Falcon NEMA 4X 4 Wire Low-Voltage Powered Indicating Transmitters

DiGi PRO 4® F4DR F4DRBL

Electrical Specifications

Ranges and Resolution

Bold: standard ranges, price adder for all others
abs: absolute reference (atmospheric pressure to zero at full vacuum)
vac: vacuum gauge, minus sign not used unless specified
Resolution is fixed as indicated in table below

Contact factory for other engineering units	199.9 inHg abs	1600 mmHg	70.0 bar	±1.000 kg/cm²
	199.9 inHg	760 torr abs	140.0 bar	1.000 kg/cm²
	50.0 oz/in²	1600 torr abs	199.9 bar	1.999 kg/cm² abs
3.00 psig	80.0 oz/in²	1999 mmH_2O	350 bar	1.999 kg/cm²
5.00 psig	240 oz/in² abs	199.9 cmH_2O	19.99 kPa	4.00 kg/cm²
15.00 psi abs	240 oz/in² vac	350 cmH_2O	35.0 kPa	7.00 kg/cm² abs
15.00 psig vac	±240 oz/in²	1000 cmH_2O	100.0 kPa abs	7.00 kg/cm²
±15.00 psig	240 oz/in²	1999 cmH_2O	100.0 kPa vac	14.00 kg/cm²
15.00 psig	85.0 inH_2O	199.9 mbar	±100.0 kPa	19.99 kg/cm²
30.0 psi abs	140.0 inH_2O	350 mbar	100.0 kPa	35.0 kg/cm²
30.0 psig	400 inH_2O abs	1000 mbar abs	199.9 kPa abs	70.0 kg/cm²
60.0 psig	400 inH_2O vac	1000 mbar vac	199.9 kPa	140.0 kg/cm²
100.0 psi abs	±400 inH_2O	±1000 mbar	400 kPa	199.9 kg/cm²
100.0 psig	400 inH_2O	1000 mbar	700 kPa abs	350 kg/cm²
199.9 psig	850 inH_2O	1999 mbar abs	700 kPa	1.000 atm abs
300 psig	7.00 ftH_2O	1999 mbar	1500 kPa	±1.000 atm
500 psig	12.00 ftH_2O	1.000 bar abs	1999 kPa	1.000 atm
1000 psig	35.0 ftH_2O	1.000 bar vac	3.50 MPa	4.00 atm
1999 psig	70.0 ftH_2O	±1.000 bar	7.00 MPa	7.00 atm
6.00 inHg	140.0 ftH_2O	1.000 bar	14.00 MPa	14.00 atm
10.00 inHg	230 ftH_2O	1.999 bar abs	19.99 MPa	19.99 atm
30.0 inHg abs	480 ftH_2O	1.999 bar	35.0 MPa	35.0 atm
30.0 inHg vac	150.0 mmHg	4.00 bar	1000 g/cm² abs	70.0 atm
±30.0 inHg	260 mmHg	7.00 bar abs	1000 g/cm²	135.0 atm
30.0 inHg	760 mmHg abs	7.00 bar	1999 g/cm² abs	199.9 atm
60.0 inHg abs	760 mmHg vac	14.00 bar	1999 g/cm²	340 atm
60.0 inHg	760 mmHg	19.99 bar	1.000 kg/cm² abs	
120.0 inHg	1600 mmHg abs	35.0 bar	1.000 kg/cm² vac	

Accuracy (linearity, hysteresis, repeatability)

Standard: ±0.25% of full scale ±1 least significant digit
Optional:
-HA ±0.1% FS ±1LSD (most ranges)
-4A ±0.4% FS ±1LSD
CD Factory calibration data
NC NIST traceable test report and calibration data

Display (update rate, type, size)

3 readings per second nominal display update rate
DR in ranges up to 1999: 3½ digit LCD, ½" digit height
DRBL ranges up to 1999: 3½ digit LCD, ½" digit height, red LED backlight

Controls

Non-interactive zero and span: ±10% range
Test calibration level: 0-100% range
Retransmission zero and span: internal potentiometers

Retransmission Output

True analog output, 50 milliseconds typical response time.
-I model: Current output, 4-20 mA DC, output drive (compliance) determined by power source. See graph.
-V model: Voltage output, 0-2 VDC into 5 kΩ or greater

Test Function

Front panel TEST button, when depressed sets display and retransmission output to "test calibration" level, independent of pressure input to allow testing of system operation.
Test level is set by top-accessible multiturn potentiometer to any value from 0 to 100% of full scale.

Power

Any AC source of 8 to 24 VAC 50/60 Hz or any DC source of 9 to 32 VDC
30 mA maximum, 40 mA for DRBL model with backlighting
3 ft long, 4-conductor 22 AWG shielded cable
Order optional **WMPSK** 12 VDC wall mount power supply kit to operate on 115 VAC

Environmental Specifications

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***
- ***316 Stainless Steel Wetted Parts***
- ***Low-Voltage AC/DC-Powered***
- ***4-20 mA or 0-2 V Analog Output***
- ***Output Test Function***
- ***DRBL Includes Backlit Display***



F4DR200PSIG
0 to 199.9 psig range

Mechanical Specifications

Size

3.5" W x 3.0" H x 2.0" D housing
Add approximately 0.75" to height for pressure fitting
Add approximately 1" to depth for strain relief and wire clearance

Weight (approximate)

Gauge: 9 ounces
Shipping weight: 1 pound

Housing

NEMA 4X
UV stabilized polycarbonate/ABS case, light gray color
Clear polycarbonate window to protect display
Gasketed rear cover, six captive stainless steel screws

Pressure/Vacuum Connection & Material

¼" NPT male, 316 stainless steel

Media Compatibility

All wetted parts are 316 SS
Compatible with most liquids and gases

Overpressure

3000 psig range and metric equivalents: 5000 psig
5000 psig range and metric equivalents: 7500 psig
All others 2x rated pressure minimum

Burst Pressure

4x rated pressure minimum or 10,000 psi, whichever is less

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Installation and Precautions

Install or remove the gauge using wrench on hex fitting only. Do not attempt to tighten by turning housing or any other part of the gauge. Use fittings appropriate for the pressure range of the gauge. Do not apply vacuum to gauges not designed for vacuum operation. Due to the hardness of 316 stainless steel, it is recommended that a thread sealant be used to ensure leak-free operation. **NEVER** insert objects into the gauge port or blow out with compressed air. Permanent damage not covered by warranty will result to the sensor.

Electrical Connection

***NEVER** connect the gauge wires directly to 115 VAC or permanent damage not covered by warranty will result.*

The **F4DR** and **F4DRBL** 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.

Connection is made with the 4-conductor cable at the gauge rear. This cable accommodates both the gauge power supply and retransmission output. This cable has one RED and one BLACK lead. If using a 9 to 32 VDC power source, connect the (+) supply to the RED lead and the (–) supply to the BLACK lead. If using a 8 to 24 VAC 50/60 Hz power source, connect to the RED and BLACK leads. When using low voltage AC power, there is of course, no polarity consideration.

The (+) retransmission output appears on the WHITE lead, and the (–) retransmission output appears on the GREEN lead. Use of the shield (drain) wire of the retransmission output 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 output is a continuous analog signal based on the transducer output rather than the display. This output is filtered to improve noise immunity and has a response time of about 50 milliseconds.

The power supply (–) lead is tied to the retransmission output ground. Therefore, if a DC supply is used, the power supply (–) lead should be considered common with regard to the retransmission output (–) connection.

Using the Retransmission Output

NEVER connect retransmission output wires together or to an external power source or permanent damage not covered by warranty will result.

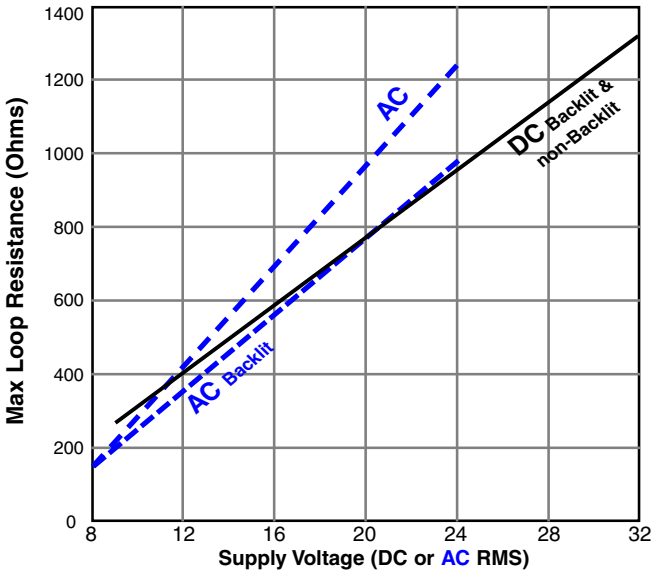
For 4-20 mA output models, be sure to observe the output compliance (voltage drive) capabilities of the gauge. The compliance, and therefore the maximum loop resistance the output can drive, is a function of the supply voltage to the gauge. Consult the graph below for maximum loop resistance vs. gauge supply voltage. 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. Also, avoid large capacitive loads (greater that 1000 pF) such as those caused by long runs of shielded cable. For long retransmission runs, use the 4-20 mA output model instead.

Operation

The gauge is powered on whenever a supply voltage is applied. Warm-up time is negligible. In normal operation, the system pressure is displayed on the gauge LCD and an output signal will be present. **F4DRBL** model display backlighting will be on whenever power is applied. The display backlighting will not be apparent under bright lighting conditions.

Voltage Compliance for 4-20 mA Current Retransmission Output



TEST Button

When the front-panel TEST button is held depressed, the display and retransmission output are switched, independent of the system pressure, to a test level determined by the setting of the Test potentiometer. This test mode will allow setup and testing of the output and any external device(s) connected to it by switching to this test level whenever desired without having to alter the system pressure.

To set the test output level, see gauge label for location of Test potentiometer. Press and hold the front-panel TEST button and adjust the Test potentiometer to set the display and retransmission output to the desired test level.

Calibration

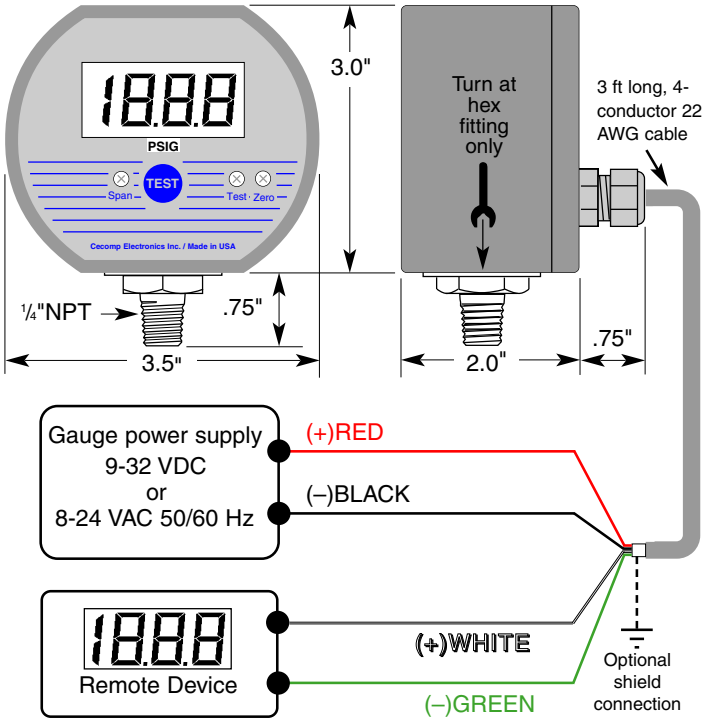
See gauge label for location of controls to adjust the zero and span of the display.

GAUGE reference units may be re-zeroed without affecting the span calibration. The gauge port must be open to the ambient with no pressure/vacuum applied. Adjust the Zero control until the gauge reads zero with the minus (–) sign occasionally flashing.

Span calibration should only be attempted if the user has access to a pressure reference of known accuracy. The quality of the calibration is only as good as the accuracy of the calibration equipment and ideally should be at least four times the gauge accuracy. Zero calibration must be done before span calibration. Record readings at three to five points over the range of gauge and adjust span control to minimize error and meet specifications.

ABSOLUTE reference gauges require vacuum generation and atmospheric pressure measurement equipment for accurate calibration and thus are more difficult to calibrate in the field. Gauges may be returned to Cecomp Electronics for factory certified recalibration. NIST traceability is available.

Internal potentiometers adjust the agreement between the displayed value and the analog output. These are set at the factory and should not normally be adjusted. If adjustment is required, consult factory. Accurate pressure generation and measurement and current measurement equipment are required to successfully complete this calibration.



Part Numbers

F4DR or F4DRBL range units ref - output

Pressure/Vacuum Range (see table)

Units (see table)

G=Gauge, **A**=Absolute, **VAC**=Vacuum

I = Current 4-20 mA
V = Voltage 0-2 V

Example: F4DR100PSIG-I = F4DR, 100.0 psig, Current (4-20 mA) output

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

Pressure

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