**Ranges and Resolution**

See table below. Consult factory for special engineering units. Resolution is fixed as indicated in table.

**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

<table>
<thead>
<tr>
<th>PSI</th>
<th>Res</th>
<th>inHg/PSI</th>
<th>Res</th>
<th>mmHg</th>
<th>Res</th>
<th>kPa</th>
<th>Res</th>
</tr>
</thead>
<tbody>
<tr>
<td>3PSIG</td>
<td>.001</td>
<td>±30VPSIG</td>
<td>.1</td>
<td>2100MMHG</td>
<td>.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5PSIG</td>
<td>.001</td>
<td>±50VPSIG</td>
<td>.1</td>
<td>3500MMHG</td>
<td>.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15PSIG</td>
<td>.001</td>
<td>±150VPSIG</td>
<td>.1</td>
<td>10000MMHG</td>
<td>.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30PSIG</td>
<td>.001</td>
<td>±300VPSIG</td>
<td>.1</td>
<td>20000MMHG</td>
<td>.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60PSIG</td>
<td>.001</td>
<td>±600VPSIG</td>
<td>.1</td>
<td>40000MMHG</td>
<td>.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>100PSIG</td>
<td>.1</td>
<td>±1000VPSIG</td>
<td>.1</td>
<td>60000MMHG</td>
<td>.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>150PSIG</td>
<td>.1</td>
<td>±1500VPSIG</td>
<td>.1</td>
<td>90000MMHG</td>
<td>.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>200PSIG</td>
<td>.1</td>
<td>±2000VPSIG</td>
<td>.1</td>
<td>120000MMHG</td>
<td>.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>300PSIG</td>
<td>.1</td>
<td>±3000VPSIG</td>
<td>.1</td>
<td>180000MMHG</td>
<td>.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>500PSIG</td>
<td>.1</td>
<td>±5000VPSIG</td>
<td>.1</td>
<td>300000MMHG</td>
<td>.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1000PSIG</td>
<td>.1</td>
<td>±10000VPSIG</td>
<td>.1</td>
<td>600000MMHG</td>
<td>.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1500PSIG</td>
<td>.1</td>
<td>±15000VPSIG</td>
<td>.1</td>
<td>900000MMHG</td>
<td>.1</td>
<td></td>
<td></td>
</tr>
<tr>
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<td>.1</td>
<td>±20000VPSIG</td>
<td>.1</td>
<td>1200000MMHG</td>
<td>.1</td>
<td></td>
<td></td>
</tr>
<tr>
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<td>±30000VPSIG</td>
<td>.1</td>
<td>1800000MMHG</td>
<td>.1</td>
<td></td>
<td></td>
</tr>
<tr>
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<td>.1</td>
<td>±50000VPSIG</td>
<td>.1</td>
<td>3000000MMHG</td>
<td>.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10000PSIG</td>
<td>.1</td>
<td>±100000VPSIG</td>
<td>.1</td>
<td>6000000MMHG</td>
<td>.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15000PSIG</td>
<td>.1</td>
<td>±150000VPSIG</td>
<td>.1</td>
<td>9000000MMHG</td>
<td>.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20000PSIG</td>
<td>.1</td>
<td>±200000VPSIG</td>
<td>.1</td>
<td>12000000MMHG</td>
<td>.1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Display**

4 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

Alarm 1 and Alarm 2 LCD indicators and bi-color (red/green) LEDs

**Controls & Functions**

SEL select and display alarm trip points

TEST alarm, acknowledge, or toggle alarms when in test mode

Increase alarm setpoint when in setpoint adjust mode

Decrease alarm setpoint when in setpoint adjust mode

Multi-level pass code protection, set-up and calibration

**ADA and DAR Alarm Outputs**

Programmable dual form C (SPDT) relay contacts for HI/V, HI/LO, LO/LO, normal or reverse acting with 1% deadband, or adjustable trip and reset points for each relay, manual or auto acknowledge. 1A/24VDC, 0.5A/115VAC, non-inductive

120 milliseconds typical response time

**DAR Retransmission Output**

Updated approximately 16 times per second

- Current output, 4-20 mA DC

  Output drive (compliance) determined by power source

  6,553 counts over sensor range

  -V: Voltage output, 0-2 VDC into 5k ohm or greater

  -BV: Bipolar voltage output (-2.0 - 0.0 V) for bipolar ranges

   ±2 VDC into 5k ohm or greater

   13,107 counts over sensor range

**Calibration**

Non-interactive, ±10% of range

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

**Power**

8 to 24 VAC 50/60 Hz or 9 to 32 VDC

Gauge is on when power is on. Designed for continuous operation.

1.0 watt maximum power consumption

**Weight**

9.5 ounces (approx.) shipping wt. 1 pound (approx.)

**Housing**

Standard: Extruded aluminum case, epoxy powder coated, ABS/poly carbonate bezel, front and rear gaskets, poly carbonate label

N: NEMA 4X ABS/poly carbonate case, rear gasket, poly carbonate label

Connection, Material, Media Compatibility

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 others: 2 X pressure range

3000 psi, 5000 psi, and 4 digit ranges 112.5% full scale out-of-range display: 1- or –, –, –, –

±0.25% Test Gauge Accuracy

±0.1% FS ±1 LSD. Not available with 3 conductor output

Calibration data; 5 test points and date

**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)

**Alpha-numeric display**

G = gauge reference pressure

VAC = gauge reference vacuum

A = absolute reference

If vacuum gauge requires a minus sign, please specify.

**DAR Output**

I 4-20 mA current output. Provides power to the loop.

V 0-2 volt output

BV ±2 volt output, bipolar or compound ranges only

<table>
<thead>
<tr>
<th>psi</th>
<th>-150</th>
<th>0</th>
<th>+150</th>
</tr>
</thead>
<tbody>
<tr>
<td>mbar</td>
<td>1500</td>
<td>2000</td>
<td>Mbar</td>
</tr>
<tr>
<td>inHg</td>
<td>1500</td>
<td>2000</td>
<td>1500</td>
</tr>
<tr>
<td>mmHg</td>
<td>1500</td>
<td>2000</td>
<td>1500</td>
</tr>
<tr>
<td>bar</td>
<td>1500</td>
<td>2000</td>
<td>1500</td>
</tr>
</tbody>
</table>

- **Options**
  - **HA** High accuracy, ±0.1% FS ±1 LSD. Not available with 3 conductor output.
  - **PM** Panel mount, 4.1" x 4.1". Not for NEMA models.
  - **MC** Metal cover. Not for NEMA models.
  - **CC** Moisture resistant circuit board conformal coating.
  - **12** 12 ft long cables for F16ADA

- **WMP Series** 115 VAC / 12 VDC power supply kit

**How to Specify Type**

<table>
<thead>
<tr>
<th>ADA</th>
<th>DAR</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>F16ADA</td>
<td>Range - options</td>
<td>Dual alarms</td>
</tr>
<tr>
<td>F16ADABL</td>
<td>Range - options</td>
<td>Dual alarms, backlit display</td>
</tr>
<tr>
<td>F16ADA</td>
<td>Range - options</td>
<td>Dual alarms, NEMA 4X</td>
</tr>
<tr>
<td>F16DANBL</td>
<td>Range - options</td>
<td>Dual alarms, NEMA 4X, backlit display</td>
</tr>
<tr>
<td>F16DAR</td>
<td>Range - output - options</td>
<td>Dual alarms, analog output</td>
</tr>
<tr>
<td>F16DARA</td>
<td>Range - output - options</td>
<td>Dual alarms, analog output, backlight display</td>
</tr>
<tr>
<td>F16DAR</td>
<td>Range - output - options</td>
<td>Dual alarms, analog output, NEMA 4X</td>
</tr>
<tr>
<td>F16DAR</td>
<td>Range - output - options</td>
<td>Dual alarms, analog output, NEMA 4X, backlight display</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>psi</th>
<th>inHg</th>
<th>mmHg</th>
<th>mbar</th>
</tr>
</thead>
<tbody>
<tr>
<td>torr</td>
<td>1013</td>
<td>25</td>
<td>1013</td>
</tr>
</tbody>
</table>

- **Alpha-numeric display**
  - **Alarm 1 status LED**
  - **Alarm 2 status LED**

<table>
<thead>
<tr>
<th>psi</th>
<th>-150</th>
<th>0</th>
<th>+150</th>
</tr>
</thead>
<tbody>
<tr>
<td>mbar</td>
<td>1500</td>
<td>2000</td>
<td>Mbar</td>
</tr>
<tr>
<td>inHg</td>
<td>1500</td>
<td>2000</td>
<td>1500</td>
</tr>
<tr>
<td>mmHg</td>
<td>1500</td>
<td>2000</td>
<td>1500</td>
</tr>
<tr>
<td>bar</td>
<td>1500</td>
<td>2000</td>
<td>1500</td>
</tr>
</tbody>
</table>

- **Options**
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  - **MC** Metal cover. Not for NEMA models.
  - **CC** Moisture resistant circuit board conformal coating.
  - **12** 12 ft long cables for F16ADA

**Accessories**

- **CD** Calibration data, 5 test points and date
- **NC** NIST traceability documentation, 5 points and date
- **WMP Series** 115 VAC / 12 VDC power supply kit
Installation and Instructions

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 returns.
- 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 316 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.
- Do not exceed relay current and voltage ratings. Use an appropriate contractor for larger loads. Inductive inrush currents may be up to 5x normal current and may require an RC snubber.
- Good design practice dictates that positive displacement liquid pumps include pressure 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 diaphragm may cause silicone oil inside sensor to react with oxygen.

Operation with Adjustable Hysteresis Alarms

In the adjustable hysteresis mode, two independent set and reset trip points used for each relay. The LEDs indicate green for a RESET state and red for a SET state. Refer to the table below.

**Alarm Types**

The factory default configuration is 1% fixed deadband mode with SPI, HI and SP2 LO, normal relay acting, zero tare enabled, and no pass code required for test function.

Alarms may be configured to operate in fixed deadband mode or adjustable hysteresis mode.

In the fixed deadband mode, the alarm set/reset point deadband is factory set to 1% of full scale. Each alarm may be configured as either HI or LO with a user adjustable alarm set point for each relay.

In the adjustable hysteresis mode, two independent set and reset trip points are user adjustable for each relay. The set or reset state at power up when between trip points is user configurable.

**Power Up**

The gauge is powered on whenever a supply voltage is applied. Warm-up time is negligible. The gauge may be left on at all times. All configuration information is stored in non-volatile memory. When power is first applied, the gauge proceeds through a startup sequence. During the startup sequence, relays are de-energized, the status LEDs are off, and the retransmission output is low (~2.5 VDC or 0 mA).

1. The firmware version number is displayed briefly.
2. All active display segments are turned on for approx. 1 second.
3. The full scale pressure is indicated for approx. 1 second while the engineering units and FS (full scale) are indicated for 1/2 second on the character display.
4. The display is tested again for approximately 1 second.
5. The gauge then proceeds to the normal operating mode. For DAR models the retransmission output corresponds to the applied pressure.

**Operation with Fixed Deadbands**

Each relay may be independently configured as a high or low alarm in User-set up and operate as shown in the table below.

### Normal operating mode

<table>
<thead>
<tr>
<th><strong>Normal, High alarm SP_H</strong></th>
<th><strong>Normal, low alarm SP_L</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Power coil On</td>
<td>Power coil Off</td>
</tr>
<tr>
<td>Pressure &lt; Set point -1%FS &gt; Set point +1%FS</td>
<td></td>
</tr>
<tr>
<td>Relay coil Off</td>
<td>Relay coil On</td>
</tr>
<tr>
<td>Alarm 1 continuity C-NO (Red-White) C-NC (Red-Black)</td>
<td></td>
</tr>
<tr>
<td>Alarm 2 continuity C-NO (Brown-Blue) C-NC (Brown-Green)</td>
<td></td>
</tr>
<tr>
<td>LED Green</td>
<td>LED Red</td>
</tr>
<tr>
<td>Normal operating, Low alarm SP_L</td>
<td>Normal, high alarm SP_H</td>
</tr>
<tr>
<td>Pressure &lt; Set point -1%FS &gt; Set point +1%FS</td>
<td></td>
</tr>
<tr>
<td>Relay coil Off</td>
<td>Relay coil On</td>
</tr>
<tr>
<td>Alarm 1 continuity C-NO (Red-White) C-NC (Red-Black)</td>
<td></td>
</tr>
<tr>
<td>Alarm 2 continuity C-NO (Brown-Blue) C-NC (Brown-Green)</td>
<td></td>
</tr>
<tr>
<td>LED Red</td>
<td>LED Green</td>
</tr>
</tbody>
</table>

**Operation with Adjustable Hysteresis Alarms**

<table>
<thead>
<tr>
<th><strong>Normal (Fail-safe) acting, RESET value less than SET</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure &lt; Low Set point &gt; High SET point</td>
</tr>
<tr>
<td>Relay coil Off</td>
</tr>
<tr>
<td>Alarm 1 continuity C-NC (Red-Black) C-NO (Red-White)</td>
</tr>
<tr>
<td>Alarm 2 continuity C-NC (Brown-Green) C-NO (Brown-Blue)</td>
</tr>
<tr>
<td>LED Green</td>
</tr>
</tbody>
</table>

**Reverse acting, RESET value less than SET**

<table>
<thead>
<tr>
<th>Pressure &lt; Low Set point &gt; High SET point</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relay coil Off</td>
</tr>
<tr>
<td>Alarm 1 continuity C-NC (Red-Black) C-NO (Red-White)</td>
</tr>
<tr>
<td>Alarm 2 continuity C-NC (Brown-Green) C-NO (Brown-Blue)</td>
</tr>
<tr>
<td>LED Green</td>
</tr>
</tbody>
</table>

**Contact ratings**

Connect to 8-24 VAC, 50/60Hz or 9-32 VDC. When using low voltage AC power, either polarity may be used. Use the correct polarity for the application.

**Power wires**

- BLACK NC Normally Closed SPST 1
- WHITE NC Normally Closed SPST 2
- GREEN NC Normally Closed SPST 3
- RED NC Normally Closed SPST 4
- NC NO 2-conductor relay wires
- NC NO 6-conductor relay wires

**Electrical Connections**

The ADA 2-conductor cable or the DAR 4-conductor cable with the RED and BLACK leads is for the gauge power supply.

**Operation with Adjustable Hysteresis Alarms**

In the adjustable hysteresis mode, two independent set and reset trip points used for each relay. The LEDs indicate green for a RESET state and red for a SET state. Refer to the table below.

**Types of Gauges**

Gauge reference models read zero with the gauge port open.

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

1,000 psi and higher sensors are a sealed reference type. They read zero with the gauge port open and are internally referenced to 14.7 psi. They are functionally similar to gauge reference sensors.

Absolute reference gauge readings are referenced to zero at full vacuum and atmospheric pressure with the gauge port open. Note that readings of atmospheric pressure vary continuously.

**Alarm Contact Ratings**

Gauges are not for oxygen service. Accidental rupture of sensor diaphragm may cause silicone oil inside sensor to react with oxygen.

Alarms may be configured to be automatically acknowledged when the alarm condition clears or manually acknowledged by pressing the TEST button.

The SET trip points, and the RESET trip points may be selected for display as follows.

While in the normal operating mode, press and release the SET button. The upper display will indicate the value of set point 1 with ‘SET_1’ on the lower display.

While set point 1 is being displayed, press and release the SET button. The upper display will indicate the value of set point 1 with ‘RST_1’ on the lower display.

While reset point 2 is being displayed, press and release the SET button. The upper display will indicate the value of set point 2 with ‘RST_2’ on the lower display.

While the reset point 2 is being displayed, press and release the SET button. The upper display will indicate the applied pressure and engineering units.

**Alarm Types**

- Normal (fail-safe) acting, RESET value less than SET
- Reverse acting, RESET value less than SET
- Normal (fail-safe) acting, SET value less than RESET
- Reverse acting, SET value less than RESET

**DAR Output Types**

DAR model retransmission output corresponds to the applied pressure, except when in zero range, test mode, or test function. Note that analog output resolution is always over the entire sensor range and is updated approximately 16 times per second. The ±4-20 mA output provides power to the current loop and output drive is determined by power source.

Output values listed below are nominal factory set ranges and may be user configured. Note that ~15 psi, ~100 kPa, etc. is not achievable, but prevents running out of range at whatever full vacuum is reached.

**Contact Rating and Protection**

The alarm contacts are rated at 1/2A/DC/40V or 0.5A/115VAC. Using mechanical relay contacts above their rating, or with large inductive loads, will shorten their life. For inductive loads, RC snubbers or arc suppression devices are required to protect the contacts. For large loads a heavier contactor is required.

No internal fusing is included in the alarm contact circuits. The alarm outputs should be externally fused by the user in applications where good design practices dictate.

**F16DAR Output Types**

DAR model retransmission output corresponds to the applied pressure, except when in zero range, test mode, or test function. Note that analog output resolution is always over the entire sensor range and is updated approximately 16 times per second. The ±4-20 mA output provides power to the current loop and output drive is determined by power source.

Output values listed below are nominal factory set ranges and may be user configured. Note that ~15 psi, ~100 kPa, etc. is not achievable, but prevents running out of range at whatever full vacuum is reached.
Pass Code Entry
A pass code is required to calibrate and configure the gauge. Additional levels of security may be enabled by defining separate pass codes for configuration, output test and set point adjust modes. See Changing the User-Defined Pass Code at the end of this manual to change pass codes.

Functions in user configuration mode
- Restore original factory configuration
- Enable/disable zero tare function
- Fixed 1% deadband or adjustable hysteresis mode of operation
- Operation for blinking alarm LEDs
- Set point modes (high alarm/low alarm or state at power-up)
- Relation mode (normal/reverse)
- D/A model transmission output upper and lower limits
- Enable/disable a pass code for output test and set point adjust

Adjust Setpoint, Fixed Deadband Mode
"Set Point" is defined as the pressure value that will result in a change of state only from a normal to an alarm condition.
"Trip Point" is defined as the pressure value that will result in a change from a state of alarm condition and includes the effect of deadband when returning from an alarm to a normal condition.

Set Point 1
From the normal operating mode press the SEL button to display Trip Point. Press and hold the TEST button and press the SEL button. Release both buttons when the display indicates . . . . . .
If pass code protection is enabled, before the unit enters the Set Point 1 Adjust Mode, the display initially indicates . . . . . with the left-most underscore blinking, and with TSTPC on the display. Enter the pass code as described in the Pass Code Entry section. While in the Set Point 1 Adjust mode with no buttons pressed, the display will indicate Trip Point 1 with TRIP1 blinking at a slow rate on the lower display, and the alarm indicators and the transmission output will correspond to the applied pressure.
To adjust the Set Point 1 value, press and hold the TEST button. The alarm relays, LEDs, LCD alarm icons, and the D/A output will maintain their prior states until the TEST button is released. Note: The gauge will not respond to changes in applied pressure while the TEST button is pressed.
To exit the Set Point 1 Adjust mode and return to the normal operating mode, press and release the SEL button.

Set Point 2
From the normal operating mode press the SEL button twice to display Trip Point. Press and hold the TEST button and press the SEL button. Release both buttons when the display indicates . . . . . .
If pass code protection is enabled, before the unit enters the Set Point 2 Adjust Mode, the display initially indicates . . . . . with the left-most underscore blinking, and with TSTPC on the display. Enter the pass code as described in the Pass Code Entry section. While in the Set Point 2 Adjust mode with no buttons pressed, the display will indicate Trip Point 2 with TRIP2 blinking at a slow rate on the lower display, and the alarm indicators and the transmission output will correspond to the applied pressure.
To adjust the Set Point 2 value, press and hold the TEST button. The alarm relays, LEDs, LCD alarm icons, and the D/A output will maintain their prior states until the TEST button is released. Note: The gauge will not respond to changes in applied pressure while the TEST button is pressed.
To exit the Set Point 2 Adjust mode and return to normal operation, press and release the SEL button.

Adjust Trip Point, Adjustable Hysteresis Mode
From the normal operating mode press the SEL button to display the desired trip point (SET_1, RST_1, SET_2, or RST_2). Press and hold the TEST button and press the SEL button. Release both buttons when the display indicates . . . . . .
If pass code protection is enabled, before the unit enters the Set Point Adjust Mode, the display initially indicates . . . . . with the left-most underscore blinking, and with TSTPC on the lower display. Enter the pass code as described in the Pass Code Entry section. While in the Trip Point Adjust mode with no buttons pressed, the display will indicate the trip point value with its designator (SET_1, RST_1, SET_2, or RST_2) blinking at a slow rate.
To adjust the displayed trip point value, press and hold the TEST button. The display will continue to indicate the trip point value. Operate the or buttons to adjust the trip point to the desired value. The trip point value is stored when the TEST button is released. Note: The relays and indicators will not correspond to the applied pressure value until the TEST button is released.
To exit the Trip Point Adjust mode and return to the normal operating mode, press and release the SEL button.

User Configuration
From the normal operating mode, press and hold the TEST and the buttons. Then press the SEL button.
Release all buttons when the display indicates CFG.
Before the gauge enters the Configuration mode, the display initially indicates . . . . with the first underscore blinking, and with CFGPC on the lower display.

Enter the pass code as described in the Pass Code Entry section.

Restore Factory Configuration
The upper display will be blank, and the lower display will display either USER_ or FCTRY_
If USER_ is selected, the existing user configuration will be retained and will be accessible for modification in the following steps. To select USER_, press and release the button. The lower display will indicate USER_.
If FCTRY_ is selected, the existing user configuration will be replaced by the configuration as it left the factory and will be accessible for modification in the following steps. To select FCTRY_, press and release the button. The lower display will indicate FCTRY_.
Press and release the SEL button to move on to the next parameter.

Zero Tare Configuration
The upper display will be blank, and the lower display will display either ZTARE_ or NOZT.
If ZTARE_ is selected, the user will be able to manually zero the gauge from the normal operating mode. To select ZTARE_, press and release the button. The lower display will indicate ZTARE_.
If NOZT is selected, the user will be prevented from zeroing the gauge from the normal operating mode. This is default setting for absolute reference ranges.
To select ZTARE_, press and release the button. The lower display will indicate NOZT.
Press and release the SEL button to move on to the next parameter.

Setpoint Type Configuration
The lower display will either indicate DBAND_ or ADJ_H.
If DBAND_ is selected, each output relay will operate with a 1% of full-scale deadband between set and reset.
To select DBAND, press and release the button. The lower display will indicate DBAND.
If ADJ_H is selected, each output relay will have an adjustable SET point and an adjustable RESET point.
To select ADJ_H, press and release the button. The lower display will indicate ADJ_H.
Press and release the SEL button to move on to the next parameter.

Alarm Annunciator Function Selection
The lower display will indicate either A_ACK, M_ACK or NO_A.
If A_ACK is selected, an alarm condition will be automatically acknowledged when the alarm condition clears. When an alarm condition occurs, the LED for that alarm will begin to blink red and will continue to blink red until it has been manually acknowledged or until the alarm condition clears. If an alarm is manually acknowledged, the LED will be steadily red while the alarm condition continues to exist.
The LED will be steadily green whenever no alarm condition exists.
If M_ACK is selected, an alarm condition must be manually acknowledged. When an alarm condition occurs, the LED for that alarm will blink red if the alarm condition exists or green if the alarm condition no longer exists. The LED will continue to blink until it has been manually acknowledged by pressing the TEST button. Once an alarm has been acknowledged, the LED will be steadily red while the alarm condition exists or green when the alarm no longer exists.
If NO_A is selected, the LEDs will not blink. When an alarm condition occurs, the LED associated with that alarm will be illuminated steadily red or green if the alarm condition no longer exists. In addition, the LCD display for ALARM1 and ALARM2 will not be displayed during alarm conditions.
Use the or buttons to cycle through the three choices. When the lower display indicates the desired annunciator action, press and release the SEL button to move on to the next parameter.

Alarm Action Selection (Fixed Deadband Configuration)
The lower display will either display either SP1_1 or SP1_2.
If SP1_1 is selected Alarm 1 will be a low alarm. Alarm 1 will be set when the pressure falls below Setpoint 1. Alarm 1 will be reset when the pressure rises above Setpoint 1 plus the preset deadband. To select SP1_1, press and release the button. The lower display will indicate SP1_1.
If SP1_2 is selected Alarm 1 will be a high alarm. Alarm 1 will be set when the pressure rises above Setpoint 1. Alarm 1 will be reset when the pressure falls below Setpoint 1 minus the preset deadband. To select SP1_2, press and release the button. The lower display will indicate SP1_2.
Press and release the SEL button to move to Alarm 2.
The upper display will be blank, and the lower display will display either SP2_1 or SP2_2.
If SP2_1 is selected Alarm 2 will be a low alarm. Alarm 2 will be set
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User Configuration—cont.
when the pressure falls below Setpoint 2, Alarm 2 will be reset.

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

Output Test and Set Point Adjust Modes Pass Code Protection
The upper display section will be blank, and the lower section will display either TSTPC or RETPC.

To enable Output Test and Set Point Adjust Modes pass code protection, press and release the A button. The lower display will indicate TSTPC.

To disable Output Test and Set Point Adjust Modes pass code protection, press and release the A button. The lower display will indicate RETPC.

Press and release the SEL button to save the configuration parameters and restart the unit.

Note: The configuration parameters will not be saved if the procedure is interrupted before completion.

Calibration Preparation
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. 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 capable of producing a vacuum of 100 micrometers (0.1 torr or 100 milliliters) or lower is required for vacuum and absolute gauges.

For DAR models use an accurate volt or mA meter for calibration of vacuum and absolute gauges.

Full range of the gauge. A vacuum pump able to produce a vacuum of 100 micrometers (0.1 torr or 100 milliliters) or lower is required for vacuum and absolute gauges.

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 capable of producing a vacuum of 100 micrometers (0.1 torr or 100 milliliters) or lower is required for vacuum and absolute gauges.

For DAR models use an accurate volt or mA meter for calibration of vacuum and absolute gauges.

To store the calibration parameters and exit calibration mode, press and hold the SEL button until the display indicates – – – – .

Changing the User-Defined Pass Codes
Configuration Pass Code
From the normal operating mode, press and hold the TEST and the A buttons. Then press the SEL button. Release all buttons when the display indicates CFG.

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

Relay Power Up State (Adjustable Hysteresis configuration)
The lower display will display either _NORL or _REV1.

Press and release the SEL button to step to the pressure calibration sequence, indicated by CAL on the display.

Note: The display indicates – – – – if the procedure is interrupted before completion.

Test and Set Point Adjust Pass Code (optional)
From the normal operating mode, press and hold the TEST and the A buttons. Then press the SEL button. Release all buttons when the display indicates – – – – .

Enter Factory Pass Code 1220
Use the A and B buttons to set the left-most digit to 1.
Press and release the SEL button to index to the next position. The 1 will remain, and the second position will be blinking.

Use the A and B buttons to select 2.
Press and release the SEL button to index to the next position. 1 2 will remain, and the third position will be blinking.
Use the A and B buttons to select 2.
Press and release the SEL button to index to the next position. 1 2 2 will remain, and the fourth position will be blinking.
Use the A and B buttons to select 0.
Press and release the SEL button to proceed. Note: If an incorrect pass code was entered, the gauge will exit to the normal operating mode.

Once the correct password has been entered, the display will indicate the existing pass code with CFGP, CALPC, or TSTPC on the display.

Note: While in the pass code change mode, the LEDs will extinguish and the unit will not respond to changes in applied pressure and the output relays will be de-energized.

Operate the A or B button to select the first character of the calibration password.

When the correct first character is being displayed, press and release the SEL button to proceed to the next password character.
Repeat 1 & 2 above until the entire password is complete.

To exit the User-Defined Pass Code change mode, press and hold the SEL button. Release the button when the display indicates – – – – and reverts to the normal operating mode.