

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!

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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.

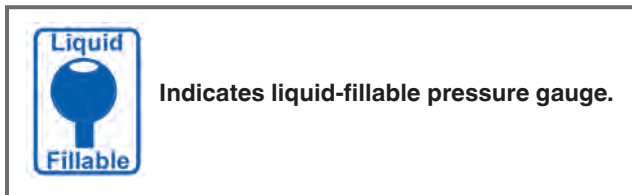
Advantages of Liquid-filled Gauges

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

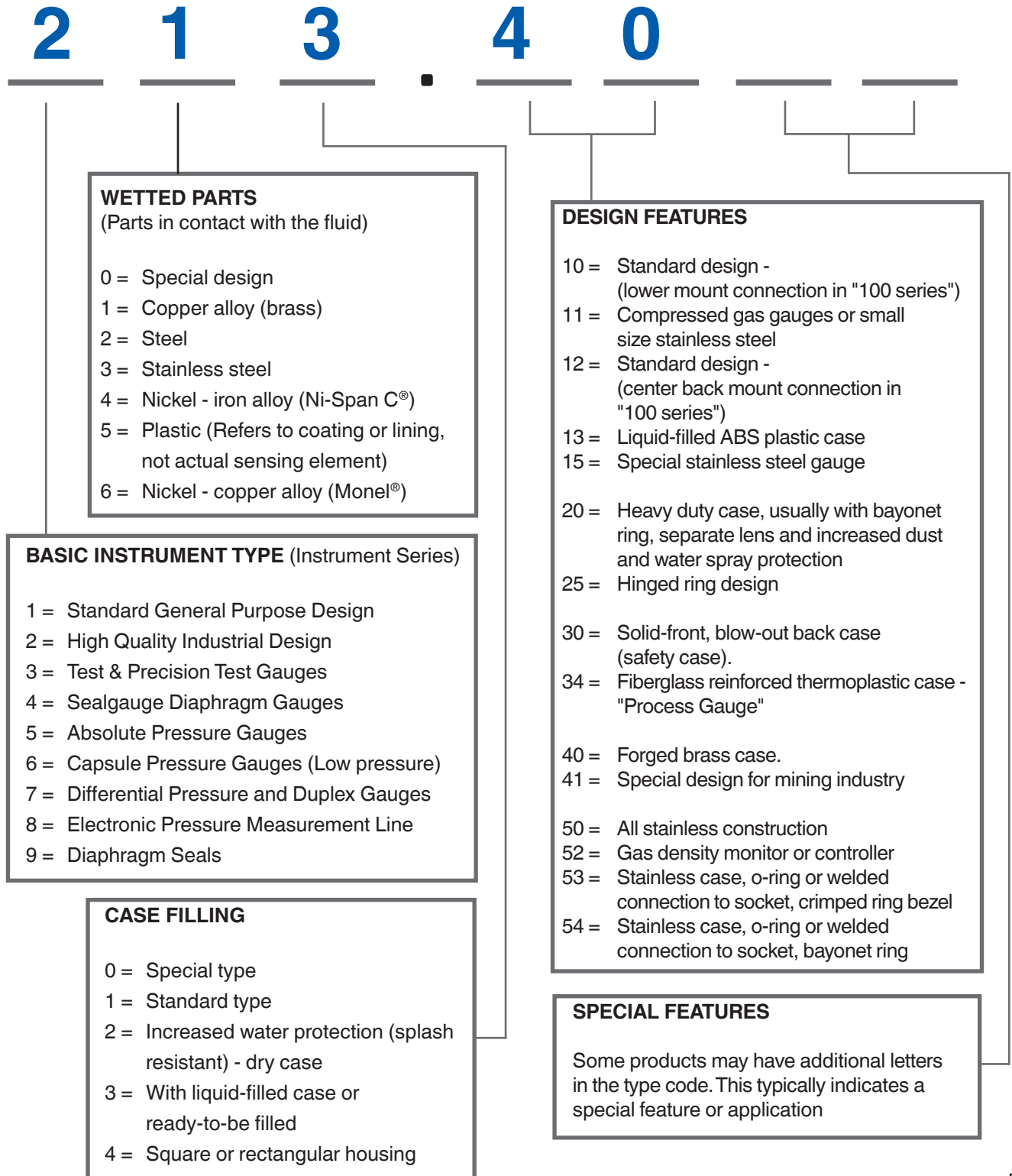
The higher the liquid viscosity, the greater its dampening capacity. The reason for this is that dampening changes in proportion to the temperature-dependent viscosity of the filling liquid. The suitable degree of dampening depends on the operating requirements the gauge must meet, such as pointer response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

Fill Fluid	Allowable Operating Range
Glycerine Dow 99.7% USP, Synthetic 1118 Centistokes at 68°F	-4°F to 140°F -20°C to 60°C
Silicone Dow Corning 200 Fluid 1000 Centistokes at 77°F	-40°F to 140°F -40°C to 60°C
Halocarbon® 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	
232.34	4.5	100 psi	1/2"	LM	SG, PM
(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.

Mechanical Pressure > Process Gauges > 23X.34

Type 23X.34



Specifically designed for the chemical and petroleum processing industries, WIKA XSEL™ process gauges have the construction, materials and engineering it takes to withstand rugged conditions. They are engineered to deliver years of accurate service, while withstanding vibration, corrosive media, corrosive environments and a wide range of temperature extremes. WIKA is so confident in the durability and performance of the XSEL™ process gauge series, that it comes with an industry leading warranty.

Standard Features

Size:	4½" & 6"	Pointer:	Black aluminum, adjustable
Case:	Black Pocan®	Accuracy:	±0.5% of span
Ring:	Threaded black Pocan®	Connection:	ASME B40.100 Grade 2A
Wetted Parts:	316L SS	Restrictor:	Standard
Window:	Acrylic		
Dial:	White aluminum		



Type 232.34 - Dry case
Type 233.34 - Liquid-filled case

MECHANICAL PRESSURE

Type	232.34 (Dry)			233.34 (Filled)			
Size	4½"			4½"			
Connection	LM	LM	LBM	LM	LM		
Conn. Size	1/4" NPT	1/2" NPT	1/2" NPT	1/4" NPT	1/2" NPT		
Press. Scale	PSI	PSI	PSI/KPA	PSI	PSI	PSI/KPA	
30" Hg	9834478	9834729	9837604	4217004	9833735	9833914	9836769
30"-0-15 psi	9834486	9834737	9837566		9833744	9833922	9836777
30"-0-30 psi	9834494	9834745	9837523	4220854	9833752	9833930	9836785
30"-0-60 psi	9834508	9834753	9837485		9833760	9833948	9836794
30"-0-100 psi	9834516	9834761	9792818		9833778	9833956	9836807
30"-0-160 psi	9834524	9834770			9833786	9833965	
30"-0-200 psi	9834532	9834788	9837361		9833795	9833973	
30"-0-300 psi	4260163	4260180					
30"-0-400 psi	4260171	4260198					
15 psi	9834559	9834800	9776885	4242131	9833808	9833981	9836824
30 psi	9834567	9834818	9837680	4247923	9833816	9833999	9836832
60 psi	9834575	9834826	9776877	9797607	9833825	9834006	9836840
100 psi	9834583	9834834	9837760	9797615	9833833	9834015	9836858
160 psi	9834591	9834842	9776869	9797624	9833841	9834023	9836866
200 psi	9834605	9834850	9837841	9797632	9833859	9834031	9836875
300 psi	9834613	9834869	9837884	9797640	9833867	9834049	9836883
400 psi	9834621	9834877	8985116	9797658	9833875	9834057	9836891
600 psi	9834630	9834885	9837965	9797666	9833884	9834065	9836905
800 psi	9835008	9834974		9797675	9833905	9834155	
1,000 psi	9834648	9834893	9778918	9797683	9833892	9834074	9836913
1,500 psi	9793318	9834907	9838082	4247931		9834082	9836921
2,000 psi	9793661	9834915	9838120	4247940		9834090	9836939
3,000 psi	9748911	9834923	9838163	4247958		9834104	9836947
5,000 psi	9793521	9834931	9838201	4247966		9834112	9836955
10,000 psi	9793679	9834940	9838244			9834120	\$184.25
15,000 psi		9834958				9834138	
20,000 psi	N/A	9834966			N/A	9834146	
Accessory order codes (installed at factory)							
4½ panel kit					+ PM		
External zero adjust					+ EXT ADJ		
Dampened movement		+ DAMP				--	
Glycerine fill		Type 233.34				--	
Silicone fill		Type 233.34 + SIL				-	

Available Options

- Dampened movement
- Safety glass or instrument glass window
- Drag pointer (maximum reading indicator)
- Cleaned for oxygen service
- Magnetic or inductive contact switches
- Special connections

Applications

- A liquid-filled case and socket restrictor are available for applications with high dynamic pressure pulsations or vibration
- Suitable for corrosive environments and gaseous or liquid media that will not obstruct the pressure system
- Process industry: chemical/ petrochemical, power stations, mining, on and offshore, environmental technology, mechanical engineering and plant construction

Abbreviations

LM - Lower mount
SS - Stainless steel

Stock items shown in blue print

For datasheets and additional information, please visit www.wika.com or call 1-888-945-2872.

Type 23X.34

MECHANICAL PRESSURE

Type	232.34 (Damp)	232.34 (Dry)
Size	4½"	6"
Connection	LM	LM
Conn. Size	1/2" NPT	1/2" NPT
Press. Scale	PSI	PSI
30" Hg	4334478	4317492
30"-0-15 psi		
30"-0-30 psi		
30"-0-60 psi		
30"-0-100 psi		
30"-0-160 psi		
30"-0-200 psi		
30"-0-300 psi		
30"-0-400 psi		
15 psi	4339623	
30 psi	4334486	4317505
60 psi	4334494	4317513
100 psi	4333960	4317590
160 psi	4333978	4317521
200 psi	4334507	4317531
300 psi	4337329	4317549
400 psi	4333986	
600 psi	4334515	4317557
800 psi	4334523	
1,000 psi	4334531	4317565
1,500 psi	4334541	4343281
2,000 psi	4333994	
3,000 psi	4334559	
5,000 psi	4334567	
10,000 psi		
15,000 psi		
20,000 psi		
Accessory order codes (installed at factory)		
4½ panel kit	+ PM	--
External zero adjust	+ EXT ADJ	--
Glycerine fill	Type 233.34	
Silicone fill	Type 233.34 + SIL	

Liquid Fill Conversion Kits (Use for preparing a dry gauge for liquid filling)		
For use with	Conn.	P/N
Glycerine/Silicone Material: EPDM	LM	1126768
	LBM	2044480
Halocarbon® Material: Viton®	LM	1654268
	LBM	2044498

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

Stock items shown in blue print