Falcon NEMA 4X Low Voltage-Powered Digital Pressure Gauges

DiGi PRO 4® F4AD F4ADBL

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 engineering units not listed

–30.0 inHg/15.0 psig	**120.0 inHg**	1600 mmHg	35.0 bar	1.000 kg/cm² abs
–30.0 inHg/100.0 psig	199.9 inHg abs	760 torr abs	70.0 bar	1.000 kg/cm² vac
–30.0 inHg/199.9 psig	**199.9 inHg**	1600 torr abs	140.0 bar	±1.000 kg/cm²
3.00 psig	50.0 oz/in²	2100 mmH_2O	199.9 bar	1.000 kg/cm²
5.00 psig	80.0 oz/in²	3500 mmH_2O	350 bar	1.999 kg/cm² abs
15.00 psi abs	240 oz/in² abs	199.9 cmH_2O	19.99 kPa	1.999 kg/cm²
15.00 psig vac	240 oz/in² vac	350 cmH_2O	35.0 kPa	4.00 kg/cm²
±15.00 psig	±240 oz/in²	1000 cmH_2O	100.0 kPa abs	7.00 kg/cm² abs
15.00 psig	240 oz/in²	2100 cmH_2O	100.0 kPa vac	7.00 kg/cm²
30.0 psi abs	85.0 inH_2O	199.9 mbar	±100.0 kPa	14.00 kg/cm²
30.0 psig	140.0 inH_2O	350 mbar	100.0 kPa	19.99 kg/cm²
60.0 psig	400 inH_2O abs	1000 mbar abs	199.9 kPa abs	35.0 kg/cm²
100.0 psi abs	400 inH_2O vac	1000 mbar vac	199.9 kPa	70.0 kg/cm²
100.0 psig	±400 inH_2O	±1000 mbar	400 kPa	140.0 kg/cm²
199.9 psig	400 inH_2O	1000 mbar	700 kPa abs	199.9 kg/cm²
300 psig	850 inH_2O	1999 mbar abs	700 kPa	350 kg/cm²
500 psig	7.00 ftH_2O	1999 mbar	1500 kPa	1.000 atm abs
1000 psig	12.00 ftH_2O	4000 mbar	1999 kPa	±1.000 atm
1999 psig	35.0 ftH_2O	1.000 bar abs	3500 kPa	1.000 atm
3000 psig	70.0 ftH_2O	1.000 bar vac	5000 kPa	4.00 atm
5000 psig	140.0 ftH_2O	±1.000 bar	3.50 MPa	7.00 atm
6.00 inHg	230 ftH_2O	1.000 bar	7.00 MPa	14.00 atm
10.00 inHg	480 ftH_2O	1.999 bar abs	14.00 MPa	19.99 atm
30.0 inHg abs	150.0 mmHg	1.999 bar	19.99 MPa	35.0 atm
30.0 inHg vac	260 mmHg	4.00 bar	35.0 MPa	70.0 atm
±30.0 inHg	760 mmHg abs	7.00 bar abs	1000 g/cm² abs	135.0 atm
30.0 inHg	760 mmHg vac	7.00 bar	1000 g/cm²	199.9 atm
60.0 inHg abs	760 mmHg	14.00 bar	2100 g/cm² abs	340 atm
60.0 inHg	1600 mmHg abs	19.99 bar	2100 g/cm²	

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
Ranges up to 1999: 3½ digit LCD, 0.5" digit height
3000 psi, 5000 psi, **-400** option: 4½ digit LCD, 0.5" digit height, lower display for engineering units
ADBL: Red LED backlight on whenever gauge is on

Controls

Ranges up to 1999:
Front pushbutton turns gauge on or off
Front-accessible calibration potentiometers
Non-interactive zero and span, ±10% range

3000 psi, 5000 psi, **-400** option:
Gauge is on whenever power is applied
Front pushbutton One-Touch zero
Internal calibration pushbuttons
Non-interactive zero and span, ±10% range

Power

Any AC source 8 to 24 VAC 50/60 Hz or any DC source 9 to 32 VDC
F4AD series: Approximately 5 mA
F4ADBL series: Approximately 80 mA
3 ft long, 2-conductor 22 AWG cable
All models are designed for continuous operation
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***
- ***Powered by 8-24 VAC or 9-32 VDC***
- ***Pressure, Vacuum, Absolute or Compound***
- ***ADBL includes Backlit Display***



F4AD100PSIG
0 to 100.0 psig range



F4AD5000PSIG
0 to 5000 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 and 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
3000 psi, 5000 psi, **-400** option: 112.5% out-of-range display **I** – – – or **I** –.–.–.–
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 gauge using wrench on gauge 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.

Use only with liquids or gases compatible with 316 stainless steel.

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.

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

Installation

The **F4AD** and **F4ADBL** can be powered by:

AC source: 8 to 24 VAC 50/60 Hz or DC source: 9 to 32 VDC

The type and magnitude of the supply voltage have negligible effects on the gauge calibration as long as it is within the voltage ranges stated above. No recalibration is needed, and no jumpers need to be moved to use either AC or DC power within the specified range. No polarity needs to be observed when connecting a DC supply. Therefore, they can be used with inexpensive unregulated low voltage AC or DC power sources in applications requiring a continuous pressure display.

After the gauge is installed, route the wires away from heat sources and moving equipment and connect the low-voltage power source to the gauge cable.

The only important consideration is to ensure that the gauge supply voltage does not fall below 8 VAC RMS if AC power is used, or 9 VDC if DC power is used. Operation with less than these values may cause erratic or erroneous readings. If your application requires operation of multiple gauges from the same power supply, consult the factory for wiring recommendations.

Operation – Ranges up to 1999

When a supply voltage is applied, the gauge will be ready to use. If the gauge display is off, press the center button to turn the gauge on. If the gauge is in the power-on state and the power is disconnected, the gauge will turn on when power is reapplied. The gauge can be left on continuously or turned off when not in use. **ADBL** model backlighting will be on whenever the gauge is on. The display backlighting will not be apparent under bright lighting conditions.

Operation – 3000 psi, 5000 psi Ranges and -400 Option

When the supply voltage is applied, the gauge will go through a power-up sequence. The full-scale range is indicated, display segments are tested, and then the reading and units are displayed. **ADBL** model backlighting will be on whenever the gauge is on. The display backlighting will not be apparent under bright lighting conditions.

One-Touch Zero Button (Gauge reference models only)

1. This feature corrects slight drift from zero due to temperature changes. Make absolutely certain no pressure is applied to the gauge. The gauge port should be exposed to normal atmospheric pressure.
2. Press and hold the pushbutton.
3. The full-scale range is indicated and the display segments are tested.
4. Continue to press the pushbutton until **0 0 0 0** is displayed and then release the button. This indicates that the gauge has been zeroed and a corrected zero reading is displayed until pressure/vacuum is applied.
5. If the button is released before **0 0 0 0** is displayed, the stored zero correction is erased and the actual reading is displayed.

Attempting to zero the gauge with pressure greater than approximately 3% of full-scale applied will result in an error condition, and the display will alternately indicate **Err 0** and the actual measured pressure. Repeat the One-Touch Zero procedure to correct the error condition.

Absolute reference gauges do not use the zero feature since they read atmospheric pressure under normal conditions.

Normal Operation

Following the start-up initialization, the display indicates the pressure reading updated approximately 3 times per second.

If excessive vacuum is applied to a pressure-only gauge, the display will indicate **– Err** until the vacuum is released. Applying vacuum to a gauge designed for pressure may damage the pressure sensor. If excessive pressure is applied (112.5% over range), an out-of-range indication of **1 – – –** or **1 –.–.–.–** will be displayed depending on model.

Calibration

All Falcon gauges are factory calibrated on NIST traceable calibration equipment. No calibration is required before placing the gauge into service.

Ranges up to 1999 – Remove the calibration potentiometer covers on the front of the unit to access the zero and span controls.

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

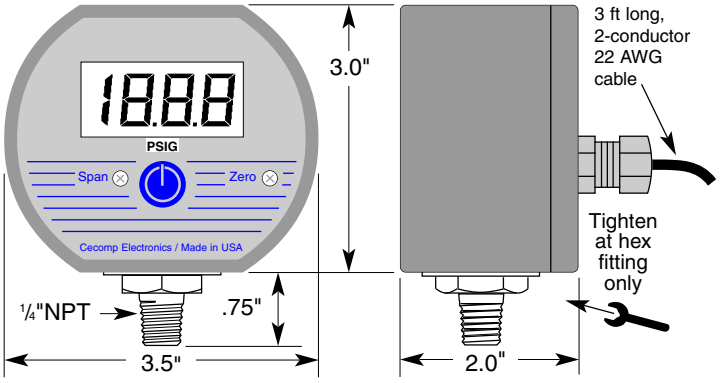
Span calibration should only be attempted if the user has access to a pressure reference of known accuracy. The quality of the calibration is only as good as the accuracy of the calibration equipment and ideally should be at least four times the gauge accuracy. Zero calibration must be done before span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

3000 psi, and 5000 psi Ranges: The calibration adjustments are internal on these models. The procedure is available from *www.cecomp.com* or by calling to request the "F16" calibration instructions.

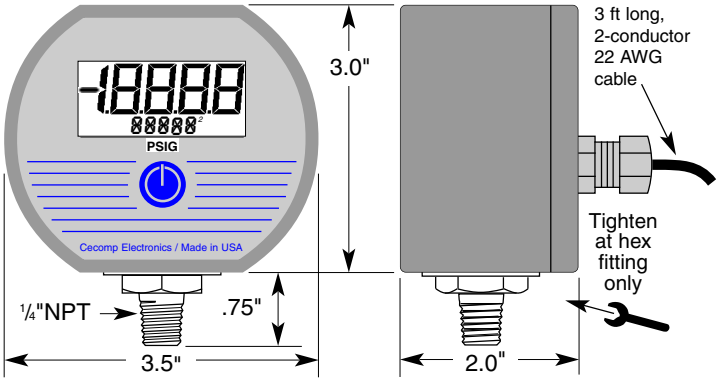
Absolute Reference – These models display atmospheric pressure if the gauge port is open to the ambient. It is normal for the reading to constantly change in response to atmospheric pressure changes. These gauges require vacuum generation and atmospheric pressure measurement equipment for accurate calibration and thus are more difficult to calibrate in the field.

Gauges can be returned to Cecomp Electronics for factory certified recalibration, repairs and refurbishment. NIST traceability is available. Gauges can also be recalibrated by any metrology lab with pressure calibration equipment at least four times more accurate than the gauge.

Dimensions



Ranges up to 1999



3000 and 5000 psi ranges

Part Numbers

F4AD or F4ADBL range units ref

Pressure/Vacuum Range (see table) –
Units (see table) –
G=Gauge, **A**=Absolute, **VAC**=Vacuum

Example: F4AD15PSIA = F4AD 15.00 PSI Absolute

Unit Abbreviations			
oz/in² = ZIN	inH_2O = INH2O	mmH_2O = MMH2O	g/cm² = GCM
	ftH_2O = FTH2O	kg/cm² = KGCM	cmH_2O = CMH2O

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.