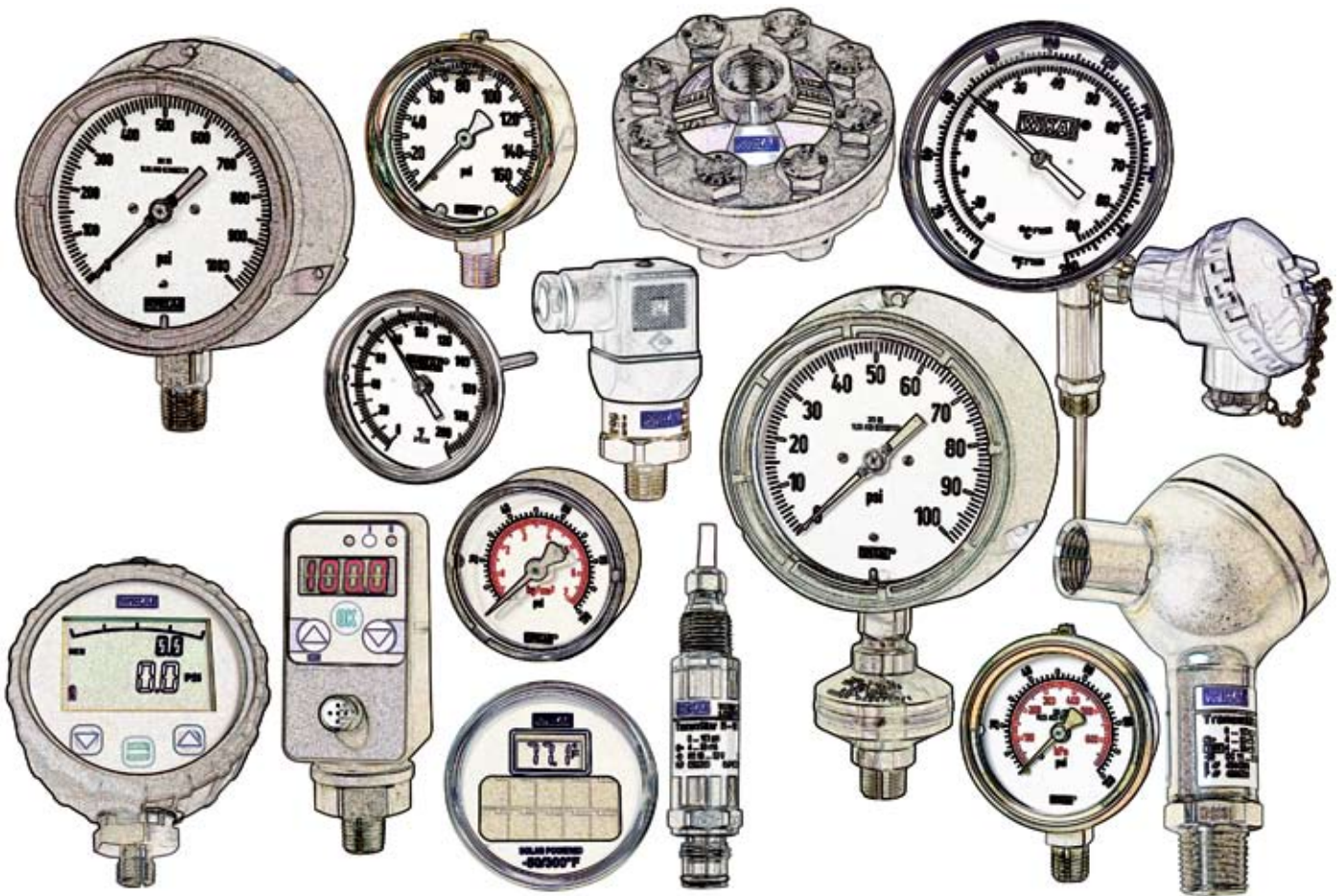


Product Catalog 800



 Part of your business

Table of Contents

Selecting a Pressure Gauge	3
Chemical Compatibility Table	5
Advantages of Liquid-Filled Gauges	6
WIKA Part Numbers	7
Ordering Guidelines for Pressure Gauges	8

MECHANICAL PRESSURE

Commercial Gauges 9

111.10 1½", 2", 2½", 4"	10
111.10SP - Fire Sprinkler 4"	13
111.10 & 111.12 1½", 2", 2½"	14
111.12 1½", 2", 2½" 3½", 4"	16
111.11 1½", 2", 2½"	19
111.11RF - Refrigeration 2½"	20
111.16PM 1½", 2"	21
111.11PM 2½"	22
111.25CT 4½"	23
113.13 1½", 2½"	24
Additional 100 Series Options & Accessories	25

Industrial & Process Gauges 27

131.11 1½", 2"	28
1X1.15 2", 2½"	29
13X.53 4"	30
2X1.11 10"	31
212.20 6"	32
213.40 2½", 4"	33
21X.40PM 3½"	36
21X.53 2", 2½", 4"	37
23X.53 2", 2½", 4"	42
21X.54 2½", 4"	45
23X.54 2½", 4"	46
233.55 2½"	50
23X.30 2½", 4"	51
23X.50 2½", 4", 4½", 6"	53
21X.34 4½"	56
22X.34 4½"	57
23X.34 4½", 6"	58
26X.34 4½"	61
232.34DD 4½"	62
212.25 4½", 6"	63
232.25 4½", 6"	64
Sealgauge® Principles	65
42X.12/43X.12 4", 6"	66
43X.30 4", 6"	67
43X.36 4", 6"	68
43X.50 4", 6"	69
45X.50 4", 6"	70
43X.56 4", 6"	71

Low Pressure Gauges 73

6X1.10 2", 2½"	74
611.13 2", 2½"	75
612.20 4"	76
6X2.34 4½"	77
63X.50 2½", 4", 6"	78

Differential & Duplex Gauges 79

700.04 2½", 4½"	80
700.05 2½", 4½"	81
7X1.12 4", 6"	82
732.14 4", 6"	83
712.25DP 4½", 6"	85
712.25DX 4½", 6"	86
716.11 2½", 4", 6"	87
732.25 4½", 6"	88
732.26 4½", 6"	89
732.51 4", 6"	90

High Precision Gauges 91

312.20 6"	92
332.30 6"	93
332.34 4½"	94
332.54 4"	95
342.11 10"	96

Calibration Test

Equipment & Accessories 97

CPP30	98
CPP1000-M	98
65-2000 & 65-2000 II	99
CPH-6200	100
CPH-6000	100

ELECTRONIC PRESSURE MEASUREMENT 101

Electronic Measurement 102

Industrial Pressure Transmitters 105

S-10/S-11	106
IS-20/IS-21/IS-20-F/IS-21-F	115
F-20/F-21	127
HP-1	135
PSD-10	136

OEM Pressure Transmitters 143

C-10	144
A-10	150
ECO-1	156
N-10/N-11	161
E-10/E-11	169
MH-1	177
MH-2	179
OT-1	184
OC-1	189
TTF-1	189

3A Sanitary & Submersible Transmitters 191

S-10-3A	192
F-20-3A	194
SA-11	198
LS-10/LH-10	200
IL-10	207

Special Purpose Transmitters 209

UT-10/UT-11	210
DG-10	218
P-10, P-11	224
DP-10	225

Meters & Displays 229

907.50.9X0	230
A-AI-1	233
DI-15	235
TRONIC LINE Miscellaneous Accessories & Replacement Parts List	237

DIAPHRAGM SEALS 239

Assembled Seals 245

M93X.25	246
M93X.3A	249
M93X.2C	252
M990.30	255
M93X.D1	257

Threaded Seals 261

L990.TA	262
L990.TB	264
L990.10	267
L990.TC	270
L990.14	273
L990.40	275
L990.34	278
L990.36	280

Flanged Seals 283

L990.12	284
L990.FA	287
L990.FC	290
L990.FD	293
L990.FB	296
L990.26	299
L990.27	302
L990.FR	305
L990.28	308
L990.29	311
L990.35	313
L990.41	315

Sanitary Seals 319

L990.18	320
L990.22	322
L990.57	324
L990.58	326
L990.SD	328

Plastic Seals 331

L990.31	332
L990.PA	334
L990.PF	335

Table of Contents continued

INLINE Seals™	337	Thermowells	425
L981.10	338	TW.TH (Threaded)	429
L981.18	341	TW.SW (Socket/Weld)	434
L981.22	343	TW.FL (Flanged)	436
L981.27	346	TW.SC (Sanitary)	437
L981.31	349	Industrial Glass	439
L981.57	351		
L981.SY	353		
Capsule Seals	355	ELECTRONIC TEMPERATURE TRANSMITTERS	441
L970.10	356	T19.10	442
L970.11	357	T19.30	442
		T23.10	443
Seal Accessories	359	T24.10	443
910.27	360	T12.10	444
L910.ZA	362	T12.30	445
General Seal Information	365	T32.10/T32.30	446
		T42.10	447
MECHANICAL TEMPERATURE	373	ACCESSORIES	449
Bimetal Thermometers	374	910.10 Gauge Cocks	450
TI.1005	376	910.11 Needle Valves	451
TI.ST	377	910.11.100 Mini-Needle Valves	452
TI.T20/TI.T17	378	910.11.200 Block & Bleed Valves	453
TI.20	380	910.11.300 Multi-Port Valves	454
TI.30/TI.50	381	910.12.100/910.12.200/	
TI.31/TI.51	382	910.12.300 Snubbers	455
TI.32/TI.52	383	910.13 Overpressure Protectors	456
TI.33/TI.34/TI.53/TI.54	384	910.14.100 Test Port Plug	457
		910.14.200 Adaptors	458
Bimetal Thermometer Options	387	910.14.300 Couplings	459
		910.15.100/910.15.200 Siphons	460
Digital Thermometers	389	CP3000/CP4000 Alarm Contacts	461
TI.1006DW	390	Socket Restrictor	464
TI.80/TI.82	391	Drag Pointer	464
		Alarm Contacts	464
Twin-Temp Thermometers	393	GENERAL INFORMATION	471
TT.30/TT.32/TT.50/TT.52	394		
TT.80/TT.82	399		
Gas Actuated Thermometers	401		
TI.R45/TI.R60	404		
TI.TSG60	408		
Vapor Actuated Thermometers	411		
TI.V20/TI.V25/TI.V35/TI.V45	412		
Industrial Glass Thermometers	417		
TI.61102/TI.61104	418		
TI.62102/TI.62104	418		
TI.701/TI.901	420		
TI.D01	423		

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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 Sealgaug[®] 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, and 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 sideways, horizontally, or upside down, contact WIKA Customer Service for gauge type compatibility.

Required accuracy

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

7

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 Service for assistance!

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Chemical Compatibility Table

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 Stainless Steel

C = Monel®
D = Consult Factory

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

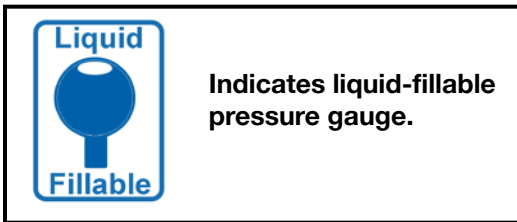
Advantages of Liquid-Filled Gauges

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.

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

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

WIKAI Type Numbers

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

2 1 3 . 4 0

WETTED PARTS

(Parts in contact with the fluid)

- 0 = Special design
- 1 = Copper alloy (brass)
- 2 = Steel
- 3 = Stainless steel
- 4 = Nickel - iron alloy (Ni-Span C®)
- 5 = Plastic (Refers to coating or lining, not actual sensing element)
- 6 = Nickel - copper alloy (Monel®)

BASIC INSTRUMENT TYPE (Instrument Series)

- 1 = Standard General Purpose Design
- 2 = High Quality Industrial Design
- 3 = Test & Precision Test Gauges
- 4 = Sealgaug[®] Diaphragm Gauges
- 5 = Absolute Pressure Gauges
- 6 = Capsule Pressure Gauges (Low pressure)
- 7 = Differential Pressure and Duplex Gauges
- 8 = TRONIC Line
- 9 = Diaphragm Seals

CASE FILLING

- 0 = Special type
- 1 = Standard type
- 2 = Increased water protection (splash resistant) - dry case
- 3 = With liquid filled case or ready-to-be filled
- 4 = Square or rectangular housing

DESIGN FEATURES

- 10 = Standard design - (lower mount connection in "100 series")
- 11 = Compressed gas gauges or small size stainless steel
- 12 = Standard design - (center back mount connection in "100 series")
- 13 = Liquid-filled ABS plastic case
- 15 = Special stainless steel gauge
- 20 = Heavy duty case, usually with bayonet ring, separate lens and increased dust and water spray protection
- 25 = Hinged ring design
- 30 = Solid-front, blow-out back case (safety case).
- 34 = Fiberglass reinforced thermoplastic case - "Process Gauge"
- 40 = Forged brass case.
- 41 = Special design for mining industry
- 50 = All stainless construction
- 52 = Gas density monitor or controller
- 53 = Stainless case, o-ring or welded connection to socket, crimped ring bezel
- 54 = Stainless case, o-ring or welded connection to socket, bayonet ring

SPECIAL FEATURES

Some products may have additional letters in the type code. This typically indicates a special feature or application

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:

<u>Standard Product Description Section</u>					<u>Additional Options & Accessories</u>
232.34	4.5	100 psi	1/2"	LM	SG, PM
(Typel #)	(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 Model Type. Additional options may be located on the Accessory pages section in the back of the Catalog 700.
- Please reference the WIKA Type Number (pg. 7) for additional Model/Type information. WIKA Model 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.