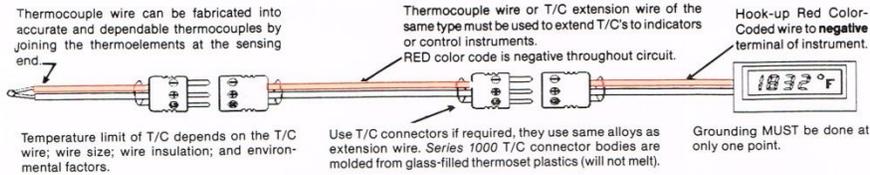


Marlin – Thermocouple Connectors – 3-Pole Application

THERMOCOUPLE CONNECTORS 3-POLE APPLICATION



A thermocouple is a pair of dissimilar wires so joined as to produce a thermally generated emf when its ends are at different temperatures. Several combinations of dissimilar pairs have become standardized and used in temperature instrumentation. T,J,E,K,N,R,S,B are letter codes designating some popular thermocouples that are readily available. Each combination has its own unique emf output and its own properties that make them more applicable for a particular use. Thermocouple theory allows the extension of the thermocouple without affecting its emf output when the extension wire and connectors have the same thermoelectric characteristics. For example, when a type "K" thermocouple is being used the wires and connectors used to extend it should be also type "K." The different types have color codes, for instance "K" type is yellow, assigned to them for easy identification so as to help prevent mismatching of extension wire, connectors, and thermocouples. For example in the yellow color code of the type "K" circuit a blue type "T" connector would be an obvious improper component.

The generalized thermocouple system may be divided into five basic areas: Hot Zone/Gradient Area/Extension Region/Reference Junction/and Readout. The extension region is generally where thermocouple connectors are used to facilitate thermocouple-to-readout hook-up. In a simplistic and isolated system the thermocouple will perform to specifications. Unfortunately, these low voltage thermocouple signals can be interfered with from power lines, relays, motors, transformers and all other power associated appliances. This electrical noise can be reduced by the correct application of shields and grounding techniques.

3-pole thermocouple connectors provide a shield terminal that maintains the shield circuit from metal sheathed thermocouples to extension wires or from wire

to wire hook-ups. Grounding must be done at one point and only one point.

Thermocouple connectors and panels are polarized making them virtually impossible to mismatch. *Series 1000* connectors and panels are molded from glass-filled thermoset compounds for high strength. They will not melt and are rated for continuous use to 400°F (205°C) continuous duty and 500°F (260°C) intermittently. They are color coded and letter coded for type and polarization identification. Current carrying metal parts are made of alloys matching the characteristics of the thermocouple type with which they are intended to be used. Contact springs are non-magnetic, non-corrosive, and are specially selected and processed to withstand the rated operating conditions.

An exception to the color code is the red colored high temperature version of these connectors and panels which are rated for use to 800°F (425°C) continuous duty and 1000°F (540°C) intermittently. They are molded from a highly stable and inert silicone-based thermoset compound filled with glass fibers for strength. These high temperature units are colored red for all thermocouple types but do retain the letter and polarization identification. The premium materials of which these high-temperature products are made make them unusually suitable for harsh environments, even where extreme temperature tolerance may not be a factor. In particular, these high temperature units have proven durable in the presence of radiation, and their low-outgassing properties also make them highly satisfactory for use under vacuum. These high temperature connectors are fully compatible, mechanically and electrically, with normal-temperature connectors, and share the same accessories and hardware. Regular and high-temperature connectors of like kind will fully intermate.