Bourdon Tube Pressure Gauges

Field Repairable

All Stainless Steel Construction

Process Industry Series Liquid Fillable • Type 23x.54

Pressure Gauges

Application
Suitable for corrosive environments compatible with 316 stainless steel wetted parts, dry and liquid fillable case, where vibration and/or pressure pulsation occur in liquid or gaseous media which will not obstruct the pressure system. Ideal for pressure gauge / chemical seal combinations where recalibration is required.

Sizes
2½" & 4" (63 & 100mm)

Accuracy
2½": ±1.5% of span
4": ±1.0% of span (ASME B40.1 Grade 1A)

Ranges (All ranges not stocked)
Vacuum / Compound to 30"HG / 0 / 200 PSI
Pressure from 15 PSI to 15,000 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" & 4½"	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)
Center back mount (CBM) 2½"
Lower back mount (LBM) 4"
1/4" NPT or 1/2" NPTlimited to wrench flat area

Bourdon Tube
Material: 316 stainless steel
30"Hg (Vac) to 1000 PSI C-type (2½")
30"Hg (Vac) to 1500 PSI C-type (4" & 4½")
1500 PSI to 15,000 PSI helical type (2½")
2000 PSI to 15,000 PSI helical type (4" & 4½")

Movement
300-series stainless steel

Dial
White aluminum with black lettering. 2½" with stop pin.

Pointer
Black aluminum, friction adjustable

Case
304 stainless steel with vent plug and polished stainless steel bayonet ring. EPDM o-ring between case and connection (4"). Welded case/socket connection (2½")

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

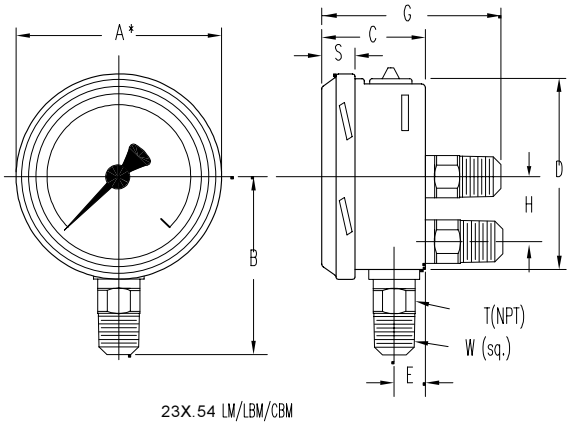
Window
Laminated safety glass

Case Filling
232.54 - none
233.54 - glycerine

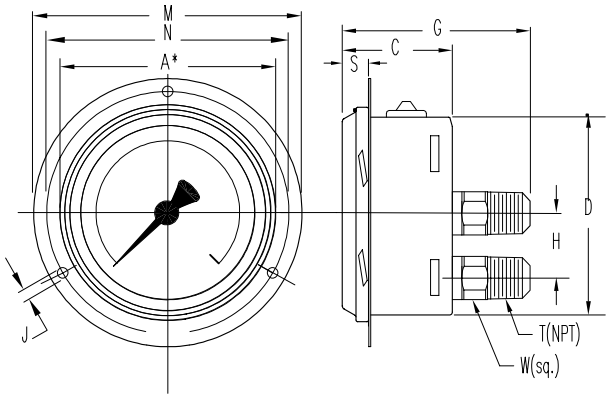
ORDER OPTIONS (min. order may apply)
Improved accuracy to ±0.5% of span (4" only)
Custom dial layout
Front flange stainless steel polished
Rear flange stainless steel
Steel zinc plated u-clamp bracket (field installable)
Stainless steel u-clamp bracket (field installable)
316 SS threaded restrictor
Silicone or fluorolube case filling **(Type 233.54)** (NOTE 1)
Acrylic or flat glass window
Special connections limited to wrench flat area
Other pressure scales available:
Bar, kPa, MPa, Kg/cm² and dual scales
DIN standards
Cleaned for oxygen service
Externally adjustable red drag pointer (max. hand)
Externally adjustable red mark pointer (set pointer)
Chemical seals available

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)

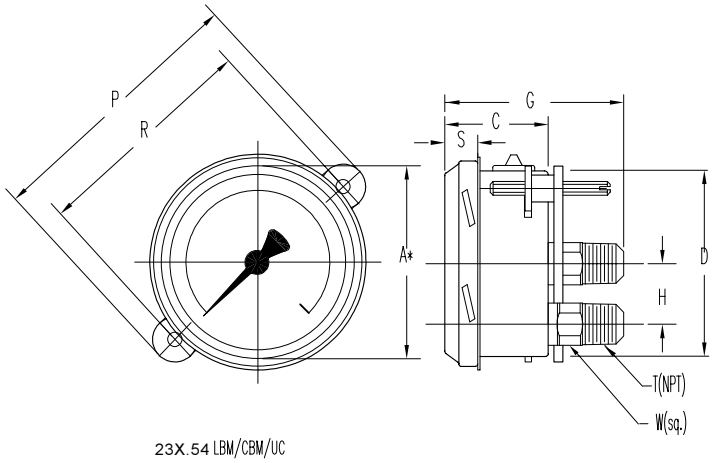
Dimensions:



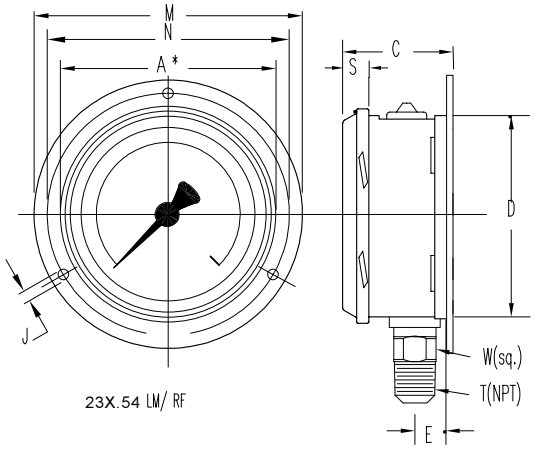
23X.54 LM/LBM/CBM



23X.54 LM/LBM/FF



23X.54 LBM/CBM/UC



23X.54 LM/ RF

A* NOMINAL SIZE

TYPE	WEIGHT	KEY	A*	B	C	D	E	G	H	J	M	N	P	R	S	T	W
23X.54 2.5"	0.36 lbs. + 0.08 lbs. if filled	mm	63	54	33.5	62	13	55.5	--	3.6	85	75	87	72	12	--	14
		in	2.5	2.13	1.32	2.44	0.51	2.19		0.14	3.35	2.95	3.43	2.83	0.47	1/4"	0.55
23X.54 4"	1.10 lbs. + 0.66 lbs. if filled	mm	100	87	49.5	100	15.5	81	30	4.8	132	116	125	110	15	--	22
		in	4	3.43	1.95	3.94	0.61	3.19	1.18	0.19	5.2	4.57	4.92	4.33	0.59	1/2"	0.87

NOTE: For 4" gauges with 1/4" NPT connections, reduce B dimension by 5 mm (0.2 in.).

Chemical Seal Mounting Options

Chemical Seal

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.

Chemical Seal Assembly with Cooling Element

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.

Chemical Seal Assembly with Capillary Line, Gauge Support and Adaptor

Gauge Support and Adaptor

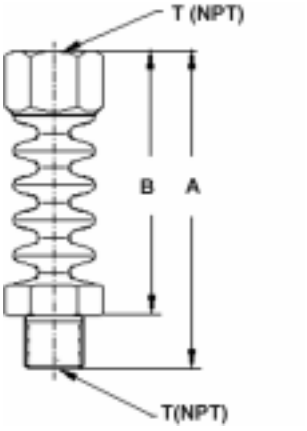
Provides wall mounting of pressure instrument by clamping to gauge adaptor. Material: gauge support - aluminum or stainless steel, gauge adaptor - stainless steel.

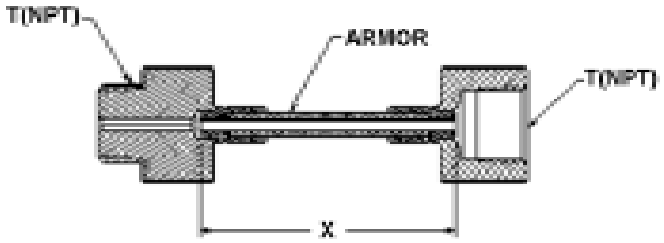
To determine the effects of temperature and response time in a specific application, contact the factory for an ***Application Questionnaire***. The information provided will allow WIKA Technical Support to accurately model your application parameters using state-of-the-art computer simulation techniques.

Cooling Element

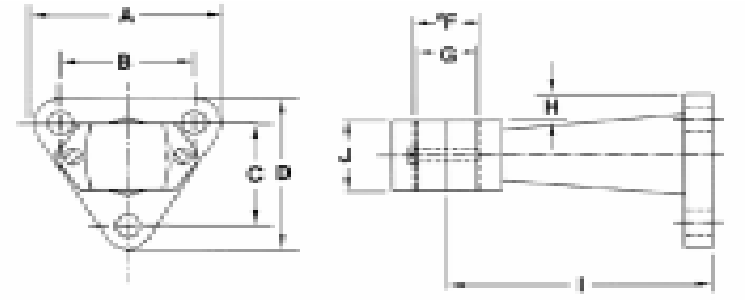
Dimensions:

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

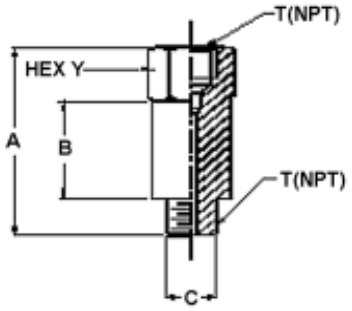




X = 5 feet standard, maximum 48 ft.; T = 1/4" or 1/2"



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.

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.

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

	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

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

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

Dimensions:

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.

WIKA Instrument Corporation
1000 Wiegand Boulevard
Lawrenceville, Georgia 30043-5868
Tel: 770-513-8200 Fax: 770-338-5118
http://www.wika.com e-mail: info@wika.com