

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 _{0.5}	t _{0.9}	t _{0.5}	t _{0.9}
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

Measuring range, sensor element

-50 – 200 °C	0
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Sensing element

1 × Pt 100	0
1 × Pt 1000 (Class B only)	1
2 × Pt 100	2
2 × Pt 1000 (Class B only)	3
Other	9

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

Acid-proof steel, ø8 × 1 mm	0
Other	9

Extension length

None	0
50 mm	1

Insertion length

50 mm	050
80 mm	080
100 mm	100
150 mm	150
200 mm	200
250 mm	250
xx0 mm	xx0

Tolerance

EN 60751 Class B	0
Other	9

Process connection

None	0
G 1/4 A	1
G 1/2 A	2
1/2 – 14 NPT	3
G 3/4 A	4
M18 × 1.5	5
Other	9

Electrical Connections

EN175301/803 excl. female plug	0
EN175301/803 plug Pg 9 (IP65)	1
EN175301/803 plug Pg 11 (IP65)	2
EN175301/803 plug Pg 13,5 (IP65)	3
ITT Canon 4 pins Au	8
EN175301/803 GL. plug Pg 13,5 (IP65) Sn pins	A
EN175301/803 Pg 9–4 pins without earth (IP65)	B
EN175301/803 Pg 11–4 pins without earth (IP65)	C
Other	9

Preferred versions

Technical data

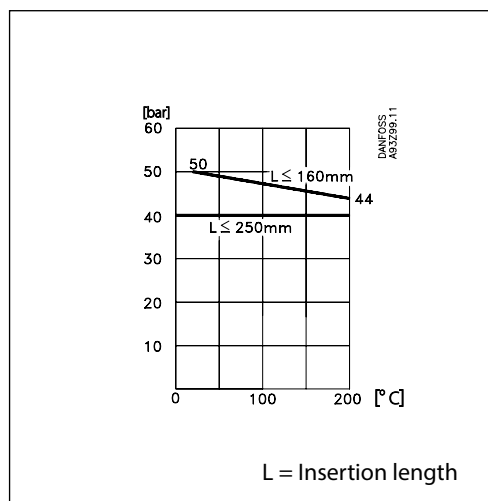
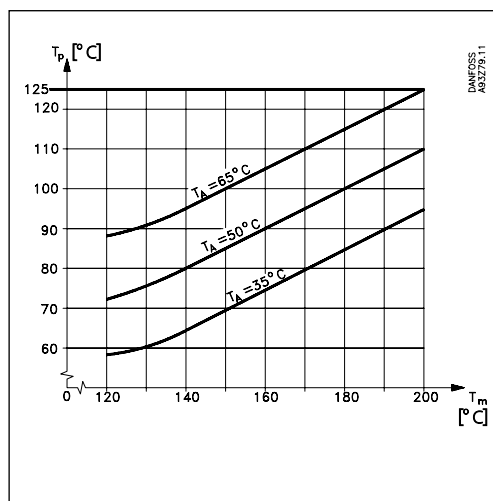
MBT 5250, MBT 5260

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

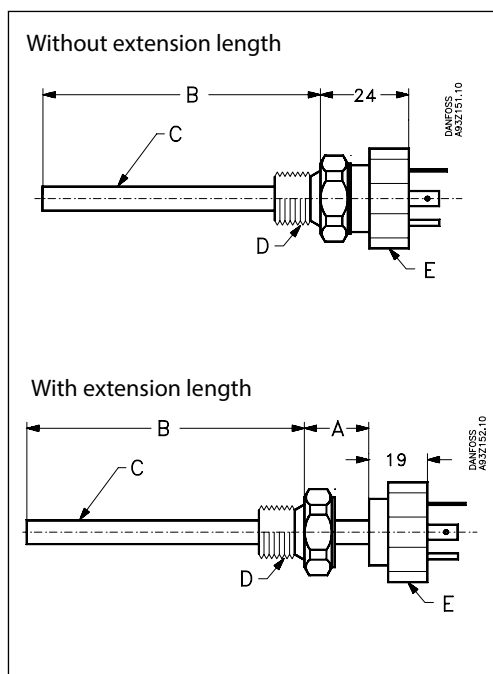
Note: for extension length = 50 mm
 no limitations up to 200 °C media temperature
 and 90 °C ambient temperature

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

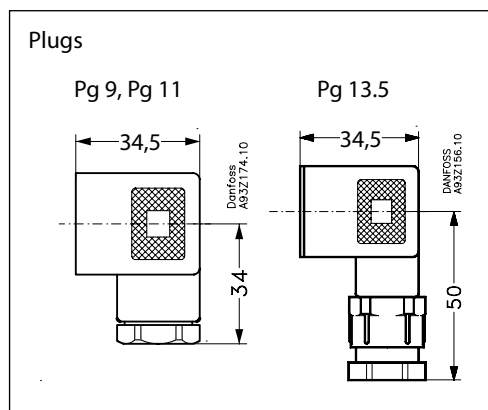
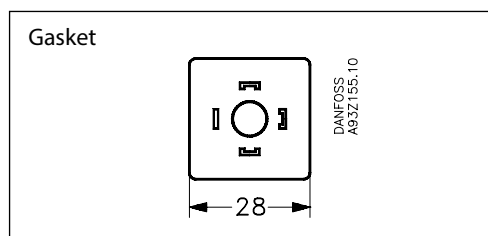
Process connection	G 1/4 A	G 1/2 A G 3/8 A – M18	G 3/4 A M24
Max. tightening torque	25 Nm	50 Nm	100 Nm

Dimensions

MBT 5250, MBT 5260



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



All dimensions in millimeters

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: 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 _{0.5}	t _{0.9}	t _{0.5}	t _{0.9}
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. temperature ¹⁾	Ambient:	90 °C for sensors without temperature transmitter	
	Transmitter:	85 °C for sensors with temperature transmitter	
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 2 – 100 Hz, measured acc. to IEC 60068-2-6	
Enclosure	IP65 according to IEC 60529		
Cable entry B-head	Pg 16		
Cable entry BM	Pg 9		
Temperature transmitter MBT 9110	Supply voltage:	8 – 35 V d.c.	
	Output:	4 – 20 mA	

¹⁾ 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

placed in a separated enclosure, as described in the separate data sheet for MBT 9110.

Materials

Protection tube in contact with media	W. no. 1.4571 (AISI 316 Ti)
Process connection in contact with media	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

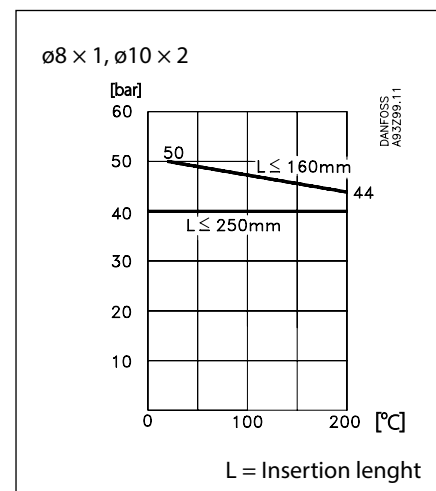
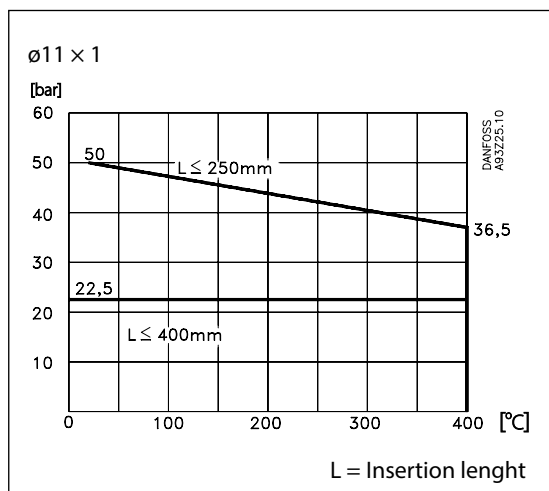
Ordering standard

Type MBT 5252		Sensor		Transmitter	
Measuring range, sensor element					Transmitter setting, end of range
-50 – 200 °C	0			0 0	0 °C (or none)
-50 – 400 °C	1			1 1	
Sensing element				2 2	
1 × Pt 100	0			3 3	Temperature range 220 °C = 22
2 × Pt 100 (-50 – 200 °C)	1			9 4	Temperature range 150 °C = 15
1 × Pt 1000	2			5	1. digit defines 100's
2 × Pt 1000 (-50 – 200 °C)	3			6	2. digit defines 10's
Other	9			7	
Protection Tube, W.nr. 1.4571 (AISI 316 Ti)				8	
Acid-proof steel, ø8 mm (-50 – 200 °C)	0			9	Other
Acid-proof steel, ø10 mm (-50 – 200 °C)	1				
Acid-proof steel, ø11 mm (-50 – 400 °C)	2				Transmitter setting, start of range
Other	9			0	None
Extension length				1	0 °C
None	0			4	-50 °C
50 mm	1			9	Other
100 mm	2				
Other	9				Transmitter type
Insertion length					As terminal block
50 mm	0050			0	None
100 mm	0100			G	Standard
150 mm	0150			L	Standard EEx ia IIC T4/T6
200 mm	0200				In heightened lid
250 mm	0250			A	Standard
300 mm	0300			J	Standard EEx ia IIC T4/T6
400 mm	0400			B	Galvanically isolated
500 mm	0500			9	Other
xx0 mm	xxx0				
Connection head					Connection
B (IP65)	0			0	2-wire, 3 terminals
B-mini (IP65) (only up to 4 terminals)	1			1	4-wire, also to be used for 3 wire
Other	9			2	2 wire, 2 terminals
Process connection					Tolerance
G ¼ A (only ø8 mm protection tube)	0			0	EN 60751 Class B
G ¾ A	1			3	EN 60751 Class A
G ½ A	2			9	Other
G ¾ A	3				
½ – 14 NPT	7				
Other	9				

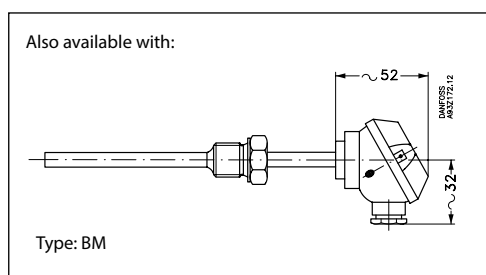
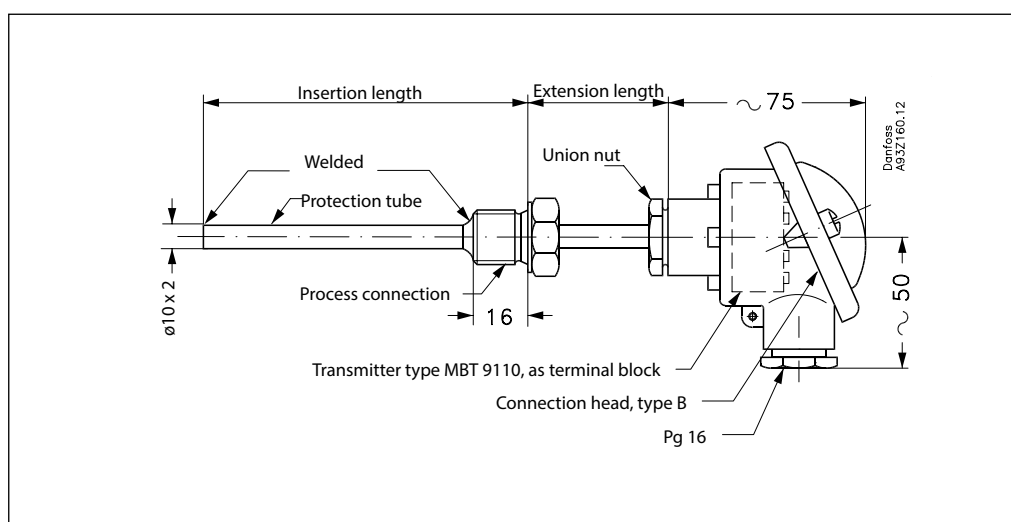
Preferred versions

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