

## 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.

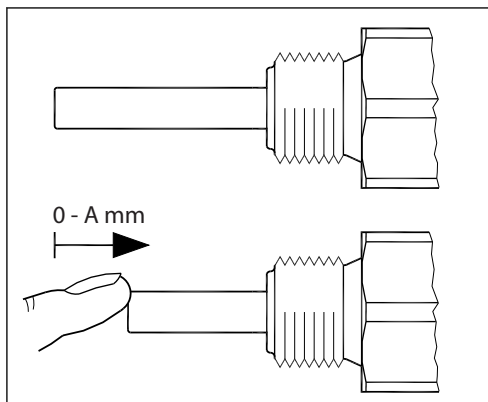
The sensor is fitted with an adjustable spring loaded protection tube which ensures metallic contact between bearing and sensor at all times.

**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]

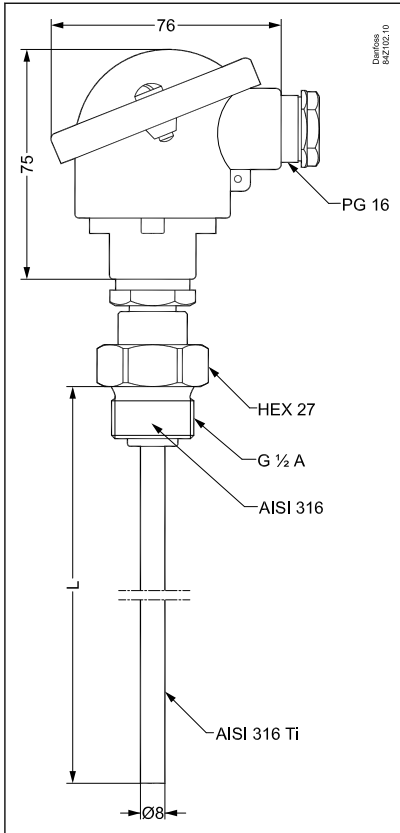
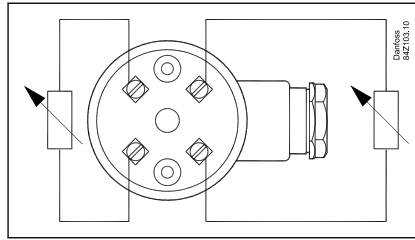
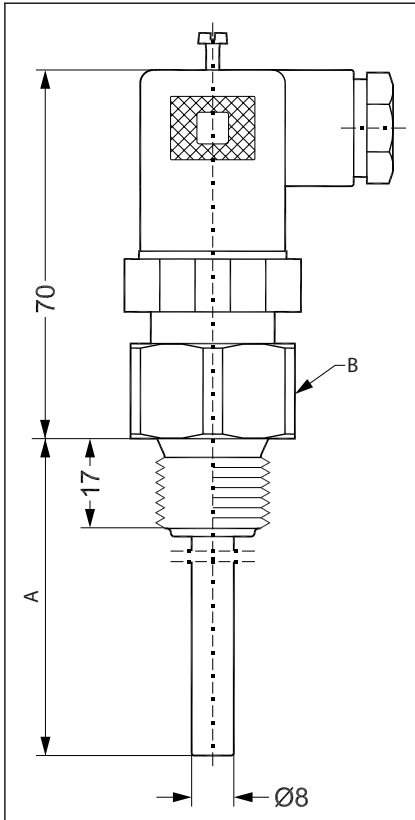


Figure 2: Electrical connection



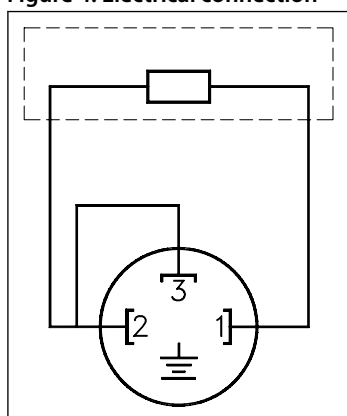
## Electrical connection and dimensions

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

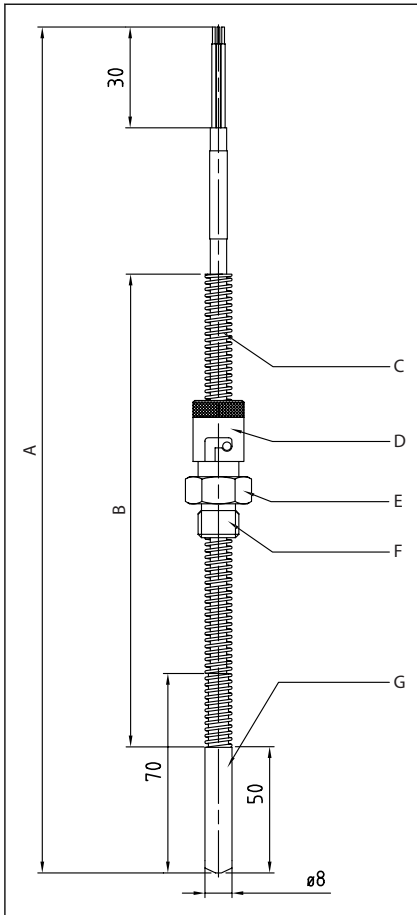
Table 7: Materials

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: $\pm (0.3 \text{ °C} + 0.005 \times t)$ 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]**



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

**Ordering**

**Ordering standard Plug and B-head**

**Type MBT 5310**

Resistance value		Tolerance EN 60751 Class B
1 × Pt 100	0	
2 × Pt 100 <sup>1)</sup>	1	
1 × Pt 1000	2	
2 × Pt 1000 <sup>1)</sup>	3	
Other	9	

Protection Tube, W.nr. 1.4571 (AISI 316 Ti)		Process connection
Acid-proof steel, ø8 × 1 mm	0	
Other	9	0 G ½ A Stainless steel
		1 G ¾ A Stainless steel
		2 G ½ A Brass
		3 G ¾ A Brass
		7 ½ – 14 NPT Stainless steel
		9 Other

Insertion length (working range)			Electrical Connections
Brass	Stainless		
70 – 85 mm	73 – 85 mm	85	
85 – 100 mm	88 – 100 mm	100	
145 – 160 mm	148 – 160 mm	160	
210 – 225 mm	213 – 225 mm	225	
225 – 240 mm	228 – 240 mm	240	
555 – 570 mm	558 – 570 mm	570	
Other		xxx	
			1 EN 175301-803-A, plug Pg 9 (IP65) 2 wire / 3 terminals
			3 B-mini head 2 wire / 3 terminals
			4 B-mini head 4 wire / 4 terminals
			5 B-head standard, 4 wire / 4 terminals
			6 B-mini head 2 wire / 2 terminals
			7 EN 175301-803-A, plug Pg 9 (IP65) 4 terminals no grounding pin
			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**

<sup>1)</sup> Not all electrical connections are possible

### Ordering standard cable version

**Type MBT 5310**

Resistance value	Protection Tube, Stainless Steel / Brass	Insertion length	Cable length	Cable type	Tolerance	Process connection	Electrical Connections
1 × Pt 100	Acid-proof steel, ø8 × 1 mm	100 mm	0100	None	EN 60751 Class B	Bayonet coupling	2-Wire
2 × Pt 100 <sup>1)</sup>	Acid-proof steel, ø10 × 2 mm	300 mm	0500	FEP cable	Other	Other	3-Wire (only 1 × element)
1 × Pt 1000	Acid-proof steel, ø12 × 1 mm	xxx mm	1000	Polyolefin cable			4-Wire (only 1 × element)
2 × Pt 1000 <sup>1)</sup>	Other		xxxx	Other			Other
Other							

**Preferred versions**

<sup>1)</sup> Not all electrical connections are possible

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**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

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