



### 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  
 Contact factory for engineering units not listed

-30.0 inHg/15.0 psig	200.0 inHg abs	1600 mmHg	20.00 bar	2100 g/cm <sup>2</sup>
-30.0 inHg/100.0 psig	200.0 inHg	3200 mmHg	35.00 bar	1.000 kg/cm <sup>2</sup> abs
-30.0 inHg/200.0 psig	50.00 oz/in <sup>2</sup>	760.0 torr abs	70.00 bar	1.000 kg/cm <sup>2</sup> vac
3.000 psig	80.0 oz/in <sup>2</sup>	1600 torr abs	140.0 bar	±1.000 kg/cm <sup>2</sup>
5.000 psig	240.0 oz/in <sup>2</sup> abs	2100 mmHg	200.0 bar	1.000 kg/cm <sup>2</sup>
15.00 psi abs	240.0 oz/in <sup>2</sup> vac	3500 mmHg	350.0 bar	2.000 kg/cm <sup>2</sup> abs
15.00 psig vac	±240.0 oz/in <sup>2</sup>	210.0 cmHg	±20.0 kPa	2.000 kg/cm <sup>2</sup>
±15.00 psig	240.0 oz/in <sup>2</sup>	350.0 cmHg	35.0 kPa	4.000 kg/cm <sup>2</sup>
15.00 psig	85.0 inH <sub>2</sub> O	1000 cmHg	100.0 kPa abs	7.000 kg/cm <sup>2</sup> abs
30.00 psi abs	140.0 inH <sub>2</sub> O	2100 cmHg	100.0 kPa vac	7.000 kg/cm <sup>2</sup>
30.00 psig	400.0 inH <sub>2</sub> O abs	200.0 mbar	±100.0 kPa	14.00 kg/cm <sup>2</sup>
60.00 psig	400.0 inH <sub>2</sub> O vac	350.0 mbar	100.0 kPa	20.00 kg/cm <sup>2</sup>
100.0 psi abs	±400 inH <sub>2</sub> O	1000 mbar abs	200.0 kPa abs	35.00 kg/cm <sup>2</sup>
100.0 psig	400.0 inH <sub>2</sub> O	1000 mbar vac	200.0 kPa	70.00 kg/cm <sup>2</sup>
200.0 psig	850 inH <sub>2</sub> O abs	±1000 mbar	400.0 kPa	140.0 kg/cm <sup>2</sup>
300.0 psig	850 inH <sub>2</sub> O	1000 mbar	700.0 kPa abs	200.0 kg/cm <sup>2</sup>
500.0 psig	7.000 ftH <sub>2</sub> O	2000 mbar abs	-100 to 700 kPa	350.0 kg/cm <sup>2</sup>
1000 psig	12.00 ftH <sub>2</sub> O	2000 mbar	700.0 kPa	1.000 atm abs
2000 psig	35.00 ftH <sub>2</sub> O	4000 mbar	1500 kPa	±1.000 atm
3000 psig	70.00 ftH <sub>2</sub> O	1.000 bar abs	2000 kPa	1.000 atm
5000 psig	140.0 ftH <sub>2</sub> O	1.000 bar vac	3500 kPa	2.000 atm
6.000 inHg	230.0 ftH <sub>2</sub> O	±1.000 bar	7000 kPa	4.000 atm
10.00 inHg	480.0 ftH <sub>2</sub> O	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/cm <sup>2</sup> abs	135.0 atm
60.00 inHg	760.0 mmHg	7.000 bar	1000 g/cm <sup>2</sup>	200.0 atm
120.0 inHg	1600 mmHg abs	14.00 bar	2100 g/cm <sup>2</sup> 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  
**BL** models: Red LED backlight on whenever gauge is on  
 LCD Alarm 1 and Alarm 2 indicators and bi-color (red/green) LEDs on front panel

### Controls and Functions

**SEL** Select display alarm trip points  
**TEST** Toggle relay state when in test mode  
 ▲ Up: Increase set/reset point when in setpoint adjust mode  
 ▼ Down: Decrease set/reset point when in setpoint adjust mode

### 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

### Alarm Outputs

Keypad adjustable trip and reset points for each relay  
 Dual form C (SPDT) relay contacts; 1A/24VDC, 0.5A/115VAC, non-inductive  
 3 ft long, 6-conductor 22 AWG cable with stripped and tinned wire ends  
 120 milliseconds typical response time

### Power

Gauge is on whenever power is applied. Designed for continuous operation.  
 Any AC source of 8 to 24 VAC 50/60 Hz or any DC source of 9 to 32 VDC  
 1.0 watt maximum power consumption  
 3 ft long 2-conductor 22 AWG power cable with stripped and tinned wire ends  
 Order optional **WMPSK** 12 VDC wall mount power supply kit to operate on 115 VAC

### 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)

- Dual SPDT Alarms with Programmable Set and Reset
- NEMA 4X and Display Backlighting Optional
- Bi-Color Red/Green Alarm LEDs
- Alarm Test Function



### Size

**F16ADAH:** 3.38" W x 2.88" H x 1.65" D housing  
**F16ADAHN:** 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 wt.: 1 pound (approx.)

### Housing

**F16ADAH:** Extruded aluminum case, light gray epoxy powder coated, black ABS/ polycarbonate bezel (gray aluminum bezel optional), front and rear gaskets, black/gold polycarbonate label  
**F16ADAHN:** 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: / - - - or / - - - - depending on model

### Burst Pressure

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

### Models and Options

Standard	<b>F16ADAH</b>	range units ref - alarm
Backlit	<b>F16ADAHBL</b>	range units ref - alarm
NEMA 4X	<b>F16ADAHN</b>	range units ref - alarm
Backlit + NEMA 4X	<b>F16ADAHNBL</b>	range units ref - alarm

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

### Relay Options

**-NT** Normal action, relays Tripped at power up when inside deadband  
**-NR** Normal action, relays Reset at power up when inside deadband  
**-RT** Reverse action, relays Tripped at power up when inside deadband  
**-RR** Reverse action, relays Reset at power up when inside deadband

Example: **F16ADAHBL500PSIG-NR**

F16ADAH with BL display backlighting, 500 psig, normal action, relays reset at power up

### Unit Abbreviations

psi = <b>PSI</b>	ftH <sub>2</sub> O = <b>FTH2O</b>	kg/cm <sup>2</sup> = <b>KGCM</b>	mbar = <b>MBAR</b>
inHg = <b>INHG</b>	mmHg = <b>MMHG</b>	g/cm <sup>2</sup> = <b>GCM</b>	bar = <b>BAR</b>
oz/in <sup>2</sup> = <b>ZIN</b>	torr = <b>TORR</b>	kPa = <b>KPA</b>	cmH <sub>2</sub> O = <b>CMH2O</b>
inH <sub>2</sub> O = <b>INH2O</b>	mmH <sub>2</sub> O = <b>MMH2O</b>	MPa = <b>MPA</b>	atm = <b>ATM</b>



# F16ADAH Series Instructions

## INSTALLATION AND PRECAUTIONS

Install or remove gauge using wrench on hex fitting only. Do not turn using 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. **NEVER** connect the gauge power wires directly to 115 VAC or permanent damage not covered by warranty will result!

## POWER CONNECTIONS

The F16ADAH series can be powered by any AC source **8 to 24 VAC 50/60 Hz** or any DC source **9 to 32 VDC**.

Connect power to the smaller two-conductor cable with one RED and one BLACK lead. The gauge will operate on either AC or DC power, so there is no need to observe polarity. Operation with less than 8 VAC RMS if AC, or 9 VDC may cause erratic or erroneous readings or alarm operation.

The gauge is powered on whenever a supply voltage is applied. During power-up, the display briefly indicates the rated full-scale pressure with "FS" indicated on the lower display. This is followed by a test of all display segments. The gauge then proceeds to the normal operating mode. The gauge may be left on at all times or as required. Relay setpoints, the calibration passcode, and calibration information are stored in non-volatile memory.

## ALARM OUTPUT WIRING

The 6-conductor cable is for the 2 SPDT relay contacts.



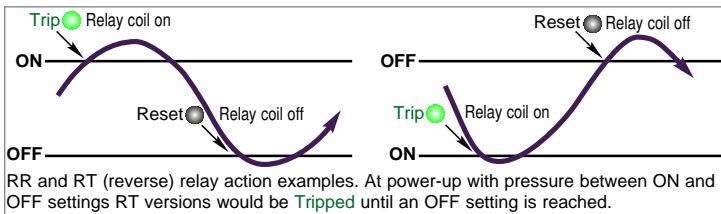
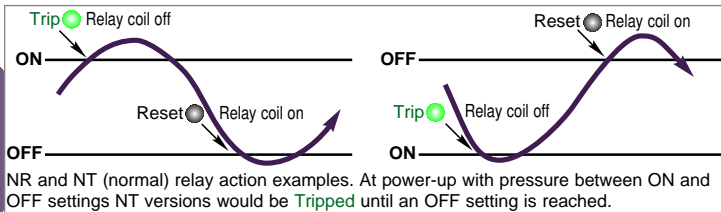
## Contact Rating and Protection

The relay contacts are rated at 1A/24VDC or 0.5A/115VAC. Using mechanical relay contacts above their rating, or with large inductive loads, will shorten their useful life. In circuits other than low-level switching or pilot duty, external contact protection such as snubber networks or arc suppression networks are required to protect the contacts. No internal fusing is included in the contact circuits. The relay outputs should be externally fused by the user in applications where good design practice dictates.

## RELAY TYPES: -NT, -NR, -RT, -RR

ON or "Trip Point" is defined as the value of applied pressure that will result in a change of state from a normal to a tripped condition. The OFF or "Reset Point" is defined as the value of applied pressure that will result in a change of state to a reset condition.

It is important to consider what will happen if the gauge loses power and the contacts return to their NC position. Also consider the desired alarm action (Tripped or Reset) when the gauge powers up with the pressure is inside the deadband.



## USING THE TEST FUNCTION

For system setup, testing, and troubleshooting, the test function can be used to toggle the state of the relays. This allows them to be switched to their opposite state on demand without the need to vary the system pressure to test devices connected to the relays.

While in the normal operating mode, press and hold the TEST button and then press the SEL button. Release both buttons when the display indicates - - - - .

While in the Test mode the display will indicate the applied pressure with engineering units blinking at a slow rate.

To invert the relay state, press the TEST button. As long as the TEST button is held pressed, the LED indicators and the relays will be opposite to what they would normally be for the applied pressure displayed.

When the TEST button is released, the LED indicators and the relays will return to their normal operating state corresponding to the applied pressure being displayed.

To exit the Test mode and return to normal operation, press and release the SEL button.

## SETTINGS

The trip (ON) and reset (OFF) points are independently adjustable anywhere within the range of the gauge. ON may be higher or lower than OFF.

### ON Trip Adjustment

1. Make sure the gauge is in the normal operating mode. To adjust the trip point (ON) press the SEL (Select) button once to show **ON** on the lower display.
2. Press and hold the TEST button, and press the SEL button. Release both buttons when the display indicates " - - - - ".
3. The display will indicate the trip point value with **ON** blinking on the lower display.
4. To adjust the ON value, press and hold the TEST button. The display will indicate the trip point value with **ON** on the character segments.
5. Operate the ▲ and ▼ buttons to adjust ON to the desired value. The trip point value is stored when the TEST button is released. The gauge will not respond to changes in applied pressure while the TEST button is held pressed. The alarm relay and LCD indicators will maintain their prior states until the TEST button is released.
6. To exit the ON adjust mode and return to normal operation, press and release the SEL button until the engineering units are displayed.

### OFF Reset Adjustment

The reset point (OFF) is adjusted in the same manner as the setpoint.

1. Make sure the gauge is in the normal operating mode. To adjust the reset point (OFF) press the SEL (Select) button twice to show **OFF** on the lower display.
2. Press and hold the TEST button, and press the SEL button. Release both buttons when the display indicates " - - - - ".
3. The display will indicate the reset point value with **OFF** blinking on the lower display.
4. To adjust the OFF value, press and hold the TEST button. The display will indicate the reset point value with **OFF** on the character segments.
5. Operate the ▲ and ▼ buttons to adjust OFF to the desired value. The reset point value is stored when the TEST button is released. The gauge will not respond to changes in applied pressure while the TEST button is held pressed. The alarm relay and LCD indicators will maintain their prior states until the TEST button is released.
6. To exit the OFF adjust mode and return to normal operation, press and release the SEL button until the engineering units are displayed.

Note: "trip point" is defined as the value of applied pressure that will result in a change of state from a normal to a relay trip condition. "Reset point" is defined as the value of applied pressure that will result in a change of state to a relay reset condition.

## NORMAL OPERATION

In normal operation the display indicates the applied pressure with engineering units displayed on the character segments. Green LEDs indicate the setpoint has been exceeded and the relay is tripped. Once the pressure is out of the deadband, the LEDs will be off and the relay reset. Note that the actual relay operation will vary depending on the setpoints and the relay configuration that was ordered with the gauge.

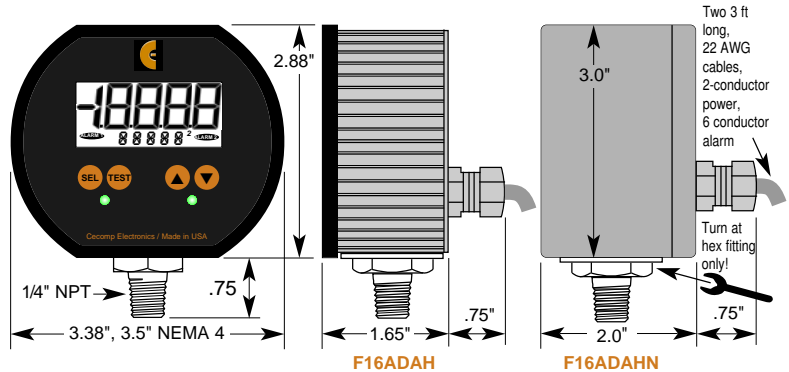
The relay trip point values are displayed by pressing the SEL (Select) button. Press once to show the **ON** setting and press again to show the **OFF** setting. Pressing the SEL button again returns the gauge to the normal display.

## CALIBRATION

Calibration should only be attempted if the user has access to pressure calibration equipment at least four times the gauge accuracy. Absolute reference gauges require vacuum generation and atmospheric pressure measurement equipment for accurate calibration and thus are more difficult to calibrate in the field.

The user-settable passcode is required to access the gauge calibration functions. The default passcode, gauge setting instructions, and gauge calibration instructions can be downloaded from [www.cecomp.com](http://www.cecomp.com) or requested by calling us at 800-942-0315. Gauges may be also returned to Cecom for factory certified or NIST traceable calibration.

## DIMENSIONS



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