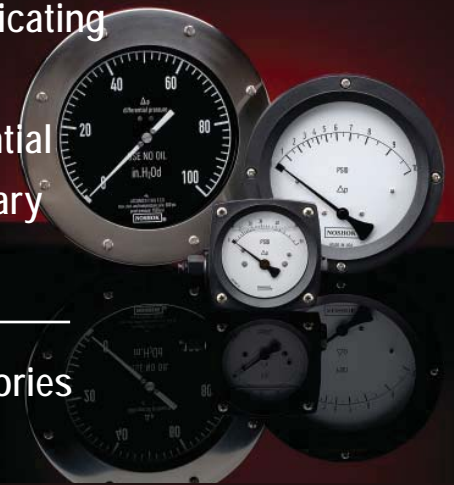


# Pressure Measurement Solutions



Dial Indicating  
Digital  
Differential  
& Sanitary  
Gauges

Accessories

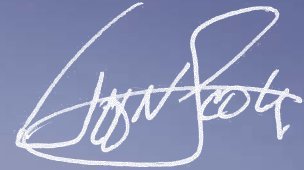


**A**t NOSHOK, we pride ourselves on being innovators in the industry by continually offering the latest technology and measurement solutions, and providing the best customer support in the marketplace.

Established in 1967, NOSHOK was one of the first companies to offer liquid filled pressure gauges. We also took a bold step by backing our quality gauges with an extended 3-year warranty. That unwavering standard of quality has endured for over 45 years, and as we have expanded our product offering we continue to provide industry-leading warranties. NOSHOK also leads the industry as one of the first companies to offer corrosion-resistant zinc nickel plating standard on our carbon steel valves.

We have the capacity to put together special requirements which are so often hard to find. If you do not find what you need in this catalog, chances are we can still put a solution together.

NOSHOK is committed to providing excellence on every level. Thank you for choosing NOSHOK products.



Jeff N. Scott  
President



**NOSHOK Corporate Headquarters**  
Your Single Source Instrumentation Company

**NOSHOK is a member and actively supports:**



NOSHOK is an ISO 9001:2008 registered company.

## WARRANTY INFORMATION

### Dry Pressure Gauges

NOSHOK's **Three Year Warranty** applies to the 1000 Series digital gauge. NOSHOK's **One Year Warranty** applies to 100, 200, 400, 640, 740, and 800 Series dry gauges; 10 and 20 Series dry sanitary gauges; and 1000, 1100, 1200, and 1300 Series dry differential gauges.

### Liquid Filled Pressure Gauges

NOSHOK's **Three Year Warranty** applies to 300, 500, 660, 760, and 900 Series liquid filled gauges; 10 and 20 Series liquid filled sanitary gauges; and 1000, 1100, 1200, and 1300 Series liquid filled differential gauges

**NOSHOK guarantees all products** to be free from defects in material and workmanship, to remain within catalogued accuracy specifications, and to operate within the catalogued performance specifications. These products must be operated within the catalogued environmental and application parameters. Determination of failure will be made by NOSHOK, Inc.'s equipment and personnel or a certified test facility specializing in this type of evaluation. Gauge failures determined to be caused by over-range, incompatibility with environment or product media and abuse will not be considered under this warranty. NOSHOK, Inc. will, at its discretion, repair or replace the working parts of the damaged gauge without cost to the customer.

**Limitations which apply are:** Bourdon tube pressure gauges must be used within their calibrated maximum range to prevent damage. Pressure gauges must be operated within the following working pressure limits: Dynamic pressure application, 60% of the dial range; Static pressure applications, where no sharp fluctuations occur, 90% of the dial range. The gauges must be operated within specified ambient temperature ranges.

### CAUTION:

Operating conditions including, but not limited to, system pressure, media compatibility and ambient conditions must be considered when selecting gauges and accessories, improper selections and use of gauges could possibly cause gauge failure and lead to possible property damage or personal injury. Refer to the American National Standard ANSI B40.1 for the correct selection and use of gauges. A copy of this standard may be obtained from the American Society of Mechanical Engineers, United Engineering Center, 345 East 47th Street, New York, NY 10017.

In keeping with and for purposes of product and/or manufacturing process improvements, NOSHOK, Inc. reserves the right to make design changes without prior notice.



# T A B L E O F C O N T E N T S

## WARRANTY INFORMATION

Dry Gauges, Liquid Filled Gauges, Diaphragm Seals & Accessories ..... 3

## DIAL INDICATING PRESSURE GAUGES

### Standard:

100 SERIES ..... 6-9

### Low Pressure Diaphragm:

200 SERIES ..... 10-13

### Brass Case Liquid Filled:

300 SERIES ..... 14-17

### All Stainless Steel, Dry & Liquid Filled:

400/500 SERIES ..... 18-21

### Process:

600/700 SERIES ..... 22-23

### Precision Test:

800 SERIES ..... 24-25

### ABS & Stainless Steel Liquid Filled:

900 SERIES ..... 26-29

## DIGITAL PRESSURE GAUGE

### Digital Gauge:

1000 SERIES ..... 30-31

## DIFFERENTIAL PRESSURE GAUGES

### Piston Type:

1000 SERIES ..... 32-33

### Diaphragm Type:

1100 SERIES ..... 34-35

### Membrane Type High Static Pressure:

1200 SERIES ..... 36-37

### Membrane Type Nominal Static Pressure:

1300 SERIES ..... 38-39

### Dial Layouts:

1000 & 1100 SERIES ..... 40-41

# T A B L E O F C O N T E N T S



## SANITARY PRESSURE GAUGES

<b>Fractional:</b>	
10 SERIES .....	42-43
<b>Heavy-Duty:</b>	
10 SERIES .....	44-45
<b>Homogenizer:</b>	
20 SERIES .....	46-47

## OPTIONS & ACCESSORIES

Overview Chart by Gauge Series .....	48-51
Panel Mounting/Flanges, Cases & Cover Rings, Lenses, Maximum Indicating Pointers, Set Pointers, Rubber Case Protectors, Orifices, Recalibrators & Adjustable Pointers, Overpressure Protection, Ammonia Refrigeration Gauges, Liquid Filling Options, Special Connections, Reid Vapor Test Gauges, Receiver Gauges, Metric Dials & Customized Special Dials, Certified Calibration, Piston-Type and Sintered Pressure Snubbers, Pigtail Steam Syphons, Swivel Adapter, Magnetic Spring Contact Switch .....	52-57
<b>Gauge Accuracy/Standard Dial Configuration Charts</b> .....	58-63
<b>Reference Material</b> .....	64-65
<b>Frequently Asked Questions</b> .....	66-67

# Standard



# 100 SERIES

- High quality dry gauges for reliable service on applications not corrosive to brass
- Vacuum and compound through 15,000 psi
- 1-1/2", 2", 2-1/2", 4" sizes – bottom, back, left and right side connections
- Dry, ABS case (steel, chrome or stainless steel optional)
- Panel mount clamp and front flange mounting
- Standard UV resistant dials are dual scale in psi and kPa (kilopascals); dual scale psi/bar and psi/kg/cm<sup>2</sup> are available in most popular ranges

## OPERATING SPECIFICATIONS

- Working Pressure Limitations**
  - Dynamic Pressure**  
The working pressure should be limited to 60% of the dial range.
  - Static Pressure**  
The working pressure, where no sharp fluctuations occur, should be limited to 90% of the dial range
- Ambient Temperature**  
0 °F to 140 °F (-18 °C to 60 °C)
- Media Temperature**  
-4 °F to 140 °F (-20 °C to 60 °C)

## APPLICATIONS

- Hydraulics
- Pneumatics
- Petrochemical
- Medical
- Food
- Pharmaceutical
- Most industrial and commercial applications

## ACCURACY

- 1-1/2, 2 and 2-1/2" 100 Series gauges: ±2.5%
- 4" 100 Series gauges: ±1.5%

	MODELS	SPECIFICATIONS
Case	15-100, 15-110, 20-100, 20-110, 20-148, 25-100, 40-100	ABS (Acryl Nitril Butadien Styrol)
	15-120, 20-120, 25-120	Black painted steel with chrome triangular bezel and U-clamp
Bezel	15-110, 20-110, 25-110	Built-in bezel, molded as an integral part of the case for ease of panel mounting.
	15-120, 20-120, 25-120	Chrome-plated steel triangular bezel
Lens	15-100, 15-110, 15-120, 20-100, 20-110, 20-120, 20-148, 25-100, 25-110, 25-120, 40-100	Clear front acrylic
Bourdon tube	15-100, 15-110, 15-120, 20-100, 20-120, 20-110, 20-148, 25-100, 25-120, 25-110, 40-100	Phosphor bronze
Connection	15-100, 15-110, 15-120, 20-100, 20-110	1/8" NPT brass
	20-148	1/8" NPT/10-32 Female brass
	20-100, 20-110, 20-120, 25-100, 25-110, 25-120, 40-100	1/4" NPT brass SAE J1926-3:7/16-20
Movement	15-100, 15-110, 15-120, 20-100, 20-110, 20-120, 20-148, 25-100, 25-110, 25-120, 40-100	Brass & nylon, or all-brass with highly polished bearing surfaces
Accuracy	15-100, 15-110, 15-120, 20-100, 20-110, 20-120, 20-148, 25-100, 25-110, 25-120	± 2.5% full scale ASME B40.1 Grade B
	40-100	± 1.5% full scale ASME B40.1 Grade A
Pointer	15-100, 15-110, 15-120, 20-100, 20-120, 20-110, 20-148, 25-100, 25-110, 25-120, 40-100	Molded plastic
Dial	15-100, 15-110, 15-120, 20-100, 20-110, 20-120, 20-148, 25-100, 25-110, 25-120, 40-100	White background with black psi scale and red kPa scale; UV resistant

For details on accuracy/standard dial configuration and dial layouts, see pages 76-81.

ORDERING INFORMATION									
SERIES	100								
SIZES	15	1-1/2"	20	2"	25	2-1/2"	40	4"	
CASE TYPES	100	ABS, bottom connection		120	Steel case panel mount				
	110	ABS, back connection		148	Square ABS, panel mount (2" only)				
PRESSURE RANGES	30vac	-30 inHg vacuum to 0 psi		30/300	-30 inHg to 0 to 300 psi		200	0 psi to 200 psi	
	30/15	-30 inHg to 0 to 15 psi		15	0 psi to 15 psi		300	0 psi to 300 psi	
	30/30	-30 inHg to 0 to 30 psi		30	0 psi to 30 psi		400	0 psi to 400 psi	
	30/60	-30 inHg to 0 to 60 psi		60	0 psi to 60 psi		600	0 psi to 600 psi	
	30/100	-30 inHg to 0 to 100 psi		100	0 psi to 100 psi		1000	0 psi to 1,000 psi	
	30/160	-30 inHg to 0 to 160 psi		160	0 psi to 160 psi		1500	0 psi to 1,500 psi	
	30/200	-30 inHg to 0 to 200 psi		Other ranges available on request					
SCALE OPTIONS***	psi	psi single scale		psi/kPa	psi/kPa dual scale		psi/kg/cm <sup>2</sup>	psi/kg/cm <sup>2</sup> dual scale	
CONNECTION SIZES	1/8	1/8" NPT		7/16	SAE J1926-3:7/16-20 Adjustable		1/4	1/4" NPT	
OPTIONS	PMC	Panel Mount Clamp		SSC	Stainless Steel Case		LL	Polycarbonate Lens	
	SSB	Polished Stainless Steel Bezel		CRC	Chrome Case		GL	Glass Lens*	
	BLRF	Black Rear Flange		FAC	Flat Sided ABS Case		SGL	Safety Glass Lens*	
	BLFF	Black Front Flange – ABS Case		BCR	Black Cover Ring**		HL	Homalite Lens*	
	CFF	Chrome Front Flange – ABS Case		SSCR	Stainless Steel Cover Ring**		SP	Red Set Pointer**	
	SBFF	Black Front Flange – Steel Case		CCR	Chrome Cover Ring**		MIP	Maximum Indicating Pointer	
	SCFF	Chrome Front Flange – Steel Case		PCCR	Polished Chrome Cover Ring**		SDM	Silicone Dampened Movement	
	BSC	Black Steel Case		CAR	Chrome Adapter Ring*		LM	Laser Marking	
	ST	Stainless Steel Tagging		CPO	Brass Sintered Orifice 20 Micron		BP1	Brass Press Fit Orifice 0.1 mm	
						BP3	Brass Press Fit Orifice 0.3 mm		
						BP8	Brass Press Fit Orifice 0.8 mm		

Please consult your local NOSHOK Distributor or NOSHOK, Inc. for availability and delivery information.

NOTE: Refer to 100 Series options & accessories chart on page 66 for availability by model number.

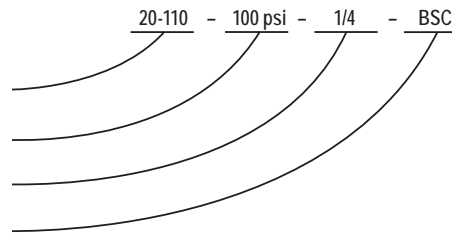
\* A steel, stainless or chrome case & cover ring must be additionally ordered when lenses other than acrylic are utilized on all 100 Series models.

\*\* Only 110 models require a steel, stainless or chrome case & cover ring to be additionally ordered when utilizing a set pointer or cover ring. Please consult factory when a set pointer is to be utilized on a 120 model.

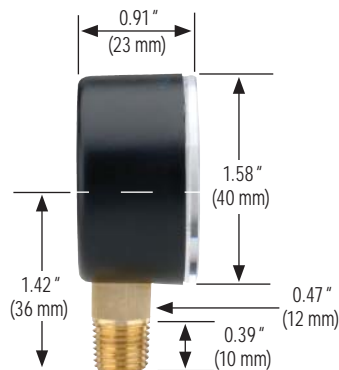
\*\*\* Other ranges available on request

### EXAMPLE

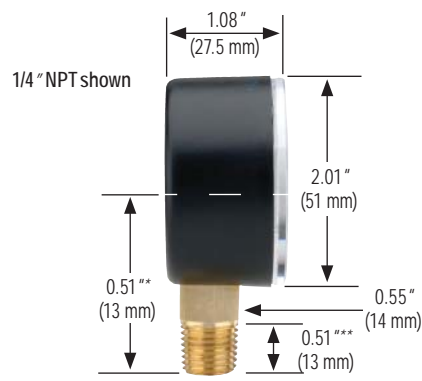
1. Select model number (size & case type)
2. Select pressure range & scale option
3. Select NPT connection size (if more than one is offered)
4. Select any required accessory or option



### 15-100

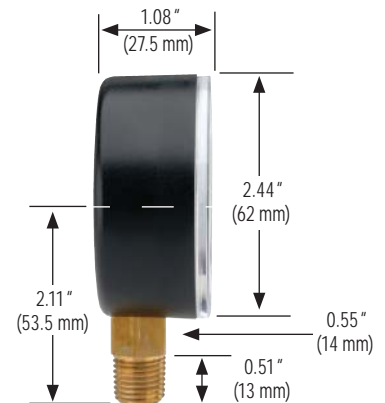


### 20-100



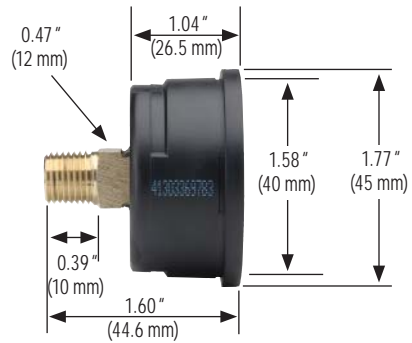
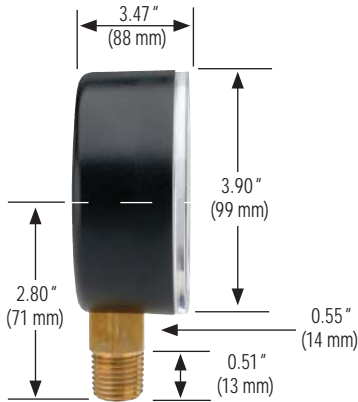
\* 1/8" NPT 1.65" (42 mm) \*\* 1/8" NPT 0.39" (10 mm)

### 25-100

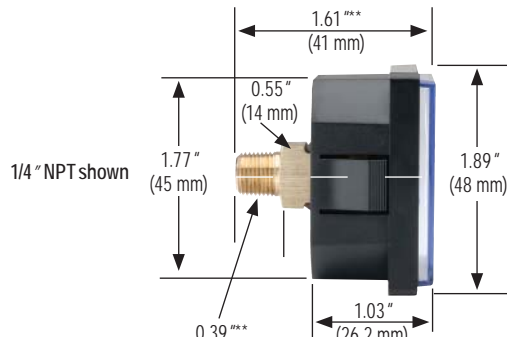
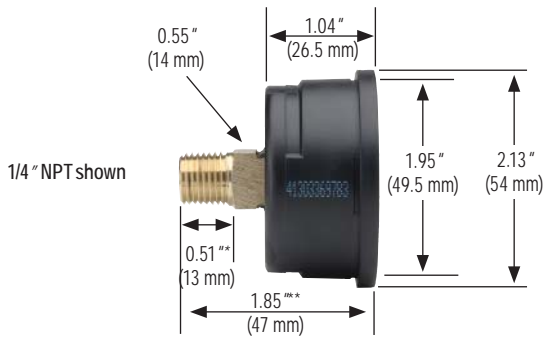


# Dimensions

**40-100** **15-110**



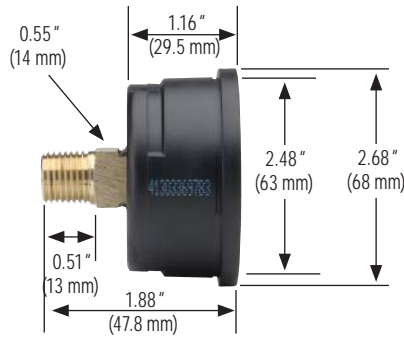
**20-110** **20-148**



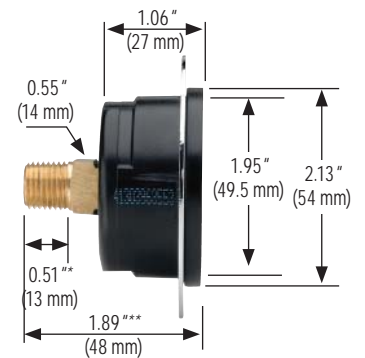
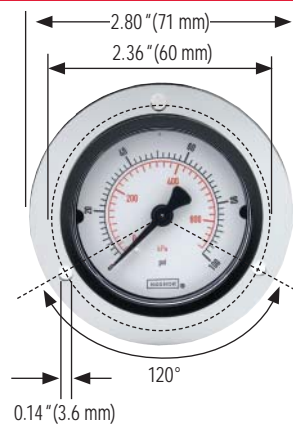
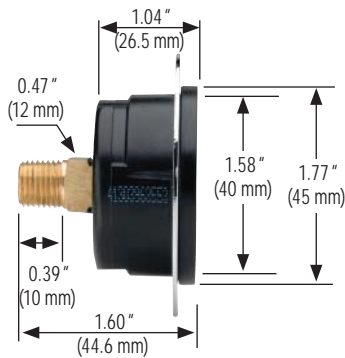
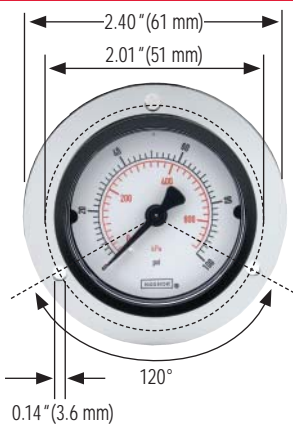
\*1/8" NPT 0.39" (10 mm) \*\* 1/8" NPT 1.77" (45 mm)

\*1/8" NPT 0.51" (13 mm) \*\*1/8" NPT 1.81" (46 mm)

**25-110**



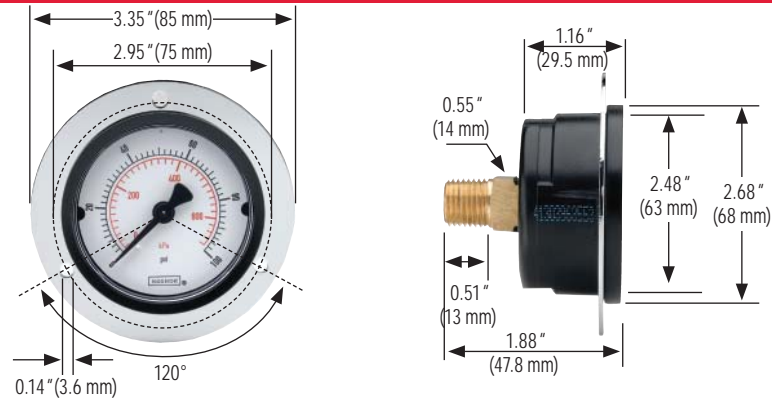
**15-110 Front Flange** **20-110 Front Flange**



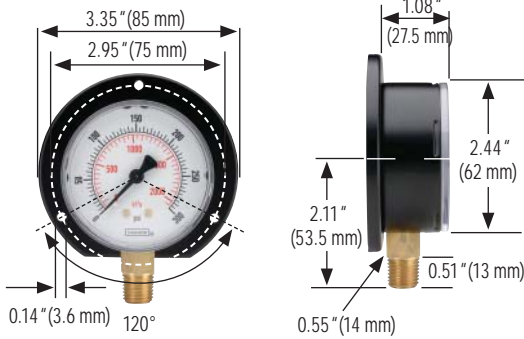
**1/4" NPT shown**  
\*1/8" NPT 0.39" (10 mm) \*\* 1/8" NPT 1.77" (45 mm)



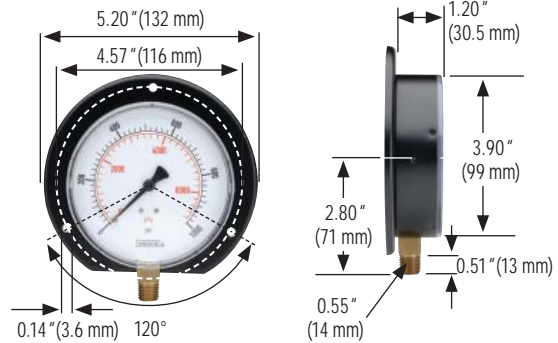
## 25-110 Front Flange



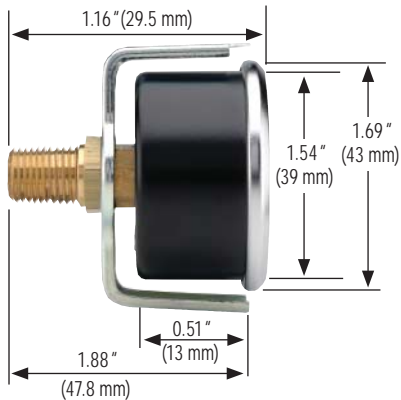
## 25-100 Rear Flange



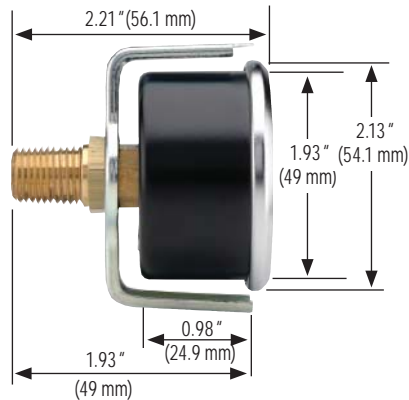
## 40--100 Rear Flange



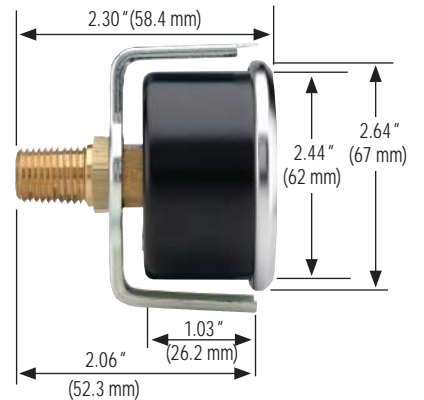
## 15-120 Chrome Triangular Bezel w/U-Clamp



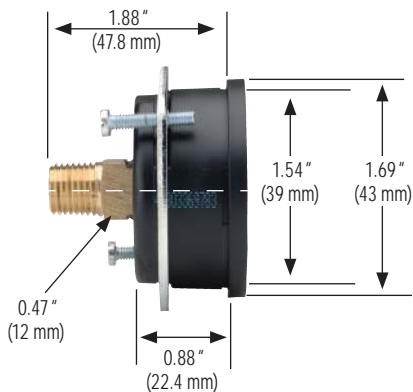
## 20-120 Chrome Triangular Bezel w/U-Clamp



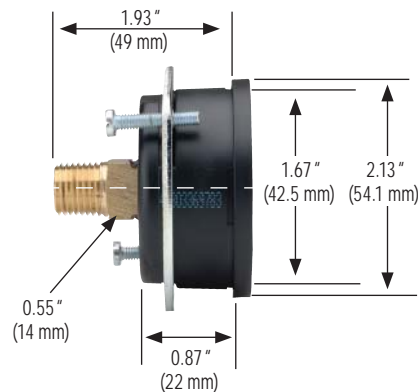
## 25-120 Chrome Triangular Bezel w/U-Clamp



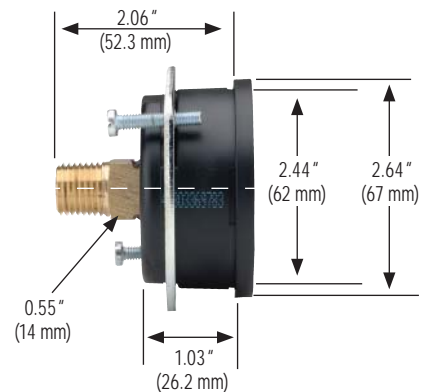
## 15-110 Panel Mount Clamp



## 20-110 Panel Mount Clamp



## 25-110 Panel Mount Clamp



# Low Pressure Diaphragm

## 200 SERIES



- Designed for extremely low pressure and vacuum measurement
- Ultra sensitive copper alloy diaphragm capsules are rated for pressure (or vacuum) as low as 0-10" of water and as high as 0-10 psi
- 2-1/2" and 4" sizes – bottom and back connections
- Molded acrylic lenses on 2-1/2" size and instrument glass on 4" size for strength and clarity
- Standard case on 2-1/2" size is black painted steel (optional stainless steel), and stainless steel on 4" case
- Phosphor bronze diaphragm capsules are coupled with precision all-brass movements to provide extremely accurate indication
- 25-206 & 25-216 are low pressure diaphragm OEM-type gauges; they feature a black ABS case and a Copper Beryllium Alloy (CuBe) diaphragm capsule coupled with Cu-Alloy movement for extremely low pressure applications
- 25-200, 25-210 and 40-200 come standard with zero point adjustment
- 25-200 and 25-210 are available with 2X to 10X overpressure protection based on full scale
- Stock availability

### OPERATING SPECIFICATIONS

#### 1. Working Pressure Limitations

##### a. Dynamic Pressure

The working pressure should be limited to 60% of the dial range.

##### b. Static Pressure

The working pressure, where no sharp fluctuations occur, should be limited to 90% of the dial range

#### 2. Ambient Temperature

0 °F to 140 °F (-18 °C to 60 °C)

#### 3. Media Temperature

-4 °F to 140 °F (-20 °C to 60 °C)

### APPLICATIONS

- Medical
- Biomedical
- HVAC
- Gas distribution
- Filtration
- Burner and gas combustion service
- Wastewater treatment
- Level indication and filter monitoring
- Everywhere low pressure and vacuum measurement is required

### ACCURACY

- 2-1/2" 200 Series gauges: ±1.5%
- 4" 200 Series gauges: ±1.0%

For details on accuracy/standard dial configuration and dial layouts, see pages 76-81.

	MODELS	SPECIFICATIONS
Case	25-200, 25-210	Black painted steel
	25-206, 25-216, 25-224	Black ABS (Acryl Nitril Butadien Styrol) with 25-224 includes zinc-plated steel panel mount clamp
	40-200	304 Stainless steel
Bezel	40-200	304 Stainless steel
Lens	25-200, 25-206, 25-210, 25-216, 25-224	Clear front acrylic
	40-200	Instrument glass
Diaphragm capsule	25-200, 25-210, 25-224, 40-200	Phosphor bronze
Connection	25-200, 25-206, 25-210, 25-216, 25-224, 40-200	1/4" NPT brass
Movement	25-200, 25-210, 25-224, 40-200	Brass and nickel-silver with highly polished bearing surfaces
	25-206, 25-216	Cu-Alloy
Accuracy	25-200, 25-210, 25-224	± 1.5% full scale ASME B40.1 Grade A
	25-206, 25-216	± 2.5% full scale ASME B40.1 Grade B
	40-200	± 1% full scale ASME B40.1 Grade 1A
Pointer	25-200, 25-206, 25-210, 25-216, 25-224, 40-200	Black finished aluminum
Dial	25-200, 25-206, 25-210, 25-216, 25-224, 40-200	Aluminum, white background with black markings. single scale except as noted in the dial configuration chart. UV resistant.

ORDERING INFORMATION								
SERIES	200							
SIZES	25	2-1/2"	40	4"				
CASE TYPES	200	Steel, bottom connection (304SS for 4")		216	ABS, back connection			
	206	ABS, bottom connection		224	ABS, panel mount			
	210	Steel, back connection		234	Gas pressure test kit**			
PRESSURE RANGES	15 inH <sub>2</sub> O Vac	-15 inH <sub>2</sub> O to 0 inH <sub>2</sub> O	100 inH <sub>2</sub> O	0 inH <sub>2</sub> O to 100 inH <sub>2</sub> O	100 oz/in <sup>2</sup>	0 oz/in <sup>2</sup> to 100 oz/in <sup>2</sup>	60 mbar	0 mbar to 60 mbar
	30 inH <sub>2</sub> O Vac	-30 inH <sub>2</sub> O to 0 inH <sub>2</sub> O	160 inH <sub>2</sub> O	0 inH <sub>2</sub> O to 160 inH <sub>2</sub> O	160 oz/in <sup>2</sup>	0 oz/in <sup>2</sup> to 160 oz/in <sup>2</sup>	100 mbar	0 mbar to 100 mbar
	60 inH <sub>2</sub> O Vac	-60 inH <sub>2</sub> O to 0 inH <sub>2</sub> O	200 inH <sub>2</sub> O	0 inH <sub>2</sub> O to 200 inH <sub>2</sub> O	20 oz/35 inH <sub>2</sub> O	0 oz/in <sup>2</sup> /inH <sub>2</sub> O to 20 oz/in <sup>2</sup> /inH <sub>2</sub> O	160 mbar	0 mbar to 160 mbar
	100 inH <sub>2</sub> O Vac	-100 inH <sub>2</sub> O to 0 inH <sub>2</sub> O	10 oz/in <sup>2</sup>	0 oz/in <sup>2</sup> to 10 oz/in <sup>2</sup>	32 oz/55 inH <sub>2</sub> O	0 oz/in <sup>2</sup> /inH <sub>2</sub> O to 32 oz/in <sup>2</sup> /inH <sub>2</sub> O	250 mbar	0 mbar to 250 mbar
	10 inH <sub>2</sub> O	0 inH <sub>2</sub> O to 10 inH <sub>2</sub> O	15 oz/in <sup>2</sup>	0 oz/in <sup>2</sup> to 15 oz/in <sup>2</sup>	3 psi	0 psi to 3 ps	400 mbar	0 mbar to 400 mbar
	15 inH <sub>2</sub> O	0 inH <sub>2</sub> O to 15 inH <sub>2</sub> O	30 oz/in <sup>2</sup>	0 oz/in <sup>2</sup> to 30 oz/in <sup>2</sup>	5 psi	0 psi to 5 psi	600 mbar	0 mbar to 600 mbar
	30 inH <sub>2</sub> O	0 inH <sub>2</sub> O to 30 inH <sub>2</sub> O	35 oz/in <sup>2</sup>	0 oz/in <sup>2</sup> to 35 oz/in <sup>2</sup>	10 psi	0 psi to 10 psi		
	60 inH <sub>2</sub> O	0 inH <sub>2</sub> O to 60 inH <sub>2</sub> O	60 oz/in <sup>2</sup>	0 oz/in <sup>2</sup> to 60 oz/in <sup>2</sup>	40 mbar	0 mbar to 40 mbar		
CONNECTION SIZE	1/4 1/4" NPT							
OPTIONS	BLRF	Black Rear Flange		GL	Glass Lens*		OP	Over Pressure Protection
	SSRF	304SS Rear Flange		SGL	Safety Glass Lens*		SSBU	Stainless Steel Bezel & U-Clamp
	BLFF	Black Front Flange		PL	Acrylic Lens		BBU	Black Bezel & U-Clamp
	SSFF	304SS Front Flange		RL	Recalibrator Lens		BCR	Black Cover Ring
	CFF	Chrome Front Flange		SP	Red Set Pointer		SSCR	Stainless Steel Cover Ring
	SSC	Stainless Steel Case		MIP	Maximum Indicating Pointer		CCR	Chrome Cover Ring
							LM	Laser Marking
							ST	Stainless Steel Tagging
						BP3	Brass Press Fit Orifice 0.3 mm	
						BT3	Brass Threaded Orifice 0.3 mm	

Please consult your local NOSHOK Distributor or NOSHOK, Inc. for availability and delivery information.

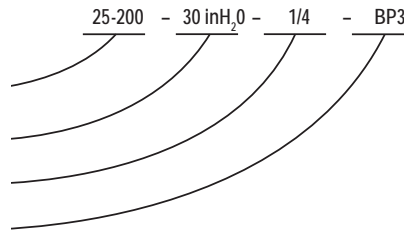
NOTE: Refer to 200 Series Options & Accessories chart on page 67 for availability by model number.

\* A steel, stainless or chrome cover ring must be additionally ordered when lenses other than acrylic are utilized on all 200 Series models

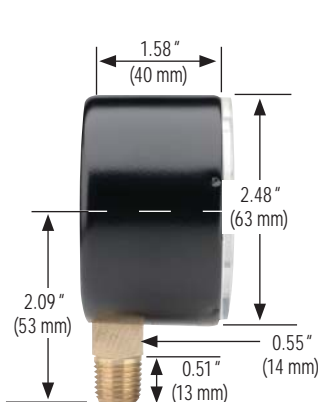
\*\* Only available in 2-1/2" size, 20 oz/35 inH<sub>2</sub>O

### EXAMPLE

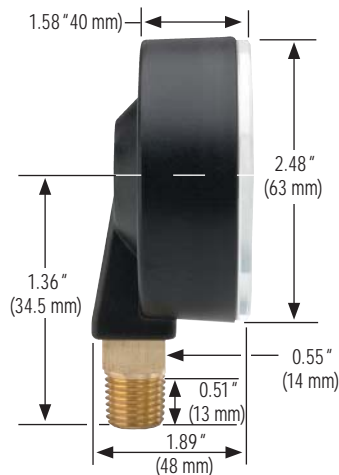
1. Select model number (size & case type)
2. Select pressure range
3. Connection size
4. Select any required accessory or option



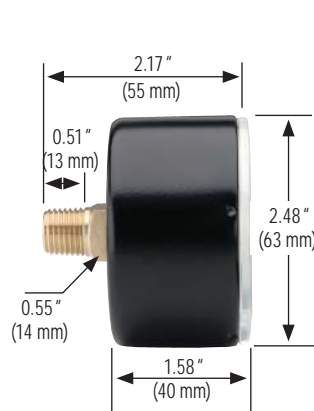
25-200



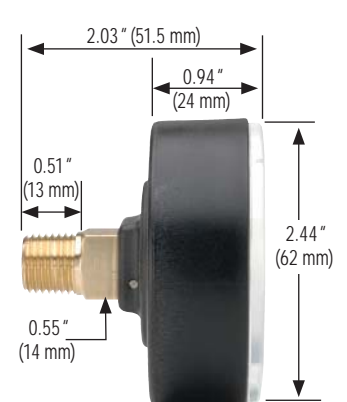
25-206



25-210

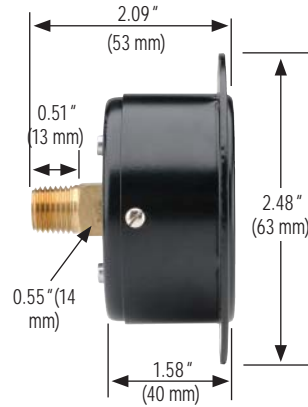
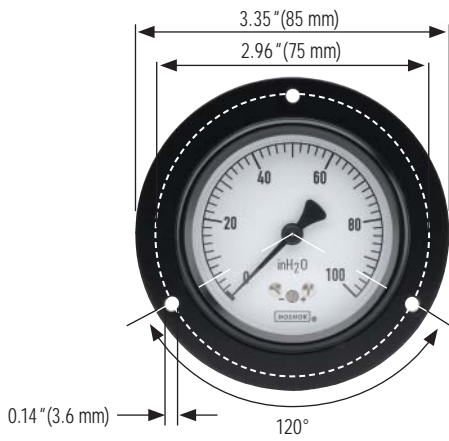


25-216

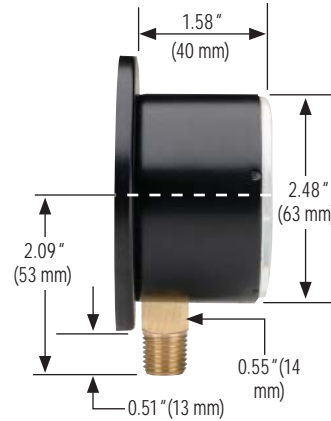
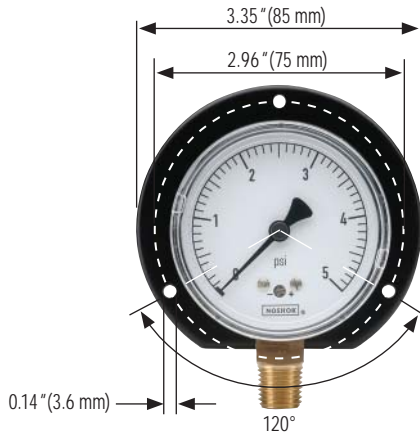


# Dimensions

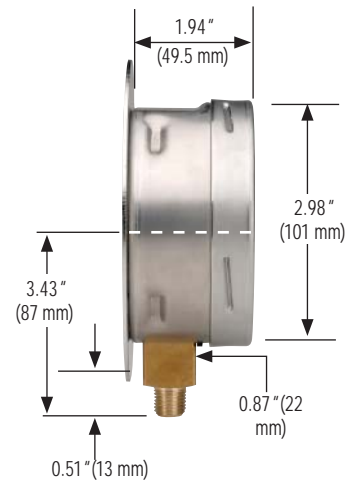
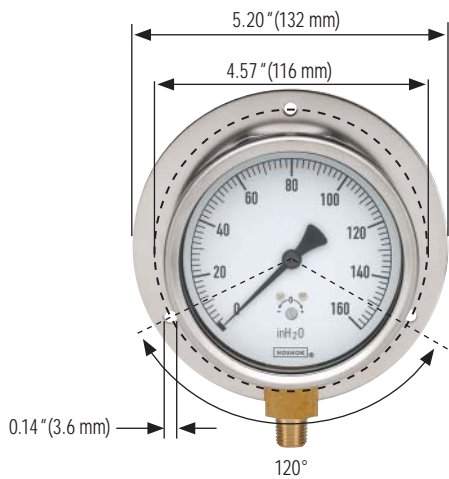
25-210 Front Flange



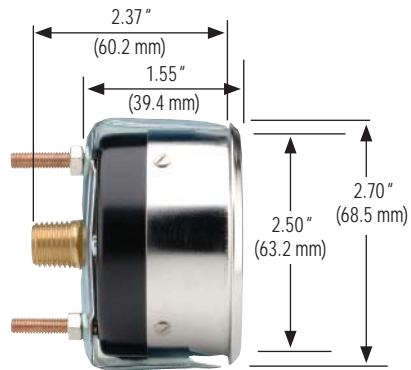
25-200 Rear Flange



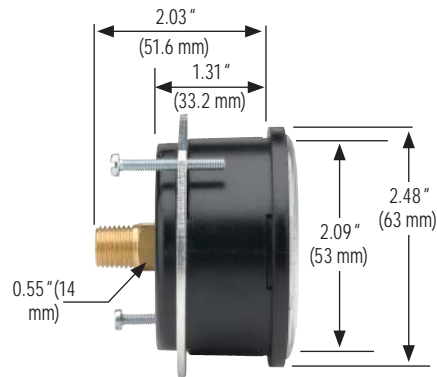
40-200 Rear Flange



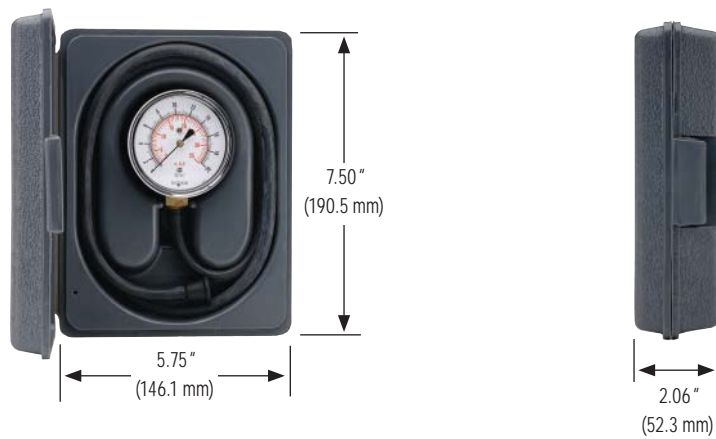
25-210 Triangular Bezel w/U-Clamp



25-224 with Panel Mount Clamp



25-234



# Brass Case Liquid Filled



# 300 SERIES

- High quality liquid-filled gauges for reliable service on applications not corrosive to brass
- Vacuum and compound through 15,000 psi
- 1-1/2", 2", 2-1/2", 4" sizes – bottom, back, left and right side connections
- Wetted materials phosphor bronze or 316 stainless steel and brass depending on the pressure range
- Panel mount clamp and front flange mounting
- Standard UV-resistant dials are dual scale in psi and kPa (kilopascals); dual scale psi/bar and psi/kg/cm<sup>2</sup> are available in most popular ranges
- Stock availability

## OPERATING SPECIFICATIONS

### 1. Working Pressure Limitations

#### a. Dynamic Pressure

The working pressure should be limited to 60% of the dial range for long service life.

#### b. Static Pressure

The working pressure, where no sharp fluctuations occur, should be limited to 90% of the dial range

### 2. Ambient Temperature

0 °F to 160 °F (-18 °C to 71 °C)

Please contact us for assistance in selecting the best fill for your application.

### 3. Media Temperature

-4 °F to 140 °F (-20 °C to 60 °C)

Optional temperature ratings available from -40 °F to 212 °F (-40 °C to 100 °C)

## APPLICATIONS

- Used in demanding applications that are not corrosive to brass, where vibration and pulsation are present

## ACCURACY

- 2-1/2" 300 Series gauges: ±1.5%
- 4" 300 Series gauges: ±1.0%

For details on accuracy/standard dial configuration and dial layouts, see pages 76-81.

	MODELS	SPECIFICATIONS
Case	25-300, 25-310, 40-300, 40-310	Die cast brass – natural brass finish
Cover ring	25-300, 25-310, 40-300, 40-310	Polished brass
Lens	25-300, 25-310, 40-300, 40-310	Molded acrylic with o-ring seal
Bourdon tube	25-300, 25-310 (≤ 600 psi)	Phosphor bronze °C tube
	25-300, 25-310 (800 psi to 6,000 psi)	Phosphor bronze coiled safety tube
	25-300, 25-310 (7,500 psi to 15,000 psi)	316 stainless steel coiled safety tube
	40-300, 40-310 (≤ 1,000 psi)	Phosphor bronze °C tube
	40-300, 40-310 (15,000 psi)	316 stainless steel coiled safety tube
Connection	25-300, 25-310	1/4" NPT die-cast brass with the case. 7/16" – 20 SAE adjustable type straight thread with FKM O-Ring is also available as a stock option on many ranges (-4 SAE).
	40-300, 40-310	1/4" NPT die-cast brass with the case. 1/2" NPT is available on certain 40-300 ranges as a stock option, and on all other 40-300 and 40-310's as a non-stock option.
Movement	25-300, 25-310, 40-300, 40-310	Brass and nickel-silver with highly polished bearing surfaces
Safety protection	25-300, 25-310, 40-300, 40-310	Safety relief disc on the top of the case
Accuracy	25-300, 25-310	± 1.5% full scale ASME B40.1 Grade A
	40-300, 40-310	± 1% full scale ASME B40.1 Grade 1A
Pointer	25-300, 25-310, 40-300, 40-310	Balanced aluminum, black finish
Dial	25-300, 25-310, 40-300, 40-310	Aluminum, white background with black markings. Single scale psi is standard. psi/bar, psi/kPa, or psi/Kg/cm <sup>2</sup> dual scale are available as stock options. On dual scale dials, the outer scale is psi in black and the inner metric scale is red. UV resistant.
Fill liquid	25-300, 25-310, 40-300, 40-310	Glycerine and water

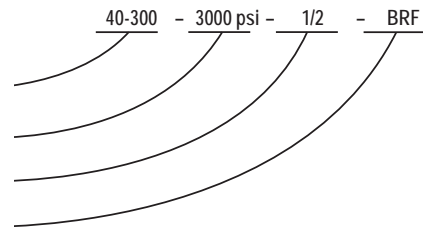
ORDERING INFORMATION															
SERIES	300														
SIZES	25	2-1/2"		40	4"										
CASE TYPES	300	Brass, bottom connection		310	Brass, back connection										
PRESSURE RANGES	30vac	-30 inHg to 0 psi		30/300	-30 inHg to 0 to 300 psi		300	0 psi to 300 psi	3000	0 psi to 3,000 psi					
	30/15	-30 inHg to 0 to 15 psi		15	0 psi to 15 psi		400	0 psi to 400 psi	5000	0 psi to 5,000 psi					
	30/30	-30 inHg to 0 to 30 psi		30	0 psi to 30 psi		600	0 psi to 600 psi	6000	0 psi to 6,000 psi					
	30/60	-30 inHg to 0 to 60 psi		60	0 psi to 60 psi		800	0 psi to 800 psi	7500	0 psi to 7,500 psi					
	30/100	-30 inHg to 0 to 100 psi		100	0 psi to 100 psi		1000	0 psi to 1,000 psi	10000	0 psi to 10,000 psi					
	30/160	-30 inHg to 0 to 160 psi		160	0 psi to 160 psi		1500	0 psi to 1,500 psi	15000	0 psi to 15,000 psi					
	30/200	-30 inHg to 0 to 200 psi		200	0 psi to 200 psi		2000	0 psi to 2,000 psi							
SCALE OPTIONS	psi	psi single scale		psi/kPa	psi/kPa dual scale		psi/kg/cm <sup>2</sup>	psi/kg/cm <sup>2</sup> dual scale		psi/bar	psi/bar dual scale				
CONNECTION SIZES	1/4	1/4" NPT			1/2	1/2" NPT			SST	SAE J1926-3:7/16-20 Adjustable					
OPTIONS	CFF	Chrome Front Flange			RF	Rear Flange			GLO	Glass Lens Overlay			ST	Stainless Steel Tagging	
	CFFN	Chrome Front Flange w/o holes			CCR	Chrome Cover Ring			SGO	Safety Glass Overlay			BT3	Brass Threaded Orifice 0.3 mm	
	BFF	Brass Front Flange			CBU	Chrome Bezel & U-Clamp			AR	Adapter Ring			BT4	Brass Threaded Orifice 0.4 mm	
	BLFF	Black Front Flange			MIP	Maximum Indicating Pointer			LM	Laser Marking			BT8	Brass Threaded Orifice 0.8 mm	
	SSRF	304SS Rear Flange			LL	Polycarbonate Lens									

Please consult your local NOSHOK Distributor or NOSHOK, Inc. for availability and delivery information.

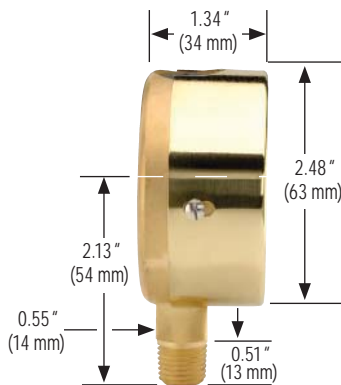
NOTE: Refer to 300 Series Options & Accessories chart on page 67 for availability by model number.

### EXAMPLE

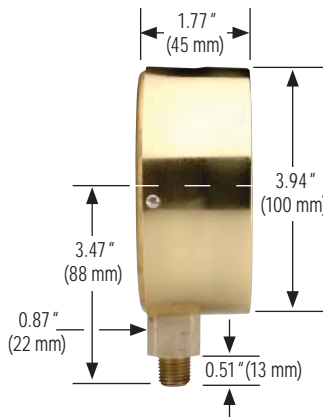
1. Select model number (size & case type)
2. Select pressure range & scale option
3. Select connection size (if more than one is offered)
4. Select any required accessory or option



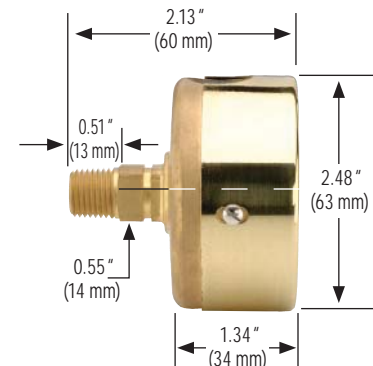
25-300



40-300

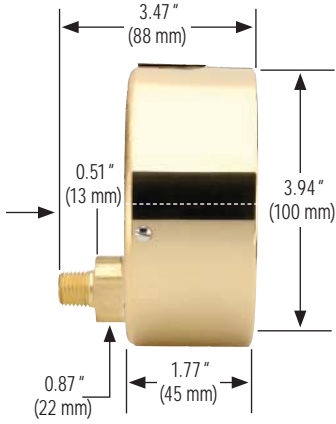


25-310

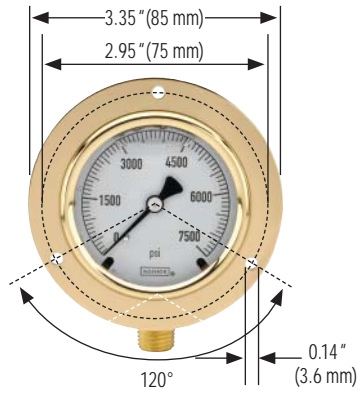


# Dimensions

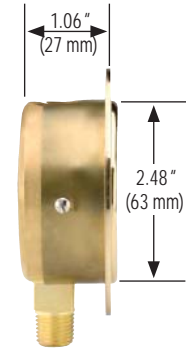
40-310



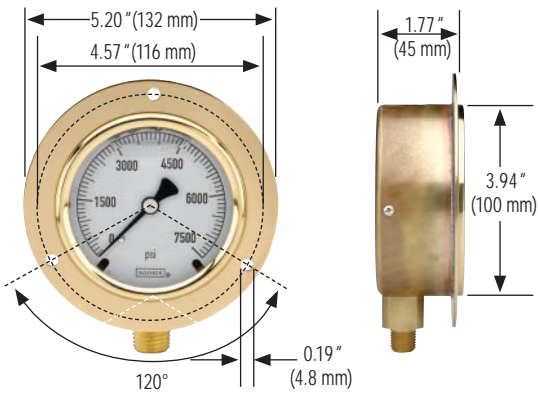
25-300 Front Flange



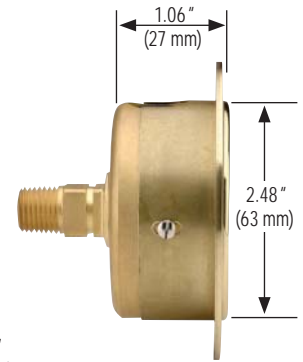
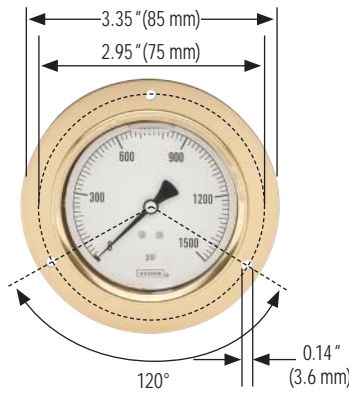
25-300



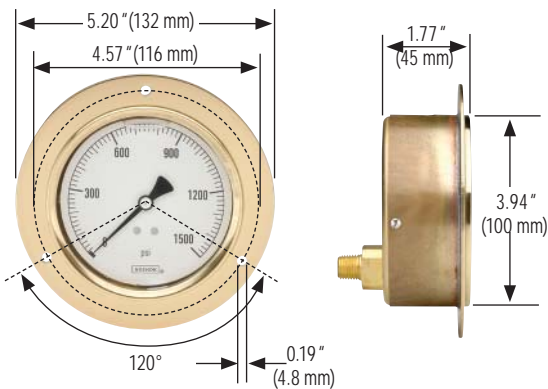
40-300 Front Flange



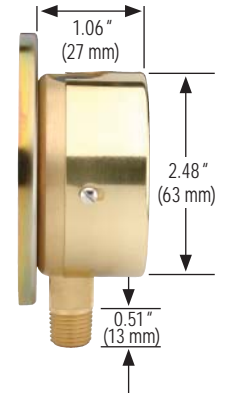
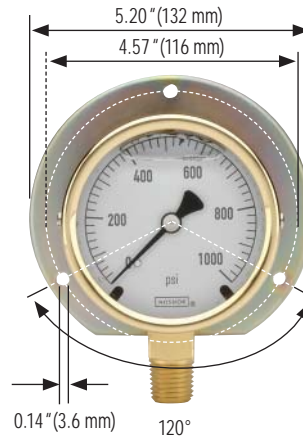
25-310 Front Flange



40-310 Front Flange

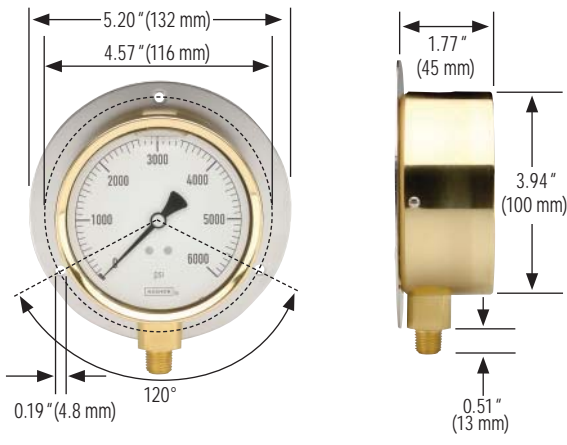


25-300 Rear Flange

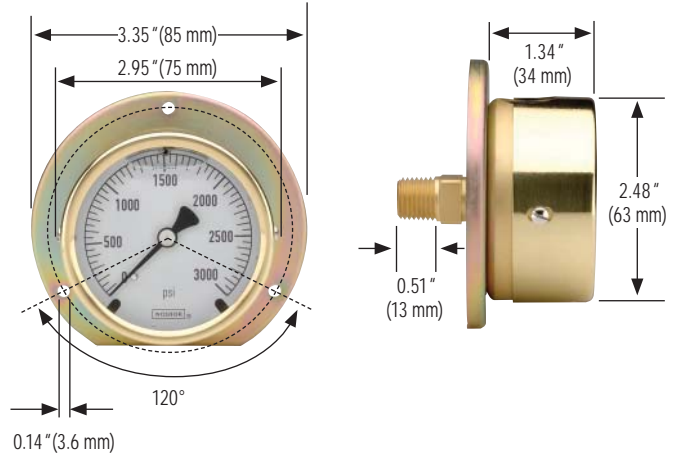




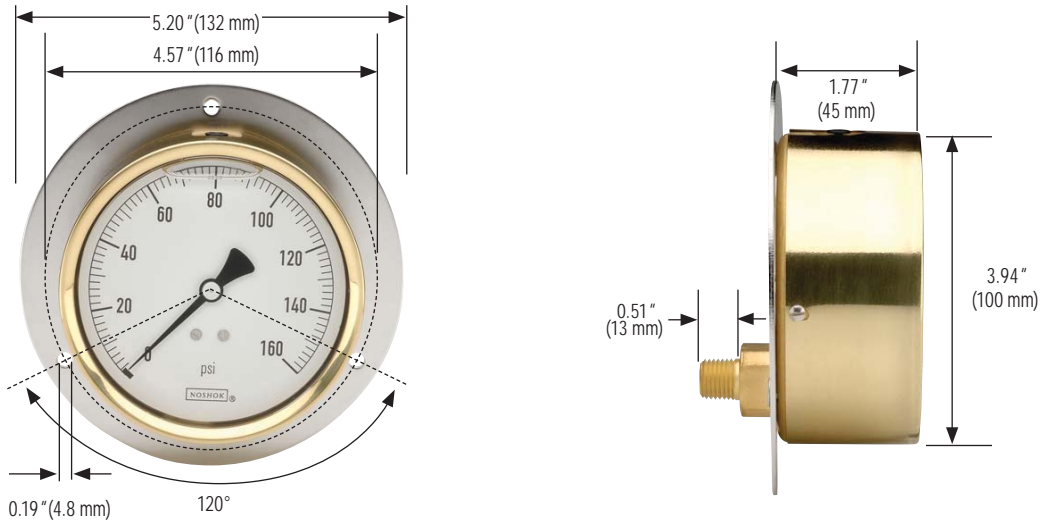
## 40-300 Rear Flange



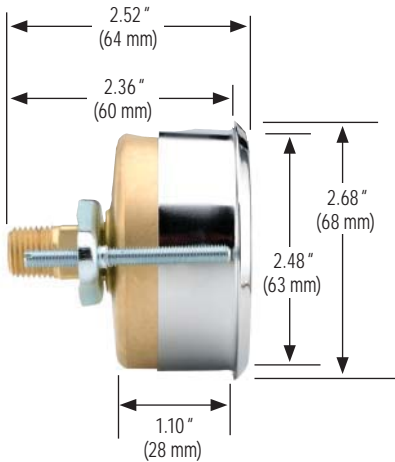
## 25-310 Rear Flange



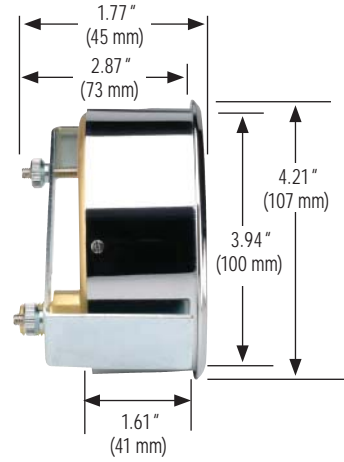
## 40-310 Rear Flange



## 25-310 Chrome Triangular Bezel with U-Clamp



## 40-310 Chrome Triangular Bezel with U-Clamp



# All Stainless Steel Dry & Liquid-Filled



# 400/500 SERIES

- The ultimate corrosion-resistant heavy-duty vacuum and pressure gauges
- **Extreme high pressure** ranges available from vacuum through 100,000 psi
- 1-1/2", 2", 2-1/2", 4" and 6" sizes – bottom or back connected
- Cases and polished bezels are constructed of solid 304 stainless steel, with 316 stainless steel internals
- Vacuum, compound and zero based ranges
- Bourdon tubes are matched to stainless steel precision movements and balanced pointers for smooth, accurate indication
- Glycerine filling (in the 500 Series) further enhances gauge life by constantly lubricating the movement and dampening the effects of vibration, pulsation and shock.
- NOSHOK's agriculture ammonia gauges (25-406 and 25-506) feature a nickel-plated brass connection with a 316 stainless steel Bourdon tube
- Stock availability

## OPERATING SPECIFICATIONS

### 1. Working Pressure Limitations

#### a. Dynamic Pressure

The working pressure should be limited to 60% of the dial range for long service life.

#### b. Static Pressure

The working pressure, when no sharp fluctuations occur, should be limited to 90% of the dial range.

### 2. Ambient Temperature

#### a. 400 Series

-40 °F to 140 °F (-40 °C to 60 °C)

#### b. 500 Series

-4 °F to 140 °F (-20 °C to 60 °C)  
glycerine fill  
-40 °F to 140 °F (-40 °C to 60 °C)  
special fill

### 3. Media Temperature

#### a. 400 Series

-40 °F to 212 °F (-40 °C to 100 °C)  
1-1/2" and 2-1/2" sizes  
-40 °F to 392 °F (-40 °C to 200 °C)  
4" and 6" sizes

#### b. 500 Series

-4 °F to 212 °F (-20 °C to 100 °C)  
glycerine fill  
-40 °F to 212 °F (-40 °C to 100 °C)  
special fill

## APPLICATIONS

- Chemical plants
- Petrochemical refineries
- Pharmaceutical
- Food and beverage processing
- Offshore oil platforms
- Paper mills
- Salt mines
- Fertilizer plants
- Shipboard

## ACCURACY

- 1-1/2" 400 Series gauges: ±2.5%
- 2-1/2" 400 Series gauges: ±1.5%
- 4 and 6" 400 Series gauges: ±1.0%
- 2-1/2" 500 Series gauges: ±1.5%
- 4 and 6" 500 Series gauges: ±1.0%

For details on accuracy/standard dial configuration and dial layouts, see pages 76-81.

	MODELS	SPECIFICATIONS
Case	15-401, 15-411, 40-400, 40-410, 60-400, 60-410, 60-500, 60-510	304 Stainless steel (Optional 316 Stainless steel)
	25-400, 25-410, 25-500, 25-510, 40-500, 40-510	Polished 304 Stainless steel
Cover ring	15-401, 15-411, 25-400, 25-410, 25-500, 25-510, 40-400, 40-410, 40-500, 40-510	Polished 304 Stainless steel
	60-400, 60-410, 60-500, 60-510	Polished 304 Stainless steel bayonet ring
Lens	15-401, 15-411, 40-400, 40-410, 40-500, 40-510	Instrument glass
	25-400, 25-410, 25-500, 25-510	Trogamide
Bourdon tube	60-400, 60-410, 60-500, 60-510	Laminated safety glass
	15-401, 15-411, 25-400, 25-410, 25-500, 25-510, 40-400, 40-410, 40-500, 40-510, 60-400, 60-410, 60-500, 60-510 (up to 6000 psi)	316 Stainless steel C-Type tube
	25-400, 25-410, 25-500, 25-510, 40-400, 40-410, 40-500, 40-510, 60-400, 60-410, 60-500, 60-510 (greater than 600 psi)	Coiled safety tube
Connection	15-401, 15-411	1/8" NPT, 316 Stainless steel
	25-400, 25-410, 25-500, 25-510	1/4" NPT, 316 Stainless steel
Movement	40-400, 40-410, 40-500, 40-510, 60-400, 60-410, 60-500, 60-510	1/2" NPT, 316 Stainless steel. 9/16" – 18 high pressure connections are standard on 0 - 30,000 psi and higher
	15-401, 15-411, 25-400, 25-410, 25-500, 25-510	Stainless steel with highly polished bearing surfaces
	40-400, 40-410, 40-500, 40-510	All Stainless steel with internal zero stop and highly polished bearing surfaces
	60-400, 60-410, 60-500, 60-510	Stainless steel with highly polished bearing surfaces. An internal zero stop is standard.
Safety protection	25-400, 25-410, 25-500, 25-510	Safety relief disc on the top of the case
	40-400, 40-410, 40-500, 40-510, 60-400, 60-410, 60-500, 60-510	Safety relief disc on the back and top of the case
Accuracy*	15-401, 15-411	± 2.5% full scale ASME B40.1 Grade B
	25-400, 25-410, 25-500, 25-510	± 1.5% full scale ASME B40.1 Grade A
	40-400, 40-410, 40-500, 40-510, 60-400, 60-410, 60-500, 60-510	± 1% full scale ASME B40.1 Grade 1A; ≥ 30,000 psi ± 1.5% full scale ASME Grade A
	15-401, 15-411	Black finished aluminum
Pointer	25-400, 25-410, 25-500, 25-510, 40-400, 40-410, 40-500, 40-510	Balanced aluminum, black finish
	60-400, 60-410, 60-500, 60-510	Balanced micro-adjustable aluminum, black finish
Dial	15-401, 15-411	Aluminum, white background with black markings. Single scale psi. UV resistant
	25-400, 25-410, 25-500, 25-510, 40-400, 40-410, 40-500, 40-510, 60-400, 60-410, 60-500, 60-510	Aluminum, white background with black markings. Single scale psi is standard. psi/bar, psi/kPa, or psi/Kg/cm <sup>2</sup> dual scale are available as stock options. On dual scale dials, the outer scale is psi in black and the inner metric scale is red. UV resistant.
Fill liquid	25-500, 25-510, 40-500, 40-510, 60-500, 60-510	Glycerine and water

\* On 40-400, 40-410, 40-500, 40-510, 60-400, 60-410, 60-500, and 60-510 models with pressure ranges between 20,000 and 60,000 psi, the accuracy is ±1.5% or 1.6%.

ORDERING INFORMATION			
SERIES	400/500		
SIZE	15 1-1/2"	25 2-1/2"	40*** 4" 60*** 6"
CASE TYPE	400 All SS, dry/fillable, bottom connection 401 All SS, dry, bottom connection 402 SS case, solid front, dry, bottom connection** 406 Ammonia, dry/fillable, bottom connection	410 All SS, dry/fillable, back connection 411 All SS, dry, back connection 500 SS case, liquid filled, bottom connection 502 SS case, solid front, liquid filled, bottom connection**	506 Ammonia, liquid filled, bottom connection 510 SS case, liquid filled, back connection
PRESSURE RANGES	30vac -30 inHg to 0 psi 30/15 -30 inHg to 0 to 15 psi 30/30 -30 inHg to 0 to 30 psi 30/60 -30 inHg to 0 to 60 psi 30/100 -30 inHg to 0 to 100 psi 30/160 -30 inHg to 0 to 160 psi 30/200 -30 inHg to 0 to 200 psi 30/300 -30 inHg to 0 to 300 psi 15 0 to 15 psi 30 0 to 30 psi 60 0 to 60 psi	100 0 to 100 psi 160 0 to 160 psi 200 0 to 200 psi 300 0 to 300 psi 400 0 to 400 psi 600 0 to 600 psi 800 0 to 800 psi 1000 0 to 1,000 psi 1500 0 to 1,500 psi 2000 0 to 2,000 psi 3000 0 to 3,000 psi	5000 0 to 5,000 psi 6000 0 to 6,000 psi 10000 0 to 10,000 psi 15000 0 to 15,000 psi 20000 0 to 20,000 psi 30000 0 to 30,000 psi 40000 0 to 40,000 psi 60000 0 to 60,000 psi 80000 0 to 80,000 psi 100000 0 to 100,000 psi
SCALE OPTION	psi psi single scale psi/kPa psi/kPa dual scale	psi/kg/cm <sup>2</sup> psi/kg/cm <sup>2</sup> dual scale psi/bar psi/bar dual scale	
CONNECTION SIZE	1/8 1/8" NPT 1/4 1/4" NPT	1/2 1/2" NPT 9/16-18 9/16"-18 UNF 2B high pressure cone*	SST SAE J1926-3:7/16-20 Adjustable
OPTIONS	SSFF 304SS Front Flange SSRF 304SS Rear Flange SSBU Stainless Steel Bezel & U-Clamp SPMC 304SS Panel Mount Clamp PMC Steel Panel Mount Clamp	SSFR 304SS Flange Ring FR Flange Ring AP Adjustable Pointer SGL Safety Glass Lens MIP Maximum Indicating Pointer	SP Red Set Pointer LM Laser Marking ST Stainless Steel Tagging ST5 Stainless Steel Threaded Orifice 0.5 mm ST8 Stainless Steel Threaded Orifice 0.8 mm

Please consult your local NOSHOK Distributor or NOSHOK, Inc. for availability and delivery information.

NOTE: Refer to 400/500 Series options & Accessories chart on page 52 for availability by model number.

\* Connection size for pressures 30,000 psi and above. Equivalent to F250C Parker Autoclave.

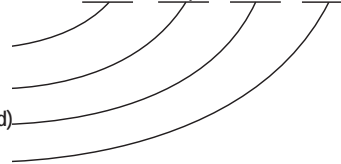
\*\* 6" solid front, safety case and blowout back is standard for pressures 80,000 psi and above.

\*\*\* On 40-400, 40-410, 40-500, 40-510, 60-400, 60-410, 60-500, and 60-510 models with pressure ranges between 20,000 and 60,000 psi, the accuracy is ±1.5% or 1.6%.

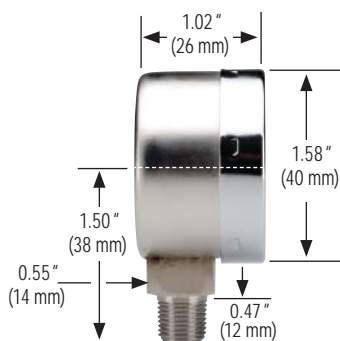
### EXAMPLE

1. Select model number (size & case type)
2. Select pressure range & scale option
3. Select connection size (if more than one is offered)
4. Select any required accessory or option

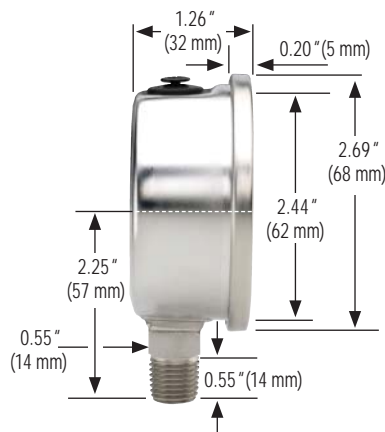
400-500 - 600psi - 1/2 - MIP



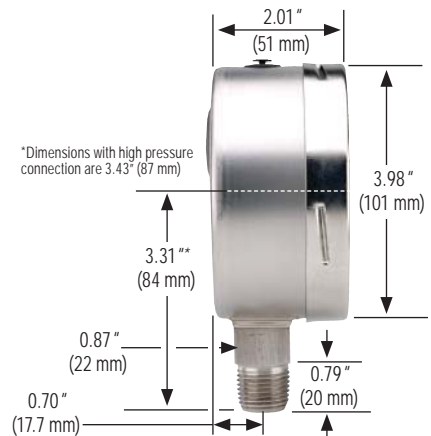
15-401



25-400/500



40-400/500

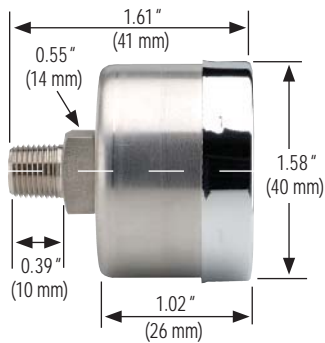


# Dimensions

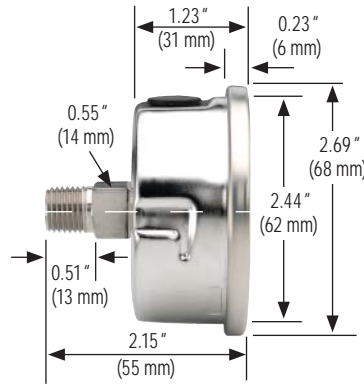
60-400/500



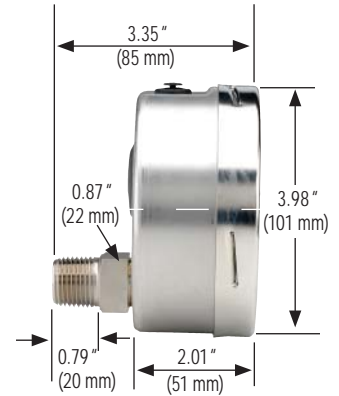
15-411



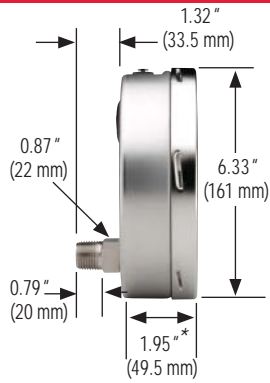
25-410/510



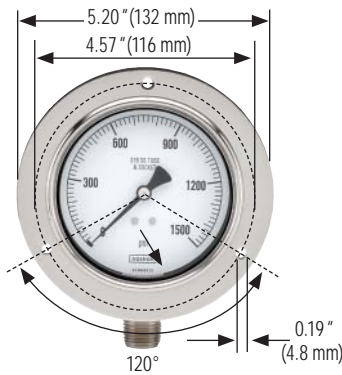
40-410/510



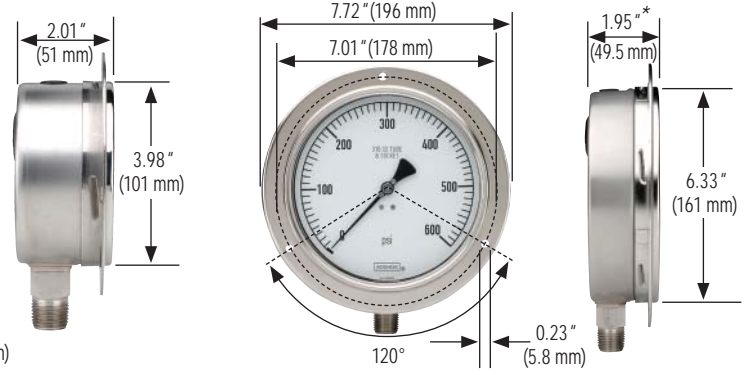
60-410/510



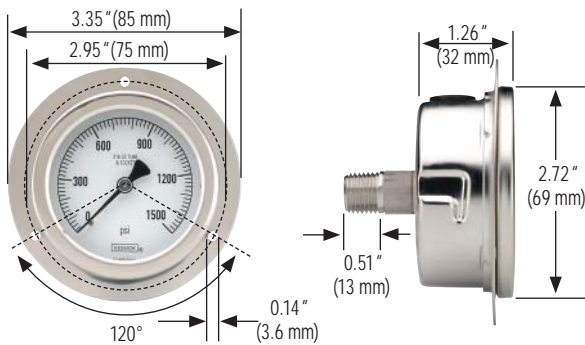
40-400/500 Front Flange



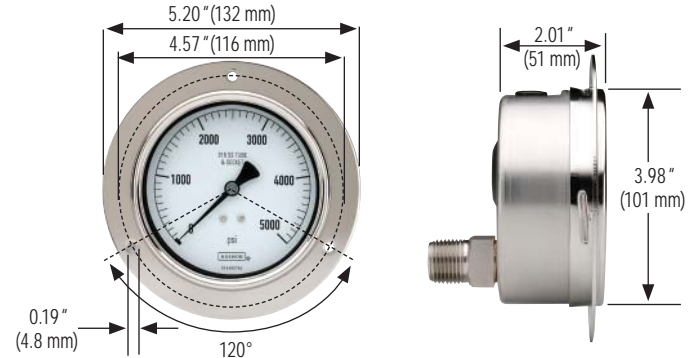
60-400/500 Front Flange



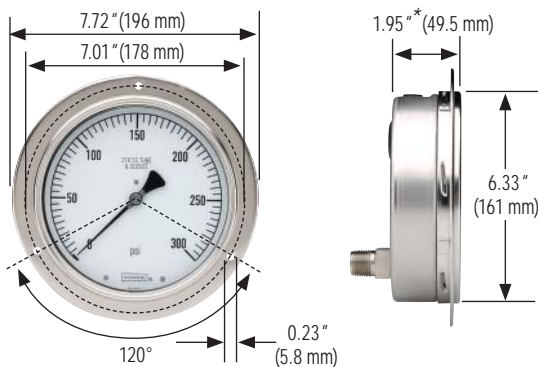
25-410/510 Front Flange



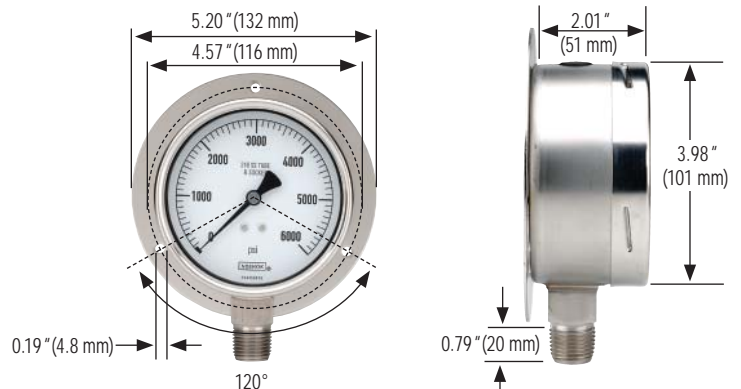
40-410/510 Front Flange



60-410/510 Front Flange

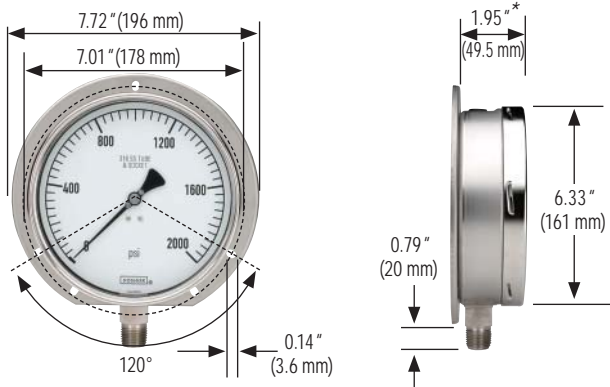


40-400/500 Rear Flange

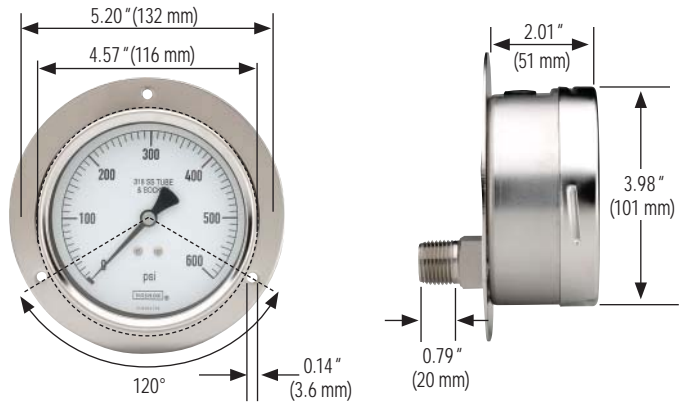


# 400/500 SERIES DIMENSIONS

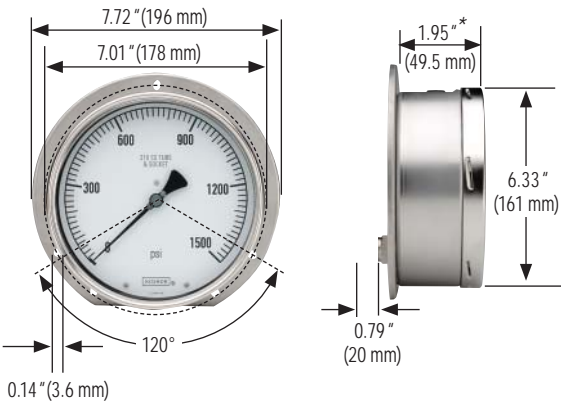
60-400/500 Rear Flange



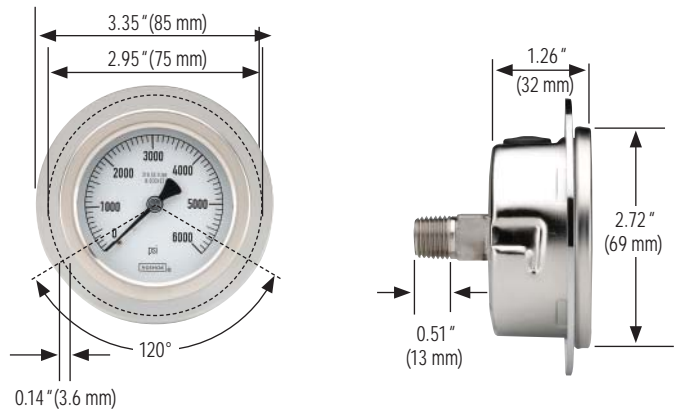
40-410/510 Rear Flange



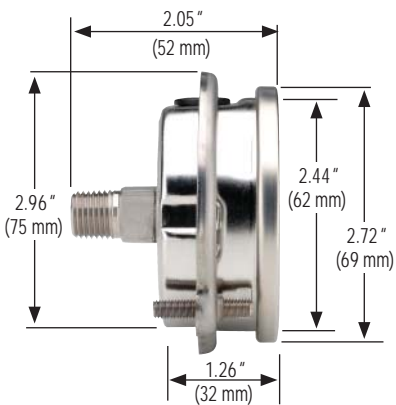
60-410/510 Rear Flange



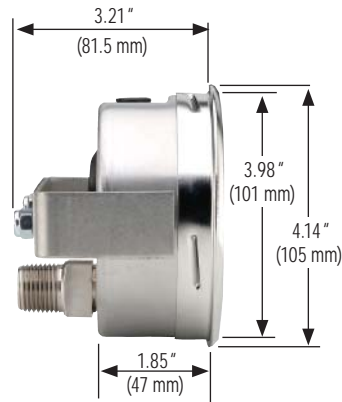
25-410/510 Flange Ring



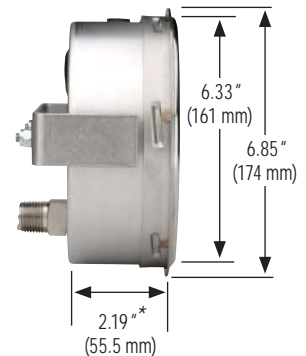
25-410/510 Panel Mount Clamp



40-410/510 SS Narrow Bezel w/U-Clamp



60-410/510 SS Narrow Bezel w/U-Clamp



\* Dimension will be 2.58" (65.5 mm) for pressure ranges above 1,500 psi.

# 600/700 SERIES



- 600 Series (brass) and 700 Series (316 stainless steel) gauges are specifically designed for demanding applications in the chemical and petroleum processing industries
- Extreme high pressure ranges available from vacuum through 60,000 psi
- Low pressure ranges from -30 inH<sub>2</sub>O vac through 10 psi
- 4-1/2" size – bottom connected
- Turret style cases are constructed of a rugged, corrosion-resistant phenolic material
- Solid front, safety case with a blow-out black isolates the gauge face from the pressure
- Adjustable pointer
- Standard lenses are shatter resistant acrylic; safety glass lenses available
- Stock availability

## OPERATING SPECIFICATIONS

### 1. Working Pressure Limitations

#### a. Dynamic Pressure

The working pressure should be limited to 60% of the dial range.

#### b. Static Pressure

The working pressure, when no sharp fluctuations occur, should be limited to 90% of the dial range.

### 2. Ambient Temperature

#### a. 640/740 Series

-40 °F to 150 °F (-40 °C to 65 °C)

#### b. 660/760 Series

-4 °F to 150 °F (-20 °C to 65 °C) Glycerine fill  
-40 °F to 150 °F (-40 °C to 65 °C) Special fill

### 3. Media Temperature

#### a. 640 Series

-4 °F to 150 °F (-20 °C to 65 °C)

#### b. 660 Series

-4 °F to 150 °F (-20 °C to 65 °C) Glycerine fill  
-40 °F to 150 °F (-40 °C to 65 °C) Special fill

#### c. 740 Series

-40 °F to 212 °F (-40 °C to 100 °C)  
500 °F (260 °C)

Maximum for short term/intermittent

#### d. 760 Series

-4 °F to 212 °F (-20 °C to 100 °C) Glycerine fill  
-40 °F to 212 °F (-40 °C to 100 °C) special Fill  
250 °F (130 °C) Maximum for short term/intermittent

## APPLICATIONS

- Chemical petroleum and petrochemical refineries
- Utilities
- Food processing plants
- Paper mills
- Power generating stations
- Water treatment plants
- Wherever accuracy, safety, readability and reliability are crucial

## ACCURACY

- 4-1/2" 600 Series gauges: ±0.5%
- 4-1/2" 700 Series gauges: ±0.5%
- 4-1/2" 700 Series gauges (LP): ±1.5%
- 4-1/2" 700 Series gauges (HP): ±1.0%

	MODELS	SPECIFICATIONS
Case	45-640, 45-660, 45-740, 45-760	Turret style black phenolic case. Solid front, safety case with blow-out back PBT.
Bayonet ring	45-640, 45-660, 45-740, 45-760	Threaded black PBT
Lens	45-640, 45-660, 45-740, 45-760	Acrylic. Laminated safety glass is available as a stock option
Measuring Element	45-640, 45-660 (up to 600 psi)	Beryllium copper C-Type Bourdon tube
	45-740, 45-760 (up to 600 psi)	316 Stainless steel C-Type Bourdon tube
	45-640, 45-660, 45-750, 45-760 (>600 psi)	316 Stainless steel coiled safety Bourdon tube
	45-740 (≤ 10 psi)	316 Stainless steel capsule
Connection	45-640, 45-660	1/4" NPT brass
	45-740, 45-760	1/4" NPT or 1/2" NPT 316 Stainless steel
Movement	45-640, 45-660	Brass and nickel-silver with highly polished bearing surfaces. An internal zero stop is standard.
	45-740, 45-760	Stainless steel with highly polished bearing surfaces. An internal zero stop is standard.
Safety protection	45-640, 45-660, 45-740, 45-760	Blow-out back on the rear of case.
Accuracy*	45-640, 45-660	± 1/2% full scale ASME B40.1 Grade 2A
	45-740, 45-760	± 1/2% full scale ASME B40.1 Grade 2A. ± 1.5% full scale ASME B40.1 Grade A for inH <sub>2</sub> O, 5 psi and 10 psi ranges. ≥30,000 psi ±1% Grade 1A.
Pointer	45-640, 45-660, 45-740, 45-760	Balanced micro-adjustable aluminum, black finish
Dial	45-640, 45-660, 45-740, 45-760	Aluminum, white background with black markings. Single scale psi is standard. psi/bar, psi/kPa, or psi/Kg/cm <sup>2</sup> dual scale are available as stock options. On dual scale dials, the outer scale is psi in black and the inner metric scale is red. UV-resistant.
Fill liquid	45-660, 45-760	Glycerine and water. Silicone and Halocarbon® are available as options.

\* On 45-740 and 45-760 models with pressure ranges between 20,000 and 60,000 psi, the accuracy is ±1%.

For details on accuracy/standard dial configuration and dial layouts, see pages 76-81.

ORDERING INFORMATION												
SERIES	600/700											
SIZES	45 4-1/2"											
CASE TYPES	640	Brass, dry, bottom connection		660	Brass, liquid filled, bottom connection							
	740*	SS, dry, bottom connection		760*	SS, liquid filled, bottom connection							
PRESSURE RANGES	30 inH <sub>2</sub> O vac	-30 inH <sub>2</sub> O to 0 inH <sub>2</sub> O		30/30	-30 inHg to 0 to 30 psi		60	0 psi to 60 psi				
	60 inH <sub>2</sub> O vac	-60 inH <sub>2</sub> O to 0 inH <sub>2</sub> O		30/60	-30 inHg to 0 to 60 psi		100	0 psi to 100 psi				
	60/60 inH <sub>2</sub> O	-60 inH <sub>2</sub> O to 60 inH <sub>2</sub> O		30/100	-30 inHg to 0 to 100 psi		160	0 psi to 160 psi				
	60 inH <sub>2</sub> O	0 inH <sub>2</sub> O to 60 inH <sub>2</sub> O		30/160	-30 inHg to 0 to 160 psi		200	0 psi to 200 psi				
	100 inH <sub>2</sub> O	0 inH <sub>2</sub> O to 100 inH <sub>2</sub> O		30/200	-30 inHg to 0 to 200 psi		300	0 psi to 300 psi				
	160 inH <sub>2</sub> O	0 inH <sub>2</sub> O to 160 inH <sub>2</sub> O		30/300	-30 inHg to 0 to 300 psi		400	0 psi to 400 psi				
	200 inH <sub>2</sub> O	0 inH <sub>2</sub> O to 200 inH <sub>2</sub> O		5	0 psi to 5 psi		600	0 psi to 600 psi				
	300 inH <sub>2</sub> O	0 inH <sub>2</sub> O to 300 inH <sub>2</sub> O		10	0 psi to 10 psi		800	0 psi to 800 psi				
	30vac	-30 inHg to 0 psi		15	0 psi to 15 psi		1000	0 psi to 1,000 psi				
	30/15	-30 inHg to 0 to 15 psi		30	0 psi to 30 psi		1500	0 psi to 1,500 psi				
SCALE OPTIONS	inH <sub>2</sub> O	inH <sub>2</sub> O	single scale	psi	psi	single scale	psi/kg/cm <sup>2</sup>	psi/kg/cm <sup>2</sup>	dual scale	psi/bar	psi/bar	dual scale
CONNECTION SIZES	1/4	1/4" NPT		1/2	1/2" NPT		9/16-18	9/16-18 UNF 3B (above 30,000 psi standard)				
OPTIONS	SGL	Safety Glass Lens		CPMR	Uninstalled Chrome Panel Mount Ring		ST	Stainless Steel Tagging				
	GL	Glass Lens		MDM	Manocont Dampened Movement		BP3	Brass Press Fit Orifice 0.3 mm				
	MIP	Maximum Indicating Pointer		OS	Overload Stop		BT3	Brass Threaded Orifice 0.3 mm				
	BPMR	Uninstalled Black Panel Mount Ring		LM	Laser Marking		ST8	316SS Threaded Orifice 0.8 mm				

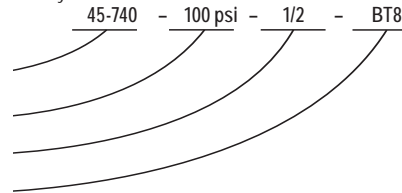
Please consult your local NOSHOK Distributor or NOSHOK, Inc. for availability and delivery information.

NOTE: Refer to 600/700 Series Options & Accessories chart on page 68 for availability by model number.

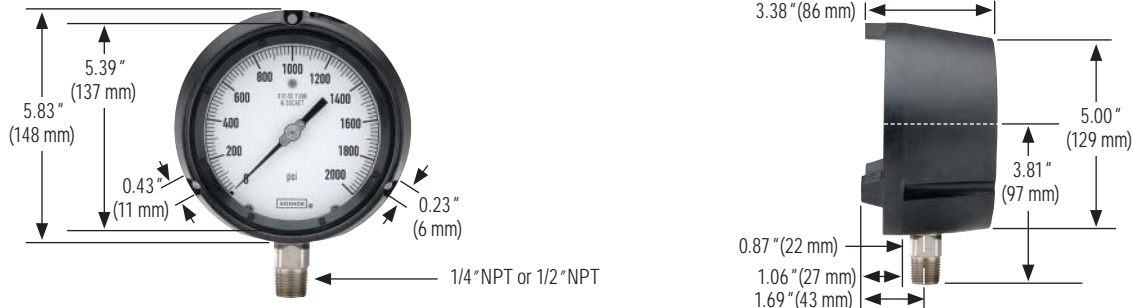
\* On 45-740 and 45-760 models with pressure ranges between 20,000 and 60,000 psi, the accuracy is ±1%.

### EXAMPLE

1. Select model number (size & case type)
2. Select pressure range & scale option
3. Select connection size (if more than one is offered)
4. Select any required accessory or option



### 45-640/660 & 45-740/760



### 45-640/660 & 45-740/760 Panel Mount Ring



# Precision Test



## 800 SERIES

- Meet the specification of ASME B40.1 Grade 3A
- Ranges available vacuum through 6,000 psi
- +/-0.25% accuracy to 100% of dial range on rising or falling pressure
- 6" size – bottom connected
- Adjustable knife-edge pointer and mirrored dial eliminate parallax error\*
- Brass or 316 stainless steel wetted parts
- Safety blow-out disc on the rear case is standard
- Instrument glass lens and 304 stainless steel case
- Jeweled brass and nickel silver bearings and movement
- Panel mountable, optional carrying case
- Stock availability

\* The difference in apparent position of an object as seen from two different points not on a straight line with the object

### OPERATING SPECIFICATIONS

#### 1. Working Pressure Limitations Static Pressure

The working pressure, when no sharp fluctuations occur, should be limited to 100% of the dial range.

**NOTE:** 800 Series test precision gauges are not intended for dynamic applications.

#### 2. Ambient Temperature

-40 °F to 140 °F (-40 °C to 60 °C)

#### 3. Media Temperature

-40 °F to 180 °F (-40 °C to 80 °C)

### APPLICATIONS

- Laboratories on calibration test stands
- Sophisticated aerospace equipment used in launching space vehicles
- Gauge repair facilities
- Wherever high accuracy and sensitivity are critical

	MODELS	SPECIFICATIONS
Case	60-800	304 Stainless steel
Cover	60-800	304 Stainless steel
Lens	60-800	Instrument glass
Bourdon tube	60-800	Beryllium copper to 1,000 psi 316 SS 1,500 psi to 6,000 psi
Connection	60-800	1/4" NPT bottom connection
Movement	60-800	Brass with jeweled bearings nickel-silver pinion gear and shafts
Safety protection	60-800	Safety relief disc on the back of the case
Accuracy	60-800	± 0.25% full scale ASME B40.1 Grade 3A
Pointer	60-800	Adjustable knife-edge pointer
Dial	60-800	Aluminum, white mirrored background with black graduations

For details on accuracy/standard dial configuration and dial layouts, see pages 76-81.



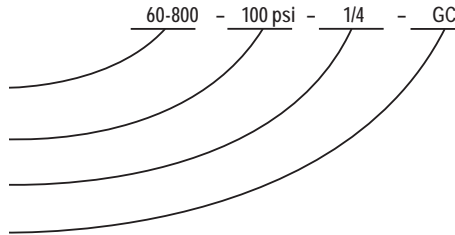
ORDERING INFORMATION								
SERIES	800							
SIZE	60 6"							
CASE TYPE	800 SS Case, bottom connection							
PRESSURE RANGES	30vac	-30 inHg to 0 psi	30/300	-30 inHg to 0 to 300 psi	300	0 psi to 300 psi	5000	0 psi to 5,000 psi
	30/15	-30 inHg to 0 to 15 psi	15	0 psi to 15 psi	400	0 psi to 400 psi	6000	0 psi to 6,000 psi
	30/30	-30 inHg to 0 to 30 psi	30	0 psi to 30 psi	600	0 psi to 600 psi		
	30/60	-30 inHg to 0 to 60 psi	60	0 psi to 60 psi	1000	0 psi to 1,000 psi		
	30/100	-30 inHg to 0 to 100 psi	100	0 psi to 100 psi	1500	0 psi to 1,500 psi		
	30/160	-30 inHg to 0 to 160 psi	160	0 psi to 160 psi	2000	0 psi to 2,000 psi		
	30/200	-30 inHg to 0 to 200 psi	200	0 psi to 200 psi	3000	0 psi to 3,000 psi		
SCALE OPTION	psi psi single scale							
CONNECTION SIZES	1/4	1/4" NPT	1/2	1/2" NPT	SST			SAE J1926-3: 7/16-20 Adjustable
OPTIONS	SSFF	304SS Front Flange	ST	Stainless Steel Tagging				
	SSRF	304SS Rear Flange	BP3	Brass Press Fit Orifice 0.3 mm				
	GC	Gauge Carrying Case	BT8	Brass Threaded Orifice 0.8 mm				
	LM	Laser Marking						

Please consult your local NOSHOK Distributor or NOSHOK, Inc. for availability and delivery information.

NOTE: Refer to 800 Series Options & Accessories chart on page 68 for availability by model number.

### EXAMPLE

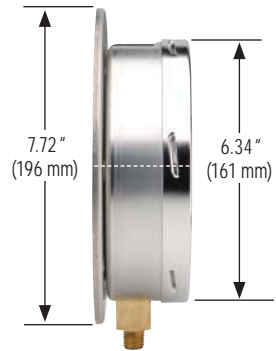
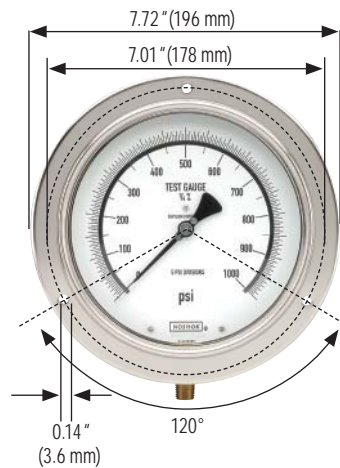
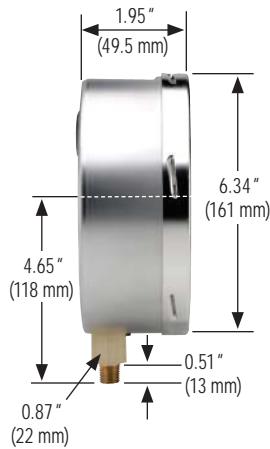
1. Select model number (size & case type)
2. Select pressure range
3. Select connection size (if more than one is offered)
4. Select any required accessory or option



60-800\*

60-800 Front Flange

60-800 Rear Flange



\*For ranges  $\leq 60$  psi and  $\geq 1,500$  psi, depth dimension changes to 2.58" (65.5 mm)

# ABS & Stainless Steel Liquid Filled

## 900 SERIES



- Extremely high quality pressure gauges available in a liquid filled version for extended service life and shock resistance
- Ranges available from vacuum to 15,000 psi
- 1-1/2", 2", 2-1/2", 4" sizes – bottom or back connected
- Lightweight shatter-resistant ABS case with acrylic lens for extra strength, or 304 stainless steel case with polycarbonate lens
- Unique o-ring case and connection seals guard against leakage and protect against shock and vibration
- Relief disc on top or back provides positive case relief
- Brass and copper alloy movement
- High grade glycerine fill dampens the effects of pulsation, vibration and shock loads, and provides lubrication of the movement
- Volume oriented
- Stock availability

### OPERATING SPECIFICATIONS

#### 1. Working Pressure Limitations

##### a. Dynamic Pressure

The working pressure should be limited to 60% of the dial range

##### b. Static Pressure

The working pressure, when no sharp fluctuations occur, should be limited to 90% of the dial range.

#### 2. Ambient Temperature

-4 °F to 140 °F (-20 °C to 60 °C) Glycerine fill  
-40 °F to 140 °F (-40 °C to 60 °C) Special fill

#### 3. Media Temperature

-4 °F to 140 °F (-20 °C to 60 °C) Glycerine fill  
-40 °F to 140 °F (-40 °C to 60 °C) Special fill

### APPLICATIONS

- Industrial applications where pulsation, vibration and shock are present

### ACCURACY

- 1-1/2" and 2" 900 Series gauges: ±2.5%
- 2-1/2" 900 Series gauges: ±1.5%
- 4" 900 Series gauges: ±1.0%

For details on accuracy/standard dial configuration and dial layouts, see pages 76-81.

	MODELS	SPECIFICATIONS
Case	15-910, 25-900, 25-910	ABS (Acryl Nitril Butadien Styrol)
	25-901, 25-911, 40-901, 40-911	304 Stainless steel
Bezel	25-901, 25-911, 40-901, 40-911	304 Stainless steel
Lens	15-910, 25-900, 25-910	Acrylic; ultrasonically welded to the case
	25-901, 25-911	Polycarbonate
	40-901, 40-911	Instrument glass
Bourdon tube	15-910, 25-900, 25-910, 25-901, 25-911, 40-901, 40-911 (up to 600 psi)	Phosphor bronze C-Type Bourdon tube
	15-910, 25-900, 25-910, 25-901, 25-911, 40-901, 40-911 (> 600 psi)	Coiled safety tube
Connection	15-910	1/8" NPT brass
	25-900, 25-910, 25-901, 25-911	1/4" NPT brass or 7/16"-20 adjustable
	40-901, 40-911	1/4" NPT brass, 1/2" NPT brass or 7/16"-20 adjustable
Movement	15-910, 25-900, 25-910, 25-901, 25-911,	Brass and nylon with highly polished bearing surfaces
Safety protection	15-910, 25-900, 25-910	Safety relief disc on the back of the case
	25-901, 25-911, 40-901, 40-911	Safety relief disc on the top of the case
Accuracy	15-910, 20-901, 20-911	± 2.5% full scale ASME B40.1 Grade B
	25-900, 25-910, 25-901, 25-911	± 1.5% full scale ASME B40.1 Grade A
	40-901, 40-911	± 1% full scale ASME B40.1 Grade 1A
Pointer	15-910, 25-900, 25-910, 25-901, 25-911	Molded plastic
	40-901, 40-911	Balanced aluminum, black finish
Dial	15-910, 25-900, 25-910, 25-901, 25-911	Molded plastic, white background with black psi scale and red kPa scale. UV resistant
	40-901, 40-911	Aluminum, white background, dual scale psi – kPa. black psi scale and Red kPa scale. UV resistant
Fill liquid	15-910, 25-900, 25-910, 25-901, 25-911, 40-901, 40-911	Glycerine and water

ORDERING INFORMATION						
SERIES	900					
SIZES	15 1-1/2"	20 2"	25 2-1/2"	40 4"		
CASE TYPES	900 ABS Case, liquid filled, bottom connection		910 ABS Case, liquid filled, back connection		911 SS Case, liquid filled, back connection	
PRESSURE RANGES	30vac -30 inHg to 0 psi	100 0 psi to 100 psi	5000 0 psi to 5,000 psi	10 0 bar to 10 bar		
	30/15 -30 inHg to 0 to 15 psi	160 0 psi to 160 psi	6000 0 psi to 6,000 psi	16 0 bar to 16 bar		
	30/30 -30 inHg to 0 to 30 psi	200 0 psi to 200 psi	7500 0 psi to 7,500 psi	25 0 bar to 25 bar		
	30/60 -30 inHg to 0 to 60 psi	300 0 psi to 300 psi	10000 0 psi to 10,000 psi	40 0 bar to 40 bar		
	30/100 -30 inHg to 0 to 100 psi	400 0 psi to 400 psi	15000 0 psi to 15,000 psi	60 0 bar to 60 bar		
	30/160 -30 inHg to 0 to 160 psi	600 0 psi to 600 psi	-1 -1 bar to 0 bar	100 0 bar to 100 bar		
	30/200 -30 inHg to 0 to 200 psi	800 0 psi to 800 psi	1 0 bar to 1 bar	160 0 bar to 160 bar		
	30/300 -30 inHg to 0 to 300 psi	1000 0 psi to 1,000 psi	1.6 0 bar to 1.6 bar	250 0 bar to 250 bar		
	15 0 psi to 15 psi	1500 0 psi to 1,500 psi	2.5 0 bar to 2.5 bar	400 0 bar to 400 bar		
	30 0 psi to 30 psi	2000 0 psi to 2,000 psi	4 0 bar to 4 bar	600 0 bar to 600 bar		
	60 0 psi to 60 psi	3000 0 psi to 3,000 psi	6 0 bar to 6 bar	1000 0 bar to 1,000 bar		
SCALE OPTIONS	psi psi single scale	psi/kg/cm <sup>2</sup> psi/kg/cm <sup>2</sup> dual scale	bar/psi bar/psi dual scale	psi/kPa psi/kPa dual scale		
	psi/bar psi/bar dual scale					
CONNECTION SIZES	1/8 1/8" NPT	1/4 1/4" NPT	1/2 1/2" NPT	SST SAE J1926-3:7/16-20 Adjustable		
OPTIONS	PMC Steel Panel Mount Clamp	AP Adjustable Pointer	SSF 304SS Front Flange	BP3 Brass Press Fit Orifice 0.3 mm		
	SPMC 304SS Panel Mount Clamp	MIP Maximum Indicating Pointer	SSRF 304SS Rear Flange	BT5 Brass Threaded Orifice 0.5 mm		
	SSBU Stainless Steel Bezel & U-clamp	SP Red Set Pointer	LM Laser Marking	BT8 Brass Threaded Orifice 0.8 mm		
	SSB Stainless Steel Bezel	SGL Safety Glass Lens	ST Stainless Steel Tagging	7/16"-20 Straight Thread Available*		
	SSCR 304SS Cover Ring	BLFF Black Front Flange				

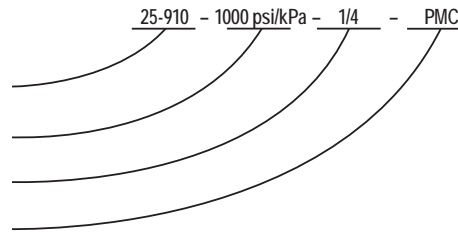
Please consult your local NOSHOK Distributor or NOSHOK, Inc. for availability and delivery information.

NOTE: Refer to 900 Series Options & Accessories chart on page 69 for availability by model number.

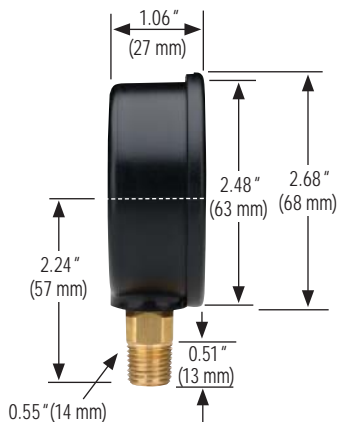
\* Includes FKM o-ring

### EXAMPLE

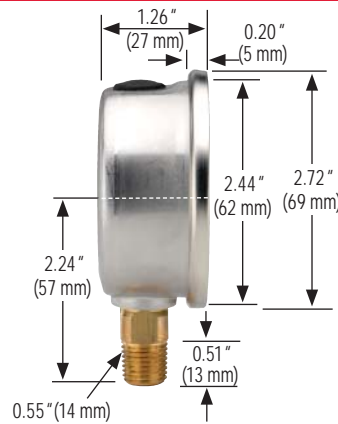
1. Select model number (size & case type)
2. Select pressure range & scale option
3. Select connection size (if more than one is offered)
4. Select any required accessory or option



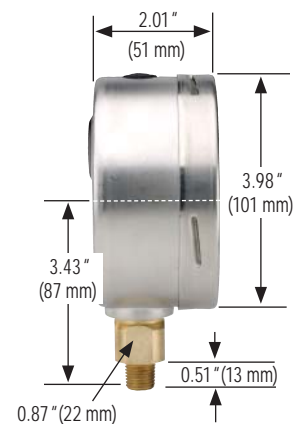
### 25-900



### 25-901

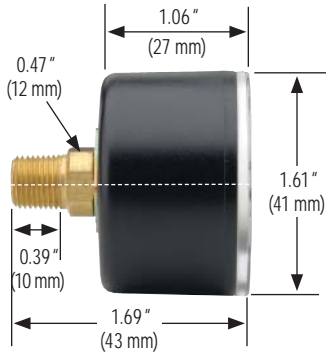


### 40-901

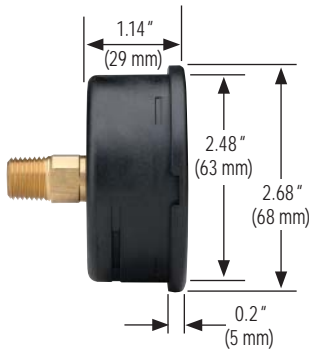


# Dimensions

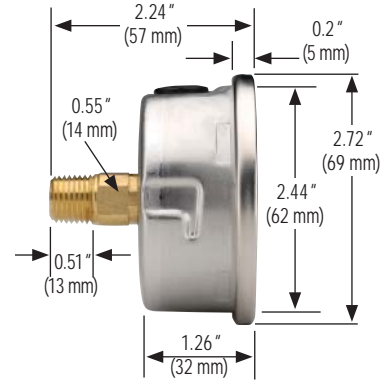
15-910



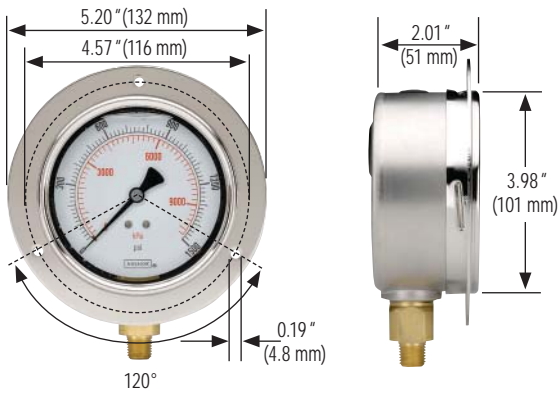
25-910



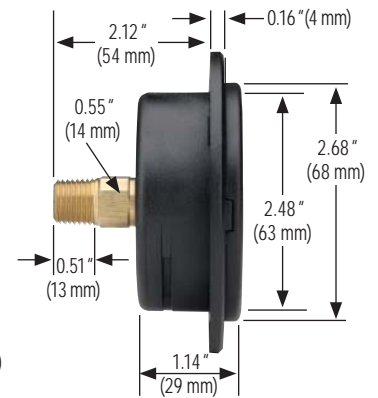
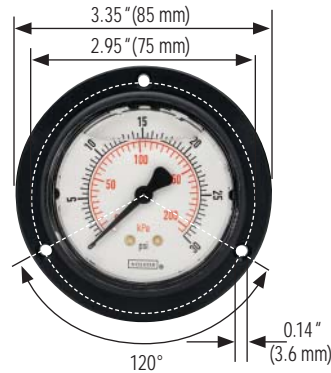
25-911



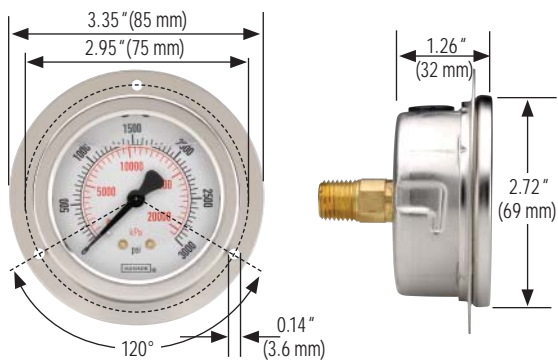
40-901 Front Flange



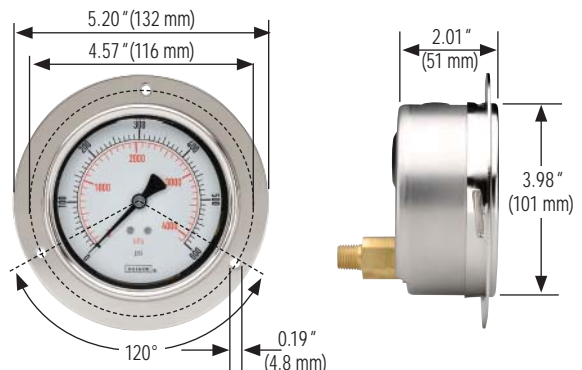
25-910 Front Flange



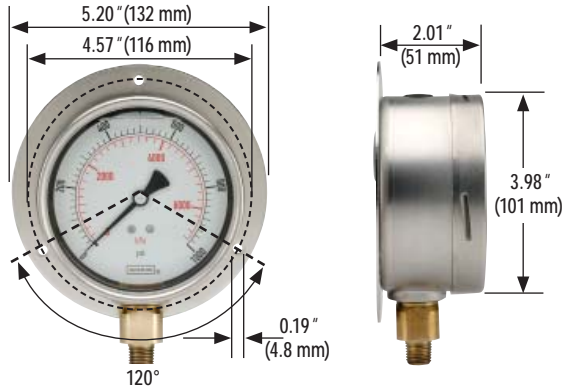
25-911 Front Flange



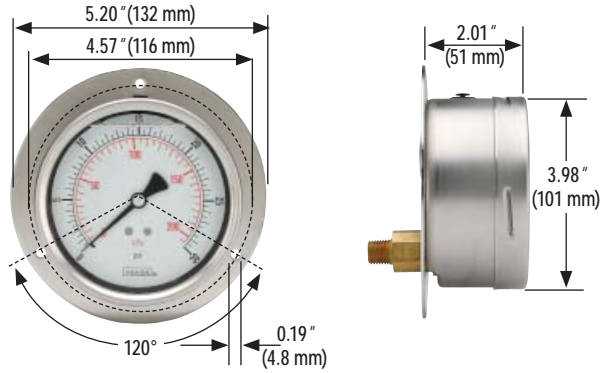
40-911 Front Flange



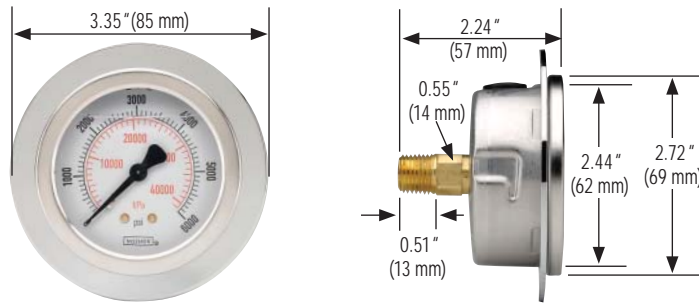
40-901 Rear Flange



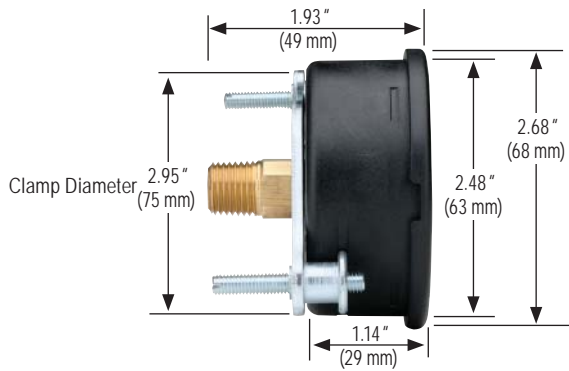
40-911 Rear Flange



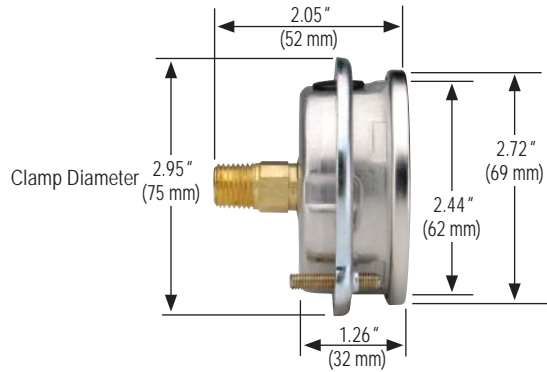
25-911 Flange Ring



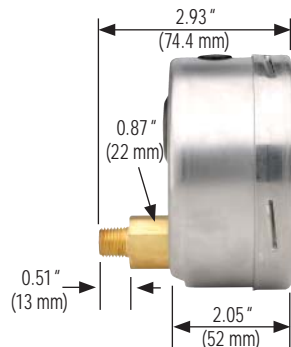
25-910 Panel Mount Clamp



25-911 Panel Mount Clamp



40-911





Shown with enhanced software.

**APPLICATIONS**

- Machine construction
- Plant and apparatus construction
- Hydraulics
- Pneumatics
- Measuring equipment monitoring



# 1000 SERIES

- Allows for local digital indication of pressure in place of mechanical gauges
- Integrated battery provides 4,000 hours of battery life
- Pressure ranges from 30/30 psi to 10,000 psi
- 3.31" size – bottom connected
- Durable 304 stainless steel case
- Display has an integrated bar graph with a trailing indicating pointer to show the trends in a working pressure system
- Additional 4-1/2 digit display provides a direct readout of the peak value, tare, min./max. memory, and other functions
- Optional internal light ensures display is optimally lit for a clear readout in all lighting conditions
- Buttons on the front of the display allow easy adjustment of the programmable functions
- Meets all electromagnetic compatibility requirements (EMC) to EN 61326
- CE compliant to suppress RFI, EMI and ESD
- Optional features: tare function, password protection, internal lighting, 300° rotatable base, rubber case protector, gauge carrying case

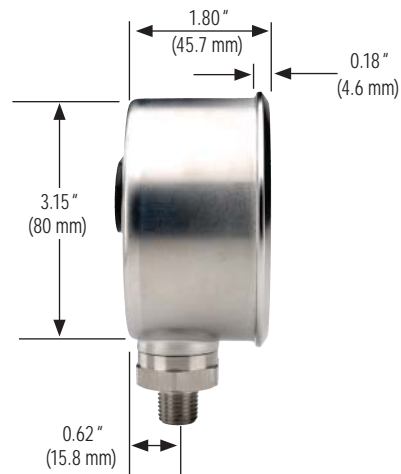
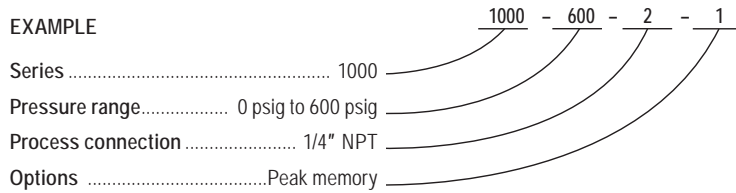
**SPECIFICATIONS**

Display	0.43" high liquid crystal display
Digits	4 STD. 4-1/2, up to 9999
Accuracy	±0.25 % full scale (BFSL)
Update rate	5 times/second
Pressure ranges	Standard ranges from 30 psig to 10,000 psig, compound ranges from 30/30 psig to 30/600 psig
Proof pressure	2 times full scale range, maximum 15,000 psi
Wetted materials	≤ 750 psig stainless steel, aluminum, NBR, ceramic measuring element ≥ 1,000 psig stainless steel, thin-film measuring element
Housing material	Stainless steel
Power supply	2 x 1.5V "AA" battery 4,000 hrs ("AA" 2,000 mAh)
Programmable functions	Adjustable through front key pad Tare ±20% of full scale range (optional) On/Off Adjustable automatic turn off (optional) Measuring Unit bar, psi, MPa (standard)
Temperature influence	Compensated 32 °F to 140 °F (0 °C to 60 °C) Effect ±0.15 % per 10K at zero and span Span effect is ±0.005 % full scale/ °F
Temperature ranges	Storage -4 °F to 158 °F (-20 °C to 70 °C) Media -22 °F to 185 °F (-30 °C to 85 °C) Ambient 14 °F to 140 °F (-10 °C to 60 °C)
Environmental rating	NEMA 4X (IP 65 according to EN60529/IEC529)
Electromagnetic rating	Compliant to EN 61326, EMI and ESD protection
Weight	0.88 lb.

ORDERING INFORMATION								
SERIES	1000							
PRESSURE RANGES	30/30	-30 inHg to 30 psig	30	0 psig to 30 psig	1450	0 psig to 1,450 psig	7500	0 psig to 7,500 psig
	30/60	-30 inHg to 60 psig	60	0 psig to 60 psig	2000	0 psig to 2,000 psig	10000	0 psig to 10,000 psig
	30/145	-30 inHg to 145 psig	145	0 psig to 145 psig	3000	0 psig to 3,000 psig		
	30/300	-30 inHg to 300 psig	300	0 psig to 300 psig	5000	0 psig to 5,000 psig		
	30/600	-30 inHg to 600 psig	600	0 psig to 600 psig	6000	0 psig to 6,000 psig		
		psig = gauge pressure	Other ranges available on special request					
PROCESS CONNECTION	2 1/4" NPT							
OPTIONS	1 Peak Memory - Standard		ORF Threaded Orifice					
	6 Enhanced Software		RCP Rubber Case Protector					
	GC Gauge Carrying Case							

Please consult your local NOSHOK Distributor or NOSHOK, Inc. for availability and delivery information.

### EXAMPLE



# Differential Gauge, Piston Type



## 1000 SERIES

- Accurately measures the pressure drop across filters, pumps, strainers, separators and valves
- Maximum static or working pressure to 6,000 psi
- 2-1/2" and 4-1/2" sizes - back or side connected
- Rugged case construction with weather-resistant NEMA 4X enclosure
- Single piece construction of ceramic magnet/piston minimizes "blow by" and increases accuracy
- Optional liquid filling lubricates gauge internals and extends service life by dampening the effects of vibration, pulsation and shock
- Media leakage within the sensor body is by design and kept to a minimum through precise engineering specifications
- Shipped with a certificate of calibration to ensure accuracy and quality performance
- Cost effective

### APPLICATIONS

- Filters
- Flow indicators
- Heat exchangers
- Back flow restrictors
- Hydraulic and pneumatic systems
- Water treatment systems
- Pumps and compressors
- Industrial machinery and machine tools

### SPECIFICATIONS

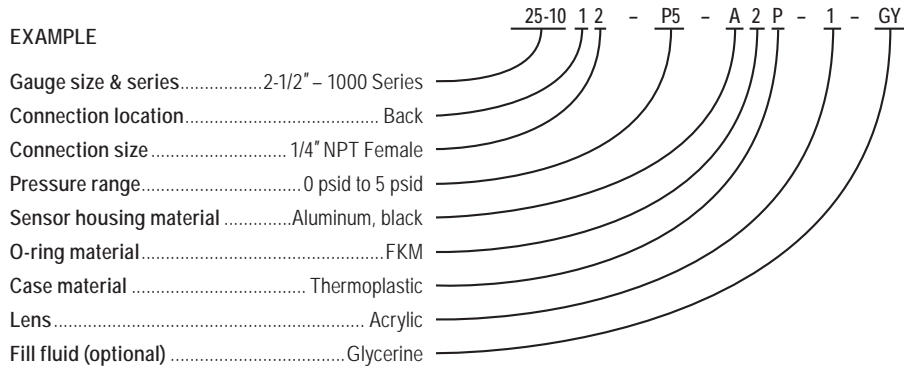
Case and bezel material	Fiberglass reinforced thermoplastic
Lens	Acrylic - standard Laminated safety glass - optional
Sensor housing material	Black anodized aluminum - standard 316L Stainless steel - optional
Sensor material	316 Stainless steel and ceramic piston/magnet
O-ring material	FKM (standard) NBR (optional) EPDM (optional)
Process connection	1/4" NPT Female, back connection (standard) 1/4" NPT Female, side connection (optional)
Accuracy	±2% of full scale on rising pressure
Dial	Aluminum, white background with black markings
Pointer	Balanced aluminum, black finish
Gauge fill fluid	Glycerine - optional Others available - please consult factory
Operating temp.	-40 °F to 200 °F (-40 °C to 93 °C)
Ranges	0 to 5 psid through 0 to 100 psid
Max. working static pressure	6,000 psig



ORDERING INFORMATION				
GAUGE SIZE & SERIES	25 - 10 2-1/2"	45 - 10 4-1/2"		
CONNECTION LOCATIONS	1 Back	2 Side		
CONNECTION SIZES	2 1/4" NPT Female			
PRESSURE RANGES	P5 0 to 5 psid	P20 0 to 20 psid	P50 0 to 50 psid	P100 0 to 100 psid
	P10 0 to 10 psid	P25 0 to 25 psid	P60 0 to 60 psid	
	P15 0 to 15 psid	P30 0 to 30 psid	P75 0 to 75 psid	
SENSOR HOUSING MATERIALS	A Aluminum, black	S 316L Stainless steel		
O-RING MATERIALS	2 FKM	3 NBR		
CASE MATERIAL	P Thermoplastic			
LENSES	1 Acrylic	2 Safety Glass	3 Maximum Indicating Pointer	
FILL FLUIDS (OPTIONAL)	GY Glycerine	SL Silicone	HL Halocarbon®	

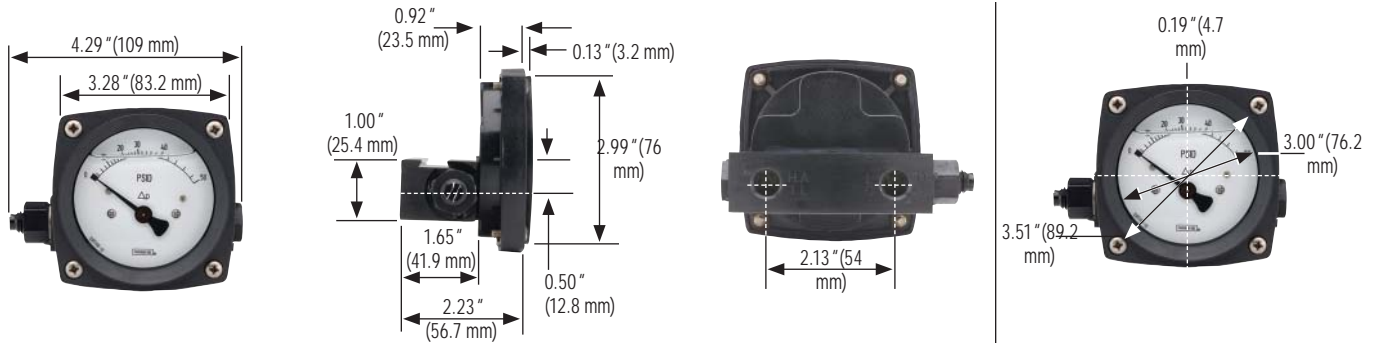
Please consult your local NOSHOK Distributor or NOSHOK, Inc. for availability and delivery information.

### EXAMPLE

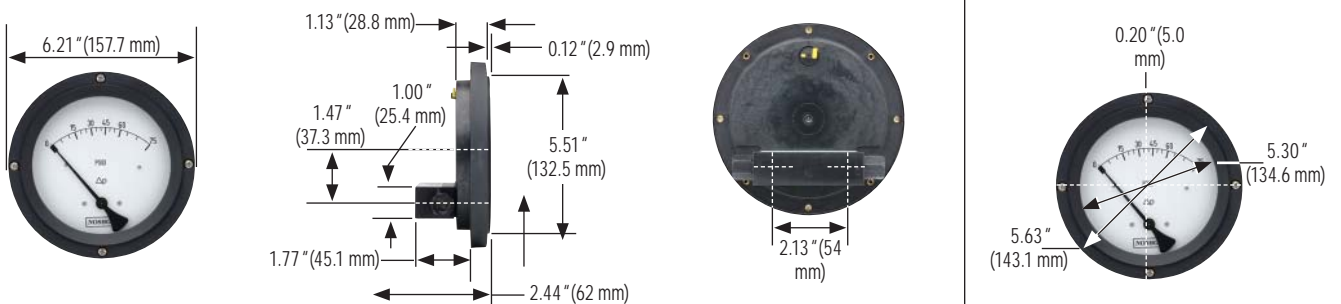


### PANEL CUT-OUT DIMENSIONS

#### 2-1/2" Gauge



#### 4-1/2" Gauge





# 1100 SERIES

- Precisely measures pressure drops across filters, strainers, separators, heat exchangers and applications where a higher level of solids are present in the measuring media
- High side is completely isolated from low side to prevent fluid movement between ports
- Maximum static or working pressure to 3,000 psi, 1,500 psi with brass housing
- 2-1/2" and 4-1/2" sizes – top & bottom, or back connected
- Sensor housing is cast in a black anodized aluminum, 316L Stainless steel or brass and comes standard with a weather-resistant NEMA 4X enclosure and shatter-resistant acrylic lens
- Optional liquid filling lubricates gauge internals and extends service life by dampening the effects of vibration, pulsation and shock
- Convoluted diaphragm fully supported to the rated working pressure of the gauge
- Shipped with a certificate of calibration to ensure accuracy and quality performance

## APPLICATIONS

- Filters
- Flow indicators
- Heat exchangers
- Back flow restrictors
- Hydraulic and pneumatic systems
- Water treatment systems
- Pumps and compressors
- Industrial machinery and machine tools

## SPECIFICATIONS

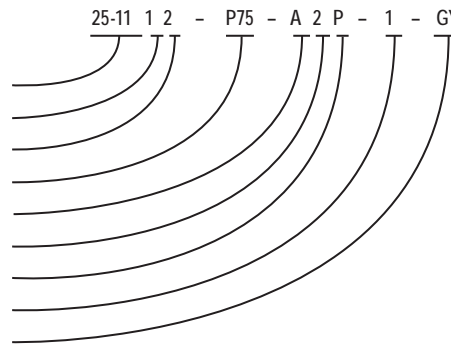
Case and bezel material	Fiberglass reinforced thermoplastic
Lens	Acrylic – standard Laminated safety glass – optional
Sensor housing material	Black anodized aluminum – standard 316L Stainless steel – optional
Sensor material	316 Stainless steel and ceramic magnet
O-Ring material	NBR – standard FKM – optional EPDM – optional
Process connection	1/4" NPT Female, back connection – standard 1/4" NPT Female, top & bottom – optional
Accuracy	±2% full scale for ranges 0 psid to 15 psid & above ±5% full scale for ranges below 0 psid to 15 psid
Dial	Aluminum, white background with black markings.
Pointer	Balanced aluminum, black finish
Gauge fill fluid	Glycerine – optional Others available – please consult factory
Operating temp.	-40 °F to 200 °F (-40 °C to 93 °C)
Ranges	0 to 50 inH <sub>2</sub> O through 0 psid to 100 psid
Max. working static pressure	3,000 psig – 316L Stainless steel and aluminum housing

ORDERING INFORMATION				
GAUGE SIZE & SERIES	25 - 11 2-1/2"	45 - 11 4-1/2"		
CONNECTION LOCATIONS	0 Top & bottom	1 Back		
CONNECTION SIZE	2 1/4" NPT Female			
PRESSURE RANGES	W50 0 to 50 inH <sub>2</sub> O	W300 0 to 300 inH <sub>2</sub> O	P15 0 to 15 psid	P75 0 to 75 psid
	W75 0 to 75 inH <sub>2</sub> O	W400 0 to 400 inH <sub>2</sub> O	P25 0 to 25 psid	P100 0 to 100 psid
	W100 0 to 100 inH <sub>2</sub> O	P5 0 to 5 psid	P30 0 to 30 psid	
	W200 0 to 200 inH <sub>2</sub> O	P10 0 to 10 psid	P50 0 to 50 psid	
SENSOR HOUSING MATERIALS	A Aluminum, black	S 316L Stainless steel		
O-RING MATERIALS	2 FKM	3 NBR		
CASE MATERIAL	P Thermoplastic			
LENSES	1 Acrylic	2 Safety glass	3 Maximum Indicating Pointer	
FILL FLUIDS (optional)	GY Glycerine	SL Silicone	HL Halocarbon®	

Please consult your local NOSHOK Distributor or NOSHOK, Inc. for availability and delivery information.

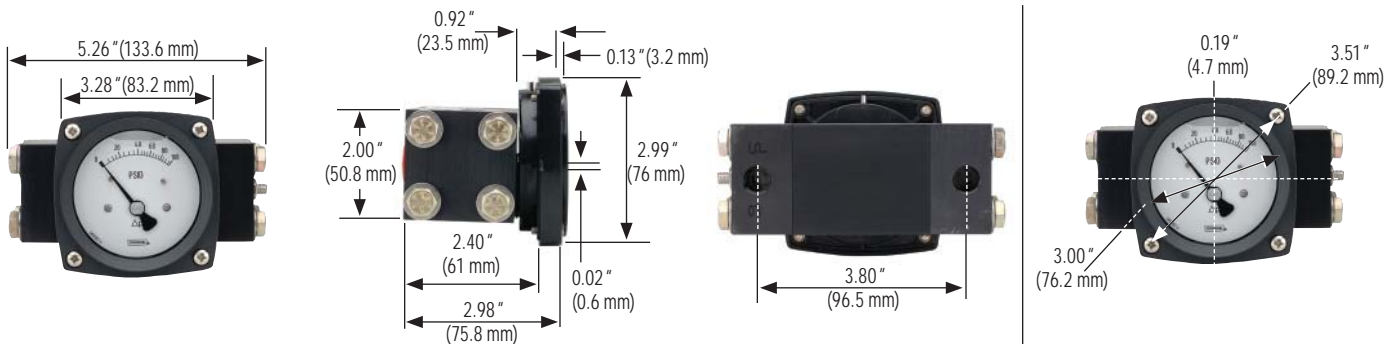
### EXAMPLE

Gauge size & series..... 2-1/2" – 1100 Series  
 Connection location..... Back  
 Connection size..... 1/4" NPT Female  
 Pressure range..... 0 psid to 75 psid  
 Sensor housing material ..... Aluminum, black  
 O-ring material..... FKM  
 Case material ..... Thermoplastic  
 Lens..... Acrylic  
 Fill fluid (optional)..... Glycerine

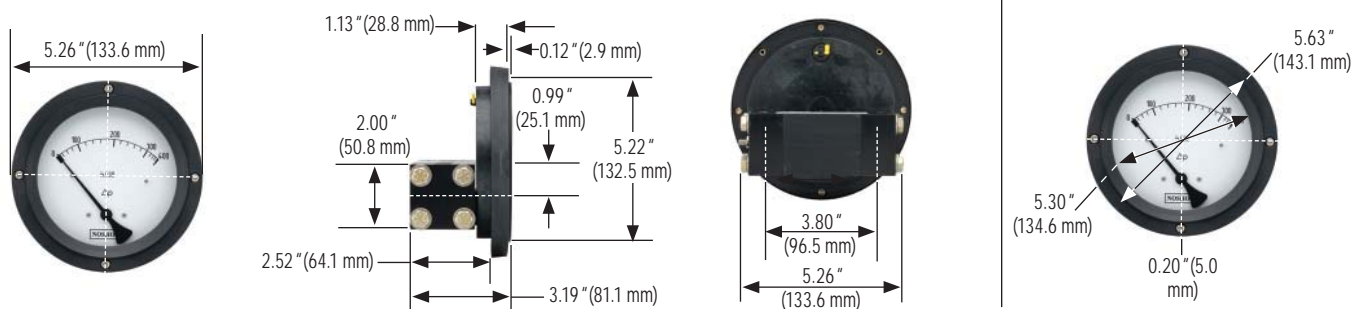


### PANEL CUT-OUT DIMENSIONS

#### 2-1/2" Gauge



#### 4-1/2" Gauge



# Differential Gauge, Membrane Type High Static Pressure

## 1200 SERIES



- Designed for applications requiring high static pressure & high differential pressure measurement
- Maximum static or working pressure to 3,000 psi
- Full scale accuracy of  $\pm 1\%$  on rising pressure – zero adjustment standard
- 4-1/2" and 6" sizes – top & bottom, or back connected
- Durable case construction with weather-resistant NEMA 4X rating & shatter-resistant acrylic lens
- A bidirectional overpressure valve protects the sensor membrane from damage
- Monel membranes and 316L stainless steel wetted parts
- Optional liquid filling lubricates gauge internals and extends service life by dampening the effects of vibration, pulsation and shock
- Shipped with a certificate of calibration to ensure accuracy and quality performance

### APPLICATIONS

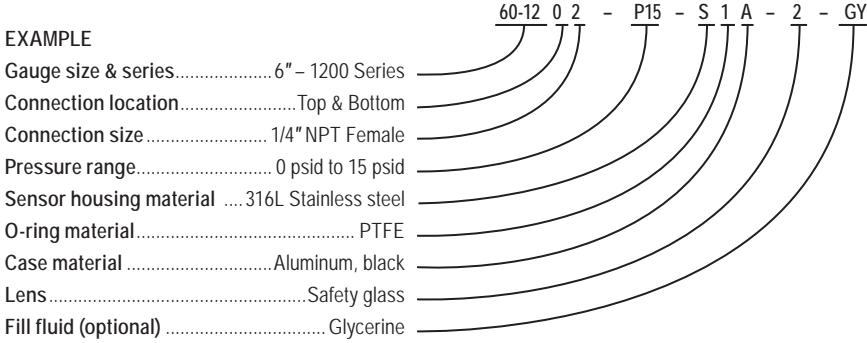
- Filters
- Flow indicators
- Heat exchangers
- Back flow indicators
- Hydraulic and pneumatic systems
- Water treatment systems
- Pumps and compressors
- Cryogenic gases and corrosive media

### SPECIFICATIONS

Dial case material	Black anodized aluminum – standard 316L Stainless steel – optional
Bezel material	316L Stainless steel
Lens	Acrylic – standard Laminated safety glass – optional
Sensor housing	316L Stainless steel
Membrane fill	Halocarbon®
Sensor element	Monel 500 – standard
O-ring material	PTFE
Process connection	1/4" NPT Female, back connection – standard 1/4" NPT Female, dual top & bottom – optional
Movement	Stainless steel
Accuracy	$\pm 1\%$ of full scale or rising pressure
Dial	Aluminum, white background with black markings – standard Aluminum, black background with white markings – optional
Pointer	Balanced aluminum, black finish
Gauge fill fluid	Glycerine – optional Others available – please consult factory
Operating temp.	-40 °F to 200 °F (-40 °C to 93 °C)
Ranges	0 to 100 inH <sub>2</sub> O through 0 to 600 psid
Max. working static pressure	3,000 psig

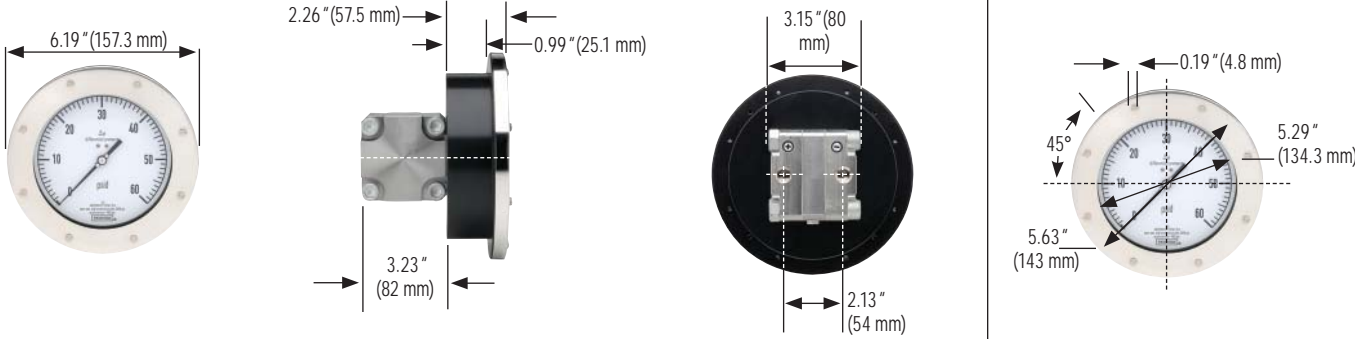
ORDERING INFORMATION				
GAUGE SIZE & SERIES	45 - 12 4-1/2"	60 - 12 6"		
CONNECTION LOCATIONS	0 Top & bottom	1 Back		
CONNECTION SIZE	2 1/4" NPT Female			
PRESSURE RANGES	W100 0 to 100 inH <sub>2</sub> O	W400 0 to 400 inH <sub>2</sub> O	P100 0 to 100 psid	P500 0 to 500 psid
	W150 0 to 150 inH <sub>2</sub> O	P15 0 to 15 psid	P230 0 to 230 psid	P600 0 to 600 psid
	W200 0 to 200 inH <sub>2</sub> O	P30 0 to 30 psid	P300 0 to 300 psid	
	W300 0 to 300 inH <sub>2</sub> O	P60 0 to 60 psid	P400 0 to 400 psid	
SENSOR HOUSING MATERIAL	S 316L Stainless steel			
O-RING MATERIAL	1 PTFE			
CASE MATERIALS	A Aluminum, black	S 316L Stainless steel		
LENSES	1 Acrylic	2 Safety glass		
FILL FLUIDS (optional)	GY Glycerine	SL Silicone	HL Halocarbon®	

Please consult your local NOSHOK Distributor or NOSHOK, Inc. for availability and delivery information.

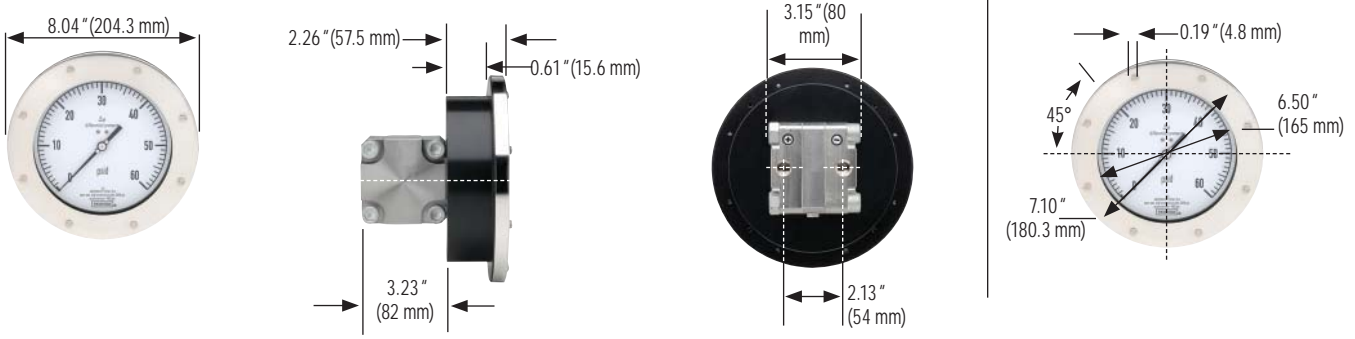


**PANEL CUT-OUT DIMENSIONS**

**4-1/2" Gauge**



**6" Gauge**



# Differential Gauge, Membrane Type Nominal Static Pressure



## 1300 SERIES

- Designed for integral process applications requiring nominal static and low differential pressure measurement
- Maximum static or working pressure to 600 psi
- Full scale accuracy of  $\pm 1\%$ , on rising pressure - zero adjustment standard
- 4-1/2" and 6" sizes – top & bottom, or back connected
- Durable case construction with weather-resistant NEMA 4X rating & shatter-resistant acrylic lens
- A bidirectional overpressure valve protects the sensor membrane from damage
- 316L stainless steel wetted parts
- Optional liquid filling lubricates gauge internals and extends service life by dampening the effects of vibration, pulsation and shock
- Shipped with a certificate of calibration to ensure accuracy and quality performance

### APPLICATIONS

- Settings which include caustic liquid or gaseous media and/or low temperature gases
- Filters
- Flow indicators
- Heat exchangers
- Back flow indicators
- Hydraulic and pneumatic systems
- Water treatment systems
- Pumps and compressors
- Cryogenic gases and corrosive media

### SPECIFICATIONS

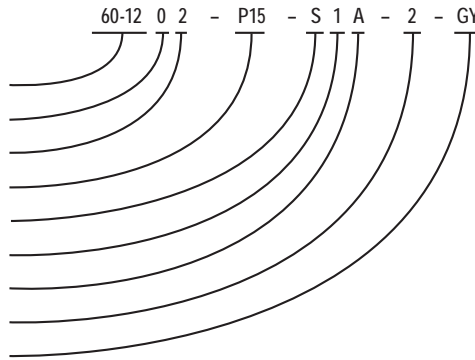
Dial case material	Black anodized aluminum – standard 316L Stainless steel – optional
Bezel material	316L Stainless steel
Lens	Acrylic – standard Laminated safety glass – optional
Sensor housing	316L Stainless steel
Membrane fill	Halocarbon®
Sensor element	316L Stainless steel (NACE compliant)
O-ring material	PTFE, FKM or NBR – optional
Process connection	1/4" NPT Female, dual top & bottom – standard 1/4" NPT Female, back connection – optional
Movement	Stainless steel
Accuracy	$\pm 1\%$ of full scale on rising pressure
Dial	Aluminum, black background with white markings – standard Aluminum, white background with black markings – optional
Pointer	Balanced aluminum, black finish
Gauge fill fluid	Glycerine – optional Others available – please consult factory
Operating temp.	-40 °F to 200 °F (-40 °C to 93 °C)
Ranges	0 to 100 inH <sub>2</sub> O through 0 to 400 psid
Max. working static pressure	600 psig

ORDERING INFORMATION			
GAUGE SIZE & SERIES	45 - 13 4-1/2"	60 - 13 6"	
CONNECTION LOCATIONS	0 Top & bottom	1 Back	
CONNECTION SIZE	2 1/4" NPT Female		
PRESSURE RANGES	W100 0 to 100 inH <sub>2</sub> O W150 0 to 150 inH <sub>2</sub> O W200 0 to 200 inH <sub>2</sub> O W300 0 to 300 inH <sub>2</sub> O	W400 0 to 400 inH <sub>2</sub> O P15 0 to 15 psid P30 0 to 30 psid P60 0 to 60 psid	P100 0 to 100 psid P230 0 to 230 psid P300 0 to 300 psid P400 0 to 400 psid
SENSOR HOUSING MATERIAL	S 316L Stainless steel		
O-RING MATERIALS	1 PTFE	2 FKM	3 NBR
CASE MATERIALS	A Aluminum, black	S 316L Stainless steel	
LENSES	1 Acrylic	2 Safety glass	
FILL FLUIDS (optional)	GY Glycerine	SL Silicone	HL Halocarbon®

Please consult your local NOSHOK Distributor or NOSHOK, Inc. for availability and delivery information.

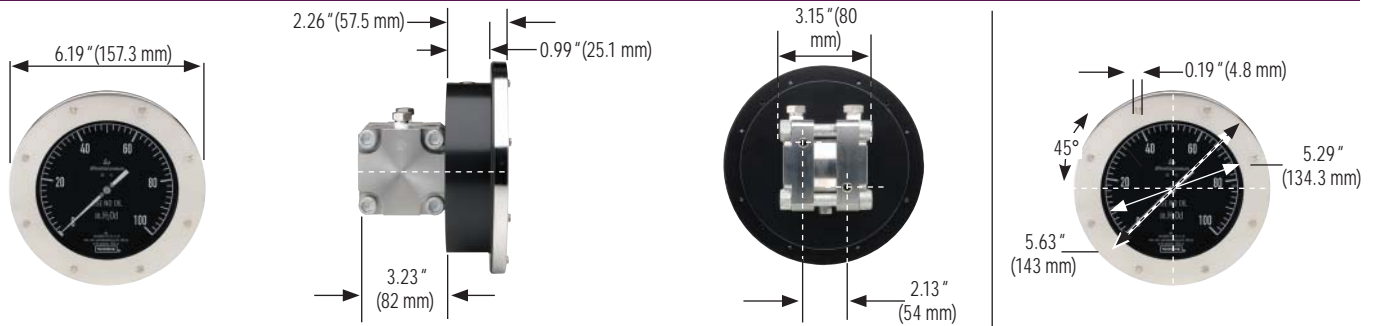
### EXAMPLE

Gauge size & series.....4-1/2" - 1300 Series  
 Connection location.....Top & bottom  
 Connection size.....1/4" NPT Female  
 Pressure range.....0 to 100 inH<sub>2</sub>O  
 Sensor housing material ....316L Stainless steel  
 O-ring material.....PTFE  
 Case material .....Aluminum, black  
 Lens.....Safety glass  
 Fill fluid (optional) .....Glycerine

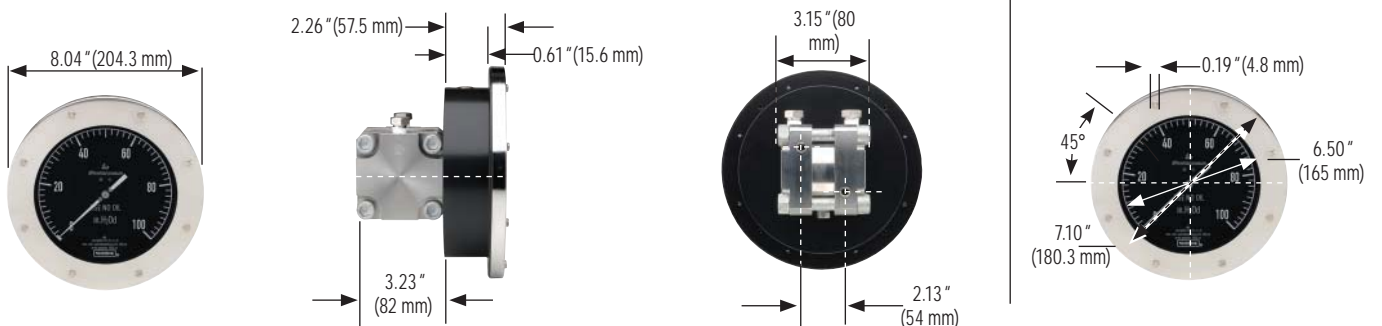


### PANEL CUT-OUT DIMENSIONS

#### 4-1/2" Gauge

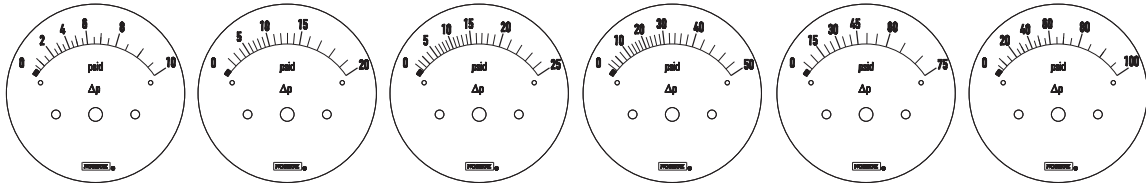


#### 6" Gauge

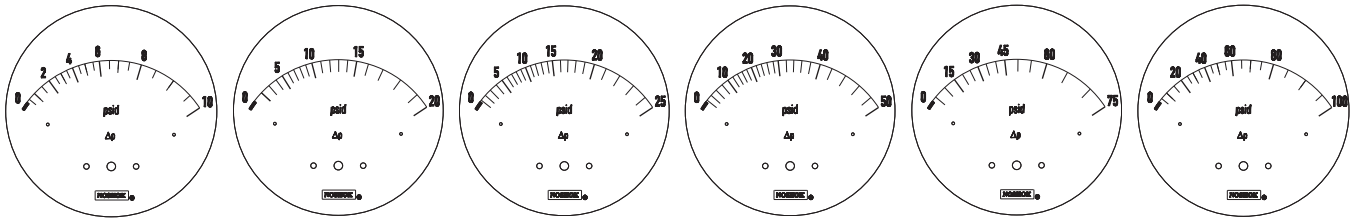


# Dial Layouts

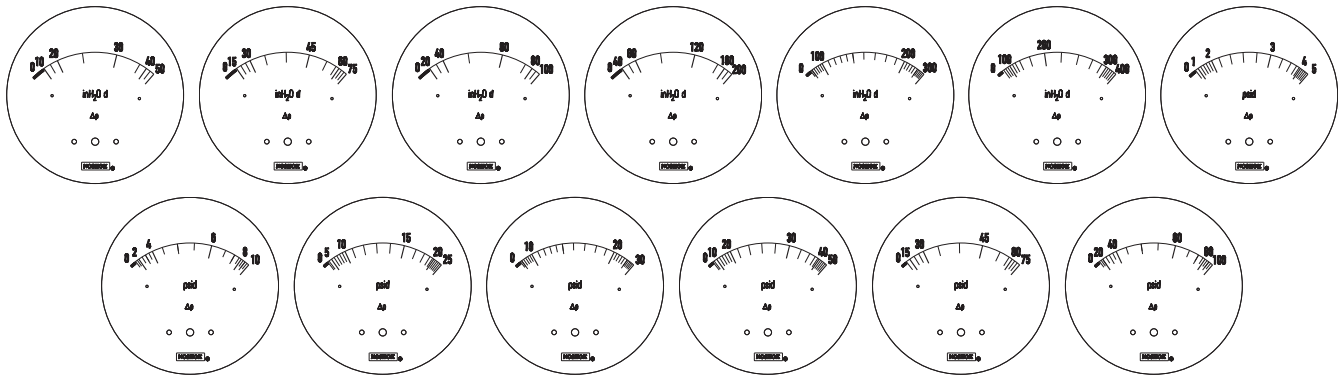
## 1000 Series 2-1/2"



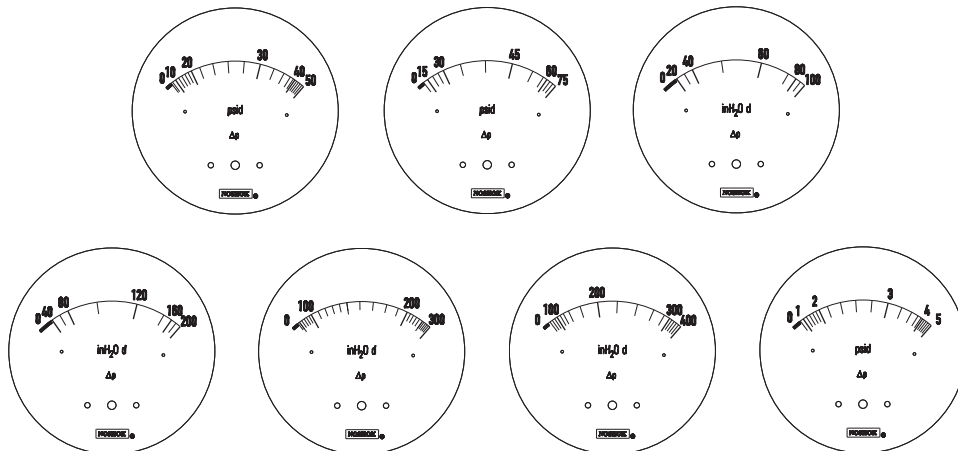
## 1000 Series 4-1/2"



## 1100 Series 2-1/2"

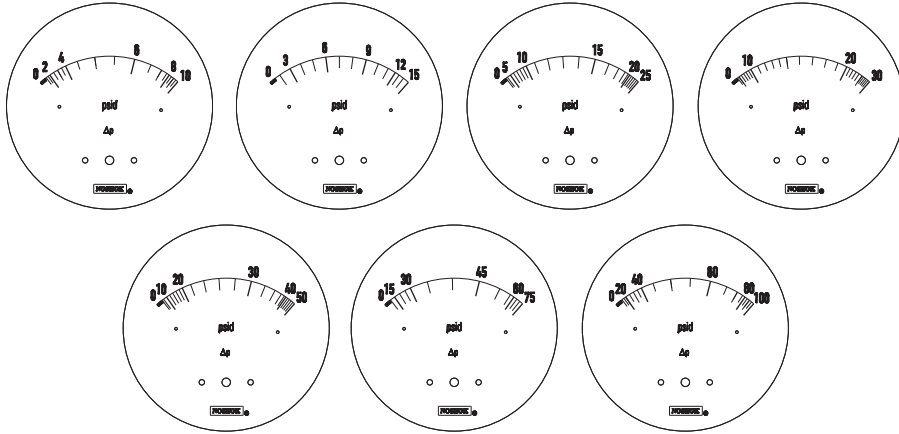


## 1100 Series 4-1/2"

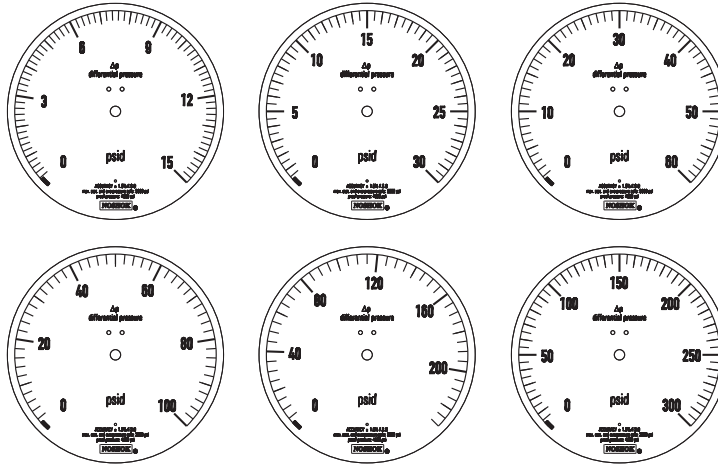




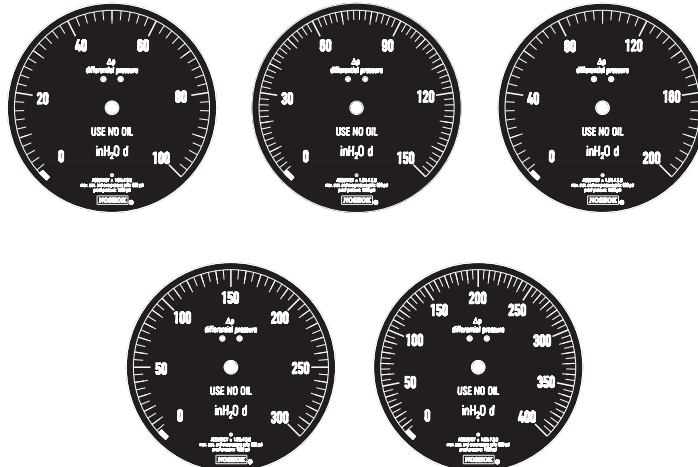
1100 Series 4-1/2"



1200 Series 4-1/2"



1300 Series 4-1/2"





#### APPLICATIONS

- Food & beverage
- Dairy
- Pharmaceutical
- Biomedical

## 10 SERIES

- Meets current standards for 3A and ASME BPE-2009
- Compact size for space restricted applications
- Wide variety of ranges from vacuum to 600 psi
- Process temperatures up to 300 °F (150 °C)
- Gauge size 2", clamp size 3/4"
- Case and cover ring are electropolished stainless steel for exceptional corrosion resistance, complemented with a polycarbonate lens
- ASME-BPE Sanitary Clamp housing and diaphragm are constructed from 316L stainless steel with wetted surfaces electropolished to Ra25 or better
- 316L stainless steel socket is welded to the process connection for greater strength and durability
- C.I.P, S.I.P and Autoclave for the demanding needs of the sanitary market

#### SPECIFICATIONS

Case	2" Electropolished 304 Stainless steel
Cover ring	Electropolished 304 Stainless steel
Lens*	Polycarbonate
Bourdon tube	316 Stainless steel
Socket	316L Stainless steel welded to process connection
Movement	Stainless steel
Accuracy	±2.5% full scale, ANSI Grade B
Pointer	Aluminum, black finish
Dial	Aluminum, white background, black print
Process connection	3/4" ASME-BPE Sanitary Clamp
Seal housing material	316L Stainless steel
Diaphragm material	316L Stainless steel, electropolished to Ra25 or better
Fill fluid	Glycerine, USP Grade
Media temperature	-40 °F to 300 °F (-40 °C to 150 °C)

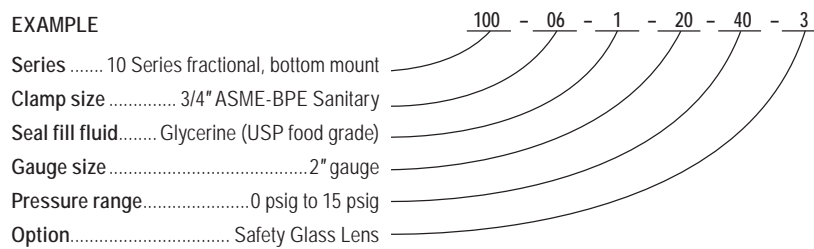
\*Note: Autoclave requires the addition of optional laminated safety glass lens

Diaphragm seal must be installed facing downward or in a vertical position for drainability. Do not install diaphragm seal facing in an upward position.

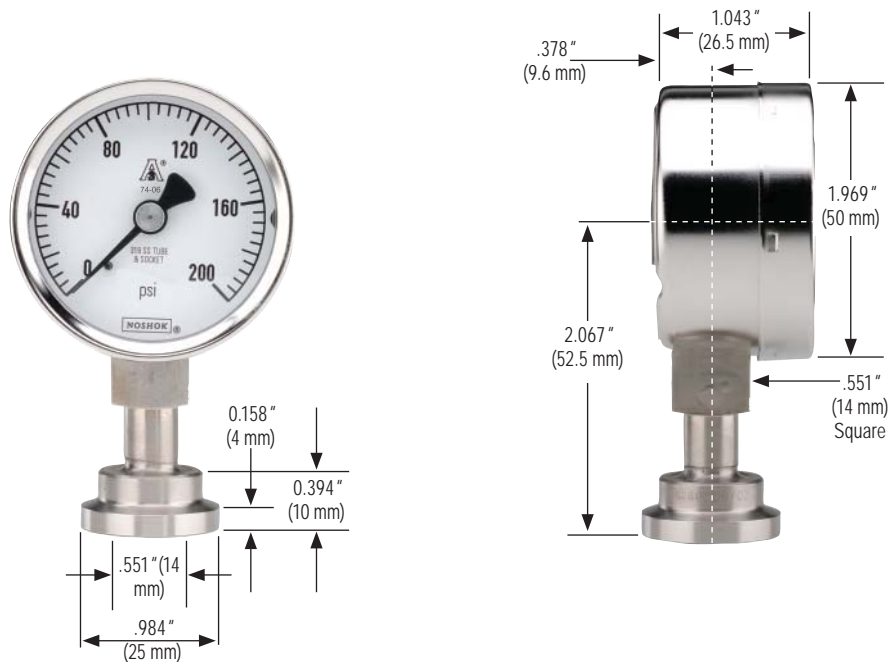
ORDERING INFORMATION			
SERIES	100	10 Series fractional	
CLAMP SIZE	06	3/4"	
SEAL FILL FLUID	1	Glycerine	Other food grade quality fill fluids available – please consult factory
GAUGE SIZE	20	2"	
PRESSURE RANGES	43	0 psig to 30 psig	55 0 psig to 160 psig    64 0 psig to 400 psig
	46	0 psig to 60 psig	58 0 psig to 200 psig    70 0 psig to 600 psig
	49	0 psig to 100 psig	61 0 psig to 300 psig
OPTIONS	0	None	3 Safety Glass Lens    Required for Autoclave applications

Please consult your local NOSHOK Distributor or NOSHOK, Inc. for availability and delivery information.

### EXAMPLE



### 2" Gauge with 3/4" ASME-BPE Sanitary Clamp Connection





#### APPLICATIONS

- Food & beverage
- Dairy
- Pharmaceutical

## 10 SERIES

- Meets current standards for 3A and ASME BPE-2009
- Ranges from -30 inHg to 0 psi through -30 inHg to 600 psi
- 2-1/2" and 4" sizes available, with 1-1/2" or 2" ASME-BPE Sanitary Clamp process connections
- Electropolished 304 stainless steel case with welded 316LSS socket and ASME-BPE Sanitary Clamp process connection
- 316L stainless steel wetted materials electropolished to Ra25 or better for outstanding performance
- Optional liquid filling lubricates gauge internals and extends service life by dampening the effects of vibration, pulsation and shock
- Optional maximum indicating pointer or adjustable pointer
- Exceptional corrosion resistance
- C.I.P, S.I.P and Autoclave\* for the demanding needs of the sanitary market

\*Only dry case gauges are recommended for Autoclave

#### SPECIFICATIONS

Case	Electropolished 304 Stainless steel
Bayonet ring	Electropolished 304 Stainless steel
Lens	Safety glass
Bourdon tube	316 Stainless steel "C" tube
Socket	316L Stainless steel, welded to case & process connection
Movement	Stainless steel
Accuracy	2-1/2" gauge $\pm 1.5\%$ full scale, ANSI Grade A 4" gauge $\pm 1.0\%$ full scale, ANSI Grade 1A
Pointer	Balanced aluminum, black finish
Dial	Aluminum, white background, black print
Gauge fill fluid	Glycerine, USP Grade (optional)
Process connection	1-1/2" or 2" ASME-BPE Sanitary Clamp
Seal housing material	316L Stainless steel
Diaphragm material	316L Stainless steel, electropolished to Ra25 or better
Fill fluid	Glycerine, USP Grade
Media temperature	-40 °F to 300 °F (-40 °C to 150 °C)

Diaphragm seal must be installed facing downward or in a vertical position for drainability. Do not install diaphragm seal facing in an upward position.

ORDERING INFORMATION				
SERIES	100 10 Series heavy-duty			
CLAMP SIZES	12 1-1/2"	16 2"		
SEAL FILL FLUID	1 Glycerine	Other food grade quality fill fluids available – please consult factory		
GAUGE SIZES	25 2-1/2"	40 4"		
PRESSURE RANGES	01 -30 inHg to 0 psig*	16 -30 inHg to 160 psig	46 0 psig to 60 psig	64 0 psig to 400 psig
	04 -30 inHg to 15 psig	19 -30 inHg to 200 psig	49 0 psig to 100 psig	70 0 psig to 600 psig
	07 -30 inHg to 30 psig	22 -30 inHg to 300 psig	55 0 psig to 160 psig	
	10 -30 inHg to 60 psig	40 0 psig to 15 psig*	58 0 psig to 200 psig	
	13 -30 inHg to 100 psig	43 0 psig to 30 psig	61 0 psig to 300 psig	
GAUGE FILLS	0 None	1 Glycerine	2 Silicone	3 Mineral oil
	(All food grade quality fill fluids)			
GAUGE OPTIONS	0 None	1 Max. Indicating Pointer	2 Adjustable Pointer	

Please consult your local NOSHOK Distributor or NOSHOK, Inc. for availability and delivery information.

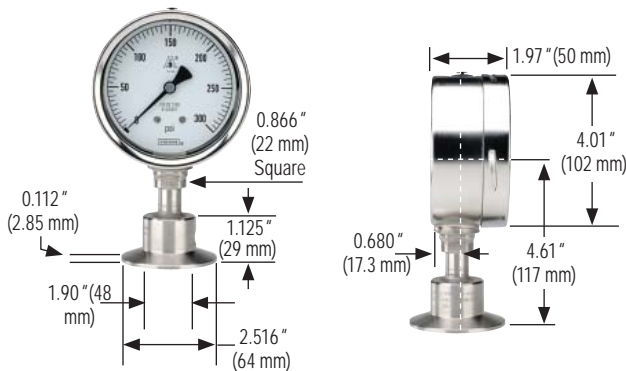
\* Not available on 4" gauge and 1-1/2" ASME-BPE Sanitary Clamp

### EXAMPLE

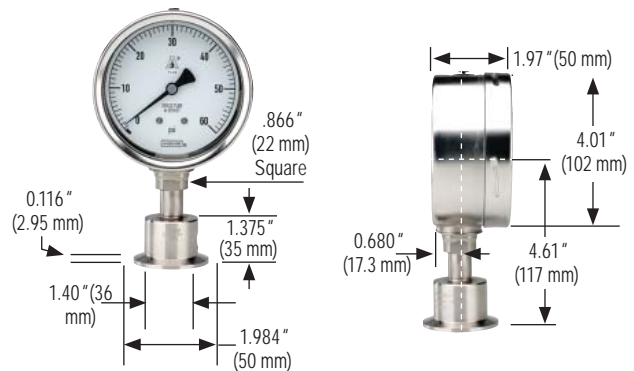
Series ..... 10 Series sanitary gauge, bottom mount  
 Clamp size ..... 1-1/2" ASME-BPE Sanitary  
 Seal fill fluid ..... Glycerine (USP food grade)  
 Gauge size ..... 2-1/2" gauge  
 Pressure range ..... 0 psig to 160 psig  
 Gauge fill ..... Glycerine  
 Option ..... Maximum Indicating Pointer

100 - 12 - 1 - 25 - 55 - 1 - 1

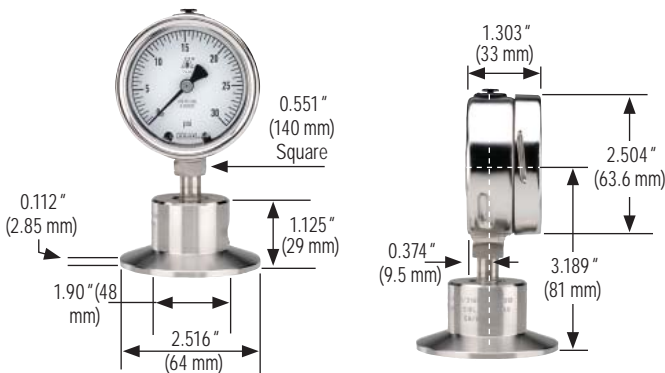
### 4" Gauge with 2" ASME-BPE Sanitary Clamp Connection



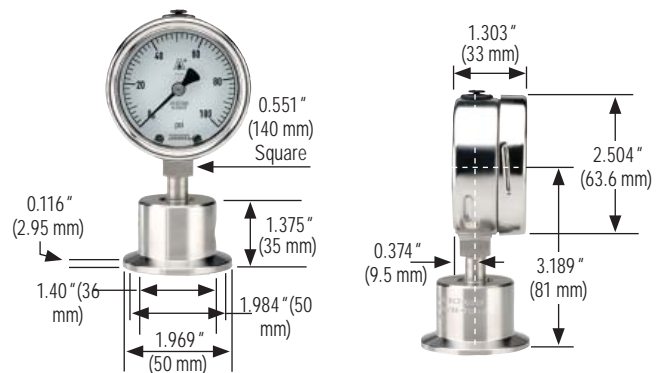
### 4" Gauge with 1-1/2" ASME-BPE Sanitary Clamp Connection



### 2-1/2" Gauge with 2" ASME-BPE Sanitary Clamp Connection



### 2-1/2" Gauge with 1-1/2" ASME-BPE Sanitary Clamp Connection





#### APPLICATIONS

- High pressure applications in:
  - Dairy
  - Food
  - Chemical
  - Biotechnology
  - Pharmaceutical

## 20 SERIES

- Meets current standards for 3A and ASME BPE-2009
- Ranges from 1,000 psi to 15,000 psi
- Process temperatures up to 300 °F for use in more applications
- 4" size with 1-1/8" flanged process connection
- Electropolished 304 stainless steel case with welded 316L stainless steel socket and process connection for greater performance in high pressure applications
- 316L stainless steel wetted materials electropolished to Ra25 or better
- Scratch-resistant laminated safety glass provides clear viewing without discoloring
- Optional liquid filling lubricates gauge internals and extends service life by dampening the effects of vibration, pulsation and shock
- C.I.P, S.I.P and Autoclave\* for the demanding needs of the sanitary market

\*Only dry case gauges are recommended for Autoclave

#### SPECIFICATIONS

Case	Electropolished 304 stainless steel
Bayonet ring	Electropolished 304 stainless steel
Lens	Laminated safety glass
Bourdon tube	316 Stainless steel coiled safety tube
Socket	316L Stainless steel, welded to case & process connection
Movement	Stainless steel
Accuracy	±1.0% full scale, ANSI Grade 1A
Pointer	Balanced aluminum, black finish
Dial	Aluminum, white background, black print
Gauge fill fluid	Glycerine, USP Grade
Mounting	Flange mounted
Process connection	1-1/8" Homogenizer flange
Seal housing material	316L Stainless steel
Diaphragm material	316L Stainless steel, electropolished to Ra25 or better
Fill fluid	Glycerine, USP Grade
Media temperature	-40 °F to 300 °F (-40 °C to 150 °C)

Diaphragm seal must be installed facing downward or in a vertical position for drainability. Do not install diaphragm seal facing in an upward position.

ORDERING INFORMATION				
SERIES	200 20 Series homogenizer			
CLAMP SIZE	42 1-1/8" flange			
SEAL FILL FLUID	1 Glycerine	Other food grade quality fill fluids available- please consult factory		
GAUGE SIZE	40 4"			
PRESSURE RANGES	73 0 psig to 1,000 psig	79 0 psig to 2,000 psig	85 0 psig to 5,000 psig	81 0 psig to 10,000 psig
	76 0 psig to 1,500 psig	82 0 psig to 3,000 psig	88 0 psig to 6,000 psig	94 0 psig to 15,000 psig
GAUGE FILLS	0 None	1 Glycerine	2 Silicone	3 Mineral oil
	(All food grade quality fill fluids)			
GAUGE OPTIONS	0 None	1 Max. Indicating Pointer	2 Adjustable Pointer	

Please consult your local NOSHOK Distributor or NOSHOK, Inc. for availability and delivery information.

**EXAMPLE**

Series ..... 20 Series homogenizer gauge, bottom mount

Clamp size ..... 1-1/8" flange

Seal fill fluid.....Glycerine (USP food grade)

Gauge size.....4" gauge

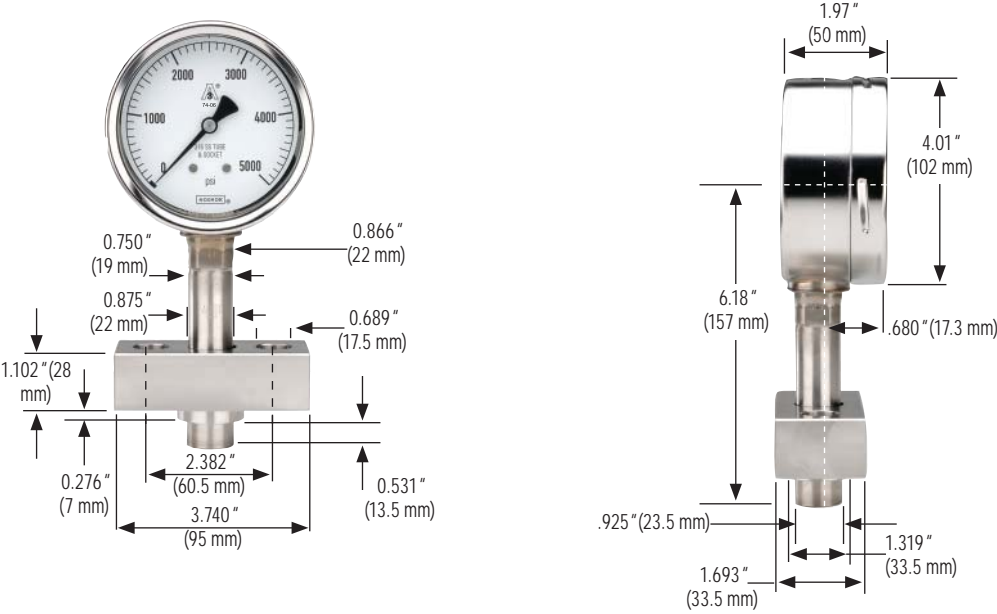
Pressure range.....0 psig to 10,000 psig

Gauge fill.....Glycerine

Option..... Maximum Indicating Pointer

200 - 42 - 1 - 40 - 91 - 1 - 1

**4 "Gauge with 1-1/8 " Homogenizer Flange**



(Custom Flange Dimensions are Available to your Specifications - Please Consult Factory)

# Options & Accessories by Gauge Series

## 100 SERIES STANDARD PRESSURE GAUGE ACCESSORIES

- = Option/accessory is available
- C = Consult factory for availability
- N/C = No charge (consult factory for availability and minimum quantity)
- STD = Standard stock model specification

MODEL NO.	15-100	15-110	15-120	20-100	20-110	20-120	20-148	25-100	25-110	25-120	40-100
CONNECTION											
Installed Panel Mount Clamp (PMC)		•			•				•		
Uninstalled Panel Mount Clamp (15-110 PMC, 20-110 PMC, 25-110 PMC)		•			•				•		
Polished Stainless Steel Bezel (SSB)		•			•				•		
Black Rear Flange (BLRF)								•			•
Black Front Flange (BLFF) - ABS Case		•			•				•		
Chrome Front Flange (CFF) - ABS Case		•			•				•		
Black Front Flange (SBFF) - Steel Case	C			C	•			•	•		•
Chrome Front Flange (SCFF) - Steel Case	C	•		C	•			•	•		•
Black Steel Case (BSC)	C	•	STD	C	•	STD		•	•	STD	•
Stainless Steel Case (SSC)	C	•		C	•			•	•		
Chrome Case (CRC)	C	•		C	•			•	•		
Flat Sided ABS Case (FAC)		•			•				•		
Black Cover Ring (BCR)**	C	•		C	•			•	•		•
Stainless Steel Cover Ring (SSCR)**	C	•		C	•			•	•		
Chrome Cover Ring (CCR)**	C	•		C	•			•	•		•
Chrome Bezel with U-Clamp (CBU)			STD			STD				STD	
Chrome Adapter Ring (CAR)		•	•		•	•			•	•	
Glass Lens (GL)*	C	N/C	•	C	N/C	•		N/C	N/C	•	N/C
Polycarbonate Lens (LL)*								•	•		
Safety Glass Lens (SGL)*								•	•		•
Homalite Lens (HL)*			•			•				•	
Red Set Pointer (SP)**	•	C	C	•	•	C	•	•	•	C	•
Maximum Indicating Pointer (MIP)								C	C	C	
Silicone Dampened Movement (SDM)	C	C	C	C	C	C	C	C	C	C	C
Laser Marking (LM)	•	•	•	•	•	•	•	•	•	•	•
Stainless Steel Tagging (ST)	•	•	•	•	•	•	•	•	•	•	•
Orifice - Brass Press Fit Sintered (20 Micron) (CPO)	•	•	•	•	•	•	•	•	•	•	•
Orifice - Brass Press Fit - 0.1 mm (BP1)	•	•	•	•	•	•	•	•	•	•	•
Orifice - Brass Press Fit - 0.3 mm (BP3)	•	•	•	•	•	•	•	•	•	•	•
Orifice - Brass Press Fit - 0.8 mm (BP8)	•	•	•	•	•	•	•	•	•	•	•

STANDARD ORIFICE FOR 100 SERIES GAUGE IS 0.3 MM PRESS FIT, UNLESS OTHERWISE SPECIFIED.

\* A steel, stainless or chrome case & cover ring must be additionally ordered when lenses other than acrylic are utilized on all 100 Series models

\*\* Only 110 Models require a steel, stainless or chrome case & cover ring to be additionally ordered when utilizing a set pointer or cover ring. Please consult factory when a set pointer is to be utilized on a 120 Model.

Consult factory for additional non-stock and special accessory availability.



## 200 SERIES LOW PRESSURE DIAPHRAGM GAUGE ACCESSORIES

- = Option/accessory is available
- C = Consult factory for availability
- STD = Standard stock model specification

MODEL NO.	25-200	25-210	25-224	40-200
CONNECTION				
Black Rear Flange (BLRF)	•	C		
304SS Rear Flange (SSRF)				•
Black Front Flange (BLFF)	•	•		•
304SS Front Flange (SSFF)				•
Chrome Front Flange (CFF)	•	•		
Stainless Steel Case (SSC)	•	•		STD
Glass Lens (GL)*	•	•		•
Safety Glass Lens (SGL)*	•	•		•
Acrylic Lens (PL)	STD	STD		•
Recalibrator Lens (RL)	•	•		
Red Set Pointer (SP)	•	•	•	•
Maximum Indicating Pointer (MIP)	•	•	•	C
Overpressure Protection (OP)	C	C	C	C
SS Bezel w/U-Clamp (SSBU)		•		
Black Bezel w/U-Clamp (BBU)		•		
Black Cover Ring (BCR)	•	•		
Stainless Steel Cover Ring (SSCR)	•	•		STD
Chrome Cover Ring (CCR)	•	•		
Laser Marking (LM)	•	•	•	•
Stainless Steel Tagging (ST)	•	•	•	•
Orifice - Brass Press Fit - 0.3 mm (BP3)		•	•	•
Orifice - Brass Threaded - 0.3 mm (BT3)	•	•	•	•





STANDARD ORIFICE FOR 200 SERIES GAUGE IS 0.3 MM PRESS FIT, UNLESS OTHERWISE SPECIFIED.

\* A steel, stainless or chrome cover ring must be additionally ordered when lenses other than acrylic are utilized on all 2-1/2" 200 Series models.

Consult factory for additional non-stock and special accessory availability.

## 300 SERIES BRASS CASE LIQUID-FILLED GAUGE ACCESSORIES

- = Option/accessory is available

MODEL NO.	25-300	25-310	40-300	40-310
CONNECTION				
Chrome Front Flange (CFF)	•	•	•	•
Chrome Front Flange (CFF) w/o Holes	•	•	•	•
Brass Front Flange (BFF)	•	•	•	•
Black Front Flange (BLFF)			•	•
304SS Rear Flange (SSRF)			•	•
Rear Flange (RF)	•	•		
Chrome Cover Ring (CCR)	•	•	•	
Chrome Bezel with U-Clamp (CBU)		•		•
Maximum Indicating Pointer (MIP)	•	•		
Polycarbonate Lens (LL)			•	•
Glass Lens Overlay (GLO)	•	•		
Safety Glass Overlay (SGO)	•	•	•	•
Safety Glass Lens (SGL)			•	•
Adapter Ring (AR)		•		•
7/16" - 20 Straight Thread (SST)*	•	•	•	•
Laser Marking (LM)	•	•	•	•
Stainless Steel Tagging (ST)	•	•	•	•
Orifice - Brass Threaded - 0.3 mm (BT3)	•	•	•	•
Orifice - Brass Threaded - 0.4 mm (BT4)	•	•	•	•
Orifice - Brass Threaded - 0.8 mm (BT8)	•	•	•	•

STANDARD ORIFICE FOR 300 SERIES GAUGE IS 0.8 MM THREADED, UNLESS OTHERWISE SPECIFIED.










\* Includes FKM o-ring. Consult factory for availability.

Consult factory for additional non-stock and special accessory availability.

# Options & Accessories by Gauge Series

## 400/500 SERIES ALL STAINLESS STEEL PRESSURE GAUGES DRY, LIQUID & AMMONIA GAUGE ACCESSORIES





- = Option/accessory is available
- C = Consult factory for availability
- STD = Standard stock model specification

MODEL NO.	15-401	15-411	25-400	25-410	40-400	40-410	60-400	60-410	25-406
			25-500	25-510	40-500	40-510	60-500	60-510	25-506
CONNECTION									
304 SS Front Flange (SSFF)				•	•	•	•	•	
304 SS Rear Flange (SSRF)			C	C	•	•	•	•	C
SS Bezel w/U-Clamp (SSBU)						•		•	
Installed 304SS Panel Mount Clamp (SPMC)				•					
Uninstalled 304SS Panel Mount Clamp (25-459-1-SS-PMC)				•					
Installed Steel Panel Mount Clamp (PMC)				•					
Uninstalled Steel Panel Mount Clamp (25-459-1-PMC)				•					
Flange Ring (FR)				•					
Flange Ring 304SS (SSFR)				•					
Adjustable Pointer (AP)					•	•	STD	STD	
Safety Glass Lens (SGL)			•	•	•	•	STD	STD	•
Maximum Indicating Pointer (MIP)			•	•	•	•	•	•	•
Red Set Pointer (SP)			•	•	•	•	•	•	•
Laser Marking (LM)	•	•	•	•	•	•	•	•	•
Stainless Steel Tagging (ST)	•	•	•	•	•	•	•	•	•
Orifice - 316SS Threaded Orifice - 0.8 mm (ST8)	•	•	•	•	•	•	•	•	•
Orifice - 316SS Threaded Orifice - 0.5 mm (ST5)	•	•	•	•	•	•	•	•	•

STANDARD ORIFICE FOR 400/500 SERIES GAUGE IS 0.8 MM THREADED, UNLESS OTHERWISE SPECIFIED.

Consult factory for additional non-stock and special accessory availability.


## 600/700 SERIES PROCESS GAUGE ACCESSORIES

MODEL NO.	DRY		LIQUID FILLED	
	45-640	45-740	45-660	45-760
CONNECTION				
Safety Glass Lens (SGL)	•	•	•	•
Glass Lens (GL)	•	•	•	•
Maximum Indicating Pointer (MIP)	•	•	•	•
Uninstalled Black Panel Mount Ring (BPMR)	•	•	•	•
Uninstalled Chrome Panel Mount Ring (CPMR)	•	•	•	•
Manocont "Dampened" Movement (MDM)	•	•		
Overload Stop (OS)	•	•	•	•
Laser Marking (LM)	•	•	•	•
Stainless Steel Tagging (ST)	•	•	•	•
Orifice - Brass Press Fit - 0.3 mm (BP3)	•		•	
Orifice - Brass Threaded - 0.8 mm (BT8)	•		•	
Orifice - 316SS Threaded - 0.8 mm (ST8)		•		•

STANDARD ORIFICE FOR 600/700 SERIES GAUGE IS 0.8 MM THREADED, UNLESS OTHERWISE SPECIFIED.

Consult factory for additional non-stock and special accessory availability.

## 800 SERIES PRECISION TEST GAUGE ACCESSORIES








MODEL NO.	60-800
CONNECTION	
304 SS Front Flange (SSFF)	•
304 SS Rear Flange (SSRF)	•
Carrying Case (GC)	•
Laser Marking (LM)	•
Stainless Steel Tagging (ST)	•
Orifice - Brass Press Fit - 0.3 mm (below 10,000 psi) (BP3)	•
Orifice - Brass Threaded - 0.8 mm (below 10,000 psi) (BT8)	•
Orifice - 316SS Threaded - 0.8 mm (10,000 - 20,000 psi) (ST8)	•

STANDARD ORIFICE FOR 800 SERIES GAUGE IS 0.8 MM THREADED, UNLESS OTHERWISE SPECIFIED.

Consult factory for additional non-stock and special accessory availability.

## 900 SERIES - LIQUID FILLED PRESSURE GAUGE ACCESSORIES

- = Option/accessory is available
- C = Consult factory for availability
- STD = Standard stock model specification

MODEL NO.	15-910	25-900	25-910	25-901	25-911	40-901	40-911
CONNECTION							
Chrome Flange Ring (CFR)			•		•		
304 SS Polished Flange Ring (SSFR)			•		•		
Installed 304SS Panel Mount Clamp (SPMC)					•		
Uninstalled 304SS Panel Mount Clamp (25-459-1-55-SPMC)					•		
Installed Steel Panel Mount Clamp (PMC)			•		•		
Uninstalled Steel Panel Mount Clamp (25-459-1-PMC)			•		•		
SS Bezel with U-Clamp (SSBU)							•
Adjustable Pointer (AP)						•	•
Safety Glass Lens (SGL)				•	•	•	•
Black Front Flange (BLFF)			•				
304 SS Front Flange (SSFF)					•	•	•
304 SS Rear Flange (SSRF)				C	C	•	•
Maximum Indicating Pointer (MIP)				•**	•**	•	•
Red Set Pointer (SP)				•	•	•	•
7/16" - 20 Straight Thread (SST)*		•	•	•	•	•	•
Laser Marking (LM)	•	•	•	•	•	•	•
Stainless Steel Tagging (ST)	•	•	•	•	•	•	•
Orifice - Brass Press Fit - 0.3 mm (BP3)	•	•	•	•	•	•	•
Orifice - Brass Threaded - 0.5 mm (BT5)	•	•	•	•	•		
Orifice - Brass Threaded - 0.8 mm (BT8)						•	•

STANDARD ORIFICE FOR 900 SERIES GAUGE IS 0.3 MM PRESS FIT, UNLESS OTHERWISE SPECIFIED.

\* Includes FKM o-ring. Consult factory for availability.

\*\* For ranges 60 psi and above.

Consult factory for additional non-stock and special accessory availability.

# Options & Accessories

## Panel Mounting/Flanges

- Many panel mounting options are available and can be installed in the field
- Options include:
  - Brass Front Flanges (BFF)
  - Black Painted Steel Front Flanges (BLFF)
  - Chrome Front Flanges (CFF)
  - Stainless Steel Front Flanges (SSFF)
  - Chrome Triangular Bezel with U-Clamp (CBU)
  - Black Painted Steel Triangular Bezels with U-Clamp (BBU-Clamp)
  - Stainless Steel Narrow Bezel Front Flanges (SSBU)
  - Panel Mount Clamps (PMC)
- Chrome plated steel Adapter Rings (AR) are available in conjunction with several of these flanges to adapt to oversized panel cut outs, including:
  - Stainless Steel Flange Rings (SSFR)
  - Chrome Plated Steel Flange Rings (CFR)
  - Black or Chrome Panel Mount Rings (BPMR & CPMR)
- Rear Flanges (RF) for front of panel mounting are also available as a factory installed option on some models



Panel Mount Clamp  
20-110 PMC



Chrome Triangular Bezel  
with U-Clamp



Cases and Cover Rings

## Cases and Cover Rings

- The following cases and cover rings are available on many models as production options:
  - Black painted steel (BCR)
  - Chrome-plated steel (CCR)
  - 304 Stainless steel (SSCR)
- Some models are also available with a solid front, safety case

## Lenses

- A variety of lens options are available on many models as a production option:
  - Instrument glass lenses
  - Laminated safety glass lenses
  - Acrylic lenses
  - Homalite lenses (resistant to many industrial solvents)
- A steel or stainless case and cover ring may be required when other than acrylic lenses are utilized

## Maximum Indicating Pointers (MIP)

- An invaluable tool for identifying pressure spikes in a system
- Extremely helpful during system start up and troubleshooting
- MIPs add an additional  $\pm 1\%$  error to the gauge because of the increased load on the Bourdon tube
- On ranges of 60 psi and lower, MIPs may double the allowed error of the gauge



Maximum Indicating Pointer

See the Gauges Accessories & Options Charts on pgs. 66-68 for availability on specific models

### Set Pointers (SP)

- Used to identify an operating minimum or maximum pressure or vacuum value
- Set pointers are available on many models



Set Pointers

### Rubber Case Protectors (RCP)

- Ideal for gauges that are subjected to direct physical shock
- 2-1/2" covers are blue and 4" covers are black



Rubber Case Protectors

### Orifices

- Press-fit or threaded orifices in brass or 316 stainless steel are available on all NOSHOK pressure gauges
- Available with I.D.'s from .004" to .032" depending on the model
- Used in a gauge to restrict the flow of rapidly increasing and decreasing pressures, reducing the immediate effect of pulsations and pressure spikes
- Recommended for all dynamic applications

### Recalibrators & Adjustable Pointers

- This option gives the user the capability of resetting the pointer by an adjustment screw accessible through the dial, or by a gear located on the pointer

### Overpressure Protection

- Overpressure protection of 3 times up to 10 times of the dial range is available on some models as a production option

### Ammonia Refrigeration Gauges

- Ammonia and refrigeration gauges with dials reading in both pressure and temperature are available in 400/500 Series 2-1/2" and 4" sizes
- Refrigeration gauges with dials reading in pressure and temperature are available in 300, 400 and 500 Series for R-12 and R-22



Ammonia Gauges

### Liquid Filling Options

- Many NOSHOK gauges are available with liquid filling options
- Standard fill is glycerine
- Optional fill liquids include Dow Corning 200® Silicone and Halocarbon®

### Special Connections

- Available on most NOSHOK gauges
- Some examples include:
  - Metric threads
  - Female threads
  - Straight threads (flare or swivel type)
  - Special o-ring connections
- Please contact us with your requirements for prices, availability and minimum quantities

### Reid Vapor Test Gauges

- Configuration includes a handle, special dial and special pressure port
- Available in 600/700 Series gauges with pressure ranges of 0 psi to 5 psi, 0 psi to 5 psi and 0 psi to 30 psi

See the Gauges Accessories & Options Charts on pgs. 66-68 for availability on specific models

# Options & Accessories

## Receiver Gauges

- 3 psi to 15 psi receiver gauges are available in both 600 Series (brass) and 700 Series (316 stainless steel)

## Metric Dials And Customized Special Dials

- Dual scale metric dials in psi/bar, psi/kPa and psi/kg/cm<sup>2</sup> are available on many models
- Certain other scales are available for specific sizes and ranges, such as single scale bar and kPa, refrigerant scales and altitude scales
- Please consult the factory for availability
- Customized special dials such as non-standard metric scale, tons of ram, lbs. of force, etc. are available in small quantities (as few as one piece) on some models



Metric Dials and Customized Special Dials

## Certified Calibration

- Available on all NOSHOK gauges
- Certified calibration provides the user with a serial numbered gauge along with a calibration sheet against a primary pressure standard
- Traceable to the National Institute of Standards and Technology

## Piston-Type Snubbers

- Resist clogging and are self cleaning
- Five different sized pistons included with each snubber to ensure the correct amount of snubbing for virtually every application
- Available in brass and 316 stainless steel in 1/4" NPT, 1/2" NPT or SAE J1926-3: 7/16-20

### Options & Accessories

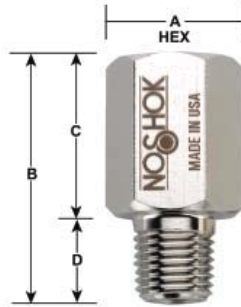
#### Sintered Snubbers Specifications

MODEL NO.	SIZE	MATERIAL	PRESSURE RATING
1325	1/4" NPT	Brass	6,000 psi
1335	SAE J1926-3:7/16-20	Brass	5,000 psi
1350	1/2" NPT	Brass	6,000 psi
5025	1/4" NPT	316 Stainless steel	15,000 psi
5035	SAE J1926-3:7/16-20	316 Stainless steel	8,000 psi
5050	1/2" NPT	316 Stainless steel	15,000 psi



Piston-Type Snubbers

DIMENSIONS		1/4" NPT	1/2" NPT	SAE J1926-3: 7/16-20
A	IN	0.812	1.125	0.812
	MM	20.6	28.6	20.6
B	IN	1.60	1.875	1.60
	MM	40.6	47.6	40.6
C	IN	1.04	1.25	1.24
	MM	26.4	31.8	31.5
D	IN	.56	0.625	0.36
	MM	14.2	15.9	9.1



PISTON	SUGGESTED USE
A, B*	Gases
B, C	Water
C, D	Light Oil
E	Heavy Oil

\* Snubber assembled and shipped with the B piston installed

## Sintered Snubbers

- Cost effective solution to protect expensive instrumentation
- Increases gauge readability by smoothing out pressure surges, pulsations and spikes
- Eliminates instrument failure due to pressure shock
- 5 basic elements available for each snubber to accommodate specific application needs
- Snubbing action achieved by utilizing a corrosion resistant 316 stainless steel sintered porous element
- Exotic materials or intermediate disc grades available
- Provides long service life with no moving parts to wear out

### Options & Accessories

#### Sintered Snubbers Specifications

MODEL NO.	SIZE	MATERIAL	PRESSURE RATING
1125-X	1/4" NPT	Brass	6,000 psi
1135-X	SAE J1926-3:7/16-20	Brass	5,000 psi
1150-X	1/2" NPT	Brass	6,000 psi
5125-X	1/4" NPT	316 Stainless steel	15,000 psi
5150-X	1/2" NPT	316 Stainless steel	15,000 psi

Note: The "X" in the Model Number denotes the Disc option (example: 1135-C).

See chart below for Disc options.

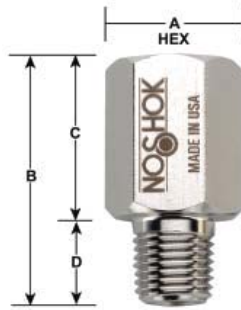


Sintered Snubbers



Sintered Snubbers Replacement Discs

DIMENSIONS		1/4" NPT	1/2" NPT	SAE J1926-3: 7/16-20
A	IN	0.812	1.125	0.812
	MM	20.6	28.6	20.6
B	IN	1.60	1.875	1.60
	MM	40.6	47.6	40.6
C	IN	1.04	1.25	1.24
	MM	26.4	31.8	31.5
D	IN	.56	0.625	0.36
	MM	14.2	15.9	9.1



#### Sintered Snubbers Replacement Disc Options

DISC GRADE	MODEL NO.	AVERAGE AIR FLOW ESTIMATE	MICRON GRADE (reference)	SUGGESTED USE
A	PD8-A-SS1	0.25 L/MIN @ 1 psi	2	Gases
B	PD8-B-SS1	0.63 L/MIN @ 1 psi	10	Gases, Water
C	PD8-C-SS1	1.46 L/MIN @ 1 psi	20	Water, Light Oil
D	PD8-D-SS1	2.79 L/MIN @ 1 psi	40	Light Oil
E	PD8-E-SS1	3.14 L/MIN @ 1 psi	60	Heavy Oil

# Options & Accessories

## Pigtail Steam Syphons

- Protect the instrument from the damaging effects of high temperature steam
- Recommended for use in steam applications and systems that contain superheated vapor
- Available in 1/4" and 1/2" NPT sizes in welded steel, welded 316 stainless steel or seamless 316 stainless steel with ratings to 3,800 psi @ 850 °F

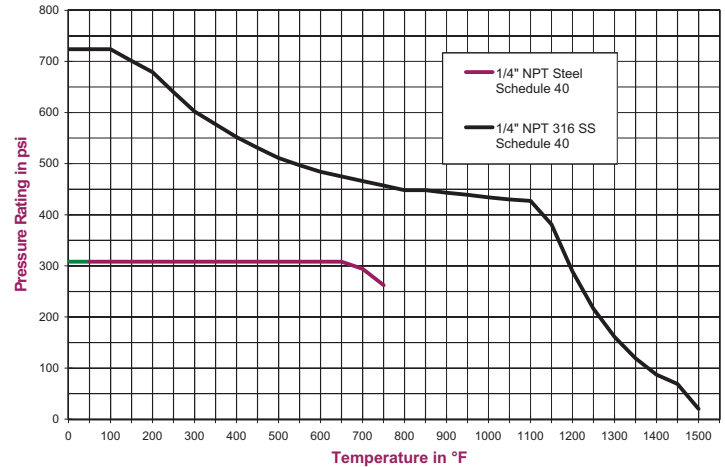
Pigtail Steam Syphons



### Product Specifications

MODEL NO.	COIL STYLE	SIZE	MATERIAL
1225	90°	1/4" NPT	Welded steel, schedule 40
1250		1/2" NPT	Welded steel, schedule 80
2225		1/4" NPT	Welded 316SS, schedule 40
2250		1/2" NPT	Seamless 316SS, schedule 80
1025	180°	1/4" NPT	Welded steel, schedule 40
1050		1/2" NPT	Welded steel, schedule 80
2025		1/4" NPT	Welded 316SS, schedule 40
2050		1/2" NPT	Seamless 316SS, schedule 80
1425	270°	1/4" NPT	Welded steel, schedule 40
1450		1/2" NPT	Welded steel, schedule 80
2325		1/4" NPT	Welded 316SS, schedule 40
2350		1/2" NPT	Seamless 316SS, schedule 80
1525	360°	1/4" NPT	Welded steel, schedule 40
1550		1/2" NPT	Welded steel, schedule 80
2525		1/4" NPT	Welded 316SS, schedule 40
2550		1/2" NPT	Seamless 316SS, schedule 80

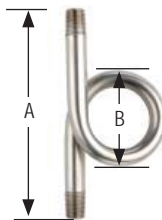
1/4" NPT Steam Syphons Temperature vs. Pressure



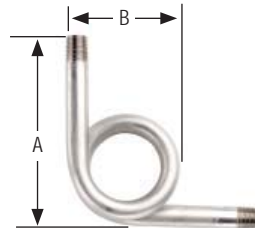
90° Syphon



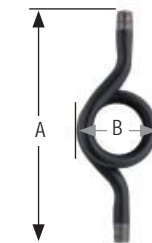
180° Syphon



270° Syphon

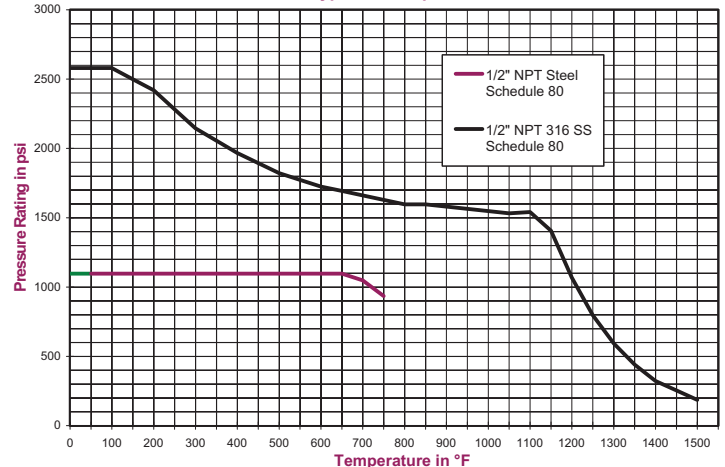


360° Syphon



CONNECTION SIZE			1/4" NPT	1/2" NPT
90°	A	IN	4.25	6.5
		MM	107.95	165.1
90°	B	IN	2.625	4.0
		MM	66.675	101.6
180°	A	IN	5.5	8.875
		MM	139.7	225.425
180°	B	IN	2.5	4.0
		MM	63.5	101.6
270°	A	IN	4.5	7.5
		MM	114.3	190.5
270°	B	IN	2.625	4.0
		MM	66.675	101.6
360°	A	IN	2.625	4.125
		MM	66.675	104.775
360°	B	IN	7.25	12.0
		MM	184.15	304.8

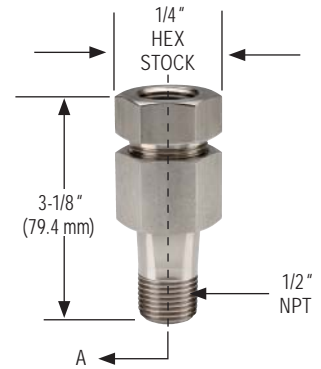
1/2" NPT Steam Syphons Temperature vs. Pressure





## Swivel Adapter

- Temperature ratings: 15,000 psi @ 200 °F and 3,000 psi @ 1,000 °F
- Used with gauges and gauge valves to adjust the line of sight
- Rotates 360° to allow the connected instrument to be positioned in the desired direction
- The pressure connection is achieved with a tapered cone style compression fitting simply by tightening the swivel hex nut
- All 316 stainless steel construction
- Standard with 1/2" NPT male process – 1/2" NPT female instrument connections
- Also available with 1/4" NPT connections

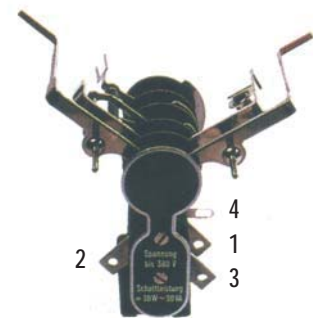


## Magnetic Spring Contact Switch (MSCS)

- An excellent choice when an accurate pressure switch is required in addition to a reliable pressure gauge
- Fully adjustable by the user
- These switches are actuated by the pressure gauge pointer to provide accurate field adjustment
- A removable adjustment key makes them tamper-proof
- They operate with an extremely broad power supply, AC or DC up to 250V max. (30W 50 VA), allowing them to be used virtually anywhere in the world in addition to very remote applications with only DC battery pack power available
- Standard units consist of (2) two magnetic spring switches; either one or both switches may be used:
  - Switch (1) one is normally closed
  - Switch (2) two is normally open with operation referenced on rising (or increasing) pressure
- Magnetic spring contact switches are available as a factory installed option on models 40-400, 40-410, 40-901 dry and 40-911 dry.
- The lowest full scale pressure range this switch may be used on is 0 psi to 60 psi because of the increased load on the pointer and Bourdon tube
- A matching 4-pin connector with 5' of 4-wire and color coded shielded cable is standard



Magnetic Spring Contact Switch



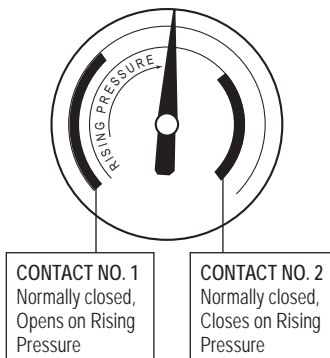
### WIRING AND TERMINAL LOCATION

1. Contact Switch No. 1; Red or Black
2. Contact Switch No. 2; Blue
3. Power; Green or Brown
4. Ground; Yellow/Green Stripe

SPECIFICATIONS	
Type of power	A.C. or D.C. 24 to 250V max
Maximum amps	1.0 A
Maximum switching capacity	30W/50 VA
Gauge accuracy	Add an additional $\pm 2\%$
Minimum magnet holding force	1g
Contact pin material	Silver Tungsten
Ambient temperature limitation	0 °F to 140 °F (-18 °C to 61 °C)
Minimum full scale pressure range	0-60 psi

### APPLICATIONS

- Air compressors
- Gas compressors
- Hydraulic and pneumatic circuitry
- Die-cast machinery
- Plastic injection molding machinery
- Anywhere accurate off/on switching capabilities based on pressure are required



## Accuracy/Standard Dial Configuration

Applies to:

300 Series Gauges: 4"

400/500 Series Gauges: 4" and 6"

900 Series Gauges: 4"

ACCURACY: ±1.0% full scale ASME B40.100 Grade 1A											
Primary Scale				Secondary Scales							
Dial Range	Figure	Graduation	kPa	Figure	Graduation	Figure	Graduation	bar	Figure	Graduation	
-30 inHg to 0 psi	-5 inHg	-0.5 inHg	-100 kPa to 0 kPa	-20 kPa	-2 kPa	-1 kg/cm <sup>2</sup> to 0 kg/cm <sup>2</sup>	-0.2 kg/cm <sup>2</sup>	-0.02 kg/cm <sup>2</sup>	-1 bar to 0 bar	-0.2 bar	-0.02 bar
-30 inHg to 15 psi	-10 inHg 5 psi	-1 inHg 0.5 psi	-100 kPa to 100 kPa	-50 kPa 50 kPa	-5 kPa 2 kPa	-1 kg/cm <sup>2</sup> to 1.05 kg/cm <sup>2</sup>	-0.5 kg/cm <sup>2</sup> 0.5 kg/cm <sup>2</sup>	-0.05 kg/cm <sup>2</sup> 0.05 kg/cm <sup>2</sup>	-1 bar to 1 bar	-0.5 bar 0.5 bar	-0.05 bar 0.05 bar
-30 inHg to 30 psi	-10 inHg 5 psi	-1 inHg 0.2 psi	-100 kPa to 200 kPa	-50 kPa 50 kPa	-5 kPa 5 kPa	-1 kg/cm <sup>2</sup> to 2.10 kg/cm <sup>2</sup>	-1 kg/cm <sup>2</sup> 0.5 kg/cm <sup>2</sup>	-0.1 kg/cm <sup>2</sup> 0.01 kg/cm <sup>2</sup>	-1 bar to 2.05 bar	-0.5 bar 0.5 bar	-0.05 bar 0.05 bar
-30 inHg to 60 psi	-30 inHg 10 psi	-2 inHg 1 psi	-100 kPa to 410 kPa	-100 kPa 100 kPa	-10 kPa 10 kPa	-1 kg/cm <sup>2</sup> to 4.2 kg/cm <sup>2</sup>	-1 kg/cm <sup>2</sup> 1 kg/cm <sup>2</sup>	-0.1 kg/cm <sup>2</sup> 0.1 kg/cm <sup>2</sup>	-1 bar to 4 bar	-1 bar 1 bar	-1 bar .01 bar
-30 inHg to 100 psi	-30 inHg 20 psi	-5 inHg 2 psi	-100 kPa to 680 kPa	-100 kPa 200 kPa	-20 kPa 20 kPa	-1 kg/cm <sup>2</sup> to 7 kg/cm <sup>2</sup>	-1 kg/cm <sup>2</sup> 2 kg/cm <sup>2</sup>	-0.2 kg/cm <sup>2</sup> 0.2 kg/cm <sup>2</sup>	-1 bar to 6.8 bar	-1 bar 2 bar	-0.2 bar 0.2 bar
-30 inHg to 160 psi	-30 inHg 20 psi	-10 inHg 2 psi	-100 kPa to 1,100 kPa	-100 kPa 200 kPa	-20 kPa 20 kPa	-1 kg/cm <sup>2</sup> to 11.2 kg/cm <sup>2</sup>	-1 kg/cm <sup>2</sup> 2 kg/cm <sup>2</sup>	-0.2 kg/cm <sup>2</sup> 0.2 kg/cm <sup>2</sup>	-1 bar to 11 bar	-1 bar 2 bar	-0.2 bar 0.2 bar
-30 inHg to 200 psi	-30 inHg 40 psi	-5 inHg 4 psi	-100 kPa to 1,360 kPa	-100 kPa 400 kPa	-20 kPa 40 kPa	-1 kg/cm <sup>2</sup> to 14 kg/cm <sup>2</sup>	-1 kg/cm <sup>2</sup> 4 kg/cm <sup>2</sup>	-0.2 kg/cm <sup>2</sup> 0.4 kg/cm <sup>2</sup>	-1 bar to 13.6 bar	-1 bar 4 bar	-0.2 bar 0.4 bar
-30 inHg to 300 psi	-30 inHg 50 psi	-10 inHg 5 psi	-100 kPa to 2,050 kPa	-100 kPa 500 kPa	-50 kPa 50 kPa	-1 kg/cm <sup>2</sup> to 21 kg/cm <sup>2</sup>	-1 kg/cm <sup>2</sup> 5 kg/cm <sup>2</sup>	-0.5 kg/cm <sup>2</sup> 0.5 kg/cm <sup>2</sup>	-1 bar to 20.5 bar	-1 bar 5 bar	-0.5 bar 0.5 bar
0 psi to 15 psi	3 psi	0.2 psi	0 kPa to 100 kPa	30 kPa	2 kPa	0 kg/cm <sup>2</sup> to 1.05 kg/cm <sup>2</sup>	0.3 kg/cm <sup>2</sup>	0.05 kg/cm <sup>2</sup>	0 bar to 1 bar	0.3 bar	0.02 bar
0 psi to 30 psi	5 psi	0.5 psi	0 kPa to 205 kPa	50 kPa	5 kPa	0 kg/cm <sup>2</sup> to 2.1 kg/cm <sup>2</sup>	0.5 kg/cm <sup>2</sup>	0.1 kg/cm <sup>2</sup>	0 bar to 2.05 bar	0.5 bar	0.05 bar
0 psi to 60 psi	10 psi	1 psi	0 kPa to 410 kPa	100 kPa	10 kPa	0 kg/cm <sup>2</sup> to 4.2 kg/cm <sup>2</sup>	1 kg/cm <sup>2</sup>	0.2 kg/cm <sup>2</sup>	0 bar to 4.1 bar	1 bar	0.01 bar
0 psi to 100 psi	20 psi	2 psi	0 kPa to 680 kPa	200 kPa	20 kPa	0 kg/cm <sup>2</sup> to 7 kg/cm <sup>2</sup>	2 kg/cm <sup>2</sup>	0.2 kg/cm <sup>2</sup>	0 bar to 6.8 bar	2 bar	0.2 bar
0 psi to 160 psi	20 psi	2 psi	0 kPa to 1,100 kPa	200 kPa	20 kPa	0 kg/cm <sup>2</sup> to 11.0 kg/cm <sup>2</sup>	2 kg/cm <sup>2</sup>	0.4 kg/cm <sup>2</sup>	0 bar to 11 bar	2 bar	0.2 bar
0 psi to 200 psi	40 psi	4 psi	0 kPa to 1,360 kPa	400 kPa	40 kPa	0 kg/cm <sup>2</sup> to 14 kg/cm <sup>2</sup>	4 kg/cm <sup>2</sup>	0.5 kg/cm <sup>2</sup>	0 bar to 13.6 bar	4 bar	0.4 bar
0 psi to 300 psi	50 psi	5 psi	0 kPa to 2,050 kPa	500 kPa	50 kPa	0 kg/cm <sup>2</sup> to 21 kg/cm <sup>2</sup>	5 kg/cm <sup>2</sup>	0.5 kg/cm <sup>2</sup>	0 bar to 20 bar	5 bar	0.5 bar
0 psi to 400 psi	50 psi	5 psi	0 kPa to 2,700 kPa	500 kPa	50 kPa	0 kg/cm <sup>2</sup> to 28 kg/cm <sup>2</sup>	5 kg/cm <sup>2</sup>	0.5 kg/cm <sup>2</sup>	0 bar to 27 bar	5 bar	0.5 bar
0 psi to 600 psi	100 psi	10 psi	0 kPa to 4,100 kPa	1,000 kPa	100 kPa	0 kg/cm <sup>2</sup> to 42 kg/cm <sup>2</sup>	10 kg/cm <sup>2</sup>	1 kg/cm <sup>2</sup>	0 bar to 41 bar	10 bar	1 bar
0 psi to 1,000 psi	200 psi	20 psi	0 kPa to 6,800 kPa	2,000 kPa	200 kPa	0 kg/cm <sup>2</sup> to 70 kg/cm <sup>2</sup>	20 kg/cm <sup>2</sup>	2 kg/cm <sup>2</sup>	0 bar to 68 bar	20 bar	2 bar
0 psi to 1,500 psi	300 psi	20 psi	0 kPa to 10,000 kPa	3,000 kPa	200 kPa	0 kg/cm <sup>2</sup> to 105 kg/cm <sup>2</sup>	30 kg/cm <sup>2</sup>	2 kg/cm <sup>2</sup>	0 bar to 100 bar	30 bar	2 bar
0 psi to 2,000 psi	400 psi	40 psi	0 kPa to 13,600 kPa	4,000 kPa	400 kPa	0 kg/cm <sup>2</sup> to 140 kg/cm <sup>2</sup>	40 kg/cm <sup>2</sup>	4 kg/cm <sup>2</sup>	0 bar to 136 bar	40 bar	4 bar
0 psi to 3,000 psi	500 psi	50 psi	0 kPa to 20,500 kPa	5,000 kPa	500 kPa	0 kg/cm <sup>2</sup> to 210 kg/cm <sup>2</sup>	50 kg/cm <sup>2</sup>	5 kg/cm <sup>2</sup>	0 bar to 205 bar	50 bar	5 bar
0 psi to 5,000 psi	1,000 psi	100 psi	0 kPa to 34,000 kPa	10,000 kPa	1,000 kPa	0 kg/cm <sup>2</sup> to 350 kg/cm <sup>2</sup>	100 kg/cm <sup>2</sup>	10 kg/cm <sup>2</sup>	0 bar to 340 bar	100 bar	10 bar
0 psi to 6,000 psi	1,000 psi	100 psi	0 kPa to 41,000 kPa	10,000 kPa	1,000 kPa	0 kg/cm <sup>2</sup> to 420 kg/cm <sup>2</sup>	100 kg/cm <sup>2</sup>	10 kg/cm <sup>2</sup>	0 bar to 410 bar	100 bar	10 bar
0 psi to 7,500 psi	1,500 psi	100 psi	0 kPa to 51,000 kPa	10,000 kPa	1,000 kPa	0 kg/cm <sup>2</sup> to 520 kg/cm <sup>2</sup>	100 kg/cm <sup>2</sup>	10 kg/cm <sup>2</sup>	0 bar to 510 bar	100 bar	10 bar
0 psi to 10,000 psi	2,000 psi	200 psi	0 kPa to 68,000 kPa	20,000 kPa	2,000 kPa	0 kg/cm <sup>2</sup> to 700 kg/cm <sup>2</sup>	200 kg/cm <sup>2</sup>	20 kg/cm <sup>2</sup>	0 bar to 680 bar	200 bar	20 bar
0 psi to 15,000 psi	3,000 psi	200 psi	0 kPa to 103,000 kPa	30,000 kPa	2,000 kPa	0 kg/cm <sup>2</sup> to 1,050 kg/cm <sup>2</sup>	300 kg/cm <sup>2</sup>	20 kg/cm <sup>2</sup>	0 bar to 1,030 bar	300 bar	20 bar
0 psi to 20,000 psi	4,000 psi	400 psi	0 kPa to 136,000 kPa	40,000 kPa	4,000 kPa	0 kg/cm <sup>2</sup> to 1,400 kg/cm <sup>2</sup>	400 kg/cm <sup>2</sup>	40 kg/cm <sup>2</sup>	0 bar to 1,360 bar	400 bar	40 bar
0 psi to 30,000 psi	5,000 psi	500 psi	0 kPa to 205,000 kPa	50,000 kPa	5,000 kPa	0 kg/cm <sup>2</sup> to 2,100 kg/cm <sup>2</sup>	500 kg/cm <sup>2</sup>	50 kg/cm <sup>2</sup>	0 bar to 2,050 bar	500 bar	50 bar
0 psi to 40,000 psi	5,000 psi	500 psi	0 kPa to 270,000 kPa	50,000 kPa	5,000 kPa	0 kg/cm <sup>2</sup> to 2,800 kg/cm <sup>2</sup>	500 kg/cm <sup>2</sup>	50 kg/cm <sup>2</sup>	0 bar to 2,700 bar	500 bar	50 bar
0 psi to 50,000 psi	10,000 psi	1000 psi	0 kPa to 340,000 kPa	100,000 kPa	100,000 kPa	0 kg/cm <sup>2</sup> to 3,500 kg/cm <sup>2</sup>	1,000 kg/cm <sup>2</sup>	100 kg/cm <sup>2</sup>	0 bar to 3,400 bar	1,000 bar	100 bar
0 psi to 60,000 psi	10,000 psi	1000 psi	0 kPa to 410,000 kPa	100,000 kPa	100,000 kPa	0 kg/cm <sup>2</sup> to 4,200 kg/cm <sup>2</sup>	1,000 kg/cm <sup>2</sup>	100 kg/cm <sup>2</sup>	0 bar to 4,100 bar	1,000 bar	100 bar
0 psi to 75,000 psi	15,000 psi	1000 psi	0 kPa to 510,000 kPa	100,000 kPa	100,000 kPa	0 kg/cm <sup>2</sup> to 5,200 kg/cm <sup>2</sup>	1,000 kg/cm <sup>2</sup>	100 kg/cm <sup>2</sup>	0 bar to 5,100 bar	1,000 bar	100 bar
0 psi to 100,000 psi	20,000 psi	2000 psi	0 kPa to 680,000 kPa	200,000 kPa	200,000 kPa	0 kg/cm <sup>2</sup> to 7,000 kg/cm <sup>2</sup>	2,000 kg/cm <sup>2</sup>	200 kg/cm <sup>2</sup>	0 bar to 6,800 bar	2,000 bar	100 bar

## Accuracy/Standard Dial Configuration

Applies to:

200 Series Gauges: 2-1/2" and 4"

700 Series Gauges (Low Pressure): 4-1/2"

ACCURACY: $\pm 1.0\%$ full scale ASME B40.100 Grade 1A					
Standard Dial Configurations					
Dial Range	Figure Interval	Graduation Intervals	Dial Range	Figure Interval	Graduation Intervals
-15 inH <sub>2</sub> O to 0 inH <sub>2</sub> O	3 inH <sub>2</sub> O	0.2 inH <sub>2</sub> O	0 oz/in <sup>2</sup> to 10 oz/in <sup>2</sup>	2 oz/in <sup>2</sup>	0.2 oz/in <sup>2</sup>
-30 inH <sub>2</sub> O to 0 inH <sub>2</sub> O	5 inH <sub>2</sub> O	0.5 inH <sub>2</sub> O	0 oz/in <sup>2</sup> to 15 oz/in <sup>2</sup>	3 oz/in <sup>2</sup>	0.2 oz/in <sup>2</sup>
-60 inH <sub>2</sub> O to 0 inH <sub>2</sub> O	10 inH <sub>2</sub> O	1 inH <sub>2</sub> O	0 oz/in <sup>2</sup> to 30 oz/in <sup>2</sup>	5 oz/in <sup>2</sup>	0.5 oz/in <sup>2</sup>
-100 inH <sub>2</sub> O to 0 inH <sub>2</sub> O	20 inH <sub>2</sub> O	2 inH <sub>2</sub> O	0 oz/in <sup>2</sup> to 35 oz/in <sup>2</sup>	5 oz/in <sup>2</sup>	0.5 oz/in <sup>2</sup>
-60 inH <sub>2</sub> O to 60 inH <sub>2</sub> O	-10 inH <sub>2</sub> O   10 inH <sub>2</sub> O	-1 inH <sub>2</sub> O   1 inH <sub>2</sub> O	0 oz/in <sup>2</sup> to 60 oz/in <sup>2</sup>	10 oz/in <sup>2</sup>	1 oz/in <sup>2</sup>
0 inH <sub>2</sub> O to 10 inH <sub>2</sub> O	2 inH <sub>2</sub> O	0.2 inH <sub>2</sub> O	0 oz/in <sup>2</sup> to 100 oz/in <sup>2</sup>	20 oz/in <sup>2</sup>	2 oz/in <sup>2</sup>
0 inH <sub>2</sub> O to 15 inH <sub>2</sub> O	3 inH <sub>2</sub> O	0.2 inH <sub>2</sub> O	0 oz/in <sup>2</sup> to 160 oz/in <sup>2</sup>	40 oz/in <sup>2</sup>	4 oz/in <sup>2</sup>
0 inH <sub>2</sub> O to 30 inH <sub>2</sub> O	5 inH <sub>2</sub> O	0.5 inH <sub>2</sub> O	0 oz/in <sup>2</sup> inH <sub>2</sub> O to 20 oz/in <sup>2</sup> inH <sub>2</sub> O	4 oz/in <sup>2</sup> - 10 inH <sub>2</sub> O	0.4 oz/in <sup>2</sup> - 1 inH <sub>2</sub> O
0 inH <sub>2</sub> O to 60 inH <sub>2</sub> O	10 inH <sub>2</sub> O	1 inH <sub>2</sub> O	0 oz/in <sup>2</sup> inH <sub>2</sub> O to 32 oz/in <sup>2</sup> inH <sub>2</sub> O	4 oz/in <sup>2</sup> - 10 inH <sub>2</sub> O	0.5 oz/in <sup>2</sup> - 1 inH <sub>2</sub> O
0 inH <sub>2</sub> O to 100 inH <sub>2</sub> O	20 inH <sub>2</sub> O	2 inH <sub>2</sub> O	0 psi to 3 psi	0.5 psi	0.05 psi
0 inH <sub>2</sub> O to 160 inH <sub>2</sub> O	40 inH <sub>2</sub> O	4 inH <sub>2</sub> O	0 psi to 5 psi	1 psi	0.1 psi
0 inH <sub>2</sub> O to 200 inH <sub>2</sub> O	40 inH <sub>2</sub> O	4 inH <sub>2</sub> O	0 psi to 10 psi	2 psi	0.2 psi

## Accuracy/Standard Dial Configuration

Applies to:

100 Series Gauges: 4"

300 Series Gauges: 2-1/2"

400/500 Series Gauges: 2-1/2"

900 Series Gauges: 2-1/2"

ACCURACY: ±1.5% full scale ASME B40.100 Grade A											
Primary Scale				Secondary Scales							
Dial Range	Figure	Graduation	kPa	Figure	Graduation	kg/cm <sup>2</sup>	Figure	Graduation	bar	Figure	Graduation
-30 inHg to 0 psi	-5 inHg	-0.5 inHg	-100 kPa to 0 kPa	-20 kPa	-2 kPa	-1 kg/cm <sup>2</sup> to 0 kg/cm <sup>2</sup>	-0.2 kg/cm <sup>2</sup>	-0.02 kg/cm <sup>2</sup>	-1 bar to 0 bar	-0.2 bar	-0.02 bar
-30 inHg to 15 psi	-10 inHg 5 psi	-1 inHg 0.5 psi	-100 kPa to 100 kPa	-50 kPa 50 kPa	-5 kPa 2 kPa	-1 kg/cm <sup>2</sup> to 1.05 kg/cm <sup>2</sup>	-0.5 kg/cm <sup>2</sup> 0.5 kg/cm <sup>2</sup>	-0.05 kg/cm <sup>2</sup> 0.05 kg/cm <sup>2</sup>	-1 bar to 1 bar	-0.5 bar 0.5 bar	-0.05 bar 0.05 bar
-30 inHg to 30 psi	-30 inHg 10 psi	-2 inHg 1 psi	-100 kPa to 205 kPa	-100 kPa 100 kPa	-10 kPa 10 kPa	-1 kg/cm <sup>2</sup> to 2.10 kg/cm <sup>2</sup>	-1 kg/cm <sup>2</sup> 1 kg/cm <sup>2</sup>	-0.1 kg/cm <sup>2</sup> 0.1 kg/cm <sup>2</sup>	-1 bar to 2.05 bar	-1 bar 1 bar	-0.1 bar 0.1 bar
-30 inHg to 60 psi	-30 inHg 20 psi	-5 inHg 2 psi	-100 kPa to 410 kPa	-100 kPa 200 kPa	-20 kPa 20 kPa	-1 kg/cm <sup>2</sup> to 4.2 kg/cm <sup>2</sup>	-1 kg/cm <sup>2</sup> 2 kg/cm <sup>2</sup>	-2 kg/cm <sup>2</sup> 0.2 kg/cm <sup>2</sup>	-1 bar to 4 bar	-1 bar 2 bar	-0.2 bar 0.2 bar
-30 inHg to 100 psi	-30 inHg 20 psi	-5 inHg 2 psi	-100 kPa to 680 kPa	-100 kPa 200 kPa	-20 kPa 20 kPa	-1 kg/cm <sup>2</sup> to 7 kg/cm <sup>2</sup>	-1 kg/cm <sup>2</sup> 2 kg/cm <sup>2</sup>	-0.2 kg/cm <sup>2</sup> 0.2 kg/cm <sup>2</sup>	-1 bar to 6.8 bar	-1 bar 2 bar	-0.2 bar 0.2 bar
-30 inHg to 160 psi	-30 inHg 40 psi	-10 inHg 4 psi	-100 kPa to 1,100 kPa	-100 kPa 400 kPa	-50 kPa 40 kPa	-1 kg/cm <sup>2</sup> to 11.2 kg/cm <sup>2</sup>	-1 kg/cm <sup>2</sup> 4 kg/cm <sup>2</sup>	-0.5 kg/cm <sup>2</sup> 0.4 kg/cm <sup>2</sup>	-1 bar to 11 bar	-1 bar 4 bar	-0.5 bar 0.4 bar
-30 inHg to 200 psi	-30 inHg 40 psi	-10 inHg 4 psi	-100 kPa to 1,360 kPa	-100 kPa 400 kPa	-50 kPa 40 kPa	-1 kg/cm <sup>2</sup> to 14 kg/cm <sup>2</sup>	-1 kg/cm <sup>2</sup> 4 kg/cm <sup>2</sup>	-0.5 kg/cm <sup>2</sup> 0.4 kg/cm <sup>2</sup>	-1 bar to 13.6 bar	-1 bar 4 bar	-0.5 bar 0.4 bar
-30 inHg to 300 psi	-30 inHg 50 psi	-10 inHg 5 psi	-100 kPa to 2,050 kPa	-100 kPa 500 kPa	-50 kPa 50 kPa	-1 kg/cm <sup>2</sup> to 21 kg/cm <sup>2</sup>	-1 kg/cm <sup>2</sup> 5 kg/cm <sup>2</sup>	-0.5 kg/cm <sup>2</sup> 0.5 kg/cm <sup>2</sup>	-1 bar to 20.5 bar	-1 bar 5 bar	-0.5 bar 0.5 bar
0 psi to 15 psi	3 psi	0.2 psi	0 kPa to 100 kPa	30 kPa	2 kPa	0 kg/cm <sup>2</sup> to 1.05 kg/cm <sup>2</sup>	0.3 kg/cm <sup>2</sup>	0.02 kg/cm <sup>2</sup>	0 bar to 1 bar	0.3 bar	0.02 bar
0 psi to 30 psi	5 psi	0.5 psi	0 kPa to 205 kPa	50 kPa	5 kPa	0 kg/cm <sup>2</sup> to 2.1 kg/cm <sup>2</sup>	0.5 kg/cm <sup>2</sup>	0.05 kg/cm <sup>2</sup>	0 bar to 2.05 bar	0.5 bar	0.05 bar
0 psi to 60 psi	10 psi	1 psi	0 kPa to 410 kPa	100 kPa	10 kPa	0 kg/cm <sup>2</sup> to 4.2 kg/cm <sup>2</sup>	1 kg/cm <sup>2</sup>	0.01 kg/cm <sup>2</sup>	0 bar to 4.10 bar	1 bar	0.1 bar
0 psi to 100 psi	20 psi	2 psi	0 kPa to 680 kPa	200 kPa	20 kPa	0 kg/cm <sup>2</sup> to 7 kg/cm <sup>2</sup>	2 kg/cm <sup>2</sup>	0.2 kg/cm <sup>2</sup>	0 bar to 6.8 bar	2 bar	0.2 bar
0 psi to 160 psi	40 psi	4 psi	0 kPa to 1,100 kPa	400 kPa	40 kPa	0 kg/cm <sup>2</sup> to 11.0 kg/cm <sup>2</sup>	4 kg/cm <sup>2</sup>	0.4 kg/cm <sup>2</sup>	0 bar to 11 bar	4 bar	0.4 bar
0 psi to 200 psi	40 psi	4 psi	0 kPa to 1,360 kPa	400 kPa	40 kPa	0 kg/cm <sup>2</sup> to 14 kg/cm <sup>2</sup>	4 kg/cm <sup>2</sup>	0.4 kg/cm <sup>2</sup>	0 bar to 13.6 bar	4 bar	0.4 bar
0 psi to 300 psi	50 psi	5 psi	0 kPa to 2,050 kPa	500 kPa	50 kPa	0 kg/cm <sup>2</sup> to 21 kg/cm <sup>2</sup>	5 kg/cm <sup>2</sup>	0.5 kg/cm <sup>2</sup>	0 bar to 20.5 bar	5 bar	0.5 bar
0 psi to 400 psi	100 psi	10 psi	0 kPa to 2,700 kPa	1,000 kPa	100 kPa	0 kg/cm <sup>2</sup> to 28 kg/cm <sup>2</sup>	2 kg/cm <sup>2</sup>	0.5 kg/cm <sup>2</sup>	0 bar to 27 bar	2 bar	0.5 bar
0 psi to 600 psi	100 psi	10 psi	0 kPa to 4,100 kPa	1,000 kPa	100 kPa	0 kg/cm <sup>2</sup> to 42 kg/cm <sup>2</sup>	10 kg/cm <sup>2</sup>	1 kg/cm <sup>2</sup>	0 bar to 41 bar	10 bar	1 bar
0 psi to 1,000 psi	200 psi	20 psi	0 kPa to 6,800 kPa	2,000 kPa	200 kPa	0 kg/cm <sup>2</sup> to 70 kg/cm <sup>2</sup>	20 kg/cm <sup>2</sup>	2 kg/cm <sup>2</sup>	0 bar to 68 bar	20 bar	2 bar
0 psi to 1,500 psi	300 psi	20 psi	0 kPa to 10,000 kPa	3,000 kPa	200 kPa	0 kg/cm <sup>2</sup> to 105 kg/cm <sup>2</sup>	30 kg/cm <sup>2</sup>	2 kg/cm <sup>2</sup>	0 bar to 100 bar	30 bar	2 bar
0 psi to 2,000 psi	400 psi	40 psi	0 kPa to 13,600 kPa	4,000 kPa	400 kPa	0 kg/cm <sup>2</sup> to 140 kg/cm <sup>2</sup>	40 kg/cm <sup>2</sup>	4 kg/cm <sup>2</sup>	0 bar to 136 bar	40 bar	4 bar
0 psi to 3,000 psi	500 psi	50 psi	0 kPa to 20,500 kPa	5,000 kPa	500 kPa	0 kg/cm <sup>2</sup> to 210 kg/cm <sup>2</sup>	50 kg/cm <sup>2</sup>	5 kg/cm <sup>2</sup>	0 bar to 205 bar	50 bar	5 bar
0 psi to 5,000 psi	1,000 psi	100 psi	0 kPa to 34,000 kPa	10,000 kPa	1,000 kPa	0 kg/cm <sup>2</sup> to 350 kg/cm <sup>2</sup>	100 kg/cm <sup>2</sup>	10 kg/cm <sup>2</sup>	0 bar to 340 bar	100 bar	10 bar
0 psi to 6,000 psi	1,000 psi	100 psi	0 kPa to 41,000 kPa	10,000 kPa	1,000 kPa	0 kg/cm <sup>2</sup> to 420 kg/cm <sup>2</sup>	100 kg/cm <sup>2</sup>	10 kg/cm <sup>2</sup>	0 bar to 410 bar	100 bar	10 bar
0 psi to 7,500 psi	1,500 psi	100 psi	0 kPa to 51,000 kPa	10,000 kPa	1,000 kPa	0 kg/cm <sup>2</sup> to 520 kg/cm <sup>2</sup>	100 kg/cm <sup>2</sup>	10 kg/cm <sup>2</sup>	0 bar to 510 bar	100 bar	10 bar
0 psi to 10,000 psi	2,000 psi	200 psi	0 kPa to 68,000 kPa	20,000 kPa	2,000 kPa	0 kg/cm <sup>2</sup> to 700 kg/cm <sup>2</sup>	200 kg/cm <sup>2</sup>	20 kg/cm <sup>2</sup>	0 bar to 680 bar	200 bar	20 bar
0 psi to 15,000 psi	3,000 psi	200 psi	0 kPa to 102,000 kPa	30,000 kPa	2,000 kPa	0 kg/cm <sup>2</sup> to 1,040 kg/cm <sup>2</sup>	300 kg/cm <sup>2</sup>	20 kg/cm <sup>2</sup>	0 bar to 1,020 bar	300 bar	20 bar

## Accuracy/Standard Dial Configuration

Applies to:  
600/700 Series Gauges: 4-1/2"

ACCURACY: ±0.5% full scale ASME B40.100 Grade 2A											
Primary Scale				Secondary Scales							
Dial Range	Figure	Graduation	kPa	Figure	Graduation	kg/cm <sup>2</sup>	Figure	Graduation	bar	Figure	Graduation
-30 inHg to 0 psi	-5 inHg	-0.2 inHg	-100 kPa to 0 kPa	-20 kPa	-1 kPa	-1 kg/cm <sup>2</sup> to 0 kg/cm <sup>2</sup>	-0.2 kg/cm <sup>2</sup>	-0.01 kg/cm <sup>2</sup>	-1 bar to 0 bar	-0.2 bar	-0.01 bar
-30 inHg to 15 psi	-5 inHg 3 psi	-0.5 inHg 0.2 psi	-100 kPa to 100 kPa	-20 kPa 20 kPa	-2 kPa 2 kPa	-1 kg/cm <sup>2</sup> to 1.05 kg/cm <sup>2</sup>	-0.2 kg/cm <sup>2</sup> 0.2 kg/cm <sup>2</sup>	-0.02 kg/cm <sup>2</sup> 0.02 kg/cm <sup>2</sup>	-1 bar to 1 bar	-0.2 bar 0.2 bar	-0.02 bar 0.02 bar
-30 inHg to 30 psi	-10 inHg 5 psi	-1 inHg 0.5 psi	-100 kPa to 205 kPa	-50 kPa 50 kPa	-5 kPa 5 kPa	-1 kg/cm <sup>2</sup> to 2.10 kg/cm <sup>2</sup>	-1 kg/cm <sup>2</sup> 0.5 kg/cm <sup>2</sup>	-0.1 kg/cm <sup>2</sup> 0.05 kg/cm <sup>2</sup>	-1 bar to 2.05 bar	-0.5 bar 0.5 bar	-0.05 bar 0.05 bar
-30 inHg to 60 psi	-10 inHg 10 psi	-1 inHg 0.4 psi	-100 kPa to 410 kPa	-50 kPa 100 kPa	-1 kPa 4 kPa	-1 kg/cm <sup>2</sup> to 4.2 kg/cm <sup>2</sup>	-0.5 kg/cm <sup>2</sup> 1 kg/cm <sup>2</sup>	-1 kg/cm <sup>2</sup> 0.04 kg/cm <sup>2</sup>	-1 bar to 4 bar	-0.5 bar 1 bar	-1 bar 0.04 bar
-30 inHg to 100 psi	-30 inHg 10 psi	-2 inHg 1 psi	-100 kPa to 680 kPa	-100 kPa 100 kPa	-10 kPa 10 kPa	-1 kg/cm <sup>2</sup> to 7 kg/cm <sup>2</sup>	-1 kg/cm <sup>2</sup> 1 kg/cm <sup>2</sup>	-0.1 kg/cm <sup>2</sup> 0.1 kg/cm <sup>2</sup>	-1 bar to 6.8 bar	-1 bar 1 bar	-0.1 bar 0.1 bar
-30 inHg to 160 psi	-30 inHg 20 psi	-5 inHg 2 psi	-100 kPa to 1,100 kPa	-100 kPa 200 kPa	-20 kPa 20 kPa	-1 kg/cm <sup>2</sup> to 11.2 kg/cm <sup>2</sup>	-1 kg/cm <sup>2</sup> 2 kg/cm <sup>2</sup>	-0.2 kg/cm <sup>2</sup> 0.2 kg/cm <sup>2</sup>	-1 bar to 11 bar	-1 bar 2 bar	-0.2 bar 0.2 bar
-30 inHg to 200 psi	-30 inHg 20 psi	-5 inHg 2 psi	-100 kPa to 1,360 kPa	-100 kPa 200 kPa	-20 kPa 20 kPa	-1 kg/cm <sup>2</sup> to 14 kg/cm <sup>2</sup>	-1 kg/cm <sup>2</sup> 2 kg/cm <sup>2</sup>	-0.2 kg/cm <sup>2</sup> 0.2 kg/cm <sup>2</sup>	-1 bar to 13.6 bar	-1 bar 2 bar	-0.2 bar 0.2 bar
0 psi to 15 psi	3 psi	0.1 psi	0 kPa to 100 kPa	30 kPa	1 kPa	0 kg/cm <sup>2</sup> to 1.05 kg/cm <sup>2</sup>	0.3 kg/cm <sup>2</sup>	0.01 kg/cm <sup>2</sup>	0 bar to 1 bar	0.3 bar	0.01 bar
0 psi to 30 psi	5 psi	0.2 psi	0 kPa to 205 kPa	50 kPa	2 kPa	0 kg/cm <sup>2</sup> to 2.1 kg/cm <sup>2</sup>	0.5 kg/cm <sup>2</sup>	0.02 kg/cm <sup>2</sup>	0 bar to 2.05 bar	0.5 bar	0.02 bar
0 psi to 60 psi	10 psi	0.4 psi	0 kPa to 410 kPa	100 kPa	4 kPa	0 kg/cm <sup>2</sup> to 4.2 kg/cm <sup>2</sup>	1 kg/cm <sup>2</sup>	0.04 kg/cm <sup>2</sup>	0 bar to 4.10 bar	1 bar	0.04 bar
0 psi to 100 psi	10 psi	1 psi	0 kPa to 680 kPa	100 kPa	10 kPa	0 kg/cm <sup>2</sup> to 7 kg/cm <sup>2</sup>	1 kg/cm <sup>2</sup>	0.1 kg/cm <sup>2</sup>	0 bar to 6.8 bar	1 bar	0.1 bar
0 psi to 160 psi	20 psi	1 psi	0 kPa to 1,100 kPa	200 kPa	10 kPa	0 kg/cm <sup>2</sup> to 11 kg/cm <sup>2</sup>	2 kg/cm <sup>2</sup>	0.1 kg/cm <sup>2</sup>	0 bar to 11 bar	2 bar	0.1 bar
0 psi to 200 psi	20 psi	2 psi	0 kPa to 1,360 kPa	200 kPa	20 kPa	0 kg/cm <sup>2</sup> to 14 kg/cm <sup>2</sup>	2 kg/cm <sup>2</sup>	0.2 kg/cm <sup>2</sup>	0 bar to 13.6 bar	2 bar	0.2 bar
0 psi to 300 psi	50 psi	2 psi	0 kPa to 2,050 kPa	500 kPa	20 kPa	0 kg/cm <sup>2</sup> to 21 kg/cm <sup>2</sup>	5 kg/cm <sup>2</sup>	0.2 kg/cm <sup>2</sup>	0 bar to 20.5 bar	5 bar	0.2 bar
0 psi to 400 psi	40 psi	4 psi	0 kPa to 2,700 kPa	400 kPa	40 kPa	0 kg/cm <sup>2</sup> to 28 kg/cm <sup>2</sup>	4 kg/cm <sup>2</sup>	0.4 kg/cm <sup>2</sup>	0 bar to 27 bar	4 bar	0.4 bar
0 psi to 600 psi	100 psi	4 psi	0 kPa to 4,100 kPa	1,000 kPa	40 kPa	0 kg/cm <sup>2</sup> to 42 kg/cm <sup>2</sup>	10 kg/cm <sup>2</sup>	0.4 kg/cm <sup>2</sup>	0 bar to 41 bar	10 bar	0.4 bar
0 psi to 1,000 psi	100 psi	10 psi	0 kPa to 6,800 kPa	1,000 kPa	100 kPa	0 kg/cm <sup>2</sup> to 70 kg/cm <sup>2</sup>	10 kg/cm <sup>2</sup>	1 kg/cm <sup>2</sup>	0 bar to 68 bar	10 bar	1 bar
0 psi to 1,500 psi	300 psi	10 psi	0 kPa to 10,000 kPa	3,000 kPa	100 kPa	0 kg/cm <sup>2</sup> to 105 kg/cm <sup>2</sup>	30 kg/cm <sup>2</sup>	1 kg/cm <sup>2</sup>	0 bar to 100 bar	30 bar	1 bar
0 psi to 2,000 psi	200 psi	20 psi	0 kPa to 13,600 kPa	2,000 kPa	200 kPa	0 kg/cm <sup>2</sup> to 140 kg/cm <sup>2</sup>	20 kg/cm <sup>2</sup>	2 kg/cm <sup>2</sup>	0 bar to 136 bar	20 bar	2 bar
0 psi to 3,000 psi	500 psi	20 psi	0 kPa to 20,500 kPa	5,000 kPa	200 kPa	0 kg/cm <sup>2</sup> to 210 kg/cm <sup>2</sup>	50 kg/cm <sup>2</sup>	2 kg/cm <sup>2</sup>	0 bar to 205 bar	50 bar	2 bar
0 psi to 5,000 psi	500 psi	50 psi	0 kPa to 34,000 kPa	5,000 kPa	500 kPa	0 kg/cm <sup>2</sup> to 350 kg/cm <sup>2</sup>	50 kg/cm <sup>2</sup>	5 kg/cm <sup>2</sup>	0 bar to 340 bar	50 bar	5 bar
0 psi to 6,000 psi	1,000 psi	40 psi	0 kPa to 41,000 kPa	10,000 kPa	400 kPa	0 kg/cm <sup>2</sup> to 420 kg/cm <sup>2</sup>	100 kg/cm <sup>2</sup>	4 kg/cm <sup>2</sup>	0 bar to 410 bar	100 bar	4 bar
0 psi to 10,000 psi	1,000 psi	100 psi	0 kPa to 68,000 kPa	10,000 kPa	1,000 kPa	0 kg/cm <sup>2</sup> to 700 kg/cm <sup>2</sup>	100 kg/cm <sup>2</sup>	10 kg/cm <sup>2</sup>	0 bar to 680 bar	100 bar	10 bar
0 psi to 15,000 psi	3,000 psi	100 psi	0 kPa to 103,000 kPa	30,000 kPa	1,000 kPa	0 kg/cm <sup>2</sup> to 1,050 kg/cm <sup>2</sup>	300 kg/cm <sup>2</sup>	10 kg/cm <sup>2</sup>	0 bar to 1,030 bar	300 bar	10 bar
0 psi to 20,000 psi	2,000 psi	200 psi	0 kPa to 136,000 kPa	20,000 kPa	2,000 kPa	0 kg/cm <sup>2</sup> to 1,400 kg/cm <sup>2</sup>	200 kg/cm <sup>2</sup>	20 kg/cm <sup>2</sup>	0 bar to 1,360 bar	200 bar	20 bar
0 psi to 30,000 psi	5,000 psi	200 psi	0 kPa to 205,000 kPa	50,000 kPa	2,000 kPa	0 kg/cm <sup>2</sup> to 2,100 kg/cm <sup>2</sup>	500 kg/cm <sup>2</sup>	20 kg/cm <sup>2</sup>	0 bar to 2,050 bar	500 bar	20 bar
0 psi to 40,000 psi	4,000 psi	400 psi	0 kPa to 270,000 kPa	40,000 kPa	4,000 kPa	0 kg/cm <sup>2</sup> to 2,800 kg/cm <sup>2</sup>	400 kg/cm <sup>2</sup>	40 kg/cm <sup>2</sup>	0 bar to 2,700 bar	400 bar	40 bar
0 psi to 50,000 psi	5,000 psi	500 psi	0 kPa to 340,000 kPa	50,000 kPa	5,000 kPa	0 kg/cm <sup>2</sup> to 3,500 kg/cm <sup>2</sup>	500 kg/cm <sup>2</sup>	50 kg/cm <sup>2</sup>	0 bar to 3,400 bar	500 bar	50 bar
0 psi to 60,000 psi	10,000 psi	1000 psi	0 kPa to 410,000 kPa	100,000 kPa	10,000 kPa	0 kg/cm <sup>2</sup> to 4,200 kg/cm <sup>2</sup>	1,000 kg/cm <sup>2</sup>	40 kg/cm <sup>2</sup>	0 bar to 4,100 bar	1,000 bar	40 bar

## Accuracy/Standard Dial Configuration

Applies to:

100 Series Gauges: 1-1/2", 2" and 2-1/2"

400 Series Gauges: 1-1/2"

900 Series Gauges: 1-1/2" and 2"

ACCURACY: ±2.5% full scale ASME B40.100 Grade B											
Primary Scale				Secondary Scales							
Dial Range	Figure	Graduation	kPa	Figure	Graduation	kg/cm <sup>2</sup>	Figure	Graduation	bar	Figure	Graduation
-30 inHg to 0 psi	-5 inHg	-0.5 inHg	-100 kPa to 0 kPa	-20 kPa	-5 kPa	-1 kg/cm <sup>2</sup> to 0 kg/cm <sup>2</sup>	-0.2 kg/cm <sup>2</sup>	-0.05 kg/cm <sup>2</sup>	-1 bar to 0 bar	-0.2 bar	-0.05 bar
-30 inHg to 15 psi	-10 inHg 5 psi	-1 inHg 0.5 psi	-100 kPa to 100 kPa	-50 kPa 50 kPa	-5 kPa 5 kPa	-1 kg/cm <sup>2</sup> to 1.05 kg/cm <sup>2</sup>	-0.5 kg/cm <sup>2</sup> 0.5 kg/cm <sup>2</sup>	-0.05 kg/cm <sup>2</sup> 0.05 kg/cm <sup>2</sup>	-1 bar to 1 bar	-0.5 bar 0.5 bar	-0.05 bar 0.05 bar
-30 inHg to 30 psi	-30 inHg 10 psi	-2 inHg 1 psi	-100 kPa to 205 kPa	-100 kPa 100 kPa	-10 kPa 10 kPa	-1 kg/cm <sup>2</sup> to 2.10 kg/cm <sup>2</sup>	-1 kg/cm <sup>2</sup> 1 kg/cm <sup>2</sup>	-0.1 kg/cm <sup>2</sup> 0.1 kg/cm <sup>2</sup>	-1 bar to 2.05 bar	-1 bar 1 bar	-0.1 bar 0.1 bar
-30 inHg to 60 psi	-30 inHg 20 psi	-5 inHg 2 psi	-100 kPa to 410 kPa	-100 kPa 200 kPa	-20 kPa 20 kPa	-1 kg/cm <sup>2</sup> to 4.2 kg/cm <sup>2</sup>	-1 kg/cm <sup>2</sup> 2 kg/cm <sup>2</sup>	-2 kg/cm <sup>2</sup> 0.2 kg/cm <sup>2</sup>	-1 bar to 4 bar	-1 bar 2 bar	-0.2 bar 0.2 bar
-30 inHg to 100 psi	-30 inHg 20 psi	-10 inHg 5 psi	-100 kPa to 680 kPa	-100 kPa 200 kPa	-50 kPa 50 kPa	-1 kg/cm <sup>2</sup> to 7 kg/cm <sup>2</sup>	-1 kg/cm <sup>2</sup> 2 kg/cm <sup>2</sup>	-0.5 kg/cm <sup>2</sup> 0.5 kg/cm <sup>2</sup>	-1 bar to 6.8 bar	-1 bar 2 bar	-0.5 bar 0.5 bar
-30 inHg to 160 psi	-30 inHg 40 psi	-10 inHg 4 psi	-100 kPa to 1,100 kPa	-100 kPa 400 kPa	-50 kPa 40 kPa	-1 kg/cm <sup>2</sup> to 11.2 kg/cm <sup>2</sup>	-1 kg/cm <sup>2</sup> 4 kg/cm <sup>2</sup>	-0.5 kg/cm <sup>2</sup> 0.4 kg/cm <sup>2</sup>	-1 bar to 11 bar	-1 bar 4 bar	-0.5 bar 0.4 bar
-30 inHg to 200 psi	-30 inHg 40 psi	-10 inHg 4 psi	-100 kPa to 1,360 kPa	-100 kPa 400 kPa	-50 kPa 40 kPa	-1 kg/cm <sup>2</sup> to 14 kg/cm <sup>2</sup>	-1 kg/cm <sup>2</sup> 4 kg/cm <sup>2</sup>	-0.5 kg/cm <sup>2</sup> 0.4 kg/cm <sup>2</sup>	-1 bar to 13.6 bar	-1 bar 4 bar	-0.5 bar 0.4 bar
-30 inHg to 300 psi	-30 inHg 100 psi	-30 inHg 10 psi	-100 kPa to 2,050 kPa	-100 kPa 1,000 kPa	-100 kPa 100 kPa	-1 kg/cm <sup>2</sup> to 21 kg/cm <sup>2</sup>	-1 kg/cm <sup>2</sup> 10 kg/cm <sup>2</sup>	-1 kg/cm <sup>2</sup> 1 kg/cm <sup>2</sup>	-1 bar to 20.5 bar	-1 bar 10 bar	-0.1 bar 0.1 bar
0 psi to 15 psi	3 psi	0.5 psi	0 kPa to 100 kPa	30 kPa	5 kPa	0 kg/cm <sup>2</sup> to 1.05 kg/cm <sup>2</sup>	0.3 kg/cm <sup>2</sup>	0.05 kg/cm <sup>2</sup>	0 bar to 1 bar	0.3 bar	0.05 bar
0 psi to 30 psi	5 psi	0.5 psi	0 kPa to 205 kPa	50 kPa	5 kPa	0 kg/cm <sup>2</sup> to 2.1 kg/cm <sup>2</sup>	0.5 kg/cm <sup>2</sup>	0.05 kg/cm <sup>2</sup>	0 bar to 2.05 bar	0.5 bar	0.05 bar
0 psi to 60 psi	10 psi	1 psi	0 kPa to 410 kPa	100 kPa	10 kPa	0 kg/cm <sup>2</sup> to 4.2 kg/cm <sup>2</sup>	1 kg/cm <sup>2</sup>	0.01 kg/cm <sup>2</sup>	0 bar to 4.1 bar	1 bar	0.1 bar
0 psi to 100 psi	20 psi	2 psi	0 kPa to 680 kPa	200 kPa	20 kPa	0 kg/cm <sup>2</sup> to 7 kg/cm <sup>2</sup>	2 kg/cm <sup>2</sup>	0.2 kg/cm <sup>2</sup>	0 bar to 6.8 bar	2 bar	0.2 bar
0 psi to 160 psi	40 psi	4 psi	0 kPa to 1,100 kPa	400 kPa	40 kPa	0 kg/cm <sup>2</sup> to 11 kg/cm <sup>2</sup>	4 kg/cm <sup>2</sup>	0.4 kg/cm <sup>2</sup>	0 bar to 11 bar	4 bar	0.4 bar
0 psi to 200 psi	40 psi	4 psi	0 kPa to 1,360 kPa	400 kPa	40 kPa	0 kg/cm <sup>2</sup> to 14 kg/cm <sup>2</sup>	4 kg/cm <sup>2</sup>	0.4 kg/cm <sup>2</sup>	0 bar to 13.6 bar	4 bar	0.4 bar
0 psi to 300 psi	50 psi	5 psi	0 kPa to 2,050 kPa	500 kPa	50 kPa	0 kg/cm <sup>2</sup> to 21 kg/cm <sup>2</sup>	5 kg/cm <sup>2</sup>	0.5 kg/cm <sup>2</sup>	0 bar to 20.5 bar	5 bar	0.5 bar
0 psi to 400 psi	100 psi	10 psi	0 kPa to 2,700 kPa	1,000 kPa	100 kPa	0 kg/cm <sup>2</sup> to 28 kg/cm <sup>2</sup>	2 kg/cm <sup>2</sup>	0.5 kg/cm <sup>2</sup>	0 bar to 27 bar	2 bar	0.5 bar
0 psi to 600 psi	100 psi	10 psi	0 kPa to 4,100 kPa	1,000 kPa	100 kPa	0 kg/cm <sup>2</sup> to 42 kg/cm <sup>2</sup>	10 kg/cm <sup>2</sup>	1 kg/cm <sup>2</sup>	0 bar to 41 bar	10 bar	1 bar
0 psi to 1,000 psi	200 psi	20 psi	0 kPa to 6,800 kPa	2,000 kPa	200 kPa	0 kg/cm <sup>2</sup> to 70 kg/cm <sup>2</sup>	20 kg/cm <sup>2</sup>	2 kg/cm <sup>2</sup>	0 bar to 68 bar	20 bar	2 bar
0 psi to 1,500 psi	300 psi	50 psi	0 kPa to 10,000 kPa	3,000 kPa	500 kPa	0 kg/cm <sup>2</sup> to 105 kg/cm <sup>2</sup>	30 kg/cm <sup>2</sup>	5 kg/cm <sup>2</sup>	0 bar to 100 bar	30 bar	5 bar
0 psi to 2,000 psi	400 psi	40 psi	0 kPa to 13,600 kPa	4,000 kPa	400 kPa	0 kg/cm <sup>2</sup> to 140 kg/cm <sup>2</sup>	40 kg/cm <sup>2</sup>	4 kg/cm <sup>2</sup>	0 bar to 136 bar	40 bar	4 bar
0 psi to 3,000 psi	500 psi	50 psi	0 kPa to 20,500 kPa	5,000 kPa	500 kPa	0 kg/cm <sup>2</sup> to 210 kg/cm <sup>2</sup>	50 kg/cm <sup>2</sup>	5 kg/cm <sup>2</sup>	0 bar to 205 bar	50 bar	5 bar
0 psi to 5,000 psi	1000 psi	100 psi	0 kPa to 34,000 kPa	10,000 kPa	1,000 kPa	0 kg/cm <sup>2</sup> to 350 kg/cm <sup>2</sup>	100 kg/cm <sup>2</sup>	10 kg/cm <sup>2</sup>	0 bar to 340 bar	100 bar	10 bar
0 psi to 6,000 psi	1000 psi	100 psi	0 kPa to 41,000 kPa	10,000 kPa	1,000 kPa	0 kg/cm <sup>2</sup> to 420 kg/cm <sup>2</sup>	100 kg/cm <sup>2</sup>	10 kg/cm <sup>2</sup>	0 bar to 410 bar	100 bar	10 bar

## Accuracy/Standard Dial Configuration

Applies to:  
800 Series Gauges

ACCURACY: ±0.25% full scale ASME B40.100 Grade 3A					
Primary Scale			Primary Scale		
Dial Range	Figure	Graduation	Dial Range	Figure	Graduation
0 psi to 30 psi	2 psi	0.1 psi	0 psi to 1,500 psi	100 psi	5 psi
0 psi to 60 psi	5 psi	0.2 psi	0 psi to 2,000 psi	200 psi	10 psi
0 psi to 100 psi	10 psi	0.5 psi	0 psi to 3,000 psi	250 psi	10 psi
0 psi to 160 psi	20 psi	0.8 psi	0 psi to 5,000 psi	500 psi	20 psi
0 psi to 200 psi	20 psi	1 psi	0 psi to 6,000 psi	500 psi	20 psi
0 psi to 300 psi	25 psi	1 psi	0 psi to 10,000 psi	1,000 psi	50 psi
0 psi to 400 psi	50 psi	2 psi	0 psi to 15,000 psi	1,000 psi	50 psi
0 psi to 600 psi	50 psi	2 psi	0 psi to 20,000 psi	2,000 psi	100 psi
0 psi to 1,000 psi	100 psi	5 psi			

### PRESSURE & VACUUM CONVERSIONS

Pounds per Square Inch	bar	Kilopascals	Kilograms per Square Centimeter	Ounces per Square Inch	Inches of Mercury	Millimeters of Mercury	Inches of Water
psi	bar	kPa	kg/cm <sup>2</sup>	oz-in <sup>2</sup>	inHg	mmHg*	inH <sub>2</sub> O
1	.0689476	6.89476	.0703069	16	2.03602	51.71485	27.6807
14.5038	1	100	1.019716	232.0608	29.530	750.0626	401.8596
.145038	.01	1	.0101972	2.320608	.295299	7.500610	401.8596
14.2233	.9806649	98.06649	1	227.5739	28.95901	735.5588	393.7118
.0625	.0043092	.4309223	.0043942	1	.1272513	3.23218	1.73004
.4911542	.0338639	3.386389	.0345316	7.85847	1	25.4	13.59548
.0193368	.0013332	.1333225	.0013595	.3093888	.0393701	1	.535255
.0361263	.0024908	.2490819	.0025422	.578020	.0735539	1.868268	1

\* 1 kPa = 1 kN/m<sup>2</sup>, 1 mmHg = 1 Torr, 1Kg/cm<sup>2</sup> = 1 kp/cm<sup>2</sup>  
(Conversions of: H<sub>2</sub>O are at 39.2 °F (4 °C); Hg are at 32 °F (0 °C))

### Fill Fluid Temperature Table

Fill Fluid	Temperature Range (°F)
Glycerine*	30 – 300
Silicone 200-10	-35 – 450
Silicone 710	30 – 650
Silicone 550	-40 – 600
Silicone 510	-60 – 400
Fluorolube FS-5	-40 – 500
Silicone 200-350	0 – 300
Halocarbon® Oil 6.3	-40 – 400
Ethylene Glycol	-30 – 300
Propylene Glycol	-50 – 200
Syltherm 800	-40 – 450
Mineral Oil	**
Neobee M-20	-40 – 320

\* Not recommended for use on vacuum applications

\*\* To be advised

### CONVERSIONS FOR HYDRAULIC RAM CAPACITY

$$\text{psi} \times \text{AREA} = (\text{LBS.}) \text{ FORCE}$$

$$\text{TONS} = \frac{\text{psi} \times .7854 \times \text{D2}}{2000}$$

$$\text{psi} = \frac{\text{TONS}}{\text{D2} \times .0003927}$$

For further assistance with conversions please consult the factory.

140 °F is the maximum recommended ambient media temperature for NOSHOK pressure gauges with brass wetted parts, and 212 °F for gauges with stainless steel wetted parts. For applications in which media reaches temperatures above 212 °F, NOSHOK offers several accessories designed to prevent damage to the gauge, and maintain maximum performance and accuracy.

Recommended gauge configurations are listed below. Please note that these guidelines are intended to be general recommendations. Many conditions may affect the amount of temperature reduction; including ambient temperature, media type, and process configuration.

- **Up to 140 °F:** All NOSHOK pressure gauges will provide peak performance in this range
- **Up to 212 °F:** A gauge with stainless steel wetted parts is required, such as the NOSHOK 400 and 740 Series. Do NOT use a gauge with brass wetted parts.
- **Up to 287 °F:** Accessories must be used to maintain gauge integrity and accuracy. Options include:
  - o **Pigtail Steam Syphon:** For use with a stainless steel wetted parts gauge. Should be used in steam applications and systems that contain superheated vapor. The pigtail buffers the instrument from the damaging effects of high temperature steam by holding system fluid in the coil to provide a steam trap for the fluid to condensate and dissipate the heat. Reduces temperature by 75° F/ft. on average. Multiple configurations are available.
  - o **Armored Capillary Tube:** For use with a stainless steel wetted parts gauge. Average temperature reduction is 75 °F/ft. Two feet of capillary tube can increase the media temperature range to 362 °F. Standard length is five feet, provided with thread connections; other lengths available on request. Gauge must be separated from the process with a mounting bracket or flange, and the extra capillary length can be rolled up if necessary. Recommended for use with clean media or gases.
  - o **Long Pipe:** 1/2" in diameter or greater in either steel or stainless steel construction with a stainless steel wetted parts gauge. Average temperature reduction is 75 °F/ft. Pipes can be cut and threaded for custom applications.
  - o **Cooling Element:** For use with a stainless steel wetted parts gauge. Average temperature reduction is 75 °F/4" element. Use with other accessories for additional temperature decrease (long pipe, syphon, diaphragm seal).
  - o **Cooling Tower:** For use with a stainless steel wetted parts gauge. Approved usage up to temperatures of 312 °F. Average temperature reduction is 100 °F/8" cooling tower. Recommended for use with clean media or gases.
- **Up to 300 °F:** A high temperature system fill is required, such as silicone D.C 550, and a diaphragm seal is recommended on a stainless steel wetted parts gauge.

For more information, contact NOSHOK at 440.243.0888



The technology used in today's pressure gauges has been around since the mid-eighteen hundreds, and the pressure gauge is still one of the most common methods of measuring pressure today. The majority of pressure gauges today still incorporate the Bourdon tube, socket, and geared movement; along with a pointer and dial to indicate process pressure.

Since the pressure gauge is a purely mechanical device, attention to three process conditions is necessary. The three factors that can adversely affect accuracy and performance are **Temperature, Vibration and Pulsation**.

### **Temperature Influence:**

For every 100 °F shift in temperature from which the gauge is calibrated, the user can experience up to a 2% additional error in reading. The cause is the change in the elasticity or spring rate of the Bourdon tube element with temperature. While it is difficult to circumvent the influence of ambient temperature, we can address the influence of process temperature. In steam service, the common practice is to install coil syphons or pigtail syphons to dissipate process heat. Another common practice is to install a diaphragm seal with capillary to separate the gauge from the high heat source. There are many options available with fill fluid in the seal and capillary system to withstand temperatures up to 600 °F. In severe cold ambient conditions, many users elect to heat trace their instrumentation via electric or steam trace. Process and ambient temperature is an important consideration when selecting and applying pressure gauges.

### **Vibration Influence:**

Vibration due to pumps, motors, and other rotating equipment can cause excess wear and possible premature failure of internal working parts of a pressure gauge, which include the Bourdon tube and the movement or gear mechanism. Vibration also causes difficulty in accurate reading of the gauge, due to pointer oscillation. One of the most common causes of pressure gauge failure is exposure to continuous vibration. The most widely accepted remedy is to utilize a liquid filled pressure gauge. The fill fluid of choice is either glycerine or silicone. Liquid filled gauges address not only pointer oscillation, but also serve to protect and lubricate the internal geared movement.

### **Pulsation Influence:**

Process pulsation can occur around the discharge of pumps as well as quick operating valves. Many users assume that liquid filling a pressure gauge will fully address pulsation. Although a liquid filled gauge helps to dampen the effects of pulsation, it often does not fully address this process condition. Pulsation dampeners are installed upstream of the gauge socket and they can be a piston-type snubber, a sintered metal snubber, or a threaded in-flow restrictor in the socket of the gauge. A needle valve installed upstream of the gauge that is "pinched down" or slightly opened, is another common practice to address pulsation. It is not recommended to rely solely on a needle valve to address pulsation, due to the fact that the user could inadvertently open the valve, and thereby negate flow restriction. In clean fluids (gases or clean low viscosity liquids) a threaded orifice/flow restrictor or a sintered metal snubber is the least costly way to address pulsation. In dirtier and higher viscosity fluids a piston snubber is usually installed.

### **Summary:**

Temperature, vibration and pulsation are three process conditions that adversely affect a pressure gauge. Being aware of these three process conditions, and taking the necessary steps to address them, can help minimize accuracy errors and add to the service life of the pressure gauge.

**Q: What is the purpose of the ventable & non-ventable fill plug/relief plug?**

**A:** A fill plug seals the fill hole in a pressure gauge case. On liquid filled pressure gauges, a ventable fill plug is used to relieve internal case pressures that occur due to thermal expansion of the fill fluid. In non-filled dry gauges, a non-ventable fill plug is used to occasionally drain the interior of the case from condensate or relieve internal case pressures. Ventable fill plugs incorporate a vent pin to open and close a hole for relieving internal case pressures and do not have to be removed from the case hole like non-ventable fill plugs.

**Q: What are the designed overpressure ratings for NOSHOK gauges?**

**A:** Overpressure ratings are specific to the gauge type, pressure range and accuracy ratings of the gauge. Normal overpressure protection can range from 1.1X to 1.3X depending on the gauge selected. NOSHOK gauges comply to the EN-837-1 and ASME B40.1 standards in regards to overpressure protection. When selecting a pressure gauge, it is recommended that the normal system pressure be maintained around half of the full range of the gauge as to avoid overpressure conditions. Overpressure protection of 3 times up to 10 times of the dial range is available on some models as a production option.

**Q: How is the accuracy of a gauge affected by a Maximum Indicating Pointer?**

**A:** A Maximum Indicating Pointer (MIP), also commonly referred to as a Tell Tale Pointer, adds an additional  $\pm 1\%$  error to the pressure gauge due to the increase load on the Bourdon tube.

**Q: What is a Certified Calibration?**

**A:** Certified Calibrations provide the user with a serial numbered gauge along with a calibration certificate that it has been certified in accordance to the pressure gauge standard with instruments that are traceable to NIST with accuracies of at least 4 to 1.

**Q: What is a Certificate of Conformance?**

**A:** A Certificate of Conformance is a formal statement on company letterhead stating that an instrument complies with a particular standard. It contains the signatures of the required personnel. These Certificates are often needed to show industry inspectors that a system and its components are in compliance.

**Q: How often does a gauge need to be calibrated?**

**A:** NOSHOK pressure gauges require little or no calibration within the Warranty period. Some applications may be more aggressive than others, resulting in an increased frequency in the need for calibration. The environmental limitations for the pressure gauge series should be observed in all cases. Gauges used in situations outside these requirements may result in inaccuracies, premature wear and/or failure of the gauge and would require additional maintenance. The frequency of calibration, therefore, is up to the user to judge.

**Q: When is it recommended to use an orifice?**

**A:** Orifices are a type of snubber. On pressure systems that have rapidly increasing or decreasing pressure spikes, orifices lessen the effects of these energy pulses by blocking the wave energy using restricted flow. They are recommended in dynamic pressure applications with mild pressure spikes.

**Q: When is a diaphragm seal used, and when would you apply a diaphragm seal and capillary?**

**A:** A diaphragm is used to isolate and protect the instrument from the process media. Damaging process media may include corrosives, particulates, temperatures, or any state that is not suitable for direct contact with the measuring element. Diaphragms indirectly transmit system pressures by segregating the process pressure with a thin flexible membrane that in turn transfers the pressure through a fill fluid to the instrument. Diaphragms are often used in conjunction with capillaries to further distance the instrument from the process media. Capillary tubes transmit the diaphragm fill fluid to the instrument. Capillary tubes come in several lengths and provide the user a means to measure in a remote location and may also act as heat dissipaters in high temperature applications.

**Q: What is the purpose of liquid filling a gauge, and in what applications would a liquid filled gauge be used?**

**A:** Primarily, in applications that have vibrations or pulsations, liquid filling enables reading the dial pointer by dampening the movement. Liquid filling should be considered in any system that has high dynamic operating conditions. In general, liquid filling helps extend the life of a gauge. It reduces damaging resonance induced fracturing, reduces frictional wear, prevents aggressive ambient air from entering, prevents condensation formation, and improves reliability.

**Q: How does temperature affect the accuracy of a pressure gauge?**

**A:** Temperature changes affect the stiffness of a Bourdon tube. The stiffness change is produced by a combination of changes in the elastic (Young's) modulus and a change in linear dimensions due to linear expansion and contraction. The error caused by temperature change will follow the approximate formula:  $\pm 0.04 \times (t_2 - t_1)$  % of the span.

**Q: How do you select a pressure gauge relative to process pressures, normal operating pressures, and maximum pressures in the process? (Dynamic or static process pressures)**

**A:** The pressure range of a gauge should be 10% over the maximum working pressure in static conditions (no pressure fluctuations). In dynamic conditions, the gauge range should be 40% over the maximum working pressure. Ideally, the pressure gauge range should be selected for a midscale reading during normal operating pressures.

**Q: What does a gauge accuracy statement really mean?**

**(Examples: 1% of span, 3-2-3 percent of span)**

**A:** Accuracy is the difference between the true value and the gauge indication expressed as a percent of the gauge span. It is determined by comparing a gauge indication to a known standard or certified true value and combines the effects of method, observer, apparatus, and environment. Accuracy error also includes hysteresis and repeatability errors. An ASME B40.1 Class B gauge has three accuracies. For example, a 3-2-3 percent of span designation stands for 3% in the first quarter of the scale, 2% in the middle half of the scale and 3% in the upper quarter of the scale.

**Q: What applications require the various lens materials, and to what maximum temperature can each be subjected?**

**A:** Lens materials include Instrument Glass, Laminated Safety Glass, Tempered Glass, and plastic. Glass lenses are used for abrasion, chemical and wear resistant properties. Laminated safety glass reduces the possibility of shattering if the Bourdon tube ruptures. Tempered glass is 2 to 5 times stronger than plain glass. Plastic lenses are used for impact, corrosion and chemical resistance. Special attention should be paid to the temperature and corrosive environments. Polycarbonate is selected for its superior impact resistance, acrylic for its clarity and scratch resistance and Homalite for its superior chemical resistance. In general, gauges with plastic lenses should remain below 140° F.

**Q: In what situation would a pigtail syphon be used?**

**A:** Pigtail syphons should be used in steam applications and systems that contain superheated vapor. The pigtail buffers the instrument from the damaging effects of high temperature steam by holding system fluid in the coil to provide a steam trap for the fluid to condensate and dissipate the heat.

**Q: What is the application for a gauge cleaned for O<sub>2</sub> service?**

**A:** Oxygen (O<sub>2</sub>) cleaning is performed on gauges that are used on oxygen service applications. The cleaning removes all hydrocarbons (oil and grease are common hydrocarbons) that can react violently, resulting in explosions, fire, and injury to personnel and property. Oxygen clean gauges can be used in any application that requires the cleanliness level associated with oxygen clean gauge. Glycerine fill gauge cannot be used on oxygen systems.

**Q: What fill fluids options are available, and in what applications would each be used?**

**A:** Glycerine is the most common fill fluid. Because of its unique fluid properties, Glycerine has become the standard for liquid filled gauges (see "What is the purpose of liquid filling a gauge?"). Glycerine's clarity, viscosity, stability, cost, solubility, low toxicity make Glycerine an ideal fluid for many applications. Mineral oils and silicon fluids are used when temperature extremes, chemical compatibility or viscosity fall outside of Glycerine use. Halocarbon® is an inert fluid that is compatible with chlorine, oxygen service, and some high temperature applications. Keep in mind that Glycerine is not compatible with strong oxidizers such as oxygen, chlorine, hydrogen peroxide, or nitric acid. Glycerine & Silicon are explosive in contact with chlorine. Halocarbon® is explosive in contact with aluminum and magnesium.

**Q: What is the difference between ANSI vs. DIN specification?**

**A:** ANSI is the official U.S. representative to the International Organization for Standardization (ISO) and, via the U.S. National Committee, the International Electrotechnical Commission (IEC). ANSI is also a member of the International Accreditation Forum (IAF) for the American National Standards Institute. It approves American National Standards which include ASME B40.1. DIN stands for Deutsches Institut für Normung e.V. (DIN; in English is the German Institute for Standardization) is the German national organization for standardization and is that country's (ISO) member body. Many of the DIN standards have been converted to ISO standards.

**Q: What is the purpose of throttle devices such as throttle plugs and screws?**

**A:** Throttle devices limit the flow to the pressure instrument. They are a type of snubber.

**Q: What is the purpose of an over and under load stop in a pressure gauge?**

**A:** The tip motion of a Bourdon tube is translated to rotary motion of a pointer by a linkage and sector gear acting on the pointer pinion gear. Stop pins limit the movement of the Bourdon tube, sector or pointer rotation in over and under pressure conditions that would otherwise move the pointer pinion off the sector gear which would damage the gauge.





# NOTES



A series of horizontal lines for writing, overlaid on a decorative background. The background features a large, light gray stylized letter 'W' on the left and a large, light gray stylized letter 'Q' on the right. The lines are evenly spaced and extend across the width of the page.

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## Quality Policy

NOSHOK is committed to providing a high degree of value and continually improving processes to improve customer satisfaction by focusing on customer requirements for the design, manufacture and distribution of pressure, temperature, and force measurement instruments along with needle and manifold valves.

All from world class technology.

Combined with real-world stamina.

The highest value with the industry's best warranty.

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