

Data Sheet

Temperature sensor
Type **MBT 5310**

For monitoring of bearing temperatures in Wind turbines, engines and gearboxes applications



The MBT 5310 temperature sensor series is specially designed for measuring the temperature in bearings where there is a risk of overheating.

To get a very short reaction time the measuring element is placed in a way to secure a reaction time of down to $t_{0.5} = 6$ sec. in water.

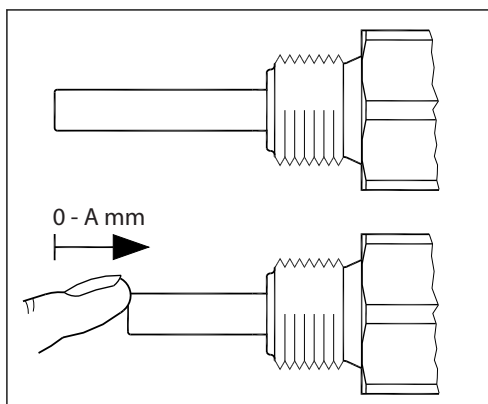
The sensor is fitted with an adjustable spring loaded protection tube which ensures metallic contact between bearing and sensor at all times.

Features

- For monitoring of bearing temperatures where there is risk of overheating, in applications such as:
 - Wind Turbines
 - Engines
 - Gearboxes
- Based on Pt 100 / Pt 1000 technology for use up to 200 °C
- Spring loaded to ensure good contact with the bearing

Functions

Spring function



Brass process connection

A = 15 mm

Stainless steel process connection

A = 12 mm

Product specification

Technical Data

Table 1: General data

Measuring range	-50 – 200 °C
Sensing element	Pt 100, Pt 1000
Protection tube	ø8 × 1 mm

Table 2: Response time

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 mm	6 s	20 s	35 s	140 s

Table 3: Materials

Protection tube in contact with the media	AISI 316
O-ring	FPM
Nut	Nickel plated brass
Process connection	AISI 316 / Brass
Gasket	Silicone
Plug EN 175301-803-A	PA (max. 125 °C)
B-head	Die cast aluminium

Table 4: Mechanical and environmental specifications

Sensor tolerance	EN 60751 Class B: $\pm (0.3\text{ °C} + 0.005 \times t)$ t = temperature of medium, numerical value	
Vibration stability	Shock	100 g/6 ms
	Vibrations	4 g sine function 2 – 100 Hz, acc. to IEC 60068-2-6
Enclosure	IP65 according to IEC 60529	
B-head	Pg 11	
Plug EN 175301-803-A	Pg 9, Pg 11	

Technical Data Drawings

Figure 1: Dimensions [mm]

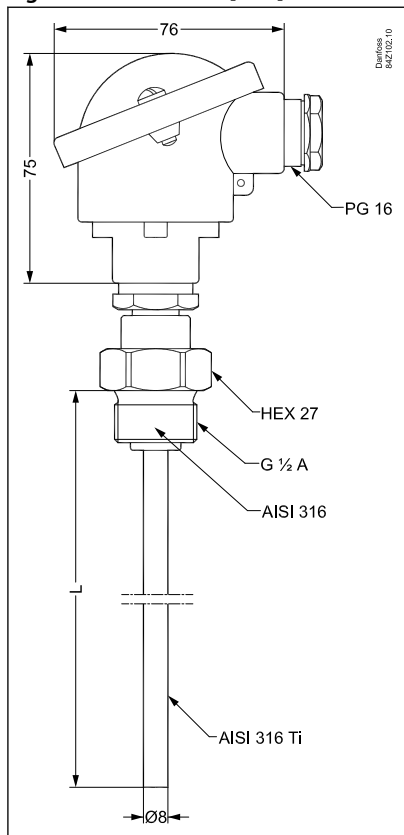
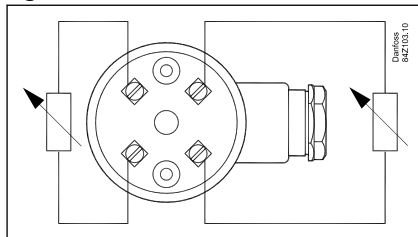
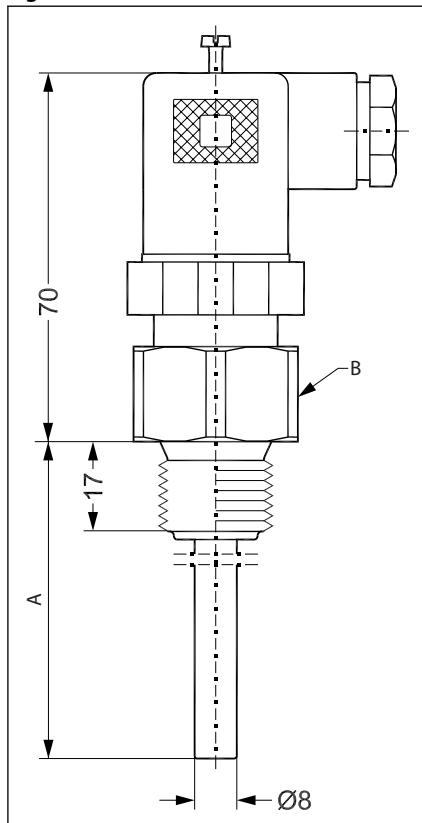


Figure 2: Electrical connection



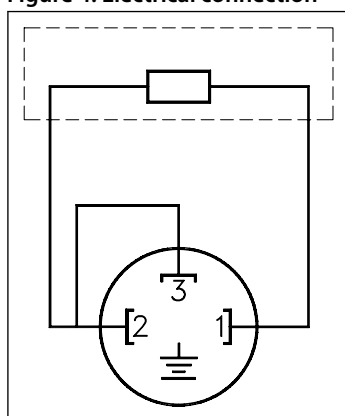
Electrical connection and dimensions

Figure 3: Dimensions



- | | |
|---|----------------------------|
| A | Insertion length, variable |
| B | Stainless or Brass |

Figure 4: Electrical connection



2 wire

3 terminals

Ground not connected

Technical data Cable version

Table 5: General data

Measuring range	-50 – 200 °C
Sensing element	Pt 100, Pt 1000
Protection tube	ø8 × 1 mm

Table 6: Response time

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 mm	6 s	20 s	35 s	140 s

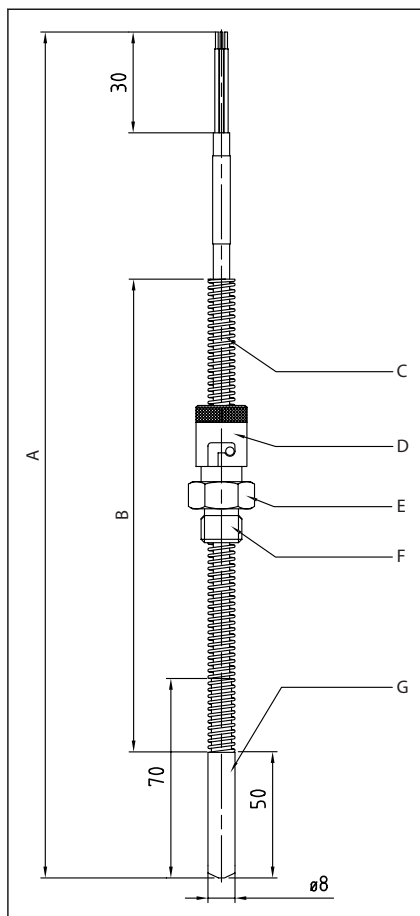
Table 7: Materials

Protection tube in contact with the media	AISI 316
Spring material	Stainless steel
Cable	FEP or Polyolefin, depending on selection
Process connection, bayonet	AISI 316

Table 8: Mechanical and environmental specifications

Sensor tolerance		EN 60751 Class B: $\pm (0.3\text{ }^{\circ}\text{C} + 0.005 \times t)$ t = temperature of medium, numerical value
Vibration stability	Shock	100 g/6 ms
	Vibrations	4 g sine function 2 – 100 Hz, acc. to IEC 60068-2-6
	Enclosure	IP67 according to IEC 60529

Cable Dimensions [mm]



A	Total length
B	Insertion length
C	Spring: Stainless steel
D	Bayonet cap: Stainless steel 316
E	Hex 17
F	2 Pin adapter G1/4A: Stainless steel 316
G	Bayonet tip: Stainless steel 316

Ordering

Ordering standard Plug and B-head

Type MBT 5310			
Resistance value			Tolerance
1 × Pt 100	0		EN 60751 Class B
2 × Pt 100 ¹⁾	1		
1 × Pt 1000	2		
2 × Pt 1000 ¹⁾	3		
Other	9		
Protection Tube, W.nr. 1.4571 (AISI 316 Ti)			Process connection
Acid-proof steel, ø8 × 1 mm	0		G ½ A Stainless steel
Other	9		G ¾ A Stainless steel
			G ½ A Brass
			G ¾ A Brass
			½ – 14 NPT Stainless steel
			Other
Insertion length (working range)			Electrical Connections
Brass	Stainless		0 EN 175301-803-A, plug Pg 11 (IP65) 2 wire / 3 terminals
70 – 85 mm	73 – 85 mm	85	1 EN 175301-803-A, plug Pg 9 (IP65) 2 wire / 3 terminals
85 – 100 mm	88 – 100 mm	100	3 B-mini head 2 wire / 3 terminals
145 – 160 mm	148 – 160 mm	160	4 B-mini head 4 wire / 4 terminals
210 – 225 mm	213 – 225 mm	225	5 B-head standard, 4 wire / 4 terminals
225 – 240 mm	228 – 240 mm	240	6 B-mini head 2 wire / 2 terminals
555 – 570 mm	558 – 570 mm	570	7 EN 175301-803-A, plug Pg 9 (IP65) 4 terminals no grounding pin
Other		xxx	8 EN 175301-803-A, plug Pg 11 (IP65) 4 terminals no grounding pin
			A M12 plug 2 wire 4 pins
			B M12 plug 4 wire 4 pins
Preferred versions			

¹⁾ Not all electrical connections are possible

Ordering standard cable version

Type MBT 5310			
Resistance value		Cable length	
1 × Pt 100	0	0100	01.0 m.
2 × Pt 100 ¹⁾	1	0500	05.0 m.
1 × Pt 1000	2	1000	10.0 m.
2 × Pt 1000 ¹⁾	3	xxxx	xx.x m.
Other	9		
Protection Tube, Stainless Steel / Brass		Cable type	
Acid-proof steel, ø8 × 1 mm	0	0	None
Acid-proof steel, ø10 × 2 mm	1	1	FEP cable
Acid-proof steel, ø12 × 1 mm	2	2	Polyolefin cable
Other	9	9	Other
Insertion length		Tolerance	
100 mm	100	0	EN 60751 Class B
300 mm	300	9	Other
xxx mm	xxx		
		Process connection	
		4	Bayonet coupling
		9	Other
		Electrical Connections	
		0	2-Wire
		1	3-Wire (only 1 × element)
		2	4-Wire (only 1 × element)
		9	Other

Preferred versions

¹⁾ Not all electrical connections are possible

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: Certificates and declarations

File name	Document type	Document topic	Approval authority
060G9688.00	Manufacturers Declaration	-	Danfoss
097R0004.01	Manufacturers Declaration	RoHS	Danfoss
UA.10146.D.00075-19	UA Declaration	EMCD/LVD	LLC CDC EURO TYSK
084R1022.01	Manufacturers Declaration	China RoHS	Danfoss
087R0017.00	Manufacturers Declaration	Simple apparatus	Danfoss