

ANSI SYMBOL	CONDUCTOR COMBINATIONS		TEMP RANGE	LIMITS OF ERROR			APPLICATION INFORMATION (See NOTES at bottom)
	POSITIVE + LEG	NEGATIVE - LEG		RANGE(°F)	STANDARD	SPECIAL	
TYPE J COLOR CODE CONNECTOR TC Grade outer Ext Wire outer	IRON (MAGNETIC) WHITE BLACK BROWN BLACK	CONSTANTAN RED	32 to 1400F (0 to 760C)	32 to 545 545 to 1400 NOTE-D: Upper limit is less for MIMS – see ASTM / AMS2750	+/- 4°F +/- 0.75%	+/- 2°F +/- 0.4%	Vacuum, reducing or inert atmosphere best. Reduced life in oxidizing atmosphere. Iron oxides rapidly above 1000°F (538C) so only heavy gauge wire is recommended for high temperature. Bare elements should not be exposed to sulphurous atmospheres above 1000F. NOTE-A
TYPE K COLOR CODE CONNECTOR TC Grade outer Ext Wire outer	CHROMEL YELLOW YELLOW BROWN YELLOW	ALUMEL (MAGNETIC) RED	32 to 2300F (0 to 1260C)	32 to 545 545 to 2300 NOTE-D: Upper limit is less for MIMS – see ASTM / AMS2750	+/- 4°F +/- 0.75%	+/- 2°F +/- 0.4%	Oxidizing or neutral atmosphere. Mostly used above 1000°F (530C). Subject to failure if exposed to sulphur. Preferential oxidation of chromium in positive leg at certain low oxygen concentrations causes 'green-rot' and large negative calibration drifts most serious in the 1500 to 1900°F range. NOTE-A
TYPE N COLOR CODE CONNECTOR TC Grade outer Ext Wire outer	NICROSIL ORANGE ORANGE BROWN ORANGE	NISIL RED	32 to 2300F (0 to 1250C)	32 to 545 545 to 2300 NOTE-D: Upper limit is less for MIMS – see ASTM / AMS2750	+/- 4°F +/- 0.75%	+/- 2°F +/- 0.4%	ALTERNATIVE to type 'K' – NOT a direct replacement. Preferred for high end of temperature range (up to 2300F). Provides better resistance to drift than 'K' at high temperatures and longer life in sulphurous atmosphere. NOTE-A
TYPE T COLOR CODE CONNECTOR TC Grade outer Ext Wire outer	COPPER BLUE BLUE BROWN BLUE	CONSTANTAN RED	-300 to 700F (-184 to 371C)	-330 to -85 -85 to 270 270 to 660 NOTE-D: Upper limit is less for MIMS – see ASTM / AMS2750	+/- 1.5% +/- 1.8°F +/- 0.75%	+/- 0.8% +/- 0.9°F +/- 0.4%	Mild oxidizing, reducing or inert atmosphere. Good where moisture is present. Low temperature and cryogenic applications. NOTE-A
TYPE E COLOR CODE CONNECTOR TC Grade outer Ext Wire outer	CHROMEL PURPLE PURPLE BROWN PURPLE	CONSTANTAN RED	-330 to 1600F (-200 to 900C)	-330 to -270 -270 to 480 480 to 640 640 to 1600 NOTE-D: Upper limit is less for MIMS – see ASTM / AMS2750	+/- 1% +/- 3°F +/- 3°F +/- 5%	+/- 1.8°F +/- 1.8°F +/- 0.4% +/- 0.4%	Oxidizing or inert atmosphere. Limited use in vacuum or reducing. Highest EMF change per degree. NOTE-A
TYPE C COLOR CODE CONNECTOR TC Grade outer Ext Wire outer	TUNGSTEN / 5% RHENIUM N/A RED N/A WHT w / RED tr	TUNGSTEN / 26% RHENIUM N/A	800 to 4200F (0 to 2315C)	800 to 4200	+/- 1%	N/A	Vacuum, inert, hydrogen atmosphere. NO OXIDATION RESISTANCE. NOTE-B
TYPE S COLOR CODE CONNECTOR TC Grade outer Ext Wire outer	PLATINUM / 10% RHODIUM BLACK GREEN N/A GREEN	PLATINUM RED	32 to 2700F (0 to 1480C)	32 to 1110 1110 to 2700	+/- 2.7°F +/- 0.25%	+/- 1.1°F +/- 0.10%	Oxidizing or inert atmosphere. Beware of contamination. DO NOT INSERT IN METAL TUBES WITHOUT CLOSED END CERAMIC P.T. While base metal MIMS is available – DO NOT USE. NOTE-C
TYPE R COLOR CODE CONNECTOR TC Grade outer Ext Wire outer	PLATINUM / 13% RHODIUM BLACK GREEN N/A GREEN	PLATINUM RED	32 to 2700F (0 to 1480C)	32 to 1110 1110 to 2700	+/- 2.7°F +/- 0.25%	+/- 1.1°F +/- 0.10%	Oxidizing or inert atmosphere. Beware of contamination. DO NOT INSERT IN METAL TUBES WITHOUT CLOSED END CERAMIC P.T. While base metal MIMS is available – DO NOT USE. NOTE-C
TYPE B COLOR CODE CONNECTOR TC Grade outer Ext Wire outer	PLATINUM / 30% RHODIUM GREY WHITE N/A GREY	PLATINUM / 6% RHODIUM RED	1600 to 3100F (870 to 1700C)	1600 to 3100	+/- 0.5%	+/- 0.25%	Oxidizing or inert atmosphere. Beware of contamination. DO NOT INSERT IN METAL TUBES WITHOUT CLOSED END CERAMIC P.T. While base metal MIMS is available – DO NOT USE. NOTE-C

NOTE-A: Can be supplied as MIMS (Mineral Insulated Metal Sheath) style tc. Choose sheath appropriate to atmosphere and temperature.

NOTE-B: Can be supplied in specially prepared molybdenum or tantalum sheaths, which must also be kept from oxidizing atmosphere.

NOTE-C: Can be supplied as SPECIAL MIMS with NOBLE metal sheath. Should NEVER be inserted in base metal tubes without closed end ceramic protection tube or used in base metal MIMS. See ASTM E2181:4.2

NOTE-D: Upper limit is less for MIMS and varies by sheath diameter. See ASTM E608: Table 1