

# Temperature sensors that can take the heat

An outstanding temperature sensor performance is characterised by:

- The element
- The ability to react fast and precise
- The packaging

## 1 Elements

Depending on the equipment different element technologies can be applied:

- RTD (Pt100/Pt1000) – for standardised signals and high accuracy the RTD's are a perfect choice
- Thermistors (NTC/PTC) – the optimum solution for OEM equipment in large volumes
- Thermocouples – a well-known technology for high temperatures and heavy-duty applications

## 2 The ability to react fast and precise

Special care has been put into the design of the sensor in relation to the reaction time. A specially developed sensor element fixture ensures contact between the element and the housing material in order to secure a fast heat transfer from the media to the sensor element. On top of this the sensor construction ensures minimum radiation of heat, which results in a measurement very close to the actual temperature of the media.

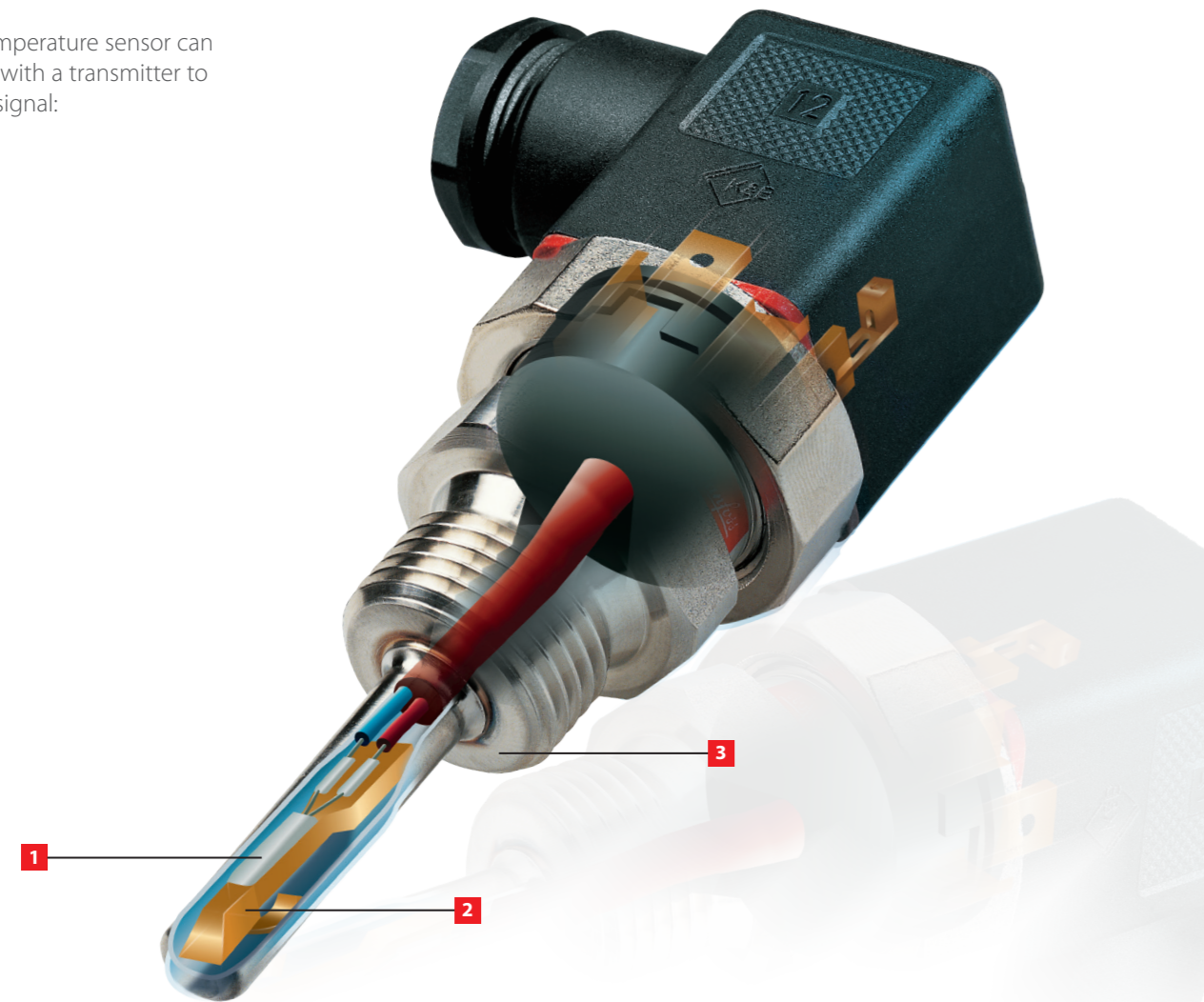
## 3 Packaging

The sensor design offers long-life stability through:

- High shock and vibration stability
- High enclosure grade (special version up to IP69K)
- Flexible choice of sensor material:
  - Stainless steel (AISI 316)
  - Brass
- Gold plated contacts to secure flawless signal

If required the temperature sensor can also be delivered with a transmitter to get an analogue signal:

- 4–20 mA
- Voltage
- Ratio metric



## Engineering Tomorrow



Danfoss is a leading global player within the development and production of mechanical and electronic products and controls. Since 1933, our extensive know-how has made modern life easier and we continue to break new ground within our core business areas.

Every day, more than 250,000 items are produced at 70 factories in 25 countries. Impressive as these figures are, we are most proud of the way our dedicated employees apply the high-quality components in customer solutions, adding value to the end products. Building strong partnerships is of great importance to us, because it is purely by understanding our customers' needs that we can meet the expectations of tomorrow.

This is also true in Industrial Automation, a Danfoss entity dedicated to focusing on the industrial world of today. Through us, you gain access to the entire Danfoss pool of technologies, with special emphasis on sensors and controls.

**We offer safer, more reliable and more efficient solutions in a close cooperation based on firm values.**

Learn more at [www.danfoss.com/ia](http://www.danfoss.com/ia)

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## Temperature sensors designed for customer needs

A temperature sensor overview



**ONE**  
stop shop  
for your  
sensor needs.

# Unsurpassed expertise makes all the difference

When you choose Danfoss as your supplier of temperature sensors, you choose a dedicated partner who truly understands the challenges in your specific application. Years of experience allow us to provide you with advanced solutions that will meet your every requirement in terms of

both performance and life cycle cost. Choose from our wide range of standard devices or team up with our worldwide sensor experts to design a customised solution for your equipment.

## Transportation



### Marine, Mobile Hydraulics and Railways

The increasing global focus on environmental and safety legislation calls for more control and automation. Danfoss accommodate this by optimising product functions and specifications, allowing you to comply with the new demands. Our wide sensor range comprises solutions for:

- Marine equipment
- Mobile hydraulic equipment
- Railway equipment

## Machine and equipment



### Industrial Hydraulics, AirCompressors, Water Pumps and Industrial Engines

Within machines and equipment the temperature sensor specifications depend on the specific application. Close cooperation with customers has allowed us to develop dedicated sensor solutions for:

- Water pumps and air compressors (MBT 3270/5250 series)
- Industrial engines
- Industrial hydraulics

## Heating and sanitation



### Sterilisers, Autoclaves, Boiler and Boiler Room Equipment

Energy efficiency and safety are frequent challenges in heating and sanitation applications. The answer is highly reliable and accurate measurements, which is achieved by using specialised sensors. Bearing the above equipment in mind we have developed dedicated temperature sensors for:

- Sterilisers and autoclaves
- Boiler and boiler room equipment

## Energy



### Wind Turbines and Electric Power

One of the most distinct global challenges now and in the future is how to produce energy in a both efficient and environmentally friendly way. In cooperation with some of the leading manufacturers of process and energy equipment, Danfoss has developed – and is continuously refining – solutions for:

- Wind turbines
- Gen sets



## TEMPERATURE SENSORS OVERVIEW



TYPE	STANDARD	MBT 3270	MBT 3252	MBT 3560	MBT 153	MBT 5250	MBT 5252	MBT 5260	
SEGMENTS	Transportation								
	Heating and sanitation								
	Machine and equipment								
	Energy								
CHARACTERISTICS	Pt 100 / Pt 1000	•	•		•	•	•	•	
	NTC / PTC	•			•	•	•		
	Thermocouple								
	Transmitter				mA / V DC				
	Transmitter as option			mA			mA		
	Measuring insert	Fixed	Fixed	Fixed	Fixed	Changeable	Changeable	Fixed	
	Medium temperature	°C	-50 – 300 °C	-50 – 200 °C	-50 – 200 °C	-50 – 200 °C	-50 – 200 °C	-50 – 400 °C	-50 – 200 °C
		°F	-58 – 572 °F	-58 – 392 °F	-58 – 392 °F	-58 – 392 °F	-58 – 392 °F	-58 – 752 °F	-58 – 392 °F
	Enclosure	IP65 (NEMA 4)	IP65 (NEMA 4)	IP65 / IP67 (NEMA 4 / NEMA 6)	IP67 (NEMA 4)	IP65 (NEMA 4)	IP65 (NEMA 4)	IP65 (NEMA 4)	
	Material protection tube	W.no. 1.4571 (AISI 316 Ti)	W.no. 1.4571 (AISI 316 Ti)	W.no. 1.4571 (AISI 316 Ti)	W.no. 1.4571 (AISI 316 Ti)	W.no. 1.4571 (AISI 316 Ti)	W.no. 1.4571 (AISI 316 Ti)	W.no. 1.4571 (AISI 316 Ti)	
Reaction time $t_{0.5}$ in water (sec)	Stainless steel 1.5 s Brass 1.2 s	3 s	10 s	1 s	9 s	12 s	2 s		
Marine approvals					•	•	•		