DPG1000ADA Series
Digital Pressure Gauges with Alarms

DPG1000DAR Series
Digital Pressure Gauges with Alarms and 4-20 mA Output

Ranges and Resolution
See table below. Call for special engineering units.
Resolution is fixed for each engineering unit

<table>
<thead>
<tr>
<th>Dual Alarm</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>DPG1000ADA-30V100</td>
<td>–30.0 InHg to 100.0 psig</td>
</tr>
<tr>
<td>DPG1000ADA-30NHG</td>
<td>0.00–30.00 InHgVac</td>
</tr>
<tr>
<td>DPG1000ADA-05G</td>
<td>0.00–5.00 psig</td>
</tr>
<tr>
<td>DPG1000ADA-15A</td>
<td>0.00–15.00 psia</td>
</tr>
<tr>
<td>DPG1000ADA-15G</td>
<td>0.00–15.00 psig</td>
</tr>
<tr>
<td>DPG1000ADA-30A</td>
<td>0.0–30.00 psia</td>
</tr>
<tr>
<td>DPG1000ADA-30G</td>
<td>0.0–30.00 psig</td>
</tr>
<tr>
<td>DPG1000ADA-60G</td>
<td>0.0–60.00 psig</td>
</tr>
<tr>
<td>DPG1000ADA-100A</td>
<td>0.0–100.00 psia</td>
</tr>
<tr>
<td>DPG1000ADA-100G</td>
<td>0.0–100.00 psig</td>
</tr>
<tr>
<td>DPG1000ADA-300G</td>
<td>0–300.00 psig</td>
</tr>
<tr>
<td>DPG1000ADA-500G</td>
<td>0–500.00 psig</td>
</tr>
<tr>
<td>DPG1000ADA-1KG</td>
<td>1–1000 psig</td>
</tr>
<tr>
<td>DPG1000ADA-2KG</td>
<td>2–2000 psig</td>
</tr>
<tr>
<td>DPG1000ADA-3KG</td>
<td>3–3000 psig</td>
</tr>
<tr>
<td>DPG1000ADA-5KG</td>
<td>5–5000 psig</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Single Alarm, 4-20 mA Output</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>DPG1000DAR-30V100</td>
<td>–30.0 InHg to 100.0 psig</td>
</tr>
<tr>
<td>DPG1000DAR-30NHG</td>
<td>0.00–30.00 InHgVac</td>
</tr>
<tr>
<td>DPG1000DAR-05G</td>
<td>0.00–5.00 psig</td>
</tr>
<tr>
<td>DPG1000DAR-15A</td>
<td>0.00–15.00 psia</td>
</tr>
<tr>
<td>DPG1000DAR-15G</td>
<td>0.00–15.00 psig</td>
</tr>
<tr>
<td>DPG1000DAR-30A</td>
<td>0.0–30.00 psia</td>
</tr>
<tr>
<td>DPG1000DAR-30G</td>
<td>0.0–30.00 psig</td>
</tr>
<tr>
<td>DPG1000DAR-60G</td>
<td>0.0–60.00 psig</td>
</tr>
<tr>
<td>DPG1000DAR-100A</td>
<td>0.0–100.00 psia</td>
</tr>
<tr>
<td>DPG1000DAR-100G</td>
<td>0.0–100.00 psig</td>
</tr>
<tr>
<td>DPG1000DAR-300G</td>
<td>0–300.00 psig</td>
</tr>
<tr>
<td>DPG1000DAR-500G</td>
<td>0–500.00 psig</td>
</tr>
<tr>
<td>DPG1000DAR-1KG</td>
<td>1–1000 psig</td>
</tr>
<tr>
<td>DPG1000DAR-2KG</td>
<td>2–2000 psig</td>
</tr>
<tr>
<td>DPG1000DAR-3KG</td>
<td>3–3000 psig</td>
</tr>
<tr>
<td>DPG1000DAR-5KG</td>
<td>5–5000 psig</td>
</tr>
</tbody>
</table>

Accuracy
Includes linearity, hysteresis, repeatability
±0.25% of full scale ±1 least significant digit

Display
4 readings per second nominal display update rate
4 digit LCD, 0.5" H main display
5 character 0.25" H alphanumeric lower display
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 for set-up and calibration

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

DAR Retransmission Output
Updated approximately 16 times per second
4-20 mA DC current output
Output drive (compliance) determined by power source
6,553 counts (2.4 µA resolution) 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, –midpoint, +midpoint, +span

Power
8 to 24 VAC 50/60 Hz or 9 to 32 VDC
Gauge is on whenever power is applied
Designed for continuous operation
1.0 watt maximum power consumption
Use DPG1000-PS 12 VDC power supply kit to operate on 115 VAC

Weight
Gauge: 10 ounces, shipping wt.: 1 pound (approximately)

Housing
Extruded aluminum case, epoxy powder coated, ABS/ polycarbonate bezel (aluminum bezel optional), front and rear gaskets, polycarbonate label

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

Overpressure
2 X pressure range for 3 psi to 2000 psi sensors
5000 psi for ranges using 5000 psi sensor
7500 psi for ranges using 5000 psi sensor
Over-range display 112.5% FS; I – – – or I – – – –
Vacuum service: all 15 psi, 30 psia, all 100 psi, all 200 psi sensors
Under-range display (non-vacuum sensors): –Err

Burst Pressure
4 X sensor pressure rating or 10,000 psi, whichever is less

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)

User's Guide
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omega.com
Made in USA

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Burst Pressure
4 X sensor pressure rating or 10,000 psi, whichever is less

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)
### 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 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 the 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 contactor 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 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, vacuum and pressure 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.

**XX** Never connect the gauge wires directly to 115 VAC or permanent damage will result.

### Types of Gauges

Gauge reference models read zero with the gauge port open. Compound ranges read vacuum in inches of Mercury, pressure in psig, and zero with the gauge port open. 1000 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 gauges read zero at full vacuum and atmospheric pressure with the gauge port open. Note that readings of atmospheric pressure vary continuously.

### 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. The gauge then proceeds to the normal operating mode.

#### DAR Output

<table>
<thead>
<tr>
<th>Power wires</th>
<th>DAR output wires</th>
</tr>
</thead>
<tbody>
<tr>
<td>BLACK</td>
<td>8-24 VAC / 50/60 Hz or 9-32 VDC</td>
</tr>
<tr>
<td>RED</td>
<td></td>
</tr>
<tr>
<td>NO 1</td>
<td>1/24 VDC, non-inductive</td>
</tr>
<tr>
<td>NO 2</td>
<td></td>
</tr>
</tbody>
</table>

#### 6-conductor relay wires

<table>
<thead>
<tr>
<th>Alarm Contact Ratings</th>
<th>Power wires</th>
</tr>
</thead>
<tbody>
<tr>
<td>0/5A, 12/24VDC, N/C, 0/5A, 115VAC</td>
<td></td>
</tr>
<tr>
<td>1/24VDC, non-inductive</td>
<td></td>
</tr>
</tbody>
</table>

Connect it to 8-24 VAC, 50/60Hz or 9-32 VDC. The gauge will operate on either AC or DC power and there is no need to observe polarity. An unregulated power supply can be used. Note that standard 24 VAC transformers with small loads may operate at voltages over the 24 VAC limit. The supply voltage, when within the stated ranges, has negligible effect on the gauge calibration. Operation below 9 VDC or 8 VAC may cause erratic or erroneous readings or output.

When operating multiple gauges from the same power supply, refer to the mA rating in the specifications to ensure adequate power. Route the wires away from heat sources and moving equipment.

### Contact Rating and Protection

The alarm contacts are rated at 1/24VDC or 0.5A/115VAC. Using mechanical relay contacts above their rating, or with large inductive loads, will shorten their life. For inductive loads, NC snubbers or arc suppression devices are required to protect the contacts. For large loads a higher capacity 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.

### Power

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 (0 mA).

- The firmware version number is displayed briefly
- 2 all active display segments are turned on for approx. 1 second.
- 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.
- The display is tested again for approximately 1 second. The gauge then proceeds to the normal operating mode.

For DAR models the retransmission output corresponds to the applied pressure.

### Alarm Types

The factory default configuration is 1% fixed deadband mode, 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 H or L 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.

#### Operation with Fixed Deadband Alarms

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

<table>
<thead>
<tr>
<th>Pressure</th>
<th>Alarm Type</th>
<th>Circuit State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure &lt; Set point – 1%FS &gt; Set point</td>
<td>Normal activity, high alarm SP_H</td>
<td>Relay coil On Off</td>
</tr>
<tr>
<td>Pressure &lt; Set point &gt; Set point + 1%FS</td>
<td>Reverse activity, high alarm SP_H</td>
<td>Relay coil On Off</td>
</tr>
</tbody>
</table>

#### Alarm Types

<table>
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<th>Pressure</th>
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<th>Circuit State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure &lt; Set point – 1%FS &gt; Set point</td>
<td>Normal activity, low alarm SP_L</td>
<td>Relay coil On Off</td>
</tr>
<tr>
<td>Pressure &lt; Set point &gt; Set point + 1%FS</td>
<td>Reverse activity, low alarm SP_L</td>
<td>Relay coil On Off</td>
</tr>
</tbody>
</table>

#### Normal activity, high alarm SP_H

<table>
<thead>
<tr>
<th>Pressure</th>
<th>Alarm Type</th>
<th>Circuit State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure &lt; Set point – 1%FS &gt; Set point</td>
<td>Normal activity, high alarm SP_H</td>
<td>Relay coil On Off</td>
</tr>
<tr>
<td>Pressure &lt; Set point &gt; Set point + 1%FS</td>
<td>Reverse activity, high alarm SP_H</td>
<td>Relay coil On Off</td>
</tr>
</tbody>
</table>

#### Normal activity, low alarm SP_L

<table>
<thead>
<tr>
<th>Pressure</th>
<th>Alarm Type</th>
<th>Circuit State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure &lt; Set point – 1%FS &gt; Set point</td>
<td>Normal activity, low alarm SP_L</td>
<td>Relay coil On Off</td>
</tr>
<tr>
<td>Pressure &lt; Set point &gt; Set point + 1%FS</td>
<td>Reverse activity, low alarm SP_L</td>
<td>Relay coil On Off</td>
</tr>
</tbody>
</table>

#### Alarm Types

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<th>Alarm Type</th>
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<tr>
<td>Pressure &lt; Set point – 1%FS &gt; Set point</td>
<td>Normal activity, high alarm SP_H</td>
<td>Relay coil On Off</td>
</tr>
<tr>
<td>Pressure &lt; Set point &gt; Set point + 1%FS</td>
<td>Reverse activity, high alarm SP_H</td>
<td>Relay coil On Off</td>
</tr>
</tbody>
</table>

The relevant LCD alarm icon will indicate an alarm condition. The relevant bi-color LED will be illuminated green for a normal condition or red for an alarm condition.

The LED will blink at a slow rate until the alarm is acknowledged indicated when alarm conditions exist, and the associated LEDs will blink to indicate unacknowledged alarm conditions.

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

The applied pressure, the SET trip points, and the RESET trip points may be selected for display as follows:

While the applied pressure is being displayed, press and release the SEL 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 SEL button. The upper display will indicate the value of set point 1 with ‘SET_1’ on the lower display.

While reset point 2 is being displayed, press and release the SEL button. The upper display will indicate the value of set point 2 with ‘RESET_2’ on the lower display.

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

#### Operation with Adjustable Hysteresis Alarms

In the adjustable hysteresis mode, two independent set and reset trip points used for each relay and operate as shown below.

<table>
<thead>
<tr>
<th>Pressure</th>
<th>Alarm Type</th>
<th>Circuit State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure &lt; Low point &gt; High point</td>
<td>Normal activity, low alarm SP_L</td>
<td>Relay coil On Off</td>
</tr>
<tr>
<td>Pressure &lt; Low point &gt; High point</td>
<td>Reverse activity, low alarm SP_L</td>
<td>Relay coil On Off</td>
</tr>
<tr>
<td>Pressure &lt; Low point &gt; High point</td>
<td>Normal activity, high alarm SP_H</td>
<td>Relay coil On Off</td>
</tr>
<tr>
<td>Pressure &lt; Low point &gt; High point</td>
<td>Reverse activity, high alarm SP_H</td>
<td>Relay coil On Off</td>
</tr>
</tbody>
</table>

The LEDs indicate green for a RESET state and red for a SET state. Refer to the table for output states as a function of applied pressure. If the gauge is configured for alarms, ALARM1 and ALARM2 will be indicated when alarm conditions exist, and the associated LEDs will blink to indicate unacknowledged alarm conditions.

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

The applied pressure, the SET trip points, and the RESET trip points may be selected for display as follows:

While the applied pressure is being displayed, press and release the SEL 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 SEL button. The upper display will indicate the value of reset point 1 with ‘RESET_1’ on the lower display.

While reset point 1 is being displayed, press and release the SEL button. The upper display will indicate the value of set point 2 with ‘SET_2’ on the lower display.

While sweep point 2 is being displayed, press and release the SEL button. The upper display will indicate the value of set point 2 with ‘RESET_2’ on the lower display.

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

#### DAR Output Types

DAR models have a 4-20 mA retransmission output that corresponds to the applied pressure, except when in zero/tare mode, test mode, or during setup. Characteristics of the output types are listed below.

<table>
<thead>
<tr>
<th>Sensor</th>
<th>Full vacuum</th>
<th>“0” on display</th>
<th>Full pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gauge ref. pressure</td>
<td>n/a</td>
<td>4 mA</td>
<td>20 mA</td>
</tr>
<tr>
<td>Gauge ref. vacuum</td>
<td>20 mA</td>
<td>4 mA</td>
<td>n/a</td>
</tr>
<tr>
<td>Absolute reference</td>
<td>4 mA</td>
<td>4 mA</td>
<td>20 mA</td>
</tr>
</tbody>
</table>

See specifications for output resolution. Note that analog output resolution is always over the entire sensor range and is updated approximately 16 times per second.
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 calibration, user configuration, and output test and set point adjust modes. 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 at state power-up)
- Relay action mode (normal/reverse)
- DAR mod retransmission output and upper and lower limits
- Enable/disable a pass code for output test and set point adjust

When the gauge enters a mode requiring a pass code, the display indicates  _ _ _ _  with the first underscore blinking, and either TSTPC, CFGPC, CALPC on the lower display. All three pass codes are initially set to the factory default of 3510.

Note: During pass code entry the LEDs will be off and the gauge will not respond to changes in applied pressure. The relays will maintain their prior state. The gauge will automatically revert to the normal operating mode if no buttons are operated for approximately 15 seconds. Use the and buttons to set the left-most digit to 3.

Press and release the SEL button to index to the next position. The 3 will remain, and the second position will be blinking.

Use the and buttons to select 5.

Press and release the SEL button to index to the next position. The 5 will remain, and the third position will be blinking.

Use the and buttons to select 0.

Press and release the SEL button to proceed. If an incorrect pass code was entered, the gauge will exit to the normal operating mode. Upon successful pass code entry, follow the steps in the appropriate section of this manual.

Note: To exit a mode at any time, press and hold the SEL button and the display will indicate  _ _ _ _ .

Zero Tare Mode

If the gauge is not indicating zero with zero pressure applied but is within approximately 3% of full scale pressure of zero, you may tare the gauge to zero. This feature may be enabled or disabled. Absolute ranges are configured with this feature turned off.

From the normal operating mode with the gauge open to atmosphere, press and hold both the and buttons and press the SEL button. The relay outputs and the retransmission output will hold the last value, and the visual indicators will be deactivated.

Press and release the SEL button to index to the next position, the 3 will remain, and the fourth position will be blinking.

Use the and buttons to select 0.

Press and release the SEL button to proceed. If an incorrect pass code was entered, the gauge will exit to the normal operating mode. Upon successful pass code entry, follow the steps in the appropriate section of this manual.

Note: To exit a mode at any time, press and hold the SEL button and the display will indicate  _ _ _ _ .

Output Test Mode

From the normal operating mode, press and hold the TEST button and press the SEL button. Release both buttons when the display indicates  _ _ _ _ . If pass code protection is enabled, the display indicates  _ _ _ _  with the left-most underscore blinking and, and TSTPC on the lower display.

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

While in the Test mode with no buttons pressed, the display will indicate  _ _ _ _ , and the retransmission output will correspond to the test value.

Pressing the or button while holding the TEST button will raise or lower the test value. Note that the gauge will not respond to changes in applied pressure while the TEST button is held.

When the TEST button is released, the display, the LED indicators, and the relay outputs will correspond to the applied pressure.

Press and release the SEL button to exit the Output Test mode and return to normal operation.

Adjust Setpoint, Fixed Deadband Mode

“Setpoint” 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 of state of alarm condition, and includes the effect of deadband on returning from an alarm to a normal condition.

Set Point 1

From the normal operating mode press the SEL button to display Trip Point 1. 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 retransmission output will correspond to the applied pressure.

To adjust the Set Point 1 value, press and hold the TEST button. The display will indicate Set Point 1 with SP1 on the lower display.

Operate the and buttons to adjust Set Point 1 to the desired value. Note: The gauge will not respond to changes in applied pressure while the TEST button is pressed. The alarm relays, LEDs, LCD alarm icons, and the DAR output will maintain their prior states until the TEST button is released.

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 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 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 retransmission output will correspond to the applied pressure.

To adjust the Set Point 2 value, press and hold the TEST button. The display will indicate Set Point 2 with SP2 on the lower display.

Operate the and buttons to adjust Set Point 2 to the desired value. Release the TEST button to store the Set Point 2 value.

Note: The gauge will not respond to changes in applied pressure while the TEST button is pressed. The alarm relays, LEDs, LCD alarm icons, and the DAR output will maintain their prior states until the TEST button is released.

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 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 and 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.

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 and buttons.

Press and release 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 FCTRYP.

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 FCTRYP 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 FCTRYP, press and release the button. The lower display will indicate FCTRYP.

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

Zero Tare

The upper display will be blank, and the lower display will indicate either ZTARE or NOZT.

If ZTARE is selected, the user will be able to manually zero the gauge from the normal operating mode.

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 NOZT, press and release the button. The lower display will indicate NOZT.

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

Alarm Annunciator Function Selection

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 Action Selection

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 condition is manually acknowledged, the LED will be steady red while the alarm condition continues to exist.

The LED will be steady 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. 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 Setting

The lower display will display either either SP1_L or SP1_H.

If SP1_L 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_L, press and release the button. The lower display will indicate SP1_L.

If SP1_H 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_H, press and release the button. The lower display will indicate SP1_H.

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_L or SP2_H.

If SP2_L is selected Alarm 2 will be a low alarm. Alarm 2 will be SET...
User Configuration—cont.

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

Negative Span calibration: bipolar (and compound ranges only): Apply full-scale negative pressure. The lower display will alternate between CAL and SPAN. Use the ▲ and ▼ buttons to adjust the upper display to indicate the applied pressure value.

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 approved calibration standards and procedures.

User Configuration—cont.

Calibration
To enter the calibration mode from the normal operating mode with applied pressure being displayed, press and hold the TEST and the ▼ buttons. Then press the SEL button. Release all buttons when the display indicates CAL.
When the gauge enters the calibration mode, the display initially indicates _ _ _ _ with the first underscore blinking, and with CALPC on the lower display.
Press and release the SEL button to step to the retransmission output low value.
The upper display section will be blank, and the lower display will indicate the pre-configured pressure corresponding to the retransmission output low value. The lower display will change to indicate – – – –, and the gauge will exit the calibration mode when all buttons are released.
The upper display will indicate the pre-configured pressure corresponding to the retransmission output low value. The lower display will alternately between CAL and 4 mA. Use the ▲ and ▼ buttons to adjust the actual retransmission output to its low value.
Retransmission Output High Value (DAR only)
Press and release the SEL button to step to the retransmission output high value calibration sequence, indicated by HACL on the display.
Note: If the SEL 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.
The upper display will indicate the pre-configured pressure corresponding to the retransmission output high value. The lower display will alternately between CAL and 20 mA. Use the ▲ and ▼ buttons to adjust the actual retransmission output to its high value.
Pressure Calibration
The pressure calibration procedure adjusts the display indication, and for DAR models also the retransmission output, to correspond to the actual applied pressure.
If the applied pressure is not being displayed, press and release the SEL button to step to the pressure calibration sequence, indicated by CAL on the display.

Calibration—cont.

Note: If the SEL 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.
Zero calibration: Apply zero pressure. The lower display will alternate between CAL and ZERO. Use the ▲ and ▼ buttons to adjust the upper display to indicate zero.
Span calibration: Apply full-scale pressure. The lower display will alternate between CAL and +SPAN. Use the ▲ and ▼ buttons to adjust the upper display to indicate the applied pressure value.
Midpoint Non-Linearity calibration: Apply 50% full-scale positive pressure. The lower display will alternate between CAL and +MID. Use the ▲ and ▼ buttons to adjust the upper display to indicate the applied pressure value.

Changing the User-Defined Pass Codes
Configuration Pass Code
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.
Calibration Pass Code
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 CAL.
Test and Set Point Adjust Pass Code (optional)
From the normal operating mode, press and hold the TEST button. Then press the SEL button. Release all buttons when the display indicates – – – –.
Before the unit enters the view or change pass code mode, the display initially indicates _ _ _ _ , with the first underscore blinking, and with CFGPC, CALPC, or TSTPC on the lower display.
Note: during pass code entry, the LEDs will be off and the gauge will not respond to changes in applied pressure. The output relays will maintain their prior states and the retransmission output will maintain its prior value. The gauge will automatically revert to normal operation if no buttons are operated for approximately 15 seconds.

Enter Factory Pass Code 1220
Use the ▲ and ▼ buttons to set the least-significant digit to 1. Press and release the SEL button to index to the next position. Then press and release the SEL button to select 2.
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.

The upper display will indicate the pressure value corresponding to the 4 mA retransmission output. The lower display will display RNGLO.
Use the ▲ and ▼ buttons to adjust the display to the desired value.
Press and release the SEL button to move to the next parameter.

The upper display will indicate the pressure value corresponding to the 20 mA retransmission output. The lower display will display RNGHI.
Use the ▲ and ▼ buttons to adjust the display to the desired value.
Press and release the SEL button to move to the next parameter.

Analog Output Range Lower Limit Adjust (DAR only)
The upper display will indicate the pressure value corresponding to the 20 mA retransmission output. The lower display will display RNGLO.
Use the ▲ and ▼ buttons to adjust the display to the desired value.
Press and release the SEL button to move to the next parameter.

Analog Output Range Upper Limit Adjust (DAR only)
The upper display will indicate the pressure value corresponding to the 4 mA retransmission output. The lower display will display RNGHI.
Use the ▲ and ▼ buttons to adjust the display to the desired value.
Press and release the SEL button to move to the next parameter.

Analog Output Range Adjusted Hysterisis configuration
The lower display will display either _NOR_, or _REV_.
If _NOR_ is selected, the output relay coils will be energized in the RESET state and de-energized in the SET state (normal action). To select _NOR, press and release the ▼ button. The lower display will indicate _NOR_.
If _REV_ is selected, the output relay coils will be de-energized in the SET state and energized in the RESET state (reverse action). To select _REV_, press and release the ▲ button. The lower display will indicate _REV_.
Press and release the SEL button to move to the next parameter.

Relay Power Up State (Adjustable Hysteresis configuration)
The upper display will be blank, and the lower display will display either SP2_L or SP2_H.
If SP2_L is selected and the gauge is powered up while the applied pressure is between the Output 2 SET and RESET trip points, Output 2 will begin in the RESET state. To select SP2_L, press and release the ▼ button. The lower display will indicate SP2_L.
If SP2_H is selected and the gauge is powered up while the applied pressure is between the Output 2 SET and RESET trip points, Output 2 will begin in the SET state. To select SP2_H, press and release the ▲ button. The lower display will indicate SP2_H.
Press and release the SEL button to move to Relay 2.
The upper display will be blank, and the lower display will display either SP2_L or SP2_H.
If SP2_L is selected and the gauge is powered up while the applied pressure is between the Output 2 SET and RESET trip points, Output 2 will begin in the SET state. To select SP2_L, press and release the ▼ button. The lower display will indicate SP2_L.
If SP2_H is selected and the gauge is powered up while the applied pressure is between the Output 2 SET and RESET trip points, Output 2 will begin in the SET state. To select SP2_H, press and release the ▲ button. The lower display will indicate SP2_H.
Press and release the SEL button to move on to the next parameter.

Relay Action Selection (Adjustable Hysteresis configuration)
The upper display will be blank, and the lower display will display either _NOR1_ or _REV1_.
If _NOR1_ is selected, the Output 1 relay coil will be energized in the RESET state and de-energized in the SET state (normal action). To select _NOR1_, press and release the ▼ button. The lower display will indicate _NOR1_.
If _REV1_ is selected, the Output 1 relay coil will be de-energized in the RESET state and energized in the SET state (reverse action). To select _REV1_, press and release the ▲ button. The lower display will indicate _REV1_.
Press and release the SEL button to move on to Relay 2.
The upper display will be blank, and the lower display will display either SP1_L or SP1_H.
If SP1_L is selected and the gauge is powered up while the applied pressure is between the Output 1 SET and RESET trip points, Output 1 will begin in the RESET state. To select SP1_L, press and release the ▼ button. The lower display will indicate SP1_L.
If SP1_H is selected and the gauge is powered up while the applied pressure is between the Output 1 SET and RESET trip points, Output 1 will begin in the SET state. To select SP1_H, press and release the ▲ button. The lower display will indicate SP1_H.
Press and release the SEL button to move to Relay 2.
The upper display will be blank, and the lower display will display either SP2_L or SP2_H.
If SP2_L is selected and the gauge is powered up while the applied pressure is between the Output 2 SET and RESET trip points, Output 2 will begin in the SET state. To select SP2_L, press and release the ▼ button. The lower display will indicate SP2_L.
If SP2_H is selected and the gauge is powered up while the applied pressure is between the Output 2 SET and RESET trip points, Output 2 will begin in the SET state. To select SP2_H, press and release the ▲ button. The lower display will indicate SP2_H.
Press and release the SEL button to move on to the next parameter.