

# TEMPERATURE SENSORS

## TOLERANCES AND COLOUR CODING

### Thermocouple Tolerances and Application Limits

Thermocouple types listed lowest to highest temperature ranges.

IEC 60584 2013

Type	Class	Tolerance Values	Applicable Range	Continuous Limits (Maximum Temperature*)	Short Term Limits (Maximum Temperature*)	Magnetic
<b>T</b>	Class 1	0.5 or $0.004 \times  t $	-40°C to 350°C	+300°C*	+350°C*	
	Class 2	1 or $0.0075 \times  t $				
<b>J</b>	Class 1	1.5 or $0.004 \times  t $	-40°C to 750°C	+600°C*	+750°C*	+ Conductor is Magnetic
	Class 2	2.5 or $0.0075 \times  t $				
<b>E</b>	Class 1	1.5 or $0.004 \times  t $	-40°C to 800°C	+690°C*	+800°C*	
	Class 2	2.5 or $0.0075 \times  t $	-40°C to 900°C			
<b>K</b>	Class 1	1.5 or $0.004 \times  t $	-40°C to 1000°C	+1100°C*	+1200°C*	- Conductor is Magnetic
	Class 2	2.5 or $0.0075 \times  t $	-40°C to 1200°C			
<b>N</b>	Class 1	1.5 or $0.004 \times  t $	-40°C to 1000°C	+1200°C*	+1250°C*	
	Class 2	2.5 or $0.0075 \times  t $	-40°C to 1200°C			
<b>R</b>	Class 1	1 for $t < 1100^\circ\text{C}$ [ $1 + 0.003 \times (t - 1100)$ ] for $t > 1100^\circ\text{C}$	0°C to 1600°C	+1400°C	+1600°C	
	Class 2	1.5 or $0.0025 \times  t $				
<b>S</b>	Class 1	1 for $t < 1100^\circ\text{C}$ [ $1 + 0.003 \times (t - 1100)$ ] for $t > 1100^\circ\text{C}$	0°C to 1600°C	+1400°C	+1600°C	
	Class 2	1.5 or $0.0025 \times  t $				
<b>B</b>	Class 1	Not defined in the standards		+1500°C	+1700°C	
	Class 2	1.5 or $0.0025 \times  t $	600°C to 1700°C			

Tolerance values  $\pm^\circ\text{C}$ , the greater figure applies.

Tolerances are sourced from BS EN 60584-1:2013 Thermocouple EMF & Tolerances.

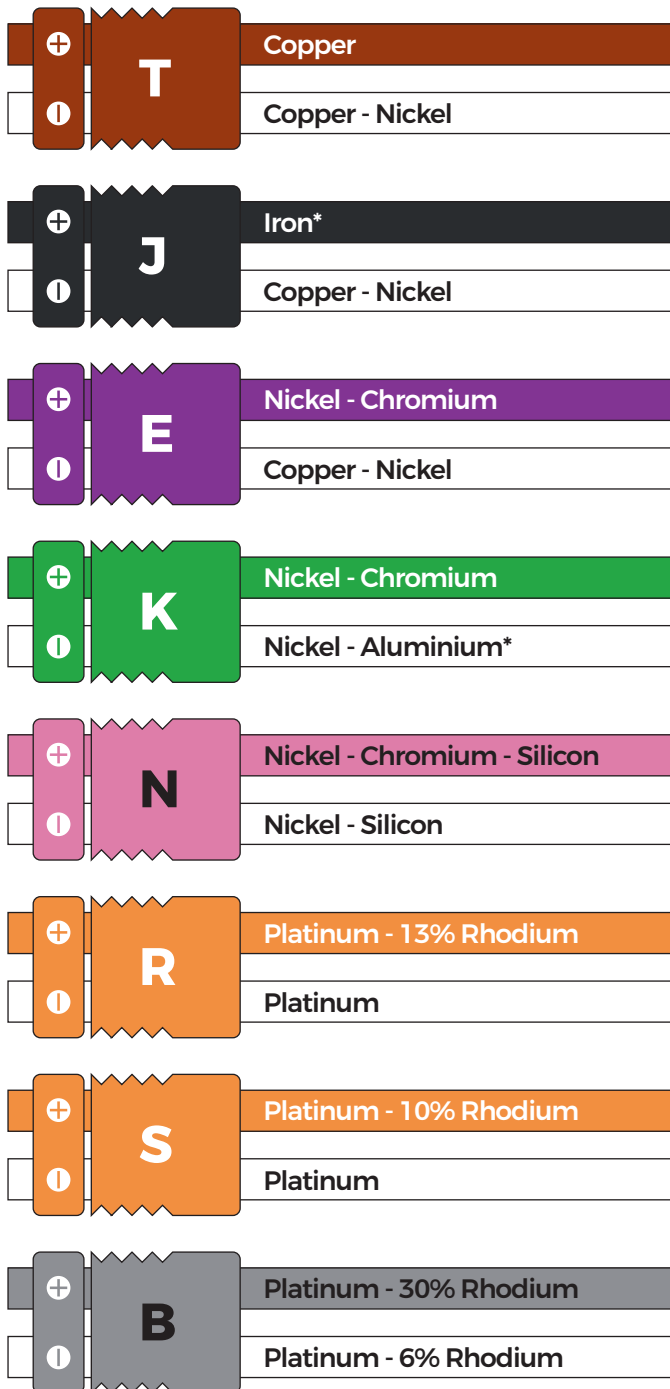
Maximum temperature\*

\*restrictions on achieving maximum temperature may be restricted by thermocouple diameter, insulation and environment.

# TEMPERATURE SENSORS TOLERANCES AND COLOUR CODING

## Thermocouple Colour Coding

IEC 60584-3



\*Conductor is magnetic

## Platinum Resistance Thermometers

### Tolerances for Thermometers

IEC 60751 - 2008

Tolerance Class	Valid Temperature Range °C		Tolerance Values <sup>a</sup>
	Wire Wound Resistors	Film Resistors	
AA	-50 to +250	-50 to +250	$\pm (0.1 + 0.0017  t )$
A	-100 to +450	-30 to +300	$\pm (0.15 + 0.002  t )$
B	-196 to +600	-50 to +500	$\pm (0.3 + 0.005  t )$
C	-196 to +600	-50 to +600	$\pm (0.6 + 0.01  t )$

<sup>a</sup>  $|t|$  = modulus of temperature in °C without regard to sign.

If you are unsure on the temperature sensor you require or would like further guidance on this information, please speak to our technical team and they will support you.