Cecomp® Programmable 4-Wire Digital Pressure Transmitters — F16DR, F16DRN

Ranges and Resolution

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

‡ -HA option not available

PSI	Res	inHg/PSI	Res	mmH₂O	Res
3PSIG‡	.001	–30V15PSIG‡	.1	2100MMH20G‡	1
5PSIG‡	.001	–30V100PSIG‡	.1	3500MMH20G‡	1
15PSIA	.01	–30V200PSIG‡	.1	**cmH₂O**	**Res**
15PSIVAC‡	.01	**inH₂O**	**Res**	210CMH20G‡	.1
±15PSIG‡	.01	85INH20G‡	.01	350CMH20G‡	.1
15PSIG	.01	140INH20G‡	.1	1000CMH20A	1
30PSIA	.01	400INH20A	.1	1000CMH20VAC‡	1
30PSIG	.01	400INH20VAC‡	.1	±1000CMH20G‡	1
60PSIG	.01	±400INH20G‡	1	1000CMH20G	1
100PSIA	.1	400INH20G	.1	2100CMH20A	1
–15V100PSIG‡	.1	850INH20A	1	2100CMH20G	1
100PSIG	.1	850INH20G	1	**kPa**	**Res**
–15V200PSIG‡	.1	**ftH₂O**	**Res**	20KPAG‡	.01
200PSIG	.1	7FTH20‡	.001	35KPAG‡	.1
300PSIG	.1	12FTH20‡	.01	100KPAA	.1
500PSIG	.1	35FTH20	.1	100KPAVAC‡	.1
1000PSIG	1	70FTH20	.1	±100KPAG‡	.1
2000PSIG	1	140FTH20	.1	100KPAG	.1
3000PSIG	1	230FTH20	.1	200KPAA	.1
5000PSIG	1	480FTH20	.1	200KPAG	.1
oz/in²	**Res**	700FTH20	.1	400KPAG	.1
50ZING‡	.01	1150FTH20	1	700KPAA	.1
80ZING‡	.1	2300FTH20	1	700KPAG	.1
240ZINA	.1	4600FTH20	1	–100V700KPAG‡	1
240ZINVAC‡	.1	6900FTH20	1	1400KPAG	1
±240ZING‡	.1	**mmHg**	**Res**	–100V1400KPAG‡	1
240ZING	.1	150MMHGG‡	.1	2000KPAG	1
480ZINA	.1	260MMHGG‡	.1	3500KPAG	1
480ZING	.1	760MMHGA	.1	7000KPAG	1
inHg	**Res**	760MMHGVAC‡	.1	**MPa**	**Res**
6INHGG‡	.001	±760MMHGG‡	1	1.4MPAG	.001
10INHGG‡	.01	760MMHGG	.1	–0.1V1.4MPAG‡	.001
30INHGA	.01	1600MMHGA	1	2MPAG	.001
30INHGVAC‡	.01	1600MMHGG	1	3.5MPAG	.001
±30INHGG‡	.01	**Torr**	**Res**	7MPAG	.001
30INHGG	.01	760TORRA	.1	14MPAG	.01
60INHGA	.01	760TORRVAC‡	.1	20MPAG	.01
60INHGG	.01	1600TORRA	1	35MPAG	.01
120INHGG	.1	**mbar**	**Res**	**g/cm²**	**Res**
200INHGA	.1	200MBARG‡	.1	200GCMG‡	.1
–30V200INHGG‡	.1	350MBARG‡	.1	350GCMG‡	.1
200INHGG	.1	1000MBARA	1	1000GCMA	1
–30V400INHGG‡	.1	1000MBARVAC‡	1	1000GCMVAC‡	1
400INHGG	.1	±1000MBARG‡	1	±1000GCMG‡	1
600INHGG	.1	1000MBARG	1	1000GCMG	1
1000INHGG	1	2000MBARA	1	2100GCMA	1
2000INHGG	1	2000MBARG	1	2100GCMG	1
4000INHGG	1	**bar**	**Res**	**kg/cm²**	**Res**
atm	**Res**	1BARA	.001	1KGCMA	.001
1ATMA	.001	1BARVAC‡	.001	1KGCMVAC‡	.001
1ATMVAC‡	.001	±1BARG‡	.001	±1KGCMG‡	.001
±1ATMG‡	.001	1BARG	.001	1KGCMG	.001
1ATMG	.001	2BARA	.001	2KGCMA	.001
2ATMA	.001	2BARG	.001	2KGCMG	.001
2ATMG	.001	4BARG	.001	4KGCMG	.001
4ATMG	.001	7BARA	.001	7KGCMA	.001
7ATMA	.001	7BARG	.001	7KGCMG	.001
7ATMG	.001	–1V7BARG‡	.01	–1V7KGCMG‡	.01
–1V7ATMG‡	.01	14BARG	.01	14KGCMG	.01
14ATMA	.01	–1V14BARG‡	.01	–1V14KGCMG‡	.01
–1V14ATMG‡	.01	20BARG	.01	20KGCMG	.01
20ATMG	.01	35BARG	.01	35KGCMG	.01
34ATMG	.01	70BARG	.01	70KGCMG	.01
70ATMG	.01	140BARG	.1	140KGCMG	.1
140ATMG	.1	200BARG	.1	200KGCMG	.1
200ATMG	.1	350BARG	.1	350KGCMG	.1
340ATMG	.1				

Accuracy

Accuracy includes linearity, hysteresis, repeatability
Standard accuracy: ±0.25% of full scale ±1 least significant digit
HA accuracy option: ±0.1% FS ±1 LSD, see ranges for availability
Sensor hysteresis: ±0.015% FS, included in accuracy
Sensor repeatability: ±0.01% FS, included in accuracy

Display

4 readings per second nominal display update rate
4 digit LCD, 0.5" H and 5 character 0.25" H alphanumeric
DRBL: Red LED backlight on when gauge is on

Controls

SEL Select display for setup
TEST Set output to test level when in test mode
▲ Up: Increase when in test or calibration mode
▼ Down: Decrease when in test or calibration mode
Zero/tare function can be enabled or disabled

Calibration

User settable pass code required to enter calibration mode
All pressure and absolute models: zero, midpoint, span
All vacuum models: –span, –midpoint, zero
Vacuum/pressure models: –span, zero, +midpoint, +span
±15 psi models: –span, –midpoint, zero, +midpoint, +span

Output Characteristics

Updated approximately 16 times per second
User scalable pressure range to correspond to output
-I: 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
6,553 counts over sensor range
-BV: Bipolar voltage output (–2 - 0 - 2 V) for ±15 psig sensor only
±2 VDC into 5k ohm or greater
13,107 counts over sensor range

Power

8-24 VAC 50/60 Hz or 9-32 VDC
Gauge is on when power is on. Designed for continuous operation.
DR: 30 mA maximum
DRBL: Approximately 40 mA maximum

Weight

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

Housing

F16DR: Extruded aluminum case, epoxy powder coated, ABS/polycarbonate bezel (aluminum bezel optional), front and rear gaskets, polycarbonate label

F16DRN: ABS/polycarb. NEMA 4X case, rear gasket, polycarb. label

Connection, Material, Media Compatibility

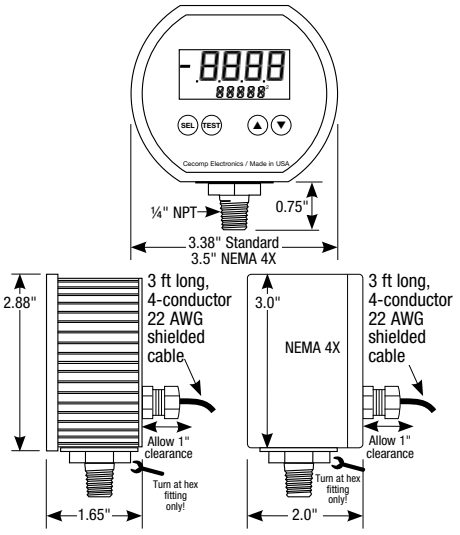
1/4" NPT male fitting. All wetted parts are 316L stainless steel.

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 l –.–.–.–
4 X sensor burst pressure rating, or 10,000 psi, whichever is less
Vacuum service: 15 psia, ±15 psig, 15 psig, 30 psia, 100 psig, 100 psia, 200 psig 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)



- *±0.25% Test Gauge Accuracy*
- *316L Stainless Steel Wetted Parts*
- *Low Voltage Powered*
- *4-20 mA or 0-2 V Analog Output*
- *Output Test Function*

MADE IN USA

F16DR

F16DRN

NEMA 4X Housing

Quick Link: cecomp.com/xmtr

How to Specify	Type
F16DR *range - output - options*	Standard housing
F16DRBL *range - output - options*	Standard housing, backlit display
F16DRN *range - output - options*	NEMA 4X housing
F16DRNBL *range - output - options*	NEMA 4X housing, backlit display

Range—see table at left

psi = PSI	torr = TORR	mbar = MBAR
inHg = INHG	mmH_2O = MMH2O	bar = BAR
oz/in^2 = ZIN	kg/cm^2 = KGCM	cmH_2O = CMH2O
inH_2O = INH2O	g/cm^2 = GCM	atm = ATM
ftH_2O = FTH2O	kPa = KPA	
mmHg = MMHG	MPa = MPA	

G = gauge reference pressure
VAC = gauge reference vacuum
A = absolute reference

Output

Specify: **I** 4-20 mA
V 0-2 V
BV ±2 V for ranges using ±15 psig sensor only

Options—add to end of model number	
HA	High accuracy, ±0.1% FS ±1 LSD. See table at left for availability.
PM	Panel mount, 4.1" x 4.1", n/a NEMA 4X
CC	Moisture resistant circuit board conformal coating
CD	Calibration data; 5 test points and date
NC	NIST traceability documentation, 5 points and date
Accessories—order separately	
WMPSK	Wall mount power supply kit, 115 VAC/12 VDC

SCR14SS
Filter screen fitting keeps debris out of gauge sensor. Use for food vacuum packaging applications. 303 SS body, 100 micron 304 SS screen.

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 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 diaphragm may cause silicone oil inside sensor to react with oxygen.
- ☒ NEVER connect the gauge wires directly to 115 VAC or permanent damage will result.

Cecomp maintains a constant effort to upgrade and improve its products. Specifications are subject to change without notice. See cecomp.com for latest product information. Consult factory for your specific requirements.

WARNING: This product can expose you to chemicals including lead, nickel and chromium, which are known to the State of California to cause cancer or birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov

Types of Gauges

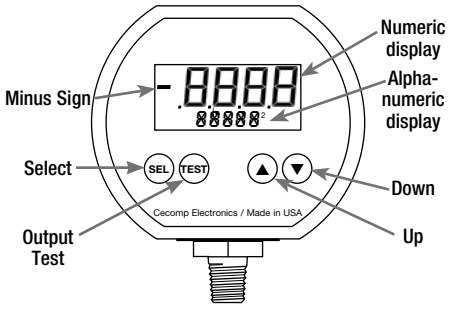
Gauge reference models read zero with the gauge port open.

Bipolar ranges read positive pressure and vacuum in the same units, 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 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.

Display and Keypad



Electrical Connections

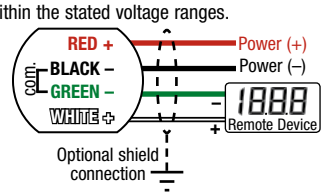
Connection is made with the four conductor cable at the gauge rear. This cable accommodates both the gauge power supply and retransmission output.

Route the wires away from heat sources and moving equipment. See wiring diagram.

Electrical Connections—continued

Power

The F16DR series can be powered by any 9 to 32 VDC or 8 to 24 VAC 50/60 Hz power source. An inexpensive unregulated low voltage source can be used. The magnitude of the supply voltage has negligible effect on the gauge calibration as long as it is within the stated voltage ranges.



Do not allow the gauge supply voltage fall below 9 VDC or 8 VAC RMS. Operation below these values may cause erratic or erroneous readings or output. Models with 4-20 mA output power the current loop. Use a power source with sufficient voltage to operate the current loop.

Connect power as shown below. When using low voltage AC power, either polarity may be used. Use the correct polarity with a DC supply.

Note that standard 24 VAC transformers with small loads may operate at voltages over the 24 VAC limit.

Output

If the analog output is not required, the transmitter will function as a low voltage powered gauge. Protect the output wires to prevent a short circuit.

NEVER connect retransmission output wires together or to an external power source or permanent damage will result.

Use of the shield (drain) wire is optional. It is not generally needed for 4-20 mA current loops unless very long cable lengths are used in electrically noisy environments.

The **-I** version with 4-20 mA output provides power to the current loop. Use a gauge power source with sufficient voltage to operate the current loop.

For long cable runs, 4-20 mA output model provides better performance.

The power supply (–) lead is tied to the retransmission output ground. If a DC supply is used, the power supply (–) lead is common with regard to the retransmission output (–) connection.

For 4-20 mA output models, be sure to observe the output compliance (voltage drive) capabilities of the gauge. The compliance, and therefore the maximum loop resistance the output can drive, is a function of the supply voltage to the gauge. Too large a loop resistance will cause the gauge output to "limit" or saturate before reaching its full 20 mA output.

When using the 0-2 volt retransmission output, do not allow the resistive load on the output to fall below 5k ohms. Avoid large capacitive loads (greater that 1000 pF) such as those caused by long runs of shielded cable. For long cable runs, use a 4-20 mA output model.

The retransmission output corresponds to the applied pressure, except when in zero/tare mode, test mode, or during setup. Characteristics of the output types are listed below.

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.

Range Type	Output Option	Full vacuum	"0" on display	Full pressure
Gauge reference pressure	**-I**	n/a	4 mA	20 mA
	-V	n/a	0 V	2 V
Gauge reference vacuum	**-I**	20 mA	4 mA	n/a
	-V	2 V	0 V	n/a
Absolute reference	**-I**	4 mA	4 mA	20 mA
	-V	0 V	0 V	2 V
Vacuum/pressure ranges using ±15 psi sensor	**-I**	4 mA	12 mA	20 mA
	-V	0 V	1 V	2 V
	-BV	–2 V	0 V	2 V
Vacuum/pressure ranges using –15V100 psi sensor	**-I**	4 mA	~6.1 mA	20 mA
	-V	0 V	~0.26 V	2 V
Vacuum/pressure ranges using –15V/200 psi sensor	**-I**	4 mA	~5.1 mA	20 mA
	-V	0 V	~0.14 V	2 V

Operation

When power is first applied, the gauge proceeds through a startup sequence. During the startup sequence the retransmission output is low (–2.5 VDC or 0 mA).

The firmware version number is displayed briefly

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.

The retransmission output corresponds to the applied pressure, except when in zero/tare mode, test mode, or during setup.

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.

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 – – – – or _ _ _ _.

If pass code protection is enabled, the display indicates _ _ _ _ with the left-most underscore blinking, and TSTPC.

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 the pressure with the engineering units blinking at a slow rate.

When the TEST button is pressed, the display will indicate the preset test value with TEST on the lower display, and the retransmission output will correspond to the test value.

Pressing the ▲ or the ▼ 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 will correspond to the applied pressure.

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

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, it is possible to tare the gauge to zero.

The zero tare function may be enabled or disabled in User Configuration. It is disabled for absolute reference gauges. If disabled, it may be enabled in User Configuration.

Note that this procedure can only be used with absolute pressure gauges if a full vacuum is applied to the gauge port using a vacuum pump capable of creating at least 100 millitorr.

From the normal operating mode with applied pressure equal to zero, press and hold both the ▲ and ▼ buttons and press the SEL button.

The retransmission output will hold the last value.

Release all buttons when the display indicates ' o o o o '.

The display will initially indicate a newly calculated zero tare value with Z OFF on the character segments. Note: If not within approximately 3% of zero, Err0 will be displayed.

Press the SEL button to clear the error and return to normal mode without affecting any existing zero tare value.

To cancel and remove any existing zero tare value, press and release the ▼ button.

The display will indicate zero.

To restore the newly calculated zero tare value, press and release the ▲ button.

To exit the Zero/Tare mode, press and release the SEL button.

The gauge will return to the normal mode. The display and the retransmission output will correspond to applied pressure.

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.

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
- Retransmission output upper and lower limits
- Enable/disable a pass code for output test

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 gauge will not respond to changes in applied pressure. The gauge will automatically revert to the normal operation 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. 3 5 will remain, and the third position will be blinking.

Use the ▲ and ▼ buttons to select 1.

Press and release the SEL button to index to the next position. 3 5 1 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 to 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 until the display indicates – – – – .

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 indicate either ZTARE or NOZTR.

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 NOZTR is selected the user will be prevented from zeroing the gauge from the normal operating mode. This is default setting for absolute reference ranges.

User Configuration—continued

To select NOZTR, press and release the ▼ button. The lower display will indicate NOZTR.

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

Analog Output Range Lower Limit Adjust

The upper display will indicate the pressure value corresponding to the minimum retransmission output, either 4 mA, 0 VDC, or –2 VDC depending on the particular gauge model. 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 on to the next parameter.

Analog Output Range Upper Limit Adjust

The upper display will indicate the pressure value corresponding to the maximum retransmission output, either 4 mA or +2 VDC depending on the particular gauge model. 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.

Output Test Adjust Mode Pass Code Protection

The upper display section will be blank, and the lower section will display either TSTPC or NOTPC.

To enable Output Test Adjust Mode pass code protection, press and release the ▲ button. The lower display will indicate TSTPC.

To disable Output Test Adjust Mode 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.

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 able to produce a vacuum of 100 microns (0.1 torr or 100 millitorr) or lower is required for vacuum and absolute gauges.

Use an accurate volt or mA meter for calibration of the retransmission output.

Allow the gauge to equalize to normal room temperature (about 20 minutes minimum) before calibration.

Calibration Pass Code

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.

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

Upon successful calibration pass code entry, the upper display will indicate the applied pressure in the configured engineering units.

The lower display of the display will alternate between CAL and the calibration region corresponding to the applied pressure (ZERO, +MID, +SPAN, MID, or SPAN).

Note: To store the calibration parameters and exit calibration mode at any time, press and hold the SEL button until the display indicates – – – – .

Output Calibration

Calibration of the Retransmission Output

Calibration of the retransmission output coordinates the retransmission output to the display indication, and is performed independently of applied pressure. It requires a direct physical measurement of the retransmission output with an accurate mA or Volt meter.

Retransmission Output Low Value

Press and release the SEL button to step to the retransmission output low value calibration sequence, indicated by LCAL 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 low value.

The lower display will alternate between CAL and 4 mA, 0 VDC, or –2 VDC depending on retransmission option.

Use the ▲ and ▼ buttons to adjust the actual retransmission output to its low value.

Retransmission Output High Value

Press and release the SEL button to step to the retransmission output high value calibration sequence, indicated by HCAL 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 alternate between CAL and 20 mA or +2 VDC depending on retransmission option.

Use the ▲ and ▼ buttons to adjust the actual retransmission output to its high value.

Press the SEL button briefly to proceed to pressure calibration or hold the SEL button for 2 seconds to save and exit.

Pressure Calibration

The pressure calibration procedure adjusts the display indication, and 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.

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.

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.

Continued on next page.....

Pressure Calibration—continued

Negative Midpoint Non-Linearity Calibration (bipolar ranges only)

Apply 50% full-scale negative 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.

Exit Calibration Mode

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

Pass Code Configuration

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 extinguish 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 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 ▲ and ▼ 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 ▲ and ▼ 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 ▲ and ▼ 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 CFGPC, CALPC, or TSTPC on the character segments.

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 ▲ or ▼ 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 and 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 restarts in the normal operating mode.