Thermocouple
Section 4: Contents

* Note: C, R, S and T use extension grade materials

Operating Conditions

The electrical and thermal ratings specified are safe operating limits determined by various factors including material properties, mechanical design, and the intended operating environment. All electrical ratings are based on operation with one side in dry atmosphere and the other side in vacuum of 1 x 10^{-4} Torr maximum pressure. Temperature ratings for various mounting options may reduce the operating range of an assembly. All assemblies have a maximum thermal gradient of 25°C per minute and may be damaged if this limit is exceeded.

THERMOCOUPLE

Thermocouple is the description for electrical feedthroughs that are commonly used for temperature measurement systems. A thermocouple feedthrough does not measure temperature, but rather it is used to conduct the thermocouple's voltage signal from inside the vacuum system to an external instrumentation device. MPF uses ceramic-to-metal sealing technology to braze various metals used in thermocouple assemblies to high purity alumina ceramic insulators. Thermocouple feedthroughs are suitable for ultra high vacuum applications.

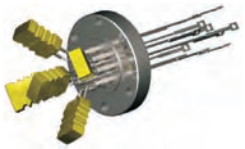
MPF offers several mounting options for all standard products: Weldable, Quick Flange (QF), and Conflat Flange (CF). Most designs are also configured for Baseplate and NPT style adapters. Custom adapters, plates and flange configurations are available by request.

Miniature & Screw Type Connectors

The most popular Thermocouple connections are miniature and screw type connections, which are commonly used in many thermocouple applications. MPF offers miniature connectors for C, E, J and K type thermocouples. R, S and T type thermocouples require a screw and nut connection.

MS Connectors

Industry standard threaded connectors are available E, J and K type thermocouples. MS Connectors provide high pin density and convenient circular style connectors for the air side, which accommodate up to 10 pairs of thermocouple leads.



Thermocouple and Power Combination

Many applications involve power leads to drive a process and the need for process control information provided by thermocouples. MPF offers several standard designs which combine thermocouple and power feedthroughs into a single assembly.

Thermocouple Reference Table

Type	Thermocouple Material	Polarity	Operating Temperature Range
K	Chromel Alumel	+ -	-184 to 1260°C
C	Tungsten 5% Rhenium Tungsten 26% Rhenium	+ -	0 to 2760°C
E	Chromel Constantan	+ -	-184 to 900°C
J	Iron Constantan	+ -	0 to 750°C
T	Copper Constantan	+ -	-184 to 400°C
N	NI-CR-SI NI-SI-MG	+ -	-270 to 1300°C
R	Platinum 13% Rhodium Platinum	+ -	0 to 1540°C
S	Platinum 10% Rhodium Platinum	+ -	0 to 1540°C