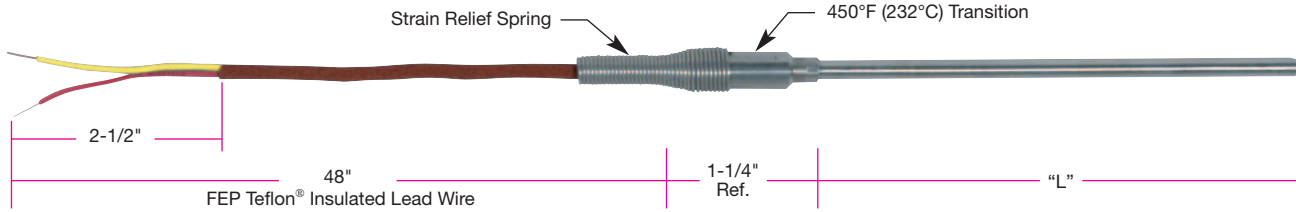




### Style MTA1 — Transition to Lead Wire (Stock)



### Ordering a Stock MTA1 Thermocouple

(Thermocouples not available from stock can be custom manufactured—see page 14-15)

TEMPCO stocks **MTA1 style Thermocouples** in type J and K in the standard lengths listed in the following two tables. These thermocouples have Teflon<sup>®</sup> insulated leads with a 2-1/2" split lead termination.

Order a stock unit from the tables after completing the ordering code with the Junction Type Code from Box 5 and Optional Compression Fitting Code from Box 6 below.

#### Type J — 316 SS Sheath

Diameter	"L" Dimension			
	6"	12"	18"	24"
0.063"	ST1-JD06B <input type="checkbox"/>	ST1-JD12B <input type="checkbox"/>	ST1-JD18B <input type="checkbox"/>	ST1-JD24B <input type="checkbox"/>
0.125"	ST1-JF06B <input type="checkbox"/>	ST1-JF12B <input type="checkbox"/>	ST1-JF18B <input type="checkbox"/>	ST1-JF24B <input type="checkbox"/>
0.250"	ST1-JH06B <input type="checkbox"/>	ST1-JH12B <input type="checkbox"/>	ST1-JH18B <input type="checkbox"/>	ST1-JH24B <input type="checkbox"/>

#### Type K — Alloy 600 Sheath

Diameter	"L" Dimension			
	6"	12"	18"	24"
0.063"	ST1-KD06B <input type="checkbox"/>	ST1-KD12B <input type="checkbox"/>	ST1-KD18B <input type="checkbox"/>	ST1-KD24B <input type="checkbox"/>
0.125"	ST1-KF06B <input type="checkbox"/>	ST1-KF12B <input type="checkbox"/>	ST1-KF18B <input type="checkbox"/>	ST1-KF24B <input type="checkbox"/>
0.250"	ST1-KH06B <input type="checkbox"/>	ST1-KH12B <input type="checkbox"/>	ST1-KH18B <input type="checkbox"/>	ST1-KH24B <input type="checkbox"/>

### Stock Modification for Fast Delivery

Above stocked items can be cut to desired length and terminated with any standard termination for fast delivery. To order a probe length not listed in the tables above, complete the Code Number below.

Ordering Code: **ST1** -

**Calibration** BOX 1  
ANSI Standard Tolerances **J K**

**Diameter** BOX 2  
**D** = .063"  
**F** = .125"  
**H** = .250"

**"L" Dimension** BOX 3  
**06", 12", 18", 24"** Stock Lengths  
For other lengths, specify in inches.

**Termination** BOX 4  
**B** = 2-1/2 in. Split Leads  
**S** = Spade Lugs  
**C** = Spade Lugs with BX Conn.  
**P** = Standard Plug  
**J** = Standard Jack  
**K** = Standard Plug and Jack  
**D** = Miniature Plug  
**E** = Miniature Jack  
**F** = Mini. Plug and Jack  
See page 14-9 for Termination Style descriptions

**Junction** BOX 5  
**G** = Grounded  
**U** = Ungrounded  
**E** = Exposed

**Optional Compression Fitting** BOX 6  
**1** = 1/8" NPT SS      **4** = 1/8" NPT Brass  
**2** = 1/4" NPT SS      **5** = 1/4" NPT Brass  
**3** = 1/2" NPT SS      **6** = 1/2" NPT Brass  
**0** = None Required

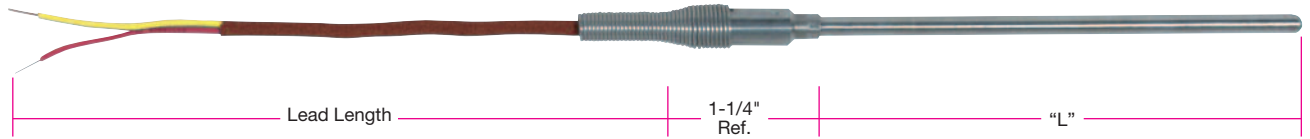


Optional Installation Compression Fitting  
See Box 6

**⚠ WARNING:** Cancer and Reproductive Harm - [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).



### Style MTA1 — Transition to Lead Wire (Custom Manufactured)



### Ordering Information

Thermocouples are offered with the options listed in the worksheet below. Create an ordering code by filling in the boxes with the appropriate number and/or letter designation for your requirements, and a part number will be assigned.



**Optional Installation  
Compression Fitting**  
See Box 13

### Design Features

- \* Mineral insulated sheath provides flexibility to form and bend the thermocouple to meet design requirements.
- \* Stainless steel transition with optional Strain Relief Spring
- \* Standard epoxy potting transition provides greater moisture resistance rated to 450°F (232°C). Optional ceramic based potting rated to 1000°F (538°C). Ceramic potting not recommended with Teflon® leads, nor for high humidity applications.

### Ordering Code:

MTA1 -

#### Calibration Code BOX 1

ANSI Standard Tolerances	J	K	E	T	N	R	S	B
Special Tolerances	3	4	5	6	7			

#### Junction BOX 8

	Grounded	Ungrounded	Exposed
Single	G	U	E
Dual, common	4	5	6
Dual, isolated	—	7	8

#### Lead Wire Length BOX 9

In inches **001 to 999**  
12" (012) Standard

#### Number of Conductors BOX 2

2 = Single (Standard)  
4 = Duplex

#### Insulation BOX 3

M = 96% min. MgO (Standard)  
H = 99.4% min. MgO

#### Sheath Material BOX 4

A = Alloy 600  
B = 304 SS  
C = 316 SS

#### Sheath O.D. BOX 5

A = .020" ±.001	K = .375" +.003/-.002
B = .032" ±.001	L = 1.0mm ±.03
C = .040" ±.001	N = 1.5mm ±.03
D = .063" ±.001	P = 2.0 mm ±.03
E = .093" ±.002	Q = 3.0 mm ±.03
F = .125" ±.002	R = 4.5 mm ±.05
G = .188" ±.002	S = 6.0 mm +.07/-.05
H = .250" +.003/-.002	T = 8.0 mm +.07/-.05
J = .313" +.003/-.002	V = 9.0 mm +.07/-.05

#### Sheath Length "L" BOX 6

Whole inches  
**01 to 99**  
For lengths over 99 in. consult TEMPCO.

#### Sheath Length "L" BOX 7

Fractional inches		
0 = 0"	3 = 3/8"	6 = 3/4"
1 = 1/8"	4 = 1/2"	7 = 7/8"
2 = 1/4"	5 = 5/8"	

#### Lead Wire Construction BOX 10

		w/ SS Overbraid	w/ SS Flex Armor
Fiberglass 900°F (482°C)	S	B	A
Teflon 400°F (204°C)	T	D	F

Depending on availability .040" to .125" uses 24 gauge lead wire. Larger than .125" thermocouples use 20 gauge lead wire depending on availability and insulation type.

#### Lead Wire Termination BOX 11

P = Standard Male Plug  
J = Standard Female Jack  
K = Std. Plug with Mating Conn.  
D = Miniature Male Plug  
E = Miniature Female Jack  
F = Miniature Plug with Mating Jack  
B = Standard—2-1/2 in. Split Leads  
S = 2-1/2 in. Split Leads with Spade Lugs  
C = 2-1/2 in. Split Leads with BX connector and Spade Lugs  
X = Other (Specify)

See page 14-9 for Termination Style descriptions

#### Strain Relief Spring BOX 12

O = Not Required  
Y = Required

#### Optional Compression Fitting BOX 13

1 = 1/8" NPT SS  
2 = 1/4" NPT SS  
3 = 1/2" NPT SS  
0 = None Required  
4 = 1/8" NPT Brass  
5 = 1/4" NPT Brass  
6 = 1/2" NPT Brass

#### Special Requirements BOX 14

H = High temp potting 1000°F (538°C)  
O = Standard Epoxy Potting 450°F (232°C)  
X = Other (Specify)



### MI Cable Thermocouple Assemblies

#### Mineral Insulated Metal-Sheathed Cable

Thermocouple Assemblies are made from TEMPCO's high quality Tempco-Pak 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 junction that best suits your particular 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 Tempco-Pak Thermocouple Assembly

Thermocouples must be selected to meet the conditions of each particular 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.

Refer to the Mineral Insulated Thermocouples and Cable section regarding sheath, insulation and calibration (pages 14-114 through 14-118).

*TEMPCO's engineering staff will be happy to assist you with the design and selection of your thermocouple requirements.*

#### Sheath Materials

The most commonly 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.

#### Formability

Because Tempco-Pak is fully annealed it can normally be formed around a mandrel 4 times the sheath diameter. Consult TEMPCO 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"	±¾"	±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%