

Hot element and manufacturing features

## Hot Junction Features

ž. UNGROUNDED For detections inside fluids



Comparison between RTDs and thermocouples						
	RTD	Thermocouple				
Measure type	Absolute, steady current [ohm]/°C	Self-generating differential, µV/°C				
Suggested temperature range	-200750°C	-2001700°C depends on type				
Accuracy/Limits	Very good (1.8°C @300°C)	Good (2.5°C @300°C)				
Life stability	Very good	Good				
Reproducibility	Very good	Good				
Repeatibility	Very good	Good				
Fast response time (same size)	Medium	High				
Mechanical sturdiness	Good, vibration sensitive if not properly manufactured	Very good, but for ceramic sheaths (poor resistance to shocks, vibrations and temp. shocks). Vertical mounting				
Temp. sensor price	Thin film: low. Ceramic: medium. Glass: high.	Up to 1000°C: low. Over 1000°C: high				
Measuring instrum. price	Medium	High (with temperature compensation of built-in cold junction				
Connection	3-wire copper cable (cheap)	Compensating cable (expansive and polarity observance)				

Guide to the choice of the protection sheath material

Sheath material		Type of atmosphere			Notes
	Oxidating > 0.5% 02	Reducing CO, CO <sub>2</sub> , H <sub>2</sub>	Vacuum > 10 -1 Tor	Inert He, Ar	
Stainless steel	950°C	110°C	1000°C	1100°C	Sulphur: 600°C max
Inconel 600	1100°C	1100°C	1000°C	1100°C	600°C max with sulphur + Reduc. 800°C max with Sulphur + Oxidating
Sintered alumina (Al <sub>2</sub> O <sub>3</sub> )	1600°C	1600°C	1600°C	1600°C	It requires a support with horizontal installation. Subject to thermal shocks.
Carborundum (SiC)	1650°C	1650°C	1650°C	1650°C	It requires dew point $> 0^{\circ}$ C Permeable to gas

Extension wire

## Most common extensions

Connection head

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## Structural Features

There are 2 macrocategories of sheathed electric sensors: • Standard ceramic or fiber glass insulated

• Mineral insulated (MgO)



## Features of Mgo insulated sensors

These sensors are manufactured with mineral insulated cables made up by wires contained in a metal sheath without weldings, insulated between them and from the sheath itself by means of highly compressed mineral insulating powder (very pure magnesium oxide). This manufacturing procedure grants feature long-life stability in most unfavourable corrosion and temperature conditions.

- Sheath ø from 0.5 to 12.7
- Extremely fast response time
- Very good sturdiness to shocks and vibrations.High flexibility and easy-to-use

- Sheath bending capacity
  They are particularly suitable for air, gas, oil and water measurements, as they have no welding on sheath, which makes them waterproof.