

## Data Sheet

Temperature sensor  
Type **MBT 3560**

Industrial temperature transmitter.



With MBT 3560 we have combined the technology of our standard temperature sensors and the electrical connections from our MBS pressure transmitters with a new developed electronics which has resulted in a compact temperature sensor with a built-in transmitter.

The MBT 3560 is designed for use in harsh industrial environments where reliable, robust and accurate equipment is required.

Available with a wide selection of process and electrical connections. Can be delivered with a 33 mm extension length which makes it possible to measure temperatures up to 200 °C without damaging the built-in electronics.

**Features:**

- Designed for use in harsh industrial environments where reliable, robust and accurate equipment is required
- All metal enclosure parts made of stainless steel (AISI 316)
- Output signals: 4 – 20 mA or Ratiometric 10 – 90%
- A wide selection of process and electrical connections
- Ultra compact design
- Temperature range -50 – 200 °C
- Sensor pockets available for applications where emptying the system is not an option
- Based on Pt 1000 technology

## Product specification

### Technical data

Table 1: Main specifications

Features	Description
Process connections	See page <a href="#">Ordering</a>
Measuring ranges	Any combinations between -50 – 200 °C
Minimum span	25 °C
Output signals	4 – 20 mA or Ratiometric 10 – 90%
Electrical connections	See page <a href="#">Electrical connection</a>

Table 2: Performance

Features	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 mm	10 s	35 s	95 s	310 s
Accuracy	Typical: < ± 0.5% FS, Maximum: < ± 1.0% FS			
Max. load protection tube	100 bar			

Table 3: Electrical specifications

Features	Nom. Output signal (short-circuit protected)	
	4 – 20 mA	Ratiometric 10 – 90% of supply voltage
Supply voltage [ $U_s$ ] polarity protected	10 – 30 V DC	4.75 – 8 V DC 5 V DC (Nom.)
Supply – current consumption	-	< 4 mA at 5 V DC
Insulation resistance	> 100 MΩ at 100 V DC	> 100 MΩ at 100 V DC
Supply voltage dependency	< ± 0.05% FS/10 V	-
Current limitation	30 mA	-
Output impedance	-	< 25 Ω
Load [ $R_L$ ]	$R_L < (U_s - 10) / (0.02 \text{ A})$ ohm	$R_L > 5 \text{ kohm}$ at 5 V DC

Table 4: Environmental conditions

Features	Description
Media temperature (max. 120 °C without extension length)	-50 – 200 °C
Temperature on electronics <sup>(1)</sup>	-40 – 85 °C
Transport temperature range	-50 – 85 °C
EMC – Emission	EN 61000-6-3
EMC – Immunity	EN 61000-6-2
Vibration stability	Sinusoidal 15.9 mm-pp, 5 – 25 Hz
	4 g, 25 Hz – 2 kHz
	Random 7.5 g <sub>ms</sub> , 5 Hz – 1 kHz
Shock resistance	Shock 500 g/1 ms
	Free fall
Enclosure (depending on electrical connections)	See page <a href="#">Electrical connection</a>

<sup>(1)</sup> Temperature of the electronics depends on the media temperature, extension length, ambient temperature and air velocity.

Table 5: Mechanical characteristics

Features	Specifications
Materials:	Wetted parts Enclosure
Measuring insert	fixed
Net weight (depending on design)	0.1 – 0.15 kg

## Electrical connection

Table 6: Electrical connection

EN 175301-803	AMP Econoseal J series (male)	IEC 947-5-2 M12 × 1	Flying leads	2 m screened cable
<b>Enclosure</b>				
IP65	IP67	IP67	IP67	IP67
<b>Materials</b>				
Glass filled polyamid, PA 6.6	Glass filled polyamid, PA 6.6	Glass filled polyamid, PA 6.6	Glass filled polyamid, PA 6.6	PUR
<b>Electrical connection, 4 – 20 mA output (2 wire)</b>				
Pin 1: +supply Pin 2: ÷supply Pin 3: Not used Earth: Not connected to MBT housing	Pin 1: +supply Pin 2: ÷supply Pin 3: Not used	Pin 1: +supply Pin 2: Not used Pin 3: Not used Pin 4: ÷supply	Red wire: +supply Black wire: ÷supply	Red wire: +supply White wire: ÷supply Red/black wire: Not used Screen: Not connected to MBT housing
<b>Electrical connection, Ratio metric (3-wire) 10 – 90%</b>				
Pin 1: +supply Pin 2: ÷supply Pin 3: Output Earth: Not connected to MBT housing	Pin 1: +supply Pin 2: ÷supply Pin 3: Output	Pin 1: +supply Pin 2: not used Pin 3: Output Pin 4: ÷supply	Red wire: +supply Black wire: ÷supply Blue wire: Output	Red wire: +supply White wire: ÷supply Red/ Black wire: Output Screen: Not connected to MBT housing

## Dimensions

Table 7: Dimensions

EN 175301-803, Pg 9	AMP Econoseal J series (male)	IEC 947-5-2 M12 × 1, 4-pin	Flying leads	2 m Screened cable

**E** Extension length = 33 mm

**L** Insertion length

**H** 9 mm

## Ordering

**Figure 1: Ordering for MBT 3560**

Type	MBT 3560
<b>Sensor</b>	
<b>Measuring range</b>	<b>Transmitter setting</b>
-50 – 200 °C	0 – 100 °C
	0 – 150 °C
	0 – 200 °C
	-50 – 150 °C
	-50 – 200 °C
	Other
<b>Output signal</b>	
4 – 20 mA	
Ratiometric...10 – 90%	
<b>Protection tube, W.no. 1.4571 (AISI 316 Ti)</b>	
Acid-proof steel, ø8 mm (-50 – 200 °C)	
<b>Extension length</b>	<b>Process connection</b>
None	G 1/4 A
33 mm	G 3/8 A
	G 1/2 A
	½ – 14 NPT
	Other
<b>Insertion length</b>	<b>Electrical connection</b>
0050 mm	Plug, EN 175301-803, Pg 9
0080 mm	Plug, AMP Econoseal, J series, Male, excl. female plug
0100 mm	Screened cable, 2 m
0120 mm	Plug, IEC 947-5-2, M12 × 1, male, excl. female plug
0150 mm	Flying leads
0200 mm	Other
0250 mm	

Preferred versions

Non-standard build up combinations may be selected. However, minimum order quantities may apply, please contact your local Danfoss office for more information

## 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.

**Table 8: MBT 3560**

File name	Document type	Document topic	Approval authority
084R1019.01	EU Declaration	EMCD/ROHS	Danfoss
DK.C.32.004.A 41460	Measuring - Performance Certificate	-	GOST
RU Д-DK.AJ87.B.00022_19	EAC Declaration	EMC	EAC
084R1022.01	Manufacturers Declaration	China RoHS	Danfoss