

# bi-metal thermometers

## all stainless steel construction

### TB8 - DS 100-125-150



These instruments are designed for use in food, beverage, pharmaceutical, chemical, petrolchemical processing industries. They are built to resist the most severe operating conditions created by the ambient environment and the process medium. An TIG welded case/bulb strengthens the whole construction. A leak tight fit is ensured if the instrument is filled with a dampening fluid to prevent damage due to vibration.

#### Functional and constructive

##### 06.TB8 all stainless steel construction

**Measuring range:** the °C measuring range has been marked by two "▼" stamped on the dial. They represent the temperature span recommended for the use of instruments as per DIN 16203.

**Accuracy:** class 1,0 as per DIN 16203.

**Ambient temperature:** -25...+65 °C.

**Working temperature:** continuous from -50 °C to +450 °C; intermittent only between 450 °C to 500°C.

**Overtemperature limit:** 30% of full scale range for temperature ≤400 °C; max 500 °C.

**Special overtemperature (option F02):** 100% of full scale range for temperature ≤150 °C; 50% of full scale range for temperature tra 150 °C e 300 °C; max. 500 °C.

**Max working pressure:** 15 bar (without thermowell).

**Protection degree:** IP 55 as per IEC 529.

**Process connection:** AISI 316 st.st.

**Bulb:** ø 6-6,4-8-9,6 mm. AISI 316 st. st.

**Measuring element:** bi-metal spiral shaped.

**Welding:** AISI 304 st.st. TIG.

**Case:** AISI 304 st.st.

**Ring:** AISI 304 st.st. bayonet lock.

**Window:** glass.

**Dial:** aluminium white with black markings.

**Pointer:** black anodized aluminium.

**Zero-Adjustment:** external zero-adjustment screw.

**Gasket:** EPDM.

#### Special version

**Measuring range:** °F, and double range °C/°F .

**Protection degree:** IP 65 (option E65).

**Case and ring:** AISI 316 st.st. (option C40).

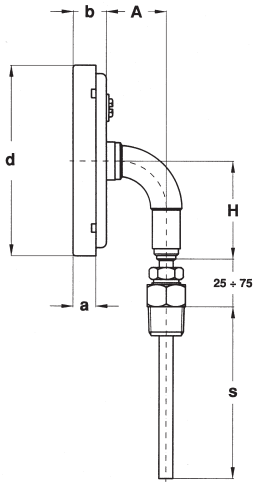
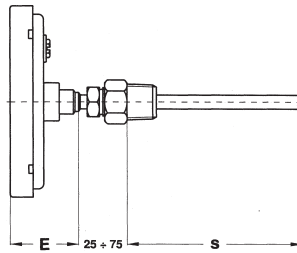
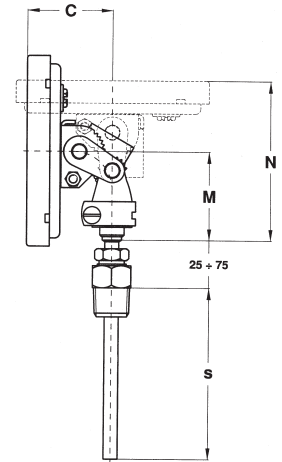
**Dampening liquid filling:** glycerine 98%, silicon oil and Fluorolube (options R10-R11-R12; see table on page 4 for limit operating conditions).

#### MEASURING

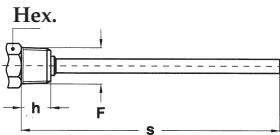
The bi-metal thermometers are built from a stainless steel tube inside of which a bi-metal helicoidal spiral is placed.

This spiral is welded to the tip of the tube and on the other side to a transmission shaft directly connected to the pointer.

The temperature vibrations create a deformation of the bi-metal which is transmitted to the pointer through a shaft rotation.

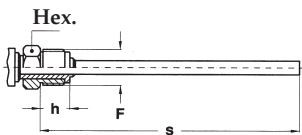
**TYPES AND DIMENSIONS (mm.)**

**Lower connection (Cod. 1)**

**Back connection  
(Cod. 4)**

**Every-angle  
connection (Cod. 9)**

DS	A	a	b	C	d	E	H	M	N	S
100	34,5	13	19	49	110,6	39	57	51,5	92,5	see page 3
125	34,5	14,5	19,5	49,5	130	39,5	65	51,5	93	see page 3
150	34,5	15	20	50	161	40	82	51,5	93,5	see page 3

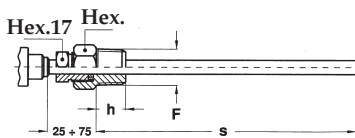
**PROCESS CONNECTION: TYPES AND DIMENSIONS (mm.)**

**Fixed male  
(Cod. 3)**

F	CODE	Hex.	h
1/2" NPT	43M	22 *	17
1/2" BSP	41M	22 *	14

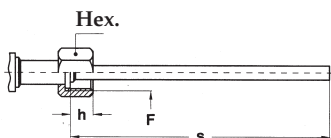
\*  $\varnothing$  24 for every-angle connection (cod.9)


**Male swivel nut  
(Cod. 5)**

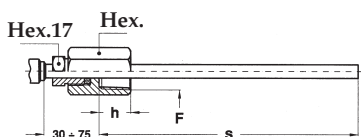
F	CODE	Hex.	h
1/2" BSP	41M	22	14
3/4" BSP	51M	27	14


**Sliding male and swivel nut  
(cod.9)**

F	CODE	Hex.	h
1/2" BSP	41M	22	14
1/2" NPT	43M	22	17
3/4" BSP	51M	27	16
3/4" NPT	53M	27	17


**Female swivel nut  
(Cod. 8)**

F	CODE	Hex.	h
1/2" BSP	41F	24	16
3/4" BSP	51F	30	16


**Sliding female and swivel nut  
(Cod. 7)**

F	CODE	Hex.	h
1/2" NPT	43F	24	18
3/4" NPT	53F	32	18

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## TB8 - DS 100-125-150

# 06.TB8

### SCALE RANGES

Tab. 1 - Single scales °C and bulb length "S".

°C	ø 6 - 6,4 (mm.)	ø 8 (mm.)	ø 9,6 (mm.)
-50...+50	100...500	* 82...900	* 82...900
-30...+50	114...500	* 88...900	* 88...900
-20...+120	83...500	* 67...900	* 67...900
-20...+40	137...500	* 107...900	* 107...900
-20...+80	100...500	* 82...900	* 82...900
0...+60	137...500	* 107...900	* 107...900
0...+80	114...500	* 88...900	* 88...900
0...+100	100...500	* 82...900	* 82...900
0...+120	88...500	* 72...900	* 72...900
0...+160	116...500	* 91...900	* 91...900
0...+200	98...500	* 79...900	* 79...900
0...+250	84...500	* 70...900	* 70...900
0...+300	100...500	* 88...900	* 88...900
0...+400	150...500	150...900	150...900
0...+500	150...500	150...900	150...900
0...+600 (1)	150...500	150...900	150...900
+50...+450	150...500	150...900	150...900
+100...+500	150...500	150...900	150...900

\* Only for sliding and swivel nuts (Cod.7 and 9), bulbs with 63 mm minimum length "S" are available (option S63).

(1) Max working temperature 500 °C (932 °F).

Tab. 2 - Single scales °F and bulb length "S".

°F	ø 6 - 6,4 (mm.)	ø 8 (mm.)	ø 9,6 (mm.)
-80...+120	94...500	* 76...900	* 76...900
-20...+120	114...500	* 88...900	* 88...900
0...+200	94...500	* 76...900	* 76...900
0...+250	83...500	* 67...900	* 67...900
+50...+400	108...500	* 89...900	* 89...900
+50...+550	112...500	* 100...900	* 100...900
+200...+700	150...500	150...900	150...900
+100...+800	150...500	150...900	150...900
+200...+1000 (1)	150...500	150...900	150...900

Tab. 3 - Dual scales °C/°F and bulb length "S".

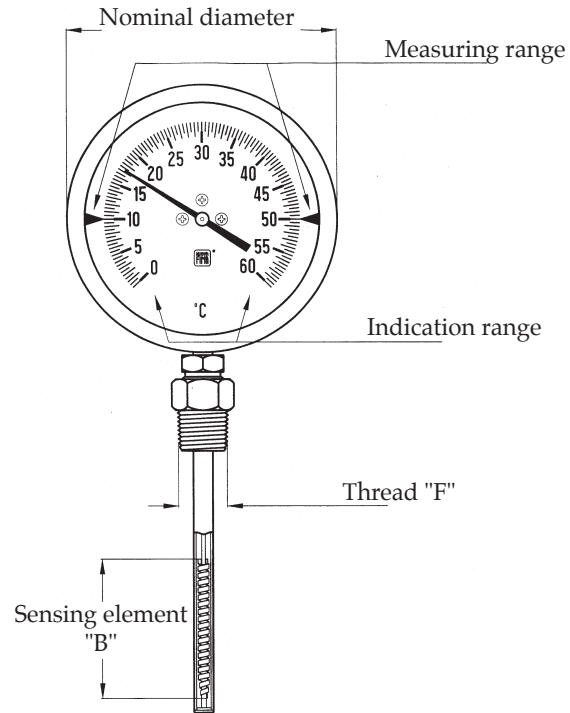
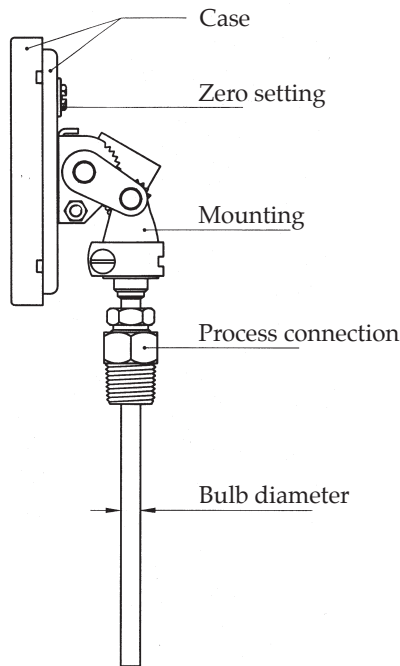
Primary °C (int.)	Secondary °F (ext.)	ø 6 - 6,4 (mm.)	ø 8 (mm.)	ø 9,6 (mm.)
-50...+50	-60...+122	100...500	* 82...900	* 82...900
-30...+50	-22...+122	114...500	* 88...900	* 88...900
-20...+120	-4...+250	82...500	* 67...900	* 67...900
0...+60	+30...+140	137...500	* 107...900	* 107...900
0...+100	+32...+212	100...500	* 82...900	* 82...900
0...+120	+32...+250	88...500	* 72...900	* 72...900
0...+160	+32...+320	116...500	* 91...900	* 91...900
0...+200	+35...+400	98...500	* 79...900	* 79...900
0...+300	+35...+570	100...500	* 88...900	* 88...900
0...+400	+40...+750	150...500	150...900	150...900
0...+500	0...+930	150...500	150...900	150...900
0...+600 (1)	0...+1110 (1)	150...500	150...900	150...900

### OPTIONS

DESCRIPTION	CODE	DS100	DS125	DS150
Case and ring AISI 316 st.st.	C40	◆	◆	◆
Protection degree IP 65 (not fillable)	E65	◆	◆	◆
Special overtemperature	F02	◆	◆	◆
General pointer IP 55 (only for type 84)	L22	◆		◆
Suitable for glycerine filling IP 67	P00	◆	◆	◆
Suitable for silicone or Fluorolube filling (2) IP 67	P01	◆	◆	◆
Glycerine filling (max +160 °C)	R10	◆	◆	◆
Silicone filling (2) (max +250 °C)	R11	◆	◆	◆
Fluorolube filling (2) (max +200 °C)	R12	◆	◆	◆
Minimum length 63 mm. bulb ø 8-9,6 mm. (1)	S63	◆	◆	◆
Tropicalization	T01	◆	◆	◆
AISI st.st. label for initialing	T25	◆	◆	◆
Plexiglas window (for ranges from 0 °C to +100 °C)	T31	◆	◆	◆
Safety double stratified glass	T32	◆	◆	◆

(1) up to +300 °C (+550 °F) only, and with sliding male and swivel nut connection only (Cod. 9)

(2) VITON gaskets.



## HOW TO ORDER

	CODE & DESCRIPTION
<b>06</b>	06 - thermometer section
<b>TB</b>	TB - bi-metal thermometer
<b>8</b>	8 - standard serie
<b>4</b>	1 - Lower connection 4 - Back connection 9 - Every-angle connection
<b>9</b>	3 - Fixed male 5 - Male swivel nut 9 - Sliding male swivel nut 8 - Female swivel nut 7 - Sliding female swivel nut
<b>E</b>	E - DS100 F - DS125 G - DS150
<b>43M</b>	see process connection tables
<b>S8</b>	S6 - ø 6 mm. bulb S7 - ø 6,4 mm. bulb S8 - ø 8 mm. bulb S9 - ø 9,6 mm. bulb
<b>200</b>	bulb length in mm.
<b>0/100 °C</b>	see ranges tables
<b>F02</b>	see options tables

## FILLING LIQUIDS

Filling liquids	Ambient temp.	Working temp.
Glycerine 98%	+15...+65 °C (+60...+150 °F)	+15...+160 °C (-60...+320 °F)
Siliconic oil	-45...+65 °C (-50...+150 °F)	-40...+250 °C (-40...+480 °F)
Fluorolube	-60...+65 °C (-76...+150 °F)	-50...+200 °C (-58...+390 °F)

Glycerine and siliconic oil must not be used with strongly oxidant agents such as oxygen, chlorine, nitric acid and hydrogen peroxide. It could be dangerous because of spontaneous chemical reactions, inflammability or explosion. In these cases the use of fluorolube is recommended.

## THERMOWELLS

Must be used on all applications where thermometer bulb is subjected to pressure, corrosive fluid or flow rate. Thermowells will make thermometer disassemble for calibration or replacement easier as the process will not be disturbed.

### Thermowells available:

-thermowells with thread connection either built up type or machined from bar stock;

-thermowells with flange either built up type or machined from a bar stock;

-thermowells to be welded machined from a bar stock.

Type, material and constructive characteristics on catalogue sheet "09".