

Model 109 – Differential Pressure Gauge Bourdon Tube

*High Accuracy, Rugged Construction
±0.5% or ±1% Full Scale Accuracy*



Product Overview – Model 109 Differential Pressure Gauge

The **Model 109** is a precision differential pressure gauge designed for medium- to high-pressure systems. It features a **test-quality Bourdon tube assembly**, anchored at one end and free to move at the other, which senses the differential pressure between two points.

The Bourdon tube is housed within a **high-pressure chamber**: one process connection applies pressure inside the tube, and the other connection applies inside the chamber. As the pressure inside the tube exceeds the chamber pressure, the tube straightens, and its free end moves proportionally to the pressure difference.

This motion is transmitted through an **adjustable linkage to a precision rack-and-pinion mechanism**, which rotates a pinion attached to a magnet. The magnet transmits the movement **through the chamber wall** to an external magnetic assembly, driving a **jeweled pointer** on a calibrated dial for accurate, friction-free readings.

For added protection, a **bi-directional relief valve** safeguards the Bourdon tube against over-range in either direction up to the rated working pressure, ensuring durability and reliability in demanding applications.

Application

Description

Filter Monitoring	Detect filter clogging and replacement needs.
Pump Protection	Monitor inlet/outlet pressure to prevent cavitation.
Heat Exchangers	Identify fouling or blockage through pressure drop.
Sealed Tank Level Measurement	Calculate fluid level from pressure differential.
Flow Monitoring	Use with orifice plates or other flow elements.
Compressor and Blower Systems	Ensure proper pressure across stages.

Key Features & Benefits

- **Bourdon Tube Sensing** — Proven, direct-acting design with stainless steel internals.
- **Bi-directional Over-Range Protection** — Relief valve protects against overpressure from both directions.
- **Weather and Corrosion Resistant** — Sealed, impact-resistant front for harsh environments.
- **Shatter-Resistant Lens** — Improves operator safety and product durability.
- **Versatile Dial Options** — Uni-directional, bi-directional, dual-scale, or square root for flow.
- **Reliable Performance** — Backed by a 5-Year Warranty.

Technical Specifications

Specification	Details
Accuracy	±0.5% FS (ASME B40.1 Grade 2A) or ±1.0% FS (ASME B40.1 Grade 1A)
Differential Pressure Ranges	0–15 PSID to 0–6000 PSID (0–1.0 bar to 0–400 bar)
Working Pressure Ratings	500, 1500, 3000, or 6000 PSIG (up to 400 bar)
Housing Materials	Aluminum, Brass, Carbon Steel, or 316 Stainless Steel
Wetted Internals	Stainless Steel Bourdon Tube
Dial Sizes	4½" and 6"
Dial Arc	270°
Dial Scale Types	PSI, bar, mbar, kPa, kg/cm ² , dual scale, square root scale for flow
O-Ring Materials	Buna-N, Viton®, Neoprene®, EPDM, FFKM
Port Configuration	¼" FNPT back connection (high port on right when facing the dial)
Mounting	Panel mounting standard plus (2) ¼-20 mounting holes on body.
Operating Temperature	–40°F to +200°F (–40°C to +93°C)
Dial Enclosure Rating	Designed and tested to meet NEMA Type 4X requirements.
Proof Pressure	2x working pressure or 10,000 PSI max at ambient temperature

Dial Range Options

- Available in PSID, kPa, bar, kg/cm², Inches H₂O, mm H₂O, and cm H₂O.
- Custom dual-scale, multi-color, and flow-rate dials are available.
- Flow rate dials (GPM, SCFM, L/S, LB/HR, M³/HR) are **available with proper engineering data**.
- Not all scales are available for every range.
- Contact customer service for help with non-standard ranges/scales.



Standard Dial Ranges – Model 109

Available in your choice of standard scales: PSID, kPa, bar, kg/cm², Inches H₂O, mm H₂O, and cm H₂O.

 Uni-Directional Dial Scales		
0 – 1.0	0 – 30	0 – 300
0 – 1.6	0 – 60	0 – 400
0 – 4.0	0 – 100	0 – 600
0 – 15	0 – 160	0 – 1000
0 – 20	0 – 200	0 – 1500

 Bi-Directional Scales		
1.0 – 0 – 1.0		
15 – 0 – 15		
20 – 0 – 20		
30 – 0 – 30		
100 – 0 – 100		

Dual Scales	
0-30 PSID & 0-200 kPa	
0-30 PSID & 0-2.1 kg/cm ²	
0-50 PSID & 0-350 kPa	
0-60 PSID & 0-400 kPa	
0-100 PSID & 0-700 kPa	
0-100 PSID & 0-7 kg/cm ²	

Model	Accuracy	Min. ΔP Range	Max. ΔP Range
109	±1/2% or 1%	0-15 PSID (0-1.0 bar)	0-6000 PSID (0-400 bar)

- ±1/2% not available on gauges above 1,000 PSID or gauges with flow scales.

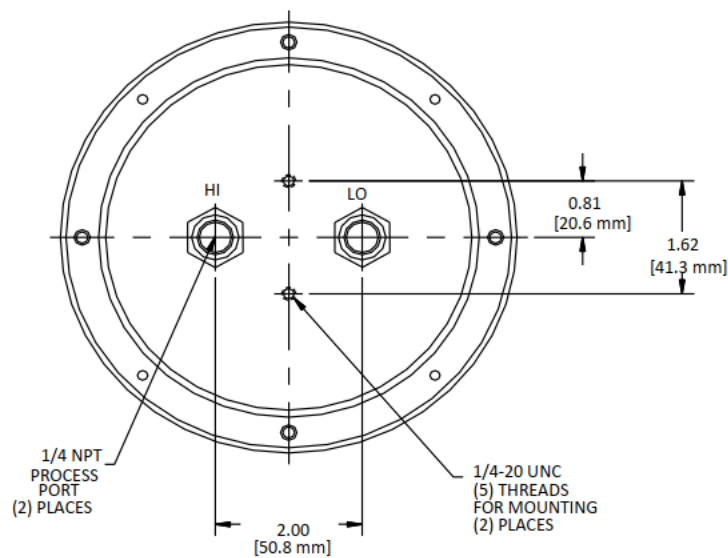
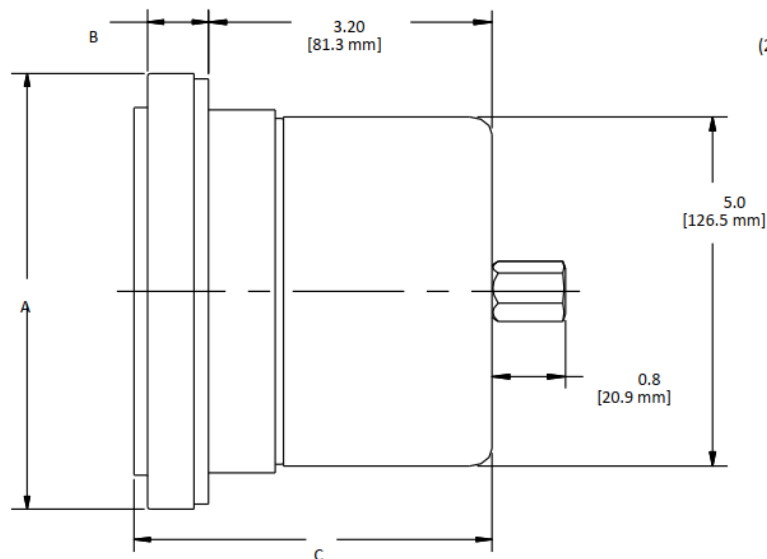
Standards

Model 109 gauge either conforms to and/or is designed to the following required standards:

- ASME B40.100
- ASME B1.20.1
- NACE MR0175
- SAE J514
- UL Std. No. 50

Dimensions

DIAL SIZE	DIAMETER A Inch (mm)	LENGTH B Inch (mm)	LENGTH C Inch (mm)
4-1/2 in.	6.21 (157.7)	0.70 (17.6)	4.05 (102.9)
6 in.	8.18 (208.0)	0.76 (19.3)	4.11 (104.4)



Standard Model Number Sequence: 109-FE-00-O-O

1500 PSIG Working Pressure, Aluminum Body, Stainless Steel Bourdon Tube, Stainless Steel Internals Buna-N Seals, ¼" FNPT Back Connections (Stainless Steel), 6" Uni-Directional Round Dial, Weather Resistant Engineered Plastic Case with Shatter Resistant Acrylic Lens, Accuracy ±1% Full Scale (Ascending & Descending)

Range: 0-15 PSID to 0-6000 PSID (0-1.0 bar to 0-400 bar)

Gauge body and internal components are considered wetted parts.

Model Number Configuration

1	0	9			-			-					-	0
[Model]	2	3			-	4	5	-	6	6	6	6	-	7

* Each character position relates to the numbered section in table below.

DP Range: _____ **Dial Scale:** _____

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Material

F	1500 PSIG, Aluminum Body, S.S. Internals – 316 Stainless Steel ¼" FNPT Back Connections
G	3000 PSIG, Aluminum Body, S.S. Internals – 316 Stainless Steel ¼" FNPT Back Connections
M	1500 PSIG, Mild Carbon Steel Body, S.S. Internals – 316 Stainless Steel ¼" FNPT Back Connections
N	3000 PSIG, Mild Carbon Steel Body, S.S. Internals – 316 Stainless Steel ¼" FNPT Back Connections
Q	1500 PSIG, 316 Stainless Steel Body, S.S. Internals – 316 Stainless Steel ¼" FNPT Back Connections
R	3000 PSIG, 316 Stainless Steel Body, S.S. Internals – 316 Stainless Steel ¼" FNPT Back Connections
T	6000 PSIG, 316 Stainless Steel Body, S.S. Internals – 316 Stainless Steel ¼" FNPT Back Connections
X	1500 PSIG, Brass Body, S.S. Internals – 316 Stainless Steel ¼" FNPT Back Connections
Y	500 PSIG, Brass Body, S.S. Internals – 316 Stainless Steel ¼" FNPT Back Connections

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Dial Size Type

E	Accuracy ±1% Full Scale Uni-Directional Dial w/Engineered Plastic Dial Case (Standard)
F	Accuracy ±1% Total Span Bi-Directional Dial w/Engineered Plastic Dial Case (±3% above 1500-0-1500 psi)
G	Accuracy ±1/2% Full Scale Uni-Directional Dial w/Engineered Plastic Dial Case Not available above 1,000 PSID. Not available with Square Root (Flow) Dials.
Z	Special (Un-coded Options)

NOTE: The use of Diaphragm seals is not recommended for Model 109 gauge.

Not all options are available in combination with other options.

4 Seal Materials

0	Buna-N (aka NBR or Nitrile) (Standard)
1	Viton [®] (aka FKM)- Viton [®] is a Registered Trademark of Dupont
2	Neoprene
5	Ethylene Propylene (aka EPDM)
6	Perfluorelastomer (aka FFKM)
9	Special (<i>Un-coded Options</i>)

5 Process Connections

0	1/4" FNPT Back Connections (Standard)
5	1/2" FNPT Back Connections
9	Special (<i>Un-coded Options</i>)

6 Additional Options

O	NONE
B	Drain & Bleed Connections (1/8" FNPT) Brass
C	Drain & Bleed Connections (1/8" FNPT) 316 Stainless Steel
F	Carbon Steel 2" Pipe Mounting Kit
G	Stainless Steel 2" Pipe Mount Kit
H	1/4" Carbon Steel Compression Tube Fittings
J	1/4" Stainless Steel Compression Tube Fittings
L	Liquid Fill - Glycerin
N	NACE (<i>Only available on Aluminum or Stainless Steel gauge bodies</i>)
Q	CRN (Canadian Registration Number) (<i>Only available with F,M,or Q bodies</i>)
S	Shatter Proof Glass Lens
T	Oxygen Cleaning
U	Stainless Steel Tag with S.S. Wire
V	Stainless Steel Tag and S.S. Screw
W	Wall Mount Kit
Y	4-1/2" Dial Case
Z	Special (<i>Un-coded Options</i>)

7 Electrical Configurations

O	NONE (<i>Electrical no longer available</i>)
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Not all options are available in combination with other options.