

Thermocouples must be selected to meet application conditions and only general recommendations of size and type can be given. Selection considerations involve useful length of service life, temperature, atmosphere, and response time. Smaller gauges provide faster response times and less service life. Larger gauges provide longer service life and reduced response times. The recommended temperature limits below are to be used as a guideline in the selection process, and the table applies only to thermocouples protected by a suitable protecting tube, sheath, or well. The color coding chart below provides ANSI/ASTM standard color codes found on thermocouple wire, extension wire, and plug and jack connectors.

Suggested Upper Temperature Limits For Protected Industrial Thermocouples

TYPE	MAXIMUM TEMPERATURE						
	8 GAGE	11 GAGE	14 GAGE	20 GAGE	24 GAGE	28 GAGE	30 GAGE
	°C [°F]	°C [°F]	°C [°F]	°C [°F]	°C [°F]	°C [°F]	°C [°F]
T			370 [700]	260 [500]	200 [400]	200 [400]	150 [300]
J	760 [1400]		590 [1100]	480 [900]	370 [700]	370 [700]	320 [600]
E	870 [1600]		650 [1200]	540 [1000]	430 [800]	430 [800]	370 [700]
K, N	1260 [2300]		1090 [2000]	980 [1800]	870 [1600]	870 [1600]	760 [1400]
M		1287 [2250]	1287 [2250]				
R, S					1480 [2700]		
B					1700 [3100]		
C					2330 [4200]		

THERMO-COUPLE TYPE	U.S. & CANADIAN (ANSI/ASTM E230, ANSI/MC96.1)			
	ALLOY COMBINATION	THERMOCOUPLE GRADE	EXTENSION GRADE	PLUG & JACK
T	Copper	Brown Blue + Red -	+ Blue Blue - Red Red	Blue ●
	Constantan (Copper-Nickel)			
J	Iron (magnetic)	Brown White + Red -	+ White Black - Red Red	Black ●
	Constantan (Copper-Nickel)			
E	Nickel - Chromium	Brown Purple + Red -	+ Purple Purple - Red Red	Purple ●
	Constantan (Copper-Nickel)			
K	Nickel - Chromium	Brown Yellow + Red -	+ Yellow Yellow - Red Red	Yellow ○
	Nickel - Aluminium (magnetic)			
N	Nicrosil (Nickel-Chromium-Silicon)	Brown Orange + Red -	+ Orange Orange - Red Red	Orange ●
	Nisil (Nickel-Silicon-Magnesium)			
S	Platinum Rhodium -10%	None Established	+ Black Green - Red Red	Green ●
	Platinum			
R	Platinum Rhodium -13%	None Established	+ Black Green - Red Red	Green ●
	Platinum			
B	Platinum Rhodium - 30%	None Established	+ Gray Gray - Red Red (Compensated Cable)	White (Uncompensated) ○
	Platinum Rhodium - 6%			
C	Tungsten Rhenium - 5%	None Established	+ Green Red - Red Red	Red ●
	Tungsten Rhenium - 26%			