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

Accuracy
Includes linearity, hysteresis, repeatability
Standard: ±0.25% of full scale ±1 least significant digit
HA option: ±0.1% FS ±1 LSD, see table 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: Red LED backlight on when gauge is on

Power
8-24 VAC 50/60 Hz or 9-32 VDC
AD: Approximately 5 mA
ADBL: Approximately 80 mA
3 1/2 long, 2-conductor 22 AWG cable
All models are designed for continuous operation
Order optional WMPSK 115V/12V wall mount power supply kit.

Controls and Functions
Front button turns gauge on or off, zero gauge reference gauges, and cycles through min/max functions
Internal buttons for engineering unit selection, auto shutdown time, min/max setup, calibration. Pass code protected setup & calibration.

Min/Max Functions
Minimum and maximum readings stored 3 times per second
Front button cycles through min display, max display, clear
Configurable for min or max, max only, min/max, or none
Configurable to clear or retain min/max values at power off

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

Weight
Gauge: 9 ounces (approximately)
Shipping: 1 pound (approximately)

Housing
F16AD: Extruded aluminum case, epoxy powder coated, ABS/ polycarbonate bezel (aluminum bezel optional), front and rear gaskets, polycarbonate label
F16ADN: ABS/polycarbonate NEMA 4X case, rear gasket, polycarbonate

Connection and Material
1/4" NPT male fitting, 316L stainless steel
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 others: 2 X pressure range
3000 psi, 5000 psi, and 4 digit ranges 112.5% full scale out-of-range display: I - - - or I - - - -
4 X sensor burst pressure rating, or 10,000 psi, whichever is less
Vacuum service: ±15 psig, 15 psig, 30 psia, 100 psig, 100 psia
Compensated overpressure: 15 psig Vac

Environmental
Storage temperature: −40 to 203°F (−40 to 95°C)
Operating temperature: −67 to 185 °F (−55 to 85 °C)
Compensation: 32 to 158 °F (0 to 70°C)

Sensor Ranges and Engineering Units

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2500</td>
<td>.001</td>
<td>600MBARR</td>
<td>.001</td>
<td>1500MBARR</td>
<td>.001</td>
<td>2500MBARR</td>
<td>.001</td>
<td>3500MBARR</td>
<td>.001</td>
<td>5000MBARR</td>
<td>.001</td>
</tr>
<tr>
<td>2500</td>
<td>.001</td>
<td>500MBARR</td>
<td>.001</td>
<td>1000MBARR</td>
<td>.001</td>
<td>2000MBARR</td>
<td>.001</td>
<td>3000MBARR</td>
<td>.001</td>
<td>5000MBARR</td>
<td>.001</td>
</tr>
<tr>
<td>2500</td>
<td>.001</td>
<td>400MBARR</td>
<td>.001</td>
<td>800MBARR</td>
<td>.001</td>
<td>1500MBARR</td>
<td>.001</td>
<td>2500MBARR</td>
<td>.001</td>
<td>5000MBARR</td>
<td>.001</td>
</tr>
<tr>
<td>2500</td>
<td>.001</td>
<td>300MBARR</td>
<td>.001</td>
<td>600MBARR</td>
<td>.001</td>
<td>1000MBARR</td>
<td>.001</td>
<td>2000MBARR</td>
<td>.001</td>
<td>5000MBARR</td>
<td>.001</td>
</tr>
<tr>
<td>2500</td>
<td>.001</td>
<td>200MBARR</td>
<td>.001</td>
<td>400MBARR</td>
<td>.001</td>
<td>800MBARR</td>
<td>.001</td>
<td>1500MBARR</td>
<td>.001</td>
<td>5000MBARR</td>
<td>.001</td>
</tr>
<tr>
<td>2500</td>
<td>.001</td>
<td>100MBARR</td>
<td>.001</td>
<td>200MBARR</td>
<td>.001</td>
<td>400MBARR</td>
<td>.001</td>
<td>800MBARR</td>
<td>.001</td>
<td>1500MBARR</td>
<td>.001</td>
</tr>
<tr>
<td>2500</td>
<td>.001</td>
<td>50MBARR</td>
<td>.001</td>
<td>100MBARR</td>
<td>.001</td>
<td>200MBARR</td>
<td>.001</td>
<td>400MBARR</td>
<td>.001</td>
<td>800MBARR</td>
<td>.001</td>
</tr>
<tr>
<td>2500</td>
<td>.001</td>
<td>10MBARR</td>
<td>.001</td>
<td>50MBARR</td>
<td>.001</td>
<td>100MBARR</td>
<td>.001</td>
<td>200MBARR</td>
<td>.001</td>
<td>400MBARR</td>
<td>.001</td>
</tr>
<tr>
<td>2500</td>
<td>.001</td>
<td>1MBARR</td>
<td>.001</td>
<td>10MBARR</td>
<td>.001</td>
<td>50MBARR</td>
<td>.001</td>
<td>100MBARR</td>
<td>.001</td>
<td>200MBARR</td>
<td>.001</td>
</tr>
<tr>
<td>2500</td>
<td>.001</td>
<td>0.01MBARR</td>
<td>.001</td>
<td>1MBARR</td>
<td>.001</td>
<td>10MBARR</td>
<td>.001</td>
<td>50MBARR</td>
<td>.001</td>
<td>100MBARR</td>
<td>.001</td>
</tr>
</tbody>
</table>

How to Specify
F16AD range - options
F16ADNL range - options

<table>
<thead>
<tr>
<th>Sensor Range</th>
<th>Engineering Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Voltage Powered</td>
<td>DIGI-MAX</td>
</tr>
</tbody>
</table>

F16ADNL range - options
Standard housing
Backlit display
Vacuum service

Accesories—order separately
WMPSK Wall mount power supply kit, 115VAC/12V DC
RB Protective rubber boot. Not available with NEMA models.
CD Calibration data; 5 test points and date
NC NIST traceability documentation, 5 points and date

Example:
F16ADBL100PSIG-HA
Low voltage powered, backlight display, 0-100 psig, high accuracy
### Installation Precautions
- Read these instructions before using the gauge. Configuration may be easier before installation. Contact the factory for assistance.
- These products do not contain user-serviceable parts. Contact us for repairs, service, or refurbishment.
- Gauges must be operated within specified ambient temperature ranges.
- Outdoor or wash down applications require a NEMA 4X gauge or installation in a NEMA 4X housing.
- Use a pressure or vacuum range appropriate for the application.
- Use fittings appropriate for the pressure range of the gauge.
- Due to the hardness of 816 stainless steel, it is recommended that a thread sealant be used to ensure leak-free operation.
- For contaminated media use an appropriate screen or filter to keep debris out of gauge port.
- Remove system pressures before removing or installing gauge.
- Install or remove gauge using a wrench on the hex fitting only. Do not attempt to turn gauge by forcing the housing.
- Good design practice dictates that positive displacement liquid pumps include protection devices to prevent sensor damage from pressure spikes, acceleration head, and vacuum extremes.
- Avoid permanent sensor damage! Do not apply vacuum to non-vacuum gauges or hydraulic vacuum to any gauges.
- Avoid permanent sensor damage! NEVER insert objects into gauge port or blow out with compressed air.
- Gauges are not for oxygen service. Accidental rupture of sensor gauge port or blow out with compressed air.
- Do not attempt to turn gauge by forcing the housing.

### Types of Gauges
- 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. Functionally similar to gauge reference sensors.
- Absolute reference gauges read zero at full vacuum and atmospheric pressure with the gauge port open. With an open gauge port the readings will vary continuously due to the effects of barometric pressure.

### Selectable Ranges
- **Range Codes**
  - The range code is part of the gauge model number and indicates the default range when the gauge is ordered.
- **Engineering Units**
  - Engineering units may be changed to any of those listed in the same ranges stated above. No polarity needs to be observed when connecting a power supply. An inexpensive unregulated low voltage AC or DC power supply can be used.
- ** absolutes**
  - The ranges listed under the psi sensor range as shown in the range table.

### Power—continued
- **Power**
  - The AD series is powered by 8-24 VAC 50/60 Hz or 9-32 VDC.
- **Power-Up**
  - The display is tested, the default full-scale range is indicated, the full-scale range in the selected units are indicated, the display is tested again, then the actual pressure and units are displayed.
- **Power-Up With Zero**
  - 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 port is exposed to normal atmospheric pressure and no pressure is applied. The zeroing function is only activated at each power-up and the stored zero correction is erased when the gauge is shut off.
- **Normal Operation**
  - Following the start-up initialization, the display indicates the pressure reading updated approximately 3 times per second. The gauge may be left on continuously or shut off as desired.
  - 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 1.000 or 1.000 will be displayed depending on model.

### Minimum and Maximum Readings
- **Minimum and Maximum Readings**
  - Gauges are normally configured with minimum and maximum capture functions enabled. One or both can be disabled in the User Configuration mode.
  - Minimum and maximum readings are continuously stored and updated whenever the gauge is on.
  - The stored readings can be manually cleared if desired. The MAX and MIN memory is also cleared whenever the gauge is off unless configured to save the readings.
  - After MAX is displayed, press and hold the button for about 1 sec until MIN is displayed alternating with the units. The minimum reading will be continuously updated. The gauge may be left in this mode.
  - If excessive vacuum is applied to a pressure-only gauge while in this mode, the display will indicate Err until the MAX/MIN readings are cleared.
  - After MIN is displayed, press and hold the button again for about 1 sec until OFF is displayed. The MAX and MIN memory is not erased and the gauge returns to normal operation with the display indicating the current reading.
  - Press and continue to hold the button until the display indicates CLR/MX/MN (about 3 seconds total) and then release the button. Both maximum and minimum values are cleared and the gauge returns to the normal mode and displays the current pressure.

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

### Display Backlighting (BL models only)
- The display backlighting will not be apparent under bright lighting conditions.

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

### Engineering Unit Selection

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

The default engineering units are mathematically converted to the newly selected engineering unit. When the gauge is powered up, the originally configured range is displayed and then the conversion with the selected engineering unit is displayed.

To change engineering units remove the rear cover to gain access to the two internal buttons located near the lower right and left corners of the circuit board.

With the gauge powered up, press and hold the 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.

Note: The gauge will automatically revert to normal operation if no buttons are operated for approximately 15 seconds. Replace the rear cover taking care not to pinch the power wires between the cover and the case.

### Advanced Configuration

User configuration allows requires a pass code for access and allows more features to be configured.

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

With the gauge off, press and hold the UP button. Then press the front button. Release all buttons when the display indicates CFG and the program version then the full-scale range is indicated and the display is tested.

The display then indicates _ _ _ with the first underscore blinking, and with CFGPC (configuration pass code) on the character segments.

Note: The gauge 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 without entering any pass code characters.

#### Pass Code Entry

The factory default is 3510, but this may be changed by the user under the Pass Code 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.
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 with configuration procedures.

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

#### Factory/User Configuration

The upper display section will be blank, and the lower section will display either USER_ or FCTRY.

If USER_ is selected, the user configuration can be modified as described in the following steps.

To select USER_, press and release the DOWN button.

The lower display will indicate USER_.

Press and release the front button to continue.

If FCTRY is selected, the existing user configuration will be replaced by the original factory configuration.

To select FCTRY, press and release the UP button.

The lower display will indicate FCTRY.

Press and release the front button to restore the factory configuration and restart the gauge.

#### Max/Min Configuration

Use the UP and 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 section will indicate cir.

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** Manually clear max. and min. values

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 compound gauges.

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

- **+/EU** Vacuum is indicated as negative pressure in the selected engineering units
- **CMNP** Compound (inHg/PSIG) gauges must be changed to display single-unit vacuum/pressure readings

Press and release the front button to save the user configuration and restart the gauge.

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

#### Calibration Preparation

All gauges are factory calibrated 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 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 appropriate calibration procedures with 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.

Connect gauge to a 8-24 VAC 50/60 Hz or 9-32 VDC power supply.

Allow the gauge to equalize to normal room temperature for approximately 20 minutes before calibration.

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.

**Continued on next page...**
### Calibration

#### Calibration—continued

**UP and DOWN Button Operation**

Each time one of the calibration 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 calibration 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 calibration 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 UP and the DOWN buttons.

Apply full-scale pressure. The character display will alternate between +SPAN and CAL. Adjust for a display indication of full-scale pressure using the UP and the DOWN 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 using the UP and the DOWN buttons.

**Gauge Reference Vacuum 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 UP and the DOWN buttons.

Apply full-scale vacuum. The character display will alternate between +SPAN and CAL. Adjust for a display indication of full-scale vacuum using the UP and the DOWN 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 UP and the DOWN buttons.

**Absolute Reference Gauges**

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 vacuum. 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% full-scale vacuum. The lower display will alternate between +MID and CAL. Press the UP and DOWN buttons to obtain an 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 UP and the DOWN buttons.

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. Adjust for a display indication equal to 50% of full-scale vacuum using the UP and the DOWN buttons.

**Save Calibration**

Once the adjustments are complete, 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 the pressure indications at 0%, 25%, 50%, 75% and 100% of full scale.

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

---

**Enter the User-Modifiable Pass Code**

The factory default is 3510, but this is user changeable.

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.
3. The 3 will remain, and the second position will be blinking.
4. Use the UP or DOWN buttons to select 5.
5. Press and release the front button to index to the next position.
6. Press and release the front button to index to the next position.
7. Use the UP or DOWN buttons to select 2.
8. Press and release the front button to proceed with configuration procedures.

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

**Enter 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 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 gauge enters the Calibration Mode, the display initially indicates . . . . . . with the first underscore blinking, and with CALPC (calibration pass code) on the lower display.

Note: The gauge 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 without entering any pass code characters.

**User-Defined Pass Code Configuration**

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

View or change user configuration pass code

With the unit off, press and hold the UP button, then press the front button.

Release all buttons when the display indicates CFG.

View or change user calibration pass code

With the unit off, press and hold the DOWN button, then press the front button.

Release all buttons when the display indicates CAL.

Enter access code 1220

Before the unit enters the view or change pass code mode, the display initially indicates ---. Then with the first underscore blinking, and with CFGPC or CALPC on the character display.

Note: The gauge 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 POWER button without entering any pass code characters.

1. Use the UP and DOWN buttons to set the left-most digit to 1.
2. Press and release the front button to move to the next position.
3. The 1 will remain, and the second position will be blinking.
4. Use the UP and DOWN buttons to select 2.
5. Press and release the front button to move to the next position.
6. Press and release the front button to index to the next position.
7. 12 will remain, and the third position will be blinking.
8. Use the UP and DOWN buttons to select 0.
9. Press and release the front button to proceed.

**Verify the pressure indications**

Before the unit enters the calibration view or change pass code mode, the display initially indicates ---. Then with the first underscore blinking, and with CFGPC or CALPC on the character display.

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 pass code with CFGPC or CALPC on the character display.

1. Operate the UP or DOWN button to select the first character of the new pass code.
2. When the correct first character is being displayed, press and release the front button to proceed to the next pass code character.
3. Repeat above until the entire pass code is complete.
4. To exit, press and hold the front button. Release the button when the display indicates Exit.
5. Replace the rear cover taking care not to pinch the wires between the cover and the case.

---

### Calibration Units

<table>
<thead>
<tr>
<th>Sensor</th>
<th>Suggested units for calibration</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 PSI</td>
<td>5.000 PSI</td>
</tr>
<tr>
<td>15 PSI</td>
<td>775.7 MMHG (TORR)</td>
</tr>
<tr>
<td>30 PSI</td>
<td>610.0 RHG</td>
</tr>
<tr>
<td>50 PSI</td>
<td>50.00 PSI</td>
</tr>
<tr>
<td>60 PSI</td>
<td>60.00 PSI</td>
</tr>
<tr>
<td>100 PSI</td>
<td>7.031 KG/CM2</td>
</tr>
<tr>
<td>200 PSI</td>
<td>407.2 RHG</td>
</tr>
<tr>
<td>300 PSI</td>
<td>610.0 RHG</td>
</tr>
<tr>
<td>500 PSI</td>
<td>500.0 PSI</td>
</tr>
<tr>
<td>1000 PSI</td>
<td>70.31 KG/CM2</td>
</tr>
<tr>
<td>2000 PSI</td>
<td>407.2 RHG</td>
</tr>
<tr>
<td>3000 PSI</td>
<td>610.0 RHG</td>
</tr>
<tr>
<td>5000 PSI</td>
<td>5000 PSI</td>
</tr>
</tbody>
</table>

Any 100.00 PCT (percent)