

BI-METAL THERMOMETER

MODEL M3.01



PRODUCT DESCRIPTION

In bimetallic thermometer the bimetallic strip is used to convert the temperature into the mechanical displacement. The working of the bimetallic strip depends on the thermal expansion property of the metal. The thermal expansion is the tendency of metal in which the volume of metal changes with the variation in temperature. As the temperature changes, the bimetallic coil contracts or expands, causing the pointer to move up or down the scale. In turn, this creates a reading, illustrating the temperature.



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KEY FEATURES

- Bi-metal helix system
- Hermetically sealed
- Steam length max 1.5 meter
- Optional external zero adjustment
- Stainless steel case & steam
- Steam length available from 50 mm
- Silicon oil filled (optional)
- With or without Thermo-well
- Standard Followed EN 13190
- Bottom/Back/Every angle entry

SPECIFICATIONS

Design Standard	:	According to EN 13190
Sensing Element	:	Bi-metal helix
Accuracy	:	Class 1 as per EN 13190
Dial Size	:	100mm (4"), 150mm (6")
Process Conn. Location	:	Direct Bottom ,back connection
Process Conn. Size	:	1/2" NPT (M), 1/2" BSP(M) (Other sizes on request)
Mounting	:	Direct back Connection
Over temp. range	:	1.3 x FS value $\geq$ 250 °C 1.1 x FS value $\geq$ 250 °C up to 500 °C
Ambient temperature	:	-25°C to 65 °C
Operating pressure	:	15 kg/cm2
Ingress Protection	:	IP68
Approvals	:	Atex

MATERIAL OF CONSTRUCTION

Case & Bezel Ring	:	SS 304
Stem & Process Connection	:	SS 316
Pointer	:	Slotted-zero Adjustable, Aluminum, black Powder coated. Fixed for NS 50mm & 63 mm
Dial	:	Aluminum, Black graduation on white background
Zero adjustment	:	Externally for mounting type (Except NS 50mm & 63mm)
Window	:	Safety glass
Gasket	:	Neoprene
Weld joints	:	TIG argon arc welding

APPLICATION

- Oil & Gas and Refinery
- Chemical & Petrochemical
- Food & Beverages
- Pulp and paper
- Nuclear power plants
- Fertilizer, cement, sugar
- Allied process industries

STANDARD RANGE

POSITIVE RANGE SINGLE SCALE

0/60 °C	0/160 °C	0/300 °C
0/80 °C	0/200 °C	0/400 °C
0/100 °C	0/250 °C	0/500 °C
0/120 °C		

COMPOUND RANGE SINGLE SCALE

-20/40 °C	-30/30 °C	-40/40 °C
-20/60 °C	-30/50 °C	-40/60 °C
-20/120 °C	-30/70 °C	-60/80 °C

CASE FILLING (OPTIONAL)

The gauges can be filled with different kind of fill fluids. Available fill fluids are:

- Glycerin fluid (99.7%)
- Silicon fluid (Ambient temperature max 65 °C)

CERTIFICATION & APPROVALS

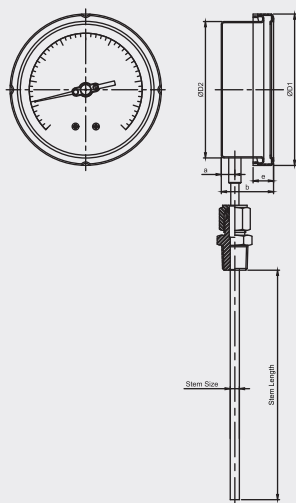
Calibration Certificate	:	Gauges are factory calibrated to full range by default 5-Point Calibration Cert.
Material Certification	:	Only For Wetted parts With Chemical Composition
NACE Compliance	:	Available as per MR 01 75/ MR 01 03 (ISO 15156) for wetted parts (Optional)
Approvals	:	ATEX: Conformity acc. to RL 2014/34/EU II 2 GD Ex h T6 (Optional)

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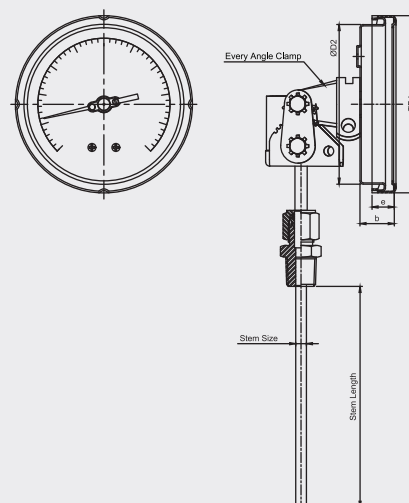
DIMENSIONAL DRAWING

Direct Bottom Connection



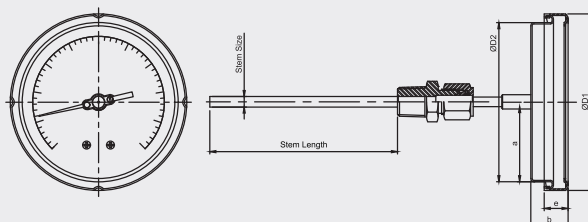
NS	Dimensions are in mm				
	a	b	ØD1	ØD2	e
100	12	50	111	100	15
160	12	50	166	148	17

Every Angle Back Entry



NS	Dimensions are in mm			
	b	ØD1	ØD2	e
100	27	111	100	15
160	27	166	148	17

Center back connection



NS	Dimensions are in mm				
	a	b	ØD1	ØD2	e
100	20	27	111	100	15
160	20	27	166	148	17

Important Notes: Above drawings are not to scale. All Dimension are in mm

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NOMINAL RANGE, MEASURING RANGES & LIMITS OF ERROR AS PER EN 13190

Nominal Range (°C)	Measuring Range (°C)	Limits of error (°C)
-20...+40	-10....+30	1
-20...+60	-10....+50	1
-20...+120	-10....+110	2
-30...+30	-20....+20	1
-30...+50	-20....+40	1
-30...+70	-20....+60	1
-40...+40	-30....+30	1
-40...+60	-30....+50	1
-60...+60	-60....+40	2
0....60	10.....50	1
0....80	10.....70	1
0...100	10.....90	1
0...120	10....110	2
0...160	20...140	2
0...200	20...180	2
0...250	30....220	2.5
0...300	30...270	5
0...400	50...350	5
0...500	50...450	5
0...600	100...500	10



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RANGE TABLE

Range, stem OD stem length selection table

The following table indicates the minimum and maximum stem lengths in mm, per stem diameter per range. The lower values are indicated are the minimum immersion length (below thread) for all types of threads. During stem length selection, please select between the limits mentioned below.

Code	Range (°C)	Φ 6 mm/6.34 mm	Φ 8 mm	Φ 10
TB01	-20...40	125 / 500	120 / 600	100 / 600
TB03	-20...60	115 / 500	110 / 600	80 / 600
TB05	-20...120	70 / 500	65 / 600	60 / 600
TB07	-30...30	125 / 500	120 / 600	90 / 600
TB09	-30...50	115 / 500	110 / 600	80 / 600
TB11	-30...70	85 / 500	80 / 600	80 / 600
TB13	-40...40	115 / 500	110 / 600	80 / 600
TB15	-40...60	85 / 500	80 / 600	80 / 600
TB17	-60...80	75 / 500	70 / 600	60 / 600
TB19	0....60	120 / 500	115 / 600	100 / 600
TB21	0....80	115 / 500	110 / 600	80 / 600
TB23	0....100	85 / 500	80 / 600	80 / 600
TB25	0....120	60 / 500	55 / 600	55 / 600
TB27	0...160	60 / 500	45 / 600	45 / 600
TB29	0...200	45 / 500	40 / 600	40 / 600
TB31	0...250	40 / 500	40 / 600	40 / 600
TB33	0...300	70 / 500	70 / 600	60 / 600
TB35	0...400	60 / 500	55 / 600	50 / 600
TB37	0...500	60 / 500	55 / 600	50 / 600
		Max Stem Length -500	Max-600	Max-600

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MODEL CODING & ORDERING INFORMATION

DESCRIPTION	CODE	M3.01	04	FX	1	B	S6	S6	12NM	B06	TB19	150	XTM
Model													
Bimetal Thermometer	M3.01	M3.01											
Dial Size													
100 mm (4")	04		04										
150 mm (6")	06												
Version													
Fixed	FX			FX									
Adjustable	AD												
Damping													
Dry (But Fillable)	1				1								
Glycerin Filled	2												
Silicon Oil Filled	3												
Type of Mounting / Connection Orientation													
Direct Bottom Connection	B					B							
Direct Lower Back Connection	L												
Every Angle Back Connection	BP												
Case and Bezel MOC													
SS304	S4												
SS316	S6						S6						
SS316L	SL												
Stem MOC													
SS304	S4												
SS316	S6							S6					
SS316L	SL												
Process Connection (Size and Type)													
1/2" NPT (M)	12NM								12NM				
1/2" BSP (M)	12BM												
1/4" BSP (M)	14BM												
1/4" NPT (M)	14NM												
3/4" BSP (M)	38BM												
3/4" NPT (M)	38NM												
M20X1.5(M)	M20M												
Stem Diameter													
Ø6 mm	B06									B06			
Ø6.35 mm	B63												
Ø8 mm	B08												
Ø10 mm	B10												
Ø12 mm	B12												
Range in (°C)													
0 TO 60	TB19										TB19		
To be selected from Table 1	XXXX												
Stem Length (SL)													
150	150											150	
As per requirement in mm	XXX												
(Refer scale for Maximum & Minimum stem length)													
Other Options													
Window in Toughened Glass	EXO												
Tag no Marking on Dial	XTM												XTM
Wetted Parts Complied To NACE	X20												
Custom Dial Design / Private Labeling	X29												
SS Tag plate	X26												
IGC Certificate	X79												
Leak Test Certificates	XLC												
External Zero adjustment	X45												
Dampening liquid silicon oil (up to 200 °C)	X98												
Dampening liquid silicon oil (up to 300 °C)	X99												
With Thermowell	X7												
With Skin Pad	X8												
Default Certification													
Callibration Certificates													
MTC for Wetted Parts													

SAMPLE ORDERING CODE:

M3.01-04-FX-1-B-S6-S6-12NM-B06-TB19-150-XTM

Note: Specifications and dimensions given in this product catalogue represents the state of engineering at the time of printing. Modifications may take place and material specified may be replaced by others without prior notice.

Dampening Temp. Range: Glycerin – up to 65 °C, Silicon Oil - up to 200 °C, Silicon Oil - up to 300 °C