SUMMIT AEROSPACE
PRODUCTS CORPORATION

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ANSI SYMBOL	CONDUCTOR COMBINATIONS		TEMP RANGE	LIMITS OF ERROR			APPLICATION INFORMATION *(See NOTES at bottom)*
	POSITIVE + LEG	NEGATIVE – LEG		RANGE(^{O}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	+/- 4^{o}F +/- 0.75%	+/- 2^{o}F +/- 0.4%	Vacuum, reducing or inert atmosphere best. Reduced life in oxidizing atmosphere. Iron oxides rapidly above 1000^{0}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 to1260C)	32 to 545 545 to 2300	+/- 4^{o}F +/- 0.75%	+/- 2^{o}F +/- 0.4%	Oxidizing or neutral atmosphere. Mostly used above 1000^{0}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^{o}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	+/- 4^{o}F +/- 0.75%	+/- 2^{o}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	+/- 1.5% +/- 1.8^{o}F +/- 0.75%	+/- 0.8% +/- 0.9 ^{o}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	+/- 1% +/- 3 ^{o}F +/- 3 ^{o}F +/- 5%	+/- 1.8 ^{o}F +/- 1.8 ^{o}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 ^{o}F +/- 0.25%	+/- 1.1 ^{o}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 ^{o}F +/- 0.25%	+/- 1.1 ^{o}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 (**M**ineral **I**nsulated **M**etal **S**heath) 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***

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