### Accuracy
Includes linearity, hysteresis, repeatability.
Standard: ±0.25% of full scale ±1 least significant digit
HA option: ±0.1% FS ±1 LSD, see table at left for availability.

### Display
4 readings per second nominal display update rate. 4 digit LCD, 0.5” H and 5 character 0.25” H alphanumeric.

### Controls and Functions
TEST: When depressed sets loop current and display to user-set output test level, independent of pressure input, to allow testing of system operation.  
- Up: set test, pass code, and calibration values.  
- Down: set test, pass code, and calibration values.

### Calibration
User-settable pass code required to enter calibration mode. All pressure and absolute models: zero, mid-point, span. All vacuum models: span, mid-point, zero. Vacuum/pressure models: span, zero, ±midpoint, ±span. ±15 psi models: span, mid-point, zero, ±midpoint, ±span.

### Loop Supply Voltage
Any DC supply/loop resistance that maintains 8-32 VDC at gauge terminals.
Reverse polarity protected.

### Output Characteristics
Current output: 4-20 mA DC. Passive transmitter, requires external loop power.
Output drive (compliance) determined by power source.
Updated approximately 16 times per second.

### Weight
9 ounces (approx.), Shipping wt. 1 pound (approx.)

### Housing
F16L: Extruded aluminum case, epoxy powder coated, ABS/polycarbonate bezel (aluminum bezel optional), front and rear gaskets, polycarbonate label.
F16LN: ABS/polycarbonate NEMA 4x case, rear gasket, polycarbonate label.

### Connection, Material, Media Compatibility
1/4” NPT male fitting, 316L stainless steel. All wetted parts are 316L stainless steel.

### Overpressure, Burst, Vacuum
Ranges using 5000 psi gauge: 5000 psi. Ranges using 5000 psi gauge: 7500 psi.
All others: 2 X pressure range. 3000 psi, 5000 psi, and 4 digit ranges ±11.25% full scale out-of-range display: 1 — — — — 1 — — — — 1.
±4 X sensor burst pressure rating, or 10,000 psi, whichever is less.
Vacuum service: ±15 psi, 15 psi, 30 psi, 100 psig, 100 psia, 200 psi sensors.
Under-range display (non-vacuum sensors): -Err.

### 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).

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### How to Specify

#### Type
- **F16L range - options**: Standard housing
- **F16LN range - options**: NEMA 4x housing

#### Range
- **see table at left**
  - psi = PSI
  - inHg = INHG
  - mmHg = MMHG
  - atm = ATM
  - bar = BAR
  - oz/in² = ZIN
  - kg/cm² = KGCM
  - mmHg = MMHG
  - atm = ATM

#### Options
- **HA**
  - High accuracy, ±0.1% FS ±1 LSD. Not available with 3 psi, bipolar, absolute, or vacuum sensors, and some 3.5 digit display ranges. See table at left for availability.
- **PM**
  - Panel mount, 4.1” x 4.1”. Not avail. with NEMA models.
- **MC**
  - Metal front cover. Not available with NEMA models.
- **CC**
  - Moisture resistant circuit board conformal coating
- **TP**
  - Top gauge port. Not available with NEMA models.

#### Accessories
- **WMP5K**
  - Wall mount power supply kit, 115 VAC/12 VDC
- **CD**
  - Calibration data; 5 test points and date
- **NC**
  - NIST traceability documentation, 5 points and date

#### Example
- F16LN100PSG-HA: 4-20mA loop powered, NEMA 4x, 0-100 psi, high accuracy.
When the TEST button is held depressed, the display and loop voltage powered gauge connect.

To use the transmitter as a low current source, the measurement circuit is filtered to improve noise immunity and is updated approximately every second. The output is a 12,000 count analog 4-20 mA signal. The output is linearly proportional to the pressure/vacuum.

If there is negligible output, the F16L will set the loop resistance to indicate – – – – , and the gauge will exit the calibration mode when all buttons are released.

Zero calibration
Press the TEST button and press it when the display indicates CAL. Apply zero pressure. The lower display will alternate between CAL and ZERO. Use \( \Delta \) or \( \Upsilon \) to adjust the upper display to indicate zero.

Span calibration
Apply full-scale pressure. The lower display will alternate between CAL and +SPAN. Press \( \Delta \) or \( \Upsilon \) to adjust the upper display to indicate the applied pressure.

Negative span calibration (bipolar and compound ranges only)
Apply full-scale negative pressure. The lower display will alternate between CAL and –SPAN. Use \( \Delta \) or \( \Upsilon \) to adjust the upper display to indicate the applied pressure.

Gauges must be operated within specified ambient temperature ranges.

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.

Panel damage will result.

Electrical connection
All operating power is supplied by the 4-20 mA current loop using the 2-wire cable at the gauge rear. The F16L can be used as an indicating transmitter in any 4-20 mA current loop or as a DC powered gauge. Reversing the connections will not harm the gauge but it will not operate correctly.

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 but not over 32 VDC.

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:

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

To use the transmitter as a low voltage powered gauge, connect it to any 9-32 VDC power supply.

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

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.

Sensor Range

<table>
<thead>
<tr>
<th>Full vacuum</th>
<th>&quot;O&quot; on display</th>
<th>Full pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gauge reference pressure</td>
<td>m/a</td>
<td>4 mA</td>
</tr>
<tr>
<td>Gauge reference vacuum</td>
<td>20 mA</td>
<td>4 mA</td>
</tr>
<tr>
<td>Compound –30inHg/15psi</td>
<td>20 mA</td>
<td>4 mA</td>
</tr>
<tr>
<td>Compound –30inHg/100psi</td>
<td>4 mA</td>
<td>5.5 mA</td>
</tr>
<tr>
<td>Compound –30inHg/200psi</td>
<td>4 mA</td>
<td>4.6 mA</td>
</tr>
<tr>
<td>Absolute reference</td>
<td>4 mA</td>
<td>4.6 mA</td>
</tr>
<tr>
<td>Bipolar ~</td>
<td>4 mA</td>
<td>12 mA</td>
</tr>
</tbody>
</table>

Test function

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. This test mode will allow setup and testing of the current loop without having to alter the system pressure.

For triangular trace calibration, use the 2-wire gauge as a low current source and apply a zero offset to the display. This will allow the display to indicate 0-4-20 mA. For negative linear calibration, apply a –15 psi offset to the display. Use the -Span region to indicate –15 psi offset to the display.

The lower display segments will indicate the preconfigured pressure corresponding to a 20 mA loop current.

Use \( \Upsilon \) or \( \Delta \) to adjust the actual loop current to 20 mA.

Press the TEST button and release it when the display indicates CAL. The upper display segments will indicate the preconfigured pressure corresponding to a 20 mA loop current.

The lower display segments will alternate between CAL and 20 MA. Use \( \Delta \) or \( \Upsilon \) to adjust the actual loop current to 20 mA.

Pressure calibration
The pressure calibration procedure simultaneously adjusts both the display indication and the loop current to correspond to the actual applied pressure.

Note: During any of the following calibration steps if the TEST button is held depressed for longer than 2 seconds, the display will change to indicate – – – – – , and the gauge will exit the calibration mode when all buttons are released.

Specifications are subject to change without notice. Consult factory for your specific requirements.