MI Cable Thermocouple Assemblies

Mineral Insulated Metal-Sheathed Cable

Thermocouple Assemblies are made from HK's high-quality mineral insulated cable and will incorporate all the same outstanding features.

Important Features:

- **Accurate**
- **High Temperature Rating**
- **Fast Response**
- **Moisture Proof**
- **Thermal Shock Resistant**
- **Can Be Formed**
- **Weldable**
- **High Pressure Rated**
- **Compact**
- **Durable**

Typical Applications

- ***Bearing Temperature***
- ***Diesel Engines***
- ***Food Processing***
- ***Furnaces***
- ***Glass Manufacturing***
- ***Heat Treating***
- ***Kilns***
- ***Metal Processing***
- ***Oil Processing***
- ***Ovens***
- ***Petrochemicals***
- ***Power Stations***
- ***Refineries***
- ***Research Laboratories***
- ***Steam Generators***
- ***Turbines***

Hot Junctions

(Hot or Measuring Junctions available on single or dual element cable)

Choose the measuring best suits your needs:

Exposed Junction (E)

Thermocouple wires are butt-welded. Insulation is sealed against liquid or gas penetration prior to use.

This junction style provides the fastest possible response time but leaves the thermocouple wires unprotected against corrosive or mechanical damage.

Grounded Junction (G)

The sheath and thermocouple wires are welded together, forming a completely sealed integral junction. Recommended in presence of liquids, moisture, gas or high pressure. The wire is protected from corrosive or erosive conditions. In the Grounded Junction, response time approaches that of the Exposed Junction.

Ungrounded Junction (U)

Thermocouple junction is fully insulated from welded sheath end. Excellent for applications where stray emf's would affect the reading and for frequent or rapid temperature cycling. With the Ungrounded Junction, response time is slightly longer than for the Grounded Junction.

Selecting the Correct Mineral Insulated Thermocouple Assembly

Thermocouples must be selected to meet the conditions of each application. The environment, operating temperature and atmosphere, response time and length of service must be considered when selecting the sheath, insulation, calibration, junction, and termination of the thermocouple assembly.

HK's engineering staff will be happy to assist you with the design and ßselection of your thermocouple requirements.

Sheath Materials

The most used sheath materials and their maximum continuous operating temperatures in an oxidizing atmosphere are as follows:

Sheath Material	Max. Operating Temperature
Alloy 600	2150°F (1177°C)
304 Stainless Steel	1650°F (899°C)
316 Stainless Steel	1650°F (899°C)
310 Stainless Steel	2100°F (1150°C)

Note: For temperatures exceeding 2200°F (1204°C), Noble or Refractory metal sheaths are normally used. Consult HK for further information

Formability

Because HK's mineral insulated cable is fully annealed it can normally be formed around a mandrel 4 times the sheath diameter. Consult HK if special forming is required.

Weldability

The thermocouple sheath can be brazed, soldered, or welded. Welding the thermocouple sheath in the field is not recommended on diameters less than .093 in. All welding should be done in an inert atmosphere.

Calibrations

The table shows the standard temperature ranges for
the various ANSI thermocouple calibrations:

ANSI Letter	Thermocouple Type	Temperature Range °F	(°C)
J	Iron-Constantan	32-1400	(0-760)
K	CHROMEL P®-ALUMEL®	32-2300	(0-1260)
N	Nicrosil-Nisil	32-2300	(0-1260)
T	Copper-Constantan	32-660	(0-350)
E	CHROMEL P®-Constantan	32-1600	(0-871)
R	Pt 13% Rhodium-Platinum	32-2700	(0-1482)
S	Pt 10% Rhodium-Platinum	32-2700	(0-1482)
B	Pt 30% Rh-Pt 6% Rh	1600-3100	(871-1704)

Assembly Tolerances: Sheath Length Dimensions

Sheath O.D.	"L" Tolerance Up to 24"	"L" Tolerance Over 24"
Up to .038"	±½"	±2%
.038" to .065"	±⅜"	±1½%
Larger than .065"	±¼"	±1%

Flexible Lead Dimensions

Lead Length (ft.)	Tolerance
Up to 5	+6", −1"
5 to 10	+6", −2"
over 10	+5%, −2%