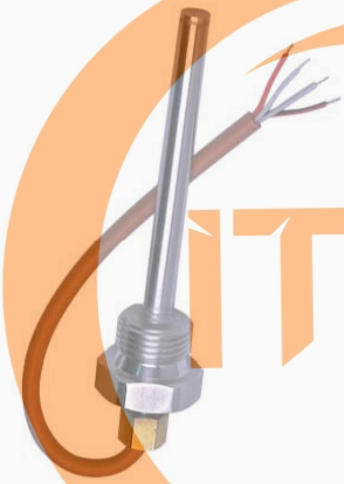
ENGINEERING TOMORROW

Data Sheet

Temperature sensor Type **MBT 153** and **MBT 120**

Temperature sensor element and pocket.

MBT 153



MBT 5253
(MBT 153 mounted in sensor pocket MBT 120)

The MBT 153 is an universal cable temperature sensor that can be used for controlling cooling water and ventilation systems within general industry applications. This temperature sensor is based on a standardized Pt 100 or Pt 1000 element, which gives a reliable and accurate measurement.

On request the MBT 153 can also be delivered with NTC / PTC elements. The sensor is based on a stainless steel housing with a cable, which makes the sensor extremely flexible.

The MBT 153 can be combined with a sensor pocket, type MBT 120, to protect the silicone cable from the media. The sensor combined with the sensor pocket is named MBT 5253.

The MBT 153 has a PVC or silicone cable as standard but it can be delivered with teflon cable on request.

Features:

- For temperature measurement where reliable, robust and accurate equipment is required
- Temperature range -50 – 200 °C
- Short response times
- Pt 100 or Pt 1000 resistance element
- 2 or 4 wire connection
- MBT 120 sensor pocket available

Product specification

Technical data

MBT 153

Table 1: Indicative response times

Indicative response times			
Water 0.2 m/s		Air 1 m/s	
$t_{0.5}$	$t_{0.9}$	$t_{0.5}$	$t_{0.9}$
2 s	10 s	28 s	107 s

Table 2: Net weight

Cable length	Net weight approx.
3.5 m	98 g
5.5 m	154 g
8.5 m	238 g

Table 3: Mechanical and environmental specifications

Features		Description
Max. ambient temperature	PVC	-40 – 100 °C (not marine approved)
	Silicone	-60 – 200 °C (marine approved)
	Teflon	-80 – 200 °C (marine approved)
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	IP67	
Cable resistance @ 20 °C[1]	PVC / Teflon	2 x 0.22 mm² Resistance per conductor R1 = 78.2 Ohm/km
	Silicone	2 x 0.25 mm² Resistance per conductor R1 = 68.8 Ohm/km
	Silicone	4 x 0.15 mm² Resistance per conductor R1 = 114.7 Ohm/km
	The constant conductor resistance : R = 2 x R1 The total resistance in the sensor circuit is therefore: R + RTD 3 & 4 wire sensor circuit are not relevant since the controller automatically compensates for the conductor resistance	

[1] Accordi

Sensor pocket, MBT 120

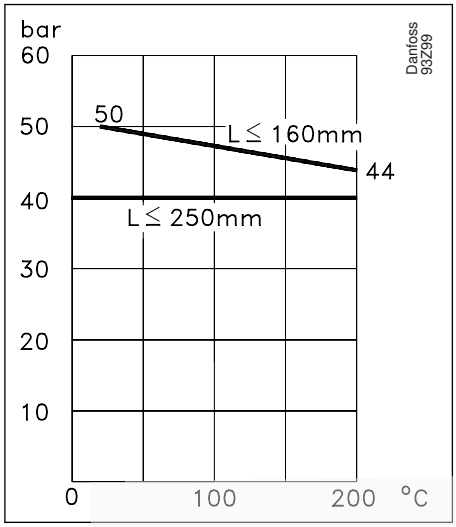
Table 4: General data

Process connection		G ½ A, ½ – 14 NPT	G ¾ A
Max. tightening torque		50 Nm	100 Nm
Permissible media velocity	Air	25 m/s	
	Water	3 m/s	

Table 5: Net weight

Insertion length	Process connection		
	G ½ A	G ¾ A	½ – 14 NPT
50 mm	87 g	128 g	87 g
100 mm	96 g	137 g	96 g
150 mm	105 g	146 g	105 g
200 mm	114 g	155 g	114 g
250 mm	123 g	164 g	123 g

Figure 1: Max. load on protection tube according to DIN 43763



L	Insertion length

MBT 5253

MBT 5253 (MBT 153 mounted with sensor pocket MBT 120)

Table 6: Indicative response times

Protection tube	Indicative response times			
	Water 0.2 m/s		Air 1 m/s	
	$t_{0.5}$	$t_{0.9}$	$t_{0.5}$	$t_{0.9}$
ø8 × 1	9 s	33 s	95 s	310 s

Table 7: Mechanical and environmental specifications

Features	Description	
Max. ambient temperature	100 °C (limited by the O-ring sealing at cable entry)	
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	IP67	
Cable	PVC 2 × 0.22 mm² Silicone 2 × 0.25 mm² (2-wire) Silicone 4 x 0.15 mm² (4-wire)	
Materials in contact with medium	-50 – 200 °C: W. no. 1.4435 (AISI 316 L) -50 – 800 °C: W. no. 1.4571 (AISI 316 Ti)	

Dimensions

MBT 153

Figure 2: Dimensions

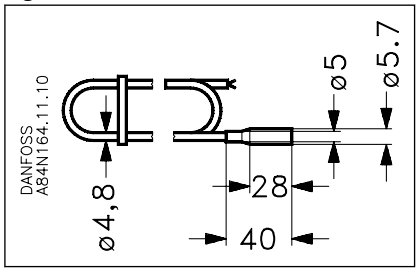
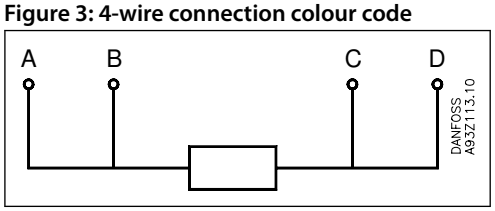


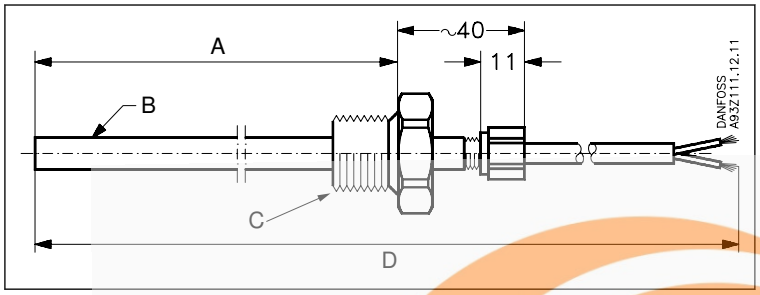
Figure 3: 4-wire connection colour code



A	Red
B	Red/black
C	White/black
D	White

MBT 5253

Figure 4: MBT 5253 – MBT 153 mounted in a MBT 120



A	Insertion length
B	Protection tube
C	Process connection
D	Cable length

Units: mm

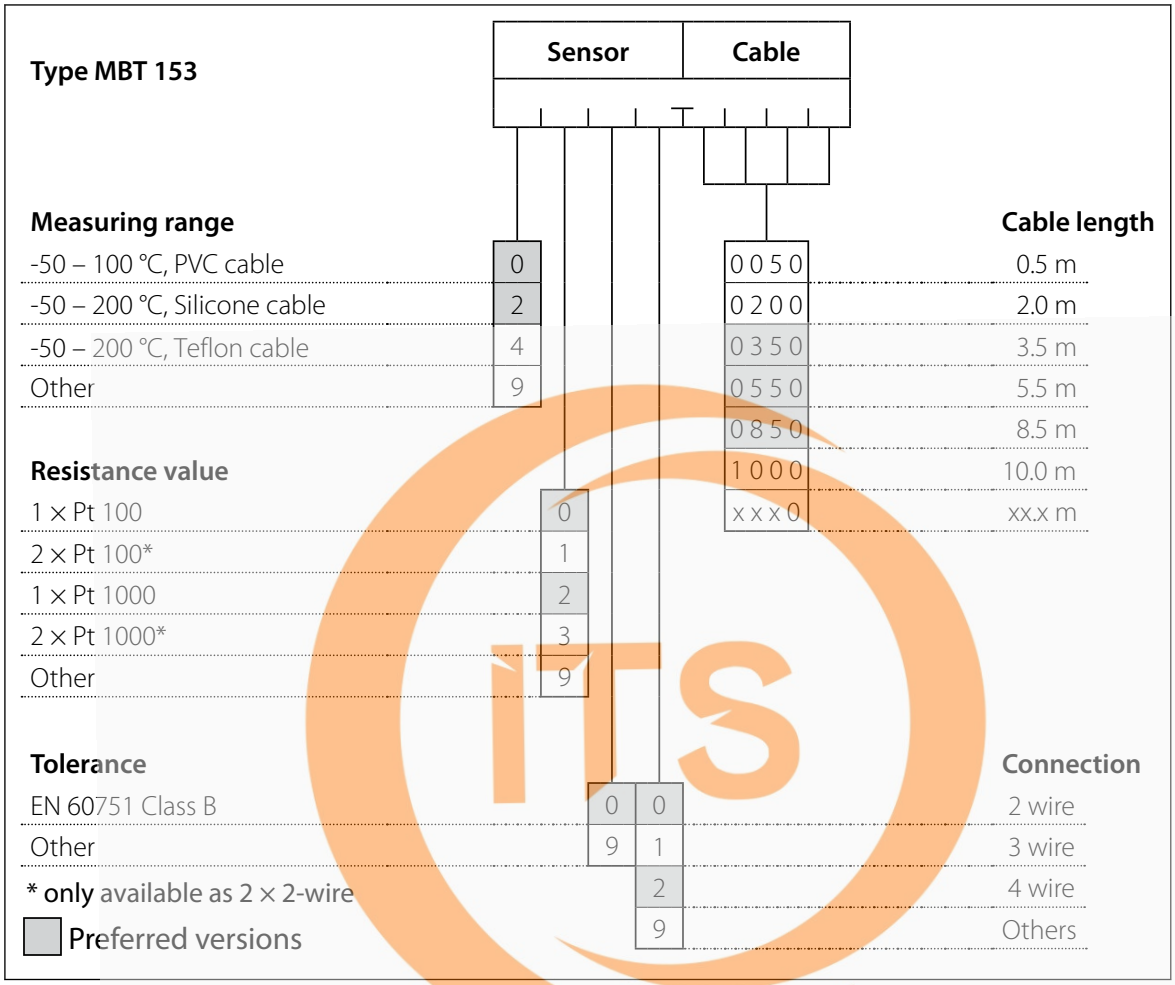
Table 8: Connections

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

Ordering

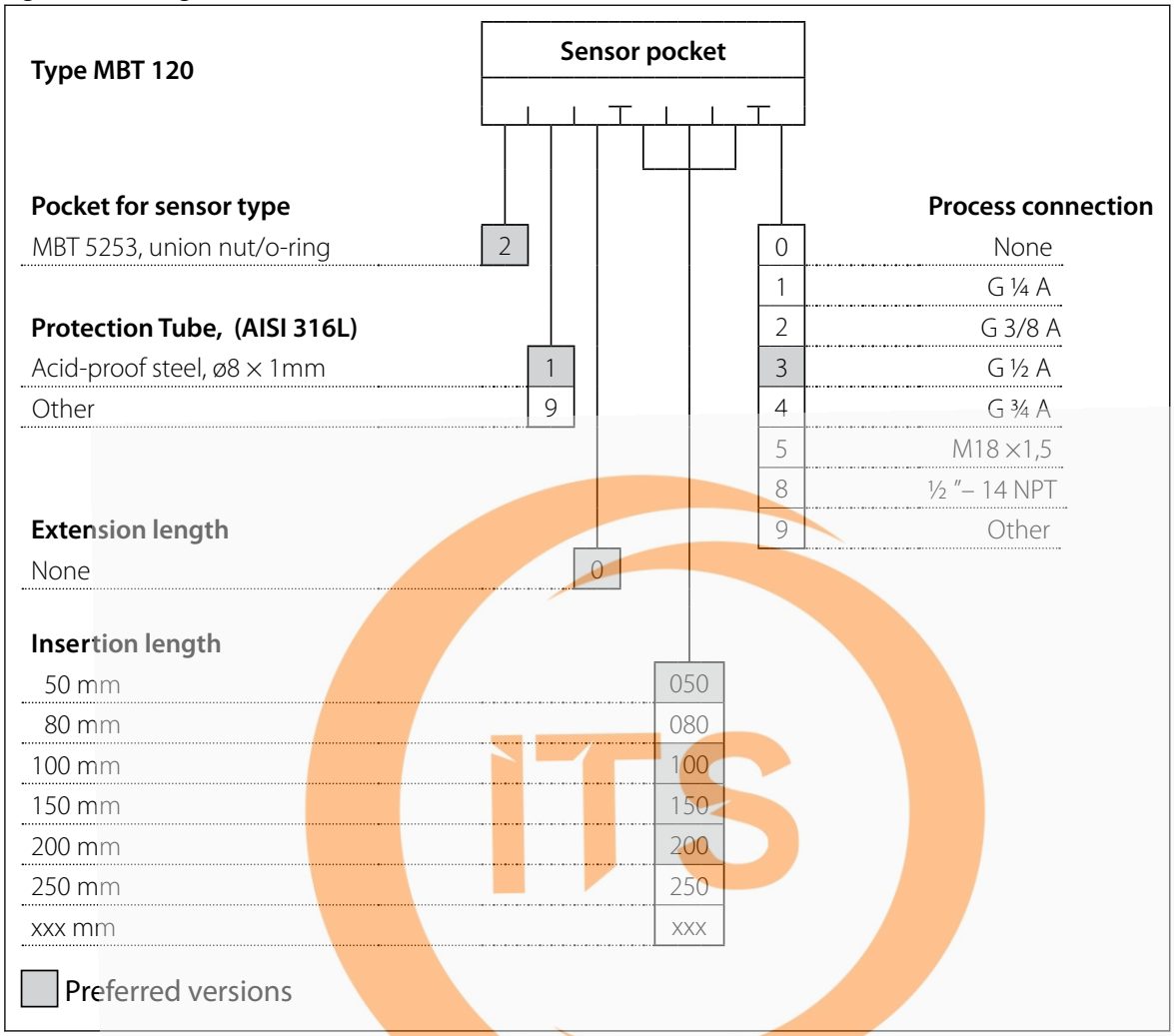
MBT 153

Figure 5: Ordering for MBT 153



MBT 120

Figure 6: Ordering for MBT 120



Certificates, declarations, and approvals

The list contains all certificates, declarations, and approvals for this product type. Individual code number may have some or all of these approvals, and certain local approvals may not appear on the list.

Some approvals may change over time. You can check the most current status at danfoss.com or contact your local Danfoss representative if you have any questions.

Table 9: MBT 153

File name	Document type	Document topic	Approval authority
GB19PTB00025	Marine - Safety Certificate	–	CCS
DK.C.32.004.A 41461	Measuring - Performance Certificate	–	GOST
097R0004.01	Manufacturers Declaration	RoHS	Danfoss
084R1022.01	Manufacturers Declaration	China RoHS	Danfoss
12CA69359	Explosive - Safety Certificate	ATEX	DEMKO
087R0017.00	Manufacturers Declaration	Simple apparatus	Danfoss
TAA000006F Rev. 2	Marine - Safety Certificate	–	DNV GL
OC.C.32.004.A 75977	Measuring - Performance Certificate	–	GOST

Table 10: MBT 120

File name	Document type	Document topic	Approval authority
06512-E1 BV	Marine - Safety Certificate	–	BV
GB19PTB00025	Marine - Safety Certificate	–	CCS
097R0004.01	Manufacturers Declaration	RoHS	Danfoss
SMS.W.II-2179-B.0	Marine - Manufacturing Permission	–	BV