Ranges and Resolution

abs: absolute reference (atmospheric pressure to zero at full vacuum)
vac: vacuum gauge, minus sign not used unless specified
Resolution is fixed as indicated in table below
Contact factory for engineering units not listed

–30.0 inHg/15.0 psig	200.0 inHg abs	1600 mmHg	20.00 bar	2100 g/cm²
–30.0 inHg/100.0 psig	200.0 inHg	3200 mmHg	35.00 bar	1.000 kg/cm² abs
–30.0 inHg/200.0 psig	50.00 oz/in²	760.0 torr abs	70.00 bar	1.000 kg/cm² vac
3.000 psig	80.0 oz/in²	1600 torr abs	140.0 bar	±1.000 kg/cm²
5.000 psig	240.0 oz/in² abs	2100 mmH₂O	200.0 bar	1.000 kg/cm²
15.00 psi abs	240.0 oz/in² vac	3500 mmH₂O	350.0 bar	2.000 kg/cm² abs
15.00 psig vac	±240.0 oz/in²	210.0 cmH₂O	20.00 kPa	2.000 kg/cm²
±15.00 psig	240.0 oz/in²	350.0 cmH₂O	35.00 kPa	4.000 kg/cm²
15.00 psig	85.0 inH₂O	1000 cmH₂O	100.0 kPa abs	7.000 kg/cm² abs
30.00 psi abs	140.0 inH₂O	2100 cmH₂O	100.0 kPa vac	7.000 kg/cm²
30.00 psig	400.0 inH₂O abs	200.0 mbar	±100.0 kPa	14.00 kg/cm²
60.00 psig	400.0 inH₂O vac	350.0 mbar	100.0 kPa	20.00 kg/cm²
100.0 psi abs	±400 inH₂O	1000 mbar abs	200.0 kPa abs	35.00 kg/cm²
100.0 psig	400.0 inH₂O	1000 mbar vac	200.0 kPa	70.00 kg/cm²
200.0 psig	850 inH₂O abs	±1000 mbar	400.0 kPa	140.0 kg/cm²
300.0 psig	850 inH₂O	1000 mbar	700.0 kPa abs	200.0 kg/cm²
500.0 psig	7.000 ftH₂O	2000 mbar abs	–100 to 700 kPa	350.0 kg/cm²
1000 psig	12.00 ftH₂O	2000 mbar	700.0 kPa	1.000 atm abs
2000 psig	35.00 ftH₂O	4000 mbar	1500 kPa	±1.000 atm
3000 psig	70.00 ftH₂O	1.000 bar abs	2000 kPa	1.000 atm
5000 psig	140.0 ftH₂O	1.000 bar vac	3500 kPa	2.000 atm
6.000 inHg	230.0 ftH₂O	±1.000 bar	7000 kPa	4.000 atm
10.00 inHg	480.0 ftH₂O	1.000 bar	3.500 MPa	7.000 atm
30.00 inHg abs	150.0 mmHg	2.000 bar abs	7.000 MPa	14.00 atm
30.00 inHg vac	260.0 mmHg	2.000 bar	14.00 MPa	20.00 atm
±30.00 inHg	760.0 mmHg abs	4.000 bar	20.00 MPa	35.00 atm
30.00 inHg	760.0 mmHg vac	7.000 bar abs	35.00 MPa	70.00 atm
60.00 inHg abs	±760 mmHg	–1.00 to 7.00 bar	1000 g/cm² abs	135.0 atm
60.00 inHg	760.0 mmHg	7.000 bar	1000 g/cm²	200.0 atm
120.0 inHg	1600 mmHg abs	14.00 bar	2100 g/cm² abs	340.0 atm

Accuracy

Includes linearity, hysteresis, repeatability
Standard: ±0.25% of full scale ±1 least significant digit
Optional: **-HA** ±0.1% FS ±1LSD (most ranges)
CD Factory 5-point calibration data
NC NIST traceable test report and 5-point calibration data

Display

4 readings per second nominal display update rate
4½ digit LCD, 0.5" H main display
5 character 0.25" H alphanumeric lower display for units, functions, and setup

Controls & Functions

TEST When held sets loop current and display to test level, independent of pressure, to allow testing of system operation
▲ Up: set test, passcode, and calibration values
▼ Down: set test, passcode, and calibration values

Calibration

User settable passcode required to enter calibration mode
All pressure and absolute models: zero, midpoint, span
All vacuum models: –span, –midpoint, zero
Vacuum/pressure models: –span, zero, +midpoint, +span
±15 psi models: –span, –midpoint, zero, +midpoint, +span

Loop Supply Voltage

Any DC supply/loop resistance that maintains 8 to 32 VDC at gauge terminals
Gauge is reverse polarity protected
3 ft long, 2-conductor 22 AWG cable with stripped and tinned wire ends
Order optional **9046-24-008** loop power supply

Loop Output Characteristics

12,000 counts over sensor range for 4-20 mA output
Updated approximately 16 times per second
Factory configurable pressure range to correspond to 4-20 mA output
Indication on display for low loop power

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)

- *2-Wire Loop Powered*
- *NEMA 4X Models Availalbe*
- *4-20 mA Output*
- *Output Test Function*



F16L100PSIG
100.0 psig Range



F16LN100PSIG
100 psig Range, NEMA 4X

Size

F16L: 3.38" W x 2.88" H x 1.65" D housing
F16LN: 3.5" W x 3.0" H x 2.0" D housing
Add approximately 0.75" to height for pressure fitting
Add approximately 1" to depth for strain relief and wire clearance

Weight

Gauge: 9 ounces (approx.)
Shipping weight: 1 pound (approx.)

Housing

F16L: Extruded aluminum case, light gray epoxy powder coated, black ABS/ polycarbonate bezel (gray aluminum bezel optional), front and rear gaskets, black/gold polycarbonate label
F16LN: Light gray ABS/polycarbonate NEMA 4X case, rear gasket, black/gold polycarbonate label

Pressure/Vacuum Connection Size and Material

1/4 NPT male
All wetted parts are 316 stainless steel

Overpressure

3000 psig range and metric equivalents: 5000 psig
5000 psig range and metric equivalents: 7500 psig
All others 2 times sensor pressure
112.5% out-of-range display: ***I*** **– – –** or ***I*** **–.–.–.–** depending on model

Burst Pressure

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

Models and Options

Standard **F16L range units ref**
NEMA 4X **F16LN range units ref**

Pressure/Vacuum Range
Units
G=Gauge, **A**=Absolute, **VAC**=Vacuum

Example: **F16L500PSIG**
F16L, 500 psig, 4-20 mA output

Unit Abbreviations

psi = **PSI**	ftH₂O = **FTH2O**	kg/cm² = **KGCM**	mbar = **MBAR**
inHg = **INHG**	mmHg = **MMHG**	g/cm² = **GCM**	bar = **BAR**
oz/in² = **ZIN**	torr = **TORR**	kPa = **KPA**	cmH₂O = **CMH2O**
inH₂O = **INH2O**	mmH₂O = **MMH2O**	MPa = **MPA**	atm = **ATM**

Cecomp Electronics

F16L Series Instructions

DESCRIPTION

All operating power for the **F16L** series is supplied by the 4-20 mA current loop. The 2-wire connection allows the **F16L** to be used as a digital indicating transmitter in any 4-20 mA current loop application. The output is a 12,000 count analog 4-20 mA signal. The output is filtered to improve noise immunity and is updated approximately 16 times per second. The temperature compensated piezoresistive transducer features 316 stainless steel wetted parts.

The TEST pushbutton, when depressed, switches the display and output loop to a preset level determined by the keypad setting of the test value.

INSTALLATION AND PRECAUTIONS

Install or remove gauge using wrench on hex fitting only. Do not attempt to tighten by turning housing or any other part of the gauge. Use fittings appropriate for the pressure range of the gauge. Do not apply vacuum to gauges not designed for vacuum operation. Due to the hardness of 316 stainless steel, it is recommended that a thread sealant be used to ensure leak-free operation.

NEVER insert objects into the gauge port or blow out with compressed air. Permanent damage not covered by warranty will result to the sensor.

ELECTRICAL CONNECTION

Connection to the **F16L** is made with the 2-wire cable at the gauge rear. Connect the loop (+) supply to the RED lead and the loop (–) supply to the BLACK lead. Reversing the connections will not harm the gauge but the **F16L** will not operate with incorrect polarity.

LOOP VOLTAGE

Select a loop power supply voltage and total loop resistance so that when the loop current is 20 mA, the gauge will have at least 8 VDC at its terminals. For correct operation and to avoid erratic or erroneous readings, the gauge terminal voltage must not fall below 8 VDC. Too large a loop resistance will cause the gauge output to “limit” or saturate before reaching its full 20 mA output.

The **minimum** loop supply voltage may be calculated from the formula:

$$V_{min} = 8V + (20mA \times \text{Total loop resistance})$$

If the terminal voltage of the gauge falls below about 7.8 VDC, erratic operation may occur. This is an indication that the loop supply/resistance may not allow adequate headroom for reliable operation. This should never occur in normal use. If it does, examine the loop supply/resistance.

OPERATION

The **F16L** is designed for continuous operation. Warm-up time is negligible. When power is first applied, the **F16L** will set the loop current to maximum and check the voltage available. If there is sufficient voltage available to power the unit, all active segments will be displayed briefly.

Then the full scale pressure range and engineering units are displayed. All active segments will again displayed briefly. Then the display will show the system pressure, and the loop current will also be proportional to the pressure/vacuum. The output is linearly proportional to the pressure.

Pressure, vacuum, or absolute ranges:	4 mA = Zero or low end 20 mA = Span, full-scale or high end
Bipolar ranges:	4 mA = negative or low end 12 mA = Zero 20 mA = Span, full-scale or high end
Compound ranges: (can be custom scaled by factory)	4 mA = negative or low end 12 mA = midscale over entire range 20 mA = Span, full-scale or high end

At power-up, if the voltage available is not sufficient, only the low power segment will be displayed. This is an indication that the loop impedance is too high or the loop power supply voltage is too low. After successful power-up, if the loop voltage falls below the minimum required for reliable operation, the **F16L** will continue to indicate pressure with the low power segment blinking at a slow rate.

TEST BUTTON

When the front-panel TEST button is held depressed, the display and loop current are switched, independent of the system pressure, to a test level determined by the test setting. This test mode will allow setup and testing of the current loop by switching to this test level whenever desired without having to alter the system pressure.

To set the test output level, press and hold the front-panel TEST button and press the up or down arrow buttons to adjust the test output to the desired pressure setting. This setting is stored in non-volatile memory.

When the TEST button is held depressed, the display and loop current are switched, independent of the actual pressure, to a level determined by the test setting. When the button is released, normal operation is resumed.

CALIBRATION

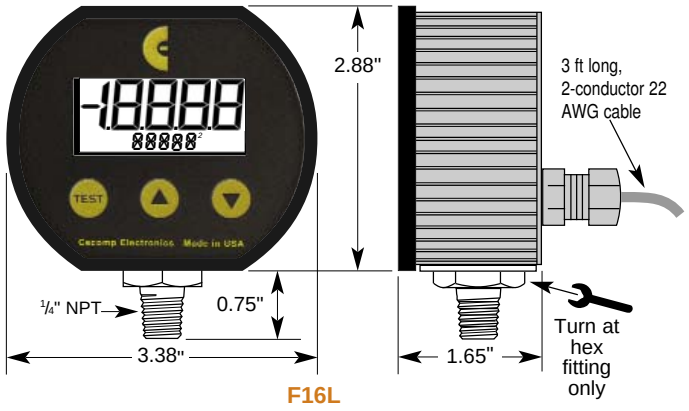
The gauge is calibrated at the factory using equipment traceable to NIST. There is no need to calibrate the gauge before putting it in service. Complete calibration instructions can be downloaded from **www.cecomp.com**.

Calibration should only be performed by qualified individuals using appropriate calibration standards and procedures. The calibration equipment should be 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 10 microns (0.01 torr or 10 millitorr) or lower is required for vacuum and absolute gauges.

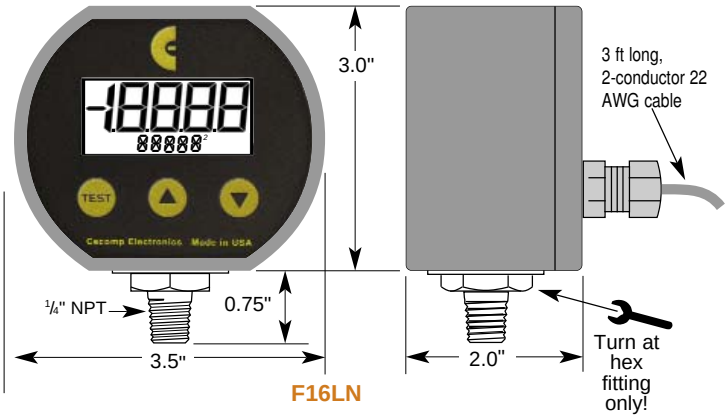
The F16 series uses a user-modifiable calibration passcode to enter the calibration mode. In the calibration mode, the gauge automatically recognizes the calibration region corresponding to the applied pressure. There are 3, 4, or 5 calibration regions depending upon the pressure range of the gauge. All gauges have Zero, +Midpoint, and +Span regions. Gauges that measure vacuum as well as pressure will also have a –Span region, and if the sensor is 15 psig or less, the gauge will have a –Midpoint region as well.

Calibration of the loop output coordinates the 4-20 mA output to the display indication, and is performed independently of applied pressure. It requires a direct physical measurement of the output. Calibration of the output coordinates the loop output to the display indication, and normally does not need to be adjusted. This calibration procedure can be downloaded from **www.cecomp.com**.

DIMENSIONS



F16L



F16LN

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

Pressure