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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

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# 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)<br>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<br>The total resistance in the sensor circuit is therefore: R + RTD<br>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**

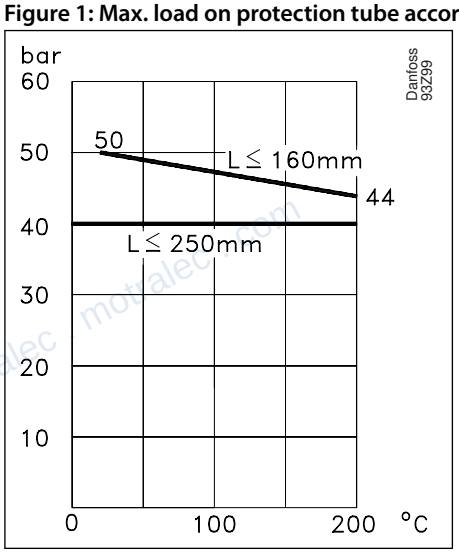
| Process connection | | G ½ A, ½ – 14 NPT | G ¾ A |
|---|---|---|---|
| Max. tightening torque | | 50 Nm | 100 Nm |
| Permissible media velocity | Air | 25 m/s | |
| | Water | 3 m/s | |

**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 |

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**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 |

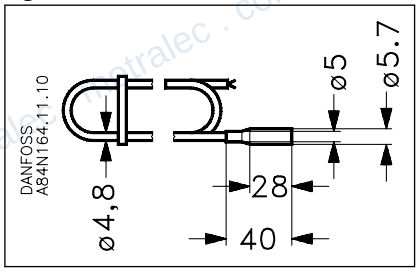
**Table 7: Mechanical and environmental specifications**

| 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)<br>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<br>Silicone 2 × 0.25 mm² (2-wire)<br>Silicone 4 x 0.15 mm² (4-wire) | |
| Materials in contact with medium | -50 – 200 °C: W. no. 1.4435 (AISI 316 L)<br>-50 – 800 °C: W. no. 1.4571 (AISI 316 Ti) | |

# Dimensions

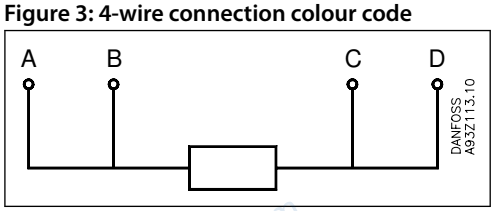
## MBT 153

**Figure 2: Dimensions**




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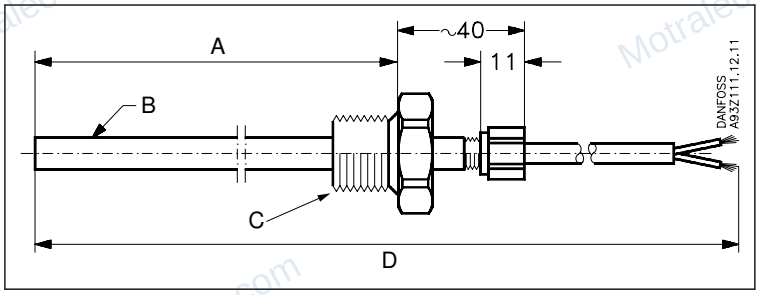
**Figure 3: 4-wire connection colour code**




| | |
|---|---|
| **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**

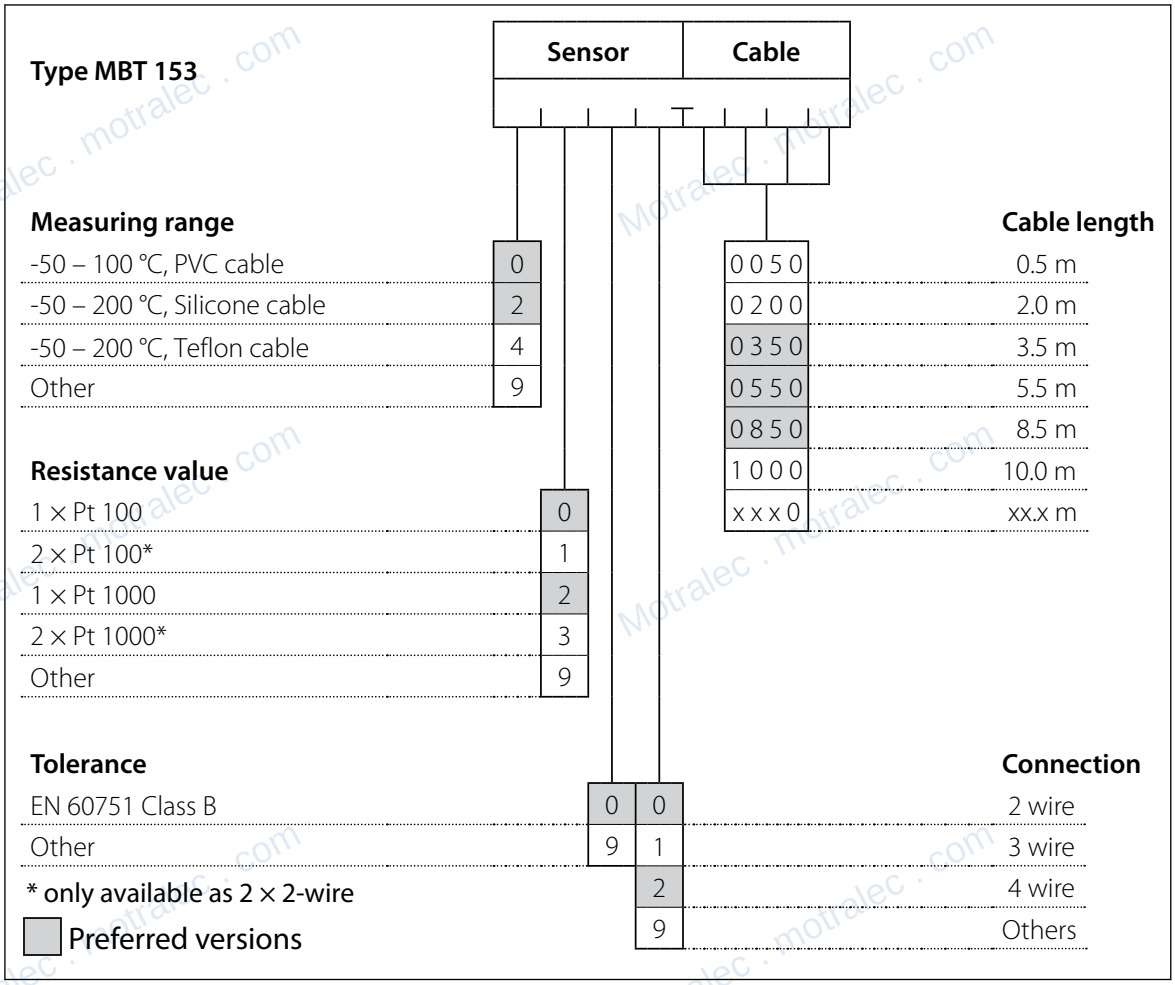
| Process connection | G ½ A, ½–14 NPT | G ¾ A |
|---|---|---|
| Width across flats | HEX 27 | HEX 32 |

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## Ordering

### MBT 153

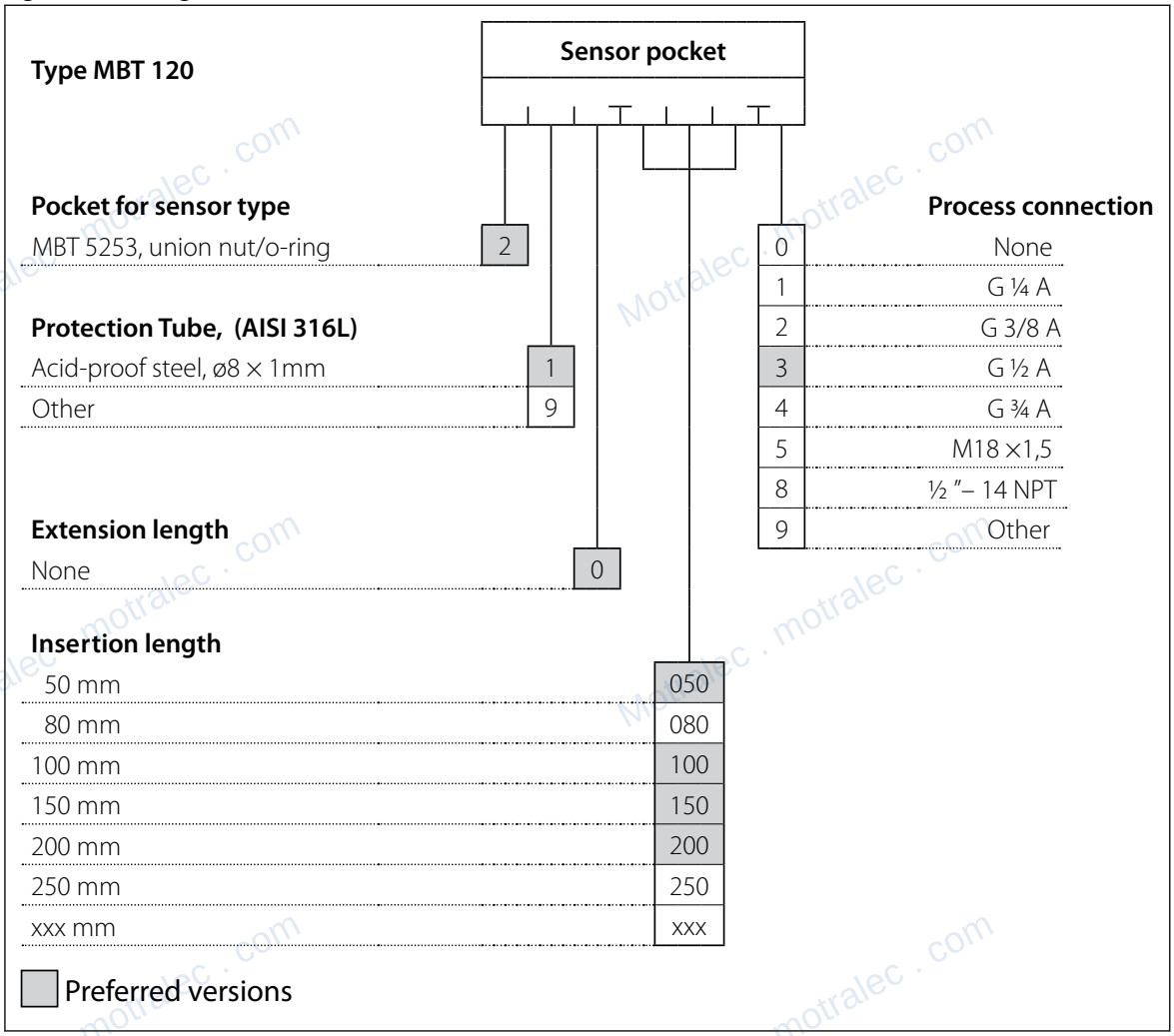
**Figure 5: Ordering for MBT 153**




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## MBT 120

**Figure 6: Ordering for MBT 120**




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## 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 |

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