the display to match the calibrator reading.

Apply 50% full-scale vacuum. The character display will alternate between +MID and CAL. Use the UP and DOWN buttons to adjust the display to match the calibrator reading.

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 readings at 0%, 25%, 50%, 75% and 100% of full scale.

Absolute Reference Gauges

Apply full vacuum to the gauge. The character display will alternate between ZERO and CAL. Use the UP and DOWN buttons to adjust the display to zero.

Note: At this point you may re-zero the gauge without doing any other calibration. Press and hold the front 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. The character display will alternate between +SPAN and CAL. Use the UP and DOWN buttons to adjust the display to match the calibrator reading.

Apply 50% of full-scale pressure. The lower display will alternate between +MID and CAL. Use the UP and DOWN buttons to adjust the display to match the calibrator reading.

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 readings at 0%, 25%, 50%, 75% and 100% of full scale.

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. Use the UP and DOWN buttons to adjust the display to match the calibrator reading.

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. Use the UP and DOWN buttons to adjust the display to match the calibrator reading.

Change Passcodes

The factory default passcode 3510 may be changed to different values for configuration and/or calibration.

To change the configuration passcode: With the unit off, press and hold the UP button. Then press the front button. Release all buttons when the display indicates CFG.

To change the calibration passcode: With the unit off, press and hold the DOWN button to view and/or change the user calibration passcode. Then press the front button. Release all buttons when the display indicates CAL.

The display initially indicates _ _ _ _ with the first underscore blinking and either CFGPC or CALPC on the character display, depending on which one you selected above.

Note: The unit 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.

Enter access code 1220. This allows you to change passcodes or retrieve a lost or forgotten passcode.

Use the UP and DOWN buttons to set the left-most digit to 1.

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

Use the UP and DOWN buttons to select 2.

Press and release the front button to index to the next position. 1 2 will remain, and the third position will be blinking.

Use the UP and DOWN buttons to select 2.

Press and release the front button to index to the next position. 1 2 2 will remain, and the fourth position will be blinking.

Use the UP and DOWN buttons to select 0.

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 passcode with CFGPC or CALPC on the lower display.

Press the UP or DOWN button to select the first character of the new passcode. The selected characters can be 0 through 9 or A, b, C, d, E, F.

When the desired first character is being displayed, press and release the front button to proceed to the next character.

Repeat above until the entire new passcode is complete.

To exit the passcode change mode, press and hold the front button. Release the button when the display indicates - - - - to restart the gauge.