Falcon Digital Pressure Gauges with Dual Alarms and Analog Output

DPG1000DAR

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	**120.0 inHg**	1600 mmHg	35.0 bar	1.000 kg/cm² abs
	199.9 inHg abs	760 torr abs	70.0 bar	1.000 kg/cm² vac
	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, ½" digit height
3000 and 5000 psi ranges: 4 digit LCD, 0.4" digit height

Controls

Non-interactive zero and span, ±10% range
Test calibration level: 0-100% range
Setpoint 1 and Setpoint 2: 0-100% range
Retransmission zero/span: Internal potentiometers

Alarm Deadband (hysteresis)

1% of of full scale

Alarm Outputs

Dual form C (SPDT) relay contacts; 1A/24VDC, 0.5A/115VAC, non-inductive
Setpoint 1 and Setpoint 2 settings via top-accessible multiturn potentiometers
HI (SP1), LO (SP2) alarms normal action (failsafe) configuration standard
3 ft long, 6-conductor 22 AWG cable
Optional HI/HI, LO/LO, normal or reverse acting

Alarm Indicators

Bi-color (red/green) LEDs on front panel

Alarm Response Time

100 milliseconds typical

Retransmission Output

True analog output, 50 milliseconds typical response time. 3 ft L, 22 AWG cable
-I option: Current output, 4-20mADC. Output drive (compliance) determined by power source. See graph.
-V option: Voltage output, 0 to 2 VDC into 5K ohm or greater

Test Function

Front panel TEST button, when depressed toggles SP1 and SP2 alarms to opposite states, and sets display and retransmission output to user-set test level.

Power

Any AC source of 8 to 24 VAC 50/60 Hz or any DC source of 9 to 32 VDC
1.0 watt maximum, 3 ft long, 22 AWG cables
Order optional **WMPSK** 12 VDC wall mount power supply kit to operate on 115 VAC

© Absolute Process Instruments, Inc. 11/04

- ***±0.25% Test Gauge Accuracy***
- ***316 Stainless Steel Wetted Parts***
- ***Dual SPDT Alarms***
- ***0-2 V or Powered 4-20 mA Analog Output***
- ***Bi-Color (Red/Green) Alarm LEDs***
- ***Output Test Function***



DPG1000DAR100PSIG-1N-I
100.0 psig range

Mechanical Specifications

Size

3.38" W x 2.88" H x 1.65" 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

Material

Extruded aluminum case, epoxy powder coated
Polycarbonate cover. Front and rear gaskets

Color

Light gray body, light gray/blue front

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
All others 2x rated pressure minimum

Burst Pressure

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

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)

MOD-TRONIC INSTRUMENTS LIMITED
1 Delta Park Blvd, #12 Brampton, ON L6T 5G1
Tel 905-457-6322 or 1-800-794-5883
Fax 905-457-4716 or 1-800-830-7122
sales@mod-tronic.com www.mod-tronic.com

Installation and Precautions

Install or remove 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 Connections

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

The two-conductor cable at the gauge rear with the RED and BLACK leads is for the gauge power supply. Connect to 8 to 24 VAC, 50/60Hz or 9 to 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. The supply voltage, when within the stated ranges, has negligible effect on the gauge calibration. Operation below 9 VDC or 8 VAC_{RMS} may cause erratic or erroneous readings or output.

The gauge is powered on whenever a supply voltage is applied. Warm-up time is negligible. In normal operation, the system pressure is displayed.

The color code for the 6-conductor alarm relay output cable is as follows.

SETPOINT 1		SETPOINT 2	
Normally Closed (NC)	**BLACK**	Normally Closed (NC)	**GREEN**
Common (C)	**RED**	Common (C)	**BROWN**
Normally Open (NO)	**WHITE**	Normally Open (NO)	**BLUE**

The shield (drain) wire is generally not needed for 4-20 mA current loops unless long cable lengths are used in electrically noisy environments.

Using the Retransmission Output

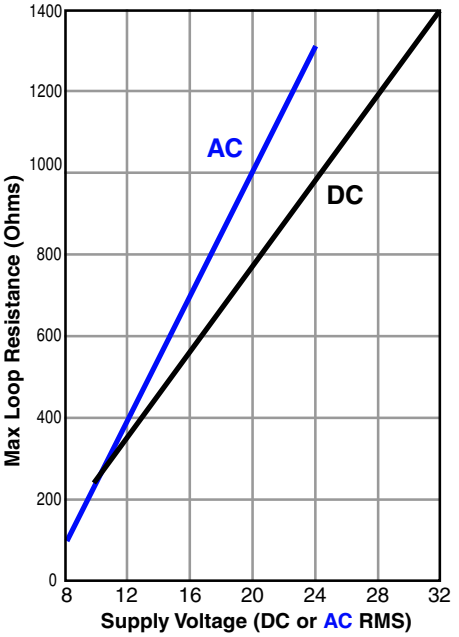
NEVER connect retransmission output wires together or to an external power source or permanent damage not covered by warranty will result.

The output is a continuous analog signal based on the transducer output rather than the display. It 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.

With the 0-2 volt retransmission output models ("-V" option), 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.

For 4-20 mA models ("-I" option) the compliance (voltage drive) capability of the gauge and the maximum loop resistance the output can drive is a function of the supply voltage to the gauge. The graph above shows the 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.

Voltage Compliance for 4-20 mA Current Retransmission Output



Alarm Operation

System pressure is compared to two independent setpoint levels; Setpoint 1 and Setpoint 2. Pressing the SP1 or SP2 buttons will switch the display to show, and allow adjusting of, the setpoint.

To adjust alarm Setpoint 1, press and hold the SP1 button. The current Setpoint 1 setting will be displayed. Turn the SP1 control to adjust. Press the SP2 button and turn the SP2 control to adjust Setpoint 2.

Alarm status is indicated on the two LEDs in the corner of the SP1 and SP2 buttons. GREEN is a "clear" or non-alarm condition; RED is an abnormal or alarm condition. For models with a HI alarm, the alarm LED will be RED if the system pressure exceeds the setpoint. For models with a LO alarm, the LED will be RED if the system pressure falls below the setpoint.

Alarm Action - The alarm configuration is set at time of manufacture. The 1N, 2N, or 3N configurations are Normal acting or "failsafe" and provide an alarm condition if the gauge loses power. The alarm relay will be CLOSED (energized) for a non-alarm (green LED) condition with continuity between the "C" and "NO" leads. The relay will be OPEN (not energized) for an alarm (red LED) condition with continuity between the "C" and "NC" leads.

The 1R, 2R, or 3R configurations are Reverse acting and provide no alarm indication when the gauge power is off. The alarm relay will be OPEN (not energized) for a non-alarm (green LED) condition with continuity from "C" to "NC" leads. The alarm relay will be CLOSED (energized) for an alarm (red LED) condition with continuity between the "C" and "NO" leads.

Alarm Hysteresis – The built-in alarm hysteresis of 1% of span eliminates alarm chatter due to minor fluctuations in pressure. For example, this is approximately 1 psi in a 100 psi gauge. If the SP1 (HI alarm) is set to 50.0 psi, the alarm will trip above 50.0 psi. After the alarm has tripped, pressing the SP1 button will show approximately 49 psi, the pressure at which the alarm will release.

Contact Rating and Protection – The alarm relay contacts are rated at 1A/24VDC or 0.5A/115VAC. Using mechanical relay contacts above their rating, or with large inductive loads, will shorten their useful life. In circuits other than low-level switching or pilot duty, use external protection such as a snubber or an arc suppression network to protect the contacts. No internal fusing is included in the alarm contact circuits. The circuit external to the gauge alarm outputs should be fused by the user in applications as good design practice dictates.

TEST Button

The TEST button toggles the alarm output relays to their opposite state and also switches the display and retransmission output to a level determined by the setting of the Test potentiometer. This allows testing of the alarms and retransmission output independent of the system pressure.

To set the Test output level, press and hold the front panel TEST button and adjust the top-mounted Test potentiometer to set the retransmission output to the desired test level as indicated on the display.

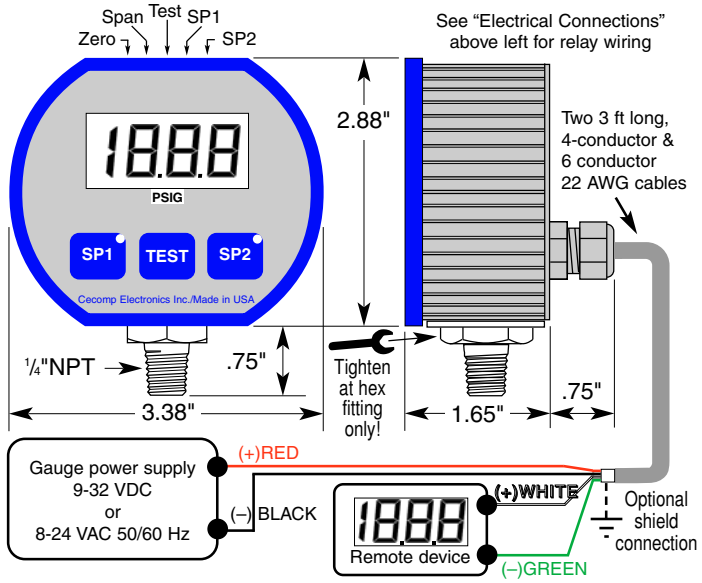
Calibration

Lift calibration label on the top of the unit to access individual 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 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.

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



Part Numbers

DPG1000DAR range units ref - alarm - output

Pressure/Vacuum Range
Units
G=Gauge, **A**=Absolute, **VAC**=Vacuum
Alarm Options

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

1N = Hi/Lo Normal action (Std)	**1R** = Hi/Lo Reverse action
2N = Hi/Hi Normal action	**2R** = Hi/Hi Reverse action
3N = Lo/Lo Normal action	**3R** = Lo/Lo Reverse action

Example: DPG1000DAR15PSIG-1N-I = DPG1000DAR, 15.00 psig, HI/LO normal action alarm relays, 4-20 mA output

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