A Pyromation MgO thermocouple assembly consists of a thermocouple element swaged in hard-packed, standard-purity (96%) Magnesium Oxide mineral insulation and encased in a metal sheath. Thermocouple sheaths have been fully annealed; they can be formed into many configurations, and can be bent into a radius of twice the size of its outer sheath. The tables found on this page and the following pages allow customer selection of standard thermocouple types, sheath diameters, mounting fittings and terminations. Custom built products are available upon request.

**ORDER CODES**

**Example Order Number:**

```
K 4 8 G M - 012 -
```

1-1 Thermocouple Types

<table>
<thead>
<tr>
<th>CODE</th>
<th>SINGLE</th>
<th>DUPLEX</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>EE</td>
<td></td>
</tr>
<tr>
<td>J</td>
<td>JJ</td>
<td></td>
</tr>
<tr>
<td>K</td>
<td>KK</td>
<td></td>
</tr>
<tr>
<td>T</td>
<td>TT</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>NN</td>
<td></td>
</tr>
</tbody>
</table>

1-2 Sheath Diameters

```
<table>
<thead>
<tr>
<th>CODE</th>
<th>DIAMETER (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1/16</td>
</tr>
<tr>
<td>2</td>
<td>1/8</td>
</tr>
<tr>
<td>3</td>
<td>3/16</td>
</tr>
<tr>
<td>4</td>
<td>1/4</td>
</tr>
<tr>
<td>6</td>
<td>3/8</td>
</tr>
</tbody>
</table>
```

[1] 1/16" will be coiled unless otherwise specified for 36" and longer lengths.

1-3 Sheath Materials

<table>
<thead>
<tr>
<th>CODE</th>
<th>MATERIAL</th>
<th>STANDARD AVAILABLE TYPES</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Alloy 600</td>
<td>K, N</td>
</tr>
<tr>
<td>4</td>
<td>310 Stainless steel</td>
<td>K</td>
</tr>
<tr>
<td>5</td>
<td>446 Stainless steel</td>
<td>K[1]</td>
</tr>
<tr>
<td>8</td>
<td>316 Stainless steel</td>
<td>E, J, K, T</td>
</tr>
</tbody>
</table>

[1] All sensors with 446SS sheaths must have an ungrounded measuring junction.

1-4 Measuring Junctions

<table>
<thead>
<tr>
<th>CODE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>G</td>
<td>Grounded junction</td>
</tr>
<tr>
<td>U</td>
<td>Ungrounded junction</td>
</tr>
<tr>
<td>E[1]</td>
<td>Exposed junction</td>
</tr>
<tr>
<td>S</td>
<td>Exposed shielded junction</td>
</tr>
</tbody>
</table>


1-5 "X" Dimension

Insert three digit sheath length ("X" Dimension) in inches

Sheath lengths over 72" will be shipped in a coiled configuration unless otherwise specified.

1-4 A Special Options

<table>
<thead>
<tr>
<th>CODE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>Special limits of error</td>
</tr>
<tr>
<td>H</td>
<td>High-Purity MgO Insulation (99.4% Pure)</td>
</tr>
</tbody>
</table>

Use this table only if options are desired.

1-2 A Reduced-Tip MgO Thermocouples

<table>
<thead>
<tr>
<th>CODE</th>
<th>NORMAL SHEATH DIA. O.D. (inches)</th>
<th>TIP DIA. (inches)</th>
<th>TIP LENGTH (inches)</th>
<th>MATERIAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>88R48</td>
<td>1/2</td>
<td>1/4</td>
<td>1 (1/4)</td>
<td>316 SS</td>
</tr>
<tr>
<td>68R38</td>
<td>3/8</td>
<td>3/16</td>
<td>1 (1/4)</td>
<td>316 SS</td>
</tr>
<tr>
<td>48R28</td>
<td>1/4</td>
<td>1/8</td>
<td>1 (1/4)</td>
<td>316 SS</td>
</tr>
</tbody>
</table>

Table 1-2 A lists thermocouple elements with reduced-tip sheaths. To order, use order code numbers from Tbl. 1-2 A in place of straight sheath order code numbers from Tbl. 1-2 and 1-3. EXAMPLE: J88R48
Select Sheath Mounting or Bend Options as desired from tables below.

**ORDER CODES**

**Example Order Number:**

K48GM - 012 - 01A,306

2-1 No Fitting or Bend Options

**CODE** 00

2-2 One-Time Adjustable Compression Fittings

<table>
<thead>
<tr>
<th>CODE</th>
<th>TYPE</th>
<th>NPT SIZE (inches)</th>
<th>PRESSURE RATED</th>
<th>AVAILABLE SHEATH DIAMETERS (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>01A</td>
<td>303 Stainless steel</td>
<td>1/8</td>
<td>NO</td>
<td>1/16, 1/8, 3/16, 1/4</td>
</tr>
<tr>
<td>05A</td>
<td>316 Stainless steel</td>
<td>1/8</td>
<td>YES</td>
<td>1/16, 1/8, 3/16, 1/4</td>
</tr>
<tr>
<td>05B</td>
<td>316 Stainless steel</td>
<td>1/4</td>
<td>YES</td>
<td>1/8, 3/16, 1/4, 3/8</td>
</tr>
<tr>
<td>05C</td>
<td>316 Stainless steel</td>
<td>1/2</td>
<td>YES</td>
<td>1/8, 3/16, 1/4, 3/8</td>
</tr>
<tr>
<td>15A</td>
<td>Brass</td>
<td>1/8</td>
<td>NO</td>
<td>1/8, 3/16, 1/4</td>
</tr>
<tr>
<td>15B</td>
<td>Brass</td>
<td>1/4</td>
<td>NO</td>
<td>1/4, 3/16</td>
</tr>
<tr>
<td>15C</td>
<td>Brass</td>
<td>1/2</td>
<td>NO</td>
<td>1/4, 3/8</td>
</tr>
</tbody>
</table>

2-3 Re-Adjustable Compression Fittings

<table>
<thead>
<tr>
<th>CODE</th>
<th>TYPE</th>
<th>NPT SIZE (inches)</th>
<th>AVAILABLE SHEATH DIAMETERS (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10A</td>
<td>303 Stainless steel</td>
<td>1/8</td>
<td>1/16, 1/8, 3/16, 1/4</td>
</tr>
<tr>
<td>10B</td>
<td>303 Stainless steel</td>
<td>1/4</td>
<td>1/8, 3/8</td>
</tr>
<tr>
<td>10C</td>
<td>303 Stainless steel</td>
<td>1/2</td>
<td>1/8, 3/8</td>
</tr>
<tr>
<td>12A</td>
<td>316 Stainless steel</td>
<td>1/8</td>
<td>1/16, 1/8, 3/16, 1/4</td>
</tr>
<tr>
<td>12B</td>
<td>316 Stainless steel</td>
<td>1/4</td>
<td>1/16, 1/8, 1/4, 3/8</td>
</tr>
<tr>
<td>12C</td>
<td>316 Stainless steel</td>
<td>1/2</td>
<td>1/8, 3/8</td>
</tr>
<tr>
<td>11A</td>
<td>Brass</td>
<td>1/8</td>
<td>1/16, 1/8, 3/16, 1/4</td>
</tr>
<tr>
<td>11B</td>
<td>Brass</td>
<td>1/4</td>
<td>1/16, 1/8, 3/16, 1/4</td>
</tr>
<tr>
<td>11C</td>
<td>Brass</td>
<td>1/2</td>
<td>1/4, 3/8</td>
</tr>
<tr>
<td>19C</td>
<td>Spring-loaded SS well fitting</td>
<td>1/2</td>
<td>3/16, 1/4</td>
</tr>
</tbody>
</table>

Teflon® gland standard 204 °C [400 °F] max. For lava gland 649 °C [1200 °F] max. opt. 10A and 10B only use letter suffix “L” after compression fitting order code. EXAMPLE: 10AL for lava gland.

Teflon® is a registered trademark of E. I. du Pont de Nemours and Company.
# MgO ORDER CODES

**Example Order Number:** K48GM - 012 - 15C - 4\(\_\)_MC or K48GM - 012 - 00 - 16

## 3-1 Plug and Jack Sheath Terminations

<table>
<thead>
<tr>
<th>CODE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>4(^{[1]})</td>
<td>Standard plug</td>
</tr>
<tr>
<td>5(^{[1]})</td>
<td>Standard jack</td>
</tr>
<tr>
<td>6(^{[2]})</td>
<td>Miniature plug</td>
</tr>
<tr>
<td>7(^{[2]})</td>
<td>Miniature jack</td>
</tr>
</tbody>
</table>

**Options**

| MC | Mating connector |
| HT | High temp connector 385 °C [725 °F] |
| SP\(^{[3]}\) | Solid pin plug |
| CL | Compression L bracket to hold plug to sheath |

\(^{[1]}\) If used with a 3/8” O.D. sheath, an option CL must be specified.  
\(^{[2]}\) Not available with 1/4 or 3/8” O.D. sheath.  
\(^{[3]}\) Standard with 385 °C [725 °F]

## 3-2 Leadwire Transitions  
(Requires Table 4 and 5 selections)

<table>
<thead>
<tr>
<th>CODE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>Extension leadwire transition with relief spring 204 °C [400 °F]</td>
</tr>
<tr>
<td>16</td>
<td>Extension leadwire transition with heat-shrink tubing 104 °C [220 °F]</td>
</tr>
<tr>
<td>13(^{[1]})</td>
<td>Same size transition with heat-shrink tubing 104 °C [220 °F]</td>
</tr>
<tr>
<td>18(^{[1]})</td>
<td>Same size transition without heat-shrink tubing 204 °C [400 °F]</td>
</tr>
<tr>
<td>19</td>
<td>Extension leadwire transition w/o spring or heat-shrink tubing 204 °C [400 °F]</td>
</tr>
</tbody>
</table>

**Options**

| HT\(^{[2]}\) | High-temperature potting 538 °C [1000 °F] |

\(^{[1]}\) Not available with Flex Armor  
\(^{[2]}\) Not available with option 13 or 16. When specifying high temp potting with Flex Armor, Option 19 must be selected.

## 3-3 Sheath Terminations

<table>
<thead>
<tr>
<th>CODE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>2” stripped leads (insert two digit strip length for other lengths - ex. 10(03”))</td>
</tr>
<tr>
<td>14(^{[1]})</td>
<td>Ceramic wafer block</td>
</tr>
<tr>
<td>22</td>
<td>Leadwire transition with 3” individual leads and terminal pins</td>
</tr>
</tbody>
</table>

\(^{[1]}\) Only available on 1/8, 3/16, 1/4” O.D. sheath.

## 3-4 Threaded Fittings with Extension Leadwire  
(Requires Table 4 and 5 selections)

<table>
<thead>
<tr>
<th>CODE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>6HN23</td>
<td>1/2” x 1/2” NPT steel hex nipple</td>
</tr>
<tr>
<td>8HN23</td>
<td>1/2” x 1/2” NPT stainless steel hex nipple</td>
</tr>
<tr>
<td>9HP23</td>
<td>1/2” NPT stainless steel bushing (no process threads)</td>
</tr>
<tr>
<td>8RNDC23</td>
<td>3/4” process x 1/2” NPT stainless steel hex nipple</td>
</tr>
</tbody>
</table>

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### ORDER CODES

**Example Order Number:** K48GM - 012 - 01A,306 - 15 - F1048

<table>
<thead>
<tr>
<th>CODE</th>
<th>DESCRIPTION</th>
<th>AVAILABLE CALIBRATIONS</th>
<th>TEMP. RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td>F1</td>
<td>Fiberglass insulation - solid conductor</td>
<td>J K T E N</td>
<td>482 °C [900 °F]</td>
</tr>
<tr>
<td>F1A</td>
<td>Fiberglass insulation - solid conductor - flexible armor</td>
<td>J K T E N</td>
<td>482 °C [900 °F]</td>
</tr>
<tr>
<td>F1B</td>
<td>Fiberglass insulation - solid conductor - stainless steel overbraid</td>
<td>J K T E N</td>
<td>482 °C [900 °F]</td>
</tr>
<tr>
<td>F3</td>
<td>Fiberglass insulation - stranded conductor</td>
<td>J K T</td>
<td>482 °C [900 °F]</td>
</tr>
<tr>
<td>F3A</td>
<td>Fiberglass insulation - stranded conductor - flexible armor</td>
<td>J K T</td>
<td>482 °C [900 °F]</td>
</tr>
<tr>
<td>F3B</td>
<td>Fiberglass insulation - stranded conductor - stainless steel overbraid</td>
<td>J K T</td>
<td>482 °C [900 °F]</td>
</tr>
<tr>
<td>H1</td>
<td>Hi-temp fiberglass insulation - solid conductor</td>
<td>J K</td>
<td>704 °C [1300 °F]</td>
</tr>
<tr>
<td>H1A</td>
<td>Hi-temp fiberglass insulation - solid conductor - flexible armor</td>
<td>J K</td>
<td>704 °C [1300 °F]</td>
</tr>
<tr>
<td>H1B</td>
<td>Hi-temp fiberglass insulation - solid conductor - stainless steel overbraid</td>
<td>J K</td>
<td>704 °C [1300 °F]</td>
</tr>
<tr>
<td>T3J</td>
<td>Individual stranded Teflon® leads - 12 inch limit</td>
<td>J K E</td>
<td>204 °C [400 °F]</td>
</tr>
<tr>
<td>T1</td>
<td>Teflon® insulation - solid conductor</td>
<td>J K T</td>
<td>204 °C [400 °F]</td>
</tr>
<tr>
<td>T1A</td>
<td>Teflon® insulation - solid conductor - flexible armor</td>
<td>J K T</td>
<td>204 °C [400 °F]</td>
</tr>
<tr>
<td>T1B</td>
<td>Teflon® insulation - solid conductor - stainless steel overbraid</td>
<td>J K</td>
<td>204 °C [400 °F]</td>
</tr>
<tr>
<td>T1M</td>
<td>Teflon® insulation - solid conductor - mylar shield</td>
<td>J K</td>
<td>204 °C [400 °F]</td>
</tr>
<tr>
<td>T3</td>
<td>Teflon® insulation - stranded conductor</td>
<td>J K T</td>
<td>204 °C [400 °F]</td>
</tr>
<tr>
<td>T3A</td>
<td>Teflon® insulation - stranded conductor - flexible armor</td>
<td>J K T</td>
<td>204 °C [400 °F]</td>
</tr>
<tr>
<td>T3B</td>
<td>Teflon® insulation - stranded conductor - stainless steel overbraid</td>
<td>J K</td>
<td>204 °C [400 °F]</td>
</tr>
<tr>
<td>P5</td>
<td>PVC insulation - solid conductor</td>
<td>J K T E N</td>
<td>105 °C [212 °F]</td>
</tr>
<tr>
<td>P7</td>
<td>PVC insulation - stranded conductor</td>
<td>J K T</td>
<td>105 °C [212 °F]</td>
</tr>
<tr>
<td>P7M</td>
<td>PVC insulation - stranded conductor - aluminum/mylar shield</td>
<td>J K T</td>
<td>105 °C [212 °F]</td>
</tr>
<tr>
<td>C3060</td>
<td>PVC insulated coil cord - stranded; 60° extended</td>
<td>J K T E</td>
<td>105 °C [212 °F]</td>
</tr>
<tr>
<td>C3120</td>
<td>PVC insulated coil cord - stranded; 120° extended</td>
<td>J K T</td>
<td>105 °C [212 °F]</td>
</tr>
<tr>
<td>K1</td>
<td>Kapton® insulation - solid conductor</td>
<td>J K</td>
<td>316 °C [600 °F]</td>
</tr>
<tr>
<td>K1A</td>
<td>Kapton® insulation - solid conductor - flexible armor</td>
<td>J K</td>
<td>316 °C [600 °F]</td>
</tr>
<tr>
<td>K3</td>
<td>Kapton® insulation - stranded conductor</td>
<td>J K</td>
<td>316 °C [600 °F]</td>
</tr>
<tr>
<td>K3A</td>
<td>Kapton® insulation - stranded conductor - flexible armor</td>
<td>J K</td>
<td>316 °C [600 °F]</td>
</tr>
</tbody>
</table>

Insert wire code number and 3 digit "B" length code. **Example:** F1036 = 36" "B" length.

For assemblies requiring leadwire beyond the flexible armor, illustrated as "C" in drawing, insert 3 digit "C" length after armor length. **Example:** T1A036-012 = 36" "C" length with additional 12" "C" length leads beyond armor.

Insulated leadwires in flexible armor are available with either extruded PVC or Teflon® covering over the flexible armor. Substitute suffix codes T (Teflon®) or P (PVC) for the suffix "A" code above. **Example:** T3T is Teflon® covered armor.

Duplex elements supplied with individual leads.

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**Configuration Code Mg01**

**Leadwire Terminations**

Select desired leadwire termination and options (if desired) by order code numbers below

**OPTIONS 4 OR 4,MC**

![Diagram of leadwire termination options](image1)

**OPTIONS 6 OR 6,MC**

![Diagram of leadwire termination options](image2)

**ORDER CODES**

**Example Order Number:** K48GM - 012 - 01A,306 - 15 - F1048 - 4, CC

<table>
<thead>
<tr>
<th>5-1 Terminations</th>
<th>5-2 Options</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CODE</strong></td>
<td><strong>DESCRIPTION</strong></td>
</tr>
<tr>
<td>0</td>
<td>Leads not stripped</td>
</tr>
<tr>
<td>2</td>
<td>2&quot; split leads, 1/4&quot; stripped</td>
</tr>
<tr>
<td>3</td>
<td>2&quot; split leads with spade lugs</td>
</tr>
<tr>
<td>4</td>
<td>Standard plug</td>
</tr>
<tr>
<td>5</td>
<td>Standard jack</td>
</tr>
<tr>
<td>6</td>
<td>Miniature plug</td>
</tr>
<tr>
<td>7</td>
<td>Miniature jack</td>
</tr>
<tr>
<td>8</td>
<td>2&quot; split leads with 1/4&quot; quick disconnect female terminal lugs</td>
</tr>
</tbody>
</table>