

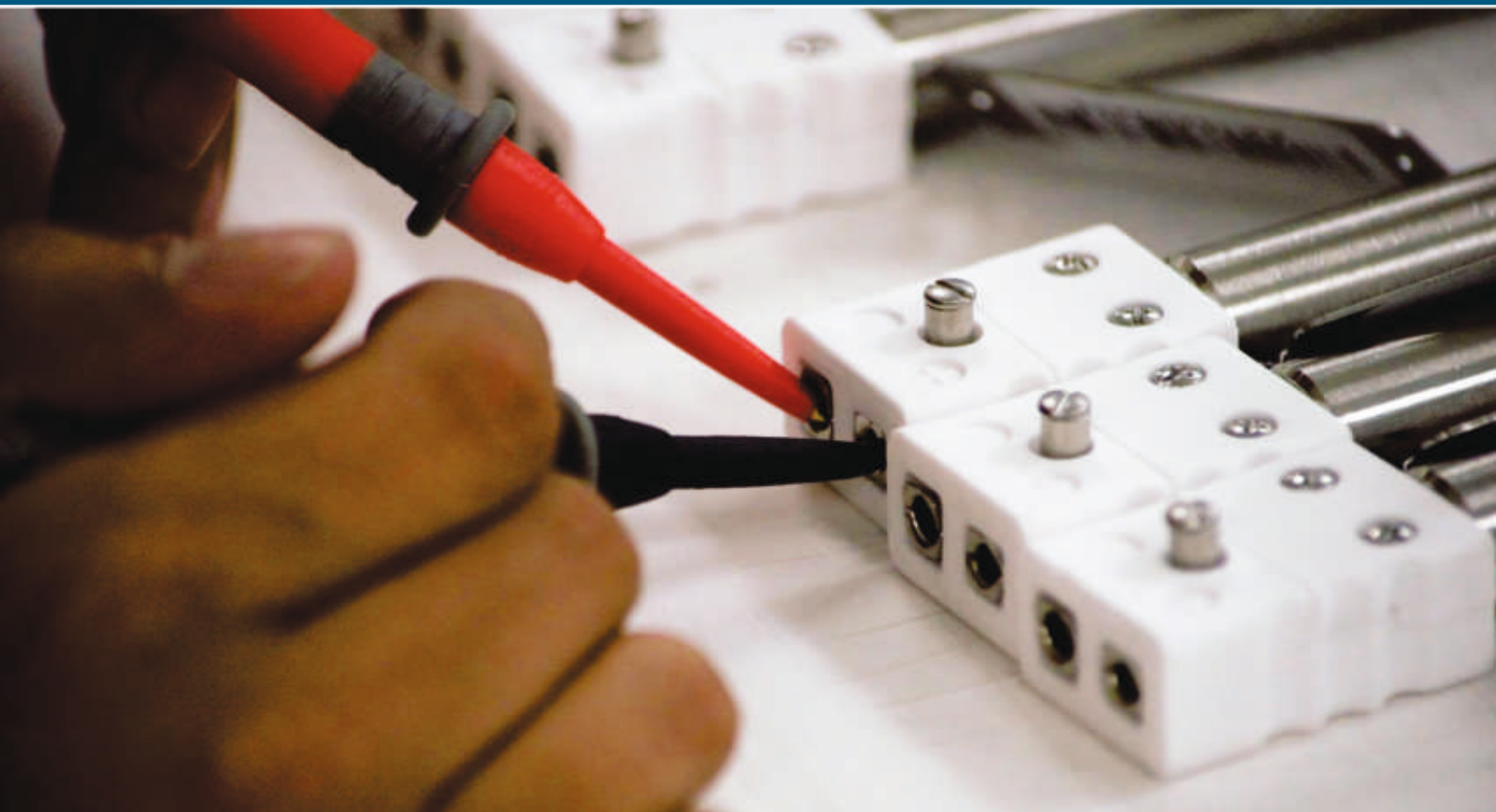


THERMO ELECTRIC

COTEMP SENSING

Temperature Measurement

Innovative Solutions **&** Lasting Relationships



PRODUCT GUIDE



Temperature measurement is paramount to optimizing any operations process yield. To trust their applications, operators must trust the quality of their temperature sensors. At Thermo Electric, it's our mission to be our customer's trusted worldwide expert in protecting their assets through superior temperature measurement.

Established in 1941, Thermo Electric is specialized in the design and manufacturing of premium temperature measurement solutions & services. Its products and solutions have been tested, trusted, and used by many major industry leaders. Engineering expertise, manufacturing efficiency, and product quality are the heart of our corporate model. We are committed to building lasting relationships through accurate and timely delivery of top quality products and customized solutions.

THERMO ELECTRIC proudly serves a worldwide customer base with a high level of proximity and top class consistency. All of our locations design and manufacture temperature sensing solutions according to the same techniques that have been proven and developed at our US headquarters for more than 85 years.



MORE THAN JUST A SENSOR

At Thermo Electric, we offer an array of products, including Thermocouples, RTD's, Multipoint Sensors, Tube Skin Sensors, Thermowells, Instrumented Wafers, Specialty Wire, Cable, and Connectors. In addition, we include a wide range of complimentary accessories, customized components, and on-site services.

THERMO ELECTRIC offers more than **50,000** sensor variations and shipped more than **20 MIL** sensors around the world

Thermocouples RTD's	IMMERSIONS 	INDUSTRIALS 	TUBESKINS 	WAFERS 
SCOPE	Gas & steam turbines Engines Renewable energy Power Industry	Process Power Industry Pipe linesVessels	Petrochemical plants Boilers Super heater tubes	Rapid thermal processing Rapid thermal annealing Post exposure back
SPECIALS	HIGH PRESSURE SENSORS-MULTIPOINTS-CUSTOM DESIGN			
ACCESSORIES	PROTECTION WELLS-TERMINAL PANELS-CONNECTORS-WIRES & CABLES			
SERVICES	CUSTOMIZATION & INNOVATION-CALIBRATION-TESTING-SITE SERVICES			
QUALITY ENGINEERING EXPERTISE SERVICES				



WE ARE
DESIGNED
ACCURACY



WE ARE
TRUSTED
EXPERTISE



WE ARE
GLOBAL
EXPERIENCE



WE ARE
ON-TIME
EXECUTION



WE ARE
PREMIUM
QUALITY



WE ARE
ENGINEERING
INNOVATION

PRODUCT GUIDE

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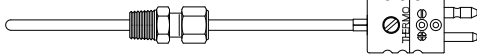
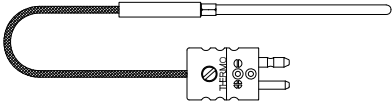
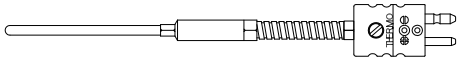
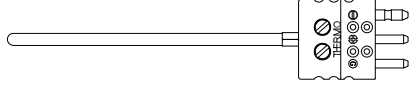
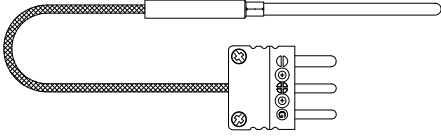
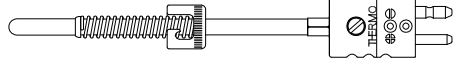
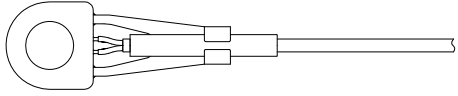
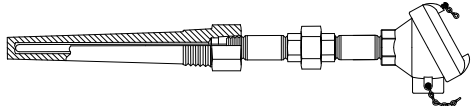
S.No.	Content	Reference Pictures	Page
1	IMMERSION THERMOCOUPLES - Available in Type J, K, T, E, and N calibrations with measuring junctions of grounded, ungrounded, or exposed loop. - Sheath sizes range from 1/25" to 3/8" in diameter, including 3 & 6mm metric, in 304, 316, and 310 stainless steel. Inconel 600 can be specified for high temperature applications. - Bare ends or factory installed quick coupling connectors and optional compression fitting can be supplied.		4
2	IMMERSION THERMOCOUPLES WITH LEAD WIRE - Same options as above but with a lead wire extension joined to MIMS cable by way of a sealed transition. - Lead wire types include fiberglass with or without stainless steel overbraid, PVC, and TEFLON.		
3	IMMERSION THERMOCOUPLES WITH ARMORED LEAD WIRE Same options as above but with flexible armor over fiberglass or PVC lead wire types		
4	IMMERSION RTD's - Standard single (3-Wire) or duplex (6-Wire) configuration, Class B accuracy, 316 stainless steel sheath. - Sheath sizes range from 3mm to 1/4" in diameter with optional low to high temperature construction. - Upgradeable to Class A accuracy and optional 2-Wire or 4-Wire configuration. - Lead wire types include both fiberglass and TEFLON with optional armor overall. - Bare ends or factory installed quick coupling connectors are available terminations. - Second element may be used as a spare, for testing purposes, or as a connection to a second instrument.	 	5
5	BAYONET THERMOCOUPLES - Standard spring loaded with twisting bayonet locking cap, 3/16" diameter sheath, grounded construction. - Available in Type J, K, and T calibrations and can include 45 or 90 degree bends in sheath. - Lead wire types include fiberglass, PVC, and TEFLON with optional armor overall on fiberglass or PVC. - Bare ends or factory installed quick coupling connectors are available terminations.		6
6	GASKET THERMOCOUPLES - Wire or high temperature MIMS cable construction with copper or stainless steel gasket options in a variety of bolt sizes. - Available in Type J, K, T, E, and N calibrations with sheath sizes for high temp. ranging from 1/25" to 1/4" in diameter. - Wire type gaskets are grounded, but high temperature gasket assemblies can be ungrounded as well. - Lead wire types include fiberglass, PVC, and TEFLON with optional armor overall on fiberglass or PVC. - Bare ends or factory installed quick coupling connectors are available terminations.		7
7	INDUSTRIALS WITH THREADED, SOCKET, WELD-IN THERMOWELLS - Aluminum, stainless steel, or cast iron connection heads available with nipple or nipple/union/nipple head extensions. - Spring loaded standard, available in Type J, K, T, E and N calibrations or low to high temperature RTD construction. - Sheath sizes of 6mm or 1/4" diameter, grounded or ungrounded thermocouples, single or duplex junction. - Threaded, socket, and weld-in thermowells available in a variety of sizes, shank styles, and materials.		8

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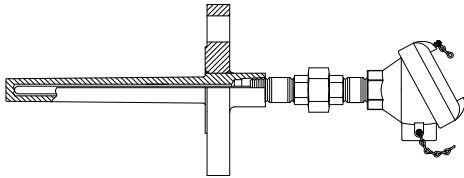
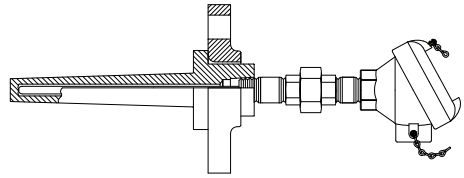
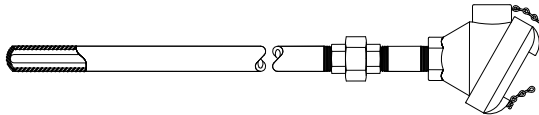
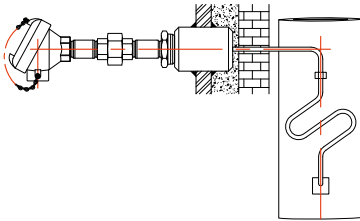
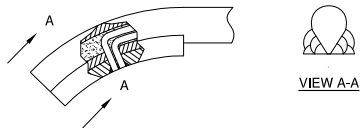
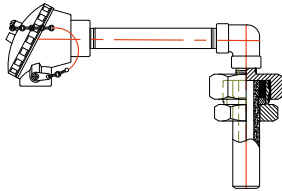
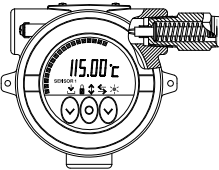
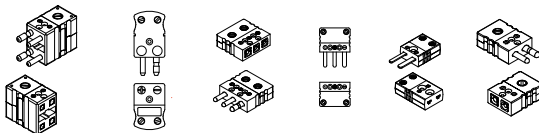
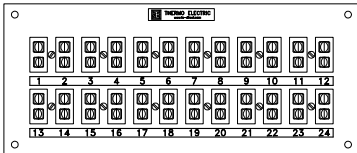
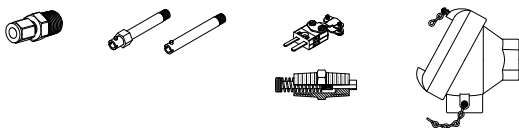
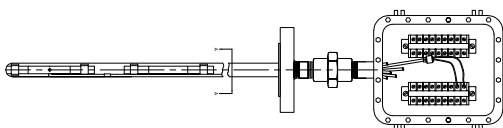
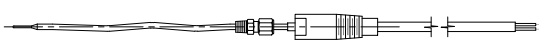
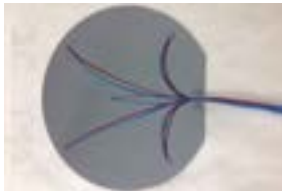
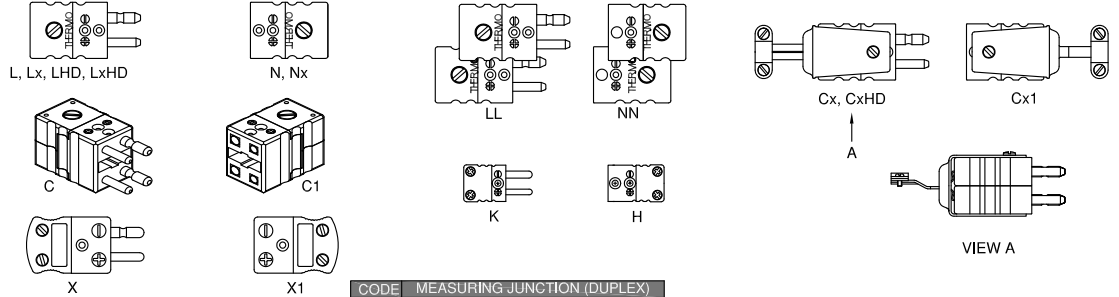
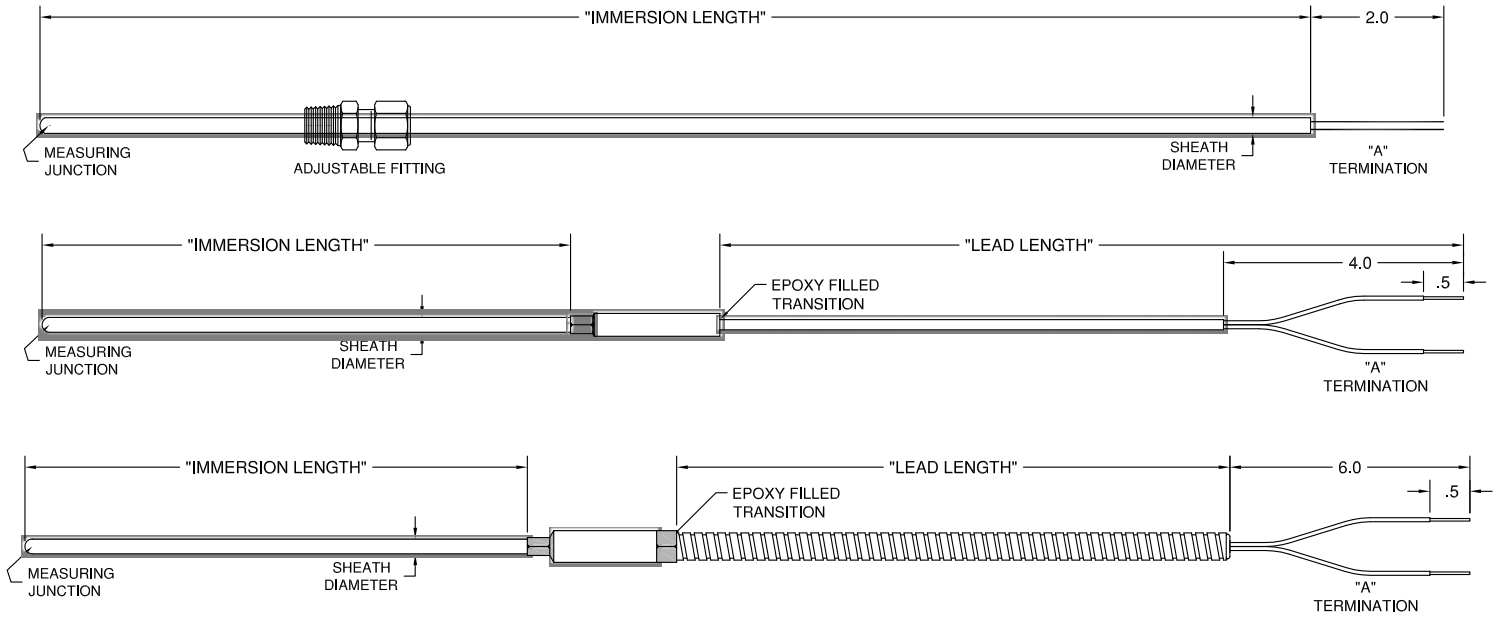
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8	INDUSTRIALS WITH FLANGED THERMOWELLS - Aluminum, stainless steel, or cast iron connection heads available with nipple or nipple/union/nipple head extensions. - Spring loaded standard, available in Type J, K, T, E and N calibrations or low to high temperature RTD construction. - Sheath sizes of 6mm or 1/4" diameter, grounded or ungrounded thermocouples, single or duplex junction. - Flanged thermowells available in a variety of sizes, shank styles, and materials.		9
9	INDUSTRIALS WITH VAN STONE THERMOWELLS - Aluminum, stainless steel, or cast iron connection heads available with nipple or nipple/union/nipple head extensions. - Spring loaded standard, available in Type J, K, T, E and N calibrations or low to high temperature RTD construction. - Sheath sizes of 6mm or 1/4" diameter, grounded or ungrounded thermocouples, single or duplex junction. - Bar stock machined van stone well available in a variety of sizes, shank styles, and materials. - Optional backing, slip-on flange can be included with order.		10
10	INDUSTRIALS WITH PIPEWELLS - Aluminum, stainless steel, or cast iron connection heads available with nipple/union head extension. - Spring loaded standard, available in Type J, K, T, E and N calibrations or low to high temperature RTD construction. - Sheath sizes ranging from 6mm to 3/8" in diameter, grounded or ungrounded thermocouples, single or duplex junction. - Ceramic beaded element construction optional. - Pipe wells available straight in a variety of sizes, schedules, and materials. - Flange or threaded bushing can be attached for process mounting purposes.		11
11	TUBE SKIN THERMOCOUPLES - Bare ends to terminate to a process or junction box with use of a compression fitting or fully assembled with a connection head and nipple/union/nipple/reducer head extension are available. - Available in Type J, K, E, and N calibrations with grounded or ungrounded measuring junction, single or duplex. - Sheath sizes range from 3/16" to 3/8" in diameter in stainless steel or Inconel. - Custom immersion lengths can include expansion loops or bends as needed. - Standard 1" square by 1/8" thick weld pad in matching sheath material curved to fit contour of process pipe. - Custom lead lengths in fiberglass with or without stainless steel overbraid. - Mounting clips can be included and used to secure probe as it runs down the process pipe. - Custom heat shields packed with a high temperature insulation are available for more accurate temperature measurement.		12
12	KNIFE EDGE THERMOCOUPLES Same options as above but with a V-shaped tip instead of weld pad. Also, supplied standard in 1/2" diameter sheath, standard or heavy wall.		13
13	THERMOCOUPLES FOR ALUMINUM - Silicon nitride or silicon carbide assembly supplied straight or with 90 degree bend with aluminum, stainless steel, or cast iron connection head. - Available in 6 or 8mm sheath diameters with 25 or 28mm tube sizes in Type K calibration. - Handheld TC available in 6mm sheath diameter in 316 stainless steel or Inconel 600 sheath material. Terminations include mini plug, 3-pin amphenol connector, or 3-pin eccentric connector.		14
14	TRANSMITTER ASSEMBLIES - Thermo Electric, offers a complete line of quality transmitters installed into any number of assembly combinations. - Transmitters can be supplied hockey puck style in head or in a large aluminum or stainless steel housing. - Transmitter types include programmable, Hart protocol, and Fieldbus and can be calibrated upon request. - Various head extensions and thermowells can be supplied if specified.		15

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15	CONNECTORS - Standard or solid pin with 2 or 3-pin options available. - Types range from mini plugs to ultra temp. - Quick-coupling, ANSI or IEC color coded, and stocked at all TE locations.		16
16	JACK PANELS - Available in a number of standard configurations, as well as, any special configuration your application may require. - Type J, K, T, SIR, E, B, and N calibrations and can be provided with junction box if required. - Single circuit panels are ideal for use on extruders and plastic molding machines to aid thermocouple interchangeability. 6, 12, 18, and 24 circuit panels are available for centralized locations and can be stacked for large installations or future expansions.		17
17	ACCESSORIES - Bore thru compression fittings with stainless steel, TEFLON reusable, or Lava replaceable inserts - Bayonet mounting adapters and reducing bushings - Wire clamp brackets and compression brackets - Double-ended 1/2" NPT threaded adapters and self-gripping springs - Screw cover connection heads in cast aluminum or 316 stainless steel with standard 6-point brass terminal block		18
18	INSULATED THERMOCOUPLE WIRE - Standard 20 gauge stranded in Type J, K, T, E, or N calibrations. - Insulating and jacketing materials include PVC, TEFLON, and fiberglass with or without stainless steel overbraid. - Wires are color coded identifiable to ANSI and IEC.		19
19	BEARING RTD's & TC's- SINGLE & DUPLEX Bearing RTD's and Thermocouples are designed for areas where there are space limitations. They are small, compact and are often used to detect temperature increases in bearings, thrust bearing plates, shafts and motor windings. They are miniature low mass sensors which are fast responding.		20
20	MULTIPOINT THERMOCOUPLE & RTD'S Very often there is a need to measure a temperature profile across a large tank or vessel. The method used is the multicouple which is an arrangement of thermocouple positions with measuring junctions at various depths. The intent is to monitor a number of temperatures at various points with all thermocouples or RTD's contained in one assembly.		21
21	TURBINE SENSOR TC'S- SINGLE & DUPLEX Turbine thermocouples provides more accurate temperature sensor readings, longer asset life, and reliable operations.		22
22	WAFER SENSOR- TC'S SINGLE & DUPLEX The "Instrumented Wafer" typically finds application in semiconductor processing equipment where knowing and controlling the temperature at the surface of a silicon wafer is critical. While these products are typically used throughout the semiconductor industry, this technology can also be used to measure the temperature uniformity of any two-dimensional surface.		23
23	STATOR RTD's - SINGLE & DUPLEX		24

IMMERSION THERMOCOUPLES – SINGLE & DUPLEX



CODE	SPECIAL (NOTE 1)	CALIBRATION
J	JJ	IRON(+) vs CONSTANTAN(-)
K	KK	CHROMEL(+) vs ALUMEL(-)
T	TT	COPPER(+) vs CONSTANTAN(-)
E	EE	CHROMEL(+) vs CONSTANTAN(-)
N	NN	NICROSIL(+) vs NISIL(-)

CODE	FRACTION	DECIMAL	METRIC
125	1/25"	.040	1.1mm
116	1/16"	.063	1.6mm
3mm		.118	3.0mm
18	1/8"	.125	3.2mm
316	3/16"	.187	4.8mm
6mm		.236	6.0mm
14	1/4"	.250	6.4mm
516	5/16"	.313	8.0mm
38	3/8"	.375	9.5mm

CODE	MEASURING JUNCTION (DUPLEX)
DG	DUPLEX GROUNDED
DU	DUPLEX UNGROUNDED
RDG	REDUCED GRD. (NOTE 2)
RDU	REDUCED UNGRD. (NOTE 2)
DE	EXPOSED LOOP

CODE	MEASURING JUNCTION (SINGLE)
G	GROUNDED
U	UNGROUNDED
RG	REDUCED GRD. (NOTE 2)
RU	REDUCED UNGRD. (NOTE 2)
E	EXPOSED LOOP

CODE	MATERIAL	SHEATH MATERIAL	STD. CALIBRATIONS (NOTE 3)
304	304 STN. STL.		J, K, T
316	316 STN. STL.		J, K, T, E, N
310	310 STN. STL.		J, K, E
I600	INCONEL 600		K, N

CODE	LEAD WIRE TYPE (NOTE 6)
0	SKINNED ENDS, NO LEAD WIRE
1	FIBERGLASS INSULATION & JACKETED
2	FIBERGLASS with ARMOR OVERALL
3	FIBERGLASS with STN. STEEL BRAID OVERALL
4	PVC INSULATION & JACKETED
5	TEFLON (FEP) INSULATION & JACKETED
8	PVC with ARMOR OVERALL

CALIBRATION	SHEATH DIAMETER	MEASURING JUNCTION	SHEATH MATERIAL	FITTING	IMMERSION LENGTH	LEAD LENGTH	LEAD WIRE TYPE	TERMINATION	MATING CONNECTOR
J	14	G	304	SS 1/4	12	24	3	L	N

CODE	FITTING
0	FITTING NOT REQUIRED
BR	ADJUSTABLE BRASS, BRASS INSERT
BRT	READJUSTABLE BRASS, TEFLON INSERT
SS	ADJUSTABLE STN. STL., STN. STL. INSERT
SST	READJUSTABLE STN. STL., TEFLON INSERT
SSL	READJUSTABLE STN. STL., LAVA INSERT

CODE	THREAD SIZE
1/8	1/8"NPT
1/4	1/4"NPT
1/2	1/2"NPT
1/4BSPP	1/4"BSPP
1/4BSPT	1/4"BSPT
1/2BSPP	1/2"BSPP
1/2BSPT	1/2"BSPT

CODE	IMMERSION LENGTH
	IN INCHES or MILLIMETER FOLLOWED BY mm

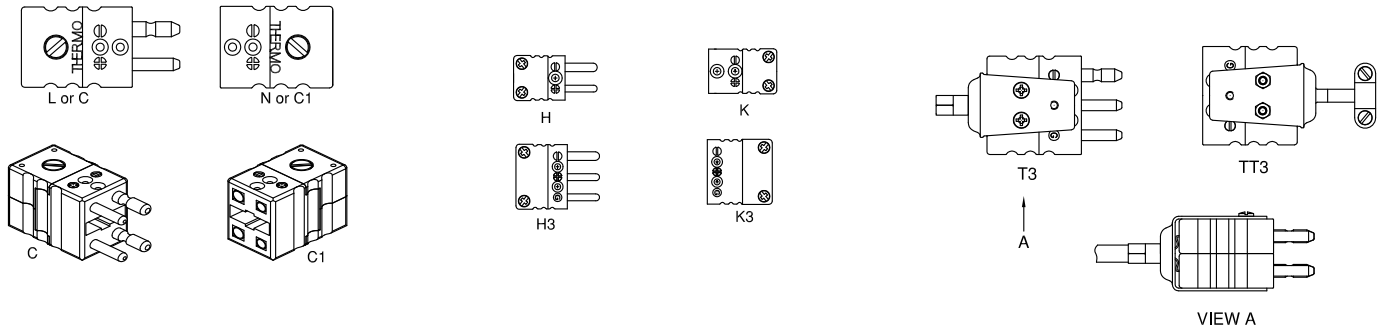
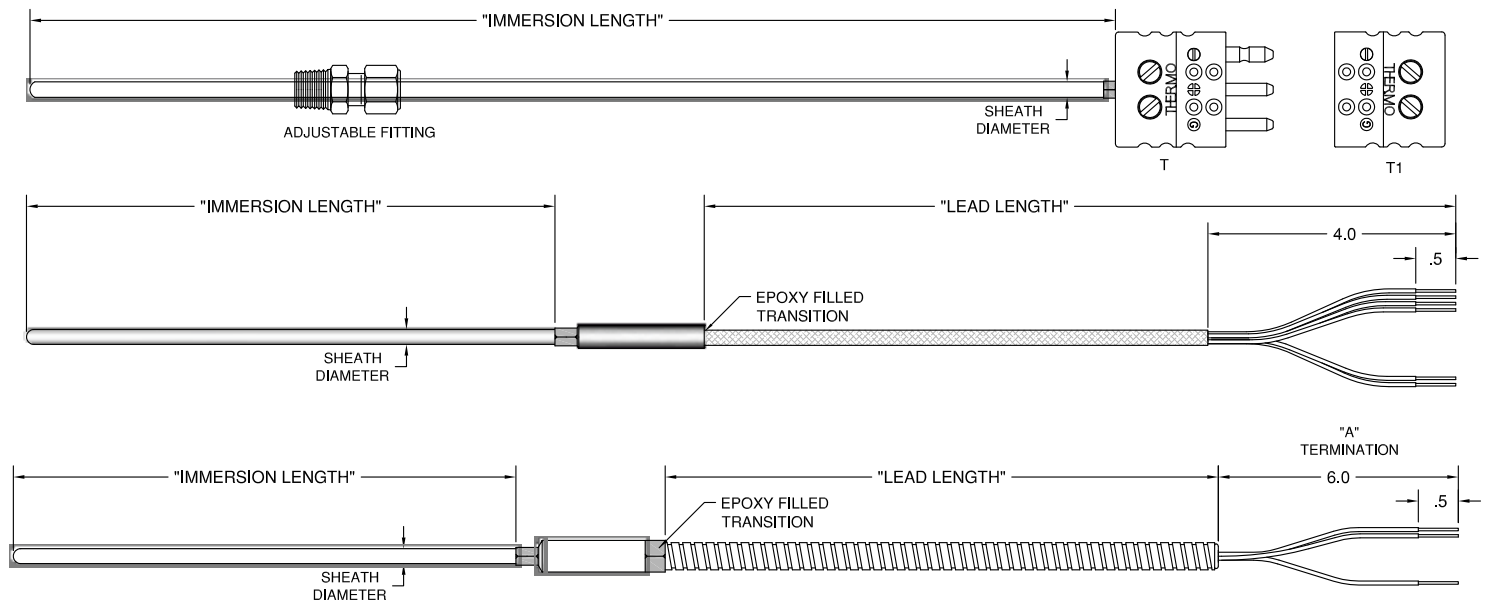
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	IN INCHES or MILLIMETER FOLLOWED BY mm

CODE	TERMINATION (SINGLE)	MATING CONN. (NOTE 4)	TEMPERATURE LIMIT
A	BARE ENDS	N	390°F(200°C)
L	STANDARD SIZE PLUG	N	390°F(200°C)
LHD	STANDARD SIZE SOLID PIN PLUG	Nx	660°F(320°C)
Lx	EXTENDED LIMITS PLUG	Nx	660°F(320°C)
LxHD	EXTENDED LIMITS SOLID PIN PLUG	Xx	1000°F(538°C)
X	ULTRA-TEMP PLUG	X1	1000°F(538°C)
H	MINIATURE PLUG (NOTE 5)	K	390°F(200°C)

CODE	TERMINATION (DUPLEX)	MATING CONN. (NOTE 4)	TEMPERATURE LIMIT
A	BARE ENDS	C1	390°F(200°C)
C	STANDARD SIZE DUPLEX PLUG	C1	390°F(200°C)
Cx	EXTENDED LIMITS DUPLEX PLUG	Cx1	660°F(320°C)
CxHD	EXTENDED LIMITS SOLID PIN DUPLEX PLUG	Cx1	660°F(320°C)

- Notes:
- (1) Meets or exceeds Special Initial Calibration Tolerances per ANSI MC96.1 and ASTM E230.
 - (2) Specify length of reduced tip when ordering.
 - (3) Contact factory for other calibrations and/or sheath materials.
 - (4) Omit mating connector if not ordered. Mating connector can be attached to the sheath.
 - (5) Available in 1/25" up to and including 1/8" diameters only.
 - (6) Standard 20 gauge stranded conductors.
 - (7) For connectors and lead wire identified with IEC color add -IEC to end of completed code.
 - (8) For an item that does not fall within the catalog description an (SP) can be added to the ordering code as part of a custom construction.

IMMERSION RTD'S – SINGLE & DUPLEX



CODE	TEMPERATURE RANGE
LT	-50 to +260° C
	-180 to +500° C (LEAVE BLANK)
HT	-180 to +650° C

CODE	IMMERSION LENGTH
	IN INCHES or
	MILLIMETERS FOLLOWED BY mm

CODE	FITTING
	OMIT IF FITTING NOT ORDERED
BR	ADJUSTABLE BRASS, BRASS INSERT
BRT	READJUSTABLE BRASS, TEFLON INSERT
SS	ADJUSTABLE STN. STL., STN. STL. INSERT
SST	READJUSTABLE STN. STL., TEFLON INSERT
SSL	READJUSTABLE STN. STL., LAVA INSERT

CODE	THREAD SIZE
1/8	1/8"NPT
1/4	1/4"NPT
1/2	1/2"NPT
1/4BSPP	1/4"BSPP
1/4BSPT	1/4"BSPT
1/2BSPP	1/2"BSPP
1/2BSPT	1/2"BSPT

RTD

CODE	SHEATH DIAMETER
3mm	3.0mm
18	1/8" (3.2mm)
316	3/16" (4.8mm)
6mm	6.0mm
14	1/4" (6.4mm)

CODE	SYSTEM
2W	2 WIRE
	3 WIRE (LEAVE BLANK)
4W	4 WIRE

CODE	ACCURACY (ASTM E1137)
	CLASS B (LEAVE BLANK)
CLA	CLASS A

Notes:

- (1) Type "HT" not available with Class A accuracy.
- (2) "H" & "H3" with sheath termination available in 3mm and 1/8" diameter only.
- (3) For an item that does not fall within the catalog description an (SP) can be added to the ordering code as part of a custom construction.

CODE	SINGLE DUPLEX
D	SINGLE DUPLEX

CODE	LEAD WIRE
0	NO LEAD WIRE
1	FIBERGLASS, FIBERGLASS JACKET
2	FIBERGLASS WITH ARMOR OVERALL
5	TEFLON, TEFLON JACKET
8	TEFLON WITH ARMOR OVERALL

CODE	LEAD LENGTH
	OMIT IF NO LEAD WIRES
	IN INCHES or MILLIMETERS FOLLOWED BY mm

CODE	TERMINATION
A	BARE ENDS
T	STANDARD SIZE 3 PIN PLUG
L	STANDARD SIZE 2 PIN PLUG
C	STANDARD SIZE 4 PIN PLUG
H	MINIATURE 2 PIN PLUG
H3	MINIATURE 3 PIN PLUG
T3	STANDARD SIZE 6 PIN PLUG

CODE	MATING CONNECTOR (OMIT IF NOT REQUIRED)
T1	STANDARD SIZE 3 PIN JACK
N	STANDARD SIZE 2 PIN JACK
C1	STANDARD SIZE 4 PIN JACK
K	MINIATURE 2 PIN JACK
K3	MINIATURE 3 PIN JACK
TT3	STANDARD SIZE 6 PIN JACK

BAYONET THERMOCOUPLES – SINGLE & DUPLEX

CONNECTOR TERMINATION

CODE	TERMINATION	MATING CONN. (NOTE 2)	TEMPERATURE LIMIT
L	STANDARD SIZE PLUG	N	390°F(200°C)
LHD	STANDARD SIZE SOLID PIN PLUG	N	390°F(200°C)
Lx	EXTENDED LIMITS PLUG	Nx	660°F(320°C)
LxHD	EXTENDED LIMITS SOLID PIN PLUG	Nx	660°F(320°C)
C	STANDARD SIZE DUPLEX PLUG	C1	390°F(200°C)
Cx	EXTENDED LIMITS DUPLEX PIN PLUG	Cx1	660°F(320°C)
CxHD	EXTENDED LIMITS SOLID PIN DUPLEX PLUG	CxHD	660°F(320°C)

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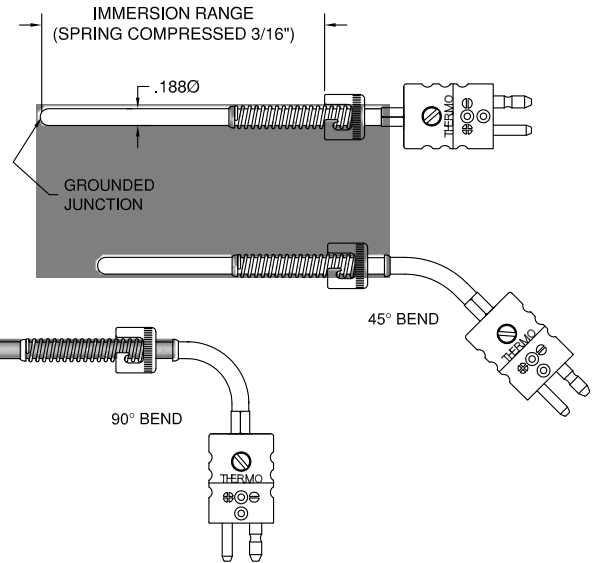
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DUAL	DUPLEX (ONLY)

CODE	MOUNTING POSITION
1	STRAIGHT
2	45° ANGLE
3	90° ANGLE

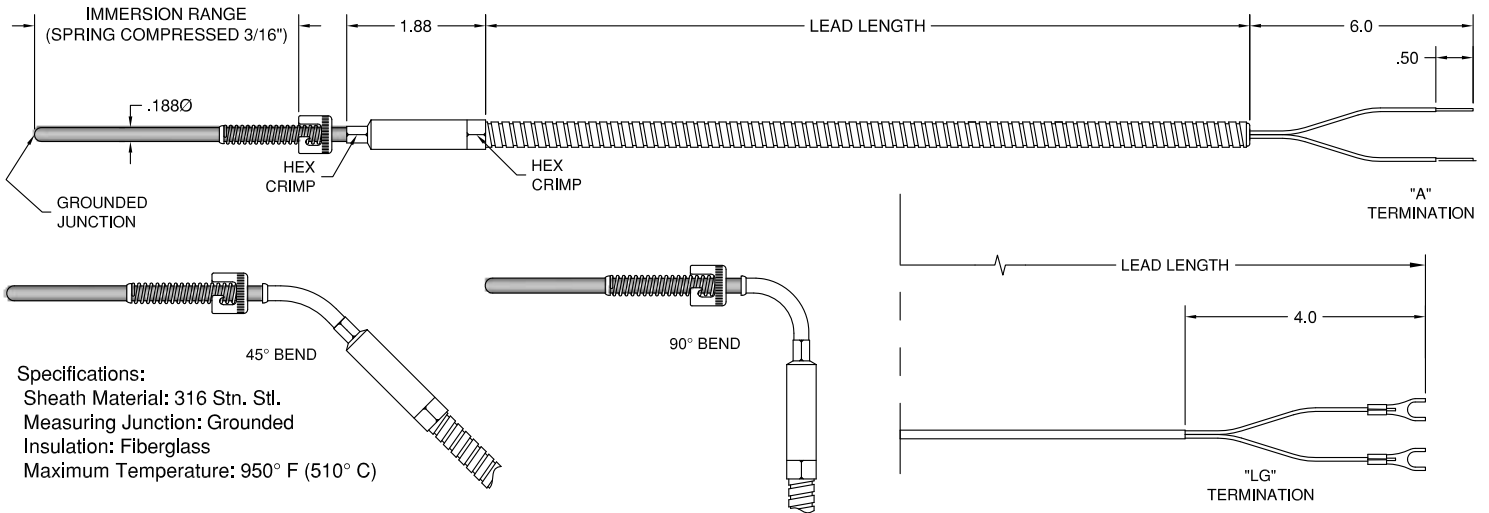
CODE	SPECIAL (NOTE 1)	CALIBRATION
J	JJ	IRON(+) vs CONSTANTAN(-)
K	KK	CHROMEL(+) vs ALUMEL(-)
T	TT	COPPER(+) vs CONSTANTAN(-)

CODE	RANGE
1.13 - 1.75	1-1/8" to 1-3/4"
1.5 - 2.13	1-1/2" to 2-1/8"
2 - 2.63	2" to 2-5/8"
2.5 - 3.13	2-1/2" to 3-1/8"
3 - 3.63	3" to 3-5/8"
3.5 - 4.13	3-1/2" to 4-1/8"
4 - 4.63	4" to 4-5/8"
4.5 - 5.13	4-1/2" to 5-1/8"
5 - 5.63	5" to 5-5/8"
5.5 - 6.13	5-1/2" to 6-1/8"
6 - 6.63	6" to 6-5/8"
6.5 - 7.13	6-1/2" to 7-1/8"
7 - 7.63	7" to 7-5/8"
7.5 - 8.13	7-1/2" to 8-1/8"
8 - 8.63	8" to 8-5/8"

EXAMPLE: 2J0131L/N, I=1.13-1.75
2J0331C/C1-DUAL, I=4-4.63



LEAD WIRE



CODE	TERMINATION	MATING CONN. (NOTE 2)	TEMPERATURE LIMIT
A	BARE ENDS		
LG	SPADE LUGS, COPPER		
L	STANDARD SIZE PLUG	N	390°F(200°C)
LHD	STANDARD SIZE SOLID PIN PLUG	N	390°F(200°C)
Lx	EXTENDED LIMITS PLUG	Nx	660°F(320°C)
LxHD	EXTENDED LIMITS SOLID PIN PLUG	Nx	660°F(320°C)
C	STANDARD SIZE DUPLEX PLUG	C1	390°F(200°C)
Cx	EXTENDED LIMITS DUPLEX PIN PLUG	Cx1	660°F(320°C)
CxHD	EXTENDED LIMITS SOLID PIN DUPLEX PLUG	CxHD	660°F(320°C)

EXAMPLE: 2J3131L/N, I=1.13-1.75, L=48"

CODE	LEAD LENGTH (IN INCHES)
------	-------------------------

2 3 1 / - - - - - I = L =

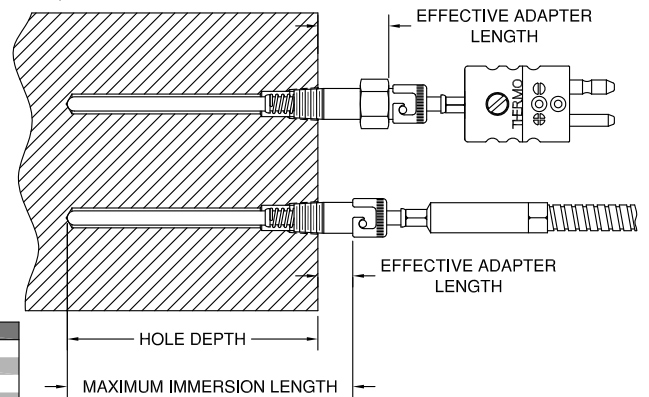
CODE	MOUNTING POSITION
1	STRAIGHT
2	45° ANGLE
3	90° ANGLE

CODE	CONSTRUCTION
DUAL	DUPLEX (ONLY)

CODE	LEAD TYPE
1	FIBERGLASS INSULATION & JACKETED
2	FIBERGLASS INSULATION, ARMOR OVERALL
3	CODE 1 WITH STN. STL. OVERBRAID
4	PVC INSULATION & JACKETED
5	TEFLON(FEP) INSULATION & JACKETED
8	PVC INSULATION, ARMOR OVERALL

CODE	SPECIAL (NOTE 1)	CALIBRATION
J	JJ	IRON(+) vs CONSTANTAN(-)
K	KK	CHROMEL(+) vs ALUMEL(-)
T	TT	COPPER(+) vs CONSTANTAN(-)

CODE	RANGE
1.13 - 1.75	1-1/8" to 1-3/4"
1.5 - 2.13	1-1/2" to 2-1/8"
2 - 2.63	2" to 2-5/8"
2.5 - 3.13	2-1/2" to 3-1/8"
3 - 3.63	3" to 3-5/8"
3.5 - 4.13	3-1/2" to 4-1/8"
4 - 4.63	4" to 4-5/8"
4.5 - 5.13	4-1/2" to 5-1/8"
5 - 5.63	5" to 5-5/8"
5.5 - 6.13	5-1/2" to 6-1/8"
6 - 6.63	6" to 6-5/8"
6.5 - 7.13	6-1/2" to 7-1/8"
7 - 7.63	7" to 7-5/8"
7.5 - 8.13	7-1/2" to 8-1/8"
8 - 8.63	8" to 8-5/8"



Notes:

- Meets or exceeds Special Initial Calibration Tolerances per ANSI MC96.1 and ASTM E230.
- Omit mating connector if not ordered. Mating connector can be attached to the sheath.

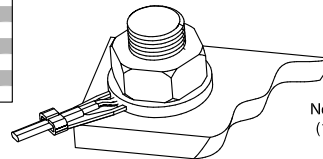
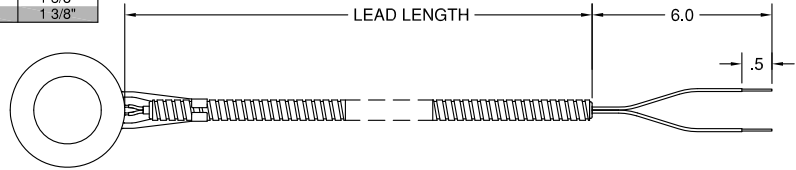
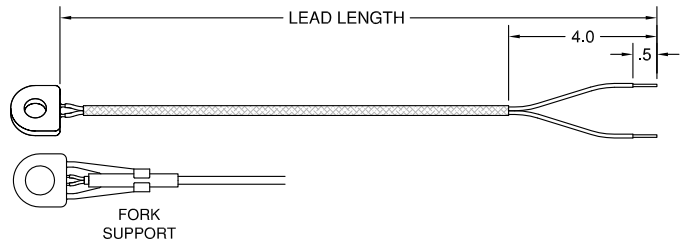
GASKET THERMOCOUPLES

WIRE TYPE

CODE		
STD.	SPECIAL (NOTE 1)	CALIBRATION
J	JJ	IRON(+/-) vs CONSTANTAN(-)
K	KK	CHROMEL(+) vs ALUMEL(-)
T	TT	COPPER(+) vs CONSTANTAN(-)
E	EE	CHROMEL(+) vs CONSTANTAN(-)
N	NN	NICROSIL(+) vs NISIL(-)

CODE	LEAD TYPE (20 Ga STANDARD)
1	FIBERGLASS INSULATION & JACKETED
2	FIBERGLASS, ARMOR OVERALL
3	CODE 1 WITH STN. STL. OVERBRAID
4	PVC INSULATION & JACKETED
5	TEFLON(FEP) INSULATION & JACKETED
8	PVC INSULATION, ARMOR OVERALL

CODE	BOLT SIZE	ID	OD
05	#6	.144"	3/8"
06	#8	3/16"	3/8"
07	#10	13/64"	5/8"
08	#12	7/32"	5/8"
10	1/4"	9/32"	5/8"
12	5/16"	11/32"	5/8"
14	3/8"	13/32"	13/16"
16	7/16"	15/32"	13/16"
18	1/2"	17/32"	13/16"
20	9/16"	19/32"	13/16"
22	5/8"	21/32"	1 3/8"
26	3/4"	13/16"	1 3/8"
30	7/8"	15/16"	1 3/8"
04	1"	1 1/16"	1 3/8"



CODE	TERMINATION	MATING CONN. (NOTE 4)	TEMPERATURE LIMIT
A	BARE ENDS	N	390°F(200°C)
L	STANDARD SIZE PLUG	N	390°F(200°C)
LHD	STANDARD SIZE SOLID PIN PLUG	Nx	660°F(320°C)
Lx	EXTENDED LIMITS PLUG	Nx	660°F(320°C)
LxHD	EXTENDED LIMITS SOLID PIN PLUG	X1	1000°F(538°C)
X	ULTRA-TEMP PLUG	K	390°F(200°C)
H	MINIATURE PLUG		

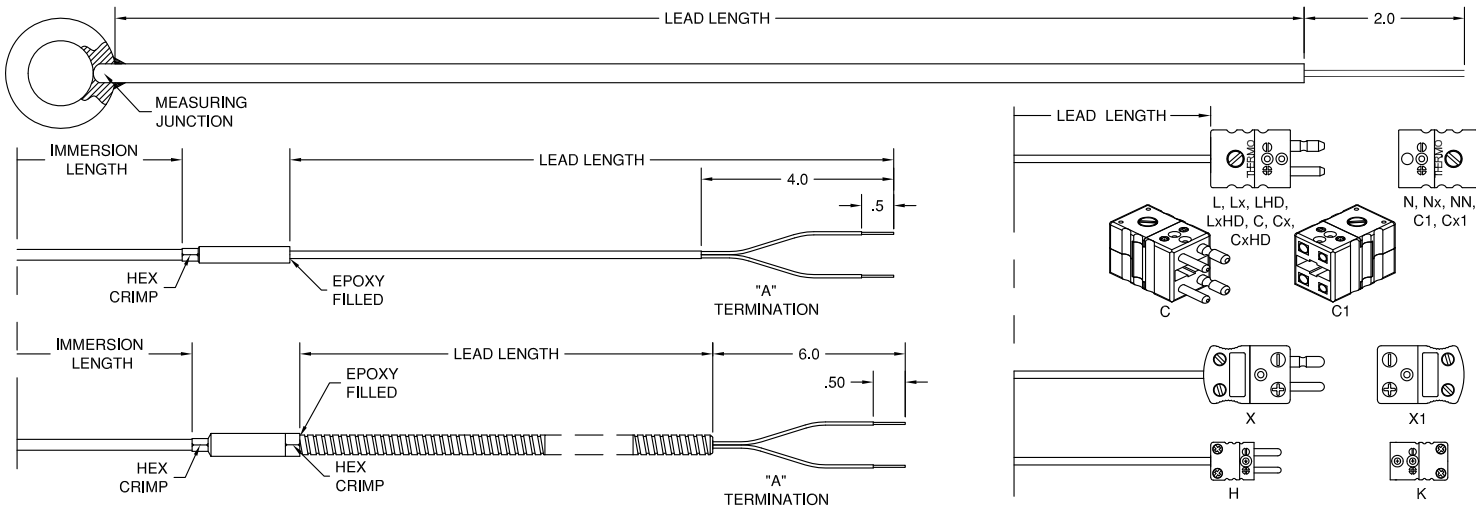
CODE	GASKET TYPE
1	COPPER GASKET, NO SUPPORT
2	COPPER GASKET, STAINLESS STEEL SUPPORT
3	STAINLESS STEEL GASKET, NO SUPPORT
4	STAINLESS STEEL GASKET, STN. STL. SUPPORT

EXAMPLE: 1J3414/L/N, L=36

Notes:

- (1) Meets or exceeds Special Initial Calibration Tolerances per ANSI MC96.1 and ASTM E230.
- (2) Specify length of reduced tip when ordering.
- (3) Contact factory for other calibrations and/or sheath materials.
- (4) Omit mating connector if not ordered. Mating connector can be attached to the sheath.
- (5) For connectors identified with IEC color add -IEC to end of completed code.
- (6) For an item that does not fall within the catalog description an (SP) can be added to the ordering code as part of a custom construction.

HIGH TEMPERATURE



CODE		
STD.	SPECIAL (NOTE 1)	CALIBRATION
J	JJ	IRON(+/-) vs CONSTANTAN(-)
K	KK	CHROMEL(+) vs ALUMEL(-)
T	TT	COPPER(+) vs CONSTANTAN(-)
E	EE	CHROMEL(+) vs CONSTANTAN(-)
N	NN	NICROSIL(+) vs NISIL(-)

CODE	FRACTION	DECIMAL	METRIC
125	1/25"	.040	1.1mm
116	1/16"	.063	1.6mm
18	1/8"	.125	3.2mm
316	3/16"	.187	4.8mm
14	1/4"	.250	6.4mm

CODE	MEASURING JUNCTION
G	GROUNDING
U	UNGROUNDING
DG	DUPLEX GROUNDING
DU	DUPLEX UNGROUNDING

CODE	MATERIAL	STD. CALIBRATIONS (NOTE 3)
304	304 STN. STL.	J, K, T
316	316 STN. STL.	J, K, T, E, N
310	310 STN. STL.	J, K, E
1600	INCONEL 600	K, N

EXAMPLE: J14G-316-G-3-10-12-48-1/L/N

CODE	BOLT SIZE	ID	OD
05	#6	.144"	3/8"
06	#8	3/16"	3/8"
07	#10	13/64"	5/8"
08	#12	7/32"	5/8"
10	1/4"	9/32"	5/8"
12	5/16"	11/32"	5/8"
14	3/8"	13/32"	13/16"
16	7/16"	15/32"	13/16"
18	1/2"	17/32"	13/16"
20	9/16"	19/32"	13/16"
22	5/8"	21/32"	1 3/8"
26	3/4"	13/16"	1 3/8"
30	7/8"	15/16"	1 3/8"
04	1"	1 1/16"	1 3/8"

CODE	IMMERSION LENGTH (IN INCHES)
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CODE	LEAD LENGTH (IN INCHES) OMIT IF LEAD WIRE 0
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CODE	LEAD TYPE (20 Ga STANDARD)
0	NO LEAD WIRE
1	FIBERGLASS INSULATION & JACKETED
2	FIBERGLASS, ARMOR OVERALL
3	CODE 1 WITH STN. STL. OVERBRAID
4	PVC INSULATION & JACKETED
5	TEFLON(FEP) INSULATION & JACKETED
8	PVC INSULATION, ARMOR OVERALL

CODE	TERMINATION	MATING CONN. (NOTE 4)	TEMPERATURE LIMIT
A	BARE ENDS	N	390°F(200°C)
L	STANDARD SIZE PLUG	N	390°F(200°C)
LHD	STANDARD SIZE SOLID PIN PLUG	Nx	660°F(320°C)
Lx	EXTENDED LIMITS PLUG	Nx	660°F(320°C)
LxHD	EXTENDED LIMITS SOLID PIN PLUG	X1	1000°F(538°C)
X	ULTRA-TEMP PLUG	K	390°F(200°C)
H	MINIATURE PLUG	C1	390°F(200°C)
C	STANDARD SIZE DUPLEX PLUG	Cx1	660°F(320°C)
Cx	EXTENDED LIMITS DUPLEX PLUG	Cx1	660°F(320°C)
CxHD	EXT. LIMITS SOLID PIN DUPLEX PLUG	NN	390°F(200°C)
LL	TWO STANDARD SIZE 2-PIN PLUGS		



CODE	CONNECTION HEAD
AN	ALUMINUM
SN	STAINLESS STEEL
A	CAST IRON

CODE	CONDUIT OPENING
1/2	1/2" NPT
3/4	3/4" NPT
M20	M20 x 1.5

CODE	"A" LENGTH
	IN INCHES

CODE	"F" LENGTH
	IN INCHES or MILLIMETERS FOLLOWED BY mm

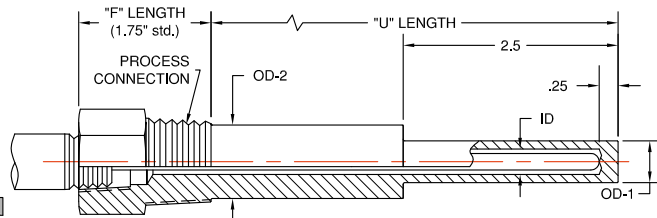
CODE	"U" LENGTH
	IN INCHES or MILLIMETERS FOLLOWED BY mm

CODE	WELL MATERIAL
P	304 STAINLESS STEEL
B	BRASS
R	316 STAINLESS STEEL
RL	316 STN. STL., LOW CARBON
N	CARBON STEEL

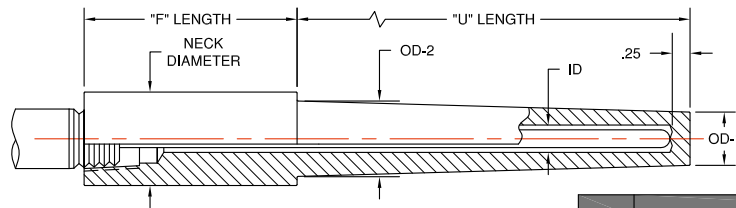
The diagram illustrates a cross-section of a rod end assembly. Key features include:

- "F" LENGTH (1.75" std.)**: The length of the process connection.
- "U" LENGTH**: The length of the main body.
- PROCESS CONNECTION**: The threaded section at the left end.
- OD-2**: The outer diameter of the main body.
- .25 ID**: The inner diameter of the central bore.
- OD**: The outer diameter of the rod end.

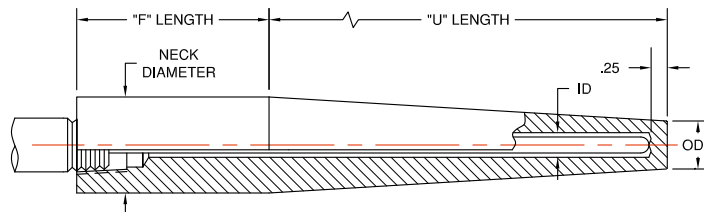
CODE	WELL TYPE - TAPERED				
	PROCESS NPT	OD-1	OD-2	ID	HEX
05	1/2"	.500	.625	.260	1.13
11	3/4"	.563	.844	.203	1.13
12	3/4"	.750	.844	.385	1.13
14	1"	.750	1.11	.385	1.38
121	3/4"	.750	.844	.260	1.13
141	1"	.750	1.11	.260	1.38



CODE	WELL TYPE - STRAIGHT				
	PROCESS NPT	OD-1	OD-2	ID	HEX
16	3/4"	.750	.750	.385	1.13
18	1"	.750	.750	.385	1.38
161	3/4"	.750	.750	.260	1.13
181	1"	.750	.750	.260	1.38



CODE	WELL TYPE - STEP DOWN				
	PROCESS NPT	OD-1	OD-2	ID	HEX
122	3/4"	.500	.750	.260	1.13
142	1"	.500	.875	.260	1.38



CODE	WELL TYPE - SOCKET WELD				
	PROCESS NPS	OD-1	OD-2	ID	PIPE SIZE (ACTUAL)
01	3/4"	.750	.844	.385	3/4" (1.05")
011	3/4"	.750	.844	.260	3/4" (1.05")
02	1"	.750	1.063	.385	1" (1.315")
021	1"	.750	1.063	.260	1" (1.315")

CODE		ELEMENT CONSTRUCTION			
		SHEATH DIAMETER	WIRE SIZE (AWG)	INSULATION	SPRING LOADED
SINGLE	DUPLEX				
ASL6mm	ADSL6mm	6mm (.236")	19	MgO-SHEATH	YES
ASL14	ADSL14	.25" (6.6mm")	18	MgO-SHEATH	YES

CODE		ELEMENT CONSTRUCTION	
		SHEATH DIAMETER	SPRING LOADED
SINGLE	DUPLEX		
RTD6mm	DRTD6mm	6mm (.236")	YES
RTD14	DRTD14	.25" (6.6mm")	YES

CODE	TEMPERATURE RANGE
LT	-50 to +260° C
(LEAVE BLANK)	-180 to +500° C
HT	-180 to +650° C

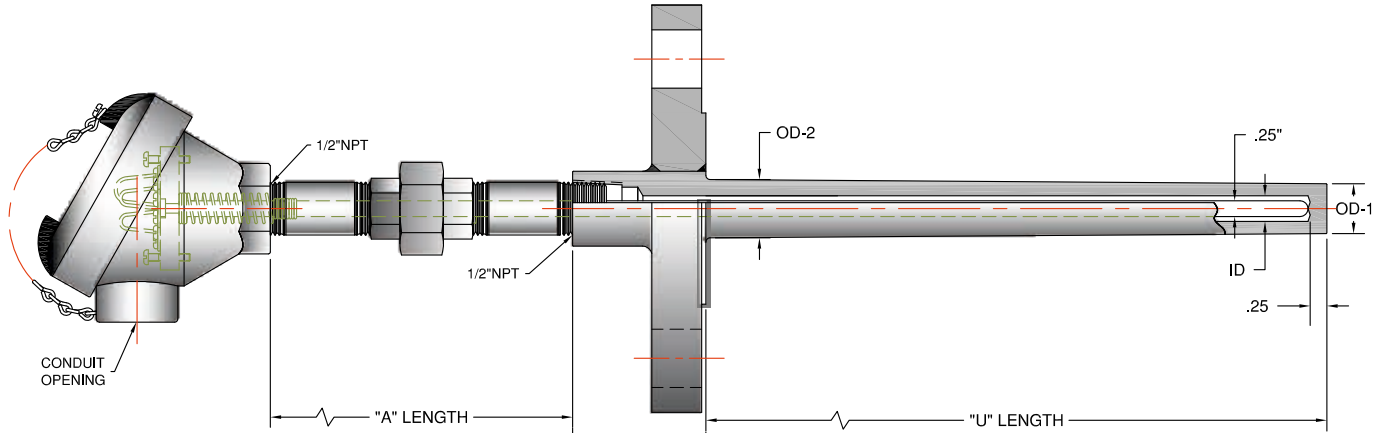
RTD CONSTRUCTION
CONSTRUCTION: 3-WIRE (6 FOR DUPLEX)
ELEMENT TYPE: PLATINUM
TCR: .00385 OHMS/OHM/°C
RESISTANCE @ °C: 100 OHMS
SHEATH MATERIAL: 316 SS

CODE		CALIBRATION
STANDARD	SPECIAL	
J	JJ	IRON (+) vs CONSTANTAN (-)
K	KK	CHROMEL (+) vs ALUMEL (-)
T	TT	COPPER (+) vs CONSTANTAN (-)
E	EE	CHROMEL (+) vs CONSTANTAN (-)
N	NN	NICROSIL (+) vs NISIL (-)

CODE	MEASURING JUNCTION
G	SINGLE GROUNDED
U	SINGLE UNGROUNDED
DG	DUPLEX GROUNDED
DU	DUPLEX UNGROUNDED

CODE	SHEATH MATERIAL
P	304 STN. STL.
R	316 STN. STL.
Q	310 STN. STL.
J	INCONEL 600

INDUSTRIAL THERMOCOUPLES & RTD'S



CODE	HEAD EXTENSION
2	NIPPLE ONLY
4	NIPPLE/UNION/NIPPLE

CODE	CONNECTION HEAD
AN	ALUMINUM
SN	STAINLESS STEEL
A	CAST IRON

CODE	CONDUIT OPENING
1/2	1/2" NPT
3/4	3/4" NPT
M20	M20 x 1.5

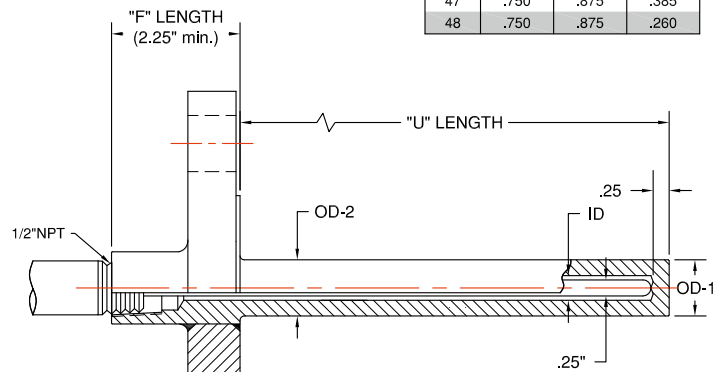
CODE	"A" LENGTH
	IN INCHES

1 2

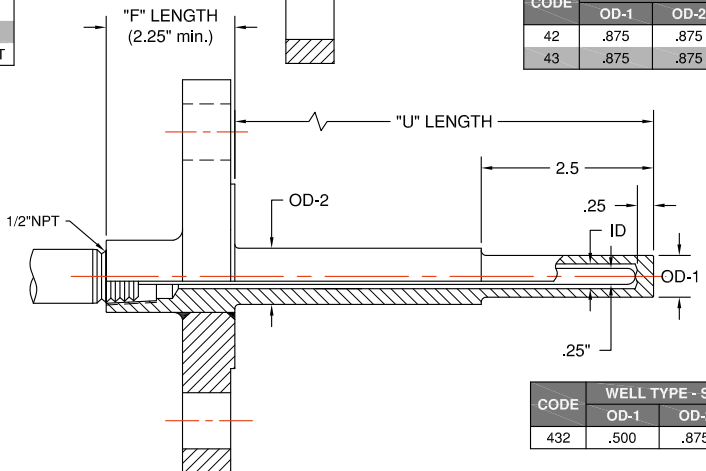


THERMOWELL SELECTION

CODE	WELL TYPE - TAPERED		
	OD-1	OD-2	ID
47	.750	.875	.385
48	.750	.875	.260



CODE	WELL TYPE - STRAIGHT		
	OD-1	OD-2	ID
42	.875	.875	.385
43	.875	.875	.260



CODE	WELL TYPE - STEP DOWN		
	OD-1	OD-2	ID
432	.500	.875	.260

THERMOCOUPLE SELECTION

CODE		ELEMENT CONSTRUCTION			
SINGLE	DUPLEX	SHEATH DIAMETER	WIRE SIZE (AWG)	INSULATION	SPRING LOADED
ASL6mm	ADSL6mm	6mm (.236")	19	MgO-SHEATH	YES
ASL14	ADSL14	.25" (6.6mm")	18	MgO-SHEATH	YES

CODE	STANDARD	SPECIAL	CALIBRATION
J	JJ		IRON (+) vs CONSTANTAN (-)
K	KK		CHROMEL (+) vs ALUMEL (-)
T	TT		COPPER (+) vs CONSTANTAN (-)
E	EE		CHROMEL (+) vs CONSTANTAN (-)
N	NN		NICROSIL (+) vs NISIL (-)

RTD SELECTION

CODE		ELEMENT CONSTRUCTION	
SINGLE	DUPLEX	SHEATH DIAMETER	SPRING LOADED
RTD6mm	DRTD6mm	6mm (.236")	YES
RTD14	DRTD14	.25" (6.6mm")	YES

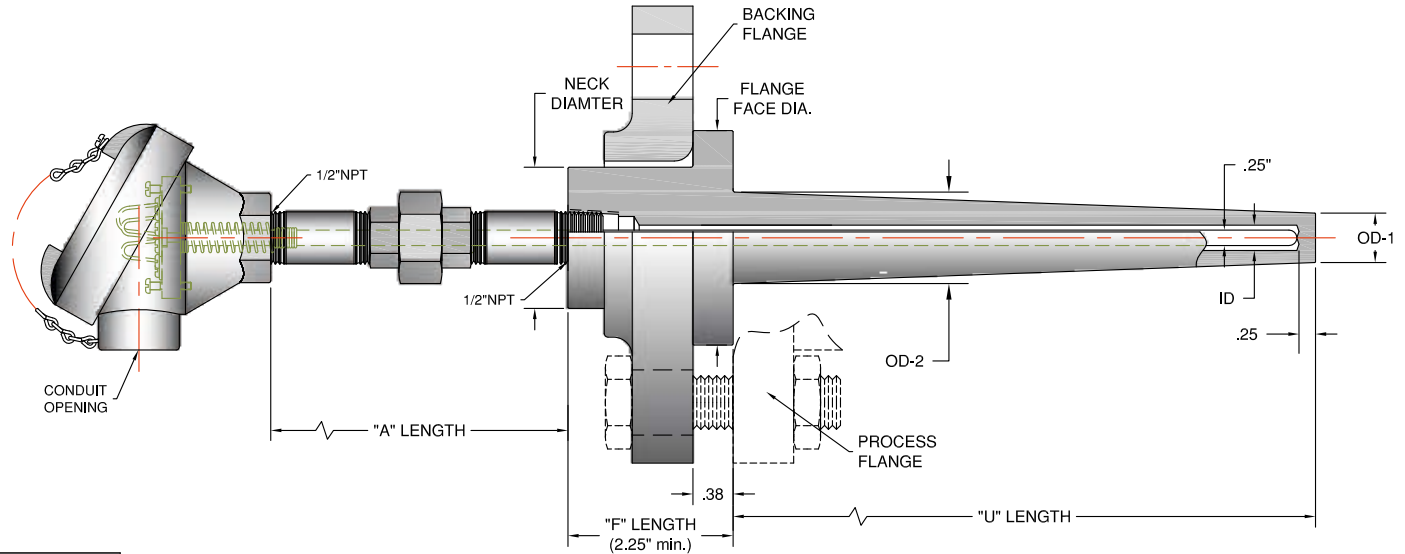
CODE	TEMPERATURE RANGE
LT	-50 to +260° C
(LEAVE BLANK)	-180 to +500° C
HT	-180 to +650° C

RTD CONSTRUCTION
CONSTRUCTION: 3-WIRE (6 FOR DUPLEX)
ELEMENT TYPE: PLATINUM
TCR: .00385 OHMS/OHM/°C
RESISTANCE @ °C: 100 OHMS
SHEATH MATERIAL: 316 SS

CODE	MEASURING JUNCTION
G	SINGLE GROUNDED
U	SINGLE UNGROUNDED
DG	DUPLEX GROUNDED
DU	DUPLEX UNGROUNDED

CODE	SHEATH MATERIAL
P	304 STN. STL.
R	316 STN. STL.
Q	310 STN. STL.
J	INCONEL 600

INDUSTRIAL THERMOCOUPLES & RTD'S



CODE	HEAD EXTENSION
2	NIPPLE ONLY
4	NIPPLE/UNION/NIPPLE

CODE	CONDUIT OPENING
1/2	1/2" NPT
3/4	3/4" NPT
M20	M20 x 1.5

CODE	CONNECTION HEAD
AN	ALUMINUM
SN	STAINLESS STEEL
A	CAST IRON

CODE	"A" LENGTH
	IN INCHES

THERMOWELL SELECTION

CODE	WELL TYPE - TAPERED				
	OD-1	OD-2	ID	FLANGE FACE DIA.	NECK DIAMETER
41	.750	.875	.385	2.0 (1" FLANGE SIZE)	1.315
44	.750	.875	.385	2.88 (1.5" FLANGE SIZE)	1.90
411	.750	.875	.260	2.0 (1" FLANGE SIZE)	1.315
441	.750	.875	.260	2.88 (1.5" FLANGE SIZE)	1.90

CODE	"F" LENGTH
	IN INCHES or MILLIMETERS FOLLOWED BY mm
CODE	"U" LENGTH
	IN INCHES or MILLIMETERS FOLLOWED BY mm

CODE	FLANGE RATING
150	150 #
300	300 #
600	600 #
900	900 #

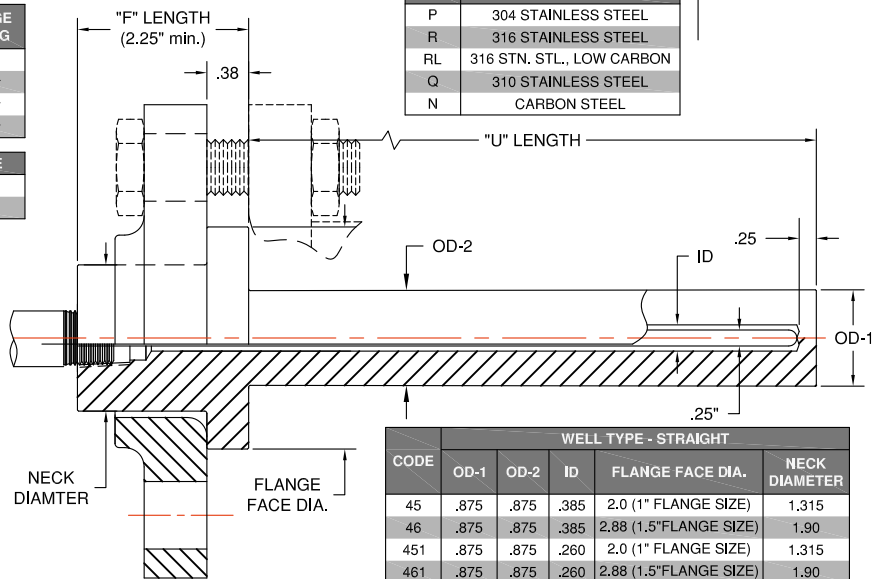
CODE	FLANGE SIZE
1	1.0"
1.5	1.5"

BACKING FLANGE, OMIT IF NOT SUPPLIED

BACKING FLANGE MATERIAL

CODE	FLANGE MATERIAL
P	304 STAINLESS STEEL
R	316 STAINLESS STEEL
RL	316 STN. STL., LOW CARBON
Q	310 STAINLESS STEEL
N	CARBON STEEL

CODE	WELL MATERIAL
P	304 STAINLESS STEEL
B	BRASS
R	316 STAINLESS STEEL
RL	316 STN. STL., LOW CARBON
N	CARBON STEEL



CODE	WELL TYPE - STRAIGHT				
	OD-1	OD-2	ID	FLANGE FACE DIA.	NECK DIAMETER
45	.875	.875	.385	2.0 (1" FLANGE SIZE)	1.315
46	.875	.875	.385	2.88 (1.5" FLANGE SIZE)	1.90
451	.875	.875	.260	2.0 (1" FLANGE SIZE)	1.315
461	.875	.875	.260	2.88 (1.5" FLANGE SIZE)	1.90

THERMOCOUPLE SELECTION

CODE	ELEMENT CONSTRUCTION			
	SINGLE	DUPLEX	SHEATH DIAMETER	WIRE SIZE (AWG)
ASL6mm	ADSL6mm	6mm (.236")	19	MgO-SHEATH
ASL14	ADSL14	.25" (6.6mm)	18	MgO-SHEATH

CODE	CALIBRATION	
	STANDARD	SPECIAL
J	JJ	IRON (+) vs CONSTANTAN (-)
K	KK	CHROMEL (+) vs ALUMEL (-)
T	TT	COPPER (+) vs CONSTANTAN (-)
E	EE	CHROMEL (+) vs CONSTANTAN (-)
N	NN	NICROSIL (+) vs NISIL (-)

RTD SELECTION

CODE	ELEMENT CONSTRUCTION		
	SINGLE	DUPLEX	SHEATH DIAMETER
RTD6mm	DRTD6mm	6mm (.236")	YES
RTD14	DRTD14	.25" (6.6mm)	YES

CODE	TEMPERATURE RANGE
LT	-50 to +260° C
(LEAVE BLANK)	-180 to +500° C
HT	-180 to +650° C

RTD CONSTRUCTION
CONSTRUCTION: 3-WIRE (6 FOR DUPLEX)
ELEMENT TYPE: PLATINUM
TCR: .00385 OHMS/OHM/°C
RESISTANCE @ °C: 100 OHMS
SHEATH MATERIAL: 316 SS

CODE	MEASURING JUNCTION
G	SINGLE GROUNDED
U	SINGLE UNGROUNDED
DG	DUPLEX GROUNDED
DU	DUPLEX UNGROUNDED

CODE	SHEATH MATERIAL
P	304 STN. STL.
R	316 STN. STL.
Q	310 STN. STL.
J	INCONEL 600

INDUSTRIAL THERMOCOUPLES & RTD'S

CODE	HEAD EXTENSION
1	(NO EXTENSION, 0" "A" LENGTH)
3	NIPPLE UNION

CODE	CONNECTION HEAD
AN	ALUMINUM
SN	STAINLESS STEEL
A	CAST IRON

CODE	CONDUIT OPENING
1/2	1/2" NPT
3/4	3/4" NPT
M20	M20 x 1.5

CODE	TUBE OPENING
1/2	1/2" NPT (with 1/4" & 1/2" TUBES)
3/4	3/4" NPT (with 3/4" & 1" TUBES)

CODE	"A" LENGTH
	IN INCHES

CODE	1/4"NPT	1/2"NPT	3/4"NPT	1"NPT
40	0.364	0.622	0.824	1.049
80	0.302	0.546	0.742	0.957
160	N/A	0.464	0.612	0.815
XXS	N/A	N/A	0.434	0.599

CODE	"F" LENGTH
	IN INCHES or MILLIMETERS FOLLOWED BY mm

CODE	"U" LENGTH
	IN INCHES or MILLIMETERS FOLLOWED BY mm

CODE	TUBE MATERIAL
P	304 STAINLESS STEEL
Q	316 STAINLESS STEEL
R	316 S.S. (LOW CARBON)
RL	316 S.S. (LOW CARBON)
N	CARBON STEEL
J	INCONEL 600
H	HASTELLOY C276

FLANGE MATERIAL
IF DIFFERENT
THEN TUBE MATERIAL

FLANGE SELECTION

CODE	FLANGE TYPE
FF	FLAT FACE
RF	RAISED FACE
RJ	RING TYPE JOINT

CODE	FLANGE RATING
150	150 #
300	300 #
600	600 #
900	900 #

CODE	FLANGE SIZE
1	1.0"
1.5	1.5"
2	2.0"
3	3.0"

CODE	FLANGED TUBE
TUBE SIZE	OD
81	1/4" NPS 0.540
82	1/2" NPS 0.840
83	3/4" NPS 1.050
84	1" NPS 1.315

CODE	PLAIN TUBE
TUBE SIZE	OD
51	1/4" NPS 0.540
52	1/2" NPS 0.840
53	3/4" NPS 1.050
54	1" NPS 1.315

CODE	THREADED TUBE		
	TUBE SIZE	PROCESS NPT	OD
601	1/4" NPS	1/2" NPT	0.540
602		3/4" NPT	
603		1" NPT	
606	1/2" NPS	3/4" NPT	0.840
607		1" NPT	
608		1 1/4" NPT	
610	3/4" NPS	1" NPT	1.050
611		1 1/4" NPT	
612		1 1/2" NPT	
613	1" NPS	1 1/4" NPT	1.315
614		1 1/2" NPT	

THERMOCOUPLE SELECTION

CODE		ELEMENT CONSTRUCTION			
SINGLE	DUPLEX	SHEATH DIAMETER	WIRE SIZE (AWG)	INSULATION	SPRING LOADED
ASL6mm	ADSL6mm	6mm (.236")	19	MgO-SHEATH	YES
ASL14	ADSL14	.25" (6.6mm")	18	MgO-SHEATH	YES
ASL516	ADSL516	.313" (8mm")	16	MgO-SHEATH	YES
ASL38	ADSL38	.38" (9.5mm")	15	MgO-SHEATH	YES
B08	BD08	.5"/.69"	8	CERAMIC BEAD	NO

CODE		CALIBRATION
STANDARD	SPECIAL (NOTE 5)	
J	JJ	IRON (+) vs CONSTANTAN (-)
K	KK	CHROMEL (+) vs ALUMEL (-)
T	TT	COPPER (+) vs CONSTANTAN (-)
E	EE	CHROMEL (+) vs CONSTANTAN (-)
N	NN	NICROSIL (+) vs NISIL (-)

CODE	MEASURING JUNCTION
G	SINGLE GROUNDED
U	SINGLE UNGROUNDED
DG	DUPLEX GROUNDED
DU	DUPLEX UNGROUNDED

CODE	SHEATH MATERIAL
P	304 STN. STL.
R	316 STN. STL.
Q	310 STN. STL.
J	INCONEL 600

RTD SELECTION

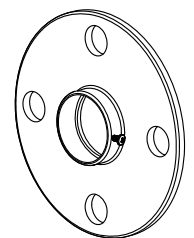
CODE	TYPE	TEMPERATURE RANGE
RTD14LT	SINGLE RTD, 3-WIRE	-50 to +260° C
RTD14	SINGLE RTD, 3-WIRE	-180 to +500° C
RTD14HT	SINGLE RTD, 3-WIRE	-180 to +650° C
DRTD14LT	DUPLEX RTD, 3-WIRE (6 TOTAL)	-50 to +260° C
DRTD14	DUPLEX RTD, 3-WIRE (6 TOTAL)	-180 to +500° C
DRTD14HT	DUPLEX RTD, 3-WIRE (6 TOTAL)	-180 to +650° C

RTD CONSTRUCTION
CONSTRUCTION: 3-WIRE (6 FOR DUPLEX)
ELEMENT TYPE: PLATINUM
TCR: .00385 OHMS/OHM/°C
RESISTANCE @ °C: 100 OHMS
SHEATH MATERIAL: 316 SS

ADJUSTABLE MOUNTING FLANGE
CAST IRON, USED TO MOUNT
SERIES 50 PROTECTION TUBES
(ORDER SEPARATELY)

CODE	TUBE TYPE	FLANGE DIA.
SS004-561	51	2.19"
SS000-282	52	3.5"
SF006-937	53	3.5"
SR002-526	54	4.0"

DROP SHEATH
MATERIAL CODE WHEN
USING CERAMIC
BEADED ELEMENTS



CONDUIT
OPENING

"A"
LENGTH

"F"
LENGTH

"A"
LENGTH

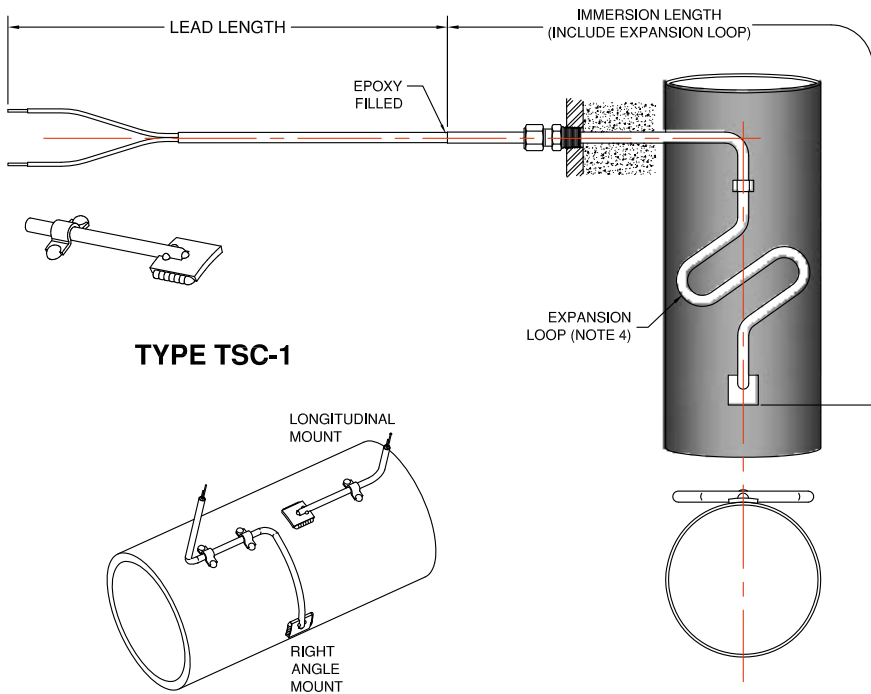
"U"
LENGTH

"U"
LENGTH

"F"
LENGTH

"U"
LENGTH

TUBE SKIN THERMOCOUPLES



TYPE TSC-1

CODE		CALIBRATION
STANDARD	SPECIAL (NOTE 1)	
J	JJ	IRON (+) vs CONSTANTAN (-)
K	KK	CHROMEL (+) vs ALUMEL (-)
E	EE	CHROMEL (+) vs CONSTANTAN (-)
N	NN	NICROSIL (+) vs NISIL (-)

SHEATH DIAMETER			
CODE	FRACTION	DECIMAL	METRIC
316	3/16"	.187	4.8mm
14	1/4"	.250	6.4mm
38	3/8"	.375	9.5mm

CODE		MEASURING JUNCTION
G	U	
G	U	SINGLE GROUNDED, GROUNDED TO SHEATH
DG	DU	DUPLEX GROUNDED, GROUNDED TO SHEATH
DU		DUPLEX GROUNDED, GROUNDED TO SHEATH

CODE		ELEMENT SHEATH MATERIAL (NOTE 2)
P	R	
P	R	304 STN. STL. (STD. CALIBR. J, K, T)
R		316 STN. STL. (STD. CALIBR. J, K, T, E, N)
Q		310 STN. STL. (STD. CALIBR. J, K, E)
J		INCONEL 600 (STD. CALIBR. K, N)

CODE	IMMERSION LENGTH (IN INCHES)

CODE	BEND RADIUS
R	RIGHT ANGLE
L	LONGITUDINAL
FLAT	FLAT SURFACE

TSC-2 - K - 14 - G - R - 60 - L 12 - 6 - AN - 1NPT

CODE	PIPE DIAMETER (IN INCHES)

CODE	"A" LENGTH (IN INCHES)

CODE	PROCESS MOUNTING
3/4NPT	3/4"NPT (NO REDUCER)
1NPT	1"NPT
1 1/2NPT	1 1/2"NPT
2NPT	2"NPT

CODE	CONNECTION HEAD
AN	ALUMINUM
SN	STAINLESS STEEL
A	CAST IRON

CODE		CALIBRATION
STANDARD	SPECIAL (NOTE 1)	
J	JJ	IRON (+) vs CONSTANTAN (-)
K	KK	CHROMEL (+) vs ALUMEL (-)
E	EE	CHROMEL (+) vs CONSTANTAN (-)
N	NN	NICROSIL (+) vs NISIL (-)

SHEATH DIAMETER			
CODE	FRACTION	DECIMAL	METRIC
316	3/16"	.187	4.8mm
14	1/4"	.250	6.4mm
38	3/8"	.375	9.5mm

CODE		MEASURING JUNCTION
G	U	
G	U	SINGLE GROUNDED, GROUNDED TO SHEATH
DG	DU	DUPLEX GROUNDED, GROUNDED TO SHEATH
DU		DUPLEX GROUNDED, GROUNDED TO SHEATH

CODE		ELEMENT SHEATH MATERIAL (NOTE 2)
P	R	
P	R	304 STN. STL. (STD. CALIBR. J, K, T)
R		316 STN. STL. (STD. CALIBR. J, K, T, E, N)
Q		310 STN. STL. (STD. CALIBR. J, K, E)
J		INCONEL 600 (STD. CALIBR. K, N)

CODE	IMMERSION LENGTH (IN INCHES)

CODE	BEND RADIUS
R	RIGHT ANGLE
L	LONGITUDINAL
FLAT	FLAT SURFACE

TSC-1 - K - 14 - G - R - 60 - L 12 - 36 - GGS

CODE	PIPE DIAMETER (IN INCHES)

CODE	LEAD LENGTH (IN INCHES)

CODE	LEAD TYPE
GG	FIBERGLASS INSULATION & JACKETED
GGG	FIBERGLASS INSULATION & JACKETED WITH STN. STL. BRAID OVERALL



Notes:

- (1) Meets or exceeds Special Initial Calibration Tolerances per ANSI MC96.1 and STM E230.
- (2) Contact factory for other calibration and sheath combinations.
- (3) For an item that does not fall within the catalog description an (SP) can be added to the ordering code as part of a custom construction.
- (4) Tube skins are normally shipped straight or coiled. Expansion loops or coils are available formed at factory to specification.

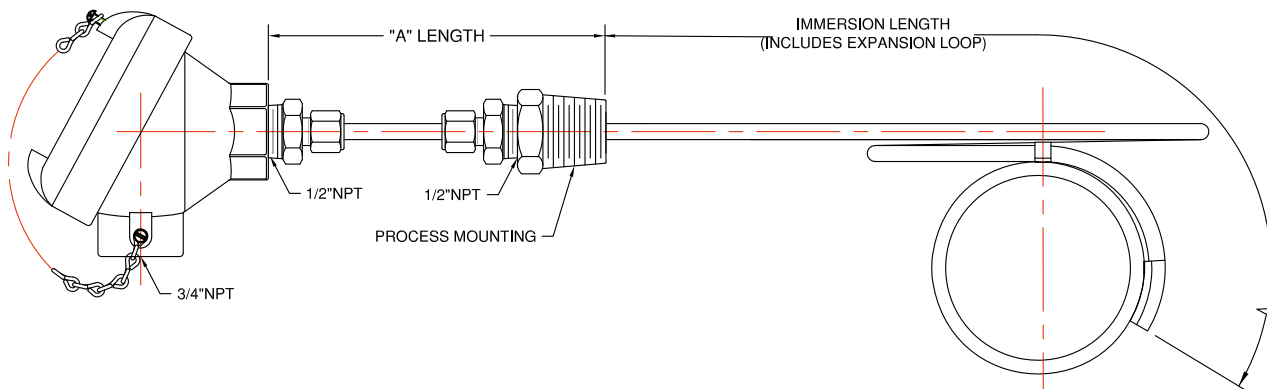
Specifications

- (1) Lead Wire Standard 20 gauge stranded conductors.
- (2) Weld pad of same material as sheath unless specified otherwise.
- (3) Pad size, 1" by 1" by .13" thk.

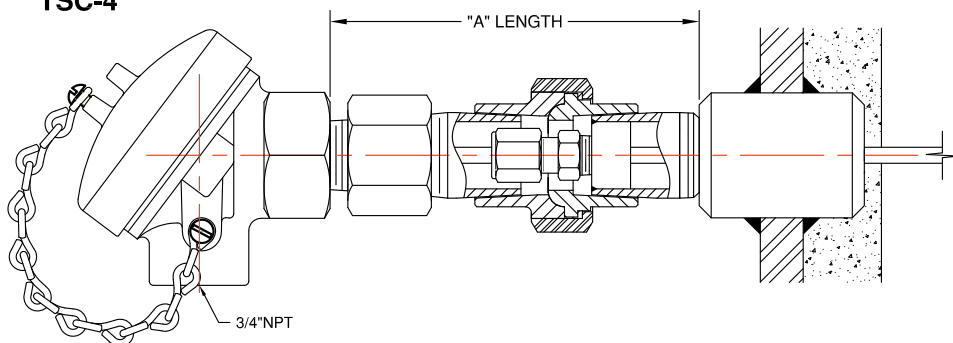
KNIFE EDGE THERMOCOUPLES



TSC-3



TSC-4



EXPANSION LOOP (NOTE 3)

CODE	HEAD EXTENSION
3	DIRECT SHEATH EXTENSION
4	NIPPLE/UNION/SEALING FITTING/NIPPLE

CODE		CALIBRATION
STANDARD	SPECIAL (NOTE 1)	
J	JJ	IRON (+) vs CONSTANTAN (+)
K	KK	CHROMEL (+) vs ALUMEL (-)
E	EE	CHROMEL (+) vs CONSTANTAN (-)
N	NN	NICROSIL (+) vs NISIL (-)

SHEATH DIAMETER & WALL THICKNESS		
CODE	FRACTION	WALL THICKNESS
12	1/2"	STANDARD WALL THICKNESS - .064"
12H	1/2"	HEAVY WALL - .120"

CODE	ELEMENT SHEATH MATERIAL
Q	310 STAINLESS STEEL
J	INCONEL 600
Y	446 STAINLESS STEEL

CODE	IMMERSION LENGTH (IN INCHES)
------	---------------------------------

CODE	BEND RADIUS
R	RIGHT ANGLE
L	LONGITUDINAL

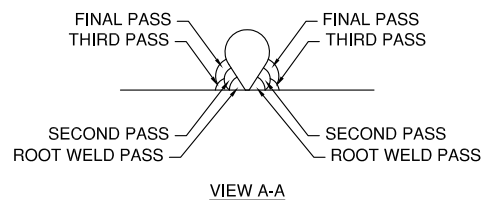
TSC-3-K-12-G-Q-60-L-12-6-AN-1NPT

CODE	PIPE DIAMETER (IN INCHES)
------	------------------------------

CODE	"A" LENGTH (IN INCHES)
------	---------------------------

CODE	PROCESS MOUNTING
3/4NPT	3/4"NPT
1NPT	1"NPT
1 1/2NPT	1 1/2"NPT
2NPT	2"NPT

CODE	CONNECTION HEAD
AN	ALUMINUM
SN	STAINLESS STEEL
A	CAST IRON



Notes:

- (1) Meets or exceeds Special Initial Calibration Tolerances per ANSI MC96.1 and ASTM E230.
- (2) For an item that does not fall within the catalog description an (SP) can be added to the ordering code as part of a custom construction.
- (3) Knife edge thermocouples are normally shipped straight or coiled. Expansion loops or coils are available formed at factory to specification.

Specifications

Fitting Material: Stainless Steel.
TCS-4: Union Material - Standard Black Malleable Iron.
Nipple Material - Standard Carbon Steel.

THERMOCOUPLES FOR ALUMINUM

CODE	HEAD EXTENSION
01	RIGHT ANGLE
02	STRAIGHT

CODE	CONNECTION HEAD
AN	ALUMINUM
SN	STAINLESS STEEL
A	CAST IRON

CODE	CONDUIT OPENING
1/2	1/2" NPT
3/4	3/4" NPT
M20	M20 x 1.5

CODE	"A" LENGTH (0 IF STRAIGHT)
	IN INCHES or MILLIMETERS FOLLOWED BY mm

CODE	TUBE SIZE
25	25mm OD/12mm ID
28	28mm OD/16mm ID

CODE	"U" LENGTH
	IN INCHES or MILLIMETERS FOLLOWED BY mm

CODE	TUBE MATERIAL	ESTIMATED OPERATIONAL LIFE
SIN	SILICON NITRIDE	1.5 YEARS
NBSC	NITRIDE BONDED SILICON CARBIDE	THREE MONTHS

CODE		ELEMENT CONSTRUCTION				
SINGLE	DUPLEX	CALIBRATION	SHEATH DIAMETER	WIRE SIZE (AWG)	INSULATION	SHEATH MATERIAL
A6mmKGR	AD6mmKGR	TYPE K	6mm (.236")	19	MgO-SHEATH	316 STN. STL.
A8mmKGR	AD8mmKGR	TYPE K	8mm (.313")	16	MgO-SHEATH	316 STN. STL.

TC-ALU 01

WEATHERPROOF CONNECTION HEAD

"A" LENGTH

ELBOW, 90 DEGREE, 1/2"NPT, 150#, CARBON STEEL (AVAILABLE IN 45 DEGREE)

CERAMIC FIBER PACKING

SPLIT HOLDING COLLAR, 25mm OD TUBE ONLY

NIPPLE EXTENSION, 1/2"NPT BY SCH.-40, CARBON STEEL

CONDUIT OPENING

FITTING TUBE HOLDER, STN. STL.

TUBE OD

"U" LENGTH

"U" LENGTH

TC-ALU 02

"IMMERSION LENGTH"

SHEATH DIAMETER 6mm

MEASURING JUNCTION

"LEAD LENGTH"

HIGH IMPACT PLASTIC HANDLE

TEFLON INSULATED & JACKETED LEAD WIRE

H

TC-ALU 03

CODE	MEASURING JUNCTION
G	GROUND
U	UNGROUND

CODE	SHEATH MATERIAL
316	316 STN. STL.
I600	ALLOY 600

CODE	IMMERSION LENGTH
	IN INCHES or MILLIMETERS FOLLOWED BY mm

CODE	LEAD LENGTH
	IN INCHES or MILLIMETERS FOLLOWED BY mm or METERS FOLLOWED BY M

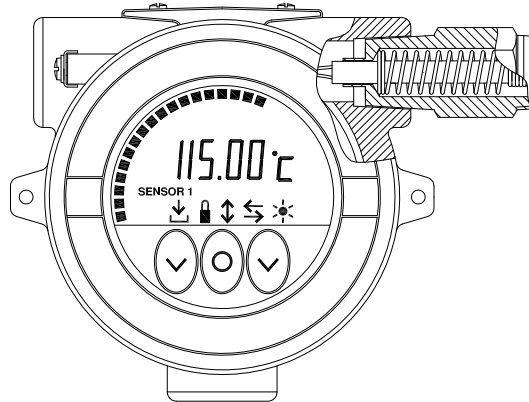
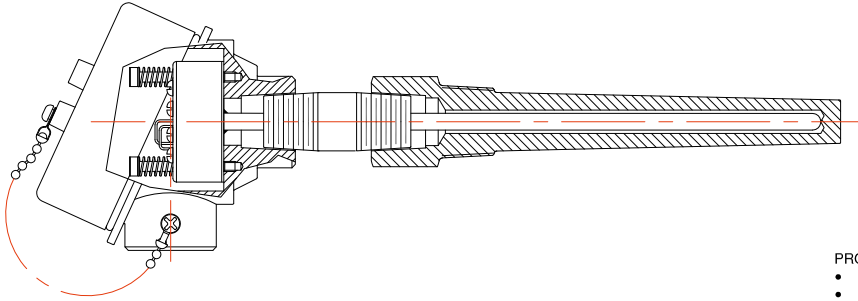
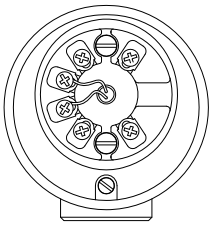
CODE	LEAD LENGTH
H	MINIATURE PLUG
3PA	3-PIN AMPHENOL (AACF-3)
3PE	3-PIN ECCENTRIC CONN.

TC-ALU 03-K6mm

3PE

3PA

TRANSMITTER ASSEMBLIES



- PROGRAMMABLE**
- THERMOCOUPLE INPUT
 - GALVANIC ISOLATION
 - SUPPLY VOLTAGE: 7.2 to 35 VDC
 - SIGNAL RANGE: 4 to 20 mA

- PROGRAMMABLE**
- 3-WIRE RTD INPUT
 - GALVANIC ISOLATION
 - SUPPLY VOLTAGE: 8 to 35 VDC
 - SIGNAL RANGE: 4 to 20 mA

- HART 5 PROTOCOL**
- THERMOCOUPLE or 3-WIRE RTD INPUT
 - SUPPLY VOLTAGE: 8 to 35 VDC
 - SIGNAL RANGE: 4 to 20 mA

- HART 5 and 7 PROTOCOL**
- THERMOCOUPLE or 3-WIRE RTD INPUT
 - HARDWARE ASSESSED FOR USE IN SIL
 - SUPPLY VOLTAGE: 8 to 35 VDC
 - SIGNAL RANGE: 4 to 20 mA

- PROFIBUS, FOUNDATION FIELDBUS**
- THERMOCOUPLE or 3-WIRE RTD INPUT
 - SUPPLY VOLTAGE: 9 to 32 VDC
 - AUTOMATIC SWITCHING BETWEEN PROTOCOLS
 - BASIC or LAS CAPABILITY with FOUNDATION FIELDBUS

CODE	TRANSMITTER TYPE
PRO	PROGRAMMABLE
HART5	HART 5 PROTOCOL
HART7	HART 7 PROTOCOL
BUS	FIELDBUS
IND	INDICATING

CODE	HEAD EXTENSION
2	NIPPLE ONLY
4	NIPPLE/UNION/NIPPLE

CODE	CONNECTION HEAD
ANT	ALUMINUM
SNT	STAINLESS STEEL

CODE	CONDUIT OPENING
1/2	1/2" NPT
3/4	3/4" NPT
M20	M20 x 1.5

CODE	"A" LENGTH IN INCHES
1/2	

TRM- [] - [] - [] - 1/2 - [] - [] COMPLETE CODE WITH THERMOWELL FROM:
PAGE 8, THREADED, SOCKET, WELD IN
PAGE 9, FLANGED
PAGE 10, VAN STONE



- INDICATING**
- THERMOCOUPLE or 3-WIRE RTD INPUT
 - SUPPLY VOLTAGE: 10 to 30 VDC
 - SIGNAL RANGE: 4 to 20 Ma
 - HART 5 or 7 PROTOCOL
 - HIGH DEFINITION LOCAL OPERATOR INTERFACE with 3 OPTICAL BUTTONS
 - SELECTABLE RED or WHITE BACK LIGHT
 - 0, 90, 180, 270 DEGREE DISPLAY ADJUSTMENT
 - 3 PORT OPENINGS

TYPE	MIN. TEMPERATURE	MAX. TEMPERATURE
J	-148° F (-100° C)	2192° F (1200° C)
K	-292° F (-180° C)	2502° F (1372° C)
T	-328° F (-200° C)	752° F (400° C)
E	-148° F (-100° C)	1832° F (1000° C)
N	-292° F (-180° C)	2372° F (1300° C)
PT100	-328° F (-200° C)	1562° F (850° C)

THERMOCOUPLE SELECTION

CODE		ELEMENT CONSTRUCTION			
SINGLE	DUPLEX	SHEATH DIAMETER	WIRE SIZE (AWG)	INSULATION	SPRING LOADED
ASL6mm	ADSL6mm	6mm (.236")	19	MgO-SHEATH	YES
ASL14	ADSL14	.25" (6.6mm)	18	MgO-SHEATH	YES

CODE		CALIBRATION
STANDARD	SPECIAL	
J	JJ	IRON (+) vs CONSTANTAN (-)
K	KK	CHROMEL (+) vs ALUMEL (-)
T	TT	COPPER (+) vs CONSTANTAN (-)
E	EE	CHROMEL (+) vs CONSTANTAN (-)
N	NN	NICROSIL (+) vs NISIL (-)

RTD SELECTION

CODE		ELEMENT CONSTRUCTION	
SINGLE	DUPLEX	SHEATH DIAMETER	SPRING LOADED
RTD6mm	DRTD6mm	6mm (.236")	YES
RTD14	DRTD14	.25" (6.6mm)	YES

CODE	TEMPERATURE RANGE
LT (LEAVE BLANK)	-50 to +260° C
HT	-180 to +500° C
	-180 to +650° C

RTD CONSTRUCTION
CONSTRUCTION: 3-WIRE (6 FOR DUPLEX)
ELEMENT TYPE: PLATINUM
TCR: .00385 OHMS/OHM/°C
RESISTANCE @ °C: 100 OHMS
SHEATH MATERIAL: 316 SS

CODE	MEASURING JUNCTION
G	SINGLE GROUNDED
U	SINGLE UNGROUNDED
DG	DUPLEX GROUNDED
DU	DUPLEX UNGROUNDED

CODE	SHEATH MATERIAL
P	304 STN. STL.
R	316 STN. STL.
Q	310 STN. STL.
J	INCONEL 600

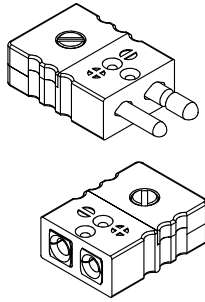
SECOND LEG OF DUPLEX SENSOR
WILL BE TIED OFF AS A SPARE

CONNECTORS

STANDARD 2-PIN

ORDERING CODE			CALIBRATION
PLUG	PLUG(SOLID PINS)	JACK	
CO-45101	CO-45101HD	CO-45201	ISA TYPE J
CO-45102	CO-45102HD	CO-45202	ISA TYPE K
CO-45103	CO-45103HD	CO-45203	ISA TYPE T
CO-45104	CO-45104HD	CO-45204	ISA TYPE R/S*
CO-45105	CO-45105HD	CO-45205	ISA TYPE E
CO-45106	CO-45106HD	CO-45206	COPPER**
(USE HD)	CO-45107HD	CO-45207	ISA TYPE N

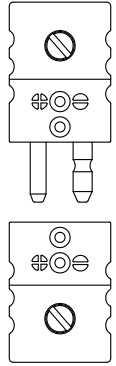
ADD*-IEC* TO END OF PART NUMBER FOR CONNECTORS WITH IEC COLOR IDENTIFICATION



EXTENDED TEMPERATURE LIMITS 2-PIN

ORDERING CODE			CALIBRATION
PLUG	PLUG(SOLID PINS)	JACK	
CO-40301	CO-40301HD	CO-40401	ISA TYPE J
CO-40302	CO-40302HD	CO-40402	ISA TYPE K
CO-40303	CO-40303HD	CO-40403	ISA TYPE T
CO-40304	CO-40304HD	CO-40404	ISA TYPE R/S*
CO-40305	CO-40305HD	CO-40405	ISA TYPE E
CO-40306	CO-40306HD	CO-40406	COPPER**
(USE HD)	CO-40307HD	CO-40407	ISA TYPE N

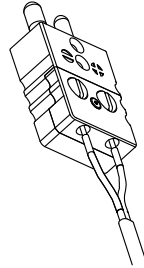
ADD*-IEC* TO END OF PART NUMBER FOR CONNECTORS WITH IEC COLOR IDENTIFICATION



QUICK WIRE 2-PIN

ORDERING CODE			CALIBRATION
PLUG	PLUG(SOLID PINS)	JACK	
CO-45111	CO-45111HD	CO-45211	ISA TYPE J
CO-45112	CO-45112HD	CO-45212	ISA TYPE K
CO-45113	CO-45113HD	CO-45213	ISA TYPE T
CO-45114	CO-45114HD	CO-45214	ISA TYPE R/S*
CO-45115	CO-45115HD	CO-45215	ISA TYPE E
CO-45116	CO-45116HD	CO-45216	COPPER**
(USE HD)	CO-45117HD	CO-45217	ISA TYPE N

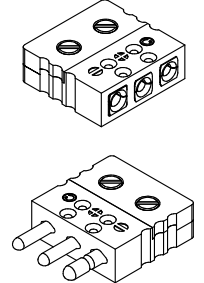
ADD*-IEC* TO END OF PART NUMBER FOR CONNECTORS WITH IEC COLOR IDENTIFICATION



STANDARD SIZE 3-PIN

ORDERING CODE			CALIBRATION
PLUG	PLUG(SOLID PINS)	JACK	
CO-46101	CO-46101HD	CO-46201	ISA TYPE J
CO-46102	CO-46102HD	CO-46202	ISA TYPE K
CO-46103	CO-46103HD	CO-46203	ISA TYPE T
CO-46104	CO-46104HD	CO-46204	ISA TYPE R/S*
CO-46105	CO-46105HD	CO-46205	ISA TYPE E
CO-46106	CO-46106HD	CO-46206	COPPER**
(USE HD)	CO-46107HD	CO-46207	ISA TYPE N

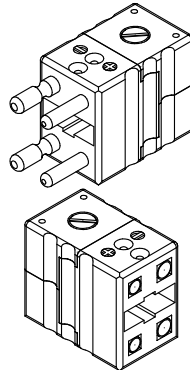
ADD*-IEC* TO END OF PART NUMBER FOR CONNECTORS WITH IEC COLOR IDENTIFICATION



DUPLEX 2-PIN (4 TOTAL)

ORDERING CODE		CALIBRATION
PLUG	JACK	
CO-40801	CO-40901	ISA TYPE J
CO-40802	CO-40902	ISA TYPE K
CO-40803	CO-40903	ISA TYPE T
CO-40804	CO-40904	ISA TYPE R/S*
CO-40805	CO-40905	ISA TYPE E
CO-40806	CO-40906	COPPER**
CO-40807	CO-40907HD	ISA TYPE N

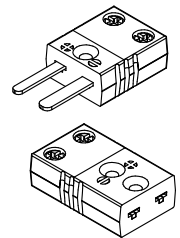
ADD*-IEC* TO END OF PART NUMBER FOR CONNECTORS WITH IEC COLOR IDENTIFICATION



MINIATURE 2-PIN

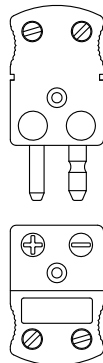
ORDERING CODE		CALIBRATION
PLUG	JACK	
CO-41101	CO-41201	ISA TYPE J
CO-41102	CO-41202	ISA TYPE K
CO-41103	CO-41203	ISA TYPE T
CO-41104	CO-41204	ISA TYPE R/S*
CO-41105	CO-41205	ISA TYPE E
CO-41106	CO-41206	COPPER**
CO-41107	CO-41207	ISA TYPE N

ADD*-IEC* TO END OF PART NUMBER FOR CONNECTORS WITH IEC COLOR IDENTIFICATION



ULTRA TEMP 2-PIN

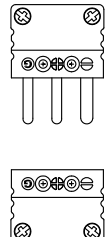
ORDERING CODE		CALIBRATION
PLUG	JACK	
CO-43101	CO-43201	ISA TYPE J
CO-43102	CO-43202	ISA TYPE K
CO-43103	CO-43203	ISA TYPE T
CO-43104	CO-43204	ISA TYPE R/S*
CO-43105	CO-43205	ISA TYPE E
CO-43106	CO-43206	COPPER**
CO-43107	CO-43207	ISA TYPE N



MINIATURE 3-PIN

ORDERING CODE		CALIBRATION
PLUG	JACK	
CO-41111	CO-41211	ISA TYPE J
CO-41112	CO-41212	ISA TYPE K
CO-41113	CO-41213	ISA TYPE T
CO-41114	CO-41214	ISA TYPE R/S*
CO-41115	CO-41215	ISA TYPE E
CO-41116	CO-41216	COPPER**
CO-41117	CO-41217	ISA TYPE N

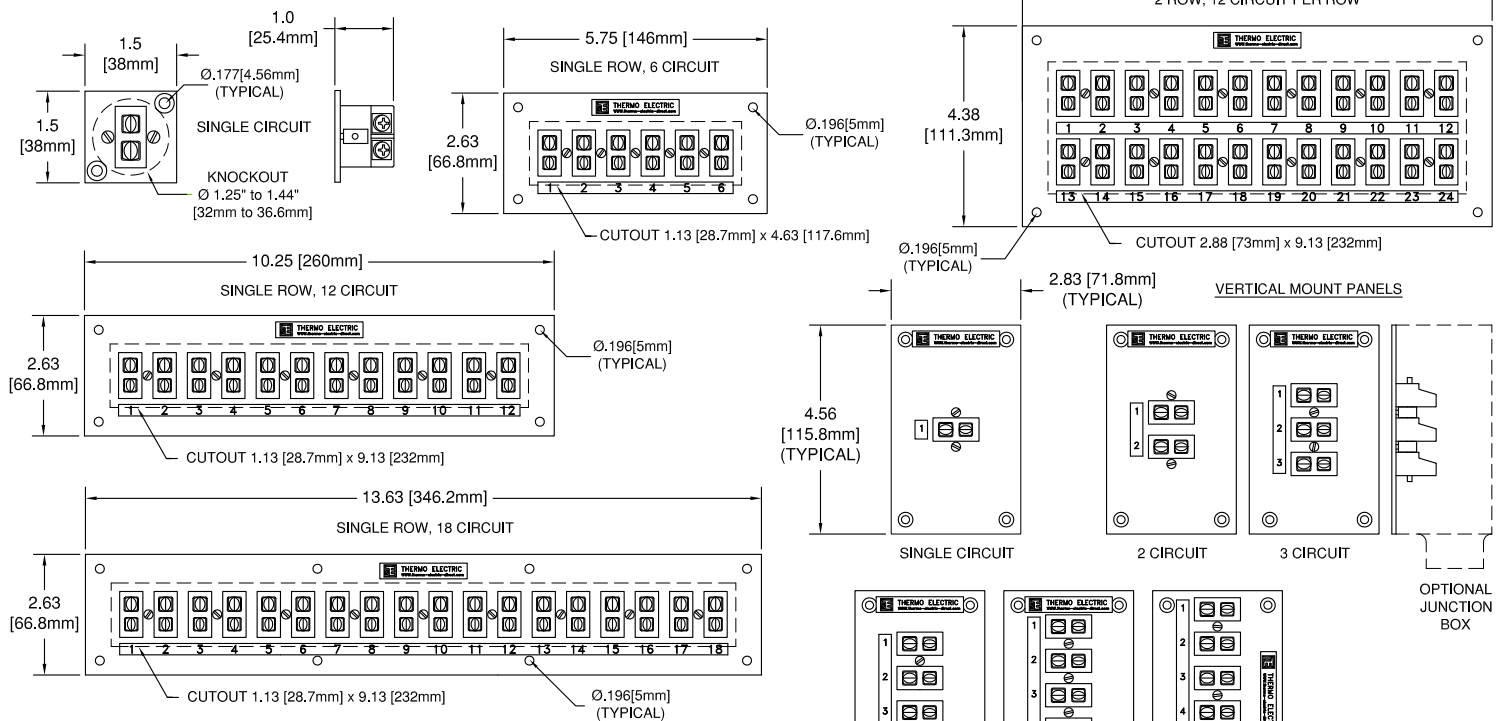
ADD*-IEC* TO END OF PART NUMBER FOR CONNECTORS WITH IEC COLOR IDENTIFICATION



* Compensating Extension Alloys used for both R and S thermocouples
** Copper used for B thermocouples or RTD's

JACK PANELS

STANDARD SIZE 2-PIN JACK PANELS



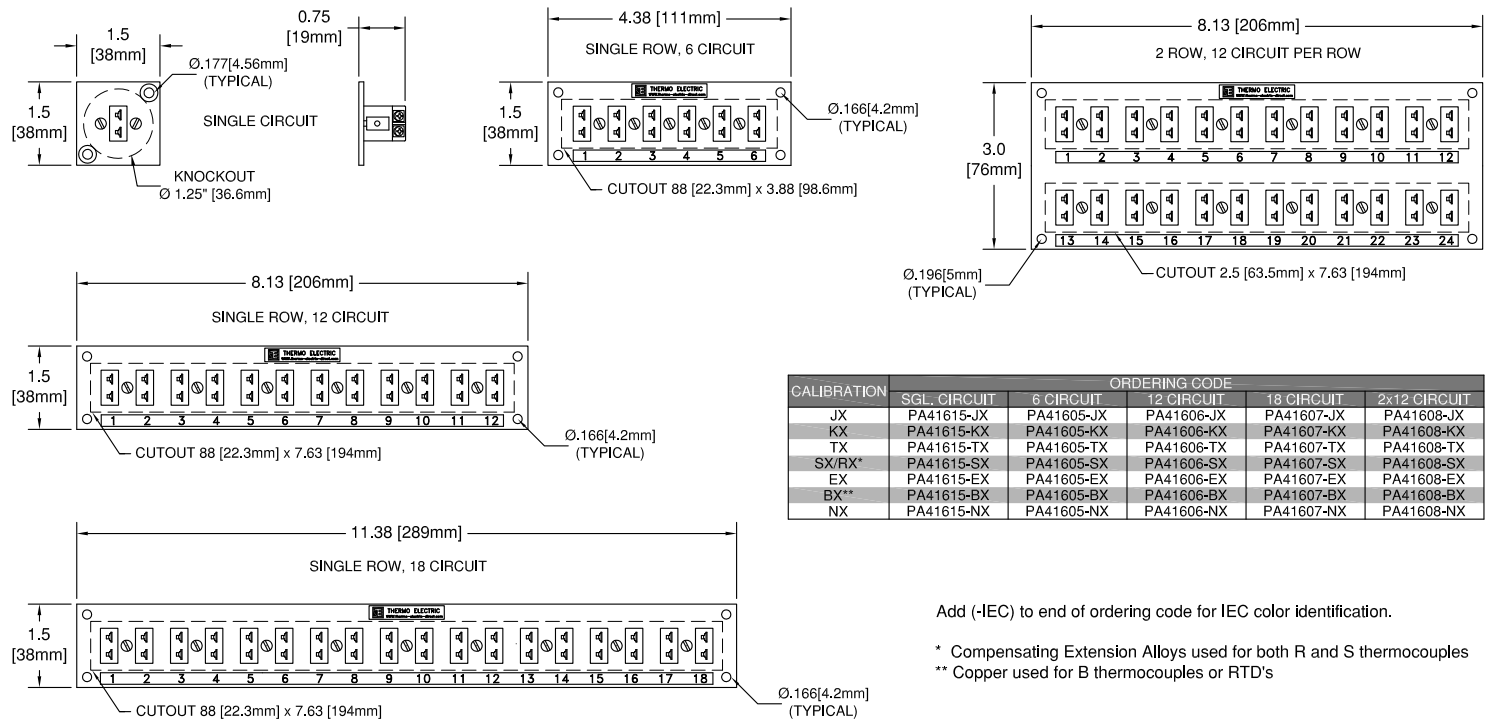
INSERTS
Color Identification: ANSI-MC96
Polarized, Spring Loaded
Insert Material: Thermocouple Alloys
Body Material: High Impact Strength
Thermoplastic
Maximum Temperature Limit: 390°F
(200°C)

Maximum Wire Diameter:
Standard Size .079" (14Ga)
Miniature .024" (24Ga)

FACE PANEL
Material: Anodized Aluminum

CALIBRATION	ORDERING CODE, VERTICAL MOUNT PANELS						JUNCTION BOX	
	SGL. CIRCUIT	2 CIRCUIT	3 CIRCUIT	4 CIRCUIT	5 CIRCUIT	6 CIRCUIT	1/2"NPT	3/4"NPT
JX	PA41801-JX	PA41802-JX	PA41803-JX	PA41804-JX	PA41805-JX	PA41805-JX		
KX	PA41801-KX	PA41802-KX	PA41803-KX	PA41804-KX	PA41805-KX	PA41805-KX		
TX	PA41801-TX	PA41802-TX	PA41803-TX	PA41804-TX	PA41805-TX	PA41805-TX		
SX/IR*	PA41801-SX	PA41802-SX	PA41803-SX	PA41804-SX	PA41805-SX	PA41805-SX		
EX	PA41801-EX	PA41802-EX	PA41803-EX	PA41804-EX	PA41805-EX	PA41805-EX	EN1527-1	EN1527-2
BX**	PA41801-BX	PA41802-BX	PA41803-BX	PA41804-BX	PA41805-BX	PA41805-BX		
NX	PA41801-NX	PA41802-NX	PA41803-NX	PA41804-NX	PA41805-NX	PA41805-NX		

MINIATURE 2-PIN JACK PANELS



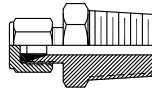
Add (-IEC) to end of ordering code for IEC color identification.

* Compensating Extension Alloys used for both R and S thermocouples
** Copper used for B thermocouples or RTD's

ACCESSORIES

BORE THRU THERMOCOUPLE & RTD COMPRESSION FITTINGS STAINLESS STEEL with STN. STL. INSERTS

ORDERING CODE	PROCESS THREAD SIZE	SHEATH (TUBE) DIAMETER	FITTING LENGTH	HEX SIZE
AF2485-4-S	1/8"NPT	1/16" (.063)	1.03	7/16
AF2485-3-S	1/8"NPT	1/8" (.125)	1.20	7/16
AF2485-2-S	1/8"NPT	3/16" (.188)	1.23	7/16
AF2485-1-S	1/8"NPT	1/4" (.250)	1.29	1/2
AF2502-6-S	1/4"NPT	1/16" (.063)	1.23	9/16
AF2502-5-S	1/4"NPT	1/8" (.125)	1.40	9/16
AF2502-4-S	1/4"NPT	3/16" (.188)	1.43	9/16
AF2502-1-S	1/4"NPT	1/4" (.250)	1.49	9/16
AF2817-6-S	1/2"NPT	1/8" (.125)	1.87	7/8
AF2817-5-S	1/2"NPT	3/16" (.188)	1.87	7/8
AF2817-2-S	1/2"NPT	1/4" (.250)	1.87	7/8



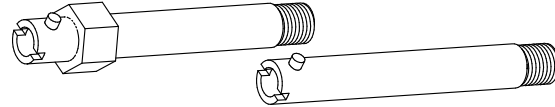
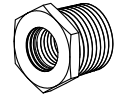
REUSEABLE INSERTS

ORDERING CODE	SHEATH(TUBE) DIAMETER	INSERT MATERIAL
FRC6443-1	1/16" (.063)	TEFLON®
FRC6443-2	1/8" (.125)	TEFLON®
FRC6443-3	3/16" (.188)	TEFLON®
FRC6443-4	1/4" (.250)	TEFLON®
FR5712-3	1/16" (.063)	LAVA
FR5712-1	1/8" (.125)	LAVA
FR5712-4	3/16" (.188)	LAVA
FR5712-2	1/4" (.250)	LAVA

REDUCING BUSHING STAINLESS STEEL

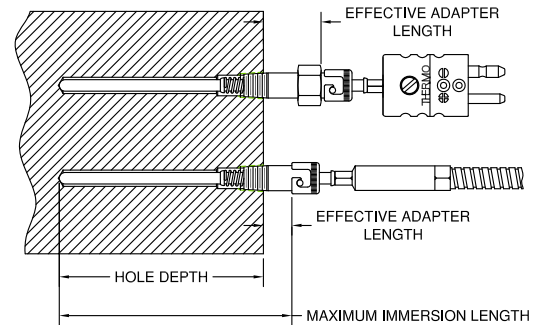
ORDERING CODE
RE1086-4

Size: 1/4"NPT Female
by 1/2"NPT Male



BAYONET MOUNTING ADAPTERS

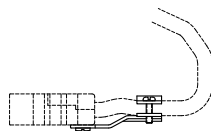
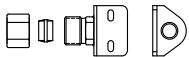
THREAD SIZE	ADAPTER TYPE	EFFECTIVE LENGTH	ACTUAL LENGTH	ORDERING CODE
1/8"NPT	SCREW DRIVER SLOT	5/32	7/8	AD1500-1
		17/32	1 1/4	AD4011-1
		1 1/32	1 3/4	AD4011-2
		1 17/32	2 1/4	AD4011-3
		2 1/32	2 3/4	AD4011-4
		2 17/32	3 1/4	AD4011-5
	HEX NUT	3 1/32	3 3/4	AD4011-6
		17/32	1 1/4	AD1855-1
		1 1/32	1 3/4	AD1855-2
		1 17/32	2 1/4	AD1855-3
		2 1/32	2 3/4	AD1855-4
		2 17/32	3 1/4	AD1855-5
3/8 - 24	SCREW DRIVER SLOT	0	7/8	AD1500-2
		3/8	1 1/4	AD2375-1
		7/8	1 3/4	AD2375-2
		1 3/8	2 1/4	AD2375-3
		1 7/8	2 3/4	AD2375-4
		2 3/8	3 1/4	AD2375-5
	HEX NUT	2 7/8	3 3/4	AD2375-6
		3/8	1 1/4	AD4010-1
		7/8	1 3/4	AD4010-2
		1 3/8	2 1/4	AD4010-3
		1 7/8	2 3/4	AD4010-4
		2 3/8	3 1/4	AD4010-5
		2 7/8	3 3/4	AD4010-6



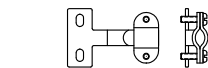
HEAD ENTRY

SR.NO.	PROCESS ENTRY	SINGLE/DUAL CABLE ENTRY
1	1/2"NPT	1/2"NPT
2	1/2"NPT	3/4"NPT
3	1/2"NPT	M20X1.5
4	3/4"NPT	1/2"NPT
5	3/4"NPT	3/4"NPT
6	3/4"NPT	M20X1.5
7	M20X1.5	1/2"NPT
8	M20X1.5	3/4"NPT
9	M20X1.5	M20/1.5

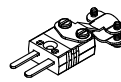
CONNECTOR ACCESSORIES



COMPRESSION BRACKET	
CODE	SHEATH DIAMETER
BK/FT21670-1	1/16" (.063)
BK/FT21670-2	1/8" (.125)
BK/FT21670-3	3/16" (.187)
BK/FT21670-4	1/4" (.25)



WIRE CLAMP BRACKET	
CODE	
BK/CL26000-2	



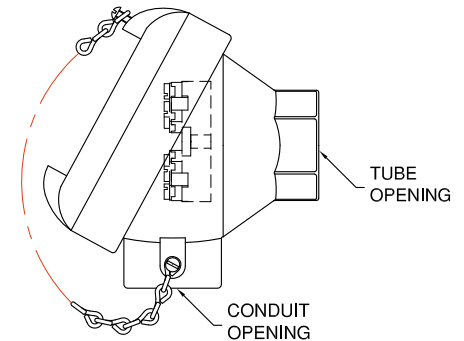
WIRE CLAMP BRACKET	
CODE	
BK/CL28519	

CONNECTION HEADS

SCREW COVER, CAPTIVE CHAIN

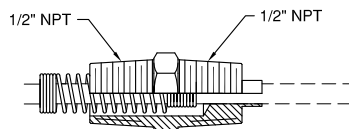
NEMA-4, 4X, IP66

6-POINT TERMINAL BLOCK (STANDARD)



HEX NIPPLE EXTENSION for SPRING LOADING or POTTING SELF-GRIPPING SPRING (SEATS UNDER TERMINAL BLOCKS) MATERIAL: STAINLESS STEEL

SHEATH DIAMETER	HEX NIPPLE CODE	SPRING CODE
1/8" (.125)	SS000-309	SR002-566
3/16" (.187)	SS000-310	SR002-565
1/4" (.25)	SS001-475	SR002-563



CONNECTION HEADS			
TUBE OPENING	CONDUIT OPENING	CODE ALUMINUM	CODE 316 STN. STL.
1/2"NPT	1/2"NPT	SS014-898	SS014-904
1/2"NPT	3/4"NPT	SS014-899	SS014-905
3/4"NPT	1/2"NPT	SS014-900	SS014-906
3/4"NPT	3/4"NPT	SS014-901	SS014-907
1/2"NPT	M20 x 1.5	SS014-902	SS014-908
3/4"NPT	M20 x 1.5	SS014-903	SS014-909

INSULATED THERMOCOUPLE WIRE

CALIBRATION	ORDERING CODE	
	STANDARD	SPECIAL
TYPE JX	W-P/P-20F-JX	W-P/P-20F-JJX
TYPE KX	W-P/P-20F-KX	W-P/P-20F-KKX
TYPE TX	W-P/P-20F-TX	W-P/P-20F-TTX
TYPE EX	W-P/P-20F-EX	W-P/P-20F-EEX
TYPE NX	W-P/P-20F-NX	W-P/P-20F-NNX

* Add (-IEC) to the end of the ordering code for IEC color coded insulation and jacketed wire.
Example: W-P/P-20F-JX-IEC

EXTENSION GRADE THERMOCOUPLE WIRE, PVC INSULATION

20 gage stranded conductors are insulated with a flexible polyvinyl chloride. Conductors are laid parallel and covered with an overall polyvinyl chloride jacket. Nominal insulation thickness, 15 mils.

Temperature Limit: 220° F (105°C)



CALIBRATION	ORDERING CODE	
	STANDARD	SPECIAL
TYPE JX	W-P/ALPTW-20-JX	W-P/ALPTW-20-JJX
TYPE KX	W-P/ALPTW-20-KX	W-P/ALPTW-20-KKX
TYPE TX	W-P/ALPTW-20-TX	W-P/ALPTW-20-TTX
TYPE EX	W-PAL/PTW-20-EX	W-P/ALPTW-20-EEX
TYPE NX	W-P/ALPTW-20-NX	W-P/ALPTW-20-NNX

* Add (-IEC) to the end of the ordering code for IEC color coded insulation and jacketed wire.
Example: W-P/ALPTW-20-JX-IEC

EXTENSION GRADE THERMOCOUPLE WIRE, PVC INSULATION - SHIELDED

20 gage solid conductors are insulated with a flexible polyvinyl chloride. Conductors are twisted with a polyester backed aluminum tape shield applied with a bare stranded copper drain wire. A polyvinyl chloride jacket is extruded over the shielded pair.

Temperature Limit: 220° F (105°C)



CALIBRATION	COLOR CODE (ANSI)			COLOR CODE (IEC)		
	POSITIVE	NEGATIVE	OVERALL	POSITIVE	NEGATIVE	OVERALL
TYPE JX	WHITE	RED	BLACK	BLACK	WHITE	BLACK
TYPE KX	YELLOW	RED	YELLOW	GREEN	WHITE	GREEN
TYPE TX	BLUE	RED	BLUE	BROWN	WHITE	BROWN
TYPE EX	PURPLE	RED	PURPLE	PURPLE	WHITE	PURPLE
TYPE NX	ORANGE	RED	ORANGE	PINK	WHITE	PINK

INITIAL CALIBRATION TOLERANCES Per ANSI MC96.1 and ASTM E230 (°F)					
TEMPERATURE RANGE	STANDARD		SPECIAL		
	CALIBRATION	TOLERANCE	CALIBRATION	TOLERANCE	
32 to 400°F	TYPE JX	±4.0°F	TYPE JJX	±2.0°F	
32 to 400°F	TYPE KX	±4.0°F	TYPE KKX	±2.0°F	
32 to 212°F	TYPE TX	±1.8°F	TYPE TTX	±0.9°F	
32 to 400°F	TYPE EX	±3.0°F	TYPE EEX	±1.8°F	
32 to 400°F	TYPE NX	±4.0°F	TYPE NNX	±2.0°F	

CALIBRATION	ORDERING CODE	
	STANDARD	SPECIAL
TYPE JX	W-TEX/TEX-20F-J	W-TEX/TEX-20F-JJ
TYPE KX	W-TEX/TEX-20F-K	W-TEX/TEX-20F-KK
TYPE TX	W-TEX/TEX-20F-T	W-TEX/TEX-20F-TT
TYPE EX	W-TEX/TEX-20F-E	W-TEX/TEX-20F-EE
TYPE NX	W-TEX/TEX-20F-N	W-TEX/TEX-20F-NN

* Add (-IEC) to the end of the ordering code for IEC color coded insulation and jacketed wire.
Example: W-TEX/TEX-20F-J-IEC

THERMOCOUPLE GRADE WIRE TEFLON® INSULATION

20 gage stranded conductors, TEFLON® (FEP) or Equivalent INSULATION Individual conductors are insulated with extruded FEP Teflon or equivalent. Conductors are laid parallel and insulated with extruded FEP Teflon or equivalent jacket.

Temperature Limit: 400° F (205°C)



CALIBRATION	ORDERING CODE	
	STANDARD	SPECIAL
TYPE JX	W-G/G-20F-J	W-G/G-20F-JJ
TYPE KX	W-G/G-20F-K	W-G/G-20F-KK
TYPE TX	W-G/G-20F-T	W-G/G-20F-TT
TYPE EX	W-G/G-20F-E	W-G/G-20F-EE
TYPE NX	W-G/G-20F-N	W-G/G-20F-NN

* Add (-IEC) to the end of the ordering code for IEC color coded insulation and jacketed wire.
Example: W-G/G-20F-JX-IEC

THERMOCOUPLE GRADE FIBERGLASS INSULATION

Individual conductors are insulated with a fiberglass braid which is saturated with a resin to improve abrasion resistance and reduce fraying. Conductors are laid parallel and covered with an overall fiberglass jacket and a final impregnation of resin.

Temperature Limit: 950° F (510°C)



CALIBRATION	ORDERING CODE	
	STANDARD	SPECIAL
TYPE JX	W-G/GS-20F-J	W-G/GS-20F-JJ
TYPE KX	W-G/GS-20F-K	W-G/GS-20F-KK
TYPE TX	W-G/GS-20F-T	W-G/GS-20F-TT
TYPE EX	W-G/GS-20F-E	W-G/GS-20F-EE
TYPE NX	W-G/GS-20F-N	W-G/GS-20F-NN

* Add (-IEC) to the end of the ordering code for IEC color coded insulation and jacketed wire.
Example: W-G/GS-20F-J-IEC

THERMOCOUPLE GRADE FIBERGLASS INSULATION with STAINLESS STEEL BRAID OVERALL

Individual conductors are insulated with a fiberglass braid which is saturated with a resin. Conductors are laid parallel and covered with an inner fiberglass jacket. Stainless steel braided outer jacket for additional abrasion resistance.

Temperature Limit: 950° F (510°C)



Buyer can be customized according to requirement

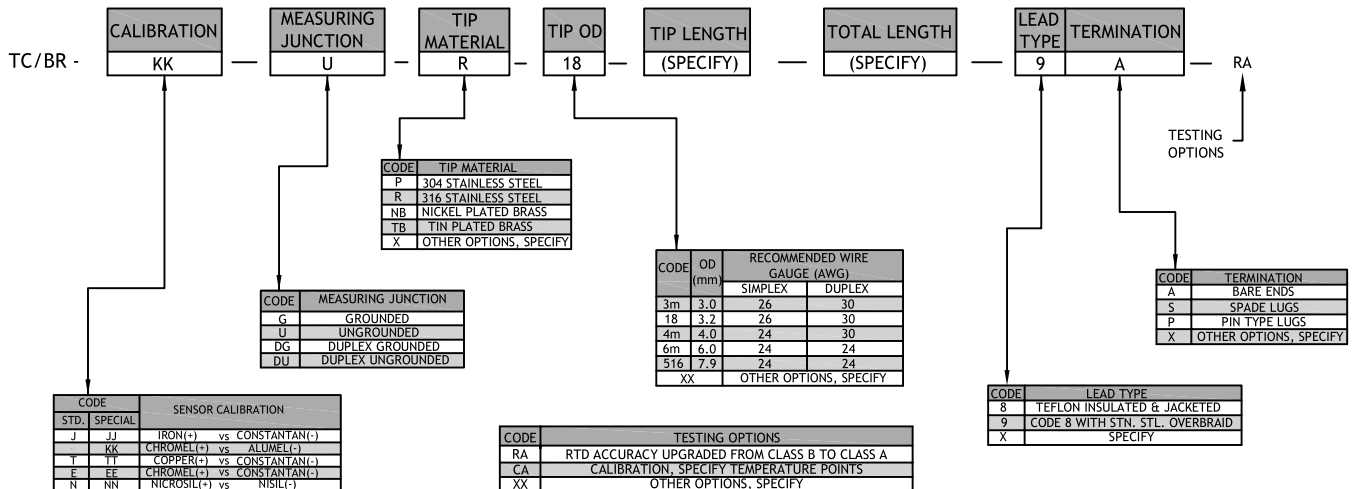
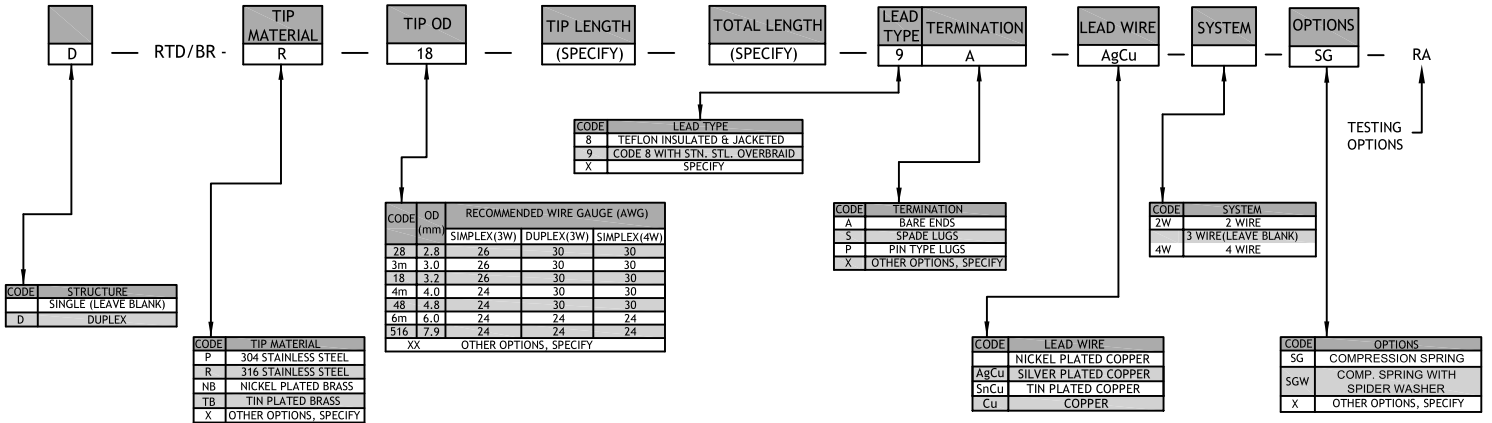
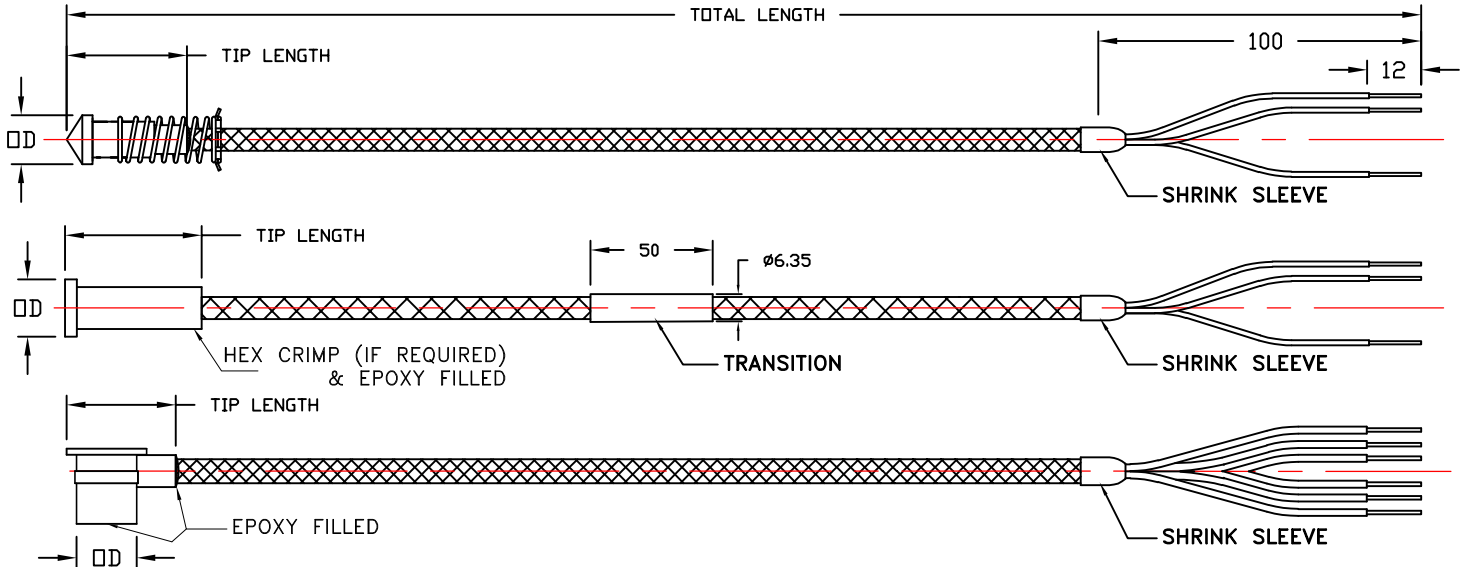
CALIBRATION	COLOR CODE (ANSI)			COLOR CODE (IEC)		
	POSITIVE	NEGATIVE	OVERALL	POSITIVE	NEGATIVE	OVERALL
TYPE J	WHITE	RED	BROWN	BLACK	WHITE	BLACK
TYPE K	YELLOW	RED	BROWN	GREEN	WHITE	GREEN
TYPE T	BLUE	RED	BROWN	BROWN	WHITE	BROWN
TYPE E	PURPLE	RED	BROWN	PURPLE	WHITE	PURPLE
TYPE N	ORANGE	RED	BROWN	PINK	WHITE	PINK

INITIAL CALIBRATION TOLERANCES Per ANSI MC96.1 and ASTM E230 (°F)					
TEMPERATURE RANGE	STANDARD		SPECIAL		
	CALIBRATION	TOLERANCE	CALIBRATION	TOLERANCE	
32 to 1400°F	TYPE J	±4.0°F or ±.75%*	TYPE JJ	±2.0°F or ±.4%*	
32 to 2300°F	TYPE K	±4.0°F or ±.75%*	TYPE KK	±2.0°F or ±.4%*	
-320 to 32°F	TYPE T	±1.8°F or ±1.5%**	TYPE TT	±0.9°F or ±.8%**	
32 to 700°F		±1.8°F or ±.75%*		±0.9°F or ±.4%*	
32 to 1600°F	TYPE E	±3.0°F or ±.50%*	TYPE EE	±1.8°F or ±.5%*	
32 to 2300°F	TYPE N	±4.0°F or ±.75%*	TYPE NN	±2.0°F or ±.4%*	

*Whichever is greater

**Values refer to specially selected cryogenic material. Special limits tolerance is based on limited data, and should only be used as a guide in establishing appropriate working Tolerances.

BEARING RTD'S & TC'S - SINGLE & DUPLEX



MULTIPOINT THERMOCOUPLES & RTD'S

SPRING LOADED MULTICOUPLES with SUPPORT STRAP The flexibility or coiling capability of this design simplifies installation and shipping. These multicouplers are simply uncoiled and guided into a protection tube thereby eliminating complex and costly installation methods usually present in long assemblies.

Notes:

- (1) Standard Nipples - Steel, Schedule 40.
Standard Unions - Black Malleable Iron, 150#.

OPTIONAL STAINLESS STEEL

Nipples - 304 or 316 Stainless Steel, Schedule 40 or 80.

Unions - 304 or 316 Stainless Steel.

Example Ordering Code: 3AE 3/4 1/2 6(R or R80).

- (2) Rated NEC class 1, Groups B, C and D.
(3) ATEX approved EEx d IIC, T6.

CODE	MULTIPOINT TYPE
01	SPRING LOADED with SUPPORT STRAP
02	FREE HANGING
03	MULTITUBE
04	SPRING LOADED
05	MINIATURE MULTICOUPLERs for TEMPERATURE PROFILING

CODE	JUNCTION BOX	
	MATERIAL	TYPE
AN	ALUMINUM	WATER PROOF
SN	STAINLESS STEEL	WATER PROOF, CORROSION RESISTANT
SE	STAINLESS STEEL	EXPLOSION PROOF, CORROSION RESISTANT (NOTE 2)
XD	ALUMINUM	EXPLOSION PROOF, FM, CSA APPROVED (NOTES 2 & 3)

NO. OF ENTRY	CONDUIT OPENING
XX	1/2" or 3/4"NPT
	1" or 1.5"NPT
	2" or 2.5"NPT
	M20 x 1.5
	OTHER OPTIONS, (SPECIFY)

REPLACE "XX" WITH NO. OF ENTRIES 01,02,03.. etc.

CODE	"A" LENGTH
	IN INCHES

CODE	FLANGE RATING
	SPECIFY

CODE	FLANGE TYPE
FF	FLAT FACE
RF	RAISED FACE
RJ	RING TYPE JOINT

MULT- - - - - - - - - - - - 150 RF (N)

USE ONLY IF FLANGE MATERIAL IS NOT
THE SAME AS WELL MATERIAL

CODE	"U" LENGTH
	IN INCHES

CODE	FLANGE SIZE
	SPECIFY

NO. OF ENTRY	CONDUIT OPENING
XX	1/2" or 3/4"NPT
	1" or 1.5"NPT
	2" or 2.5"NPT
	M20 x 1.5
	OTHER OPTIONS, (SPECIFY)

REPLACE "XX" WITH NO. OF ENTRIES 01,02,03.. etc.

CODE	PROTECTION TUBE TYPE	
	TUBE SIZE	OD
81	1/4" NPS	0.540
82	1/2" NPS	0.840
83	3/4" NPS	1.050
84	1" NPS	1.315

CODE	TUBE SCHEDULE (INSIDE DIAMETER)			
	1/4"NPT	1/2"NPT	3/4"NPT	1"NPT
40	0.364	0.622	0.824	1.049
80	0.302	0.546	0.742	0.957
160	N/A	0.464	0.612	0.815
XXS	N/A	N/A	0.434	0.599

CODE	WELL MATERIAL
P	304 STAINLESS STEEL
Q	310 STAINLESS STEEL
R	316 STAINLESS STEEL
PLorRL	304or316 S. S. (LOW CARBON)
N	CARBON STEEL
J	INCONEL 600
H	HASTELLOY C276

THERMOCOUPLE SELECTION

CODE		ELEMENT CONSTRUCTION			
SINGLE	DUPLEX	DIAMETER	WIRE SIZE (AWG)	INSULATION	SPRING LOADED
A14	AD14	1/4"	18	MgO-SHEATH	NO
ASL14	ADSL14	1/4"	18	MgO-SHEATH	YES
AS16	AD516	5/16"	16	MgO-SHEATH	NO
ASL16	ADSL16	5/16"	16	MgO-SHEATH	YES
A38	AD38	3/8"	15	MgO-SHEATH	NO
ASL38	ADSL38	3/8"	15	MgO-SHEATH	YES
B14	BD14	.325"	14	CERAMIC BEAD	NO
B08	BD08	.5" .69"	8	CERAMIC BEAD	NO

CODE		CALIBRATION
STANDARD	SPECIAL	
J	JJ	IRON (+) vs CONSTANTAN (-)
K	KK	CHROMEL (+) vs ALUMEL (-)
T	TT	COPPER (+) vs CONSTANTAN (-)
E	EE	CHROMEL (+) vs CONSTANTAN (-)
N	NN	NICROSIL (+) vs NISIL (-)

CODE	MEASURING JUNCTION
G	SINGLE GROUNDED, GROUNDED TO SHEATH
U	SINGLE UNGROUNDED, ISOLATED FROM SHEATH
DG	DUPLEX GROUNDED, GROUNDED TO SHEATH
DU	DUPLEX UNGROUNDED, ISOLATED FROM SHEATH

CODE	ELEMENT SHEATH MATERIAL
P	304 STN. STL.
R	316 STN. STL.
Q	310 STN. STL.
J	INCONEL 600

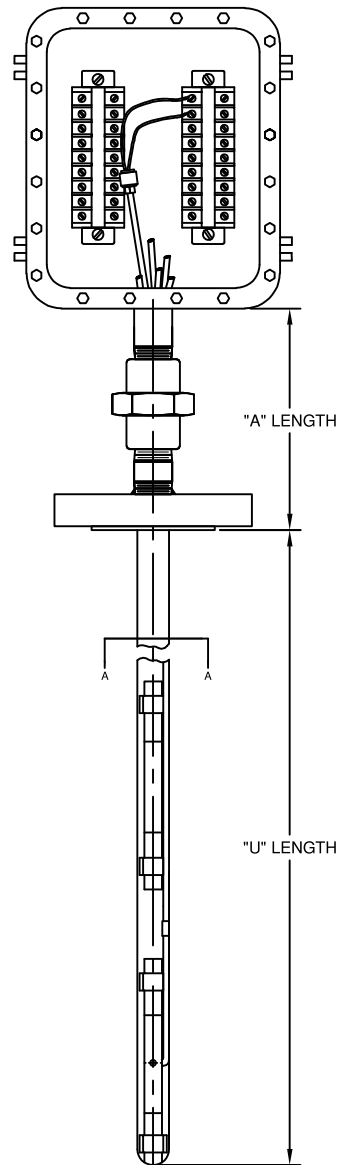
RTD SELECTION

CODE	STRUCTURE
	SINGLE (LEAVE BLANK)
D	DUPLEX

CODE	MEASURING JUNCTION
LT	-58 to +500° F (-50 to +260° C.)
MT	-58 to +900° F (-50 to +482° C.)
	-292 to +932° F (-180 to +500° C) (LEAVE BLANK)
HT	-292 to +1202° F (-180 to +650° C) (NOTE 5)

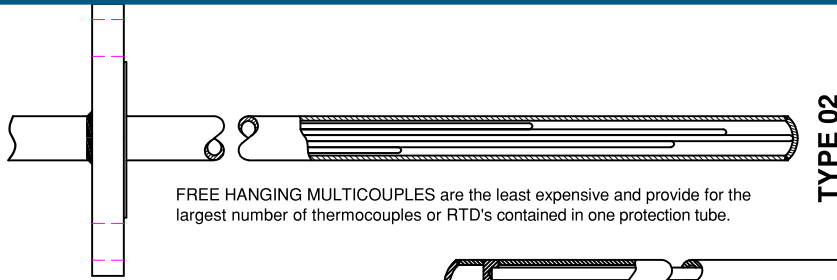
CODE	SYSTEM
2W	2 WIRE (4 WIRE TOTAL WITH DUPLEX)
	3 WIRE (LEAVE BLANK)
4W	4 WIRE (8 TOTAL WITH DUPLEX)

CODE	SYSTEM
	CLASS B (LEAVE BLANK)
CLA	CLASS A

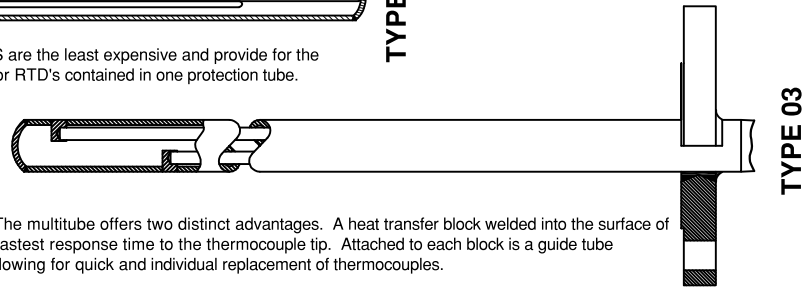


TYPE 01

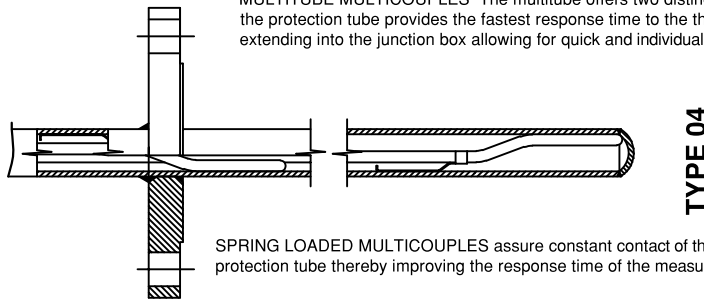
MULTIPOINT THERMOCOUPLES & RTD'S



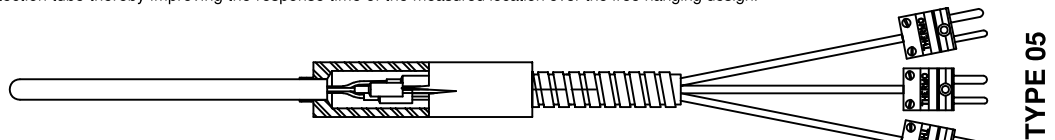
FREE HANGING MULTICOUPLES are the least expensive and provide for the largest number of thermocouples or RTD's contained in one protection tube.



MULTITUBE MULTICOUPLES The multitube offers two distinct advantages. A heat transfer block welded into the surface of the protection tube provides the fastest response time to the thermocouple tip. Attached to each block is a guide tube extending into the junction box allowing for quick and individual replacement of thermocouples.

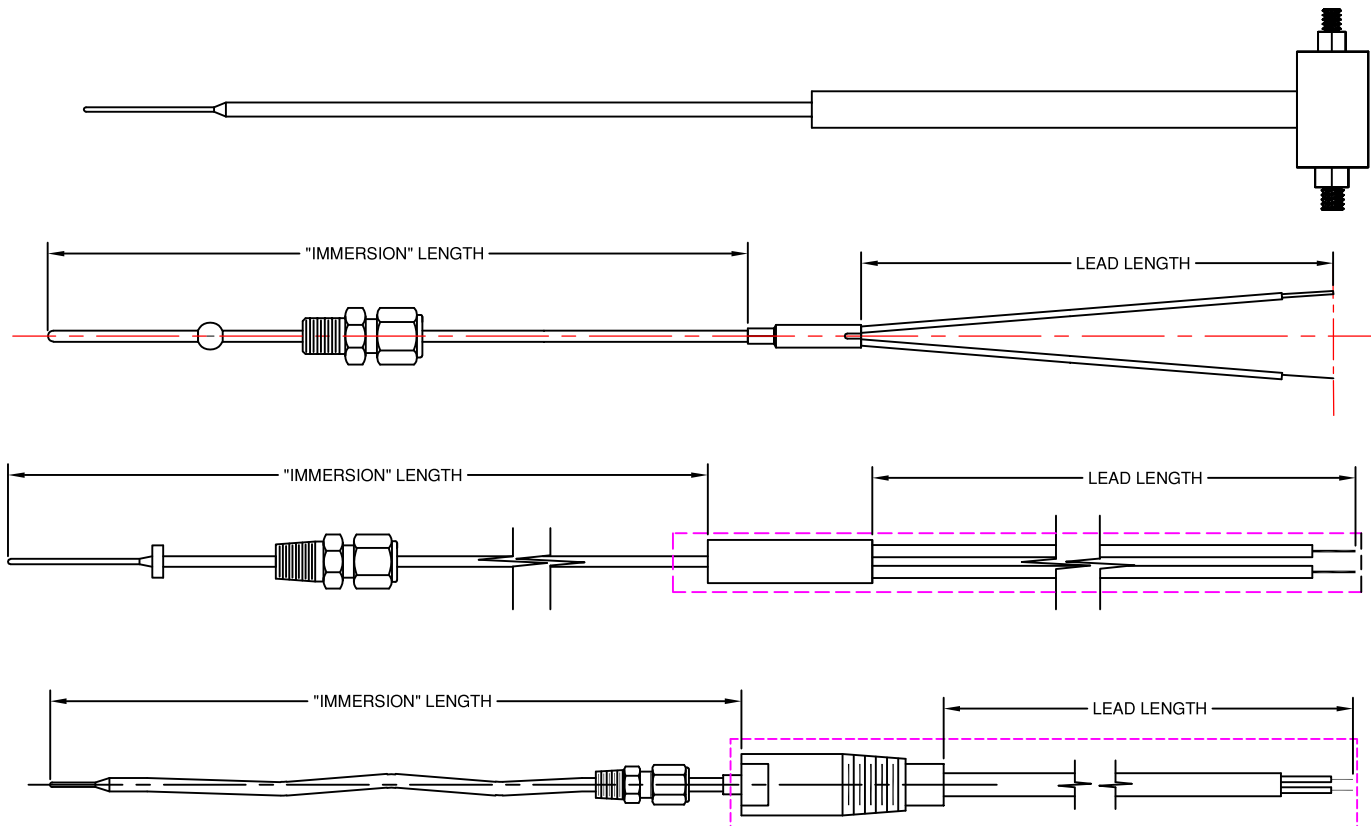


SPRING LOADED MULTICOUPLES assure constant contact of the sensor tip to the inside wall of the protection tube thereby improving the response time of the measured location over the free hanging design.

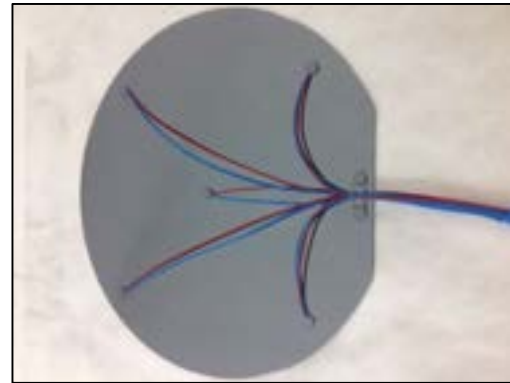
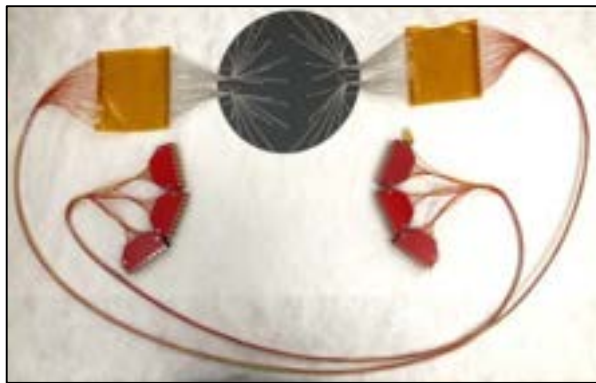


MINIATURE MULTICOUPLES can be used in situations where a number of individual thermocouples have been used to achieve profiling but when space is at a premium. Typical applications include pilot plant operations and pressurized process chambers where a minimum interruption of flow and a maximum response time is desirable.

TURBINE SENSOR TC'S - SINGLE & DUPLEX



WAFER SENSOR Tc's - SINGLE & DUPLEX



CONFIGURATION CODE - S 100 8 1 K 36 S 100 4 T 300 MP 1 T O

PRODUCT CODE	CODE
BONDED (USED IN WAFER BONDING MACHINES)	B
SURFACE MOUNT	S

WAFER SIZE	CODE
50mm (1.97"), WITH FLAT	050
75mm (2.95"), WITH FLAT	075
100mm (3.94"), WITH FLAT	100
125mm (4.92"), WITH FLAT	125
150mm (5.91"), WITH FLAT OR NOTCH	150
200mm (7.84"), WITH NOTCH	200
300mm (11.81"), WITH NOTCH	300
OTHER SIZE, SPECIFY AT TIME OF REQUEST	XXX

PRODUCT TEMPERATURE CODE	CODE
400°C	4
700°C	8
1200°C	12

QUANTITY OF THERMOCOUPLES (TOTAL)	CODE

CALIBRATION	CODE
IRON(+) vs CONSTANTAN(-)	J
CHROMEL(+) vs ALUMEL(-)	K
COPPER(+) vs CONSTANTAN(-)	T
CHROMEL(+) vs CONSTANTAN(-)	E
NICROSIL(+) vs NISIL(-)	N
PLATINUM 13% RODIUM(+) vs PLATINUM(-)	R
PLATINUM 10% RODIUM(+) vs PLATINUM(-)	S
PLATINUM 30% RODIUM(+) vs PLATINUM 6% RODIUM(-)	B

WIRE GAUGE	CODE
36 Awg (0.127 mm I.D.)	36
30 Awg (0.254 mm I.D.)	30

"B" LEADING WIRE SLEEVING MATERIAL	CODE
TEFLON	T
SILICA	S
POLYIMIDE	P
BRAIDED CERAMIC	C
QUARTZ	Q

CODE	"B" LENGTH BUNDLING
N	NONE
T	TIES
O	OVERSLEEVE

CODE	"A" LENGTH BUNDLING
N	NONE
T	TIES
O	OVERSLEEVE

CODE	STRESS RELIEF
N	NO STRESS RELIEF
1	1 STRESS RELIEF
2	2 STRESS RELIEFS
3	3 STRESS RELIEFS
4	4 STRESS RELIEFS

CODE	WIRE TERMINATION
MP	MINI PLUG
BW	BARE WIRE
CMP	CERAMIC MINI PLUG
DP	D-PIN
ST	SPADE TAGS

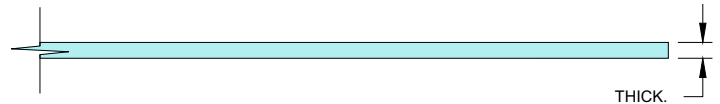
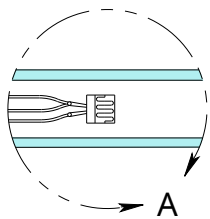
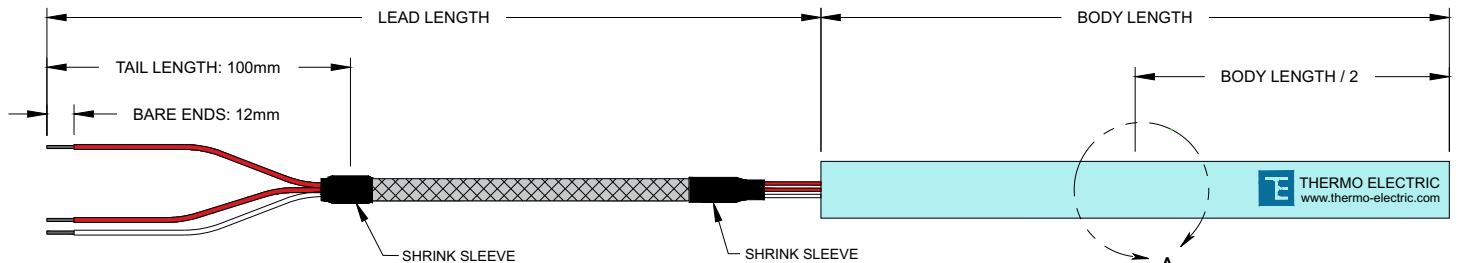
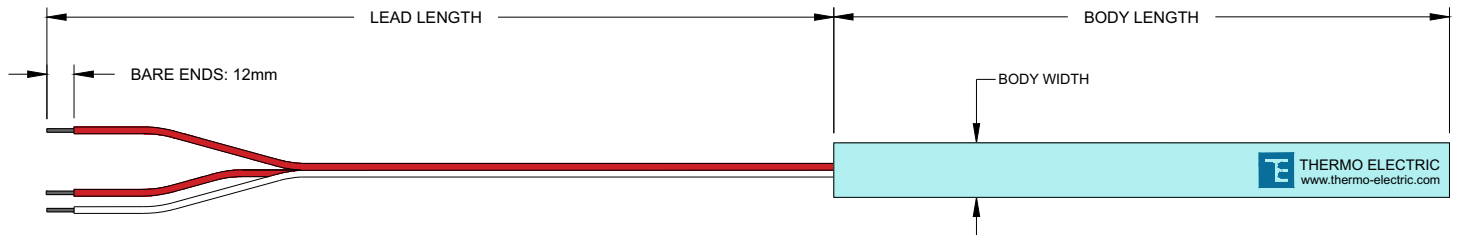
CODE	LEAD LENGTH
	SPECIFY IN mm

CODE	"B" LEADING WIRE SLEEVING MATERIAL
T	TEFLON
S	SILICA
P	POLYIMIDE
C	BRAIDED CERAMIC
Q	QUARTZ

CODE	VACUUM FEED THROUGH LENGTH
2	2 INCHES
4	4 INCHES
6	6 INCHES
8	8 INCHES
XX	OTHER LENGTH SPECIFY IN INCHES

CODE	LEAD LENGTH "A"
	SPECIFY IN mm

STATOR RTD's - SINGLE & DUPLEX



STRUCTURE	RTDs	BODY MATERIAL	BODY THICKNESS	BODY WIDTH	BODY LENGTH	LEAD LENGTH	LEAD TYPE	TERMINATION	TESTING OPTIONS
D	PT	F	SPECIFY	SPECIFY	SPECIFY	SPECIFY	SPECIFY	A	RA

STRD

CODE	THICK (mm)	RECOMMENDED WIRE GAUGE (AWG)		
		3-WIRE SIMPLEX	3-WIRE DUPLEX	4-WIRE SIMPLEX
20	2.0	30	30	30
25	2.5	24	30	24
30	3.0	24	24	24
35	3.5	18	18	18
XXX	OTHER OPTIONS, SPECIFY			

CODE	BODY WIDTH (mm)
7	7.00
8	8.00
8.5	8.50
XX	OTHER OPTIONS, SPECIFY

CODE	TERMINATION
A	BARE WIRE
S	SPADE LUGS
P	PIN TYPE LUGS

CODE	LEAD TYPE
8	STRANDED, NiCu AND TEFLON INSULATED
9	STRANDED, NiCu, TEFLON INSULATED WITH JACKETED
10	STRANDED, NiCu, TEFLON INSULATED WITH JACKETED & OVERALL SS BRAID
XXX	OTHER OPTIONS, SPECIFY

CODE	TESTING OPTIONS
CA	CALIBRATION, SPECIFY TEMPERATURE POINTS
XXX	OTHER OPTIONS, SPECIFY

CODE	RTDs
PT	PT100 PLATINUM 100 OHMS @ 0°C 0.00385 / °C
PT1	PT1000 PLATINUM 1000 OHMS @ 0°C 0.00385 / °C

CODE	BODY MATERIAL	TEMP. RANGE
F	G10	-50°C to 155°C
H	G11	-50°C to 180°C

CODE	STRUCTURE
	3-WIRE SIMPLEX (LEAVE BLANK)
D	3-WIRE DUPLEX
4W	4-WIRE SIMPLEX

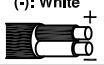
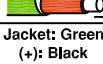
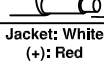
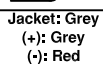
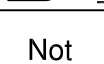
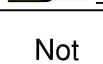
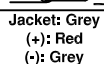
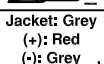
APPLICATIONS:

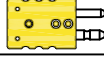
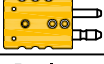
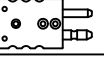
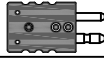
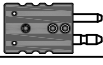
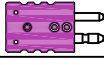
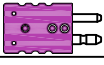
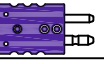
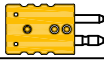
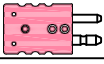
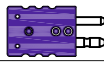
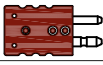
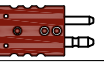
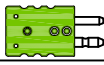
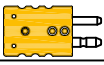
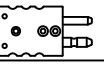
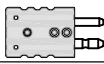
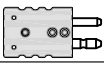
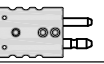
- Industrial
- Electric Motors
- Generators
- Compressors
- Pump

NOTES:

- Temperature Limit : -50°C to +180°C
- For an item that does not fall within the catalog description an (SP) can be added to the ordering code as part of a custom construction.
- Dielectric strength: 5.00 KV for 1 minute.
- The sensor will be positioned at half of the total body length.
- Minimum body thickness should be 2.00 mm
- Minimum body width should be 7.00 mm
- 3-wire duplex RTD (30 AWG) is suitable where assembly thickness ≥ 9 mm.
- Body Length min. 50mm and max as per customer requirement.
- Wire lead length shall be specified by the customer.
- Tail length and bare-ends length can be customized.

TECHNICAL REFERENCE

TYPE (Letter)	Conductor Material	POLARITY	U.S.A. 	FRANCE 	U.K. 	GERMANY 	JAPAN 	IEC 
J	Iron	+	Jacket: Black (+): White (-): Red	Jacket: Black (+): Yellow (-): Black	Jacket: Black (+): Yellow (-): Blue	Jacket: Blue (+): Red (-): Blue	Jacket: Yellow (+): Red (-): White	Jacket: Black (+): Black (-): White
	Constantan	-						
K	Chromel	+	Jacket: Yellow (+): Yellow (-): Red	Jacket: Yellow (+): Yellow (-): Purple	Jacket: Red (+): Brown (-): Blue	Jacket: Green (+): Red (-): Green	Jacket: Blue (+): Red (-): White	Jacket: Green (+): Green (-): White
	Alumel	-						
T	Copper	+	Jacket: Blue (+): Blue (-): Red	Jacket: Blue (+): Yellow (-): Blue	Jacket: Blue (+): White (-): Blue	Jacket: Brown (+): Red (-): Brown	Jacket: Brown (+): Red (-): White	Jacket: Brown (+): Brown (-): White
	Constantan	-						
E	Chromel	+	Jacket: Purple (+): Purple (-): Red	Jacket: Red (+): Yellow (-): Brown	Jacket: Brown (+): Brown (-): Blue	Jacket: Black (+): Red (-): Black	Jacket: Purple (+): Red (-): White	Jacket: Purple (+): Purple (-): White
	Constantan	-						
N	Nicrosil	+	Jacket: Orange (+): Orange (-): Red	Not Established	Jacket: Orange (+): Orange (-): Blue	Not Established	Not Established	Jacket: Pink (+): Pink (-): White
	NISIL	-						
R	Platinum 13% Rhodium	+	Jacket: Green (+): Black (-): Red	Jacket: Green (+): Yellow (-): Green	Jacket: Green (+): White (-): Blue	Jacket: White (+): Red (-): White	Jacket: Black (+): Red (-): White	Jacket: Orange (+): Orange (-): White
	Platinum	-						
S	Platinum 10% Rhodium	+	Jacket: Green (+): Black (-): Red	Jacket: Green (+): Yellow (-): Green	Jacket: Green (+): White (-): Blue	Jacket: White (+): Red (-): White	Jacket: Black (+): Red (-): White	Jacket: Orange (+): Orange (-): White
	Platinum	-						
B	Platinum 30% Rhodium	+	Jacket: Grey (+): Grey (-): Red	Not Established	Not Established	Jacket: Grey (+): Red (-): Grey	Jacket: Grey (+): Red (-): Grey	Not Established
	Platinum 6% Rhodium	-						

THERMOCOUPLE CONNECTOR COLOR CODE				THERMOCOUPLE CONNECTOR COLOR CODE			
TYPE	ANSI	IEC	DIN	TYPE	ANSI	IEC	DIN
K				R			
J			N/A	E			N/A
L	N/A	N/A		N			N/A
T				S			
				B			

- (1) ISA color codes shown is for thermocouple extension grade wire. Thermocouple grade wire has a brown jacket in all calibrations.
- (2) Compensating extension wire and connector pins (copper/alloy II) used with both R and S thermocouples.
- (3) Compensating extension wire and connector pins (copper/copper) used with B thermocouples. Connector body is usually supplied white.



ENGINEERING

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CALIBRATION

- CALIBRATION TEST CERTIFICATES
- SYSTEM CALIBRATION WITH TRANSMITTER
- NIST TRACEABLE



INSPECTION & TESTING

- CERTIFIED MATERIAL TEST REPORTS
- POSITIVE MATERIAL IDENTIFICATION (PMI)
- WPS / PQR - WELD RECORDS & CERTIFIED WELDING
- RADIOGRAPHIC (X-RAY) INSPECTION
- THERMOWELL WAKE FREQUENCY CALCULATIONS
- HYDROSTATIC PRESSURE TESTING SERVICES
- DYE PENETRANT INSPECTION (DPI)
- PHASED ARRAY ULTRASONIC TESTING
- NACE CERTIFICATE
- OXYGEN CLEANING
- INSPECTION TEST PLAN / QUALITY ASSURANCE PLAN
- LOOP RESISTANT TEST REPORT
- LIQUID NITROGEN TEST REPORT
- INSULATION RESISTANT TEST REPORT
- HELIUM LEAK TEST REPORT
- PULL TEST REPORT
- THERMAL CYCLE TEST



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