

# 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.

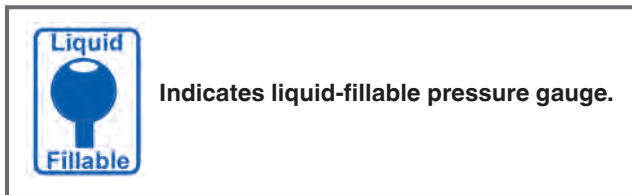
# Advantages of Liquid-filled Gauges

## 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

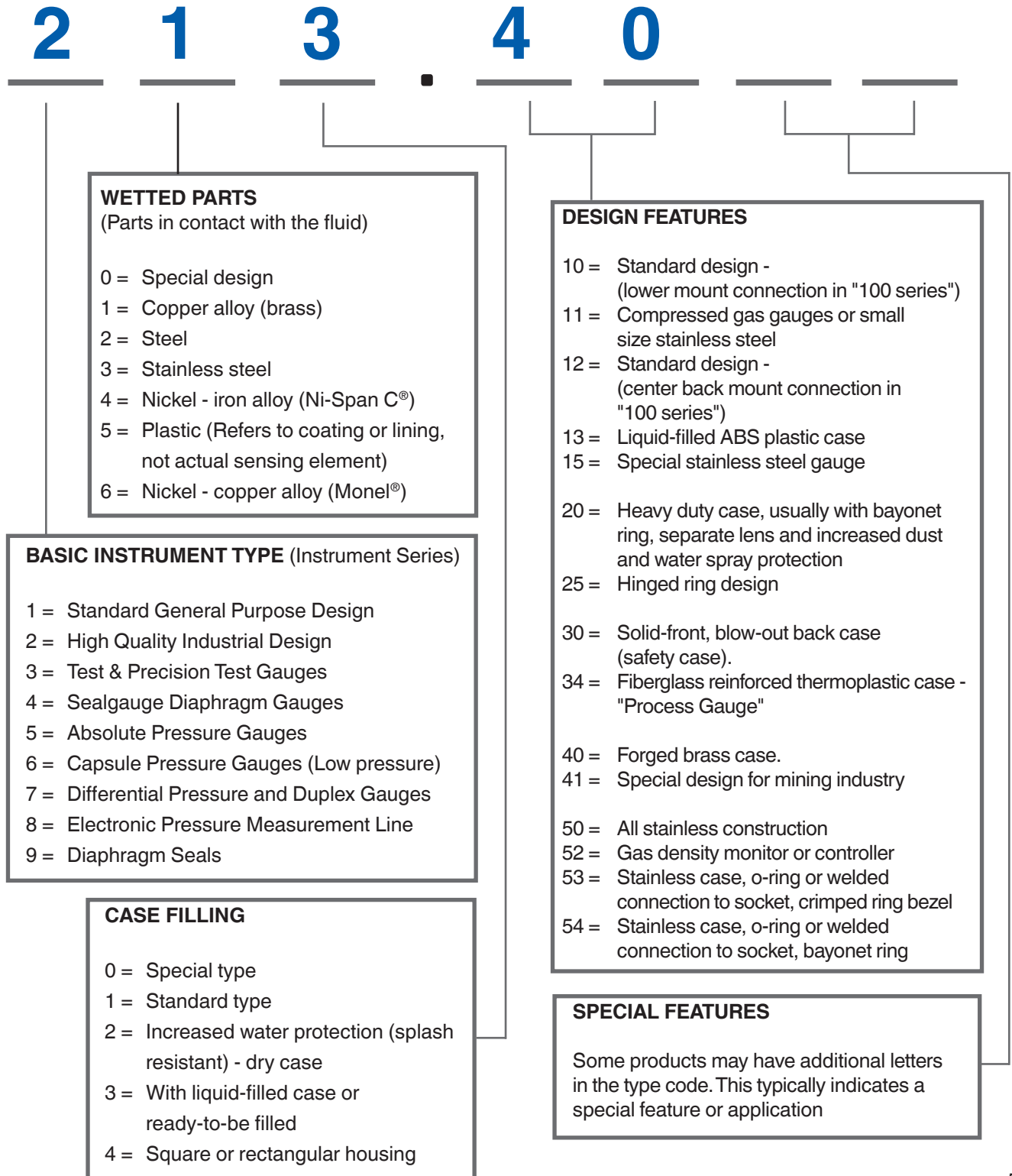
The higher the liquid viscosity, the greater its dampening capacity. The reason for this is that dampening changes in proportion to the temperature-dependent viscosity of the filling liquid. The suitable degree of dampening depends on the operating requirements the gauge must meet, such as pointer response 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 111.10

WIKA type 111.10 standard pressure gauges are designed for long and reliable service under rugged conditions. Some typical applications are for pumps, hydraulic and pneumatic systems, compressors, as a contractor's gauge and for many other applications where the measured media does not corrode brass.



MECHANICAL PRESSURE

## Standard Features

<b>Size:</b>	1½", 2", 2½" & 4"	<b>Accuracy:</b>	± 3/2/3% of span
<b>Case:</b>	Black ABS		ASME B40.100 Grade B
<b>Wetted Parts:</b>	Copper alloy	<b>Connection:</b>	Lower mount
<b>Window:</b>	Clear plastic		
<b>Dial:</b>	White ABS; (4") aluminum		
<b>Pointer:</b>	Black ABS; (4") aluminum		

Type	111.10							
Size	1½"		2"		2½"		4"	
Connection	LM		LM		LM		LM	
Conn. Size	1/8" NPT		1/8" NPT		1/4" NPT		1/4" NPT	
Press. Scale	PSI		PSI		PSI/KPA		PSI/KPA	
30" Hg	<a href="#">9747214</a>	<a href="#">8990039</a>	<a href="#">4252901</a>	<a href="#">8990250</a>	<a href="#">4253027</a>	<a href="#">8990471</a>	<a href="#">4255900</a>	<a href="#">9767991</a>
30"-0-15 psi					<a href="#">4253035</a>	<a href="#">8990489</a>	<a href="#">4255918</a>	9768009
30"-0-30 psi					<a href="#">4253043</a>	<a href="#">8990497</a>	<a href="#">4255926</a>	9768017
30"-0-60 psi					<a href="#">4253051</a>	8990501	<a href="#">4255934</a>	9768025
30"-0-100 psi					<a href="#">4253060</a>	8990519	4255942	9768033
30"-0-160 psi					4253078	8990527	<a href="#">4255951</a>	9768041
30"-0-200 psi					4253086	8990535	4255969	9768050
15 psi	<a href="#">9747222</a>	8990102	<a href="#">4252919</a>	<a href="#">8990323</a>	<a href="#">4253108</a>	<a href="#">8990552</a>	4255977	9768068
30 psi	<a href="#">9747230</a>	<a href="#">8990110</a>	<a href="#">4252927</a>	<a href="#">8990331</a>	<a href="#">4253116</a>	<a href="#">8990560</a>	<a href="#">4255985</a>	9768076
60 psi	<a href="#">9747249</a>	8990128	<a href="#">4252935</a>	<a href="#">8990349</a>	<a href="#">4253124</a>	<a href="#">8990578</a>	<a href="#">4255993</a>	<a href="#">9768084</a>
100 psi	<a href="#">9747257</a>	8990136	<a href="#">4252943</a>	<a href="#">8990357</a>	<a href="#">4253132</a>	<a href="#">8990586</a>	<a href="#">4256000</a>	<a href="#">9768092</a>
160 psi	<a href="#">9747265</a>	<a href="#">8990145</a>	<a href="#">4252951</a>	<a href="#">8990365</a>	<a href="#">4253141</a>	<a href="#">8990595</a>	<a href="#">4256018</a>	<a href="#">9768106</a>
200 psi	<a href="#">9747273</a>	8990153	<a href="#">4252960</a>	<a href="#">8990374</a>	<a href="#">4253159</a>	<a href="#">8990608</a>	<a href="#">4256026</a>	<a href="#">9768114</a>
300 psi		8990161	4252978	<a href="#">8990382</a>	<a href="#">4253167</a>	<a href="#">8990616</a>	<a href="#">4256034</a>	<a href="#">9768122</a>
400 psi			4252986		<a href="#">4253175</a>	<a href="#">8990625</a>	4256042	9768130
600 psi			4252994		<a href="#">4253183</a>	<a href="#">8990633</a>	<a href="#">4256051</a>	9768149
800 psi					4253191	8990641	4256060	
1,000 psi			4253001		<a href="#">4253205</a>	<a href="#">8990659</a>	4256078	<a href="#">9768416</a>
1,500 psi					4253213	<a href="#">8990667</a>	4256086	
2,000 psi					4253221	<a href="#">8990675</a>	4256094	
3,000 psi			<a href="#">4253019</a>		4253230	<a href="#">8990684</a>	4256107	
5,000 psi					4253248	<a href="#">8990692</a>	4256115	
Accessory order codes (installed at factory)								
Restrictor	+ R							

Stock items shown in blue print.

## Available Options

- Glass window
- Drag pointer
- Cleaned for oxygen service
- Black steel case and ring
- Stainless steel case and ring
- Special connections

## Applications

- Fire sprinkler systems
- Suitable for all media that will not obstruct the pressure system or attack copper alloy parts

**Abbreviations**  
LM - Lower mount

## Type 732.26

This opposed membrane/liquid-filled sensor element differential pressure gauge is for applications requiring low differential/medium static process pressures. The 732.26 is typically used for a variety of industrial uses, including cryogenic gases and/or corrosive environments in liquid or gaseous media.



### Standard Features

<b>Size:</b>	4½" & 6"	<b>Window:</b>	Acrylic
<b>Case:</b>	Black epoxy-coated aluminum	<b>Dial:</b>	White aluminum
<b>Ring:</b>	Polished SS	<b>Pointer:</b>	Black aluminum
<b>Wetted Parts:</b>	316L SS sensor housing, 316 SS membrane, and PTFE O-ring	<b>Accuracy:</b>	±1% of span ASME B40.100 Grade 1A
<b>Dial:</b>	White aluminum with black lettering	<b>Connection:</b>	Top/bottom mount

**600 psig Max. Safe Working Pressure**

**Handwritten calibration report standard**

**Cleaned for oxygen service,  
with "USE NO OIL" on dial**

Type	732.26	
Size	4½"	6"
<b>Conn. Size</b>	2 x 1/4" NPT Female, Top/Btm	
100 "H <sub>2</sub> O <sub>d</sub>	4375986	<b>4374246</b>
150 "H <sub>2</sub> O <sub>d</sub>	4375994	4376036
200 "H <sub>2</sub> O <sub>d</sub>	4376001	4376044
300 "H <sub>2</sub> O <sub>d</sub>	4376019	4376052
400 "H <sub>2</sub> O <sub>d</sub>	4376027	4376060
15 psid		
30 psid		
60 psid		
100 psid		
230 psid		
300 psid		
400 psid		
500 psid		
Accessory order codes (installed at factory)		
Safety glass window	+ SG	

### Available Options

- Case filling Halocarbon® (only for O<sub>2</sub> service); other case fillings (glycerine or silicone oil) are available, but not for O<sub>2</sub> service (without \* use no oil\* on dial)
- Wall/pipe mounting kit
- C-bracket mounting kit (#2353275)
- H-bracket mounting kit (#2398784)
- Special dials for liquid level measurement
- ½" NPT female adaptors (#203963)
- 304 SS case material
- Safety glass window

### Applications

- For measurement in applications requiring low to medium differential and / or static process pressures
- For cryogenic gases or corrosive environments with either liquid or gaseous media

Stock items shown in **blue** print.