



Bourdon Tube Pressure Gauges

Stainless Steel Case

Stainless Steel Wetted Parts

Process Industry Series Liquid Fillable • Type 23X.50

Pressure Gauges

Application

Industrial type gauge design for fluid medium which does not clog connection or corrode 316 stainless steel.

Example: process, chemical, petrochemical equipment.

Sizes (All sizes not stocked)

6" (160 mm)

Accuracy

±1.0% of span (ASME B40.1 Grade 1A)

Ranges (All ranges not stocked)

Vacuum / Compound to 30"HG / 0 / 200 PSI

Pressure from 10 PSI to 20,000 PSI

or other equivalent units of pressure or vacuum

Working Range

2½" Steady: 3/4 of full scale value
Fluctuating: 2/3 of full scale value
Short time: full scale value

4" & 6" Steady: Full scale value
Fluctuating: 0.9 x full scale value
Short time: 1.3 x full scale value

Operating Temperature

Ambient: -40°F to 140°F (-40°C to 60°C) ^{Note 1}

Media: max. 212°F (+100°C)

Temperature Error

Additional error when temperature changes from reference temperature of 68°F (20°C) ±0.4% for every 18°F (10°C) rising or falling. Percentage of span.

Standard Features

Connection

Material: 316 stainless steel

Lower mount (LM)

Lower back mount (LBM)

Welded to case

1/4" NPT or 1/2" NPT limited to wrench flat area

Bourdon Tube

Material: 316 stainless steel

30"Hg (Vac) to 1000 PSI C-type

1500 PSI to 20,000 PSI helical type

Movement

316 stainless steel

Dial

White aluminum with black lettering.

Pointer

Black aluminum - adjustable

Case

304 stainless steel with polished twist lock ring and blow out plug. Blow-out plug provided with venting lever standard for ranges 300PSI and lower.



Weather Protection

Weather resistant (NEMA 3 / IP 54) - dry case

Weather tight (NEMA 4X / IP 65) - liquid-filled case

Standard Scale

PSI, PSI/BAR, PSI/Kg/cm²

Window Gasket

Buna-N

Window

Laminated safety glass

Order Options (min. order may apply)

316 SS threaded restrictor

Front flange stainless steel polished

Rear flange stainless steel

U-clamp bracket with SS polished profile ring

316 SS case material

Glass window

Cleaned for oxygen service

Special connections limited to wrench flat area

Externally adjustable red drag pointer (max. hand)

Externally adjustable red mark pointer (set pointer)

DIN standards

Custom dial layout

Other pressure scales available:

Bar, kPa, MPa, Kg/cm² and dual scales

Alarm contact switches (magnetic or inductive)

Transmitters

Glycerine, silicone or Fluorlube case filling (Type 233.50)

Note 1 Temperature Ranges (Liquid filled gauges)

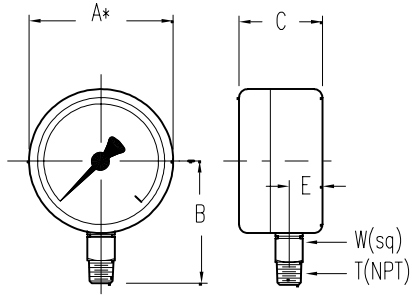
Glycerine: -4°F to 140°F (-20°C to 60°C)

Silicone: -40°F to 140°F (-40°C to 60°C)

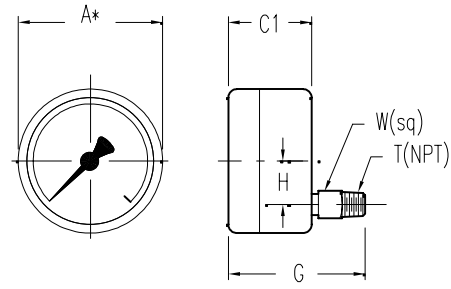
APM 23X.50

(APM 02.02)

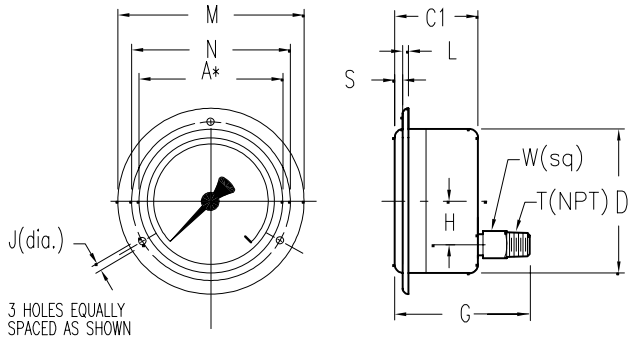
Dimensions:



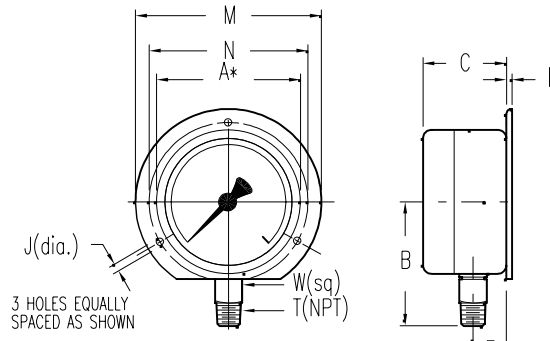
LOWER MOUNT



LOWER BACK MOUNT



LBM/FRONT FLANGE



LM/REAR FLANGE

A* NOMINAL SIZE

TYPE/SIZE	WEIGHT	KEY	A*	B (1)	C (2)	C1 (2)	E	G	H (3)	J	L	M	N	S	T	W
23X.50 6"	2.42 lbs. + 2.0 lbs. if liq. fill	mm	160	116	49.5	49.5	15.5	81	50	5.8	3	196	178	5	1/2"	.86
		in	6.00	4.57	1.95	1.95	0.61	3.19	1.97	0.23	0.12	7.72	7.00	0.2		

(1) For 1/4" NPT connections, B dimension changes to 80mm / 3.15 in. (4") or 111mm / 4.37 in (6").
 (2) For LM, range 20,000PSI and LBM ranges above 1,000PSI, C dimension changes to 65.5 mm / 2.58"



Chemical Seals

Cooling Element

Intended to protect the pressure instrument from high or low process temperature. Air flow across heat exchanging fins reduces or increases the temperature of the system fill fluid to protect the pressure measuring instrument.

The cooling element is recommended for process temperatures above 212°F. It is direct mounted between the pressure instrument and the chemical seal. Silicone fill is recommended. Effective temperature reductions of 200°F depending upon ambient conditions. All stainless steel construction back welded to stainless steel upper housing or flange.

Capillary line

Stainless steel capillary with or without stainless steel armor provides a connection between the pressure instrument and the chemical seal. It protects the pressure instrument from high or low process temperatures and provides distant or remote reading.

The capillary should be selected as short as possible, since changes in ambient temperature conditions may considerably affect the accuracy and response time of the pressure instrument. Standard length is five feet; other lengths are available upon request.

Installation on mechanical gauges normally requires a gauge support and gauge adaptor or other surface mounting provisions.

Any level difference between pressure instrument and chemical seal will cause a pressure indication error. The level difference can be compensated for during calibration of the chemical seal assembly if level difference is known.

Minor corrections can be made on site by means of an adjustable pointer or zero adjustment of the pressure instrument.

Gauge Support and Adaptor

Provides wall mounting of pressure instrument by clamping to gauge adaptor. Material: gauge support - aluminum or stainless steel, gauge adaptor - stainless steel.



Chemical Seal Assembly with Cooling Element

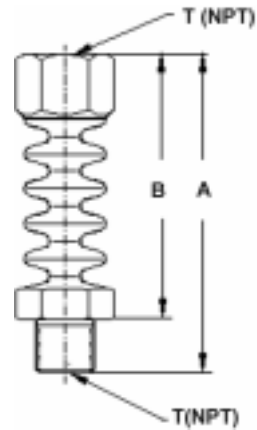


Chemical Seal Assembly with Capillary Line, Gauge Support and Adaptor

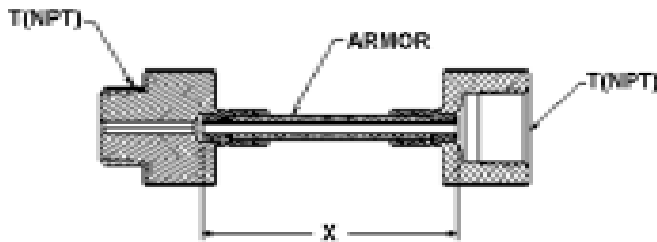
To determine the effects of temperature and response time in a specific application, contact the factory for an **Application Questionnaire**. The information provided will allow WIKA Technical Support to accurately model your application parameters using state-of-the-art computer simulation techniques.

Cooling Element

T	KEY	A	B
1/4" X 1/4"	in.	4.68	4.05
	mm	119	103
1/2" X 1/2"	in.	4.68	3.86
	mm	119	98

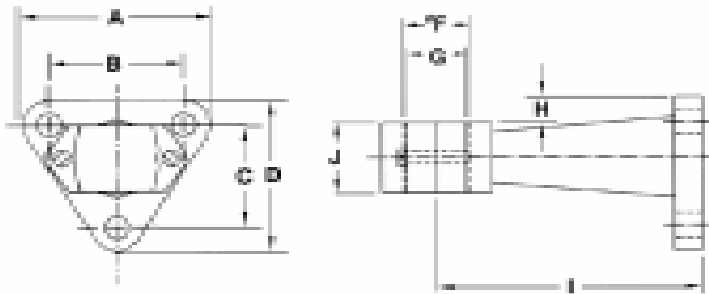


Capillary Line



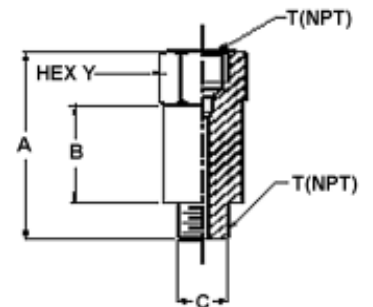
X = 5 feet standard, maximum 48 ft.; T = 1/4" or 1/2"

Gauge Support



KEY	A	B	C	D	E	F	G	H	I
in.	3.35	2.56	2.20	2.99	.276	1.02	.87	.55	3.94
mm	85	65	56	76	7	26	22	14	100

KEY	A	B	C	T	Y
in.	2.95	1.18	1.02	1/2"	1.06
mm	75	30	26	--	27



Chemical Seal Mounting Options

Chemical Seal

System Fill Fluids

The system fill fluid should be carefully selected for compatibility with the pressure medium. This is particularly true in food applications and in processes involving oxidizing media such as oxygen or chlorine. The table below lists the most common fill fluids. Alternate fill fluids are available for special applications.

Mounting Options available (connections, capillary, etc.)
See Selection Guide (over)

NOTE: For applications with oxidizing media such as oxygen or chlorine, either Halocarbon (KN 21) or Fluorolube (KN8) should be used for the system fill.

	Standard	Low Temp.	Food Application				High Temp.	Inert	
Fill Fluid ¹	Silicone Oil	Silicone Oil	Glycerine ³	Glycerine/Water ³	Vegetable Oil	Food Grade Silicone Oil	High Temp. Oil	Halocarbon 6.3	Fluorolube FS-5
Code No. (KN)	KN 2	KN 17	KN 7	KN 12	KN 13	KN 34	KN 3.2	KN 21	KN 8
Temperature (min/max)	-4 to +392°F	-130 to +176°F	+60 to +462°F	+14 to +248°F	+14 to +400°F	0-372°F	-4 to +752°F	-40 to +347°F	-40 to +392°F
Assembly design:	Part Number	Part Number	Part Number	Part Number	Part Number	Part Number	Part Number	Part Number	Part Number
- Mini Seal direct	281		280		287			283	
- Direct mounting ²	219	238	215	216	250	263	266	212	240
- with cooling element	220	296			254	264	267	213	
- with capillary Upto 9"	220	296			254	264	267	213	
- with capillary 10" to 19"	221	269			255		268	247	
- with capillary 20" to 29"	222	273			256			248	
- with capillary Over 29"	223		--		257			249	

¹ Contact factory for other filling liquids.

² Not available for Type 990.28.

³ KN 7 and KN 12 not suitable for vacuum or compound ranges

All threads welded during assembly.

+14° F when used with transmitters

Temperature ranges atmospheric pressure and up

Filling Liquids Specifications

Fill Fluid	WIKA Code No.	Suitable Temperature Range		Specific Gravity at Temperature		Viscosity at Temperature		Notes
		P <15psi [°F]	P >15psi [°F]		[°F]	[cSt]	[°F]	
Silicone Oil DC 200/50	KN 2	N/A	-4 to +392	0.96	+77	50	+77	Standard
Silicone Oil DC200/10	KN 68	-40 to +250	-40 to +400	0.934	+77	10	+77	Standard
Silicone Oil (4 cSt)	KN 17	-130 to +176	-130 to +356	0.91	+68	4	+77	Low Temperature
High Temperature Oil	KN 3.2	+14 to +392	-4 ¹ to +750	1.07	+68	39	+77	High Temperature and High Vacuum
Halocarbon® 6.3	KN 21	-40 to +176	-40 to +347	1.97	+68	14	+68	Oxygen and Chlorine Service
Fluorolube® FS-5	KN 8	N/A	-40 to +392	1.86	+77	5	+68	Oxygen and Chlorine Service
Glycerine	KN 7	N/A	+60 to +462	1.26	+68	1110	+68	Food & Beverage
Glycerine / Water	KN 12	N/A	+14 to +248	1.22	+68	88	+68	Food & Beverage
Vegetable Oil	KN 13	+14 to +200	+14 to +400	0.94	+68	66	+68	Food & Beverage
Food Grade Silicone Oil	KN 34	N/A	0 to +572	0.97	+77	350	+77	Food & Beverage
Neobee M20	KN 59	-10 to +200	-10 to +400	0.917	+77	9.8	+77	Food & Beverage

¹ +14 °F when used with transmitters

Mounting Options

This chart to be used for ease of ordering only. WIKA will convert to appropriate 3-7 digit part numbers.

DG,N/A,N,N,N,N,N,2,N

Options

- 1 = Mounting bracket, aluminum
- 2 = Mounting bracket, stainless steel
- 3 = Back weld 360° (SS only)
- 4 = Tack weld (SS only)
- 5 = Volume minimized (To improve temperature effects, see note 4)
- N = Not applicable

Fill Fluids

- 02 = KN 2, standard silicone oil (DC200-50)
- 03 = KN 3.2, high temperature silicone oil
- 07 = KN 7, glycerine (99.6% pure) (See note 2)
- 08 = KN 8, Fluorlube® FS-5 (See note 3)
- 12 = KN 12, glycerine / water (86.5% / 13.5%) (See note 2)
- 13 = KN 13, vegetable oil (See note 2)
- 17 = KN 17, low temperature silicone oil (4 cSt)
- 21 = KN 21, Halocarbon® (grade 6.3) (See note 3)
- 32 = KN 32, DC704 silicone oil (39 cSt)
- 34 = KN 34, food grade silicone oil (350 cSt) (See note 2)
- 59 = KN 59, Neobee® M-20 (77 cSt) (See note 2)
- ?? = KN ??, DC200-10 silicone oil (10 cSt)
- XX = Customer to specify
- NA = Not applicable

Support tubes / Adaptors

- 4 = Support tube, 4" (See note 1)
- A = Stainless steel adaptor
- N = Not applicable

Connection B (connection to seal/process)

- 1 = 1/4" NPT-F
- 2 = 1/4" NPT-F with fill port
- 3 = 1/2" NPT-F
- 4 = 1/2" NPT-F with fill port
- 5 = 1/4" NPT-M
- 6 = 1/4" NPT-M with fill port
- 7 = 1/2" NPT-M
- 8 = 1/2" NPT-M with fill port
- 9 = Welded to seal (See note 1)
- X = To be specified by customer
- N = Not applicable

Connection A (connection to instrument)

- 1 = 1/4" NPT-F
- 2 = 1/4" NPT-F with fill port
- 3 = 1/2" NPT-F
- 4 = 1/2" NPT-F with fill port
- 5 = 1/4" NPT-M
- 6 = 1/4" NPT-M with fill port
- 7 = 1/2" NPT-M
- 8 = 1/2" NPT-M with fill port
- 9 = Welded to instrument (See note 1)
- X = To be specified by customer
- N = Not applicable

Capillary Armor

- B = Capillary w/o protective armored tube
- A = Capillary with stainless steel armored tube
- P = Capillary with stainless steel armored tube, white PVC coating
- N = Not applicable

Capillary ID (OD x wall thickness) identification color

- 2.0 = 2.0 mm (3 x 0.5 mm) yellow
- 1.0 = 1.0 mm (3 x 1.0 mm) green
- 0.6 = 0.6 mm (3 x 1.2 mm) black
- N/A = Not applicable

Mounting and capillary length

- DG = Direct mount / gauge
- DT = Direct mount / transmitter
- DS = Direct mount / switch
- CC = Cooling element
- 0X = Capillary length 1 to 9 feet, specify length (x) use 5ft. increments
- XX = Capillary length 10 to 50 feet, specify length (XX) use 5ft. increments

Notes

1. For use with capillary only.
2. Food grade fill fluids.
3. Inert fill fluids.
4. Recommended for use with smart electronic transmitters.

Items in bold are available from stock (subject to prior sales). For optional items, consult factory for current lead-time.

Ordering Information:

State computer part number (if available) / type number / size / range / connection size and location / options required.

Specifications given in this price list represent the state of engineering at the time of printing. Modifications may take place and the specified materials may change without prior notice



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