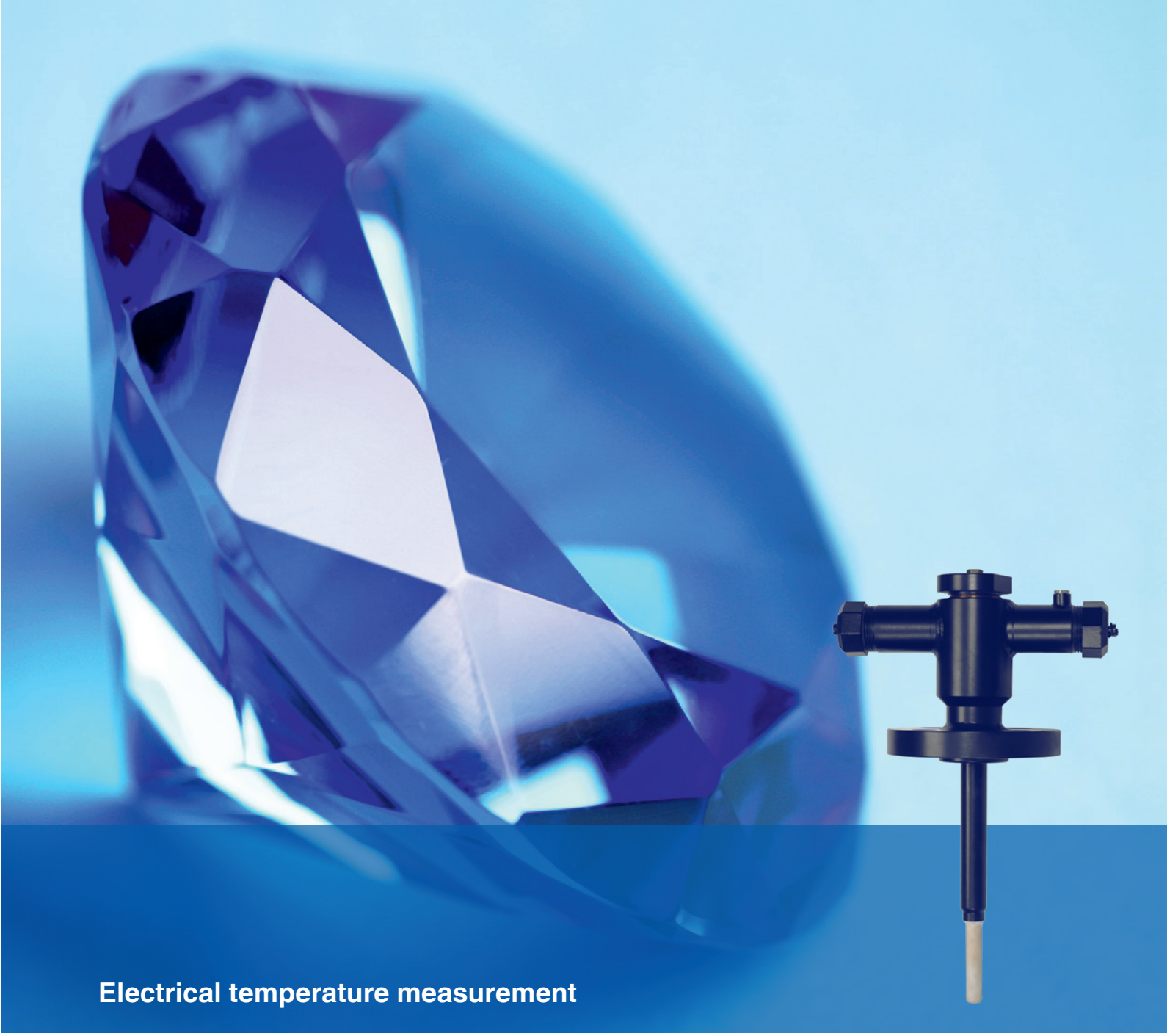


Electrical temperature measurement

Sapphire-design thermocouple

WIKA

Smart in sensing

Sapphire – the best quality

The high-temperature thermocouple TC84 features a gas-tight sapphire thermowell.

Its monocrystalline structure protects the noble metal of the thermocouple from being poisoned as a result of the aggressive atmosphere inside a gas reactor.

The optimum solution for temperature measurements in:

- Gas reactors
- GtL reactors (Gas-to-Liquids)
- Sulphur recovery plants

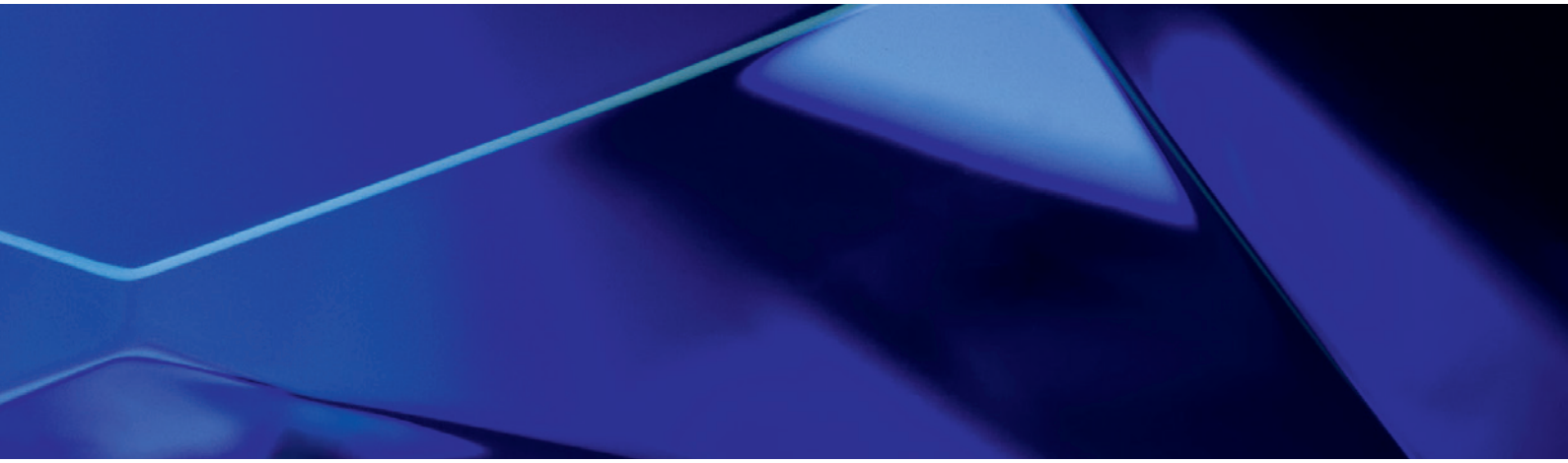
Developed specifically for extreme conditions:

- High temperatures
- High pressures
- High safety requirements
- Toxic media

Cost saving due to repair options

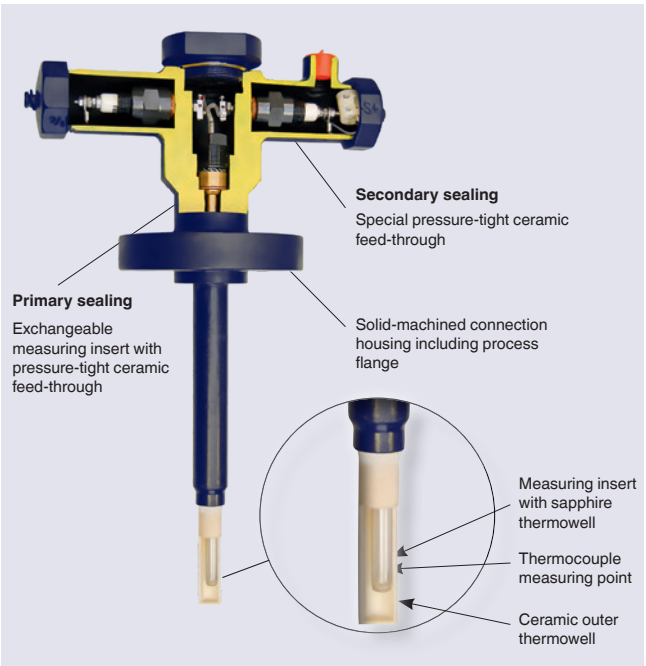
The high-temperature thermocouples are designed such that they allow low-cost repair after removing a defective sensor from the reactor.

for thermocouple protection



Benefits to the user

- 3 times longer service life in comparison to purely ceramic thermowells due to the monocrystalline structure of the sapphire thermowell
- High process safety with processes up to 1,700 °C and 65 bar
- Cost saving due to the elimination of a complex rinsing system and valves and fittings for flow measurement
- Reduction of unplanned downtime
- Increased safety against escape of toxic media through double sealing system



Protection mechanisms

- The primary sealing serves as protection against escape from the process at high pressures and temperatures. The secondary sealing is the safeguard in the event of a malfunction in the primary seal due to any unforeseeable disturbance to the primary seal.

Double-protected sensor tip

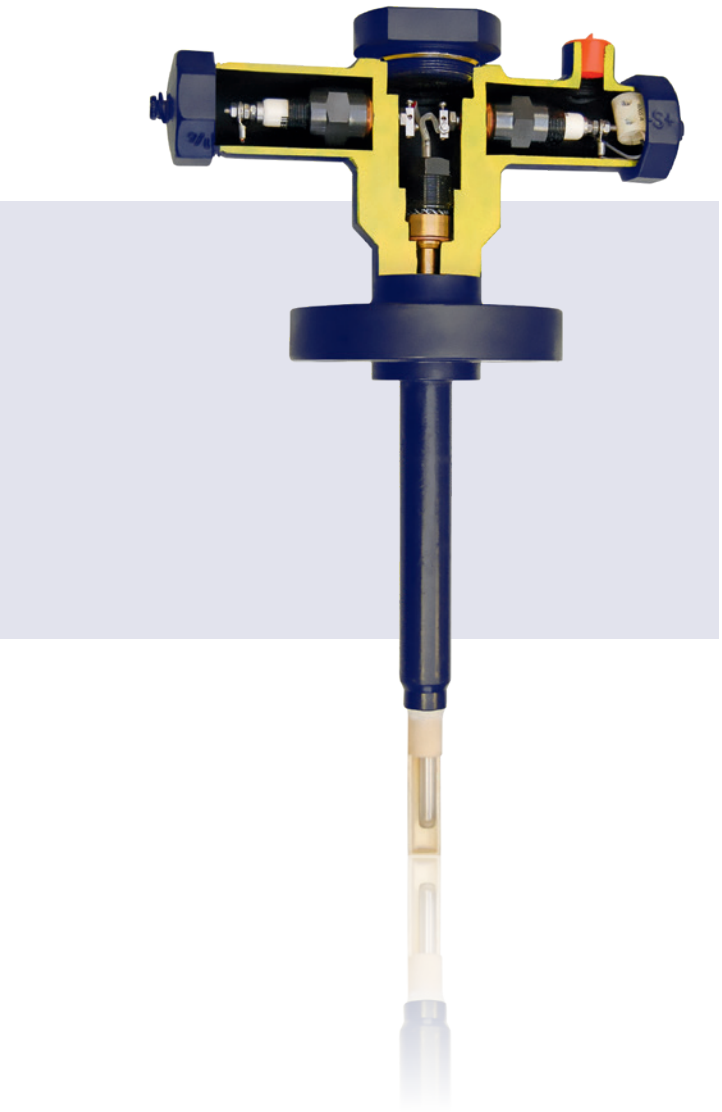
- Ceramic outer thermowell for protection against harsh process conditions
- Sapphire measuring insert thermowell for internal protection against contamination of the thermocouples through diffusion

Tests

- Measuring insert at 100 bar
- Ceramic feed-through of the secondary sealing at 100 bar
- Entire measuring instrument at 1.5 times flange pressure rating

Specifications

Process connection	
Nominal width	■ ASME: 1 ½“ ... 4“ ■ EN 1092-1: DN40 ... DN100
Pressure ratings	■ ASME: 300 ... 1,500 lbs ■ EN 1092-1: PN40 ... PN100
Sealing face	■ ASME: RF, RTJ, LT, ST ■ EN 1092-1: shape B1, B2, E, C (tongue)
Materials	
Connection case and flange	■ 1.4541, 1.5415, 1.7335, 1.7380 ■ F11, F22, SS321
Outer thermowell	
Ceramic C799:	■ Ø 15 x 2.5 mm
Ceramic C610	■ Ø 15 x 2 mm



Sensor types

Type	Recommended max. operating temperature IEC 60584-1
S	1,600 °C
R	1,600 °C
B	1,700 °C

Thermocouple

Type	Class IEC 60584-1:2013
S	1 and 2
R	1 and 2
B	2

Smart in sensing

WIKA Alexander Wiegand SE & Co. KG
Alexander-Wiegand-Straße 30 · 63911 Klingenberg · Germany
Tel. +49 9372 132-0 · info@wika.de · www.wika.de

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