

## TECHNICAL DATA

## Type S and Type R Thermocouples 5649/5650



### Key features

- Type S and R Thermocouples.
- Platinum and platinum-rhodium alloy.
- Temperature range of 0 °C to 1450 °C.
- Uncertainties as good as 0.15 °C over most of that range.
- Calibrated at four fixed points (Sn, Zn, Al, Ag) and then extrapolated to 1450 °C.
- Four version available, 20 and 25 inch lengths with and without CJC.

### Product overview: Type S and Type R Thermocouples 5649/5650

The measuring junction of both the 5649 and the 5650 thermocouples is encased in a 0.25-inch (6.35 mm) alumina sheath that can be ordered in lengths of 20 or 25 inches (50.8 or 63.5 cm) to fit the specific requirements of your application. A reference, or "cold," junction may also be ordered. The reference junction uses a stainless steel sheath and is 8.25 inches long (21 cm) by 0.188 inches in diameter (4.8 mm). The thin diameter minimizes the immersion depth needed, but the extra length ensures you can get all the immersion you like.

Special tin-plated, solid-copper connecting wires with ultra-low EMF properties are used to help retain the integrity of your thermocouple measurement junction where the probe attaches to your micro voltmeter or Hart Black Stack.

Each thermocouple probe comes with an individual calibration with fixed-point standards to reduce uncertainties to  $\pm 0.15$  °C up to 962°C,  $\pm 0.25$  °C up to 1100 °C, and increasing linearly to  $\pm 2.0$  °C at 1450 °C.

The probe assembly can be easily disassembled for performing your own bare-wire calibrations.

## Specifications: Type S and Type R Thermocouples 5649/5650

Specifications	
<b>Range</b>	0 °C to 1450 °C
<b>Type</b>	Platinum/13 % Rhodium vs. platinum (type R) Platinum/10 % Rhodium vs. platinum (type S)
<b>Calibration</b>	Fixed point calibration uncertainties (k=2): $\pm 0.15$ °C up to 962 °C, increasing linearly to $\pm 2.0$ °C at 1450 °C
<b>Hot Junction Sheath Dimensions</b>	6.35 mm (0.25 in) diameter; see Ordering Information for lengths
<b>Reference Junction Sheath Dimensions</b>	4.8 mm dia. x 210 mm long (0.188 x 8.25 in)
<b>Long-Term Stability</b>	$\pm 0.5$ °C to 1100 °C $\pm 2.0$ °C to 1450 °C (over one year depending on usage)
<b>Short-Term Stabilities</b>	$\pm 0.2$ °C to 1100 °C $\pm 0.6$ °C to 1450 °C
<b>Immersion</b>	At least 152 mm (6 in) recommended
<b>Protective Case</b>	Model 2609 case included
<b>Weight</b>	1 kg (2 lb)

## Ordering information



### 5649 / 5650 Type R and Type S Thermocouple Standards

Type R and Type S Thermocouple Standards

#### 5649-20-X

Type R TC, 508 mm (20 in)

*X = termination. Specify "B" (bare wire), "W" (generic copper-to-copper TC connector), or "R" (standard Type R/S TC connector). Models with reference junctions should not specify "R" and models without reference junctions should not specify "W".*

#### 5649-20CX

Type R TC, 508 mm (20 in), with reference junction

*X = termination. Specify "B" (bare wire), "W" (generic copper-to-copper TC connector), or "R" (standard Type R/S TC connector). Models with reference junctions should not specify "R" and models without reference junctions should not specify "W".*

#### 5649-25-X

Type R TC, 635 mm (25 in)

*X = termination. Specify "B" (bare wire), "W" (generic copper-to-copper TC connector), or "R" (standard Type R/S TC connector). Models with reference junctions should not specify "R" and models without reference junctions should not specify "W".*

#### 5649-25CX

Type R TC, 635 mm (25 in), with reference junction

*X = termination. Specify "B" (bare wire), "W" (generic copper-to-copper TC connector), or "R" (standard Type R/S TC connector). Models with reference junctions should not specify "R" and models without reference junctions should not specify "W".*

**5650-20-X**

Type S TC, 508 mm (20 in)

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*X = termination. Specify "B" (bare wire), "W" (generic copper-to-copper TC connector), or "R" (standard Type R/S TC connector). Models with reference junctions should not specify "R" and models without reference junctions should not specify "W".*

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**5650-20CX**

Type S TC, 508 mm (20 in), with reference junction

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*X = termination. Specify "B" (bare wire), "W" (generic copper-to-copper TC connector), or "R" (standard Type R/S TC connector). Models with reference junctions should not specify "R" and models without reference junctions should not specify "W".*

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**5650-25-X**

Type S TC, 635 mm (25 in)

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*X = termination. Specify "B" (bare wire), "W" (generic copper-to-copper TC connector), or "R" (standard Type R/S TC connector). Models with reference junctions should not specify "R" and models without reference junctions should not specify "W".*

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**5650-25CX**

Type S TC, 635 mm (25 in), with reference junction

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*X = termination. Specify "B" (bare wire), "W" (generic copper-to-copper TC connector), or "R" (standard Type R/S TC connector). Models with reference junctions should not specify "R" and models without reference junctions should not specify "W".*

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