ENGINEERING
TOMORROW

Data sheet

Temperature Sensors
Types MBT 5250, MBT 5260 and MBT 5252

MBT 5250
MBT 5260

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.

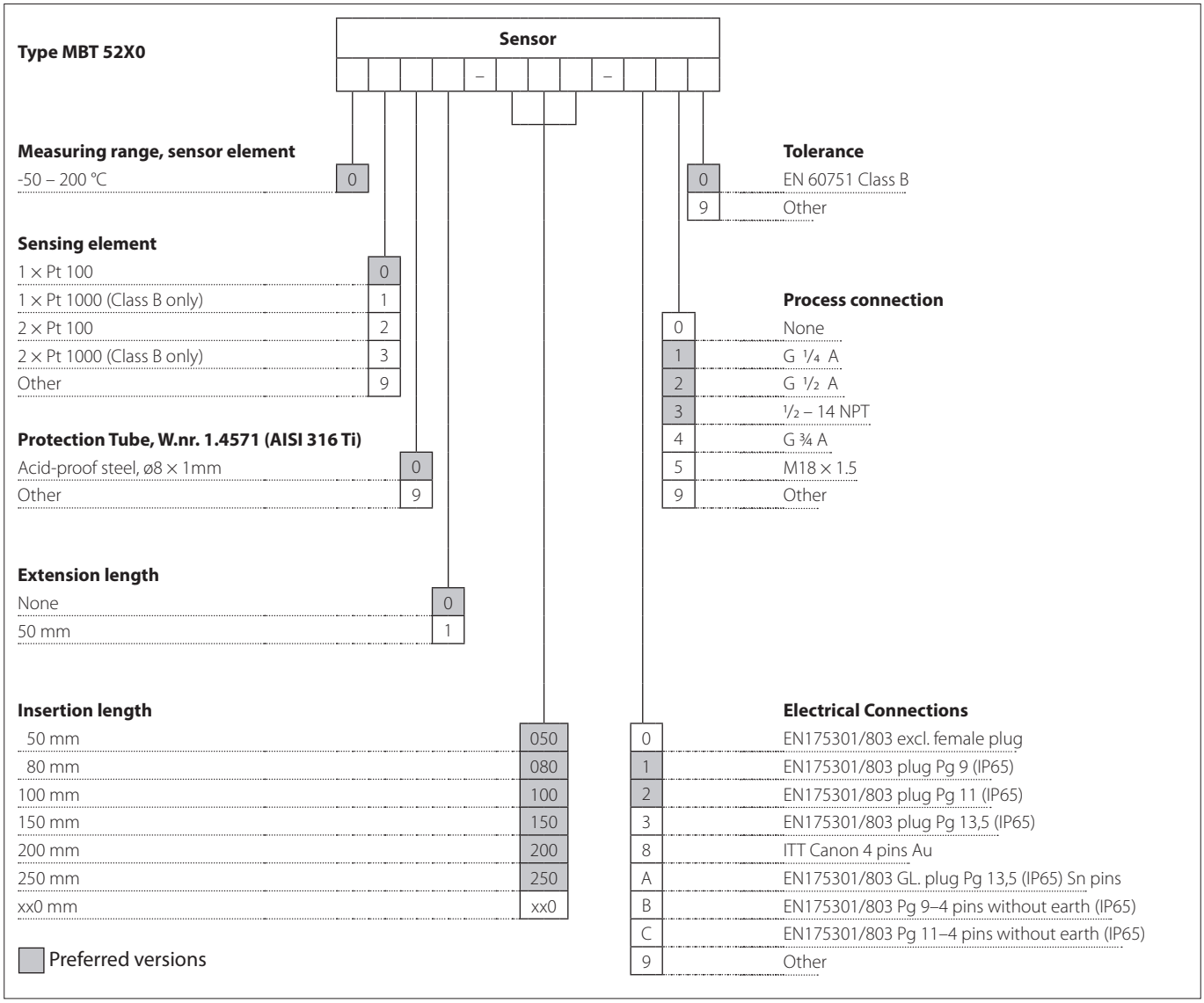
Materials

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

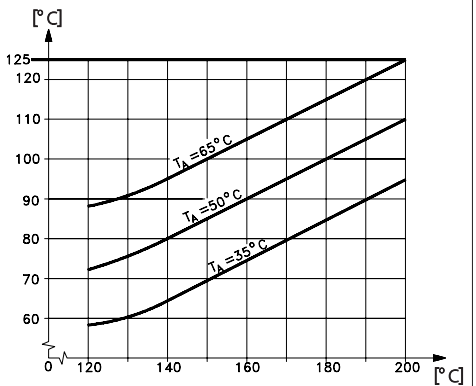
Sensor tolerance	EN 60751 Class B: ± (0.3 + 0.005 × t)	t = temperature of medium, numerical value
Vibration stability	Shock:	100 g / 6 ms
	Vibrations:	4 g sine function 5 – 200 Hz, measured acc. to IEC 60068-2-6
Enclosure	IP65 according to IEC 60529	
Cable entry EN 175301-803	Pg 9, Pg 11 or Pg 13.5	

Ordering standard (MBT 5250, MBT 5260)



Technical data MBT 5250, MBT 5260

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

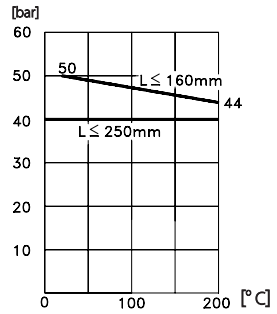


L = Insertion length

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

Max. load on protection tube
(ø8 × 1, ø10 × 2) acc. to EN 175301-803



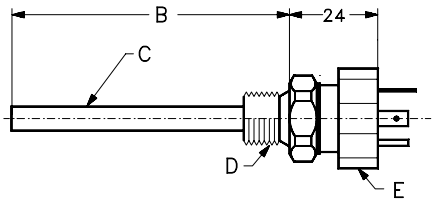
L = Insertion length

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

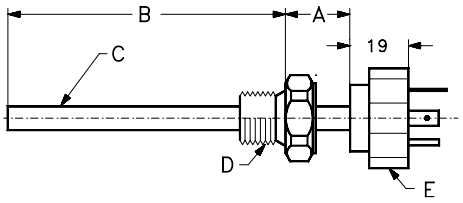
Process connection	G ¼ A	G ½ A G ⅜ A – M18	G ¾ A M24
Max. tightening torque	25 Nm	50 Nm	100 Nm

Dimensions MBT 5250, MBT 5260

Without extension length



With extension length

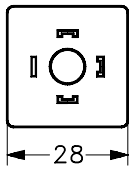


A = Extension length
B = Insertion length
C = Protection tube
D = Process connection
E = Union

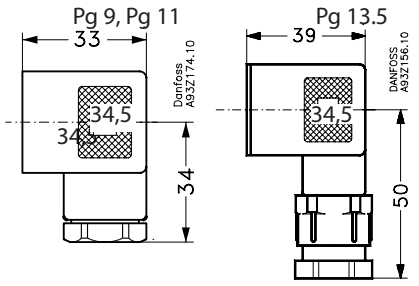
Please note:

- 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

Gasket



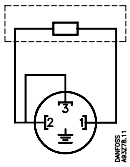
Plugs



All dimensions in millimeters

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



2-wire, 3 terminals

(Ground not connected)

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 ⅜ 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. ambient temperature [1])	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

[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 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

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Measuring range, sensor element

-50 – 200 °C	0
-50 – 400 °C	1

Sensing element

1 × Pt 100	0
2 × Pt 100 (-50 – 200 °C)	1
1 × Pt 1000	2
2 × Pt 1000 (-50 – 200 °C)	3
Other	9

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

Acid-proof steel, ø8 mm (-50 – 200 °C)	0
Acid-proof steel, ø10 mm (-50 – 200 °C)	1
Acid-proof steel, ø11mm (-50 – 400 °C)	2
Other	9

Extension length

None	0
50 mm	1
100 mm	2
Other	9

Insertion length

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

Connection head

B (IP65)	0
B-mini (IP65) (only up to 4 terminals) (transmitter not possible)	1
Other	9

Process connection

G ¼ A (only ø8 mm protection tube)	0
G ⅜ A	1
G ½ A	2
G ¾ A	3
½ –14 NPT	7
Other	9

Transmitter setting, end of range

0 0	0 °C (or none)
1 1	
2 2	
3 3	
9 4	
5	
6	
7	
8	
9 9	Other

Temperature range 220 °C = 22
Temperature range 150 °C = 15
1. digit defines 100's
2. digit defines 10's

Transmitter setting, start of range

0	None
1	0 °C
4	-50 °C
9	Other

Transmitter type

As terminal block

0	None
G	Standard
L	Standard EEx ia IIC T4/T6

In hightened lid

A	Standard
J	Standard EEx ia IIC T4/T6
B	Galvanically isolated
9	Other

Connection

0	2-wire, 3 terminals
1	4-wire, also to be used for 3 wire
2	2 wire, 2 terminals

Tolerance

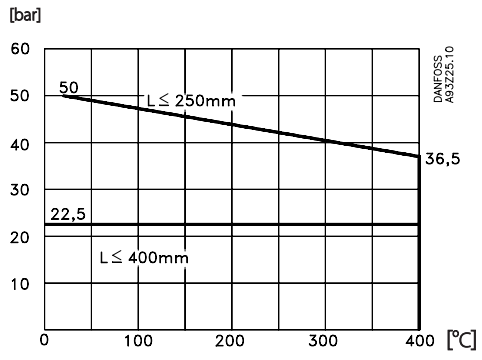
0	EN 60751 Class B
3	EN 60751 Class A
9	Other

Preferred versions

Technical data
MBT 5252

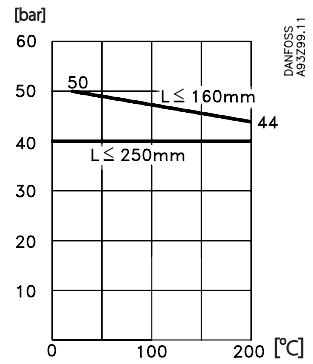
Max. load on protection tube according to DIN 43763

ø11 × 1



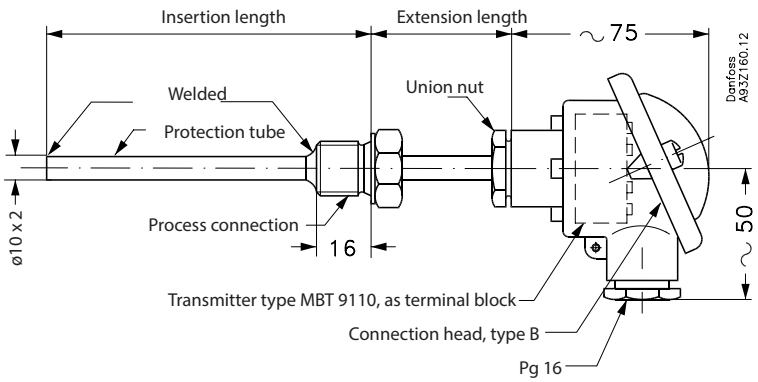
L = Insertion length

ø8 × 1, ø10 × 2



L = Insertion length

Dimensions [mm]
MBT 5252



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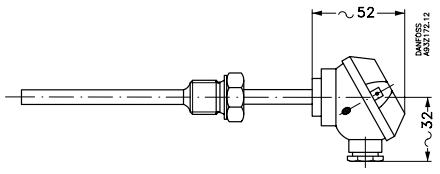

Type: BM

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

Electrical connections