

# 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	:	63mm (2.5"), 100mm (4"), 150mm (6")
Process Conn. Location	:	Direct Bottom ,back connection
Process Conn. Size	:	½" NPT (M), ½" 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

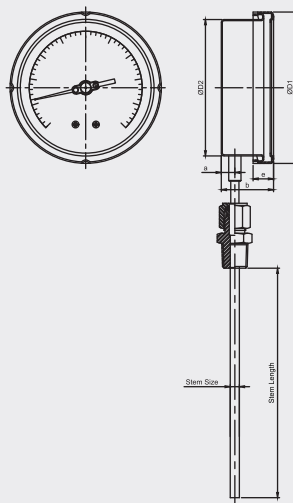
Calibration Certificate	:	Gauges are factory calibrated to full range by default 5-Point Calibration Cert.
Material Certification	:	Only For Wetted parts With Chemical Composition
NACE Compliance	:	Available as per MR 01 75/ MR 01 03 (ISO 15156) for wetted parts (Optional)
Approvals	:	ATEX: Conformity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

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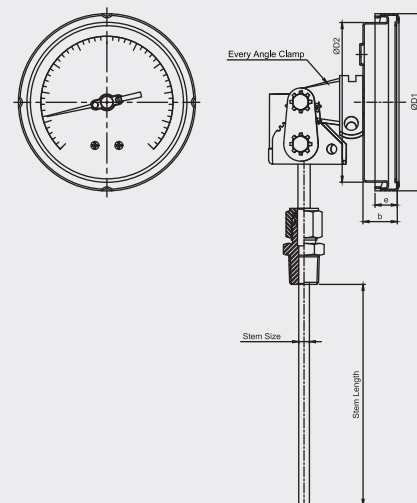
## DIMENSIONAL DRAWING

### Direct Bottom Connection



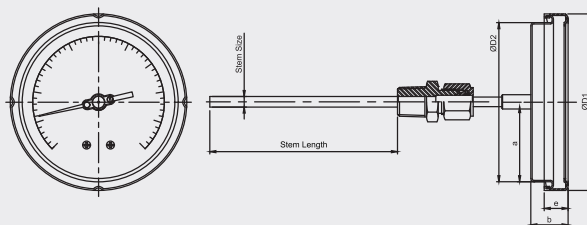
NS	Dimensions are in mm					Weight in gram	
	a	b	ØD1	ØD2	e	Dry Version	Glycerin Version
100	12	50	111	100	15	495	550
150	12	50	166	148	17	988	1075

### Every Angle Back Entry



NS	Dimensions are in mm				Weight in gram	
	b	ØD1	ØD2	e	Dry Version	Glycerin Version
100	27	111	100	15	516	584
150	27	166	148	17	1024	1096

### Center back connection



NS	Dimensions are in mm					Weight in gram	
	a	b	ØD1	ØD2	e	Dry Version	Glycerin Version
100	20	27	111	100	15	460	510
150	20	27	161	148	17	938	1075

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)	Ø 6 mm/6.34 mm	Ø 6 mm/6.34 mm	Ø 6 mm/6.34 mm
TB01	-20...40	115 / 500	95 / 600	95 / 600
TB03	-20...60	95 / 500	75 / 600	75 / 600
TB05	-20...120	65 / 500	55 / 600	55 / 600
TB07	-30...30	115 / 500	95 / 600	95 / 600
TB09	-30...50	95 / 500	75 / 600	75 / 600
TB11	-30...70	85 / 500	55 / 600	75 / 600
TB13	-40...40	95 / 500	75 / 600	75 / 600
TB15	-40...60	85 / 500	75 / 600	75 / 600
TB17	-60...80	65 / 500	55 / 600	55 / 600
TB19	0...60	115 / 500	95 / 600	95 / 600
TB21	0...80	95 / 500	75 / 600	75 / 600
TB23	0...100	65 / 500	50 / 600	75 / 600
TB25	0...120	50 / 500	40 / 600	55 / 600
TB27	0...160	45 / 500	35 / 600	55 / 600
TB29	0...200	40 / 500	30 / 600	45 / 600
TB31	0...250	45 / 500	45 / 600	45 / 600
TB33	0...300	65 / 500	55 / 600	55 / 600
TB35	0...400	55 / 500	45 / 600	45 / 600
TB37	0...500	55 / 500	45 / 600	45 / 600

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### MODEL CODING & ORDERING INFORMATION

Description	CODE	M3.01	4	AD	1	B	12NM	B08	XXX	XXX	X16
<b>Model</b>											
Bi-metal Thermometer	M3.01	M3.01									
<b>Dial Size</b>											
100 mm (4")	4		4								
150 mm (6")	6										
<b>Version</b>											
Fixed	FX										
Adjustable	AD			AD							
Swivel	SV										
<b>Dampening</b>											
Dry	1				1						
Glycerin	2										
Silicon (*)	3										
Note- * Gasket, Filling port in Viton											
<b>Type of Mounting/Connection Orientation</b>											
Direct Bottom connection	B					B					
Direct Lower Back connection	L										
Every Angle Back entry	E										
<b>Process Connection (Size &amp; Type)</b>											
1/4" BSP (M) (*)	14BM										
1/4" NPT (M) (*)	14NM										
1/2" BSP (M)	12BM										
1/2" NPT (M)	12NM						12NM				
1/8" BSP (M) (*)	18BM										
1/8" NPT (M) (*)	18NM										
3/8" BSP (M) (**)	38NM										
M20 x 1.5 (M)	M20M										
1 1/2" Tri-clover (Stem Dia. Maximum 12mm)	12TC										
Note - * Stem Dia. Maximum 6.35 mm											
** Stem Dia. Maximum 10 mm											
<b>Stem Diameter</b>											
Ø6 mm	B06										
Ø6.35 mm	B63										
Ø8 mm	B08							B08			
Ø10 mm	B10										
Ø12 mm	B12										
<b>Stem Length (SL)</b>											
As per requirement in mm	XXX								XXX		
(Refer scale for Maximum & Minimum stem length)											
<b>Range</b>											
To be selected from Table 1	XXX									XXX	
(Other custom ranges available on request)											
<b>Other Options (*Applicable for NS 100 mm &amp; above)</b>											
Toughened Safety glass*	XWT										
Tag number marking on Dial	XTM										
Calibration Certificate	X16										X16
Material test certificate	X17										
Wetted parts complied to NACE MR0175/MR0103	X20										
SS Tag plate	X26										
Custom Dial Design / Private labeling	X29										
Case & bezel SS 316*	X31										
External Zero adjustment	X45										
Dampening liquid silicon oil ( up to 200 °C)*	X98										
Dampening liquid silicon oil ( up to 300 °C)*	X99										

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

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**SAMPLE ORDERING CODE:**

**M3.01-4.AD.1.B.12NM.B08.XXX.XXX.X16**

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.