

Data Sheet

Temperature transmitter
Type **MBT 9110**

For industrial and marine applications

**MBT 9110 transmitter with box enclosure**

Standard transmitter: D
Galvanic isolated transmitter: E

**MBT 9110 transmitter for B-head**

High cap for integration with B-head temperature sensor.
Standard transmitter: A
Galvanic isolated transmitter: B

**MBT 9110 transmitter as terminal block**

Standard transmitter: G
Galvanic isolated transmitter: H

The MBT 9110 temperature transmitter can be used for converting the Pt 100 / Pt 1000 ohm signal or the thermo couple mV signal to a 4 – 20 mA signal.

The MBT 9110 is a very durable and reliable temperature transmitter with all major marine approvals and can be used together with all our sensors based on Pt or Thermocouple technology.

MBT 9110 transmitters in the standard program are delivered in an enclosure, but are also used as an integrated part of certain temperature sensors.

The transmitter is available as standard or galvanic isolated with or without EEx approval.

Features

- 2-wire universal transmitter for industrial and maritime applications
- Pt 100, Pt 1000 or thermocouple input
- 4 – 20 mA standard output - with or without galvanic isolation
- For mounting in DIN B connection head, heightened lid or in a separate enclosure
- Advanced sensor fault indication
- Temperature linearized

Product specification

Technical data

Table 1: Performance

Primary accuracy	Pt 100 Thermocouple type E, J, K, L, N, T, U Thermocouple type B, R, S	< ± 0.3 °C < ± 1.0 °C < ± 2.0 °C
Linearity error	< 0.1% FS	
Temp. coefficient	< ± 0.01% FS / °K _{amb}	
Response time	Programmable 1 – 60 sec. 1 sec. standard	
Cold solder point compensation (CJC)	< ± 1.0 °C	
Warm-up time	5 min.	
Update time	440 ms	
Effect of sensor cable resistance (3/4 wires)	< 0.002 Ω / Ω	

K_{amb} = Ambient temperature change

Table 2: Electrical specifications

Supply voltage		8 – 35 V DC
EEx Galvanic supply voltage		7.2 – 30 V DC
Effect of supply voltage variation		< 0.005% FS / V DC
Output		4 – 20 mA current loop
Sensor fault indication		Namur NE43 upscale 23 mA
Input	Standard	Pt 100 (EN 60751) 2, 3 - wire -200 – 800 °C Pt 1000 (EN 60751) 2, 3 - wire
	Galvanic isolation	Pt 100 (EN 60751) 2, 3, 4 - wire -200 – 800 °C Pt 1000 (EN 60751) 2, 3 - wire Thermocouple (EN 60584)
Signal/noise ratio		Min. 60 dB
Max. lead cross-section		1 × 1.5 mm ²
Max. cable resistance		5 Ω / core

Table 3: Environmental conditions for Box enclosure

Insulation voltage	1500 V AC
EMC	EN 61326-1
Vibration/shock	IEC 60068-2-6 / IEC 60068-2-84
Vibration	4 g / 2 – 100 Hz
Humidity	0 – 98% RH, according to IEC 60068-1, IEC 60068-2-2
Ambient temperature	-40 – 70 °C
In separate enclosure	IP54 according to IEC 60529

Table 4: Mechanical characteristics

Max. offset	50% of max. input value (Pt 100: 400 °C) (Thermocouple, type R: 650 °C)
Net weight	In heightened lid for B-head: 0.080 kg In Box enclosure: 0.360 kg

Dimensions

In separate enclosure

Figure 1: MBT 9110 transmitter

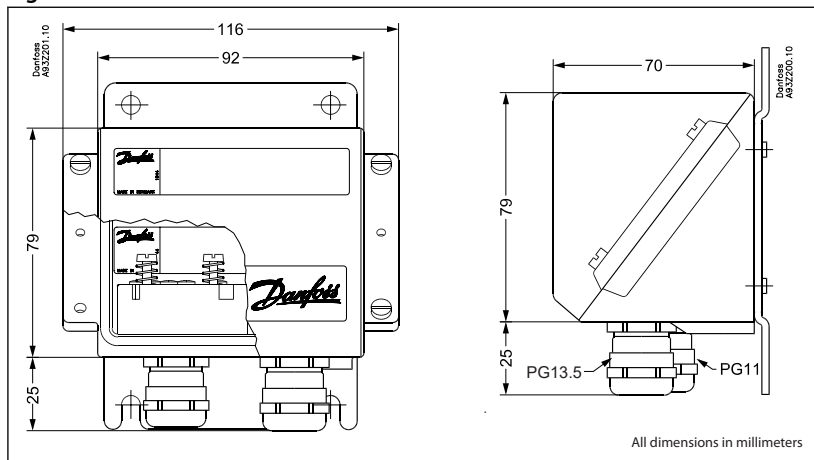
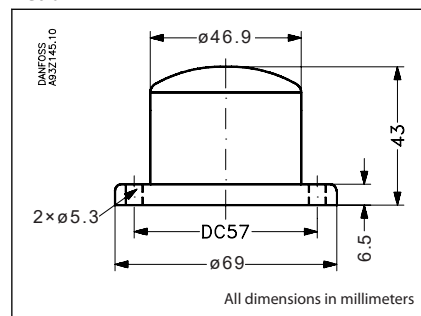


Figure 2: MBT 9110 transmitter for B-head



Ordering

Ordering standard

Figure 3: Specification code for MBT 9110

The diagram illustrates the MBT 9110 transmitter terminal block and its wiring connections. The terminal block is a 2x10 pin configuration. The top row of pins is labeled 'Transmitter' and the bottom row is labeled 'Connections'. The wiring is as follows:

- Transmitter Section:**
 - Pin 1 (M): Marine (0)
 - Pin 2: Size (0)
 - Pin 3: Sensor element (0-9)
 - Pin 4: Sensor element (0-9)
 - Pin 5: Sensor element (0-9)
 - Pin 6: Sensor element (0-9)
 - Pin 7: Sensor element (0-9)
 - Pin 8: Sensor element (0-9)
 - Pin 9: Sensor element (0-9)
 - Pin 10: Sensor element (0-9)
- Connections Section:**
 - Pin 11 (A): 2 wires
 - Pin 12 (B): 3 wires¹⁾
 - Pin 13 (C): 4 wires
 - Pin 14 (G): Standard
 - Pin 15 (L): Standard EEx ia IIC T4/T6
 - Pin 16 (H): Galvanically isolated
 - Pin 17 (I): Galvanically isolated and EEx ia IIC T4/T6
 - Pin 18 (A): In heightened lid
 - Pin 19 (B): Standard
 - Pin 20 (J): Galvanically isolated
 - Pin 21 (C): Standard EEx ia IIC T4/T6
 - Pin 22 (D): Galvanically isolated and EEx ia IIC T4/T6
 - Pin 23 (E): In separate enclosure
 - Pin 24 (D): Standard
 - Pin 25 (E): Galvanically isolated

¹⁾ Type standard is always 3 wire

NOTE:

- Only the transmitter as terminal block is Ex approved and lable marked according to our Ex approval.
- Versions with Ex transmitter in highthened lid or in separate enclosure are not Ex approved and therefore the lable can't be marked as such.

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 5: Certificates and declarations

File name	Document type	Document topic	Approval authority
TAA000013F	Marine - Safety Certificate	-	DNV GL
19-20014	Marine - Safety Certificate	-	LR
06871-FO BV	Marine - Safety Certificate	-	BV
TA16099M	Marine - Safety Certificate	-	NKK
GB19PTB00025	Marine - Safety Certificate	-	CCS
084R1019.01	EU Declaration	EMCD/ROHS	Danfoss
RU Д-ДК.А/87.В.00022_19	EAC Declaration	EMC	EAC
UA.1O146.D.00075-19	UA Declaration	EMCD/LVD	LLC CDC EURO TYSK
084R1021.00	Manufacturers Declaration	China RoHS	Danfoss
097R0004.01	Manufacturers Declaration	RoHS	Danfoss

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