

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 GAUGE	11 GAUGE	14 GAUGE	20 GAUGE	24 GAUGE	28 GAUGE	30 GAUGE
T	°C [°F]	°C [°F]	°C [°F]	°C [°F]	°C [°F]	°C [°F]	°C [°F]
			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	ALLOY COMBINATION	U.S. & CANADIAN (ANSI/ASTM E230, ANSI/MC96.1)			
		THERMOCOUPLE GRADE	EXTENSION GRADE	PLUG & JACK	
T	Copper	Brown	Blue +	Blue	Blue
	Constantan (Copper-Nickel)	Blue -	Red	Red	
J	Iron (magnetic)	Brown	White +	White	Black
	Constantan (Copper-Nickel)	White -	Red	Red	
E	Nickel - Chromium	Brown	Purple +	Purple	Purple
	Constantan (Copper-Nickel)	Purple -	Red	Red	
K	Nickel - Chromium	Brown	Yellow +	Yellow	Yellow
	Nickel - Aluminium (magnetic)	Yellow -	Red	Red	
N	Nicrosil (Nickel-Chromium-Silicon)	Brown	Orange +	Orange	Orange
	Nisil (Nickel-Silicon-Magnesium)	Orange -	Red	Red	
S	Platinum Rhodium -10%	None Established	Black +	Green	Green
	Platinum		Black -	Red	
R	Platinum Rhodium -13%	None Established	Black +	Green	Green
	Platinum		Black -	Red	
B	Platinum Rhodium - 30%	None Established	Gray +	Gray	White (Uncompensated)
	Platinum Rhodium - 6%		Gray -	Red (Compensated Cable)	
C	Tungsten Rhenium - 5%	None Established	Green +	Red	Red
	Tungsten Rhenium - 26%		Green -	Red	