

# Selecting a Pressure Gauge

When selecting a pressure gauge, it is important to consider the following factors to ensure safety and accuracy:

1. Pressure fluid composition
2. Pressure fluid temperature
3. Ambient conditions
4. Pressure range
5. Conditions affecting wear of the system
6. Method of mounting
7. Required accuracy

## 1. Pressure fluid composition

Since the sensing element of a pressure gauge may be exposed directly to the measured medium, consider the characteristics of this medium. It may be corrosive, it may solidify at various temperatures or it may contain solids that will leave deposits inside the sensing element. For pressure fluids that will not solidify under normal conditions or leave deposits, a Bourdon tube gauge is acceptable. Otherwise a Sealgauge or diaphragm seal should be used. A chemical compatibility chart follows this section to aid in the selection of the proper sensing element material.

## 2. Pressure fluid temperature

Steam and other hot media may raise the temperature of the gauge components above safe working limits of the sealed joints. In these cases it is recommended that a siphon, cooling tower or diaphragm seal be used in conjunction with the pressure gauge.

## 3. Ambient conditions

The normal ambient temperature range for WIKA pressure gauges is -40°F to +140°F (-40°C to +60°C) for dry or silicone-filled gauges and -4°F to +140°F (-20°C to +60°C) for glycerine-filled gauges. The error caused by temperature changes is +0.3% or -0.3% per 18°F rise or fall, respectively. The reference temperature is 70°F (20°C). The correction is for the temperature of the gauge, not the temperature of the measured medium.

Remote gauge mounting using a diaphragm seal and capillary line is one alternative for applications involving extreme ambient temperature.

Moisture and weather effects must also be considered. Liquid-filled gauges prevent condensation build up. For outdoor use, stainless steel, brass or plastic cased gauges are recommended.

## 4. Pressure range

A gauge range of twice the working pressure is generally selected. The working pressure in all cases should be limited to 75% of the gauge range. Where alternating pressure and pulsation are encountered, working pressure should be limited to 2/3 of the gauge range.

## 5. Conditions affecting wear of the system

In applications involving severe pressure fluctuation or pulsation, the use of restrictors and/or snubbers is recommended. In addition, liquid-filled gauges increase the service life of gauges in these conditions. WIKA liquid-filled gauges are generally filled with glycerine. Silicone for larger temperature extremes and Halocarbon® for use with oxidizing agents such as chlorine, oxygen and hydrogen peroxide are also available.

## 6. Method of mounting

Radial (LM) and back (CBM or LBM) connections are available for most WIKA gauges. WIKA stocks gauges with standard NPT threaded connections. Other types such as metric threads, straight threads, hose barbs and special fittings are available as a special order.

Pressure gauges should be mounted in the upright position. For applications where the gauge is mounted side ways, horizontally or upside down, contact WIKA Customer Service for gauge type compatibility.

## 7. Required accuracy

WIKA stocks gauges with accuracies from  $\pm 3/2/3\%$  to  $\pm 0.1\%$  of span (ASME Grade B to Grade 4A).

To ensure safe and accurate gauge selection, you must take all of the above factors into consideration. When in doubt, please do not hesitate to contact your local stocking distributor or WIKA Customer Care for assistance!

1-888-WIKA-USA

# Chemical Compatibility Chart

Acetic Acid	B	Ethyl Acetate	A	Oxygen	A
Acetic Anhydride	D	Ethyl Cellulose	B	Paraffin	A
Acetone	B	Ethylene	A	Phosphoric Acid	B
Acetylene	B	Ethylene Dibromide	B	Photographic Solutions	B
Alcohol	A	Ethylene Dichloride	D	Pickling Solutions	B
Alums	B	Ethylene Glycol	A	Picric Acid	B
Aluminum Sulfate	B	Ferric Nitrate	B	Picric Acid (dry)	B
Ammonia	B	Ferric Sulfate	B	Potassium Chloride	D
Ammonium Carbonate	B	Formaldehyde	B	Potassium Cyanide	B
Ammonium Hydroxide	D	Freon	A	Potassium Permanganate	B
Ammonium Phosphate	D	Gallic Acid	B	Prestone	A
Beer	A	Gas (for lighting)	A	Salicylic Acid	A
Benzine	A	Gasoline	A	Sea Water	C
Benzol	A	Gasoline (refined)	B	Silver Nitrate	B
Benzyl Alcohol	B	Glucose	C	Sodium Carbonate	D
Bleach Liquors	B	Glycerine	A	Sodium Cyanide	D
Bordeaux Mixture	A	Hydrocyanic Acid	B	Sodium Hydroxide	D
Butane	B	Hydrogen	B	Sodium Nitrate	B
Butanol	A	Hydrogen Peroxide	B	Sodium Peroxide	B
Butyric Acid	B	Kerosene	A	Sodium Phosphate	B
Calcium Bisulfite	B	Lacquers	A	Sodium Sulfate	B
Calcium Chloride	C	Lactic Acid	B	Sodium Sulfide	D
Calcium Hydroxide	B	Lysol	B	Sodium Sulfite	B
Carbon Dioxide(dry)	B	Magnesium Hydroxide	C	Sulfur Dioxide	D
Carbon Bisulfide	B	Magnesium Sulfate	B	Sulfur Dioxide (dry)	B
Casein	B	Mercury	B	Sulfuric (75%)	B
Chloroform	B	Methyl Chloride	D	Sulfurous Acid	B
Chromic Acid	B	Methyl Salicylate	D	Tanning Liquors	D
Citric Acid	B	Naphtha	A	Toluene	A
Coal Gas	A	Nickel Acetate	B	Vegetable Oils	B
Copper Sulfate	B	Nitric Acid (pure)	B	Vinegar	B
Cottonseed Oil	B	Nitrous Acid	D	Water	A
Creosote (crude)	B	Nitrous Oxide	D	Whiskey	B
Dextrine	A	Oil (lubricating)	A	Wines	B
Ethers	D	Oil (refined)	A	Zinc Sulfate	B

**NOTE: For steam service, a siphon is required.**

Find the process fluid in the table above and match the letter code (A,B,C, or D) with the wetted part material listed below:

**A = Brass (Copper Alloy)    B = 316 SS    C = Monel®    D = Consult Factory**

This table is provided as a reference only and is accurate to the best of WIKA's knowledge. WIKA assumes no responsibility for, or obligation from, the information here.

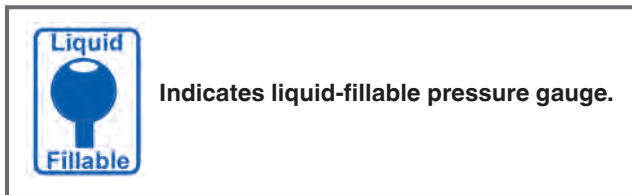
# Advantages of Liquid-filled Gauges

## Liquid-filled gauges

Liquid-filled pressure gauges provide a number of advantages:

- the liquid absorbs vibration and pressure spikes
- the dampening action of the liquid enables the operator to take readings during conditions of rapid dynamic loading and vibration
- the liquid lubricates all moving elements, dramatically reducing wear in the movement
- because most liquid-filled gauges are filled with non-aqueous liquid and hermetically sealed, they perform in corrosive environments and are immune to moisture penetration and icing, and shock effects are lessened


Liquid-filled gauges enhance the reliability and integrity of the measuring system for long periods under extreme operating conditions.



## Liquid Fill Fluid

Ambient Temperature Ratings (Table A)

**Allowable Operating Range** - Temperature range in which the operation of the gauge is not adversely affected by the filling liquid. At temperatures above the maximum rating, the fluid may break down. At temperatures below the minimum rating, the fluid may solidify (freeze).

 **NOTE:** Some parts of the pressure gauge may not be able to withstand temperatures above 140°F. Consult with the factory for technical assistance for these applications.

## Liquid-filled Gauge Case Venting

For pressure gauges with full scale ranges of 300 psi and below (including vacuum and compound ranges of 30" Hg-0-200 psi and below), case venting (after the gauge is installed) is necessary to preserve the accuracy. Temperature fluctuations during shipment and in the process application cause the liquid filling to expand and contract which in turn increases or decreases case pressure. As a result, accuracy can be decreased and the pointer may not return to zero properly until the gauge is vented to the atmosphere.

To vent a WIKA gauge, move the valve to the open position which will release any pressure or vacuum built up in the case. If the gauge is installed in an upright position, the lever can be left in the open position. The lever allows the use of a gauge in a non-upright orientation.



Vent Plug

## Choose the Right Liquid

The type of liquid used to fill the gauge varies with the application. Although pure glycerine provides the best performance in most applications, each has its own requirements. Guidelines to help ensure that a fluid is properly matched to an application are:

- if icing is a problem, use gauges filled with silicone oil or other comparable liquids. They have low viscosities even at -60°C
- if the system has electric accessories, such as contacts, use insulating oils, and
- if extreme temperature fluctuations are expected, use silicone oils

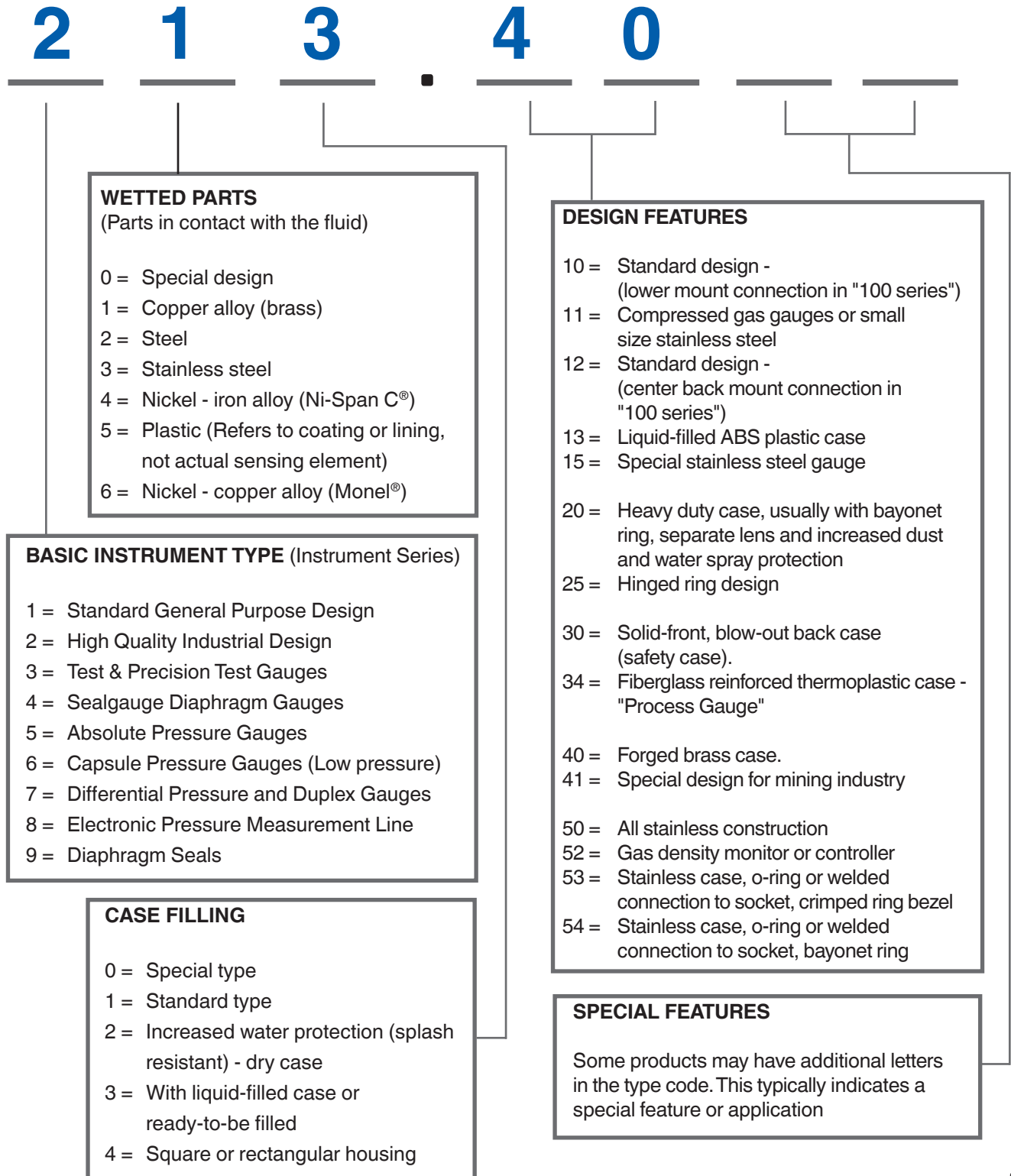
The higher the liquid viscosity, the greater its dampening capacity. The reason for this is that dampening changes in proportion to the temperature-dependent viscosity of the filling liquid. The suitable degree of dampening depends on the operating requirements the gauge must meet, such as pointer response time, pressure extremes, vibration and changes in pressure. WIKA can recommend specific liquids to suit problem applications.

Fill Fluid	Allowable Operating Range
<b>Glycerine</b> Dow 99.7% USP, Synthetic 1118 Centistokes at 68°F	-4°F to 140°F -20°C to 60°C
<b>Silicone</b> Dow Corning 200 Fluid 1000 Centistokes at 77°F	-40°F to 140°F -40°C to 60°C
<b>Halocarbon®</b> Halocarbon® Products 6.3 Centistokes at 100°F	-40°F to 140°F -40°C to 60°C

Table A - Allowable Ambient Temperature Ratings

# WIKA Type Numbers

The following is a guide to the WIKA model numbering system.



# Ordering Guidelines for Pressure Gauges

## 1) Quick Order 7- or 8-Digit Part Numbers:

**Example: 9834850**

Use the part number for the instrument you wish to order.

If you need additional options, or don't see a part number referenced for the exact product you need, you may use Descriptive Text as indicated below (see #2). **A 7-or 8-digit part number will be provided with your order confirmation.** The part number provided may then be used for re-ordering purposes.

## 2) Descriptive Text Part Number System:

**Example:**

Standard Product Description Section				Additional Options & Accessories	
<b>232.34</b>	<b>4.5</b>	<b>100 psi</b>	<b>1/2"</b>	<b>LM</b>	<b>SG, PM</b>
(Type #)	(Dial Size)	(Pressure Range)	(Process Conn. & Location)		(Additional Options / Accessories)

*The above example would indicate a 4 1/2" process gauge, dry, 100 psi dial scale, 1/2" NPT connection, lower mount connection with the following selected options: safety glass (SG) and panel mount (PM), as indicated.*

- Descriptive text can be used anytime you do not find an exact item with a listed part number. You may add as many codes at the end of the descriptive text as is required to configure the product.
- Codes and installed prices are found on a selection chart for each product type. Additional options may be located on the Accessory pages section in the back of the Catalog 900.
- Please reference the WIKA Type Number (pg. 5) for additional product type information. WIKA product types may already determine many configurations for wetted parts and case fill.
- Options and accessories should always appear at the end of the descriptive text, separated by commas. If you are not sure what to use for abbreviated code, then simply spell it out.

**NOTE: If you provide a part number and descriptive text, we will use the part number only.**

If you are unclear, do not see the option(s) needed, or require ordering assistance, please contact a WIKA Customer Care or Technical Quote Team representative.

## Type 23X.54

Type 23X.54 gauges feature 316 SS wetted parts and 304 SS case and bayonet ring, a laminated safety glass window and can be liquid-filled in the field. These gauges are ideal for process, chemical applications, oil exploration and production, power generation and pollution control equipment.



Type 232.54 - Dry case  
Type 233.54 - Liquid-filled case

### Standard Features

<b>Size:</b>	2½" & 4"	<b>Pointer:</b>	Black aluminum, adjustable
<b>Case:</b>	304 SS	<b>Accuracy:</b>	(2½") ± 2/1/2% of span
<b>Ring:</b>	Polished stainless steel		ASME B40.100 Grade A
<b>Wetted Parts:</b>	316 SS		(4") ± 1.0% of span (4" size)
<b>Window:</b>	Safety glass		ASME B40.100 Grade 1A
<b>Dial:</b>	White aluminum	<b>Connection:</b>	Lower and back mount

Type	232.54 (Dry)					
Size	2½"					
Connection	LM			CBM		
Conn. Size	1/4" NPT					
Press. Scale	PSI	PSI/BAR	PSI/KG/CM²	PSI	PSI/BAR	PSI/KG/CM²
30" Hg	9744827	9735245	9694531	9745068	9735385	9694778
30"-0-15 psi	9744835		9694549	9745076		
30"-0-30 psi	9744843		9694557	9745084		
30"-0-60 psi	9744851		9694565	9745092		
30"-0-100 psi	9744860		9694574	9745106		
30"-0-160 psi	9744878		9694582	9745114		
30"-0-200 psi	9744886		9694590	9745122		
15 psi	9744894	9735114	9694604	9745130	9735254	9694786
30 psi	<b>9744908</b>	9735122	9694612	9745149	9735262	9694795
60 psi	<b>9744916</b>	9735130	9694620	9745157	9735270	9694808
100 psi	<b>9744924</b>	9735148	9694638	9745165	9735288	9694816
160 psi	<b>9744932</b>	9735156	9694646	9745173	9735296	9694825
200 psi	<b>9744940</b>		9694655	9745181		9694833
300 psi	<b>9744959</b>	9735165	9694663	9745190	9735300	9694841
400 psi	9744967		9694671	9745203		9694859
600 psi	<b>9744975</b>	9735173	9694689	9745211	9735318	9694867
800 psi	9744983		9694697	9745220		
1,000 psi	9744991	9735181	9694701	9745238	9735326	9694875
1,500 psi	9745009	9735199	9694719	9745246	9735335	9694884
2,000 psi	9745017		9694727	9745254		9694892
3,000 psi	9745025	9735203	9694735	9745262	9735343	9694905
5,000 psi	9745033	9735211	9694744	9745270	9735351	9694914
10,000 psi	9745041	9735229	9694752	9745289	9735369	9694922
15,000 psi	9745050	9735237		9694760	9745297	9735377
Accessory order codes (installed at factory)						
Front flange, SS		--				+ FF S
U-Clamp, steel		--				+ UC Z
U-Clamp, SS		--				+ UC S
Rear flange, SS				+ RF S		
Restrictor				+ R		
Glycerine fill				Type 233.54		

### Available Options

- Dampened movement
- Instrument glass or acrylic window
- Drag pointer (max. reading indicator)
- Cleaned for oxygen service
- Special connections

### Abbreviations

LM - Lower mount  
CBM - Center back mount  
SS - Stainless steel

Stock items shown in blue print.

For datasheets and additional information, please visit [www.wika.com](http://www.wika.com) or call 1-888-945-2872.

## Type 23X.54

Type	232.54 (Dry)					
Size	4"					
Connection	LM	LM			LBM	
Conn. Size	1/4" NPT	1/2" NPT			1/2" NPT	
Press. Scale	PSI	PSI	PSI/BAR	PSI/KG/CM <sup>2</sup>	PSI	PSI/BAR
30" Hg	9745300	9745548	9734826	9694930	9745785	9734966
30"-0-15 psi	9745319	9745556		9694948	9745793	
30"-0-30 psi	9745327	9745564		9694956	9745807	
30"-0-60 psi	9745335	9745572		9694965	9745815	
30"-0-100 psi	9745343	9745580		9694973	9745823	
30"-0-160 psi	9745351	9745599			9745831	
30"-0-200 psi	9745360	9745602			9745840	
15 psi	9745378	9745610	9734699	9694981	9745858	9734835
30 psi	9745386	9745629	9734703	9694999	9745866	9734843
60 psi	9745394	9745637	9734711	9695006	9745874	9734851
100 psi	9745408	9745645	9734729	9695015	9745882	9734869
160 psi	9745416	9745653	9734737	9695023	9745890	9734877
200 psi	9745424	9745661		9695031	9745904	
300 psi	9745432	9745670	9734745	9695049	9745912	9734885
400 psi	9745440	9745688		9695057	9745920	
600 psi	9745459	9745696	9734754	9695065	9745939	9734894
800 psi	9745467	9745700		9695074	9745947	
1,000 psi	9745475	9745718	9734762	9695082	9745955	9734907
1,500 psi	9745483	9745726	9734770	9695090	9745963	9734915
2,000 psi	9745491	9745734		9695104	9745971	
3,000 psi	9745505	9745742	9734788	9695112	9745980	9734924
5,000 psi	9745513	9745750	9734796	9695120	9745998	9734932
10,000 psi	9745521	9745769	9734800	9695138	9746005	9734940
15,000 psi	9745530	9745777	9734818	9695146	9746013	9734958
Accessory order codes (installed at factory)						
Front flange, SS		--			+ FF S	
4½" panel kit		--			+ PM ADAPT	
U-clamp, steel		--			+ UC Z	
U-clamp, SS		--			+ UC S	
Rear flange, SS			+ RF S			
Restrictor			+ R			
Glycerine fill			Type 233.54			

Stock items shown in blue print.

### Abbreviations

- LM - Lower mount
- LBM - Lower back mount
- SS - Stainless steel

## Type 23X.54

Type	233.54 (Glycerine-filled)				
Size	2½"		4"		
Connection	LM	CBM	LM	LM	LBM
Conn. Size	1/4" NPT		1/4" NPT	1/2" NPT	
Press. Scale	PSI	PSI	PSI	PSI	PSI
30" Hg	9831784	9832020	9832275	9832518	9832755
30"-0-15 psi	9831792	9832046	9832284	9832526	9832764
30"-0-30 psi	9831805	9832055	9832292	9832535	9832772
30"-0-60 psi	9831814	9832063	9832305	9832543	9832780
30"-0-100 psi	9831822	9832071	9832314	9832551	9832798
30"-0-160 psi	9831830	9832089	9832322	9832569	9832802
30"-0-200 psi	9831848	9832097	9832330	9832577	9832810
15 psi	9831856	9832101	9832348	9832585	9832828
30 psi	<b>9831865</b>	9832119	9832356	9832594	9832836
60 psi	<b>9831873</b>	9832127	9832365	9832607	9832845
100 psi	<b>9831881</b>	9832135	9832373	<b>9832615</b>	9832853
160 psi	<b>9831899</b>	9832144	9832381	9832624	9832861
200 psi	<b>9831903</b>	9832152	9832399	<b>9832632</b>	9832879
300 psi	<b>9831911</b>	9832160	9832403	<b>9832640</b>	9832887
400 psi	9831929	9832178	9832411	9832658	9832895
600 psi	<b>9831937</b>	9832186	9832429	<b>9832666</b>	9832909
800 psi	9831945	9832195	9832437	9832675	9832917
1,000 psi	<b>9831954</b>	9832208	9832445	<b>9832683</b>	9832925
1,500 psi	<b>9831962</b>	9832216	9832454	<b>9832691</b>	9832934
2,000 psi	<b>9831970</b>	<b>9832225</b>	9832462	<b>9832705</b>	9832942
3,000 psi	<b>9831988</b>	9832233	9832470	<b>9832713</b>	9832950
5,000 psi	9831996	<b>9832241</b>	9832488	<b>9832721</b>	9832968
10,000 psi	9832004	9832259	9832496	<b>9832739</b>	9832976
15,000 psi	9832012	9832267	9832500	<b>9832747</b>	9832985

Accessory order codes (installed at factory)  
See tables for type 232.54

Stock items shown in **blue print**.

### Abbreviations

- LM - Lower mount
- LBM - Lower back mount
- CBM- Center back mount
- SS - Stainless steel

Type	232.54 XMAS Tree Gauge
Size	4"
Connection	LM
Conn. Size	1/2" NPT
Press. Scale	PSI
1,000 psi	<b>8992350</b>
1,500 psi	<b>8992342</b>
2,000 psi	<b>8992334</b>
3,000 psi	<b>8992325</b>
5,000 psi	<b>8992317</b>
10,000 psi	<b>8992309</b>

Type	232.54 Receiver
Size	2½"
Connection	LM
Conn. Size	1/4" NPT
100%	9749470
10 sq. ft.	9749462



## Type 700.04

This piston-style differential pressure gauge is designed for use with clean liquid or gaseous media where high differential pressure/static process pressures are required. Type 700.04 is suitable for measuring pressure drops across a variety of devices, including filters, strainers, separators and heat exchangers.



### Standard Features

<b>Size:</b>	2½" & 4½"	<b>Window:</b>	Acrylic
<b>Case:</b>	Black thermoplastic	<b>Dial:</b>	White aluminum
<b>Wetted Parts:</b>	Ceramic magnet, 316 SS spring, Viton® O-rings, sensor housing (see table)	<b>Pointer:</b>	Black aluminum
		<b>Accuracy:</b>	±2% of span (ascending pressure only)
		<b>Connection:</b>	Back mount

**6000 psig Max. Safe Working Pressure**

Type	700.04			
Size	2½"	4"	2½"	4"
Conn. Size	2 x 1/4" NPT Female, Back			
Sensor Housing	Black-anodized aluminum		316L SS	
5 psid	4390954	4390632	4390675	50334085
10 psid	<b>4375242</b>	4371866	4368084	4372170
20 psid	5375250	4368092	4371816	4372188
25 psid	<b>4375268</b>	4371883	4371824	4272196
30 psid	4390616	4390658	4390691	4390739
50 psid	4375276	4371891	4371832	4272209
60 psid	50420267	4390666		50441647
75 psid	4375285	4371905	4371840	43722147
100 psid	4372933	4371913	4371858	4372162
Accessory order codes (installed at factory)				
Safety glass	+ SG			
Wall/pipe mount kit	+ MKIT			
Drag pointer	+ DP			
Glycerine fill	Type 703.04			

Stock items shown in **blue** print

### Available Options

- ½" NPT female with adaptors (#203963)
- In-line connections (side/end connection)
- Bi-directional reading
- Reversed pressure ports: high (+) on left, low (-) on right (facing gauge)
- Buna-N or EPDM O-rings
- Reed switch with flying leads (SPST and SPDT)
- Wall / pipe - mounting brackets
- Safety glass window

### Applications

- For use in measurement applications requiring high differential/static process pressures
- Suitable for measuring pressure drops across filters, strainers, separators, etc.

### Abbreviations

SPDT - Single pole, double throw  
 SPST - Single pole, single throw  
 SS - Stainless steel