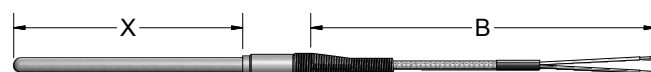
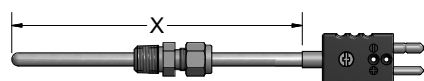
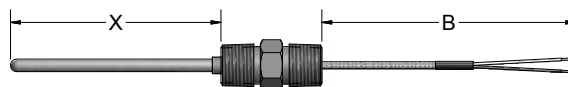


A Pyromation MgO thermocouple assembly consists of a thermocouple element swaged in hard-packed, standard-purity (96%) Magnesium Oxide mineral insulation and encased in a metal sheath. Thermocouple sheaths have been fully annealed; they can be formed into many configurations, and can be bent into a radius 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:

1-1 1-2 1-3 1-4 1-4 A 1-5
K 4 8 G M - 012 -

For Optional Sheath Mounting
 Fittings See Page MgO-2

1-1 Thermocouple Types

| CODE | | |
|--------|--------|---------|
| SINGLE | DUPLEX | TRIPLEX |
| E | EE | - |
| J | JJ | JJJ |
| K | KK | KKK |
| T | TT | - |
| N | NN | - |

1-2 Sheath Diameters

| CODE | DIAMETER (inches) |
|------|---------------------|
| 1 | 1/16 ^[1] |
| 2 | 1/8 |
| 3 | 3/16 |
| 4 | 1/4 |
| 6 | 3/8 |

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

1-3 Sheath Materials

| CODE | MATERIAL | STANDARD AVAILABLE TYPES |
|------|---------------------|--------------------------|
| 3 | Alloy 600 | K, N |
| 4 | 310 Stainless steel | K |
| 5 | 446 Stainless steel | K ^[1] |
| 8 | 316 Stainless steel | E, J, K, T |

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

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

| CODE | DESCRIPTION |
|------|---|
| M | Special limits of error |
| H | High-Purity MgO Insulation (99.4% Pure) |

Use this table only if options are desired.

1-4 Measuring Junctions

| CODE | DESCRIPTION |
|------------------|---------------------------|
| G | Grounded junction |
| U | Ungrounded junction |
| E ^[1] | Exposed junction |
| S | Exposed shielded junction |

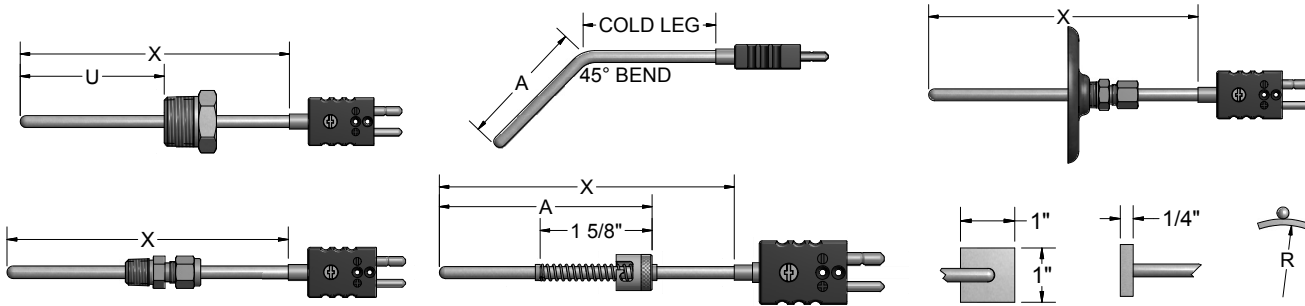
[1] Not available with 1/16" O.D..

1-2 A Reduced-Tip MgO Thermocouples

| CODE | NORMAL SHEATH DIA. O.D. (inches) | TIP DIA. (inches) | TIP LENGTH (inches) | MATERIAL |
|-------|----------------------------------|-------------------|---------------------|----------|
| 88R48 | 1/2 | 1/4 | 1 (1/4) | 316 SS |
| 68R38 | 3/8 | 3/16 | 1 (1/4) | 316 SS |
| 48R28 | 1/4 | 1/8 | 1 (1/4) | 316 SS |

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

2

Example Order Number:

K48GM - 012 - 01A,306

Page
MgO-3

Page
MgO-4

Page
MgO-5

2-1 No Fitting or Bend Options

| CODE | 00 |
|------|----|
|------|----|

2-2 One-Time Adjustable Compression Fittings

| CODE | TYPE | NPT SIZE (inches) | PRESSURE RATED | AVAILABLE SHEATH DIAMETERS (inches) |
|------|---------------------|-------------------|----------------|-------------------------------------|
| 01A | 303 Stainless steel | 1/8 | NO | 1/16, 1/8, 3/16, 1/4 |
| 05A | 316 Stainless steel | 1/8 | YES | 1/16, 1/8, 3/16, 1/4 |
| 05B | 316 Stainless steel | 1/4 | YES | 1/8, 3/16, 1/4, 3/8 |
| 05C | 316 Stainless steel | 1/2 | YES | 1/8, 3/16, 1/4, 3/8 |
| 15A | Brass | 1/8 | NO | 1/8, 3/16, 1/4 |
| 15B | Brass | 1/4 | NO | 3/16, 1/4, 3/8 |
| 15C | Brass | 1/2 | NO | 1/4, 3/8 |

2-3 Re-Adjustable Compression Fittings

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

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

2-4 Fixed Bushings

| CODE | MOUNTING THREAD NPT (inches) | AVAILABLE SHEATH DIAMETERS (inches) |
|----------------------|------------------------------|-------------------------------------|
| 316 SS | | |
| 8A __ ^[1] | 1/8 | 1/16, 1/8, 3/16, 1/4 |
| 8B __ ^[1] | 1/4 | 1/16, 1/8, 3/16, 1/4, 3/8 |
| 8C __ ^[1] | 1/2 | 1/8, 3/16, 1/4, 3/8 |
| 8D __ ^[1] | 3/4 | 1/8, 3/16, 1/4, 3/8 |

[1] When ordering fixed bushings, specify order code above plus insert length "U", as measured from hot tip to bottom of threaded bushing. EXAMPLE: order code 8A06 is 1/8" NPT, 316 SS bushing located 6" from hot tip.

2-5 Sheath Bends

| CODE | DESCRIPTION |
|------|-----------------|
| 2 __ | Sheath bent 45° |
| 3 __ | Sheath bent 90° |

When ordering bend options, specify hot leg dim. "A". EX: order code 206 is a 45° bend with 6" hot leg. Total sheath length in Table 1, referred to as "X" length = hot leg plus cold leg.

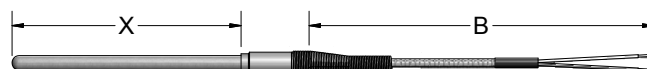
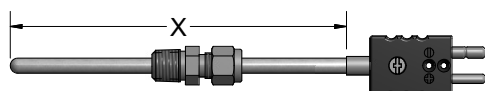
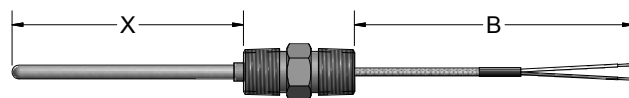
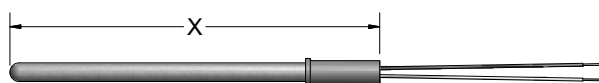
2-6 Weld Pads

| CODE | DESCRIPTION |
|------|--|
| 17 | 316 SS weld pad 1" x 1" x 1/4" thick perpendicular mount |
| 18 | 316 SS weld pad 1" x 1" x 1/4" thick horizontal mount |
| 17R | 316 SS weld pad 1" x 1" x 1/8" thick perpendicular mount with radius bend (specify radius) |
| 18R | 316 SS weld pad 1" x 1" x 1/8" thick horizontal mount with radius bend (specify radius) |

2-7 Miscellaneous Options

| CODE | DESCRIPTION | AVAILABLE SHEATH DIAMETERS (inches) |
|-----------------------|--|-------------------------------------|
| 13A __ ^[1] | Spring-loaded bayonet fitting | 1/8, 3/16 |
| 14 | Adjustable flange with brass compression fitting | 1/8, 3/16, 1/4, 3/8 |
| 16A | Compression fitting with bayonet cap and spring | 1/8 (2 5/8" min. "A" dim.) |

[1] When ordering fixed bayonet fitting, specify hot leg dimension "A". EXAMPLE: order code 13A06 for a fixed bayonet adapter with 6" hot leg. Total sheath length is Table 1 "X" length = hot leg plus cold leg.

**Mg02****ORDER CODES****Mg01****Example Order Number:****K48GM - 012 - 15C -**

3-1

4, MC**or K48GM - 012 - 00 -**

3-2

16 -Page
MgO-4Page
MgO-5**3-1 Plug and Jack Sheath Terminations**

| CODE | DESCRIPTION |
|---|--|
| 4 | Standard plug |
| 5 | Standard jack |
| 6 ^[1] | Miniature plug |
| 7 ^[1] | Miniature jack |
| Options | |
| MC | Mating connector |
| HT | High temp connector 385 °C [725 °F] |
| SP ^[2] | Solid pin plug |
| CL ^[3] | Compression L bracket to hold plug to sheath |
| ^[1] Not available with 1/4 or 3/8" O.D. sheath. ^[2] Standard with 385 °C [725 °F] ^[3] Not available with miniature connector and must be selected with HT option | |

3-1 Sheath Terminations

| CODE | DESCRIPTION |
|---|---|
| 10 | 2" stripped leads (insert two digit strip length for other lengths - ex. 10(03")) |
| 14 ^[1] | Ceramic wafer block |
| ^[1] Only available on 1/8, 3/16, 1/4" O.D. sheath. | |

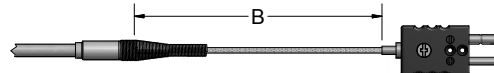
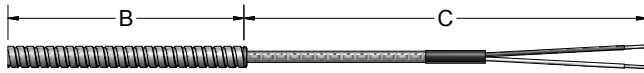
3-2 Leadwire Transitions*(Requires Table 4 and 5 selections)*

| CODE | DESCRIPTION |
|---|--|
| 15 | Extension leadwire transition with relief spring 204 °C [400 °F] |
| 16 | Extension leadwire transition with heat-shrink tubing 104 °C [220 °F] |
| 13 ^[1] | Same size transition with heat-shrink tubing 104 °C [220 °F] |
| 18 ^[1] | Same size transition without heat-shrink tubing 204 °C [400 °F] |
| 19 | Extension leadwire transition w/o spring or heat-shrink tubing 204 °C [400 °F] |
| 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. | |

3-2 Threaded Fittings with Extension Leadwire*(Requires Table 4 and 5 selections)*

| CODE | DESCRIPTION |
|--------|---|
| 6HN23 | 1/2" x 1/2" NPT steel hex nipple |
| 8HN23 | 1/2" x 1/2" NPT stainless steel hex nipple |
| 9HP23 | 1/2" NPT stainless steel bushing (no process threads) |
| 8RND23 | 3/4" process x 1/2" NPT stainless steel hex nipple |

Select desired leadwire type by order code number, followed by desired length in inches



ORDER CODES

Example Order Number: **K48GM - 012 - 01A,306 - 15 - F1048** - Page
MgO-5

| 4 | | | | | | | | | |
|---------------|-------|---|------------------------|---|---|---|---|------------------|--|
| Fiberglass | CODE | DESCRIPTION | AVAILABLE CALIBRATIONS | | | | | TEMP. RATING | |
| | F1 | Fiberglass insulation - solid conductor | J | K | T | E | N | 482 °C [900 °F] | |
| | F1A | Fiberglass insulation - solid conductor - flexible armor | J | K | T | E | N | 482 °C [900 °F] | |
| | F1B | Fiberglass insulation - solid conductor - stainless steel overbraid | J | K | T | E | | 482 °C [900 °F] | |
| | F3 | Fiberglass insulation - stranded conductor | J | K | T | E | | 482 °C [900 °F] | |
| | F3A | Fiberglass insulation - stranded conductor - flexible armor | J | K | T | E | | 482 °C [900 °F] | |
| | F3B | Fiberglass insulation - stranded conductor - stainless steel overbraid | J | K | T | | | 482 °C [900 °F] | |
| | H1 | Hi-temp fiberglass insulation - solid conductor | J | K | | | | 704 °C [1300 °F] | |
| | H1A | Hi-temp fiberglass insulation - solid conductor - flexible armor | J | K | | | | 704 °C [1300 °F] | |
| | H1B | Hi-temp fiberglass insulation - solid conductor - stainless steel overbraid | J | K | | | | 704 °C [1300 °F] | |
| Fluoropolymer | T3J | Individual stranded fluoropolymer leads - 12 inch limit | J | K | | | | 204 °C [400 °F] | |
| | T1 | Fluoropolymer insulation - solid conductor | J | K | T | | N | 204 °C [400 °F] | |
| | T1A | Fluoropolymer insulation - solid conductor - flexible armor | J | K | T | | N | 204 °C [400 °F] | |
| | T1B | Flouropolymer insulation - solid conductor - stainless steel overbraid | J | K | | | | 204 °C [400 °F] | |
| | T1M | Fluoropolymer insulation - solid conductor - polyester shield | J | K | | | | 204 °C [400 °F] | |
| | T3 | Fluoropolymer insulation - stranded conductor | J | K | T | E | | 204 °C [400 °F] | |
| | T3A | Fluoropolymer insulation - stranded conductor - flexible armor | J | K | T | E | | 204 °C [400 °F] | |
| | T3B | Fluoropolymer insulation - stranded conductor - stainless steel overbraid | J | K | | | | 204 °C [400 °F] | |
| PVC | P5 | PVC insulation - solid conductor | J | K | T | E | N | 105 °C [221 °F] | |
| | P7 | PVC insulation - stranded conductor | J | K | | | | 105 °C [221 °F] | |
| | P5M | PVC insulation - solid conductor - polyester shield | J | K | T | | | 105 °C [221 °F] | |
| | P7M | PVC insulation - stranded conductor - polyester shield | J | K | | | | 105 °C [221 °F] | |
| | C3060 | PVC insulated coil cord - stranded; 60" extended | J | K | T | E | | 105 °C [221 °F] | |
| | C3120 | PVC insulated coil cord - stranded; 120" extended | J | K | T | | | 105 °C [221 °F] | |
| Polyimide | K1 | Polyimide insulation - solid conductor | J | K | | | | 316 °C [600 °F] | |
| | K1A | Polyimide insulation - solid conductor - flexible armor | J | K | | | | 316 °C [600 °F] | |
| | K3 | Polyimide insulation - stranded conductor | J | K | | | | 316 °C [600 °F] | |
| | K3A | Polyimide insulation - stranded conductor - flexible armor | J | K | | | | 316 °C [600 °F] | |

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" "B" length with additional 12" "C" length leads beyond armor.

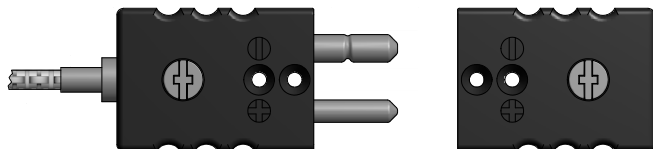
Insulated leadwires in flexible armor are available with either extruded PVC or FEP covering over the flexible armor. Substitute suffix codes T (FEP) or P (PVC) for the suffix "A" code above. **Example: T3T is FEP covered armor.**

Duplex elements supplied with individual leads.

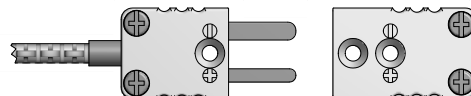


Select desired leadwire termination and options (if desired) by order code numbers below

OPTIONS 4 OR 4,MC



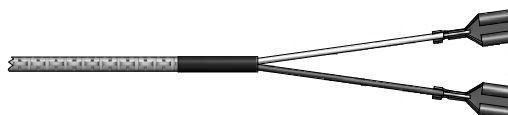
OPTIONS 6 OR 6,MC



OPTION 3



OPTION 8



ORDER CODES

Example Order Number:

K48GM - 012 - 01A,306 - 15 - F1048 -

5-1 5-2

4, CC

5-1 Terminations

| CODE | DESCRIPTION |
|------|--|
| 0 | Leads not stripped |
| 2 | 2" split leads, 1/4" stripped |
| 3 | 2" split leads with spade lugs |
| 4 | Standard plug |
| 5 | Standard jack |
| 6 | Miniature plug |
| 7 | Miniature jack |
| 8 | 2" split leads with 1/4" quick disconnect female terminal lugs |

5-2 Options

| CODE | DESCRIPTION |
|-----------------------------------|---|
| BX | 1/2" NPT BX connector with Opt. 0, 2, 3, or 8 |
| CC | Plug or jack secured to leads with cable clamp |
| RB | Rubber boot |
| SP ^[1] | Solid pin plug |
| CG | Cord grip (1/2" NPT weatherproof PVC connector) |
| MC | Mating connector |
| HT | High temp. connector 385 °C [725 °F] |
| [1] Standard with 385 °C [725 °F] | |