

## Data sheet

# Temperature Sensors

## Types MBT 5250, MBT 5260 and MBT 5252



Heavy-duty temperature sensors for controlling cooling water, lubrication oil, hydraulic oil and refrigeration plants within general industry and marine applications. These temperature sensors are based on a standardized Pt 100 or Pt 1000 element, which gives a reliable and accurate measurement. All three sensor types can be delivered with NTC / PTC elements on request.

In the low temperature version (-50 – 200 °C) the measuring insert is based on a silicone cable, which makes the sensor very resistant towards vibrations. The MBT 5250 with changeable measuring insert and MBT 5260 with fixed measuring insert are equipped with EN 175301-803-A, Pg 9 as standard. The MBT 5252 is equipped with a B-head as standard, but can also be delivered with B-mini Head on request. If needed, a transmitter (MBT 9110) can be ordered as an integrated part of the MBT 5252 sensor.

### Features

- Gaseous or liquid media, e.g. air, gas, vapour, water or oil.
- Up to 200 °C media temperature (MBT 5250 and MBT 5260)
- Up to 200 °C or 400 °C media temperature (MBT 5252)
- Pt 100 or Pt 1000 sensing element
- Can be used with 2- or 3-wire connections
- Gold plated male and female connector (MBT 5250 and MBT 5260)
- MBT 5250 and MBT 5252 with interchangeable measuring insert
- MBT 5260 with fixed measuring insert
- Available with built-in transmitter (MBT 5252)

### Approvals

Lloyds Register of Shipping, LR  
 Germanischer Lloyd, GL  
 Det Norske Veritas, DNV  
 Registro Italiano Navale, RINA

Nippon Kaiji Kyokai, NKK  
 American Bureau of Shipping, ABS  
 Korean Register of Shipping, KR  
 Bureau Veritas, BV  
 China Classification Society, CCS

**Technical data**  
**MBT 5250, MBT 5260**

*General data MBT 5250, MBT 5260*

Measuring range	-50 – 200 °C
Sensing element	Pt 100, Pt 1000
Protection tube	ø8 × 1 mm

*Response times*

Type	Protection tube	Indicative response times			
		Water 0.2 m/s		Air 1 m/s	
		t <sub>0.5</sub>	t <sub>0.9</sub>	t <sub>0.5</sub>	t <sub>0.9</sub>
MBT 5250 with interchangeable measuring insert	ø8 × 1 mm	9 s.	33 s.	95 s.	310 s.
MBT 5260 with fixed meas. ins.	ø8 × 1 mm	6 s.	20 s.	35 s.	140 s.

*Materials*

Protection tube in contact with media	W.no. 1.4571 (AISI 316 Ti)
Process connection	W.no. 1.4404 (AISI 316 L)
Extension length	W.no. 1.4571 (AISI 316 Ti)
Union	Nickel plated brass
Gasket	Silicone
Plug EN 175301-803	PA 6.6 (max 125 °C)

*Mechanical and environmental specifications*

Sensor tolerance	EN 60751 Class B: $\pm (0.3 + 0.005 \times t)$	t = temperature of medium, numerical value
Vibration stability	Shock:	100 g / 6 ms
	Vibrations:	4 g sine function 5 – 200 Hz, measured acc. to IEC 60068-2-6
Enclosure	IP65 according to IEC 60529	
Cable entry EN 175301-803	Pg 9, Pg 11 or Pg 13.5	

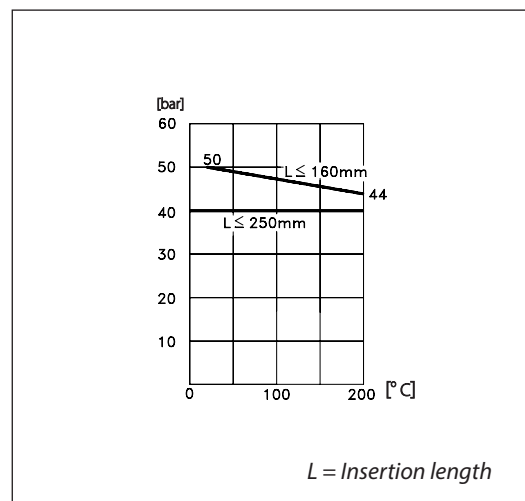
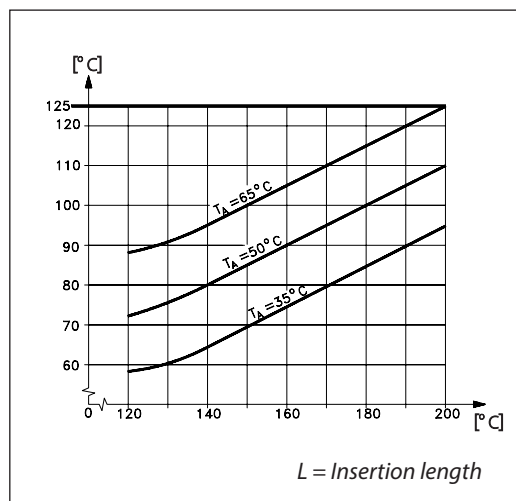
**Ordering standard  
(MBT 5250, MBT 5260)**

Type MBT 52X0		Sensor	
<b>Measuring range, sensor element</b>		<b>Tolerance</b>	
-50 – 200 °C	0	0	EN 60751 Class B
		9	Other
<b>Sensing element</b>		<b>Process connection</b>	
1 × Pt 100	0	0	None
1 × Pt 1000 (Class B only)	1	1	G 1/4 A
2 × Pt 100	2	2	G 1/2 A
2 × Pt 1000 (Class B only)	3	3	1/2 – 14 NPT
Other	9	4	G 3/4 A
		5	M18 × 1.5
		9	Other
<b>Protection Tube, W.nr. 1.4571 (AISI 316 Ti)</b>		<b>Electrical Connections</b>	
Acid-proof steel, ø8 × 1mm	0	0	EN175301/803 excl. female plug
Other	9	1	EN175301/803 plug Pg 9 (IP65)
		2	EN175301/803 plug Pg 11 (IP65)
		3	EN175301/803 plug Pg 13,5 (IP65)
		8	ITT Canon 4 pins Au
		A	EN175301/803 GL. plug Pg 13,5 (IP65) Sn pins
		B	EN175301/803 Pg 9–4 pins without earth (IP65)
		C	EN175301/803 Pg 11–4 pins without earth (IP65)
		9	Other
<b>Extension length</b>		<b>Insertion length</b>	
None	0	50 mm	050
50 mm	1	80 mm	080
		100 mm	100
		150 mm	150
		200 mm	200
		250 mm	250
		xx0 mm	xx0
<input checked="" type="checkbox"/> Preferred versions			

**Technical data**  
MBT 5250, MBT 5260

Max. temperature (Ext. length "None")  
Plug EN 175301-803

Max. load on protection tube  
( $\varnothing 8 \times 1, \varnothing 10 \times 2$ ) acc. to EN 175301-803



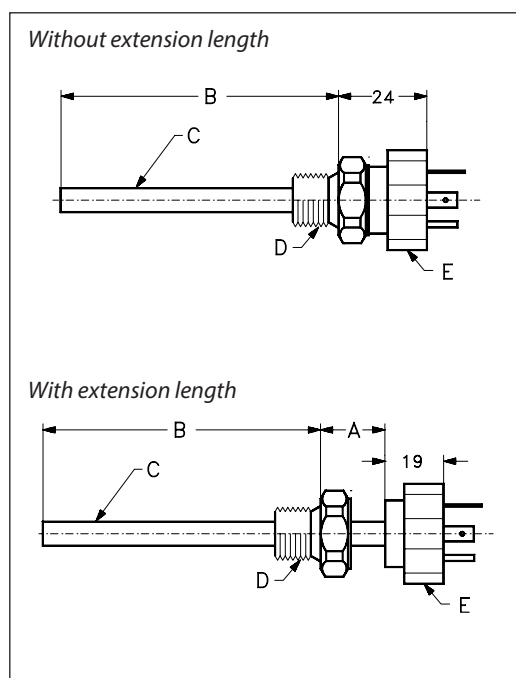
$T_m$  = Media temperature  
 $T_p$  = Temperature for electric plug  
 $T_A$  = Ambient temperature

Permissible media velocity	Air	Water
	25 m/s	3 m/s

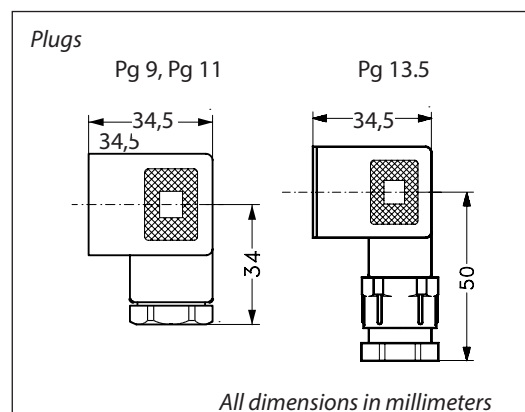
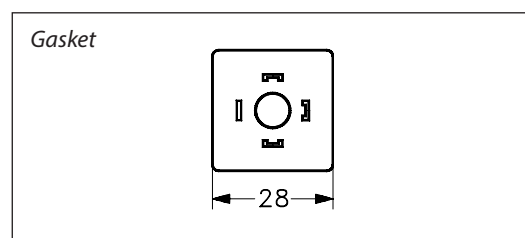
**Note:** for extension length = 50 mm  
no limitations up to 200 °C media temperature and  
90 °C ambient temperature

Process connection	G 1/4 A	G 1/2 A G 3/8 A - M18	G 3/4 A M24
Max. tightening torque	25 Nm	50 Nm	100 Nm

**Dimensions**  
MBT 5250, MBT 5260



A = Extension length  
B = Insertion length  
C = Protection tube  
D = Process connection  
E = Union



Please note:

- Tightening torque for the mounting screw at the rear end of the electrical connection plug: 25 Ncm
- Tightening torque for the union (position "E"): 17 Nm

Process connection	G 1/4	G 1/4 A - G 1/2 A G 3/8 A - M18	G 3/4 A M24
Width across flats	HEX 22	HEX 27	HEX 32

**Technical data  
MBT 5252**
*General data MBT 5252*

Measuring range	-50 – 200 °C or -50 – 400 °C
Sensing element	Pt 100, Pt 1000
Protection tube	Low temperature: $\varnothing 10 \times 2$ mm
	High temperature: $\varnothing 11 \times 1$ mm

Permissible media velocity	Air	25 m/s.
	Steam	25 m/s.
	Water	3 m/s.

<b>Process connection</b>	<b>G ¼</b>	<b>G ¼ A – G ½ A G ¾ A – M18</b>	<b>G ¾ A M24</b>
Max. tightening torque	25 Nm	50 Nm	100 Nm

**Response time**

Type	Protection tube	Indicative response times			
		Water 0.2 m/s		Air 1 m/s	
		$t_{0.5}$	$t_{0.9}$	$t_{0.5}$	$t_{0.9}$
MBT 5252	$\varnothing 10 \times 2$ mm	14 s.	42 s.	110 s.	390 s.
MBT 5252 (HT)	$\varnothing 11 \times 1$ mm	25 s.	80 s.	150 s.	450 s.

*Mechanical and environmental specifications*

Max. ambient temperature <sup>1)</sup>	Sensors without transmitter	90 °C
	Sensors with transmitter	85 °C
Sensor tolerance	EN 60751 Class B: $\pm (0.3 + 0.005 \times t)$	t = temperature of medium, numerical value
Vibration stability	Shock:	100 g / 6 ms
	Vibrations:	4 g sine function 5 – 200 Hz, measured acc. to IEC 60068-2-6
Enclosure	IP65 according to IEC 60529	
Cable entry B-head	Pg16	
Cable entry BM	Pg 9	
Temperature transmitter MBT 9110	Supply voltage:	8 – 35 V d.c.
	Output:	4 – 20 mA

<sup>1)</sup> The temperature of the transmitter is influenced by media temperature, ambient temperature and ventilation in the engine room. If the temperature of the transmitter exceeds the max. allowed temperature the transmitter must be data placed in a separated enclosure, as described in the separate sheet for MBT 9110.

**Materials**

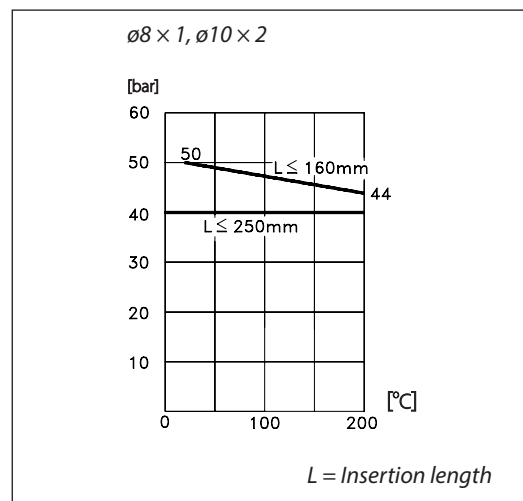
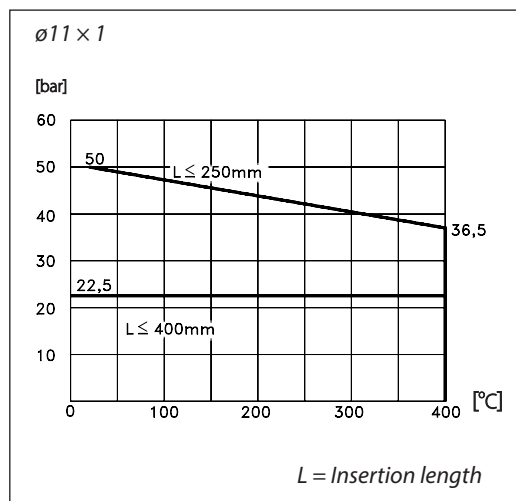
Protection tube in contact with media	W.no. 1.4571 (AISI 316 Ti)
Process connection	W.no. 1.4404 (AISI 316 L)
Extension length	W.no. 1.4571 (AISI 316 Ti)
Union nut	Nickel plated brass
Connection head	Die cast aluminium

Ordering standard

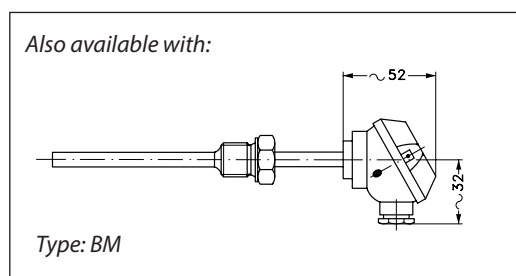
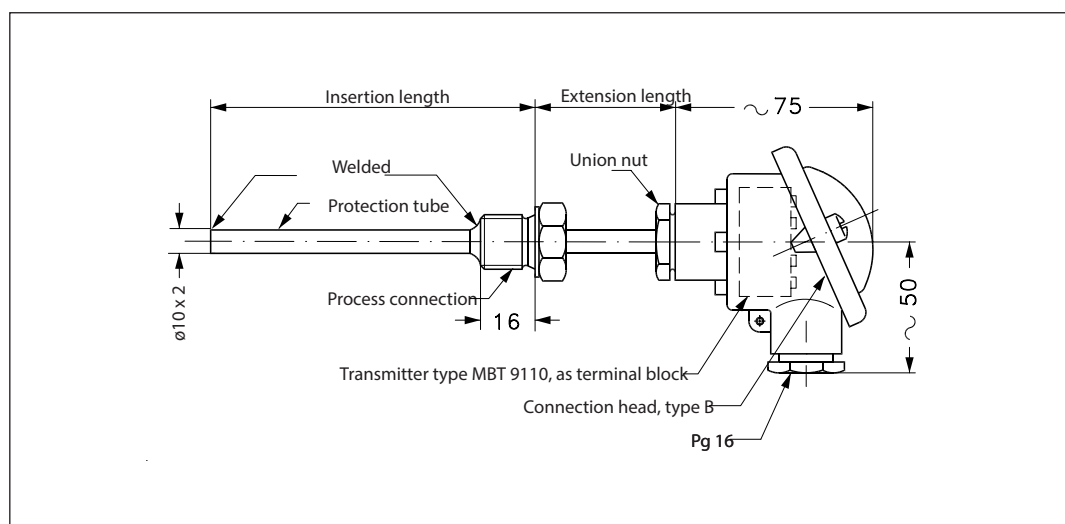
Type MBT 5252		Sensor				Transmitter					
<b>Measuring range, sensor element</b>						<b>Transmitter setting, end of range</b>					
-50 – 200 °C	0					0	0	0 °C (or none)			
-50 – 400 °C	1					1	1				
<b>Sensing element</b>											
1 × Pt 100	0					2	2	Temperature range 220 °C = 22 Temperature range 150 °C = 15 1. digit defines 100's 2. digit defines 10's			
2 × Pt 100 (-50 – 200 °C)	1					3	3				
1 × Pt 1000	2					9	4				
2 × Pt 1000 (-50 – 200 °C)	3						5				
Other	9						6				
<b>Protection Tube, W.nr. 1.4571 (AISI 316 Ti)</b>											
Acid-proof steel, ø8 mm (-50 – 200 °C)	0										
Acid-proof steel, ø10 mm (-50 – 200 °C)	1										
Acid-proof steel, ø11 mm (-50 – 400 °C)	2										
Other	9										
<b>Extension length</b>											
None	0										
50 mm	1										
100 mm	2										
Other	9										
<b>Insertion length</b>											
50 mm		0050									
100 mm		0100									
150 mm		0150									
200 mm		0200									
250 mm		0250									
300 mm		0300									
400 mm		0400									
500 mm		0500									
xx0 mm		xxx0									
<b>Connection head</b>											
B (IP65)		0									
B-mini (IP65) (only up to 4 terminals)		1									
Other		9									
<b>Process connection</b>											
G ¼ A (only ø8 mm protection tube)		0				0					
G ¾ A		1				3					
G ½ A		2				9					
G ¾ A		3									
½ –14 NPT		7									
Other		9									
<b>Transmitter setting, start of range</b>											
						0	None				
						1	0 °C				
						4	-50 °C				
						9	Other				
<b>Transmitter type</b>											
<b>As terminal block</b>											
		0				None					
		G				Standard					
		L				Standard EEx ia IIC T4/T6					
<b>In hightened lid</b>											
		A				Standard					
		J				Standard EEx ia IIC T4/T6					
		B				Galvanically isolated					
		9				Other					
<b>Connection</b>											
		0				2-wire, 3 terminals					
		1				4-wire, also to be used for 3 wire					
		2				2 wire, 2 terminals					
<b>Tolerance</b>											
		0				EN 60751 Class B					
		1				EN 60751 Class A					
		2				Other					
		3									
		7									
		9									
<b>Legend</b>											
		■				Preferred versions					

Technical data  
MBT 5252

Max. load on protection tube according to DIN 43763



Dimensions [mm]  
MBT 5252



Process connection	G ½ A, ½-14 NPT	G ¾ A
Width across flats	HEX 27	HEX 32