

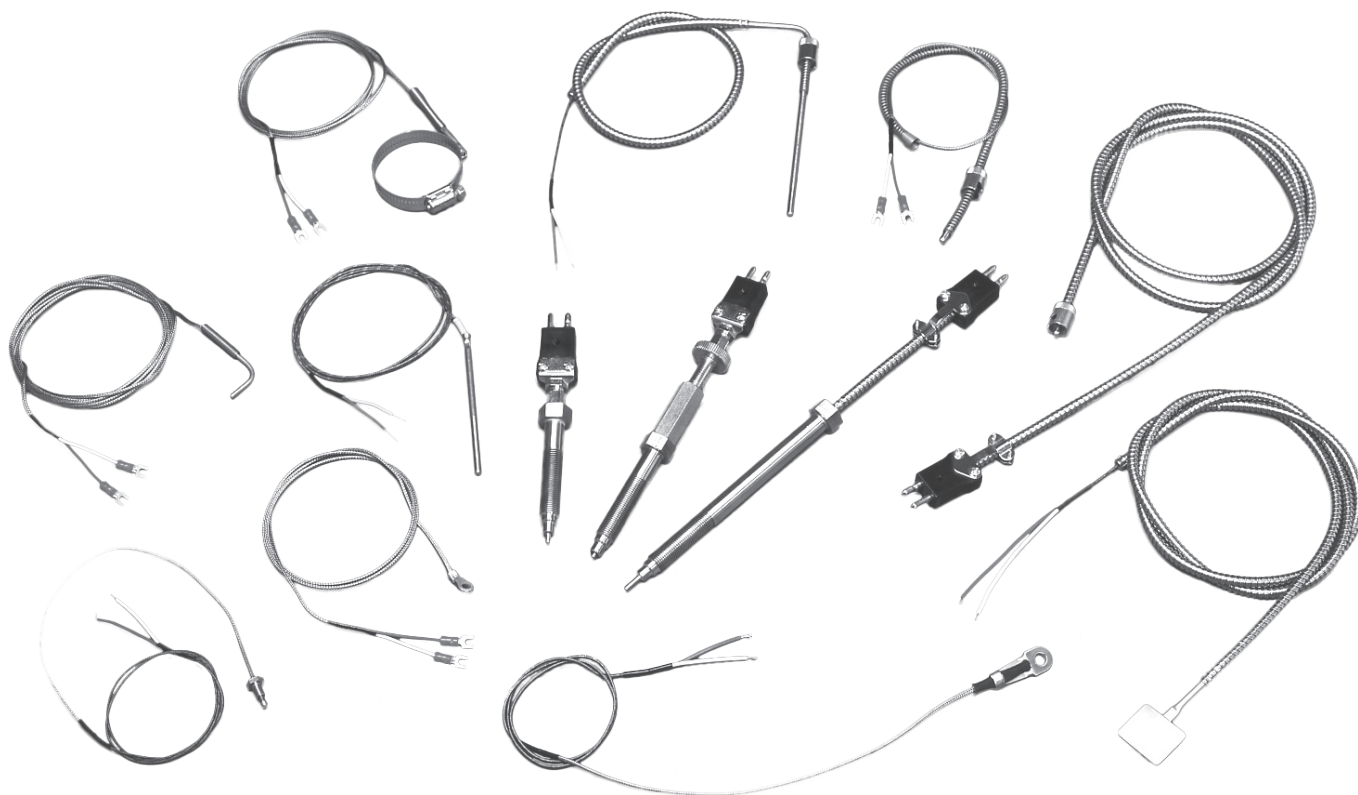


closing the loop on thermal solutions

Plastics Industry Sensors

INTRODUCTION

Durex offers a complete line of thermocouples that are specifically designed for the plastics processing industry. These thermocouples are typically ANSI type J or K calibration and consist of a flexible thermocouple conductor insulated with fiberglass. Designs utilize factory standard bayonet fittings or threaded fittings that retrofit most plastic processing equipment that is currently on the market. Durex also offers European and Japanese retrofit parts with equivalent color codes for direct replacement in these machines.



Design Features:

- Typical terminations: split leads, spade lugs, or polarized male plugs
- Adjustable to various immersion depths
- Provide fast response times
- Wide variety of sizes and styles
- Custom designs available
- Dependable temperature measurement
- Economical general purpose thermocouples

Typical Applications:

- Extrusion
- Injection Molding
- Blow Molding
- Hot Runner Systems
- Thermoforming
- Custom Die Applications

CODE DEFINITIONS AND TERMINATION TYPES

Thermocouple Type

Thermocouple Type Codes				Limits of Error
E	J	K	T	Standard Limits
2	3	4	8	Special Limits

Sheath Diameter

Code	Diameters
B	.125" or 1/8" O.D.
V	.156" or 5/32" O.D.
C	.188" or 3/16" O.D.
D	.250" or 1/4" O.D.
F	.375" or 3/8" O.D.

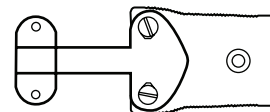
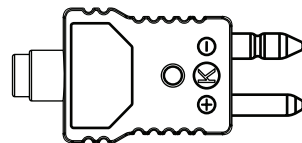
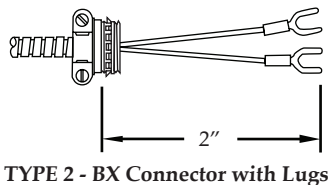
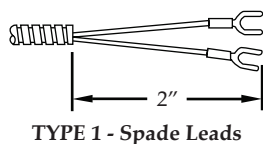
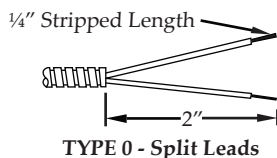
Junction Type

Code	Single Junction
G	Grounded
U	Ungrounded

Code Definitions

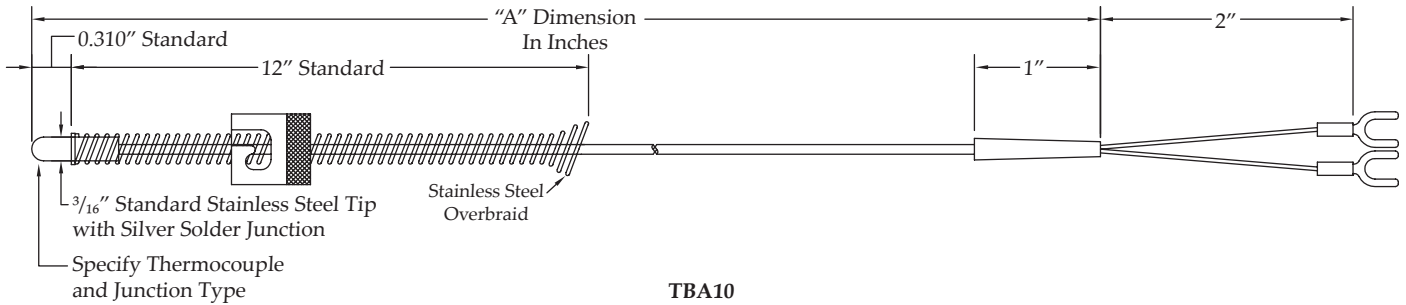
"L" Dimensions				"B" Dimensions				"A" Dimensions		Fractional Dimension Letter Code			
"L" dimensions are specified in whole inches and a single alpha character which represents a fraction. Enter the three digit code as follows:				"B" dimensions are specified in fractions from 1/8" to 1". Use the single alpha character to indicate the tip length. Enter the code as follows:				"A" dimensions are specified in whole inches only. Enter the three digit code as follows:		1/16"	A	11/16"	L
										1/8"	B	3/4"	M
3"	030	10 5/8"	10K							3/16"	C	13/16"	N
4 1/2"	04H	12"	120	1/8"	B	5/8"	K	9"	009	1/4"	D	7/8"	P
6 1/4"	06D	15 3/8"	15F	1/4"	D	3/4"	M	12"	012	5/16"	E	15/16"	R
7 7/8"	07P	17 3/4"	17M	3/8"	F	7/8"	P	36"	036	3/8"	F	1"	S
9 5/8"	09K	22 1/8"	22B	1/2"	H	1"	S	144"	144	7/16"	G	0	No
										1/2"	H	Fraction	
										9/16"	J		
										5/8"	K		

Termination Type Numbers



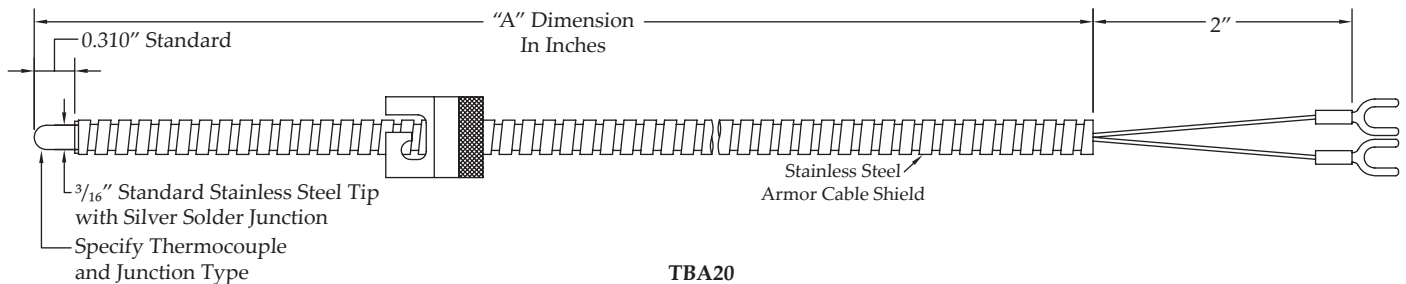
ADJUSTABLE DEPTH THERMOCOUPLE WITH SPRING

The TBA10 thermocouple uses a compression spring and bayonet lockcap which allows this design to adjust to hole depths up to 12" deep. This design also features a stainless steel tip with a silver solder junction for fast response. A tig welded junction is available upon request.



ADJUSTABLE DEPTH THERMOCOUPLE WITH ARMOR

The TBA20 thermocouple uses flexible stainless steel armor cable with a rotating bayonet lockcap on the outside diameter that adjusts to various immersion depths. The armor cable assures maximum protection of the thermocouple element for extension from the process.



Part Number Sequence

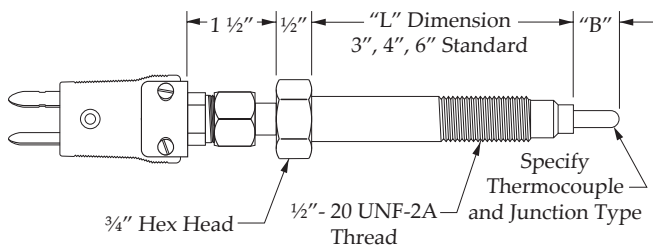
TBA10-JG-0360

See tables on page 54

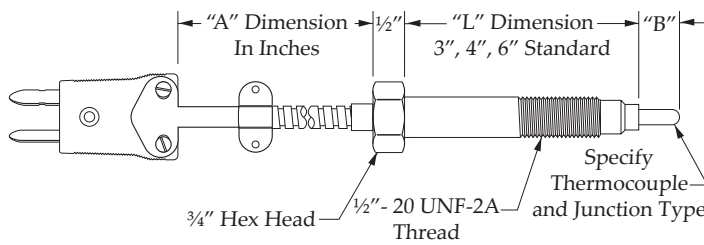
TBA10	-	J	G	-	036	0
Sensor Type & Style No.		Thermocouple Type	Junction Type		"A" Dimension	Termination Number

MELT BOLT THERMOCOUPLE

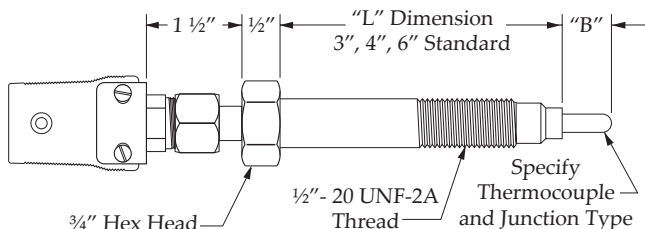
Durex melt bolts are designed for dependable temperature measurement of the plastic melt stream within extruders and injection molding equipment. Standard assemblies are supplied with mineral insulated sensing elements for extended pressure and temperature performance. Optional thermal barriers of Teflon® (500°F) and Mycalex® (900°F) are available upon request.



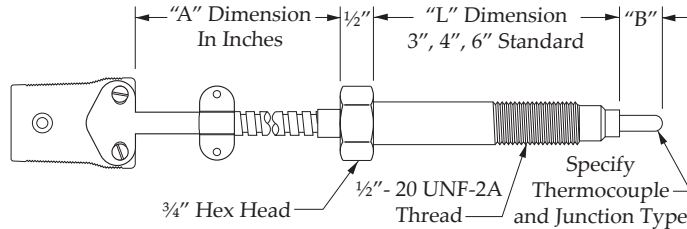
TPM0 - Melt Bolt with Standard Plug



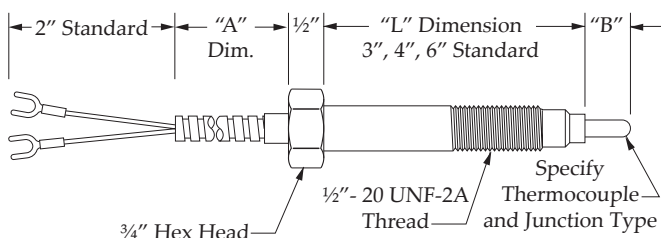
TPM1 - Melt Bolt with Standard Plug
on Stainless Steel Armor



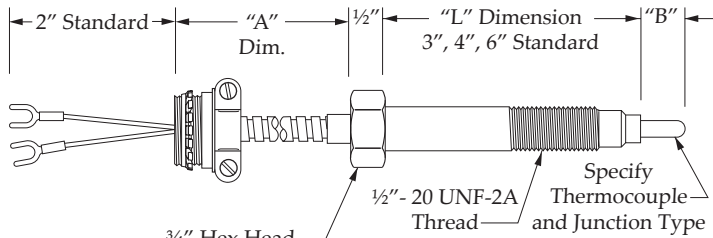
TPM2 - Melt Bolt with Standard Jack



TPM3 - Melt Bolt with Standard Jack
on Stainless Steel Armor



TPM4 - #6 Spade Lugs with
Stainless Steel Armor



TPM5 - #6 Spade Lugs with BX Con-
nector on Stainless Steel Armor

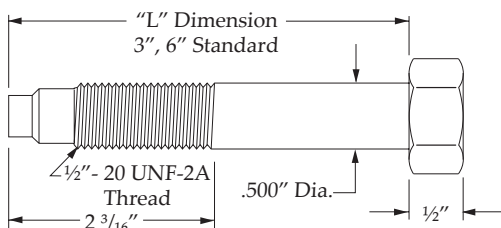
Part Number Sequence

TPM4-JG-030-P012

See tables on page 54

TPM4	-	J	G	-	030	-	P = 7/8"	012
Sensor Type & Style No.		Thermocouple Type	Junction Type		"L" Dimension		"B" Dimension	"A" Dimension

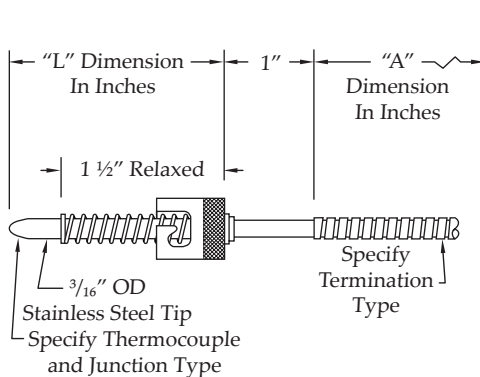
BLANK BOLTS



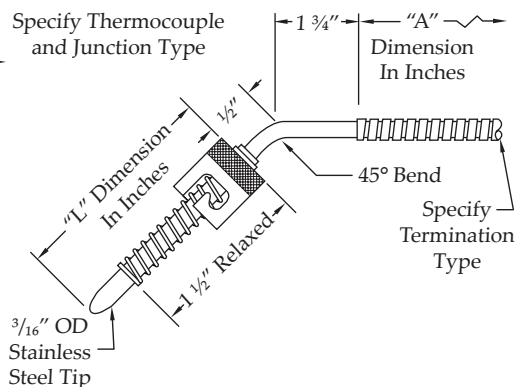
Catalog Number	"L" Dimension
244008	3"
244009	6"

Blank bolt occupies hole when melt bolt is removed.

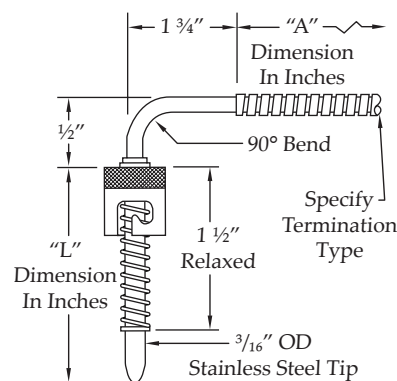
FIXED BAYONET THERMOCOUPLES



TBF00 - Straight Run Thermocouple



TBF45 - 45° Bend Thermocouple



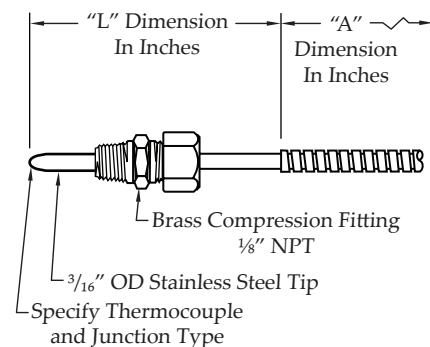
TBF90 - 90° Bend Thermocouple

Part Number Sequence

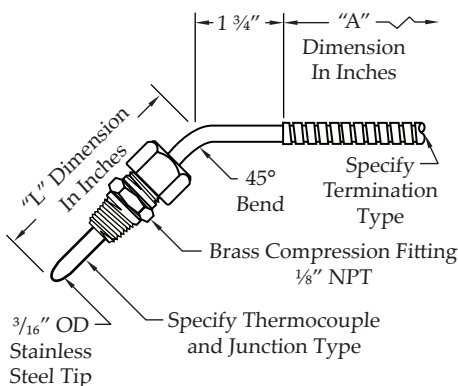
TBF45-JG-060-0241 See tables on page 54

TBF45	-	J	G	-	060	-	024	1
Sensor Type & Style No.		Thermocouple Type	Junction Type		"L" Dimension		"A" Dimension	Termination Type

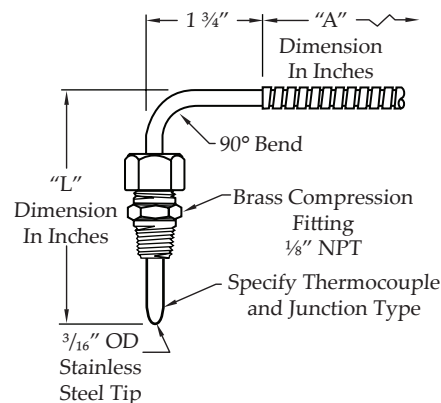
COMPRESSION FITTING THERMOCOUPLE



TCF00 - Straight Run Thermocouple



TCF45 - 45° Bend Thermocouple



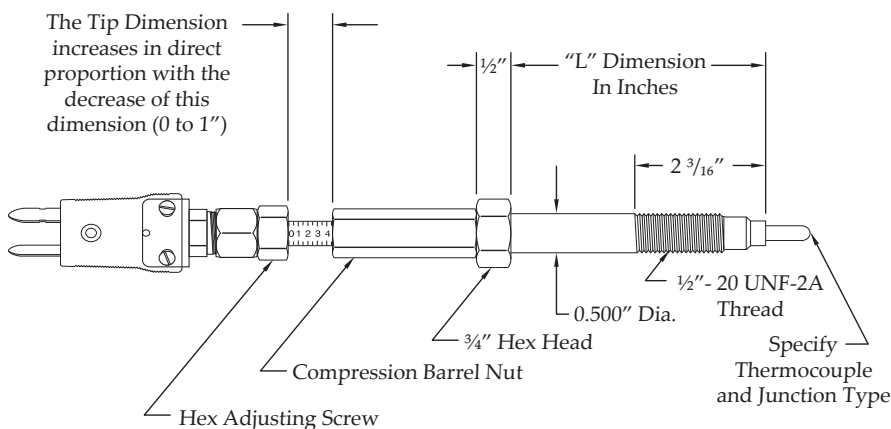
TCF90 - 90° Bend Thermocouple

Part Number Sequence

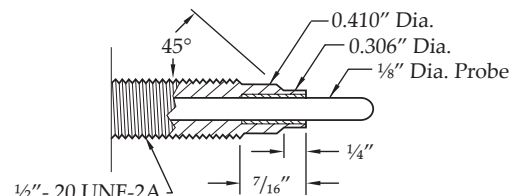
TCF00-JG-030-0361 See tables on page 54

TCF00	-	J	G	-	030	-	036	1
Sensor Type & Style No.		Thermocouple Type	Junction Type		"L" Dimension		"A" Dimension	Termination Type

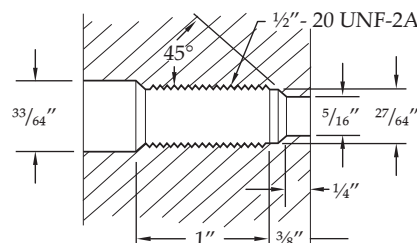
ADJUSTABLE MELT BOLT THERMOCOUPLES



TAM1 - Adjustable Tip Melt Bolt



Bolt Tip Cutaway View



Drill Pattern

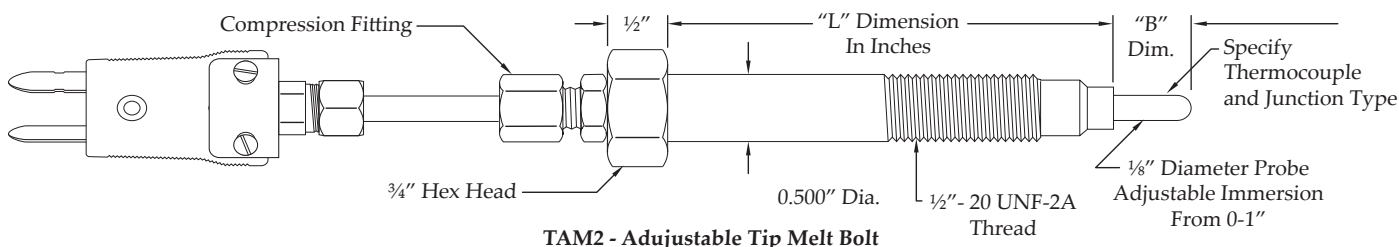
The standard assembly consists of an 1/8" Outer Diameter MgO insulated type "J" thermocouple in a stainless steel sheath. The body is stainless steel with a 1/2" - 20 UNF-2A thread. A thermal barrier reduces heat transfer from body to thermocouple. Other parts include a packing seal, compression barrel nut, hex adjusting screw, and a polarized quick-disconnect male plug. Standard immersion is adjustable from flush to 1". Standard body lengths are 3", 4", and 6" measured from the beginning of wrench flats to the bolt tip. The adjustable plastic melt thermocouple has a movable probe activated by an inner screw mechanism. The probe can be immersed into or withdrawn from the plastic melt stream while the extruder eliminates thermocouple breakage at start-up and prevents hang-up. The thermocouple is self-cleaning; as it is retracted into the body any film formed on it is scraped off.

Part Number Sequence

TAM1	-	J	G	-	040
Sensor Type & Style No.		Thermocouple Type	Junction Type		"L" Dimension (3, 4, 6" are Standard)

TAM1-JG-040

See tables on page 54



TAM2 - Adjustable Tip Melt Bolt

The TAM2 adjustable melt thermocouple features an all stainless steel construction and uses a compression fitting as the mechanism for the adjustment. The TAM2 allows for easy and economical replacement of the mineral insulated thermocouple element.

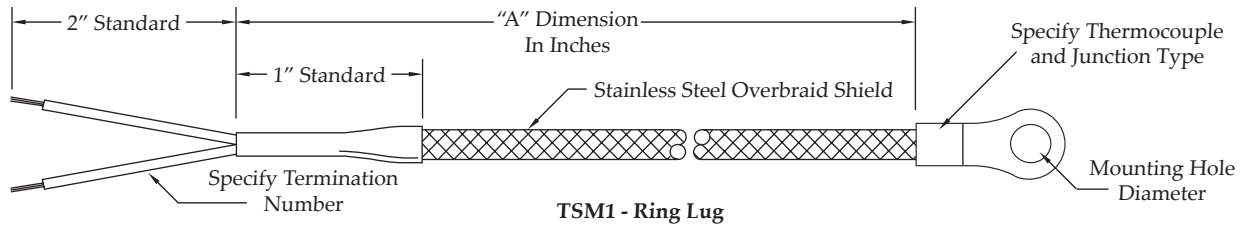
Part Number Sequence

TAM2	-	J	G	-	040	-	M = 3/4"
Sensor Type & Style No.		Thermocouple Type	Junction Type		"L" Dimension (3, 4, 6" are Standard)		"B" Dimension

TAM2-JG-040 - M

See tables on page 54

SURFACE MOUNT THERMOCOUPLES



TSM1 - Ring Lug

Leadwire Conductor is Stranded with Fiberglass Insulation and Stainless Steel Overbraid Shield

Termination Options

Termination Number	Description
0	2" Split Leads
1	#6 Spade Lugs
3	Standard Plug
4	Standard Jack
X	Special, Specify

Mounting Hole Options

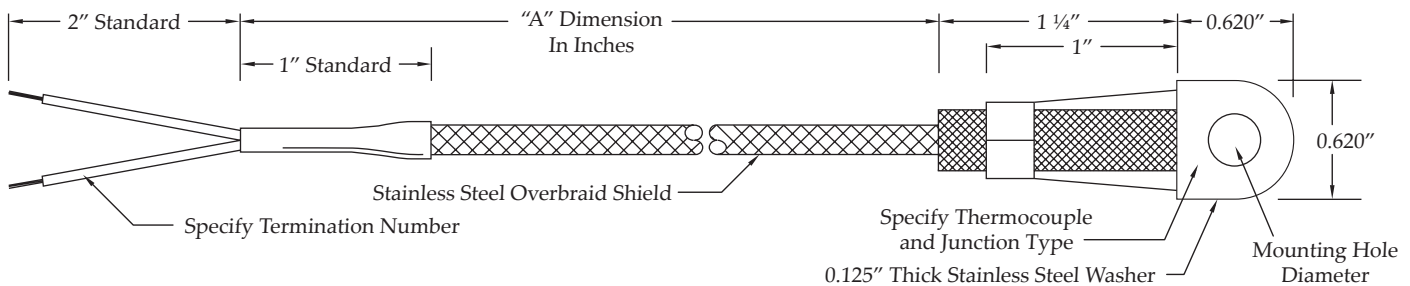
Mounting Hole Type	Stud Size	Hole Diameter
A	No. 6	.144"
B	No. 8	.169"
C	No. 10	.196"
D	1/4"	.266"
E	3/8"	.390"

Part Number Sequence

TSM1-JG-0240C

See tables on page 54

TSM1	-	J	G	-	024	0	C
Sensor Type & Style No.		Thermocouple Type	Junction Type		"A" Dimension	Termination Option	Mounting Hole Diameter



TSM2 - Gasket with Bracket

Leadwire Conductor is Stranded with Fiberglass Insulation and Stainless Steel Overbraid Shield

Termination Options

Termination Number	Description
0	2" Split Leads
1	#6 Spade Lugs
3	Standard Plug
4	Standard Jack
X	Special, Specify

Mounting Hole Options

Mounting Hole Type	Stud Size	Hole Diameter
A	1/4"	9/32"
B	5/16"	11/32"
C	3/8"	13/32"
D	7/16"	15/32"
E	1/2"	17/32"

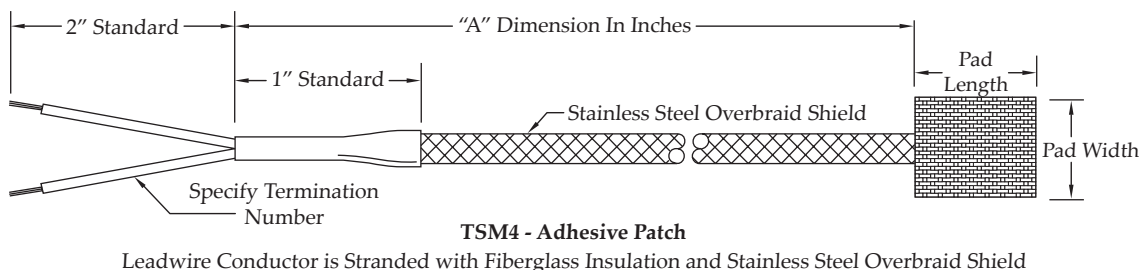
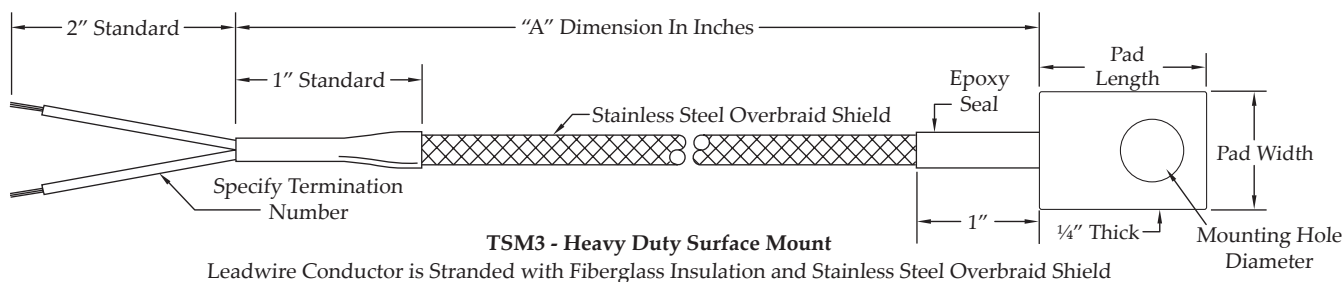
Part Number Sequence

TSM2-JG-0180B

See tables on page 54

TSM2	-	J	G	-	018	0	B
Sensor Type & Style No.		Thermocouple Type	Junction Type		"A" Dimension	Termination Option	Mounting Hole Diameter

SURFACE MOUNT THERMOCOUPLES



Pad Material

Code	Description
B	Brass
K	Kapton
S	Silicone Rubber

Pad Thickness

Code	Description
D	1/4"
F	3/8"
H	1/2"

Pad Width

Code	Description
00M	Standard 3/4"

Pad Length

Code	Description
010	Standard 1"

Leadwire Options

Code	Description
G	Fiberglass Stranded
H	Fiberglass/Stainless Steel Overbraid Stranded
J	Fiberglass/Stainless Steel Armor Stranded

Termination Options

Termination Number	Description
0	2" Split Leads
1	#6 Spade Lugs
3	Standard Plug
4	Standard Jack
X	Special, Specify

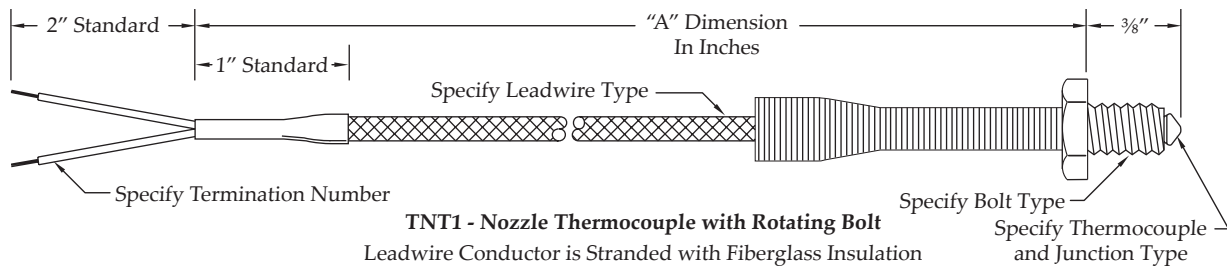
Mounting Hole Options

Mounting Hole Type	Stud Size	Hole Diameter
A	No. 6	.144"
B	No. 8	.169"
C	No. 10	.196"
D	1/4"	.266"
E	3/8"	.390"
P	Mounting Patch	

Part Number Sequence TSM3-JU-BA00M010-024G0C See tables on page 54

TSM3	-	J	U	-	B	A	00M	010	-	024	G	0	C
Sensor Type & Style No.	Thermocouple Type	Junction Type	Pad Material	Pad Thickness	Pad Width	Pad Length	"A" Dim.	Leadwire Option	Termination Option	Mounting Hole Diameter/Patch			

NOZZLE THERMOCOUPLES



Leadwire Type

Leadwire Number	Description
H	Stranded Fiberglass Leadwire with SS Overbraid
J	Stranded Fiberglass Leadwire with SS Armor

Standard assemblies supplied with stranded leadwire conductor. Solid conductor available upon request.

Termination Options

Termination Number	Description
0	2" Split Leads
1	#6 Spade Lugs
3	Standard Plug
4	Standard Jack
X	Special, Specify

Bolt Options

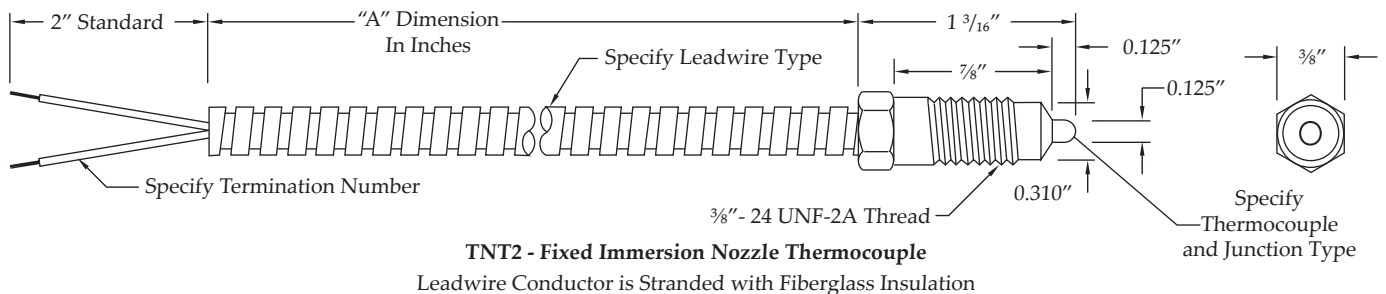
Bolt Type	Description
S	1/4 - 28
Y	M 6 x 1
Z	M 8 x 1.25

Part Number Sequence

TNT1-JG-036H0Y

See tables on page 54

TNT1	-	J	G	-	036	H	0	Y
Sensor Type & Style No.		Thermocouple Type	Junction Type		"A" Dimension	Leadwire Type	Termination Option	Bolt Options



Leadwire Type

Leadwire Number	Description
H	Stranded Fiberglass Leadwire with SS Overbraid
J	Stranded Fiberglass Leadwire with SS Armor

Standard assemblies supplied with stranded leadwire conductor. Solid conductor available upon request.

Termination Options

Termination Number	Description
0	2" Split Leads
1	#6 Spade Lugs
3	Standard Plug
4	Standard Jack
X	Special, Specify

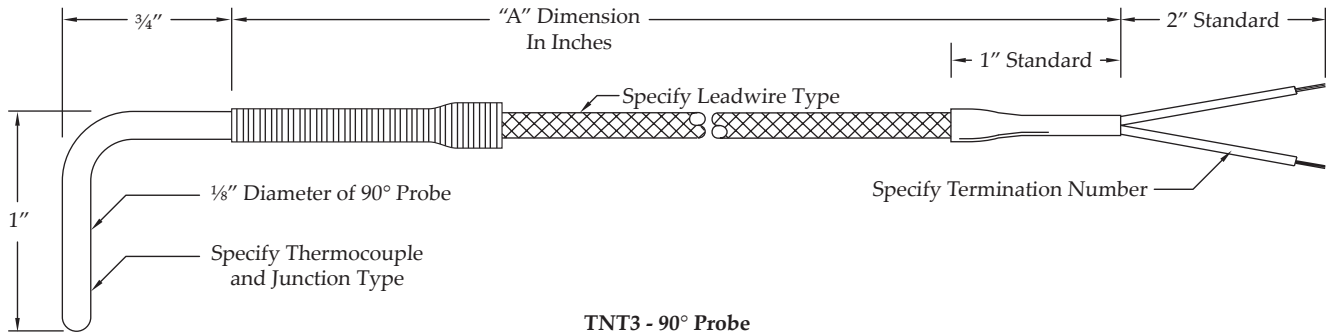
Part Number Sequence

TNT2-JG-048J0Z

See tables on page 54

TNT2	-	J	G	-	048	J	0	Z
Sensor Type & Style No.		Thermocouple Type	Junction Type		"A" Dimension	Leadwire Type	Termination Option	Enter Z

NOZZLE THERMOCOUPLES



Leadwire Type

Leadwire Number	Description
H	Stranded Fiberglass Leadwire with SS Overbraid
J	Stranded Fiberglass Leadwire with SS Armor

Termination Options

Termination Number	Description
0	2" Split Leads
1	#6 Spade Lugs
3	Standard Plug

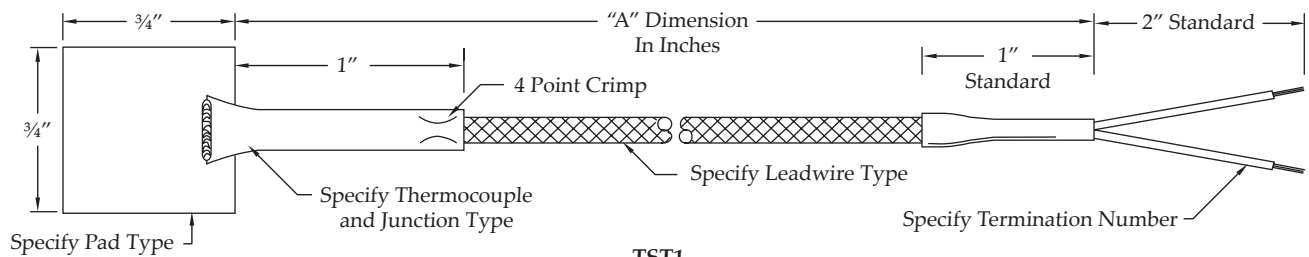
Part Number Sequence

TNT3-JG-072H0Z

See tables on page 54

TNT3	-	J	G	-	072	H	0	Z
Sensor Type & Style No.		Thermocouple Type	Junction Type		"A" Dimension	Leadwire Type	Termination Option	Enter Z

SHIM STOCK THERMOCOUPLES



Leadwire Conductor is Stranded with Fiberglass Insulation

Leadwire Type

Leadwire Number	Description
G	Stranded Fiberglass Leadwire with Fiberglass Jacket
H	Stranded Fiberglass Leadwire with SS Overbraid Shield
J	Stranded Fiberglass Leadwire with SS Armor Cable Shield

Termination Options

Termination Number	Description
0	2" Split Leads
1	#6 Spade Lugs
3	Standard Plug

Pad Options

Pad Type	Description
S	3/4" x 3/4" x .007" Thick
P	1" x 1" x .032" Thick
B	1" x 1" x .060" Thick

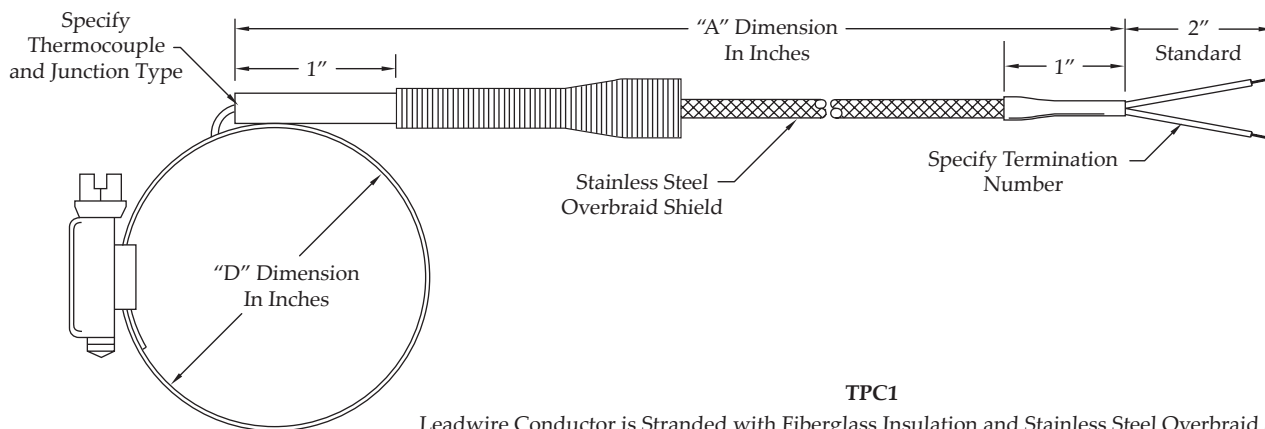
Part Number Sequence

TST1-JG-036G0P

See tables on page 54

TST1	-	J	G	-	036	G	0	P
Sensor Type & Style No.		Thermocouple Type	Junction Type		"A" Dimension	Leadwire Type	Termination Option	Pad Type

PIPE CLAMP THERMOCOUPLES



"D" Dimension Options

"D" Dimension Number	Description
N	½" to ⅞"
1	⅞" to 1 ¼"
2	1 ¼" to 2 ¼"
3	2 ¾" to 3 ⅝"
4	3 ¼" to 4 ¼"
5	4 ¼" to 5 ¼"

Termination Options

Termination Number	Description
0	2" Split Leads
1	#6 Spade Lugs
3	Standard Plug

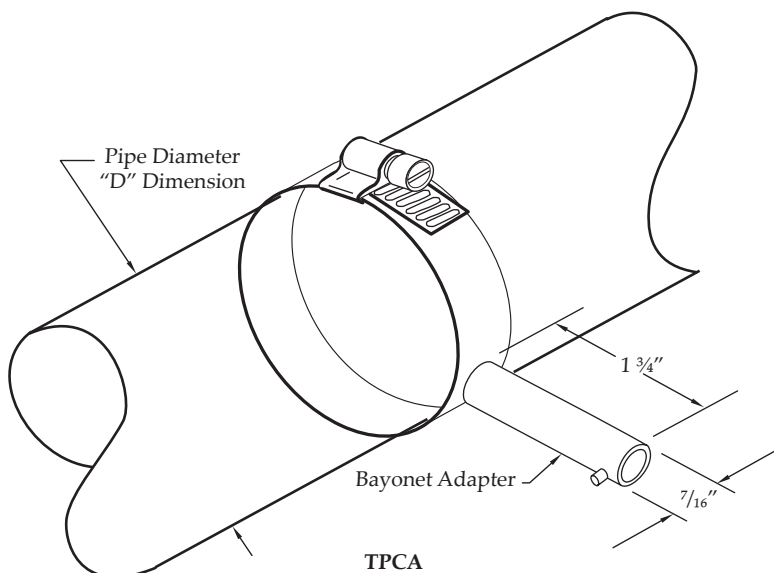
Part Number Sequence

TPC1-JG-04230

See tables on page 54

TPC1	-	J	G	-	042	3	0
Sensor Type & Style No.		Thermocouple Type	Junction Type		"A" Dimension	"D" Dimension	Termination Option

PIPE CLAMP ADAPTERS



"D" Dimension Options

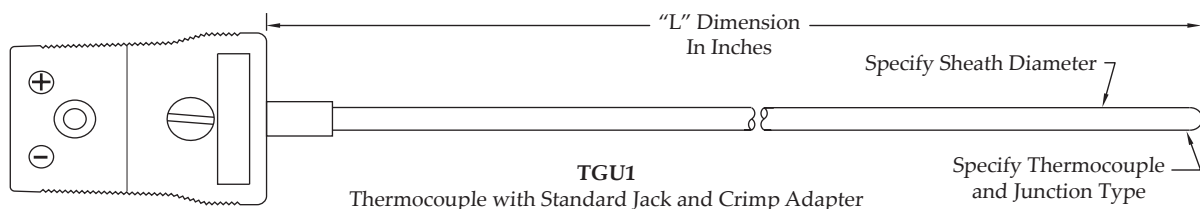
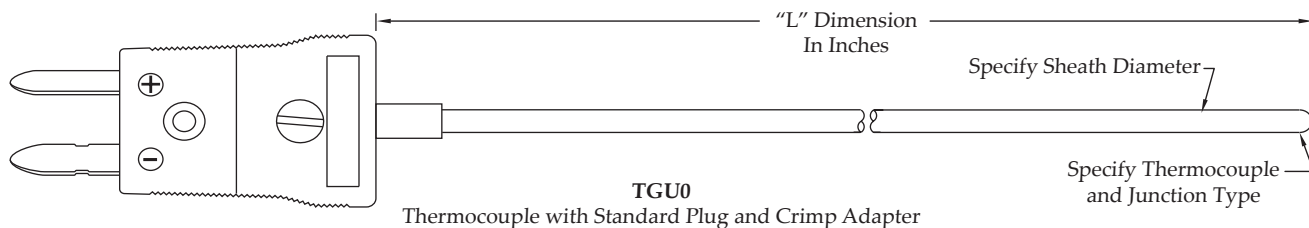
"D" Dimension Number	Description
N	½" to ⅞"
1	⅞" to 1 ¼"
2	1 ¼" to 2 ¼"
3	2 ¾" to 3 ⅝"
4	3 ¼" to 4 ¼"
5	4 ¼" to 5 ¼"

Part Number Sequence TPCA-2

TPCA	-	2
Sensor Type & Style No.		"D" Dimension

GENERAL PURPOSE THERMOCOUPLES

General purpose thermocouples are designed for economical use in a wide variety of applications up to 800°F. Sheath material is 304 stainless steel. Type J (Iron-Constantan) calibration is standard. Other calibrations available upon request.

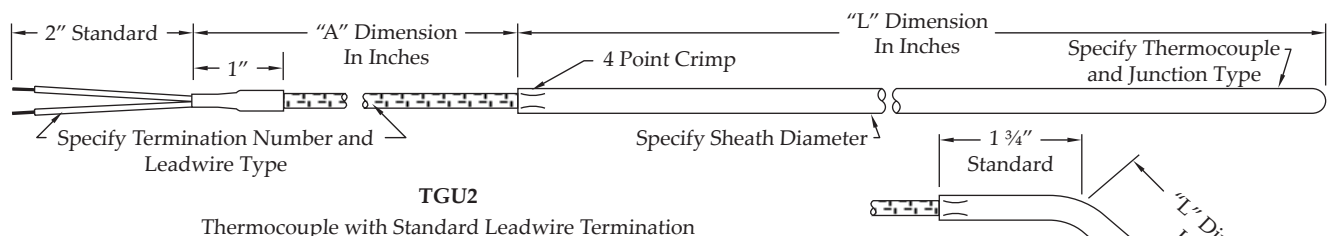


Part Number Sequence

TGU1	-	J	G	-	C (Letter CODE)	12H
Sensor Type & Style No.		Thermocouple Type	Junction Type		Sheath Diameter	"L" Dimension

TGU1-JG-C12H

See tables on page 54



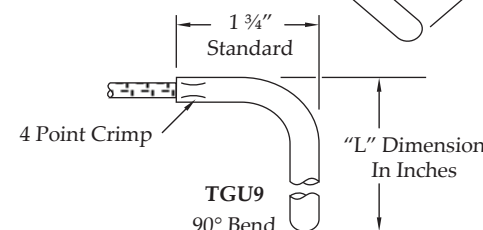
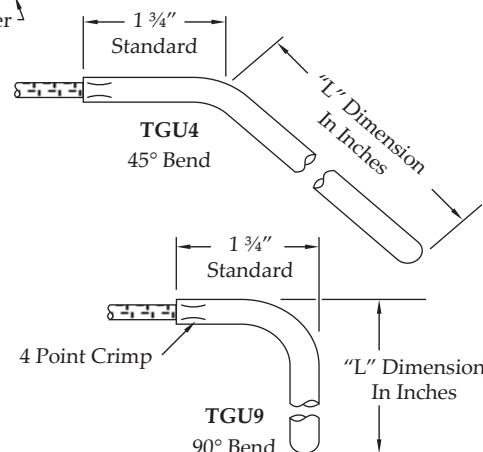
Leadwire Type

Leadwire Number	Description
G	Fiberglass Leadwire with Overall Fiberglass Jacket
H	Stranded Fiberglass Leadwire with SS Overbraid Shield
J	Stranded Fiberglass Leadwire with SS Armor Cable Shield
K	Teflon Leadwire with Overall Teflon Jacket (400°F Max.)

Termination Options

Termination Number	Description
0	2" Split Leads
1	#6 Spade Lugs
3	Standard Plug
4	Standard Jack

Standard assemblies supplied with stranded leadwire conductor. Solid conductor available upon request.



Part Number Sequence

TGU2	-	J	G	-	V = .156"	18D	-	035	H	0
Sensor Type & Style No.		Thermocouple Type	Junction Type		Sheath Diameter	"L" Dimension		"A" Dimension	Leadwire Type	Termination Option

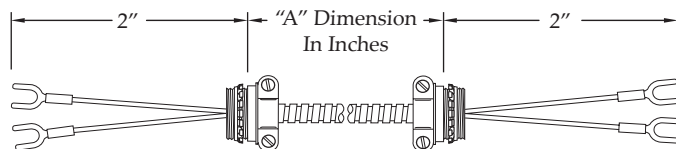
TGU2-JG-V18D-035H0

See tables on page 54

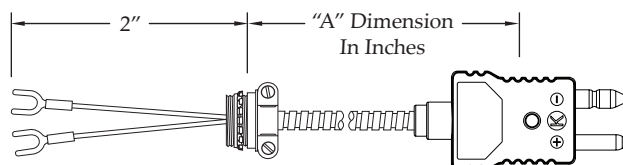
EXTENSION ASSEMBLIES

Standard assemblies are manufactured with fiberglass insulated thermocouple wire and stainless steel armor cable protection. Standard calibration is type "J". Other calibrations and special connections are available upon request.

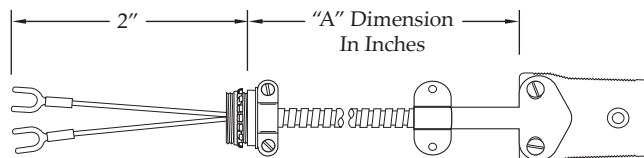
TEX1 Two BX Connectors with #6 Spade Lugs



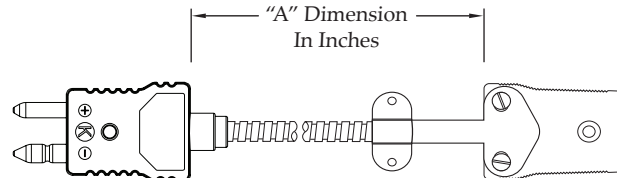
TEX2 BX Connectors with #6 Spade Lugs and Standard Molded Plug



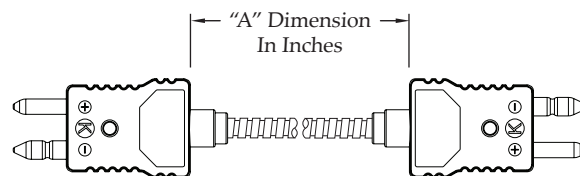
TEX3 BX Connector with #6 Spade Lugs and Standard Jack



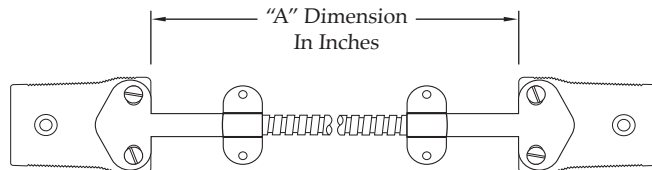
TEX4 Standard Molded Plug and Jack



TEX5 Two Standard Molded Plugs



TEX6 Two Standard Jacks



Part Number Sequence

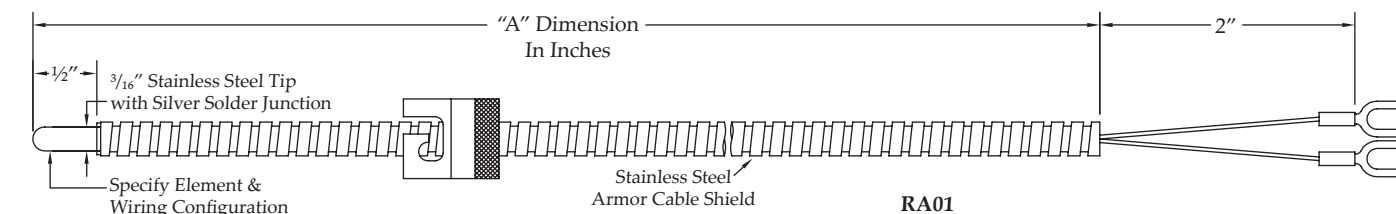
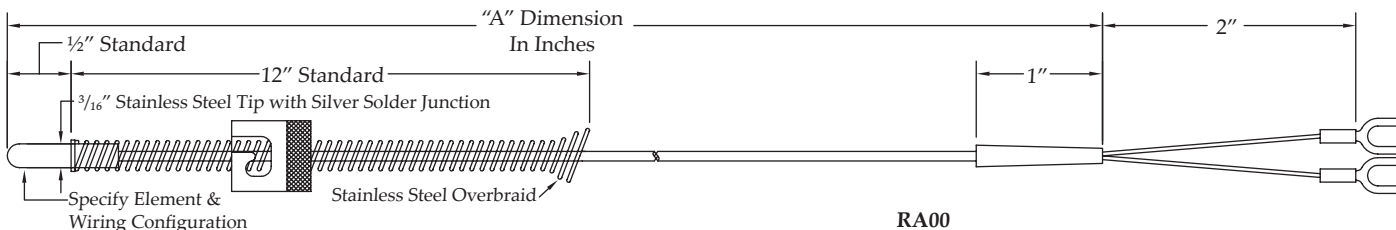
TEX4	-	J	-	048
Sensor Type & Style No.		Thermocouple Type		"A" Dimension

TEX4-J-048

See tables on page 54

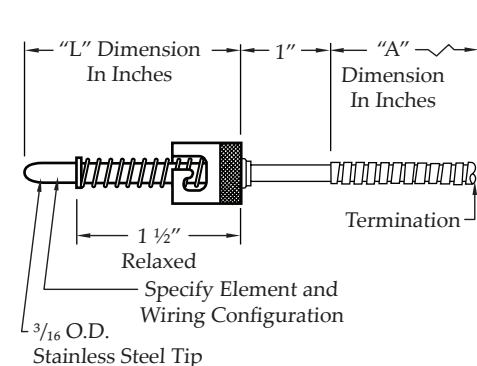
ADJUSTABLE DEPTH RTDs

Resistance Temperature Detectors (RTDs) are continuing to expand as a temperature sensor for plastic machinery applications. All the standard plastics thermocouple designs are available in RTD configurations. The standard element is 100 ohm Platinum, 0.00385 $\Omega/\Omega/^\circ\text{C}$, Class B per IEC 751 and DIN 43760 ($\pm 0.1\%$ at 0°C). All assemblies can be specified as 2, 3, or 4 wire configurations. Please specify requirements.

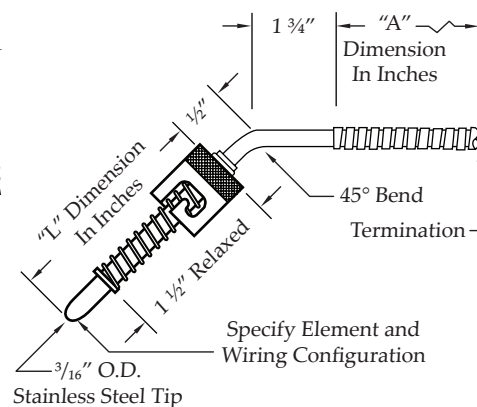


Part Number Sequence					
RA01	-	A	B	-	048
RA01	Next Page	Next Page	See page 54	L = 500°F / M = 900°F	1
Sensor Type & Style No.	Element Type	Wiring Configuration	"A" Dimension	Operating Temperature	Termination Type

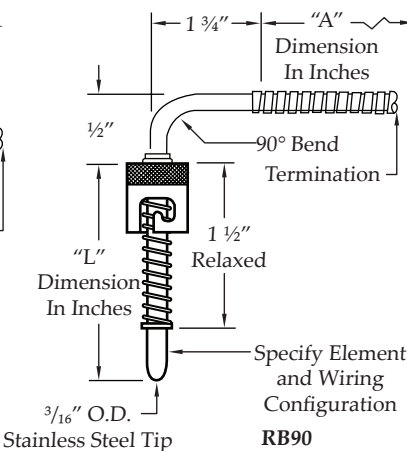
FIXED BAYONET RTDs



RB00



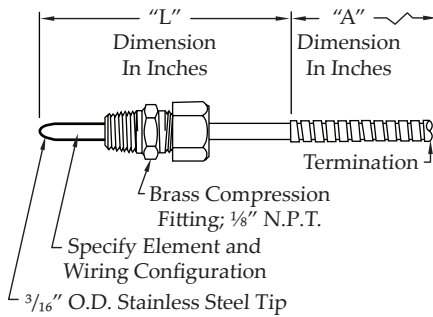
RB45



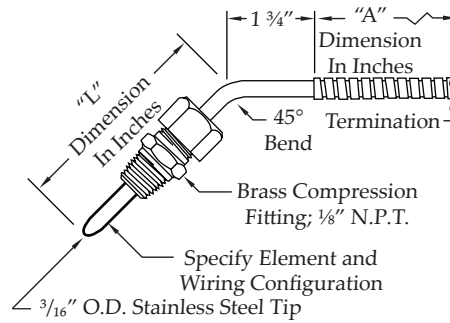
RB90

Part Number Sequence					
RB00	-	G	B	-	09F
RB00	Next Page	Next Page	See page 54	See page 54	L = 500°F / M = 900°F
Sensor Type & Style No.	Element Type	Wiring Configuration	"L" Dimension	"A" Dimension	Operating Temperature

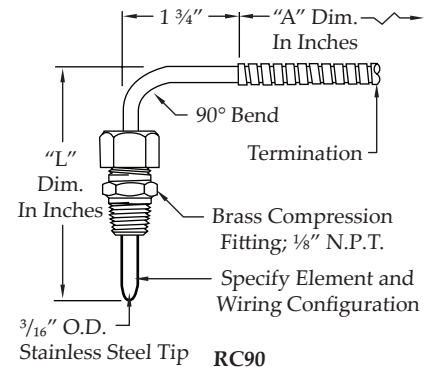
COMPRESSION FITTING RTDs



RC00



RC45



RC90

Part Number Sequence

RC45-ED-04K-028L0

See tables on next page

RC45	-	E	D	-	04K	028	-	L	0
RC45	Table Below	Table Below	See page 54	See page 54	L = 500°F / M = 900°F	Options Below			
Sensor Type & Style No.	Element Type	Wiring Configuration	"L" Dimension	"A" Dimension	Operating Temperature	Termination Type			

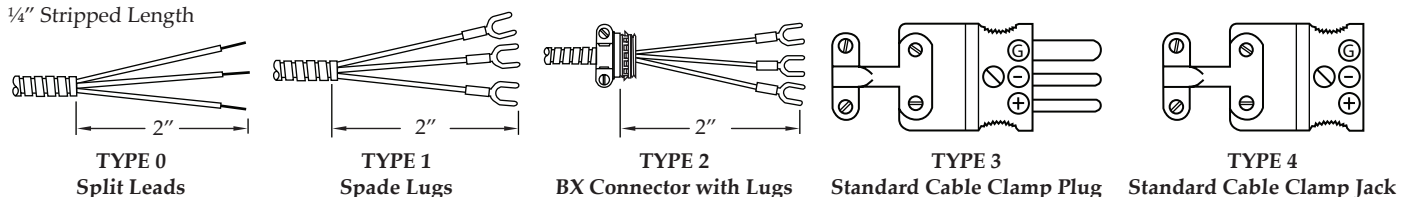
RTD OPTIONS

Code	Element Type
A	100 ohm Platinum, Class B .00385 Coefficient
B	100 ohm Platinum, Class A .00385 Coefficient
E	1000 ohm Platinum, Class B .00385 Coefficient
G	100 ohm Platinum, Class B .00392 Coefficient

Code	Wiring
A	Single, 2 Wire
B	Single, 3 Wire
C	Single, 4 Wire
D	Double, 4 Wire

TERMINATION OPTIONS

1/4" Stripped Length





closing the loop on thermal solutions

Industrial Process Thermocouples

THERMOCOUPLE TECHNICAL DATA - WIRE CODE STANDARDS

Color-codes have been adopted by various national and international standard agencies for identification of thermocouple wire and thermocouple products. In the United States, thermocouple grade wire normally has a brown overall jacket. For Types B, R, and S the color-codes relate to the compensating cable normally used.

Type	United States ANSI 96.1	United Kingdom BS 1843	Germany 43714	France NF C42-323	Japan JIS C1610-1981
E	Purple + Purple - Red	Brown + Brown - Blue	Black + Red - Black		Purple + Red - White
J	Black + White - Red	Black + Yellow - Blue	Blue + Red - Blue	Black + Yellow - Black	Yellow + Red - White
K	Yellow + Yellow - Red	Red + Brown - Blue	Green + Red - Green	Yellow + Yellow - Purple	Blue + Red - White
N	Orange + Orange - Red				
B	Grey + Grey - Red		Grey + Red - Grey		Grey + Red - White
R	Green + Black - Red	Green + White - Blue			Black + Red - White
S	Green + Black - Red	Green + White - Blue	White + Red - White	Green + Yellow - Green	Black + Red - White
T	Blue + Blue - Red	Blue + White - Blue	Brown + Red - Brown	Blue + Yellow - Blue	Brown + Red - White