TE Connectivity (TE) micro-thermocouples (MTC) are flexible fine gage thermocouples used whenever fast, accurate temperature measurements are required.

**Sensor Type:** Thermocouple  
**Thermocouple Type:** K, T  
**Package:** Spool  
**Connector Type:** Stripped Lead Ends

A thermocouple sensor consists of two dissimilar metals, joined together at one end. Thermocouples consist of two dissimilar metal wires joined together at one end creating a junction. This junction is where the temperature is measured. A small voltage is produced by the two metals, which can be measured and interpreted by a control system. The dissimilar metals are individually insulated, and an overcoat is present to maintain an intimate bifilar configuration. MTCs are offered in a variety of standard styles and custom MTC solutions are available. TE Connectivity offers long-standing experience in designing and manufacturing micro-thermocouples.

**Micro-Thermocouple Benefits**
- **Flexible, Ultra-Thin Tip Options and Design:** Low thermal mass for minimal influence on object temperature
- **Superior Accuracy:** Industry leading accuracy for maximum performance in even the most complex environments
- **Fast Time Response:** Suitable for applications where temperature changes need to be detected quickly
- **Scalable, Advanced Manufacturing:** TE Connectivity processes allow for unique offerings and advanced capabilities
MICRO-THERMOCOUPLES

FAST, ACCURATE, FLEXIBLE, FINE GAUGE THERMOCOUPLES

With an innovative ultra-thin junction insulation to minimize the tip diameter and superior accuracy, TE Connectivity (TE) micro-thermocouples (MTC) are leading the industry in performance in even the most complex environments. Our MTCs are suited for medical or specialty applications that require an extremely small temperature sensor to provide a rapid response to changes in temperature.

APPLICATIONS

- Catheters
- Medical Devices
- Tissue Shrinkage
- Ablation Catheters
- Cryotherapy

SPECIFICATIONS
THERMOCOUPLE TYPES

<table>
<thead>
<tr>
<th>Type</th>
<th>Standard</th>
<th>Special</th>
</tr>
</thead>
<tbody>
<tr>
<td>K</td>
<td>±2.2°C or 0.75%</td>
<td>±1.1°C or 0.4%</td>
</tr>
<tr>
<td>T</td>
<td>1.0°C or 0.75%</td>
<td>±0.5°C or 0.4%</td>
</tr>
</tbody>
</table>

JUNCTION TYPES

- Soldered
- Welded

JUNCTION INSULATION

- Polymer Encapsulated (Rated up to 200°C)
- Bare

STANDARD WIRE GAUGES

- 44 AWG: (0.0030“ x 0.0060“ (HxW) max)
- 40 AWG: (0.0041“ x 0.0081“ (H x W) max)

JUNCTION INSULATION

- Polyesterimide
- Polyimide

MODEL OPTIONS

- Model 600: Soldered, Non-Insulated Junction
- Model 601: Welded, Non-Insulated Junction
- Model 605: Soldered, Insulated Junction

For support call +1 800 522 6752
MICRO-THERMOCOUPLES (MTC)
Did You Know?

- The time response of MTCs from TE Connectivity is fractions of a second, making them suitable for applications where rapid temperature changes need to be detected.
- Type-T thermocouple wire is non-magnetic, so it can be used in magnetic applications without complications.
- Special Limits of Error defines the interchangeability of the thermocouple; which is the greater of 0.5°C or 0.4% for type T.
- Welded joints provide additional options for thermocouple wire types versus solder joints.
- For MTCs to provide accurate measurements, alloy wire must be used to connect a thermocouple sensor to the temperature sensing instrumentation.
- Polyesterimide is the preferred insulation material for Type-T thermocouple wire, because it bonds well to both legs of the thermocouple and is mechanically robust.
- The time response of a thermocouple is dependent upon the medium of submersion, the wire diameter, the alloy type and the applications temperature. Encapsulating the thermocouple junction will slow the time response slightly.
- TE’s innovative polymer encapsulation technology is made from a bio-compatible polymer, and is available standard and in custom lengths and thicknesses.
- The maximum temperature rating for polyesterimide insulation is 180°C.
- The maximum temperature rating for polyimide insulation 240°C.
- Micro-tube thermocouples can be supplied in a wide variety of medical grade stainless steel housings.

Resources

Application Note: Understanding Thermocouples

Application Note: RTDs vs Thermocouples
### Features

#### Product Type Features

<table>
<thead>
<tr>
<th>Feature</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensor Type</td>
<td>Thermocouple</td>
</tr>
<tr>
<td>Thermocouple Type</td>
<td>K, T</td>
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</table>

#### Configuration Features

<table>
<thead>
<tr>
<th>Feature</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connector Type</td>
<td>Stripped Lead Ends</td>
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</tbody>
</table>

#### Dimensions

<table>
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<tr>
<th>Measurement</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>Length (mm)</td>
<td>3000</td>
</tr>
<tr>
<td>Length (in)</td>
<td>120</td>
</tr>
<tr>
<td>Wire Length (mm)</td>
<td>3000</td>
</tr>
<tr>
<td>Wire Length (in)</td>
<td>120</td>
</tr>
</tbody>
</table>

#### Usage Conditions

<table>
<thead>
<tr>
<th>Condition</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Error Limits/T-Accuracy</td>
<td>Special Error Limits, Standard Limits / + - 1 °C</td>
</tr>
<tr>
<td>Ambient Temperature Range (°C)</td>
<td>-40 - 240</td>
</tr>
<tr>
<td>Ambient Temperature Range (°F)</td>
<td>-40 - 460</td>
</tr>
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</table>

#### Packaging Features

<table>
<thead>
<tr>
<th>Feature</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Package</td>
<td>Spool</td>
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</table>

### Related Materials

**Data Sheet**
- TESS-ANDO-408-0000027
  - English

**Brochure**
- Sensor Solutions for Medical Applications
  - English

**Sell Sheet**
- Medical Device Sensor Solutions
  - English