

## Thermocouples

### Industrial Base/ Noble Metal

Watlow offers two basic types of base metal thermocouples: bare and ceramic insulated elements and thermocouples with protection tubes. Many variations of each type are available to meet your application needs.

#### **Performance Capabilities**

- 1260°C (2300°F) maximum temperature

#### **Features and Benefits**

##### **Insulated wire thermocouples**

- Suitable for most general purpose applications

##### **Bare and ceramic insulated elements**

- Available in ASTM E 230 Types K and J, can be twisted or butt welded
- Choices include straight or angle types, two- or four-hole insulators and single or dual element

##### **Protected thermocouples**

- Supplied complete with head, block and protection tube
- Several styles available

#### **Applications**

- Metal processing such as aluminum, zinc, brass (with appropriate protection tube)
- Chemical
- Petrochemical
- Industrial storage tanks



# Thermocouples

## Base Metal

### Rapid Ship Sensors

Rapid Ship Type K calibration, standard limits, 8 AWG gauge with two-hole ceramic insulators, twisted and welded junction.

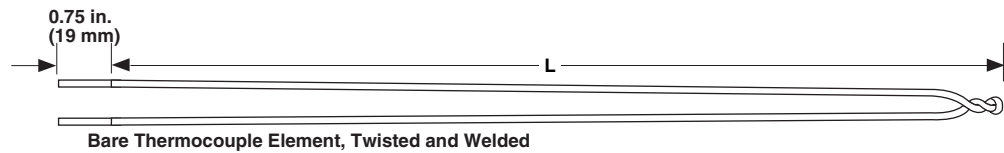
Lead Length		Part Number
in.	(mm)	
12	(305)	1409-12
18	(457)	1409-18
24	(610)	1409-24
36	(914)	1409-36
48	(1219)	1409-48

### Bare Elements

To order, specify:

Part number-length.

Example: 1402-36 or  
1432-BW-24

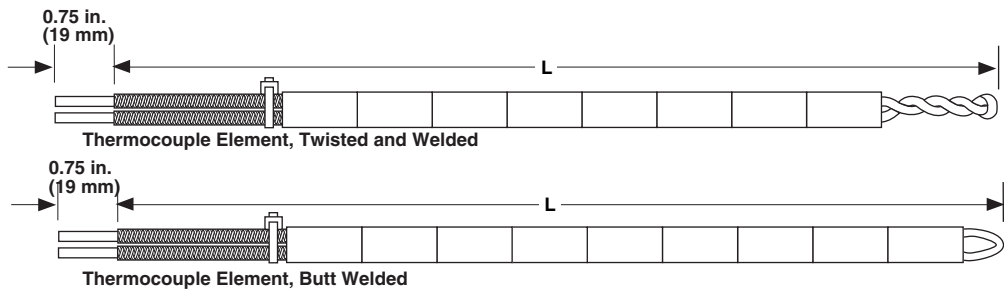


### Straight Elements with Two-Hole Insulators

To order, specify:

Part number-length.

Example: 1409-48 or  
1436-BW-18



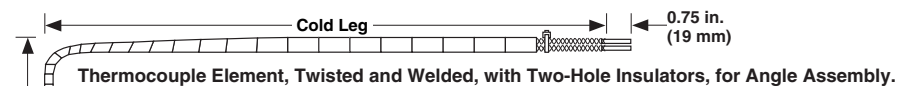
Code Number				AWG Gauge	Insulator Part No.	Length (in.)
Type K		Type J				
Twisted and Welded	Butt Welded	Twisted and Welded	Butt Welded			
<b>1402</b>	<b>1432-BW</b>	—	—	<b>8</b>	BARE	12, 18,
1403	1433-BW	—	—	11	BARE	24, 30,
1404	1434-BW	1503	1576-BW	14	BARE	36, 42,
<b>1409</b>	<b>1436-BW</b>	1507	1578-BW	<b>8</b>	301	48, 54,
1410	1437-BW	—	—	11	304	60, 66,
1411	1438-BW	1509	1579-BW	14	304	72
1412	1439-BW	1510	1580-BW	20	328	

### Angle Type with Two-Hole Insulators

To order, specify:

Part number-cold leg length-hot leg length.

Example: 1440-BW-12-24



Code Number		Insulator Part No. Hot and Cold Sections*	Hot Leg Length (in.)
Type K			
Butt Welded	AWG Gauge		
<b>1440-BW</b>	<b>8</b>	301	<b>24, 30, 36, 42</b> 48, 54, 60

\*Curved section insulators are Part No. 302 for 8 AWG gauge. Insulator dimensions on page 165.

Note: Cold leg minimum 6 in. (152 mm), maximum 36 in. (914 mm)

Note: Items in **Bolded Green Type** are preferred with shorter lead times.

# Thermocouples

## Base Metal

### Rapid Ship Sensors

Rapid Ship dual Type K calibration, standard limits, 14 AWG gauge with four-hole ceramic insulators and butt-welded junction.

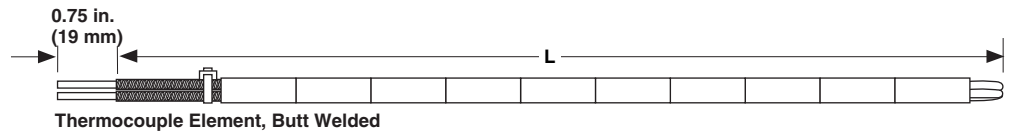
Lead Length in. (mm)	Part Number	Insulator Part No.
12 (305)	1442-BW-12	360
18 (457)	1442-BW-18	360
24 (610)	1442-BW-24	360

### Dual Element with Four-Hole Insulators

**To order, specify:**

Part number-length.

**Example:** 1442-BW-36



Code Number (Butt Welded Only)		AWG Gauge	Insulator Part No.	Length
Type K	Type J			
<b>1442-BW</b>	1584-BW	<b>14</b>	360	12, 18, 24, 30, 36, 42, 48,
1443-BW	1585-BW	20	378	54, 60, 66, 72 Inches

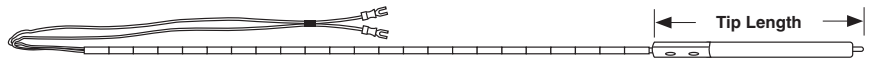
### Immersion Tips

SERV-RITE immersion tips are superior thermocouples for nonferrous molten metals. The hot junction is forged into the 446 stainless steel sheath for maximum sensitivity. Available in Type K calibration only.

**To order, specify:**

Part number-tip length-lance length.

**Example:** 1449-501-T-8-43  
1449-M-12-43



Length of Tip in. (mm)	Length of Leads in. (mm)	Part Number
8 (203)	31 (787)	<b>1449-501-T-8-31</b>
	43 (1092)	1449-501-T-8-43
	55 (1397)	1449-501-T-8-55
12 (305)	31 (787)	<b>1449-M-12-31</b>
	43 (1092)	1449-M-12-43
	55 (1397)	1449-M-12-55
15 (381)	31 (787)	<b>1449-M-15-31</b>
	43 (1092)	<b>1449-M-15-43</b>
	55 (1397)	1449-M-15-55
20 (508)	31 (787)	1449-M-20-31
	43 (1092)	1449-M-20-43
	55 (1397)	1449-M-20-55

**Note:** Items in **Bolded Green Type** are preferred with shorter lead times.

Thermocouples

# Thermocouples

## Base Metal

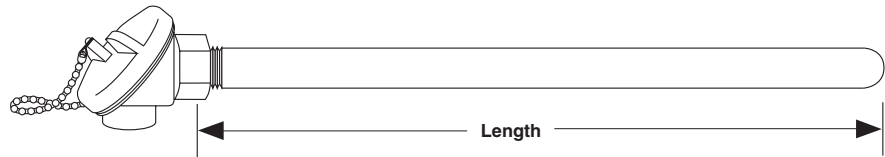
### Standard Thermocouple with Protection Straight Type

**To order, specify:**

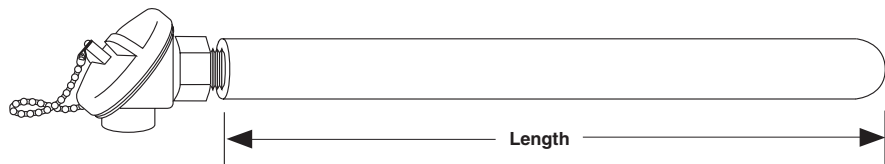
Part number-length.

**Example:** 1409-1308-24

### Metal Tube



### Cast Iron Tube



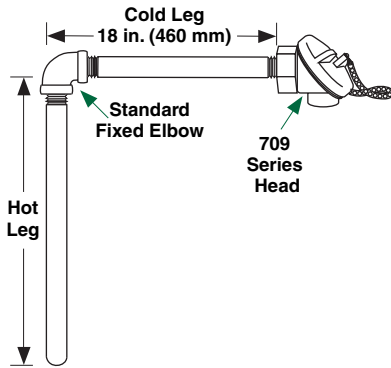
Code Number		AWG Gauge	Protection Tube		Pipe Diameter in.	Construction	Cast Iron Head	Length in.
Type K	Type J		Material	NPT Size in.				
<b>1409-1395</b>	1507-1395	<b>8</b>	<b>Alloy 601</b>	$\frac{1}{2}$	<b>0.840</b>	<b>Seamless</b>	<b>70900203</b>	12, 18, 24, 30, 36, 42, 48, 54, 60
1409-1396	1507-1396	8	Alloy 601	$\frac{3}{4}$	1.050	Seamless	70900202	
<b>1409-1341</b>	1507-1341	<b>8</b>	<b>304 SS</b>	$\frac{1}{2}$	<b>0.840</b>	<b>Welded</b>	<b>70900203</b>	
1409-1342	1507-1342	8	304 SS	$\frac{3}{4}$	1.050	Welded	70900202	
<b>1409-1307</b>	1507-1307	<b>8</b>	<b>446 SS</b>	$\frac{1}{2}$	<b>0.840</b>	<b>Seamless</b>	<b>70900203</b>	
1409-1308	1507-1308	8	446 SS	$\frac{3}{4}$	1.050	Seamless	70900202	
1409-1309	1507-1309	8	446 SS	1	1.315	Seamless	70900201	
1409-1375	1507-1375	8	Cast Iron	$\frac{3}{4}$ int	1.625	Cast	70900202	

**Note:** Items in **Bolded Green Type** are preferred with shorter lead times.

# Thermocouples

## Base Metal

### Standard Thermocouple with Protection 90 Degree Angle Type



**To order, specify:**

Part number-cold leg length  
hot leg length.

**Example:** 1414-1395-18-24

### Standard Thermocouple with Protection — 90 Degree Angle

Code Number		AWG Gauge	Protection Tube (Hot Leg)			Cast Iron Head	Hot Leg Length in.
Type K	Type J		Material	NPT Size in.	Construction		
<b>1414-1307-18</b>	1517-1307-18	<b>8</b>	<b>446 SS</b>	$\frac{1}{2}$	<b>Seamless</b>	<b>70900203</b>	12, 18, 24, 30, 36
<b>1414-1328-18</b>	1517-1328-18	<b>8</b>	<b>Black Steel</b>	<b>1</b>	<b>Welded</b>	<b>70900201</b>	
1414-1375-18	1517-1375-18	8	Cast Iron	$\frac{3}{4}$ int	Cast	70900202	
<b>1414-1395-18</b>	1517-1395-18	<b>8</b>	<b>Alloy 601</b>	$\frac{1}{2}$	<b>Seamless</b>	<b>70900203</b>	
1415-1307-18	1518-1307-18	14	446 SS	$\frac{1}{2}$	Seamless	70900203	
1415-1326-18	1518-1326-18	14	Black Steel	$\frac{1}{2}$	Welded	70900203	
1415-1328-18	1518-1328-18	14	Black Steel	1	Welded	70900201	
1415-1375-18	1518-1375-18	14	Cast Iron	$\frac{3}{4}$ int	Cast	70900202	
1415-1395-18	1518-1395-18	14	Alloy 601	$\frac{1}{2}$	Seamless	70900203	

**Pipe Diameters**

- Cast iron = 1  $\frac{5}{8}$  inch
- $\frac{1}{2}$  in. NPT = 0.840 inch
- $\frac{3}{4}$  in. NPT = 1.050 inch
- 1 in. NPT = 1.315 inch

**Notes:** Items in **Bolded Green Type** are preferred with shorter lead times.

Standard cold leg is 18 inches.