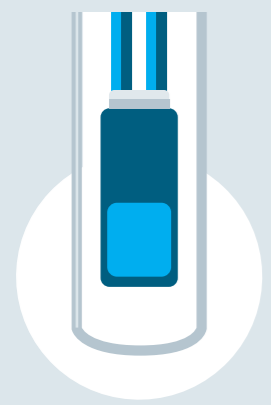


# Sensor technology for thermometers

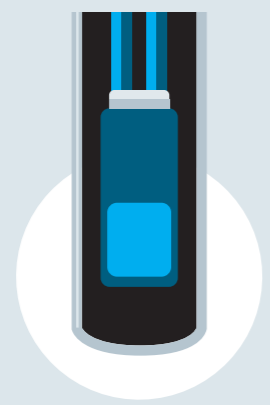
Innovative sensors for every measurement application

## Exclusive Endress+Hauser technology



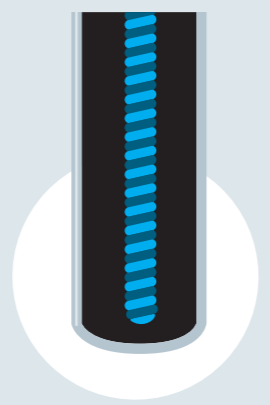
Basic thinfilm  
Pt100 (RTD)

- Thin film sensor consisting of ceramic substrate with vapor-deposited platinum
- Sensing element and wiring in stainless steel sheath



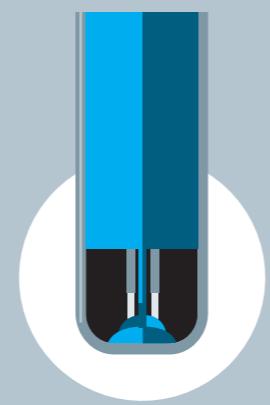
Standard thinfilm  
Pt100 (RTD)

- Small sensor consisting of ceramic substrate with vapor-deposited platinum
- Embedded in mineral isolated stainless steel sheath



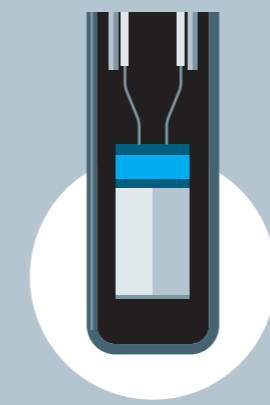
Wirewound  
Pt100 (RTD)

- Ultrapure platinum wire wound around a ceramic core
- Embedded in mineral isolated stainless steel sheath



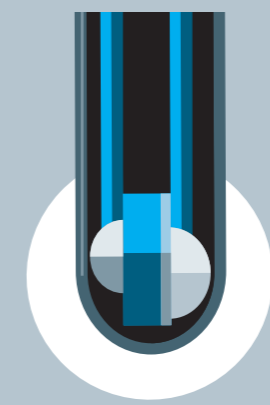
iTHERM QuickSens  
Pt100 (RTD)

- Pt100 thin film sensor with the world's fastest response time
- Sensor-on-tip technology for short immersion length
- Better process control and product quality, optimized efficiency
- Highest accuracy



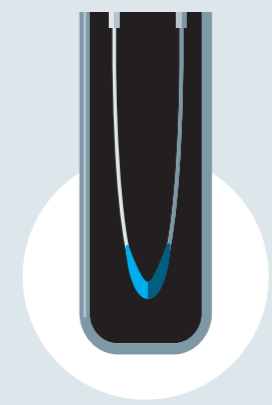
iTHERM StrongSens  
Pt100 (RTD)

- Ceramic-encapsulated Pt100 thin film RTD with unmatched robustness
- Vibration resistance up to 60g (2,116 oz) for lower life cycle cost
- High long-term stability, high plant availability



iTHERM TrustSens  
Pt100 (RTD)

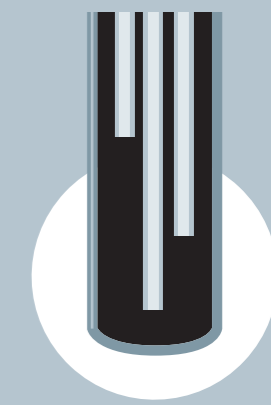
- Self-calibrating sensor unit
- Pt100 sensor and integrated fixed point reference
- Higher product quality and safety
- Lower risk, cost and effort



Thermocouple (TC)

- Two dissimilar metals spot welded (hot junction)
- Ideal for high temperatures

up to 1800 °C  
3272 °F

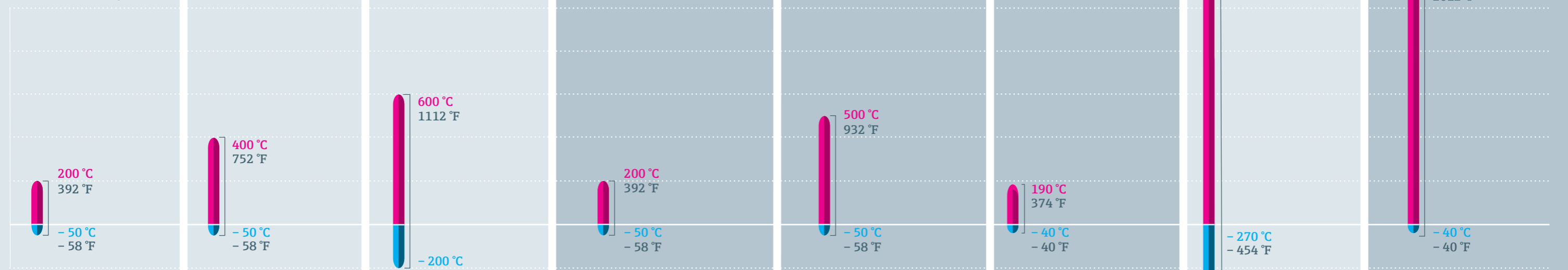


iTHERM ProfileSens  
Thermocouple (TC)

- Minimally invasive multipoint cable sensor profiling system
- Up to six individual thermocouple sensors per probe
- MI cable mineral insulated (MgO powder)
- Robust design with double metal sheathing technology

1100 °C  
2012 °F

### Measurement range



### Properties

- | Property  | Basic thinfilm Pt100 (RTD) | Standard thinfilm Pt100 (RTD) | Wirewound Pt100 (RTD) | iTHERM QuickSens Pt100 (RTD) | iTHERM StrongSens Pt100 (RTD) | iTHERM TrustSens Pt100 (RTD) | Thermocouple (TC) | iTHERM ProfileSens Thermocouple (TC) |
|---|----------------------------|-------------------------------|-----------------------|------------------------------|-------------------------------|------------------------------|-------------------|--------------------------------------|
| Measurement performance sufficient for most support processes | +                          |                               |                       |                              |                               |                              |                   |                                      |
| Limited measurement range                                     | -                          | -                             |                       |                              |                               |                              |                   |                                      |
| Long-term stability   |                            | +                             | +                     |                              |                               |                              | +                 | +                                    |
| Vibration resistance  |                            | +                             |                       |                              | +                             |                              |                   |                                      |
| Limited measurement range                                     |                            | -                             |                       |                              |                               |                              | -                 |                                      |
| Robust and reliable   |                            |                               |                       | +                            | +                             | +                            |                   | +                                    |
| For high temperatures, pressure, aggressive media             |                            |                               |                       |                              |                               |                              | +                 | +                                    |
| Increased plant safety  |                            |                               |                       |                              |                               |                              |                   | +                                    |
| Limited accuracy (compared to RTD)                            |                            |                               |                       |                              |                               |                              | -                 | -                                    |
| Self-calibrating  |                            |                               |                       |                              |                               | +                            |                   |                                      |
| High accuracy   |                            |                               |                       |                              |                               | +                            |                   |                                      |
| Reliability   |                            |                               |                       |                              |                               | +                            |                   |                                      |
| High degree of automation                                     |                            |                               |                       |                              |                               | +                            |                   |                                      |
| Risk reduction  |                            |                               |                       |                              |                               | +                            |                   |                                      |
| Limited measurement range                                     |                            |                               |                       |                              |                               | -                            |                   |                                      |
| World's fastest response time                                 |                            |                               |                       | +                            |                               |                              |                   |                                      |
| Maximum process safety  |                            |                               |                       | +                            |                               |                              |                   |                                      |
| Limited measurement range                                     |                            |                               |                       | -                            |                               |                              |                   |                                      |
| World's highest vibration resistance                          |                            |                               |                       |                              | +                             |                              |                   |                                      |
| Robust  |                            |                               |                       |                              | +                             |                              |                   |                                      |
| Long lifetime and plant availability                          |                            |                               |                       |                              | +                             |                              |                   |                                      |
| Limited measurement range                                     |                            |                               |                       |                              | -                             |                              |                   |                                      |