

## 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

**Data sheet | Temperature Sensor, Types MBT 5250, MBT 5260 and MBT 5252**
**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)**

**Type MBT 5250**

**Measuring range, sensor element**  
-50 – 200 °C

**Sensing element**

1 x Pt 100	0
1 x Pt 1000 (Class B only)	1
2 x Pt 100	2
2 x Pt 1000 (Class B only)	3
1 x NTC 2055 ± 1% Ohm	4

**Protection Tube, W.nr. 1.4571 (AISI 316 Ti)**

Acid-proof steel, ø8 x 1mm	0
Solid drilled, tapered, ø12 to ø14.5	1
Acid-proof steel, ø10 x 2 mm	2
Acid-proof steel, ø10 x 2 mm	3

**Extension length**

None	0
50 mm	1

**Insertion length**

050 mm	050
060 mm	060
080 mm	080
100 mm	100
120 mm	120
150 mm	150
200 mm	200
250 mm	250

**Sensor**

**Tolerance**

0	EN 60751 Class B
1	1/3 EN 60751 Class B
2	1/6 EN 60751 Class B
3	EN 60751 Class A
4	B-value (25°/85° C): 3540 ± 1%

**Process connection**

0	None
1	G 1/4 A <sup>1)</sup>
2	G 1/2 A
3	1/2 – 14 NPT
4	G 3/4 A
5	M18 x 1.5
6	M24 x 2
7	G 3/8 A
8	M33 x 2
9	1/4 - 18 NPT
A	M22 x 1.5
B	M16 x 1.5
C	M14 x 1.5
D	Adjustable fitting, brass G 1/4 A <sup>1)</sup>
E	3/4 – 16 UNF
F	1/4 – 18 NPT
G	M20 x 1.5

**Electrical Connections**

0	EN 175301/803 excl. female plug
1	EN 175301/803 Plug Pg 9 (IP65)
2	EN 175301/803 Plug Pg 11 (IP65)
3	EN 175301/803 Plug Pg 13.5 (IP65)
4	APD plug ISO 15170-1
5	DIN 0627, M12
6	EN 175301/803 Plug Pg 11 (IP65) with finger screw
7	EN 175301/803 Plug Pg 9 (IP65 special)
8	ITT Cannon 4 pins Au
9	Other
A	EN 175301/803 GL plug Pg 13.5 (IP65) Sn pins
B	EN 175301/803 plug Pg 9, 4 pins without earth (IP65)
C	EN 175301/803 plug Pg 11, 4 pins without earth (IP65)
D	Hunnel HSK-M/Pg 9 (IP68) Metal
E	EN 175301/803 plug M16 (IP 65)

<sup>1)</sup> Only ø8 x 1 mm tube

Preferred versions

**Ordering standard  
MBT 5260)**

Type MBT 5260		Sensor	
<b>Measuring range, sensor element</b>			
-50 – 200 °C	0		
-30 – 150 °C	1		
<b>Sensing element</b>			
1 × Pt 100	0		
1 × Pt 1000 (Class B only)	1		
2 × Pt 100	2		
Other	9		
<b>Protection Tube, W.nr. 1.4571 (AISI 316 Ti)</b>			
Acid-proof steel, ø8 × 1 mm	0		
Solid drilled, tapered, Ø12 to Ø14.5	1		
Acid-proof steel ø10 × 2 mm	2		
Acid-proof steel, ø9.5 × 1 mm	3		
Solid drilled, ø4.2	4		
Other	9		
<b>Extension length</b>			
None	0		
50 mm	1		
Other	9		
<b>Insertion length</b>			
030 mm		030	
040 mm		040	
050 mm		050	
060 mm		060	
080 mm		080	
100 mm		100	
120 mm		120	
150 mm		150	
200 mm		200	
250 mm		250	
			<b>Tolerance</b>
			EN 60751 Class B
			1/3 EN 60751 Class B
			1/6 EN 60751 Class B
			Other
			<b>Process connection</b>
			None
			G 1/4 A <sup>1)</sup>
			G 1/2 A
			1/2 – 14 NPT
			G 3/4 A
			M18 × 1.5
			M24 × 2
			G 3/8 A
			M14 × 1.5
			Other
			<b>Electrical Connections</b>
			EN175301/803 plug Pg 9 (IP65)
			EN175301/803 plug Pg 11 (IP65)
			EN175301/803 plug Pg 13.5 (IP65)
			M12 plug, 4 wire, 4 pins
			DIN 72585 Bayonet plug
			DIN 43650, Plug Pg9 (IP65) Special
			M12 plug, 2 wire, 4 pins
			EN175301/803 Pg 11 – 4 pins without earth (IP65)
			Other

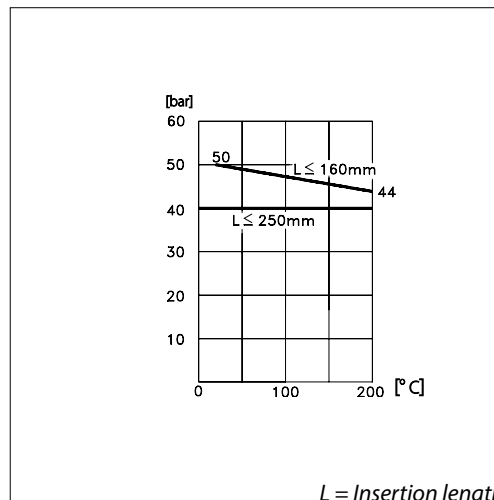
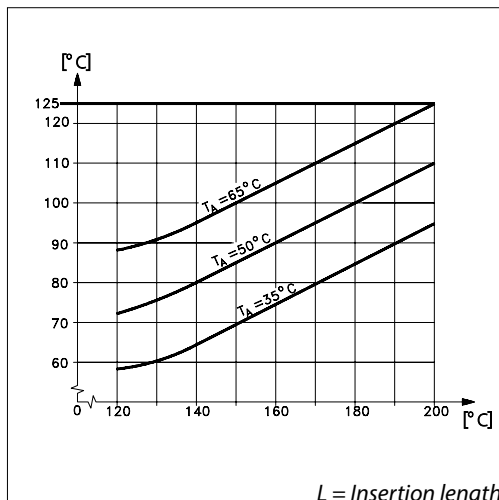
<sup>1)</sup> G 1/4 A only for ø8 mm protection tube

Preferred versions

**Technical data**  
MBT 5250, MBT 5260

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

Max. load on protection tube  
according to DIN 43763



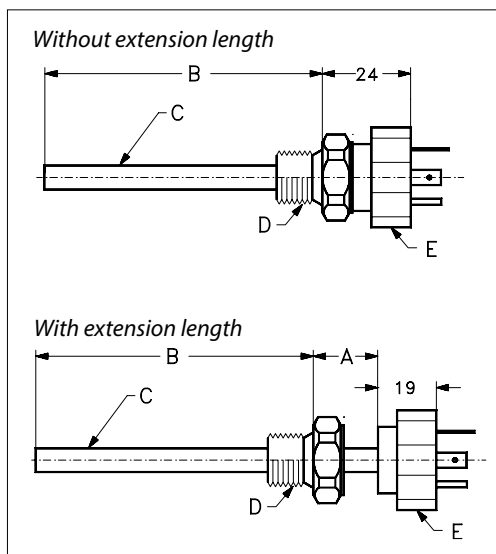
$T_m$  = Media temperature  
 $T_D$  = Temperature for electric plug  
 $T_A$  = Ambient temperature

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

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

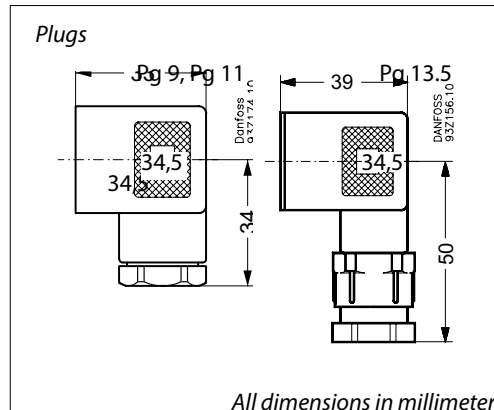
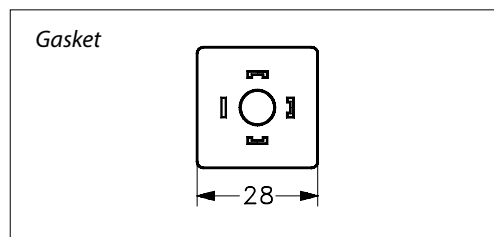
Process connection	G ¼ A	G ½ A G ⅜ A – M18	G ¾ A M24
Max. tightening torque	25 Nm	50 Nm	100 Nm

**Dimensions**  
MBT 5250, MBT 5260



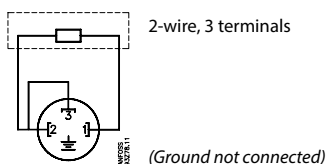
A = Extension length  
B = Insertion length  
C = Protection tube  
D = Process connection  
E = Union

- 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 ¼	G ¼ A – G ½ A G ⅜ A – M18	G ¾ A M24
Width across flats	HEX 22	HEX 27	HEX 32

**Electrical connections**



**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: ø10 × 2 mm
	High temperature: ø11 × 1 mm

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

Process connection	G ¼	G ¼ A – G ½ A G ¾ A – M18	G ¾ A M24
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 <sub>0.5</sub>	t <sub>0.9</sub>	t <sub>0.5</sub>	t <sub>0.9</sub>
MBT 5252	ø10 × 2 mm	14 s.	42 s.	110 s.	390 s.
MBT 5252 (HT)	ø11 × 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: ± (0.3 + 0.005 × 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

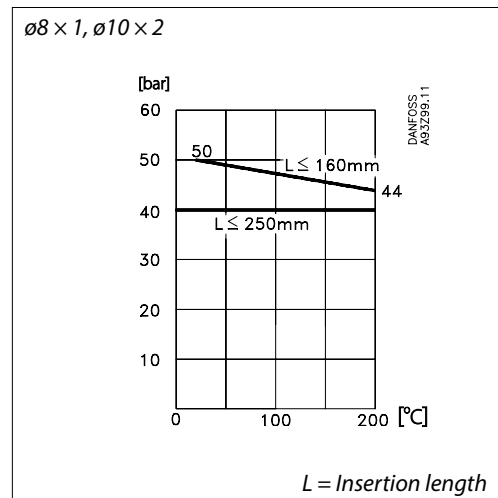
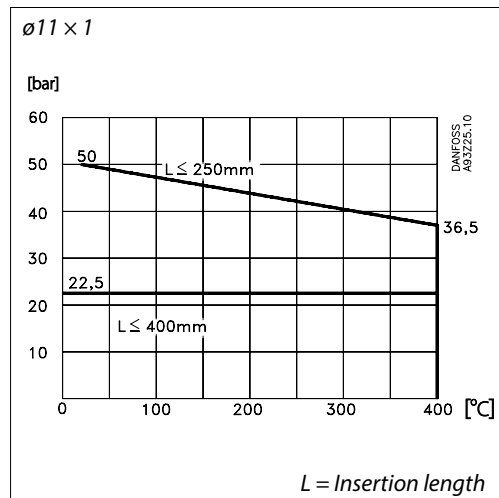
**Ordering standard**  
**MBT 5252**

		Sensor				Transmitter					
<b>Type MBT 5252</b>											
<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>						2	2			Temperature range 220 °C = 22	
1 × Pt 100						3	3			Temperature range 150 °C = 15	
2 × Pt 100 (-50 – 200 °C)						9	4			1. digit defines 100's	
1 × Pt 1000							5			2. digit defines 10's	
2 × Pt 1000 (-50 – 200 °C)							6				
Other							7				
<b>Protection Tube, W.nr. 1.4571 (AISI 316 Ti)</b>							8			Other	
Acid-proof steel, ø8 mm (-50 – 200 °C)							9				
Acid-proof steel, ø10 mm (-50 – 200 °C)										<b>Transmitter setting, start of range</b>	
Acid-proof steel, ø11 mm (-50 – 400 °C)						0				None	
Other						1				0 °C	
<b>Extension length</b>						4				-50 °C	
None						9				Other	
50 mm											
100 mm											
100 mm											
Other											
<b>Insertion length</b>										<b>Transmitter type</b>	
50 mm					0050					<b>As terminal block</b>	
100 mm					0100	0				None	
150 mm					0150	G				Standard	
200 mm					0200	L				Standard EEx ia IIC T4/T6	
250 mm					0250					<b>In hightened lid</b>	
300 mm					0300	A				Standard	
400 mm					0400	J				Standard EEx ia IIC T4/T6	
500 mm					0500	B				Galvanically isolated	
xx0 mm					xxx0	9				Other	
<b>Connection head</b>										<b>Connection</b>	
B (IP65)						0				2-wire, 3 terminals	
B-mini (IP65) (only up to 4 terminals) (transmitter not possible)						1				4-wire, also to be used for 3 wire	
Other						2				2 wire, 2 terminals	
<b>Process connection</b>										<b>Tolerance</b>	
G ¼ A (only ø8 mm protection tube)						0	0			EN 60751 Class B	
G ⅜ A						1	3			EN 60751 Class A	
G ½ A						2	9			Other	
G ¾ A						3					
½ – 14 NPT						7					
Other						9					

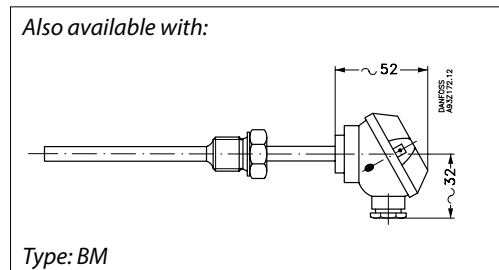
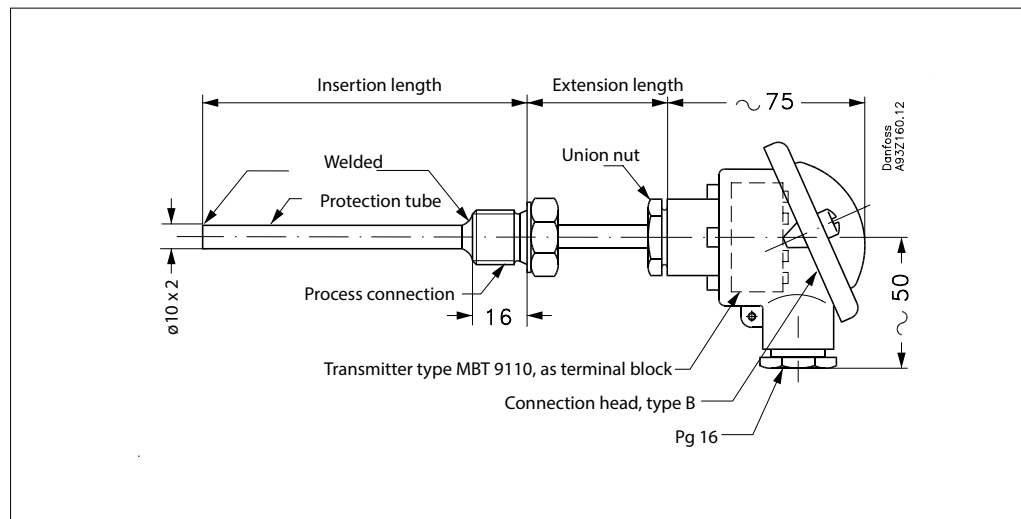
Preferred versions

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

Max. load on protection tube according to DIN 43763



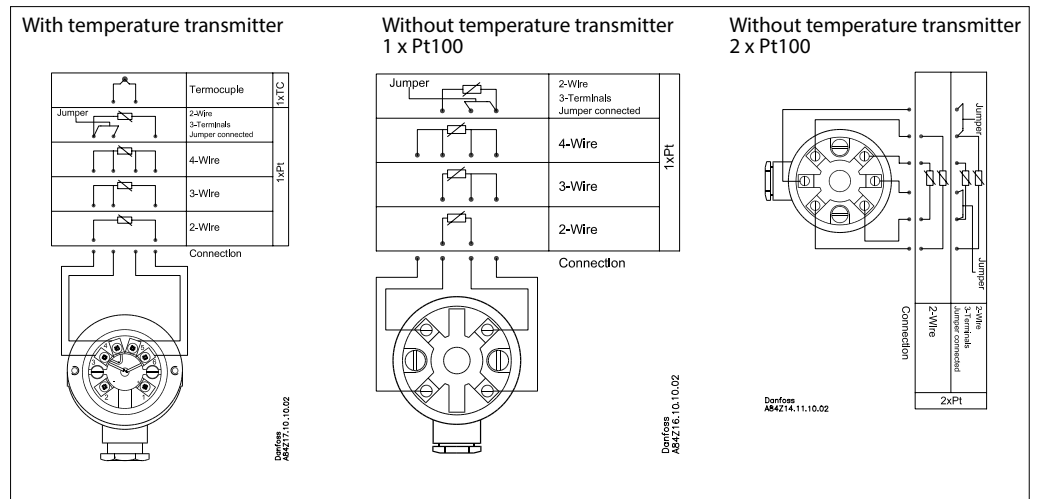
**Dimensions [mm]**  
**MBT 5252**



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



Electrical connections



ENGINEERING  
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