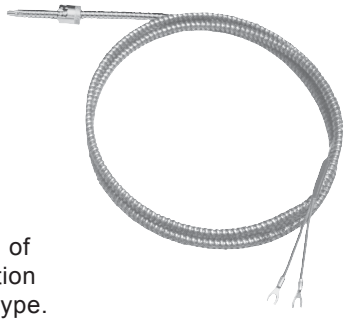
Made in the U.S.A

Thermocouples



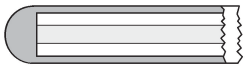
A thermocouple is a temperature measuring device consisting of two conductors of dissimilar metals or alloys that are connected only at the ends. When the ends are at different temperatures, a small voltage is produced in the wire that can be related directly to the temperature difference between the ends. If the temperature at one end is known, the temperature at the other end can be determined.

Thermocouple wire or extension grade wire is used to connect the thermocouple to the sensing or control instrumentation. The conditions of measurement determine the type of thermocouple wire and insulation to be used. Temperature range, environment, insulation requirements, response, and service life should be considered when selecting a wire type. There are two common types of thermocouple wire, Type "J" and Type "K".

Type "J" (Iron/Constantan™)
Type J thermocouples are used in vacuum, oxidizing, inert or reducing atmospheres. Iron element oxidizes rapidly at temperatures exceeding 1000°F (538°C), and therefore heavier gauge wire is recommended for longer life at these temperatures.

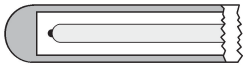
Type "K" (Chromel™/Alumel™)
Type K thermocouples are used in oxidizing, inert or dry reducing atmospheres. Exposure to vacuum is limited to short time periods. Must be protected from sulfurous and marginally oxidizing atmospheres. Reliable and accurate at high temperatures.

GROUNDED THERMOCOUPLES



The thermocouple junction is connected to the tip of the metal enclosure. Being connected to the sheath of the enclosure affords protection to the thermocouple and excellent response.

UNGROUNDED THERMOCOUPLES



The thermocouple is isolated from the metal sheath and for this reason gives up a little response time. By being electronically insulated, this design is not subjected to picking up electrical noise. Most newer Van Dorns, and some other machines, require ungrounded thermocouples.

RTD's

A Resistance Temperature Detector (RTD) is a temperature sensing probe of finely wound platinum wire that displays a linear resistance increase for a corresponding temperature increase. RTD's are built on the principle that most metals have a positive charge in electrical resistance with a change in temperature. When quality control is of extreme importance, an RTD is unequalled for accuracy and repeatability. RTD's do not require cold junction compensation or special extension wire. RTD's are available in two different temperature ranges and leadwire types, the "L" Series and the "M" Series. All sheaths and tips are manufactured from 316 stainless steel for superior resistance to corrosion, abrasion, and deterioration.

2-Wire Configuration
A 2-wire configuration is a less accurate style of RTD assembly. The added lead wire resistance is not compensated for by the temperature controller or transmitter used to monitor the resistance of the RTD. This increased resistance will cause the display temperature to be higher than the actual temperature.

3-Wire Configuration
A 3-wire configuration is the most common configuration because it is both cost effective and accurate. The added lead wire resistance is calculated by the controller through the third wire of the RTD assembly. The leadwire resistance is then subtracted from the loop resistance and true resistance is found. Through this method the controller or transmitter "compensates" the lead wire giving an accurate temperature display.

Other styles, sheath sizes and materials, leadwire types and thread sizes are also available.

Thermocouple Wire Reference Data

ACCURACY OF THERMOCOUPLE WIRE

Insulated thermocouple wire is matched to meet standard or special limits of error for temperatures above 32°F (0°C), as given in ANSI MC 96.1 and shown in the tables below.

INITIAL CALIBRATION TOLERANCES FOR THERMOCOUPLE WIRE							
THERMOCOUPLE TYPE		°F			°C		
Wire Alloys	ANSI Symbol	Temperature Range	Standard Limits	Special Limits	Temperature Range	Standard Limits	Special Limits
Iron (+) vs. Constantan™ (-)	J	+32° to +545° +545° to +1400°	±4° ±0.75%	±2° ±0.4%	0° to +285° +285° to +750°	±2.2° ±0.75%	±1.1° ±0.4%
Chromel™ (+) vs. *Alumel™ (-)	K	-330° to -165° -165° to +32° +32° to +545° +545° to +2300°	±2% ±4° ±4° ±0.75%	 ±2° ±0.4%	-200° to -110° -110° to 0° 0° to +285° +285° to +1250°	±2% ±2.2° ±2.2° ±0.75%	 ±1.1° ±0.4%
Copper (+) vs. Constantan™ (-)	T	-330° to -85° -85° to +270° +270° to +660°	±1.5% ±1.8° ±0.75%	±0.8% ±0.9° ±0.4%	-200° to -65° -65° to +130° +130° to +350°	±1.5% ±1° ±0.75%	±0.8% ±0.5° ±0.4%
Chromel™ (+) vs. Constantan™ (-)	E	-330° to -270° -270° to +480° +480° to +640° +640° to +1600°	±1% ±3° ±3° ±0.5%	±1.8° ±1.8° ±0.4% ±0.4%	-200° to -170° -170° to +250° +250° to +340° +340° to +900°	±1% ±1.7° ±1.7° ±0.5%	±1° ±1° ±0.4% ±0.4%
Nicrosil™ (+) vs. Nisil™ (-)	N	+32° to +545° +545° to +2300°	±4° ±0.75%	±2° ±0.4%	0° to +285° +285° to +1250°	±2.2° ±0.75%	±1.1° ±0.4%

*Magnetic

NOTE: Percent limits apply directly to temperatures in °C units, but for °F equivalents are applied to the number of °F above or below the ice point (+32°F). (i.e., Limit (°F) = (Temp. F-32°F) x Percentage.

Thermocouple wire cannot be expected to meet limits of error at temperatures below the ice point unless specified at time of purchase.

ACCURACY OF EXTENSION WIRE

Thermocouple extension wire has approximately the same thermoelectric characteristics as thermocouple wire, but its accuracy is guaranteed over a more limited range of temperatures. Thermocouple extension wire can offer advantages in cost when used for connections between thermocouples and instruments. For base metal types of thermocouples, extension wire is of substantially the same composition as the corresponding thermocouple type. For noble metal types, however, an entirely different alloy is formulated to match the noble metal characteristics over a specified temperature range. This is necessary due to the high cost of the noble metals which could otherwise be necessary for the interconnection. The “X” in the ANSI code denotes extension grade wire.

INITIAL CALIBRATION TOLERANCES FOR THERMOCOUPLE EXTENSION WIRE							
THERMOCOUPLE TYPE		°F			°C		
Extension Wire Alloys	ANSI Symbol	Temperature Range	Standard Limits	Special Limits	Temperature Range	Standard Limits	Special Limits
Iron (+) vs. Constantan™ (-) Chromel™ (+) vs. *Alumel™ (-)	JX KX	+32° to +400° +32° to +400°	±4° ±4°	±2° ±2°	0° to +200° 0° to +200°	±2.2° ±2.2%	±1.1° ±1.1°
Copper (+) vs. Constantan™ (-) Chromel™ (+) vs. Constantan™ (-)	TX EX	-75° to +210° +32° to +400°	±2° ±3°	±1° ±2°	-60° to +100° 0° to +200°	±1.1% ±1.7%	±0.5° ±1.1°
Nicrosil™ (+) vs. Nisil™ (-) Copper vs. Copper Alloy	NX SX RX	+32° to +400° +75° to +400°	±4° ±12°	±2°	0° to +200° +25° to +200°	±2.2° ±7°	±1.1°
PCLW630 vs. Copper Copper vs. Copper	BX 2CU**	+32° to +400° +32° to +150°	±4° ±2°		0° to +200° 0° to +65°	±2.2° ±1.1°	
Alloy 203 vs. Alloy 2235 Alloy 405 vs. Alloy 426	W3X** W5X**	+32° to +500° +32° to +1600°	±12° ±12°		0° to +260° 0° to +870°	±7° ±7°	

*Magnetic **Not ANSI Symbol

Adjustable Depth Thermocouples

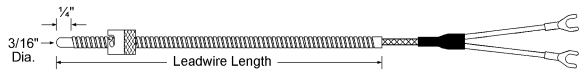
Adjustable Depth Thermocouples can easily adjust to any immersion depth - saving time and money. One simply inserts the adjustable thermocouple probe into the thermocouple adapter well. Then the thermocouple's locking cap is rotated up or down to the proper immersion depth and locked onto the adapter. Spring compression acts to keep the probe firmly seated in the well. This assures for rapid heat transfer and accurate sensing. The "AO" series has the bayonet cap on an 8" spring and allows for 7" of adjustable immersion. The "AA" series has the bayonet cap on the flexible armor and allows for full leadwire length adjustable immersion.

SPECIFICATIONS:

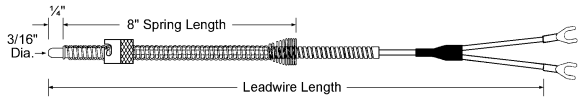
- Standard TC's Have 3/16" Diameter Tip (other diameters available)
- Leadwire is Rated to 900°F Maximum Temperature
- Type "J" (Iron/Constantan), Single Element, Grounded

TEMPERATURE RANGE: 0°F to +900°F

Series "AA"

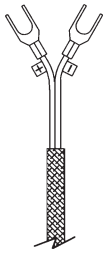
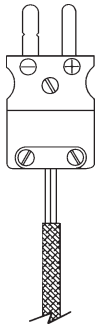


Series "AO"



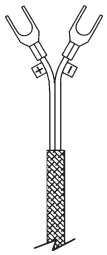
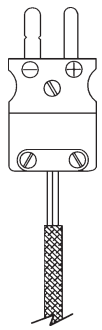
AA Series - Armor Adjustable

20-gauge solid wire with stainless steel flexible armor covering.

"B" LEAD LENGTH	Grounded with Spade Lugs			Grounded with Male Plug		
		PART NO.	PRICE EACH 1-5 / 6+		PART NO.	PRICE EACH 1-5 / 6+
24"		AA-1024-1	Call for Pricing 800-627-1033		AA-1024-2	Call for Pricing 800-627-1033
36"		AA-1036-1			AA-1036-2	
48"		AA-1048-1			AA-1048-2	
60"		AA-1060-1			AA-1060-2	
72"		AA-1072-1			AA-1072-2	
96"		AA-1096-1			AA-1096-2	
120"		AA-1120-1			AA-1120-2	

AO Series - Spring Adjustable

20-gauge stranded wire with stainless steel overbraid.

"B" LEAD LENGTH	Grounded with Spade Lugs			Grounded with Male Plug		
		PART NO.	PRICE EACH 1-5 / 6+		PART NO.	PRICE EACH 1-5 / 6+
24"		AO-2024-1	Call for Pricing 800-627-1033		AO-2024-2	Call for Pricing 800-627-1033
36"		AO-2036-1			AO-2036-2	
48"		AO-2048-1			AO-2048-2	
60"		AO-2060-1			AO-2060-2	
72"		AO-2072-1			AO-2072-2	
96"		AO-2096-1			AO-2096-2	
120"		AO-2120-1			AO-2120-2	

How To Order

To order, choose from our standard thermocouples above; or select other lead lengths, wire options, and/or terminations on page 353. Call for a quote.

Type "K" (Chromel/Alumel) and Ungrounded thermocouples also available.

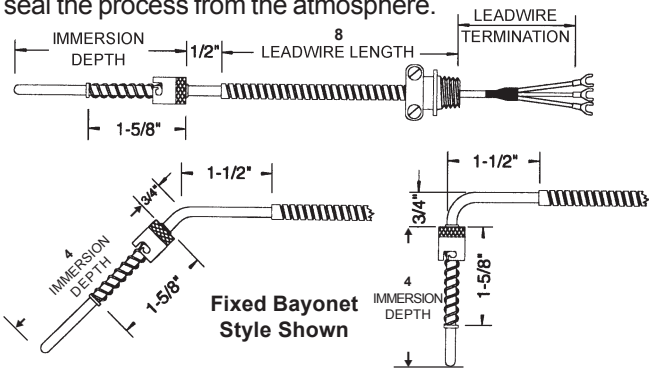
Fixed Bayonet & Rigid Tube Thermocouples

Bayonet Thermocouples are a fixed immersion thermocouple with compressible spring and locking cap. Bayonet thermocouples are well suited for applications requiring longer immersion depths. The probe of the bayonet thermocouple is more rigid and provides a more positive contact in the deeper well. The compressible spring outer covering and its locking cap hold the probe securely in place. 90° bayonet thermocouples are often selected for use where space is at a premium and the 90° bend allows for a tighter, neater installation. All bayonet thermocouples have flexible extensions (overbraid or armor), ideal for connection to near or distant junction boxes. Thermocouple Adapters for attaching bayonet thermocouples are found on page 351.

Compression/Rigid Tube Thermocouples have an adjustable attaching device that eliminates the need for an adapter. Compression thermocouples allow for the final adjustment of immersion depth to be made at the time of installation. They are ideal for the monitoring of liquids or gases since they seal the process from the atmosphere.

SPECIFICATIONS:

- Standard TC's Have 3/16" Diameter Tip (1/8" also available)
- Type "J" (Iron/Constantan™), 20-gauge Solid Wire, Single Element, Grounded. For Duplex (4-Wire), insert "4" for option [1]
- Rated for Service to 900°F Maximum Temperature



How To Order

Use the formulas below to figure your part number (call for pricing):

1	2	3	4	5	6	7	8	9	10	11
	CA	1	1	- K	02	A	1	048	- 1	

1 Insert Option:
4 = Duplex, 4-wire

2 Insert Series Code:
BA = Bayonet TC w/Flexible Armor
BO = Bayonet TC w/SS Overbraid
CA = Compression TC w/Flexible Armor
CO = Compression TC w/SS Overbraid

3 Insert Angle:
1 = Straight
2 = Bent 45°
3 = Bent 90°

4 Insert Fittings (Compression TC's Only):
0 = None
1 = Adjustable SS Compression Fitting, 1/8 NPT
2 = Adjustable Brass Compression Fitting, 1/8 NPT
3 = Adjustable Brass Compression Fitting, 1/4 NPT
4 = Re-adjustable SS Compression Fitting, 1/8 NPT
5 = Mounting Flange w/Brass Compression Fitting

5 Insert Sheath Diameter:
G = 1/8" I = 3/16" K = 1/4"

6 Insert Immersion Depth:
Insert 2-digit length (in whole inches); for example: 2" = 02

7 Insert Fraction:

A = None	G = 1/4	Q = 3/4
B = 1/16	J = 3/8	S = 7/8
C = 1/8	L = 1/2	
E = 3/16	N = 5/8	

8 Insert Leadwire Type:
1 = Solid Fiberglass w/SS Armor (For Types BA and CA)
3 = Solid Fiberglass w/SS Overbraid (For Types BO and CO)
Other types available, see page 353.

9 Insert Leadwire Length:
Insert 3-digit length (in inches); for example: 48" = 048

10 Insert Leadwire Termination:
0 = None
1 = 2½" Split Leads w/#8 Spade Lugs
2 = Standard Male Plug (200°C)
3 = Standard Plug w/Mating Jack (200°C)
4 = 2½" Split Leads w/#8 Spade Lugs & BX Connector
5 = Standard Female Jack (200°C)
6 = 2½" Split Leads
7 = Miniature Male Plug (200°C)
8 = Miniature Female Jack (200°C)
9 = Miniature Plug Mating Jack (200°C)

11 Insert Special Options:
C = Cable Clamp on Connector
F = BX Connector on Leads
S = Adjusting Spring - 12" Long
T = Tube Adapter on Connector
U = Ungrounded Junction

Type "K" (Chromel/Alumel) and Ungrounded are also available.

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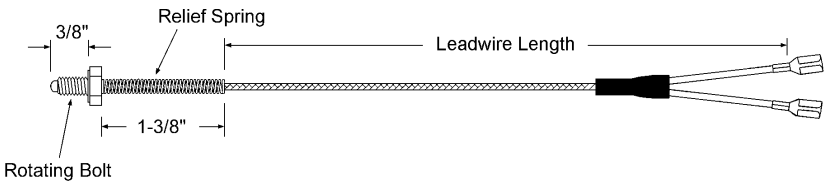
Toll Free Phone: 800-627-1033 • Fax: 800-482-4059 • Local Phone: 260-482-9211 • Fax: 260-483-8139

Threaded Nozzle Thermocouples

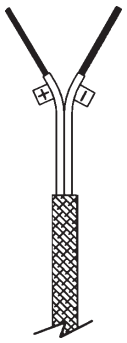
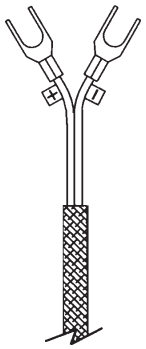
Threaded Nozzle Thermocouples measure the temperature of the nozzle, when placed in a threaded shallow drill hole on the injection nozzle. There is no direct contact with the material flow. These thermocouples are a must for nozzles with minimal wall thickness between the inside bore and hex flat. Threaded Nozzle Thermocouples come with a threaded rotatable sleeve bolt, which turns independently of the extension leads for easy installation or removal.

SPECIFICATIONS:

- 1/4 -28 x 3/8"L (Standard) Bolt Provided
- 1/8" Diameter Sheath Standard
- Type "J" (Iron/Constantan™), 24-gauge Solid Wire, Single Element, Grounded, with Stainless Steel Overbraid
- Rated for Service to 900°F Maximum Temperature
- Metric Sizes fit Nissei, Kawaguchi, and Others



TN Series - Threaded Nozzle Thermocouples

"B" LEAD LENGTH	Grounded with 2½" Stripped Leads				Grounded with Spade Lugs			
		PART NO.	PRICE EACH			PART NO.	PRICE EACH	
			1-5	6+			1-5	6+
24"		TN2-3024-6	Call for Pricing 800-627-1033			TN2-3024-1	Call for Pricing 800-627-1033	
36"		TN2-3036-6				TN2-3036-1		
48"		TN2-3048-6				TN2-3048-1		
60"		TN2-3060-6				TN2-3060-1		
72"		TN2-3072-6				TN2-3072-1		
96"		TN2-3096-6				TN2-3096-1		

How To Order

To order, choose from our standard thermocouples above; or select other lead lengths, wire options, and/or terminations on page 353. Call for a quote.

For other bolt sizes, insert the appropriate bolt code in the part number, using the following formula:

TN [2] - 3036 -1

BOLT SIZES
1 = 1/4 -20 x 3/8" Long
2 = 1/4 -28 x 3/8" Long
3 = M6 x 1.00 x 12mm Long
4 = M8 x 1.25 x 12mm Long
5 = 5/16 -24 x 1/2" Long

Type "K" (Chromel/Alumel) and Ungrounded thermocouples also available.

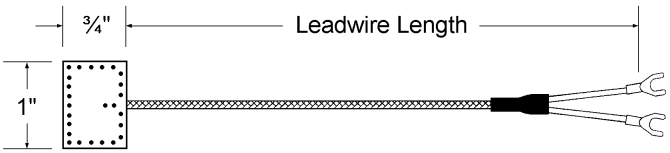
Spade & Ring Thermocouples

Spade Thermocouples measure the surface temperature by being slid underneath heater bands or held in place with a strap. They are very flat and can be placed in the gap where the two halves of a heater band come together. The heater's locking mechanism secures it in place. When used under heater bands in the nozzle area, it is relatively safe from damage by plastic back-up.

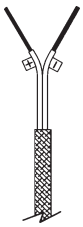
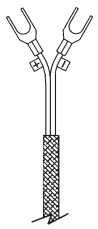
Ring Thermocouples also measure surface temperature, but are bolted to molds, platens and nozzles. They are often connected in parallel with another thermocouple to control at an average temperature. An example would be the connection of a ring thermocouple, measuring the surface temperature of the barrel, and a bayonet thermocouple, measuring deep inside the barrel's wall. The resulting reading would enable closer control for a more uniform temperature of the plastic melt. Note that the connected thermocouples must be of the same type and resistance.

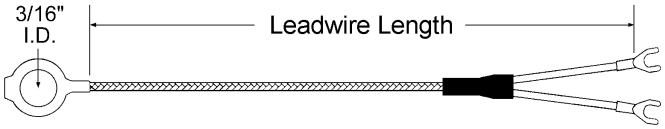
SPECIFICATIONS:

- Type "J" (Iron/Constantan™), 20-24-gauge Stranded Wire, Single Element, Grounded, with Stainless Steel Overbraid
- Rated for Service to 900°F Maximum Temperature

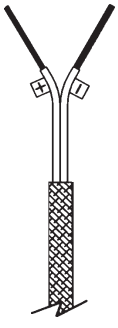
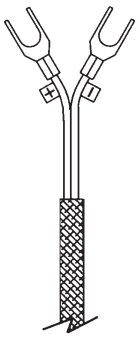


ST Series - Spade Thermocouples

"B" LEAD LENGTH	Grounded with 2½" Split Leads (wire stripped)			Grounded with Spade Lugs		
		PART NO.	PRICE EACH 1-5 / 6+		PART NO.	PRICE EACH 1-5 / 6+
36"		ST-2036-6	Call for Pricing 800-627-1033		ST-2036-1	Call for Pricing 800-627-1033
48"		ST-2048-6			ST-2048-1	
60"		ST-2060-6			ST-2060-1	
72"		ST-2072-6			ST-2072-1	



RT Series - Ring Thermocouples*

"B" LEAD LENGTH	Grounded with 2½" Split Leads (wire stripped)			Grounded with Spade Lugs		
		PART NO.	PRICE EACH 1-5 / 6+		PART NO.	PRICE EACH 1-5 / 6+
24"		RT1-2024-6	Call for Pricing 800-627-1033		RT1-2024-1	Call for Pricing 800-627-1033
36"		RT1-2036-6			RT1-2036-1	
48"		RT1-2048-6			RT1-2048-1	
60"		RT1-2060-6			RT1-2060-1	
72"		RT1-2072-6			RT1-2072-1	
96"		RT1-2096-6			RT1-2096-1	
120"		RT1-2120-6			RT1-2120-1	

**#8 bolt, 3/16" I.D. standard ring size. Other ring sizes available. Call for quote.*

How To Order

To order, choose from our standard thermocouples above; or select other lead lengths, wire options, and/or terminations on page 353. Call for a quote.

Type "K" (Chromel/Alumel) and Ungrounded also available.

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Melt Bolt Thermocouples

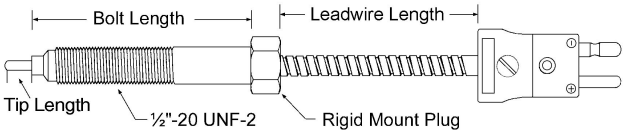
Melt Bolt Thermocouples are immersed directly into the melt for a more accurate reading. They mount in the extruder barrel near the head. The closed end sensitive portion of the tip is immersed directly into the plastic. There are two styles available. The Fiberglass type has a fiberglass insulated thermocouple element in a stainless steel probe. The MgO type obtains its insulation from magnesium oxide which is tightly compressed between the thermocouple wires and the stainless steel sheath.

SPECIFICATIONS:

- Rated for Service to 900°F Maximum Temperature

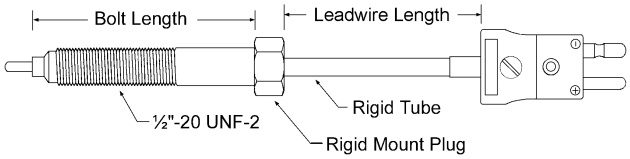
MB Series - Standard Type

Type "J" (Iron/Constantan™), 20-gauge stranded wire, single element with closed end, grounded, with stainless steel flexible armor covering. Tip has fiberglass insulated element.



MMB Series - MgO Type

Type "J" (Iron/Constantan™), 24-gauge stranded wire, single element with closed end, grounded, with 316 stainless steel rigid tube. Tip has MgO insulated element.



How To Order

Use the formula below to figure your part number (call for pricing):

1	2		3		3a	4	5		6	7
MB	3	-	0	1	G	- 4	012	-	5	

1 — Insert Series Code:

MB = Standard Type
MMB = MgO Type

2 — Insert Bolt Length & Tip Dia.:

1 = 3" Bolt Length; 1/8" Tip Dia.
2 = 3" Bolt Length; 3/16" Tip Dia.
3 = 4" Bolt Length; 1/8" Tip Dia.
4 = 4" Bolt Length; 3/16" Tip Dia.
5 = 6" Bolt Length; 1/8" Tip Dia.
6 = 6" Bolt Length; 3/16" Tip Dia.

3 — Insert Tip Length: (Whole Inches)

Insert 2-digit length (in inches);
for example: 1" = 01

3a — Insert Tip Length: (Fractional)

A = Flush	L = 1/2"
C = 1/8"	Q = 3/4"
G = 1/4"	O = Other (specify)

4 — Insert Leadwire Type:

4 = Stranded w/SS Flexible Armor (for MB Series)
0 = Stranded w/316 SS Rigid Tube (for MMB Series)
10 = Stranded Teflon w/SS Flexible Armor

5 — Insert Leadwire Length:

Insert 3-digit length (in inches);
for example: 12" = 012

6 — Insert Leadwire Termination:

0 = None
1 = 2½" Split Leads w/#8 Spade Lugs
2 = Standard Male Plug (200°C)
3 = Standard Plug w/Mating Jack (200°C)
4 = 2½" Split Leads w/#8 Spade Lugs & BX Connector
5 = Standard Female Jack (200°C)
6 = 2½" Split Leads
7 = Miniature Male Plug (200°C)
8 = Miniature Female Jack (200°C)
9 = Miniature Plug Mating Jack (200°C)

7 — Insert Special Options:

C = Cable Clamp on Connector
F = BX Connector on Leads
S = Adjusting Spring - 12" Long
T = Tube Adapter on Connector
U = Ungrounded Junction

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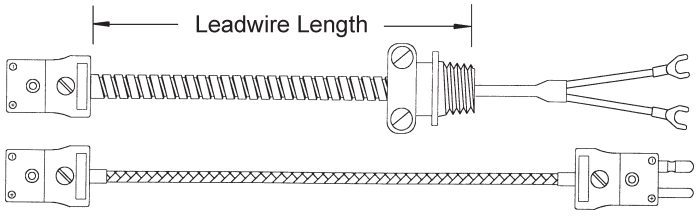
Thermocouple Extensions

Made in the U.S.A

Flexible **Thermocouple Extensions** act as an "extension cord" to provide connections between sensors, jack panels, or instruments. Extensions are constructed with thermocouple wire or thermocouple extension wire.

SPECIFICATIONS:

- Type "J" (Iron/Constantan), 20-gauge Wire, Single Element, Grounded
- Can be Used More Than Once



How To Order

Use the formula below to figure your part number (call for pricing):

1	2		3	4		5	6
E	2		2	072	-	1	

1 — Insert Leadwire Termination:

0 = None
1 = 2½" Split Leads w/#8 Spade Lugs
2 = Standard Male Plug (200°C)
3 = Standard Plug w/Mating Jack (200°C)
4 = 2½" Split Leads w/#8 Spade Lugs & BX Connector
5 = Standard Female Jack (200°C)
6 = 2½" Split Leads
7 = Miniature Male Plug (200°C)
8 = Miniature Female Jack (200°C)
9 = Miniature Plug Mating Jack (200°C)

2 — Insert Special Options:

C = Cable Clamp on Connector
F = BX Connector on Leads
S = Adjusting Spring - 12" Long
T = Tube Adapter on Connector
U = Ungrounded Junction

3 — Insert Leadwire Type:

1 = Solid Fiberglass w/SS Flex. Armor
2 = Stranded Fiberglass w/SS Overbraid
3 = Solid Fiberglass w/SS Overbraid
4 = Stranded Fiberglass w/SS Flex. Armor
5 = Stranded Fiberglass
6 = Stranded Teflon w/SS Overbraid (400°F Temp. Rating Max.)
7 = Solid Fiberglass
8 = Stranded Fiberglass w/SS Overbraid & Flexible Armor

4 — Insert Extension Length:

Insert 3-digit length (in inches); for example: 24" = 024

5 — Insert Leadwire Termination:

0 = None
1 = 2½" Split Leads w/#8 Spade Lugs
2 = Standard Male Plug (200°C)
3 = Standard Plug w/Mating Jack (200°C)
4 = 2½" Split Leads w/#8 Spade Lugs & BX Connector
5 = Standard Female Jack (200°C)
6 = 2½" Split Leads
7 = Miniature Male Plug (200°C)
8 = Miniature Female Jack (200°C)
9 = Miniature Plug Mating Jack (200°C)

6 — Insert Special Options:

C = Cable Clamp on Connector
F = BX Connector on Leads
S = Adjusting Spring - 12" Long
T = Tube Adapter on Connector
U = Ungrounded Junction

Type "K" (Chromel/Alumel) and Ungrounded also available.

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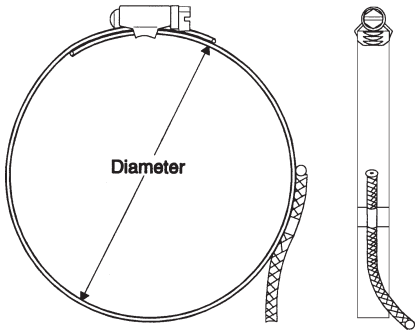
Pipe Clamp Thermocouples

Made in the U.S.A

SPECIFICATIONS:

- Available in Type “J” (Iron/Constantan) or Type “K” (Chromel/Alumel)
- Single (2-wire), Grounded Wire
- Fiberglass Insulated - SS Overbraid
- All Stainless Steel Worm Gear Hose Clamp
- Convenient in Areas Where Drilling or Tapping is Impractical



NISSEI NOZZLE TYPE REPLACEMENT

How To Order

Use the formula below to figure your part number (call for pricing):

PC [1] J [2] 1 - [3] 3 [4] 048 - [5] 1 [6]

1 Insert Type:

J = Type “J” (Iron/Constantan)
K = Type “K” (Chromel/Alumel)

2 Insert Clamp Diameter Range:

1 = 11/16” - 1 1/4” Dia. (1/2” & 3/4” IPS Size)
2 = 1 1/16” - 2” Dia. (1” & 1 1/2” IPS Size)
3 = 2” - 3 1/4” Dia. (2” & 2 1/2” IPS Size)
4 = 3” - 4 1/4” Dia. (3” & 3 1/2” IPS Size)
5 = 4 3/4” - 6” Dia. (4” IPS Size)
6 = 5 1/4” - 6 1/2” Dia. (5” IPS Size)
7 = 5 3/4” - 7” Dia. (6” IPS Size)

3 Insert Leadwire Type:

2 = 20 ga. Stranded, Fiberglass Insulated, SS Overbraid
3 = 20 ga. Solid, Fiberglass Insulated, SS Overbraid

4 Insert Leadwire Length:

Insert 3-digit length (in inches); for example: 24” = 024

5 Insert Leadwire Termination:

0 = None
1 = 2½” Split Leads w/#8 Spade Lugs
2 = Standard Male Plug (200°C)
3 = Standard Plug w/Mating Jack (200°C)
4 = 2½” Split Leads w/#8 Spade Lugs & BX Connector
5 = Standard Female Jack (200°C)
6 = 2½” Split Leads
7 = Miniature Male Plug (200°C)
8 = Miniature Female Jack (200°C)
9 = Miniature Plug Mating Jack (200°C)

6 Insert Special Options:

C = Cable Clamp on Connector
F = BX Connector on Leads
S = Adjusting Spring - 12” Long
T = Tube Adapter on Connector
U = Ungrounded Junction

Ungrounded also available. (For Ungrounded, MgO insulation will be provided for better isolation of temperature sensing element.)

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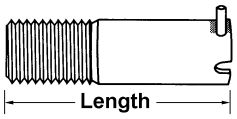
Made in the U.S.A

Thermocouple Adapters

FEATURES:
- For Use with All Standard Immersion Thermocouples
- Made from Nickel-plated Steel (Stainless Steel Also Available)



THREAD: 1/8"-27 NPT

PART NO.	"L" LENGTH	PRICE EACH
TCA-78-18	7/8"	Call for Pricing
TCA-112-18	1 1/2"	
TCA-212-18	2 1/2"	

THREAD: 3/8"-24 NF

PART NO.	"L" LENGTH	PRICE EACH
TCA-78-38	7/8"	Call for Pricing
TCA-112-38	1 1/2"	
TCA-212-38	2 1/2"	

Type "J" Thermocouple Wire

Insulated Thermocouple Wire:
- Maximum Temperature: 900°F
- Color Code: Negative - Red, Positive - White, Brown Overall Jacket

PART NO.	GAUGE	CONDUCTOR TYPE	INSULATION			PRICE PER FOOT*	
			EACH CONDUCTOR	OUTER JACKET	OVER-ALL JACKET	50'- 499	500+
J20-1-304	20	Solid	Fiberglass Braid	Fiberglass Braid	-	Call for Pricing 800-627-1033	
J20-1-S-304	20	Solid	Fiberglass Braid	Fiberglass Braid	SS Overbraid		
J20-3-304	20	Stranded	Fiberglass Braid	Fiberglass Braid	-		
J20-3-S-302	20	Stranded	Fiberglass Braid	Fiberglass Braid	SS Overbraid		
J20-1-S-315	20	Solid	Fiberglass Braid	Stainless Overbraid	-		
J24-1-304	24	Solid	Fiberglass Braid	Fiberglass Braid	-		

**PLEASE NOTE: 50' minimum order.*

Insulated Thermocouple Extension Wire:
- Maximum Temperature: 221°F
- Color Code: Negative - Red, Positive - White, Black Overall Jacket

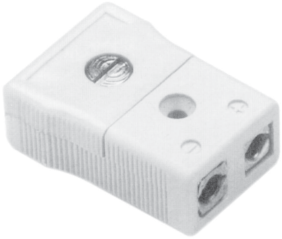
PART NO.	GAUGE	CONDUCTOR TYPE	INSULATION			PRICE PER FOOT*		
			EACH CONDUCTOR	OUTER JACKET	OVER-ALL JACKET	50'- 249'	250- 499	500+
J16-5-510	16	Solid	PVC	Aluminum Mylar	PVC	Call for Pricing 800-627-1033		
J20-5-502	20	Solid	PVC	PVC	-			

**PLEASE NOTE: 50' minimum order.*

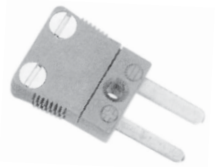
Made in the U.S.A

Type "J" Thermocouple Accessories

Standard Plug
(Male)



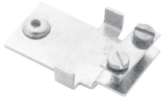
Standard Jack
(Female)



Mini Plug
(Male)

Mini Jack
(Female)

Cable Clamp



Mini Clamp

Standard Round Panel Jack
- Two (2) Mounting Screws and Terminal Screw Covers
- Unassembled for Easy Wire Attachment

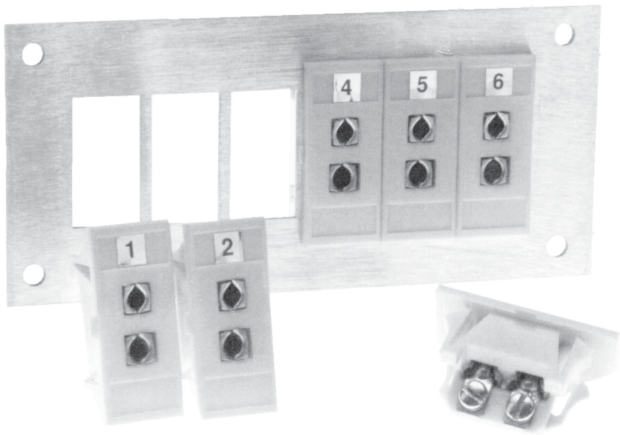
PART NO.	DESCRIPTION	PRICE EACH	
		1-11	12+
TCPLUG	Standard Plug (Male)	Call for Pricing 800-627-1033	
TCPLUG-S	Solid Pin Plug (Male)		
TCJACK	Standard Jack (Female)		
TCCLAMP	Cable Clamp		
TCMINIPLUG	Mini Plug (Male)		
TCMINIJACK	Mini Jack (Female)		
TCMINICLAMP	Mini Clamp		
TCJACKPANEL	Standard Round Panel Jack		

Type "K" also available.

For other TC accessories, call for a quote.

Type "J" Multicircuit Jack Panels

FEATURES:
- Standard or Custom Designed Panel Sizes
- Snap-in Panel Jacks
- Bezel Face Color Coded Nylon Inserts
- Designed for Ease of Installation and Removal
- Flexible Retaining Tabs Secure Panel
- Accepts Wire up to 14 AWG
- Heavy Duty Spring Loaded Inserts to Ensure Positive Plug Connection
- Accepts Any Standard Size Male Thermocouple Connector
- Front Numbering Standard; Custom Lettering Available Upon Request
- Available in 6, 12 or 18 Circuits per Row; 1, 2, 3 or 4 Rows per Panel



Call for more information!

TEMPERATURE RANGE: +400°F (204°C)

Miniature panel jacks and Type K also available. Call for pricing and availability.

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TC/RTD Wire & Termination Options

For optional TC leadwire types and/or terminations, select from the lists below to create your custom part.

TC/RTD Series Code:

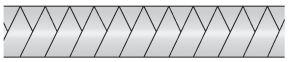
Thermocouples:
AA = Adjustable Depth TC w/Flexible Armor
AO = Adjustable Depth TC w/Spring Overbraid
BA = Bayonet TC w/Flexible Armor
BO = Bayonet TC w/Spring Overbraid
CA = Compression TC w/Flexible Armor
CO = Compression TC w/Spring Overbraid
E = TC Extension
MB = Melt Bolt TC - Fiberglass Type
MMB = Melt Bolt TC - MgO Type
ST = Spade TC
PC = Pipe Clamp TC
RT = Ring TC
TN = Threaded Nozzle TC

RTD's:
RTDAA = Adjustable Depth RTD w/Flexible Armor
RTDAO = Adjustable Depth RTD w/Spring Overbraid
RTDCA = Compression RTD w/Flexible Armor
RTDCO = Compression RTD w/Spring Overbraid
RTDMB = Melt Bolt RTD (call for quote)
RTDRT = Ring Type RTD (call for quote)
RTDTN = Threaded Nozzle RTD (call for quote)

Leadwire Type:

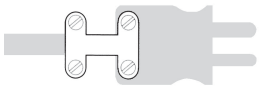
1 = Solid Fiberglass w/SS Flexible Armor
2 = Stranded Fiberglass w/SS Overbraid
3 = Solid Fiberglass w/SS Overbraid
4 = Stranded Fiberglass w/SS Flexible Armor
5 = Stranded Fiberglass
6 = Stranded Teflon w/SS Overbraid (400°F Temp. Rating Max.)
7 = Solid Fiberglass
8 = Stranded Fiberglass w/SS Overbraid & Flexible Armor
9 = Stranded Teflon
10 = Stranded Teflon w/SS Flexible Armor


SS Flexible Armor

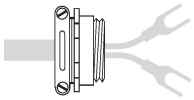

SS Overbraid

Special Options:

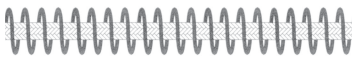
C = Cable Clamp on Connector



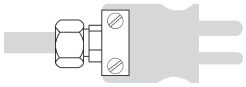
F = BX Connector on Leads



S = Adjusting Spring - 12" Long



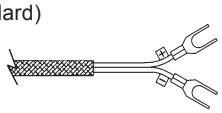
T = Tube Adapter on Connector



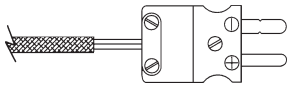
U = Ungrounded Junction

Leadwire Terminations: 0 = None

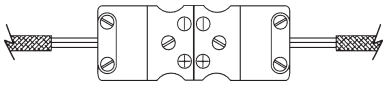
1 = 2½" Split Leads w/#8 Spade Lugs (Standard)



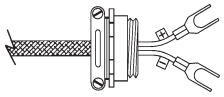
2 = Standard Male Plug (200°C)



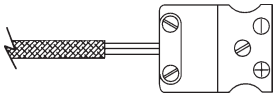
3 = Standard Plug w/Mating Jack (200°C)



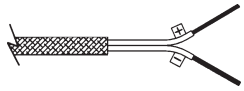
4 = 2½" Split Leads w/#8 Spade Lugs & BX Connector



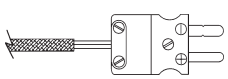
5 = Standard Female Jack (200°C)



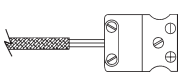
6 = 2½" Split Leads (wires stripped)



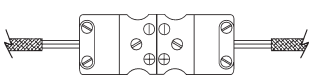
7 = Miniature Male Plug (200°C)



8 = Miniature Female Jack (200°C)



9 = Miniature Plug w/Mating Jack (200°C)



For information or pricing on Type "K" Thermocouples, or any other Thermocouples or RTD's, call 1-800-627-1033.

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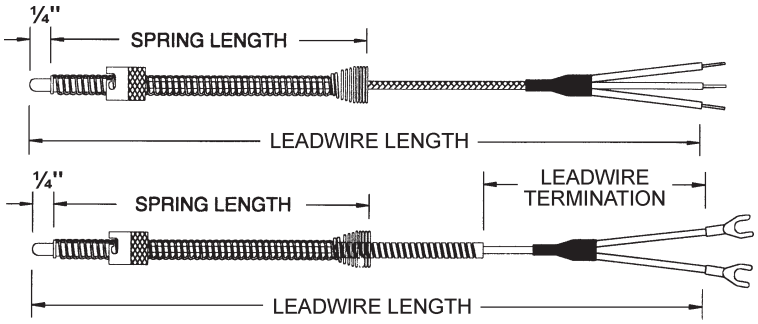
Adjustable Depth RTD's

When quality control is of extreme importance, an RTD is unequalled for accuracy and repeatability. RTD's do not require cold junction compensation or special extension wire. Like the Adjustable Depth Thermocouples, **Adjustable Depth RTD's** easily adjust to any immersion depth. When rotated, a threaded locking cap moves up and down the tension spring to adjust the depth.

SPECIFICATIONS:

- Constructed of Wire Wound Platinum Elements with 3/16" O.D. Tube
- Resistance Value of 100 ohms at 0°C
- 2-wire, Single-element Standard (3-wire and Dual-element Available)
- Class B Accuracy (.12%)

TEMPERATURE RANGE: -50°C to +450°C



How To Order

Use the formula below to figure your part number (call for pricing):

1		2	3	4	5	6
RTDAO	-	A	4	048	- 1	

1 Insert Series Code:

RTDAO = 8" Spring w/Stainless Steel Overbraid
RTDAA = Flexible Armor

2 Insert Element Type:

A = 2-wire; Single Element
B = 3-wire; Single Element
D = 2-wire; Dual Element
E = 3-wire; Dual Element

3 Insert Leadwire Type:

2 = Stranded Fiberglass, SS Overbraid
4 = Stranded Fiberglass, SS Flexible Armor

4 Insert Extension Length:

Insert 3-digit length (in inches); for example: 48" = 048

5 Insert Leadwire Termination:

0 = None
1 = 2½" Split Leads w/#8 Spade Lugs
2 = Standard Male Plug (200°C)
3 = Standard Plug w/Mating Jack (200°C)
4 = 2½" Split Leads w/#8 Spade Lugs & BX Connector
5 = Standard Female Jack (200°C)
6 = 2½" Split Leads
7 = Miniature Male Plug (200°C)
8 = Miniature Female Jack (200°C)
9 = Miniature Plug Mating Jack (200°C)

6 Insert Special Options:

C = Cable Clamp on Connector
F = BX Connector on Leads
S = Adjusting Spring - 12" Long
T = Tube Adapter on Connector
U = Ungrounded Junction

Fixed Bayonet & Rigid Tube RTD's

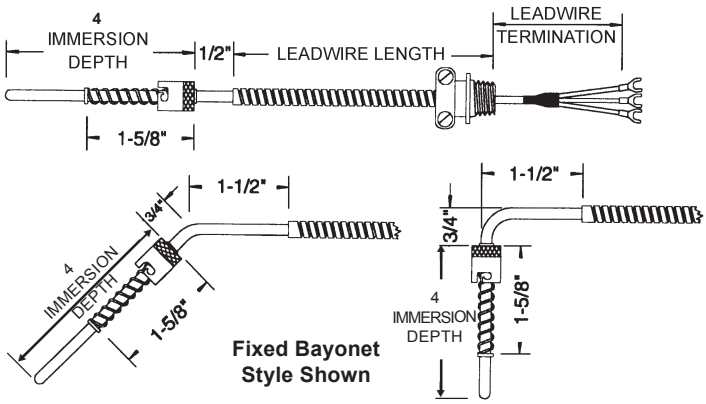
Bayonet RTD's are a fixed immersion RTD with compressible spring and locking cap. Bayonet RTD's are well suited for applications requiring longer immersion depths. The probe of the bayonet RTD is more rigid and provides a more positive contact in the deeper well. The compressible spring outer covering and its locking cap hold the probe securely in place. 90° bayonet RTD's are often selected for use where space is at a premium and the 90° bend allows for a tighter, neater installation. All bayonet RTD's have flexible extensions, ideal for connection to near or distant junction boxes.

Compression/Rigid Tube RTD's have an adjustable attaching device that eliminates the need for an adapter. Compression RTD's allow for the final adjustment of immersion depth to be made at the time of installation. They are ideal for the monitoring of liquids or gases since they seal the process from the atmosphere.

SPECIFICATIONS:

- 20-gauge Stranded Fiberglass with Stainless Steel Flexible Armor
- Constructed of Wire Wound Platinum Elements with 3/16" O.D. Tube
- Resistance Value of 100 ohms at 0°C
- 2-wire, Single-element Standard (3-wire and Dual-element Available)
- Class B Accuracy and Temp Coefficient (.12% @ 0°C, Din. 00385. Others Available.)

TEMPERATURE RANGE: -50°C to +450°C



Fixed Bayonet Style Shown

How To Order

Use the formula below to figure your part number (call for pricing):

1	2	3	4		5	6	7	8	9		10	11
RTDCA	1	1	L	-	I	02	A	2	048	-	1	

1 Insert Series Code:
RTDBA = Bayonet RTD w/Flexible Armor
RTDBO = Bayonet RTD w/SS Overbraid
RTDCA = Compression RTD w/Flexible Armor
RTDCO = Compression RTD w/SS Overbraid

2 Insert Angle:
1 = Straight
2 = Bent 45°
3 = Bent 90°

3 Insert Fittings (Compression RTD's Only):
0 = None
1 = Adjustable SS Compression Fitting, 1/8 NPT
2 = Adjustable Brass Compression Fitting, 1/8 NPT
3 = Adjustable Brass Compression Fitting, 1/4 NPT
4 = Re-adjustable SS Compression Fitting, 1/8 NPT
5 = Mounting Flange w/Brass Compression Fitting

4 Temperature Range:
L = -50 + 200°C (Requires Type 9 or 10 Lead Wire)
M = -50 +450°C (Requires Type 2,4, or 5 Lead Wire)

5 Sheath Diameter:
I = 3/16 K= 1/4

6 Insert Immersion Depth:
Insert 2-digit length (in whole inches); for example: 2" = 02

7 Insert Fraction:

A = None	G = 1/4	Q = 3/4
B = 1/16	J = 3/8	S = 7/8
C = 1/8	L = 1/2	
E = 3/16	N = 5/8	

8 Insert Leadwire Type:
2 = Stranded Fiberglass w/SS Overbraid
4 = Stranded Fiberglass w/SS Flexible Armor
5 = Stranded Fiberglass
9 = Stranded Teflon
10 = Stranded Teflon w/SS Flexible Armor

9 Insert Leadwire Length:
Insert 3-digit length (in inches); for example: 48" = 048

10 Insert Leadwire Termination:
0 = None
1 = 2½" Split Leads w/#8 Spade Lugs
2 = Standard Male Plug (200°C)
3 = Standard Plug w/Mating Jack (200°C)
4 = 2½" Split Leads w/#8 Spade Lugs & BX Connector
5 = Standard Female Jack (200°C)
6 = 2½" Split Leads
7 = Miniature Male Plug (200°C)
8 = Miniature Female Jack (200°C)
9 = Miniature Plug Mating Jack (200°C)

11 Insert Special Options:
C = Cable Clamp on Connector
F = BX Connector on Leads
S = Adjusting Spring - 12" Long
T = Tube Adapter on Connector
U = Ungrounded Junction

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