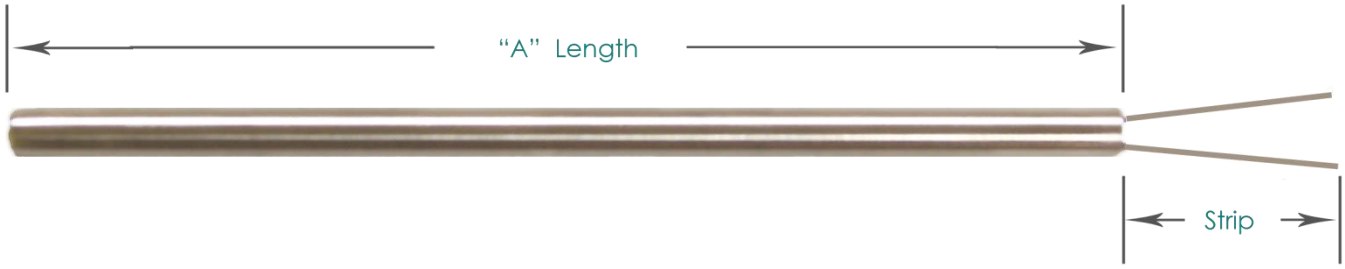
Thermocouple Elements



1	2	3	4		5	6	7	8	9		10
M	A			-						-	

(1) Sheath Termination

Bulk Material, Stripped Bare Lead	A

(2) ANSI / ASTM Calibration

Type "J"	J	Type "T"	T
Type "K"	K	Type "E"	E

(3) Thermocouple Element Options

Limits of Error (Accuracy)	Standard	Special
Single Element (2-wire)	0	1
Duplex Element (4-wire)	4	5
Single, High Purity Insulation	2	3
Duplex, High Purity Insulation	6	7

(4) Junction Type

Exposed	E	Grounded	G	Ungrounded	U

(5) Sheath Diameter (inches)

.040	D	1/8 (.125)	G	1/4 (.250)	K
1/16 (.063)	E	3/16 (.188)	I	3/8 (.375)	N

(6) Sheath Material

Inconel 600	J	304 SST	T	316 SST	W
446 SST	S	310 SST	V		

(7 & 8) Sheath Length ("A")

Whole Inches: Example 06 = 6 inches

(9) Sheath Fractional Length ("A" Fractional)

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

(10) Strip Length

1/4"	A
1/2"	B
3/4"	C
1"	D
2"	E
2-1/2"	F
3"	G

Note: The available strip length options may be limited on small diameter & some duplex configurations due to the fragile nature of the conductors.

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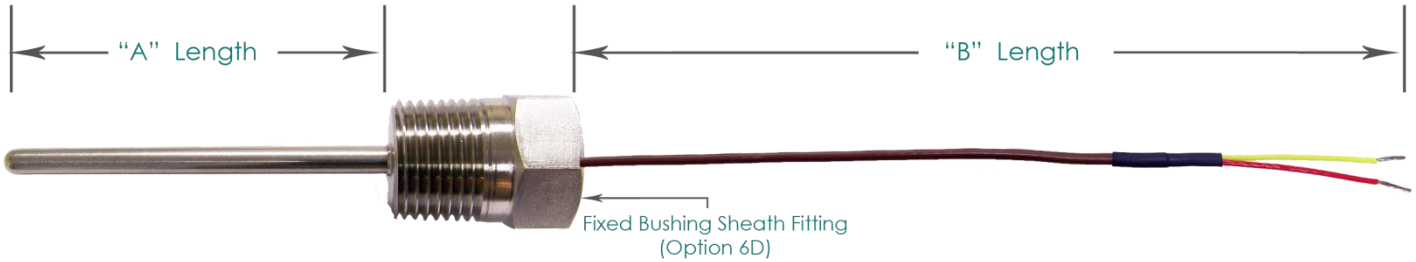
Thermocouple Sheath & Lead Wire Style



		1	2	3		4	5	6	7	8		9	10		11	12	13	14	15		16
M	B				-						-			-						-	

(1) ANSI / ASTM Calibration

Type "J"	J	Type "T"	T
Type "K"	K	Type "E"	E

(2) Thermocouple Element Options

Limits of Error (Accuracy)	Standard	Special
Single Element (2-wire)	0	1
Duplex Element (4-wire)	4	5
Single, High Purity Insulation	2	3
Duplex, High Purity Insulation	6	7

(3) Junction Type

Exposed	E	Grounded	G	Ungrounded	U

(4) Sheath Diameter (inches)

1/16 (.063)	E	3/16 (.188)	I	3/8 (.375)	N
1/8 (.125)	G	1/4 (.250)	K		

(5) Sheath Material

Inconel 600	J	304 SST	T	316 SST	W
446 SST	S	310 SST	V		

(6 & 7) Sheath Length ("A")

Whole Inches: Example 06 = 6 inches

(8) Sheath Fractional Length ("A" Fractional)

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

(9 & 10) Sheath Mounting Fitting

NPT Size →	1/8"	1/4"	1/2"
Fixed Hex Bushing, 316 SST	6A	6B	6D
Fixed Hex Nipple, 316 SST	46	47	48

Note: For a complete listing of sensor mounting options, compatibility, specifications, and ordering instructions, please see page M-?.

(11) Lead Wire Type

Stranded Wire	°C	°F	Code
Fiberglass Insulated Cable	450°C	842°F	D
Fiberglass w/ SST Flex Armor	450°C	842°F	E
Fiberglass w/ SST Over Braid	450°C	842°F	F
Teflon Insulated Cable	200°C	392°F	M
Teflon Cable w/ SST Flex Armor	200°C	392°F	N
Teflon Cable w/ SST Over Braid	200°C	392°F	O
Shielded Teflon Cable	200°C	392°F	P

Note: For a complete list of all wire options, refer to page

(12, 13, & 14) Lead Wire Length Inches ("B")

Whole Inches: Example: 048 = 48 inches

Note: For lead wire beyond the flex armor ("C" length), include length After "B" length. Example: 048(012) = 12" of leads beyond the flex

(15) Lead Wire Termination Options

None	A
Split Leads (2-1/2") / Stripped	B
Split Leads with #8 Spade Lugs	C
Split Leads with 1/4" Push-On Terminals	E
Split Leads with Insulated Wire Sleeves	J
Standard Male Plug (200°C / 382°F)	K
Standard Plug with Mating Jack	L
Standard Female Jack	M
Miniature Male Plug (200°C / 382°F)	Q
Miniature Plug with Mating Jack	R
Miniature Female Jack	S

(16) Special Options

BX Electrical Connector, 1/2"	NA	NA	F
PVC Coating over Flex Armor (Black)	90°C	194°F	J
Teflon Coating over Flex Armor (White)	200°C	392°F	K
Teflon Encapsulated Sheath (Black)	200°C	392°F	T

Note: Standard temperature rating for "MB" Style is 200°C (392°F). Consult factory for higher temperature options.

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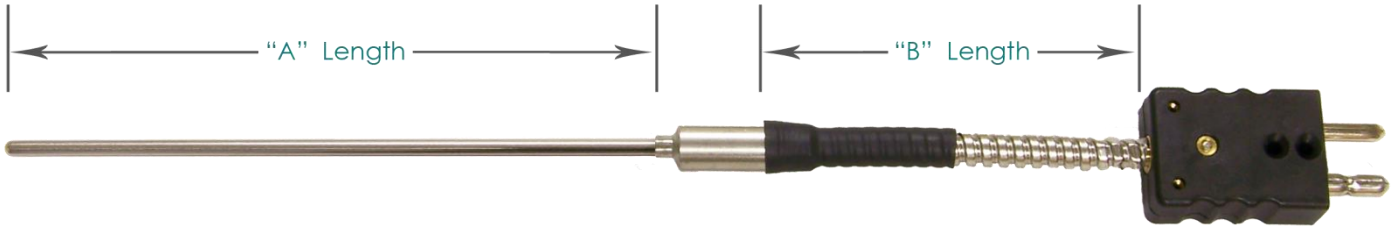
Thermocouple Transition Lead Wire Style

Transition Fitting (Code D & E)



1	2	3	4		5	6	7	8	9		10	11		12	13	14	15	16		17
M				-						-			-						-	

(1) Transition Style

Style	°C	°F	Code
Standard Transition Fitting	200°C	392°F	D
Hi-Temp Transition Fitting	450°C	842°F	E
Transition w/ Relief Spring	200°C	392°F	F
Hi Temp w/ Relief Spring	450°C	842°F	G

(2) ANSI / ASTM Calibration

Type "J"	J	Type "T"	T
Type "K"	K	Type "E"	E

(3) Thermocouple Element Options

Limits of Error (Accuracy)	Standard	Special
Single Element (2-wire)	0	1
Duplex Element (4-wire)	4	5
Single, High Purity Insulation	2	3
Duplex, High Purity Insulation	6	7

(4) Junction Type

Exposed	E	Grounded	G	Ungrounded	U

(5) Sheath Diameter (inches)

.040	D	1/8 (.125)	G	1/4 (.250)	K
1/16 (.063)	E	3/16 (.188)	I	3/8 (.375)	N

(6) Sheath Material

Inconel 600	J	304 SST	T	316 SST	W
446 SST	S	310 SST	V		

(7 & 8) Sheath Length ("A")

Whole Inches: Example 06 = 6 inches

(9) Sheath Fractional Length ("A" Fractional)

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

(10 & 11) Sheath Mounting Fitting

Select fitting from pages M-19 & M-20	
None	00

(12) Lead Wire Type

Stranded Wire	°C	°F	Code
Fiberglass Insulated Cable	450°C	842°F	D
Fiberglass w/ SST Flex Armor	450°C	842°F	E
Fiberglass w/ SST Over Braid	450°C	842°F	F
Teflon Insulated Cable	200°C	392°F	M
Teflon Cable w/ SST Flex Armor	200°C	392°F	N
Teflon Cable w/ SST Over Braid	200°C	392°F	O
Shielded Teflon Cable	200°C	392°F	P

Note: For a complete list of all wire options, refer to page ??

(13, 14, & 15) Lead Wire Length Inches ("B")

Whole Inches: Example: 048 = 48 inches

Note: For lead wire beyond the flex armor ("C" length), include length After "B" length. Example: 048(012) = 12" of leads beyond the flex

(16) Lead Wire Termination Options

None	A
Split Leads (2-1/2") / Stripped	B
Split Leads with #8 Spade Lugs	C
Split Leads with 1/4" Push-On Terminals	E
Split Leads with Insulated Wire Sleeves	J
Standard Male Plug (200°C / 382°F)	K
Standard Plug with Mating Jack	L
Standard Female Jack	M
Miniature Male Plug (200°C / 382°F)	Q
Miniature Plug with Mating Jack	R
Miniature Female Jack	S

(17) Special Options

PVC Coating over Flex Armor (Black)	90°C	194°F	J
Teflon Coating over Flex Armor (White)	200°C	392°F	K
Teflon Encapsulated Sheath (Black)	200°C	392°F	T

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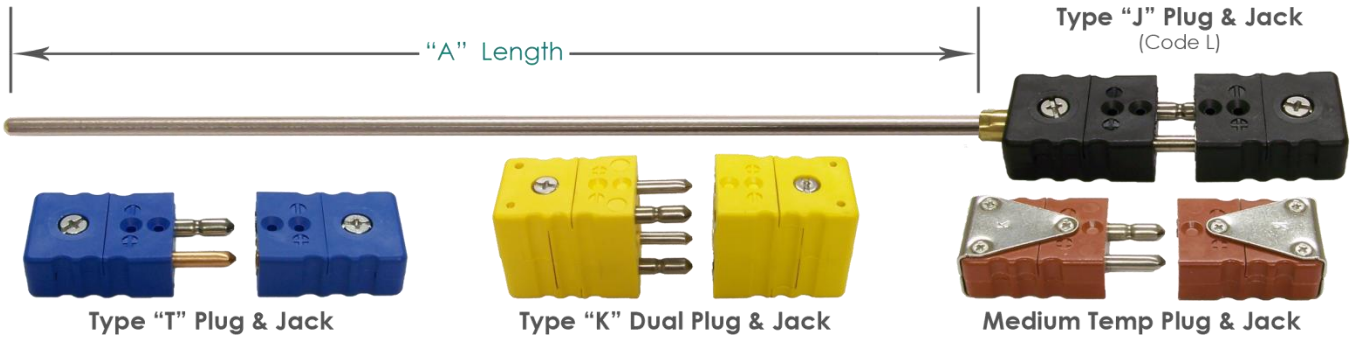
Thermocouple Standard Connectors



1	2	3	4		5	6	7	8	9		10	11		12
M				-						-			-	

(1) Sheath Termination

Connector Option	°C	°F	Code
Standard Male Plug	200°C	392°F	K
Standard Plug with Mating Jack	200°C	392°F	L
Standard Female Jack	200°C	392°F	M
Medium Temp Male Plug	427°C	800°F	N
Medium Temp Plug with Mating Jack	427°C	800°F	O
Medium Temp Female Jack	427°C	800°F	P

(2) ANSI / ASTM Calibration

Type "J"	J	Type "T"	T
Type "K"	K	Type "E"	E

(3) Thermocouple Element Options

Limits of Error (Accuracy)	Standard	Special
Single Element (2-wire)	0	1
Duplex Element (4-wire)	4	5
Single, High Purity Insulation	2	3
Duplex, High Purity Insulation	6	7

(4) Junction Type

Exposed	E	Grounded	G	Ungrounded	U

(5) Sheath Diameter (inches)

.040	D	1/8 (.125)	G	1/4 (.250)	K
1/16 (.063)	E	3/16 (.188)	I	3/8 (.375)	N

(6) Sheath Material

Inconel 600	J	304 SST	T	316 SST	W
446 SST	S	310 SST	V		

(7 & 8) Sheath Length ("A")

Whole Inches: Example 06 = 6 inches

(9) Sheath Fractional Length ("A" Fractional)

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

(10 & 11) Sheath Mounting Fitting

NPT Size →	1/8"	1/4"	1/2"
SST Compression Fitting	1A	1B	1D
Brass Compression Fitting	2A	2B	2D
Re-Adjustable SST Compr. Ftg.	3A	3B	3D

Note: For a complete listing of sensor mounting options, compatibility, specifications, and ordering instructions, please see page M-?.

(12) Special Options

Compression Tube Adapter on Connector	C
Teflon Encapsulated Sheath 200°C / 392°F (Black)	T

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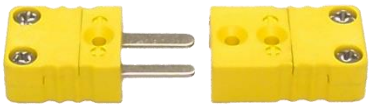
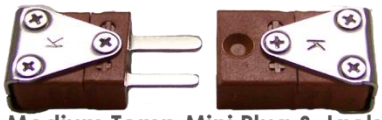
Thermocouple Miniature Connectors


Type "K" Mini Plug & Jack


Type "T" Mini Plug & Jack


Medium Temp Mini Plug & Jack

1	2	3	4		5	6	7	8	9		10	11		12
M				-						-			-	

(1) Sheath Termination

Connector Option	°C	°F	Code
Miniature Male Plug	200°C	392°F	Q
Miniature Plug with Mating Jack	200°C	392°F	R
Miniature Female Jack	200°C	392°F	S

(2) ANSI / ASTM Calibration

Type "J"	J	Type "T"	T
Type "K"	K	Type "E"	E

(3) Thermocouple Element Options

Limits of Error (Accuracy)	Standard	Special
Single Element (2-wire)	0	1
Duplex Element (4-wire)	4	5
Single, High Purity Insulation	2	3
Duplex, High Purity Insulation	6	7

(4) Junction Type

Exposed	E	Grounded	G	Ungrounded	U

(5) Sheath Diameter (inches)

.040	D	1/8 (.125)	G
1/16 (.063)	E	3/16 (.188)	I

(6) Sheath Material

Inconel 600	J	304 SST	T	316 SST	W
446 SST	S	310 SST	V		

(7 & 8) Sheath Length ("A")

Whole Inches: Example 06 = 6 inches

(9) Sheath Fractional Length ("A" Fractional)

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

(10 & 11) Sheath Mounting Fitting

NPT Size →	1/8"	1/4"	1/2"
SST Compression Fitting	1A	1B	1D
Brass Compression Fitting	2A	2B	2D
Re-Adjustable SST Compr. Ftg.	3A	3B	3D

Note: For a complete listing of sensor mounting options, compatibility, specifications, and ordering instructions, please see page M-?.

(12) Special Options

Compression Tube Adapter on Connector	C
Teflon Encapsulated Sheath (Black)	T

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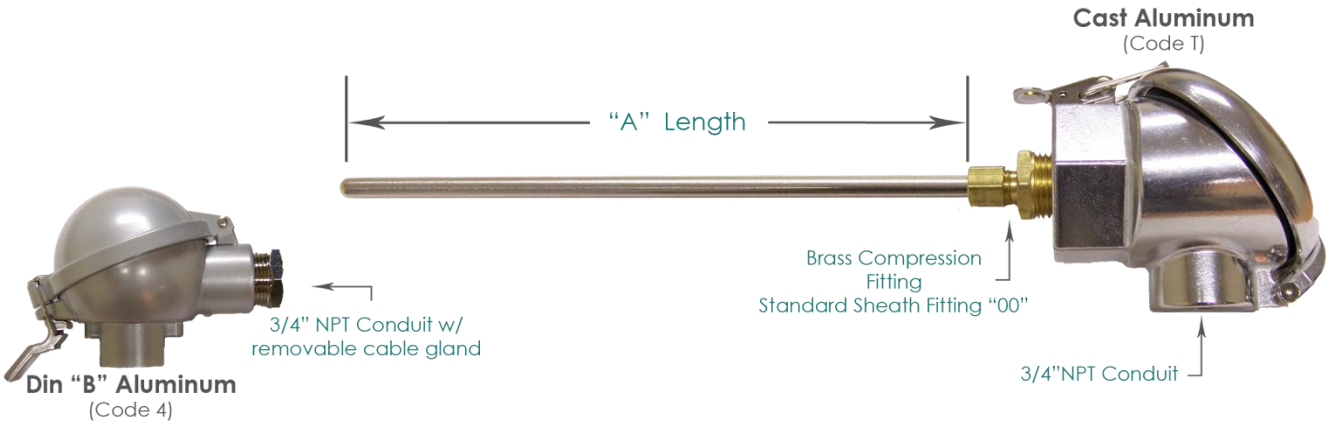
Thermocouple Flip-Top Connection Heads



1	2	3	4		5	6	7	8	9		10	11		12
M				-						-			-	

(1) Sheath Termination

Material	°C	°F	Code
Cast Aluminum	200°C	392°F	T
Din "B" Size Aluminum WP	200°C	392°F	4

(2) ANSI / ASTM Calibration

Type "J"	J	Type "T"	T
Type "K"	K	Type "E"	E

(3) Thermocouple Element Options

Limits of Error (Accuracy)	Standard	Special
Single Element (2-wire)	0	1
Duplex Element (4-wire)	4	5
Single, High Purity Insulation	2	3
Duplex, High Purity Insulation	6	7

(4) Junction Type

Exposed	E	Grounded	G	Ungrounded	U

(5) Sheath Diameter (inches)

1/8 (.125)	G	1/4 (.250)	K
3/16 (.188)	I	3/8 (.375)	N

(6) Sheath Material

Inconel 600	J	304 SST	T	316 SST	W
446 SST	S	310 SST	V		

(7 & 8) Sheath Length ("A")

Whole Inches: Example 06 = 6 inches

(9) Sheath Fractional Length ("A" Fractional)

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

(10 & 11) Sheath Mounting Fitting

NPT Size →	1/8"	1/4"	1/2"
SST Compression Fitting	1A	1B	1D
Brass Compression Fitting	2A	2B	2D
Re-Adjustable SST Compr. Ftg.	3A	3B	3D
Fixed Hex Nipple, 316 SST	46	47	48
Spring Loaded Hex Nipple SST	N/A	N/A	56

Note: For a complete listing of sensor mounting options, compatibility, specifications, and ordering instructions, please see page M-?.

(12) Special Options

Non-Isolated Transmitter, PC Programmable	Q9
Isolated Transmitter, PC Programmable	Q2
Grounding Stud (Screw)	G
Conduit Opening Reducer, 3/4" x 1/2"	R
Teflon Encapsulated Sheath 200°C / 392°F (Black)	T

See the Temperature Transmitter Section for complete transmitter options and specifications.

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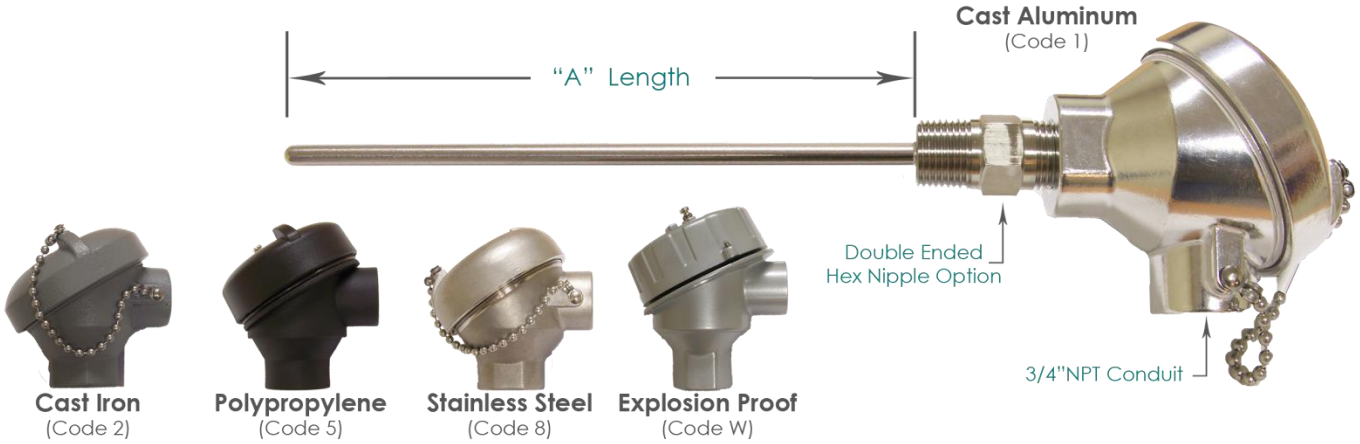
Thermocouple Screw-Cover Connection Heads



1	2	3	4		5	6	7	8	9		10	11		12
M				-						-			-	

(1) Sheath Termination

Material	°C	°F	Rating	Code
Cast Aluminum	200°C	392°F	NEMA 4	1
Cast Iron	200°C	392°F	NEMA 4	2
Black Polypropylene	90°C	194°F	IP65	5
Stainless Steel (316)	200°C	392°F	NEMA4X	8
Explosion Proof *	90°C	194°F	NEMA 4	W

*FM Approved Class I, DIV I, Groups A,B,C,D, T6
Class II, III, DIV I, Groups E, F, G, T6

(2) ANSI / ASTM Calibration

Type "J"	J	Type "T"	T
Type "K"	K	Type "E"	E

(3) Thermocouple Element Options

Limits of Error (Accuracy)	Standard	Special
Single Element (2-wire)	0	1
Duplex Element (4-wire)	4	5
Single, High Purity Insulation	2	3
Duplex, High Purity Insulation	6	7

(4) Junction Type

Exposed	E	Grounded	G	Ungrounded	U

(5) Sheath Diameter (inches)

1/8 (.125)	G	1/4 (.250)	K
3/16 (.188)	I	3/8 (.375)	N

(6) Sheath Material

Inconel 600	J	304 SST	T	316 SST	W
446 SST	S	310 SST	V		

(7 & 8) Sheath Length ("A")

Whole Inches: Example 06 = 6 inches

(9) Sheath Fractional Length ("A" Fractional)

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

(10 & 11) Sheath Mounting Fitting

NPT Size →	1/8"	1/4"	1/2"
SST Compression Fitting	1A	1B	1D
Brass Compression Fitting	2A	2B	2D
Re-Adjustable SST Compr. Ftg.	3A	3B	3D
Fixed Hex Nipple, 316 SST	46	47	48
Spring Loaded Hex Nipple SST	N/A	N/A	56

Note: For a complete listing of sensor mounting options, compatibility, specifications, and ordering instructions, please see page M-?.

(12) Special Options

Non-Isolated Transmitter, PC Programmable	Q9
Isolated Transmitter, PC Programmable	Q2
Grounding Stud (Screw)	G
Conduit Opening Reducer, 3/4" x 1/2"	R
Teflon Encapsulated Sheath 200°C / 392°F (Black)	T

See the Temperature Transmitter Section for complete transmitter options and specifications.

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Thermocouple Miniature Connection Heads

Miniature Bakelite
(Code X)

Plastic Open Disk
(Code z)

1	2	3	4		5	6	7	8	9		10	11		12
M				-						-			-	

(1) Sheath Termination

Material	°C	°F	Code
Miniature Aluminum	200°C	392°F	Y
Miniature Bakelite	200°C	392°F	X
Plastic Open Disk	200°C	392°F	Z

(2) ANSI / ASTM Calibration

Type "J"	J	Type "T"	T
Type "K"	K	Type "E"	E

(3) Thermocouple Element Options

Limits of Error (Accuracy)	Standard	Special
Single Element (2-wire)	0	1
Duplex Element (4-wire)	4	5
Single, High Purity Insulation	2	3
Duplex, High Purity Insulation	6	7

(4) Junction Type

Exposed	E	Grounded	G	Ungrounded	U

(5) Sheath Diameter (inches)

1/8 (.125)	G	1/4 (.250)	K
3/16 (.188)	I	3/8 (.375)	N

(6) Sheath Material

Inconel 600	J	304 SST	T	316 SST	W
446 SST	S	310 SST	V		

(7 & 8) Sheath Length ("A")

Whole Inches: Example 06 = 6 inches

(9) Sheath Fractional Length ("A" Fractional)

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

(10 & 11) Sheath Mounting Fitting

NPT Size →	1/8"	1/4"	1/2"
SST Compression Fitting	1A	1B	1D
Brass Compression Fitting	2A	2B	2D
Re-Adjustable SST Compr. Ftg.	3A	3B	3D
Fixed Hex Nipple, 316 SST	46	47	48
Spring Loaded Hex Nipple SST	N/A	N/A	56

Note: For a complete listing of sensor mounting options, compatibility, specifications, and ordering instructions, please see page M-?.

(12) Special Options

Non-Isolated Transmitter, PC Programmable	Q9
Isolated Transmitter, PC Programmable	Q2
Grounding Stud (Screw)	G
Conduit Opening Reducer, 3/4" x 1/2"	R
Teflon Encapsulated Sheath 200°C / 392°F (Black)	T

See the Temperature Transmitter Section for complete transmitter options and specifications.

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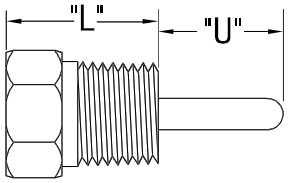
SHEATH MOUNTING FITTINGS

Fixed Brazed or Welded Bushings

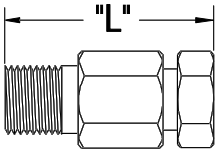
Code	Description	NPT	"L"
6A	316 Stainless Steel	1/8	.80
6B	316 Stainless Steel	1/4	.81
6D	316 Stainless Steel	1/2	1.09
6E	316 Stainless Steel	3/4	1.20
7A	Brass	1/8	.80
7B	Brass	1/4	.96
7D	Brass	1/2	1.20

Insert "U" length
Ex. 6 D04 = 4" "U" length

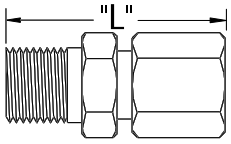


COMPRESSION FITTINGS

One-time Adjustable*			Available Sizes and "L" Length				
Code	Description	NPT	1/16"	1/8"	3/16"	1/4"	3/8"
1A	Stainless Steel	1/8	1.27	1.24	1.29	1.29	N/A
1B	Stainless Steel	1/4	1.22	1.40	1.43	1.49	1.57
1D	Stainless Steel	1/2	N/A	1.66	N/A	1.76	1.82
2A	Brass	1/8	1.03	1.02	1.10	1.15	N/A
2B	Brass	1/4	1.22	1.40	1.18	1.24	1.28
2D	Brass	1/2	1.40	1.35	1.25	1.44	1.53



Re-Adjustable*			Available Sizes and "L" Length				
Code	Description	NPT	1/16"	1/8"	3/16"	1/4"	3/8"
3A	Stainless Steel	1/8	1.21	1.21	1.21	N/A	N/A
3B	Stainless Steel	1/4	N/A	1.40	1.43	2.50	2.50
3D	Stainless Steel	1/2	N/A	1.66	N/A	1.76	1.82

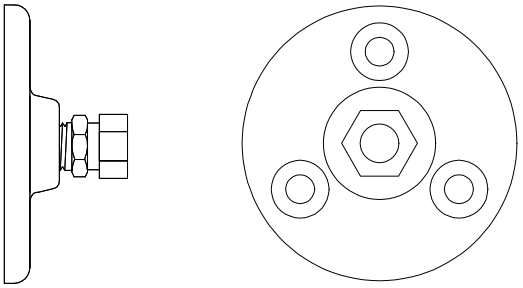


NOTE: All Re-adjustable fittings contain Teflon ferrules standard.
Consult Sales for Neoprene or Lava ferrules

Mounting Flanges*

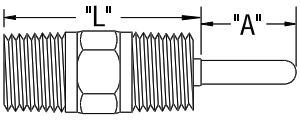
Code	Description
25	Flange w/ Brass Compression, Adjustable
26	Flange w/SS Compression, Adjustable

*** NOT AVAILABLE WITH TEFLON COATED SHEATH!**



Double Ended Hex Nipples

Code	Description	NPT	"L"	Compatible with Head Order Codes
45	Steel, brazed on	1/2	2.10	T, V, W, 1, 2, 3, 4, 5, 8
46	Stainless Steel (316SS)	1/8	1.01	T, V, X, Y, 1
47	Stainless Steel (316SS)	1/4	2.10	T, V, X, Y, 1
48	Stainless Steel (316SS)	1/2	2.10	T, V, W, 1, 2, 3, 4, 5, 8
55	Steel, spring loaded	1/2	2.10	T, V, 1, 2, 3, 4, 5, 8
56	Stainless Steel, spring loaded	1/2	2.10	T, V, 1, 2, 3, 4, 5, 8
57	Stainless Steel, self contained spring loaded (1/4" sheath only)	1/2	2.50	T, V, W, 1, 2, 3, 4, 5, 8
60	Stainless Steel (316SS)	3/4	2.50	T, V, W, 1, 2, 3, 4, 5, 8
61	Stainless Steel (316SS)	1	2.50	T, V, W, 1, 2, 3, 4, 5, 8

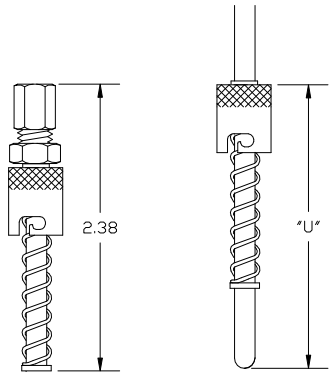


SHEATH MOUNTING FITTTINGS and BEND OPTIONS

Bayonet Fittings

Code	Description	Available Sheath Sizes
27	Adjustable Bayonet Fitting	1/8
28	Re-Adjustable Bayonet Fitting	1/8
29	Fixed Bayonet Fitting	1/8, 3/16, 1/4

* Insert "U" length
Ex. 2904 = 4" "U" length



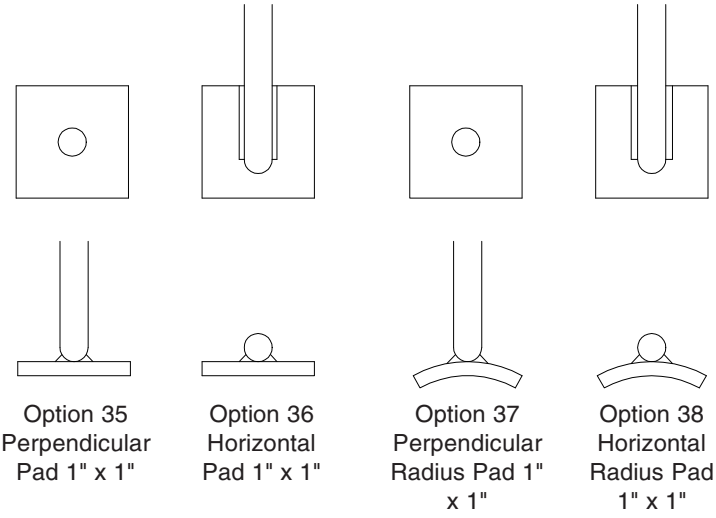
Adjustable/ Re-Adjustable Bayonet Fitting

Fixed Bayonet Fitting

Weld Pads

Code	Description
35	Perpendicular Pad, 316 SS, 1'' x 1"
36	Horizontal Pad, 316 SS, 1" x 1"
37*	Perpendicular Radius Pad*, 316 SS, 1" x 1"
38*	Horizontal Radius Pad*, 316 SS, 1" x 1"

* Specify Radius (Ex. 37(2)=2"R)



Option 35 Perpendicular Pad 1" x 1"

Option 36 Horizontal Pad 1" x 1"

Option 37 Perpendicular Radius Pad 1" x 1"

Option 38 Horizontal Radius Pad 1" x 1"

Sheath Bends

Code	Description
A*	90° Bend
B*	45° Bend

* Insert "U" Length
Ex. A04=4" "U" Length