

Head Assemblies - (Head & Connection) Thermocouples & RTD's

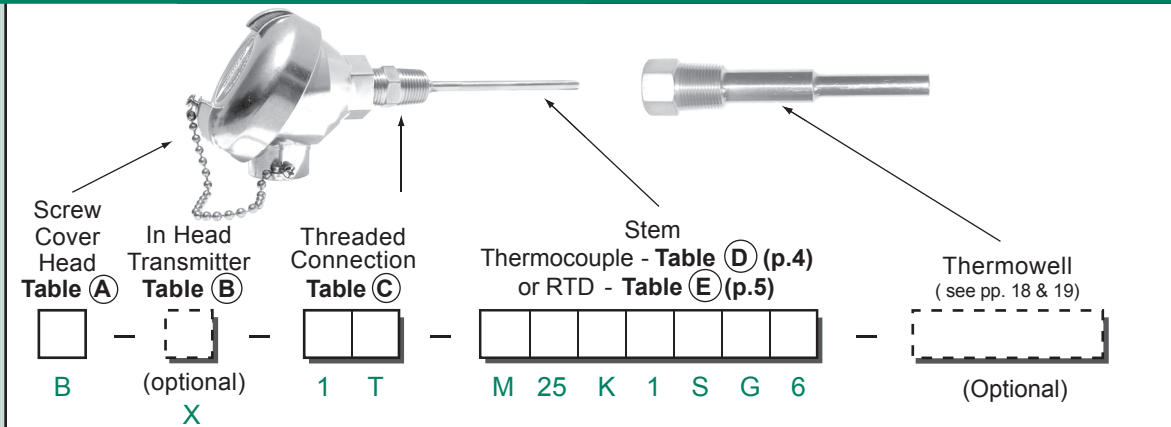


Table A - Connection Heads

TYPE B Universal Cast Aluminum	TYPE A Universal Cast Iron
TYPE G 316SS	TYPE H Aluminum Flip-Top
TYPE I Epoxy Coated Aluminum	TYPE W (use with digital display) Aluminum, Window
TYPE E Explosion Proof, Aluminum	TYPE T ATEX Explosion Proof, Aluminum
TYPE J Explosion Proof 316SS	TYPE Z (use with digital display) Explosion Proof, Window
TYPE S Poly Plastic (white)	TYPE C Poly Plastic (Black)

Table B - Transmitters - (optional)

In Head Standard	In Head with Digital Display (with window head Z)
X = 4-20mA 2-wire trans.	B = 4-20mA 2-wire trans.
R = 4-20mA 2-wire Hart trans.	A = 4-20mA 2-wire Hart trans.
	(with window head W)
	T = 4-20mA 2-wire trans.
	H = 4-20mA 2-wire Hart trans.

Table C - Threaded Connections

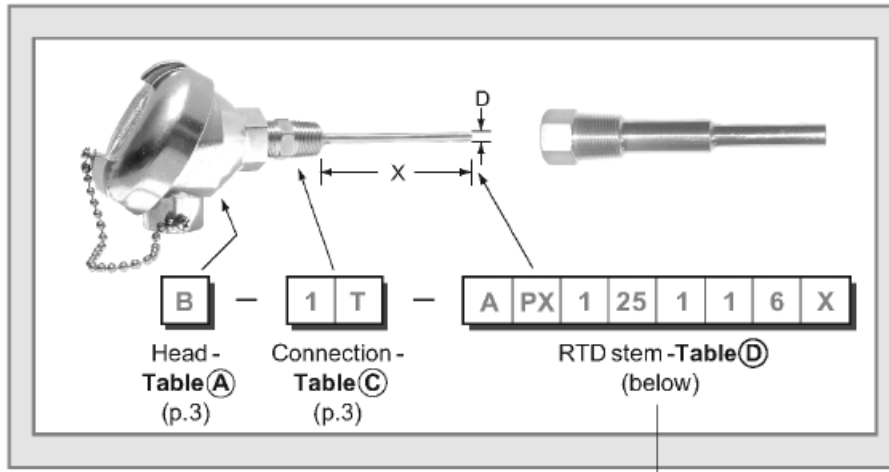
Use spring loaded connection with thermowells. Use welded connection when stem goes directly into the process medium.	Spring Loaded		Welded
	Standard 316SS Fittings	Steel Fittings	Standard 316SS Fittings
 1/2" NPT Hex Fitting 1 5/8"	1T	---	1F
 1/2" NPT Pipe-Nipple 2-1/2"	2T	2L	---
 1/2" NPT Nipple Union Nipple 5"	4T	4L	4F
 1/2" NPT Explosion Proof Hex 2"	7T	---	---

Table D - Stems

Thermocouples see p.4
RTD's see p.5

Head Assemblies - (RTD Stem) RTD's

RTD's (Resistance Temperature Detectors)



How to Order

1. Head - Table (A) (p.3)
2. Transmitter (option) - Table (B) (p.3)
3. Connection - Table (C) (p.3)
4. Stem - Table (D)

TABLE (D) RTD Stems

STEP 1 - RTD Style

A = Style "A" (stem for complete assembly)

STEP 2 - Sensor Material (Px is standard)

Insert Letter designated below.

Px - Platinum 0.00385 $\Omega/\Omega/^\circ\text{C}$

N - Nickel 0.06725 $\Omega/\Omega/^\circ\text{C}$

P - Platinum 0.00392 $\Omega/\Omega/^\circ\text{C}$

C - Copper 0.00421 $\Omega/\Omega/^\circ\text{C}$

STEP 3 - Temperature

Insert single-digit number designated below.

1 -40°F / 600°F

2 (Extended range) -328°F / 1100°F

STEP 4 - Sheath Diameter

Insert two-digit number designated below

25 = .250 dia. 12 = .125 dia. 18 = .188 dia. 37 = .375 dia.

STEP 5 - Sheath Material

Insert single-digit number designated below.

1 = 316 SS

STEP 6 - Resistance 32°F (0°C) Ohms $\pm .5\%$ (#1 is standard)

Insert single-digit number designated below

1 = 100 Ω (Pt. .00385 & .00392)

4 = 1,000 Ω (Pt. .00385 only) 5 = 500 Ω (Pt. .00385 only)

7 = 120 Ω (Nickel only) 8 = 10 Ω (Copper only)

STEP 7 - Determine the required length "X" in inches

Stem length measured from bottom of threads to stem tip.

STEP 8 - Number of Leads/RTD's

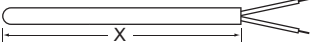
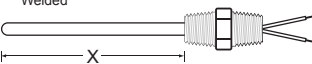
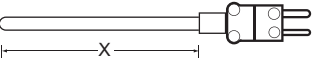
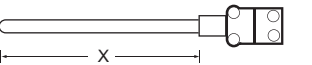
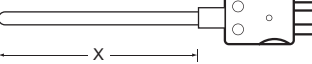
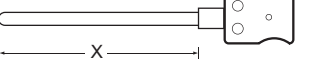
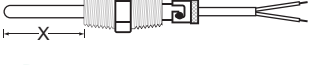
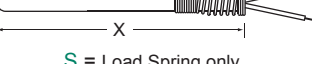
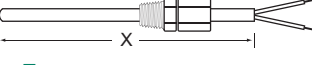
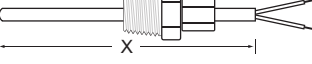
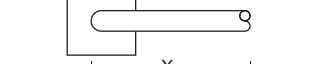
Single RTD	Leads/RTD	Duplex RTD
X	3-wire	XX
Y	4-wire	YY

A 1

Need something you don't see?
Call REOTEMP for information.
•1-800-648-7737•

Stem Only Assemblies Thermocouples & RTD's

Table (A) RTD & TC Styles

	A
A = Plain stem (choose this for all lead assemblies)	
	B
B = Welded SS bushing	
	C
C = Male mini plug	
	D
D = Female mini jack	
	F
F = Male standard plug	
	G
G = Female standard jack	
	H
H = Spring loaded bushing	
	P
P = 1/2" NPT Nipple w/ Bayonet	
	R
R = Bayo Cap w/ spring	
	S
S = Load Spring only	
Table (A-2) Stem Options Styles	
	T
T = 1/4" NPT Compression fitting, loose on stem	
	U
U = 1/2" NPT Compression fitting, loose on stem	
	W
W = Weld Pad	

RTD

STEP 1 - RTD Style

Choose RTD Style from Table (A)

(Optional) STEP 2 - Stem Options

Choose Stem Options from Table (A-2)

STEP 3 - RTD Sensor

Insert sensor code below.	Code	Material/Class	Ω @ 0°C	Acc
(Std) Din B Pt 100	*PX (std)	Pt/385/B	100	0.12%
Pt 100 with Other Accuracies	*PC	Pt/385/ A1	100 Ω	0.1%
	PD	Pt/385/ A3	100 Ω	.03%
	*PA	Pt/385/Cl A	100 Ω	0.06%
	*PE	Pt/385/A5	100 Ω	0.01%
Other RTD's	PK	Pt/385/B	1000 Ω	0.12%
	PM	Pt/385/B	500 Ω	0.12%
	*PY	Pt/392	100 Ω	0.1%
	NI	Nickel/6725	120 Ω	0.5%
	CU	Copper/421	10 Ω (@25°C)	0.5%

STEP 4 - Temperature Range

Insert single-digit number designated below

1 Std. range -60°F / 600°F

2 Extended range -328°F / 1100°F (Only available on sensors with asterisk *)

STEP 5 - Sheath Diameter

Insert two-digit number designated below

25 = .250 dia. **12** = .125 dia. **18** = .188 dia. **37** = .375 dia.

STEP 6 - Probe Length (X)

See "X" dimensions in table (A)

STEP 7 - Number of Leads/RTD's

Single RTD	Leads/RTD	Duplex RTD
X	3-wire	XX
Y	4-wire	YY

STEP 8 - Lead Wire

If leadwire, add lead wire part # (see p. 7)
Ex. LR2P36T1S

THERMOCOUPLES

STEP 1 - Style

Choose Thermocouple style from table (A)

STEP 2

Metal Sheathed thermocouple Assembly - insert "M"

STEP 3 - Sheath Diameter

Insert 2 digit number designated below

06 = .062in. **12** = .125in. **18** = .188in **25** = .250 in. **37** = .375in. **50** = .500in.

STEP 4 - ANSI Type Thermocouple

Insert designation below. **K** = Chromel Alumel **T** = Copper Constantan
J = Iron Constantan **E** = Chromel Constantan

STEP 5 - Type of Sheath Material

Insert single-digit number designated below

1 = 316 SS

3 = 304 SS

2 = 310 SS

5 = Inconel 600

STEP 6 - Number of Element

S = Single element assembly **D** = Dual element assembly

STEP 7 - Type of Junction

Elements: **G** = Grounded **E** = Exposed
U = Ungrounded **UU** = Ungrounded, Uncommon

STEP 8 - Probe Length (X)

See "X" dimensions in table (A)

STEP 9 - Lead Wire

If leadwire, leadwire part # (see p.7)
Ex. LJ2P36F1F

Lead Wire Configuration Thermocouples & RTD's

REOTEMP
INSTRUMENTS

Plain Leadwires (These are supplied without a transition)

For Plain Wire Leads, specify L __ (length in inches) example: "L6"

This applies to:

- 1) RTD's, std. temp. only, any length leads.
- 2) Thermocouples, leads up to 6".

Specify all other leadwires below

Plain Lead P/N examples:

RTD Example: APX125116X-L36 (36" lead)

TC Example: M25K1ASG6-L6 (6" lead)

Other Leadwires (These require a transition)

Table (A)

Transitions

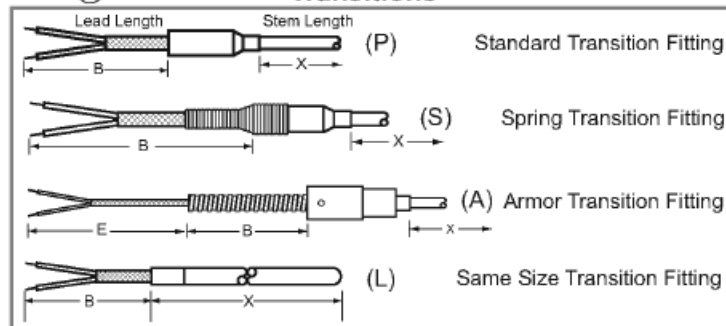
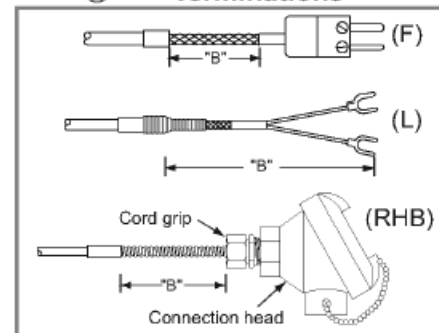


Table (B)

Terminations



Example: APX125116X - L6LJ2P36F1F

T/C or RTD stem Part # see p.6		1	2	3	4	5	6	7	8	9
		L	J	2	P	36	F1	F		

1. Lead Wire
"L"

2. Type of Wire
RTD = R
TC, Type J = J
TC, Type K = K
TC, Type E = E
TC, Type T = T

3. Number of Leads
Single T/C (or RTD 2-wire) = 2
RTD, 3-wire = 3
RTD, 4 wires total = 4
(or RTD Duplex 2-wire)
(or T/C Duplex)
RTD, Duplex 3-wire = 6
(or triplex T/C)
RTD, Duplex 4-wire = 8

4. Transition Type (Table (A))
Std, Plain = P
Std, with spring = S
Armor = A
Same size = L

5. Lead Length or Armor Length
Insert "B" Length, Inches
eg. 10ft = 120

7. Wire Termination (Table (B))
P = Plain leads- not stripped
S = Stripped leads
L = Spade lugs
T = Terminal pins
F = Std. Male plug
C = Mini Male Plug
R = Cord grip 1/2" NPT
RH* = Cord grip with connection head
(*Specify head code from table (A), p.3 e.g. RHB)

6. Insulation/Conductor
F1 = Fiberglass, solid
F2 = Fiberglass, stranded
T1 = Teflon, solid (T.C standard)
T2 = Teflon, stranded (RTD std.)
P1 = PVC, solid
P2 = PVC, stranded

9. Wire Extension
"E" Length
Wire Extension
beyond armor inches
(omit if no armor)

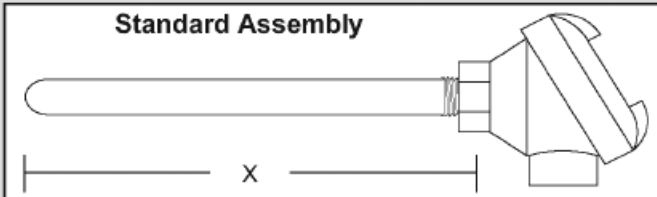
8. Wire Protection (optional)
A = SS armor
P = PVC coated ss armor
T = Teflon coated ss armor
O = SS overbraid
(omit if no armor)

"B" Armor

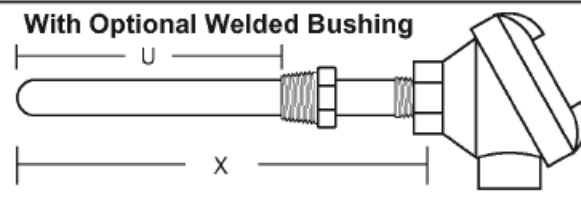
"E" Lead Extension
("6" std.)

Metal Tube Assemblies Thermocouples

Standard Assembly



With Optional Welded Bushing



Metal Tube Assembly

MTA — 1 2 3 4 5 6
A KK 20R C5 12

1. Head Type \ Connection

A = Cast Iron
B = Cast Aluminum

2. Sensor Type

Single	Dual
K	KK
J	JJ
N	NN

3. Wire Gauge / Insulator

AWG
20
14
8
R = round
C = oval

6. Options

Process Connection

W = Welded Bushing
(Specify NPT & insertion length "U")

N = Union Nipple
(Specify Extension length)

F = Malleable Iron flange

5. Tube Length (X)

12 = 12"
18 = 18"
24 = 24"
30 = 30"
36 = 36"
Other - Specify

4. Tube Material / Size

Material
S = 316SS
F = 304SS
C = Carbon Steel
I = Inconel 600
Pipe Size
2 = 1/4"
5 = 1/2"
7 = 3/4"
1 = 1"

Metal Protection Tube Only

MTO

Tube Material / Size

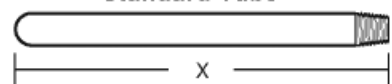
C5

Tube Length (X)

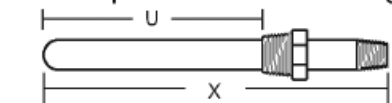
12

Options

Standard Tube



With Optional Welded Bushing



Tube Material

S = 316SS
F = 304SS
C = Carbon Steel
I = Inconel 600

Pipe Size

2 = 1/4"
5 = 1/2"
7 = 3/4"
1 = 1"

12 = 12"
18 = 18"
24 = 24"
30 = 30"
36 = 36"
Other - Specify

Process Connection

W = Welded Bushing
(Specify NPT & insertion length "U")

N = Union Nipple
(Specify Extension length)

F = Malleable Iron flange

Ceramic Tube Assemblies Thermocouples

with standard hex fitting



with optional nipple



Ceramic Tube Thermocouple Assemblies



- For High temperature process heating applications
- Alumina (max 3400 °F) or Mullite (max 2700 °F)
- Base metal or Noble metal thermocouples
- Applications: Kilns, Furnaces, Gas Heaters, Incinerators, Heat Treating, Smelting, Foundry

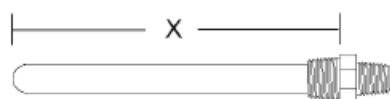
Complete Assemblies (Tube, Element, Head)

Ceramic Tube Assemblies	Head Type Connection	Sensor Type	Wire Gauge	Tube Material/Length	Tube OD/Hex Fitting Process NPT	Options																																																							
CTA	A	KK	20	M18	B																																																								
A = Cast Iron B = Cast Aluminum		<table><tr><th>Single Base Metal</th><th>Dual</th></tr><tr><td>K</td><td>KK</td></tr><tr><td>J</td><td>JJ</td></tr><tr><td>E</td><td>EE</td></tr><tr><td>T</td><td>TT</td></tr><tr><td>M</td><td>MM</td></tr><tr><th colspan="2">Noble Metal</th></tr><tr><td>R</td><td>RR</td></tr><tr><td>S</td><td>SS</td></tr><tr><td>B</td><td>BB</td></tr></table>	Single Base Metal	Dual	K	KK	J	JJ	E	EE	T	TT	M	MM	Noble Metal		R	RR	S	SS	B	BB	<table><tr><th>WG Base</th></tr><tr><td>20</td></tr><tr><td>14</td></tr><tr><td>8</td></tr><tr><th>Noble</th></tr><tr><td>24</td></tr><tr><td>26</td></tr></table>	WG Base	20	14	8	Noble	24	26	<table><tr><th>Material</th></tr><tr><td>A = Alumina (to 3400F)</td></tr><tr><td>M = Mullite (to 2700F)</td></tr><tr><th>Length (x)</th></tr><tr><td>12 = 12 Inches</td></tr><tr><td>18 = 18 Inches</td></tr><tr><td>24 = 24 Inches</td></tr><tr><td>30 = 30 Inches</td></tr><tr><td>36 = 36 Inches</td></tr><tr><td>other - specify</td></tr></table>	Material	A = Alumina (to 3400F)	M = Mullite (to 2700F)	Length (x)	12 = 12 Inches	18 = 18 Inches	24 = 24 Inches	30 = 30 Inches	36 = 36 Inches	other - specify	<table><tr><td>A = 3/8"OD x 1/2"NPT</td></tr><tr><td>B = 11/16"OD x 3/4"NPT</td></tr><tr><td>C = 1"OD x 1 1/4"NPT</td></tr><tr><td>D = 11/16" OD x 1" NPT</td></tr><tr><td>E = 11/16" OD x 1 1/4" NPT</td></tr></table>	A = 3/8"OD x 1/2"NPT	B = 11/16"OD x 3/4"NPT	C = 1"OD x 1 1/4"NPT	D = 11/16" OD x 1" NPT	E = 11/16" OD x 1 1/4" NPT	<table><tr><th>Process Connection</th></tr><tr><td>(Std. = Steel Hex Ftg.)</td></tr><tr><td>N = Pipe Nipple (specify length "E")</td></tr><tr><td>F = Malleable Iron Flange</td></tr><tr><td>S = Stainless Fitting</td></tr><tr><th>Hot Junction Styles</th></tr><tr><td>(Std. = plain)</td></tr><tr><td>T = Twisted</td></tr><tr><td>I = Insulated</td></tr><tr><th>Insulator Styles</th></tr><tr><td>(Std. = round ceramic)</td></tr><tr><td>C = Oval Ceramic</td></tr><tr><td>Q = Other (specify)</td></tr></table>	Process Connection	(Std. = Steel Hex Ftg.)	N = Pipe Nipple (specify length "E")	F = Malleable Iron Flange	S = Stainless Fitting	Hot Junction Styles	(Std. = plain)	T = Twisted	I = Insulated	Insulator Styles	(Std. = round ceramic)	C = Oval Ceramic	Q = Other (specify)
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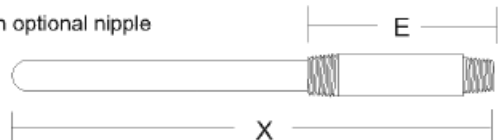
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Noble Metal (platinum) thermocouples are widely relied upon for their accuracy, durability and reliability in very high temperature (up to 3100°F) applications in both laboratory and industry.

with standard hex fitting



with optional nipple



Ceramic Tubes Only (No Element or Head)

Replacement Elements see p.10 →

Ceramic Tube- Tube Only	Tube Material Length	Tube OD/Hex Fitting Process NPT	Options																					
CTO	M18	B																						
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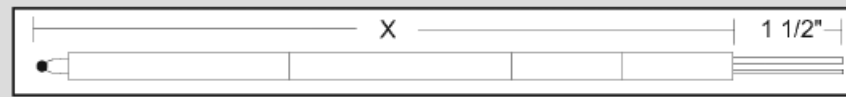
REOTEMP Replacement Elements

Thermocouples

INSTRUMENTS

For Use in REOTEMP Protection Tubes, or in other manufacturers' protection tubes.

Base Metal Thermocouples



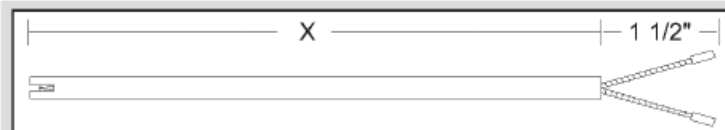
Element	Type	Wire Gauge	Insulator	Length (x)	Hot Junction Style	Lead Length
RE	K	20	R	12	P	1.5

Type	Wire Gauge	Insulator	Length (x)	Hot Junction Style	Lead Length
single K J E T M N	20 AWG 18 14 11 8	B = Bare (no insulator) C = Oval Ceramic	12 = 12" 18 = 18" 24 = 24" Other, specify	P = Plain I = Insulated T = Twisted	1.5 = 1.5" (std.) 4 = 4" etc.

Insulator	Wire gauge	Dimensions
C = Oval Ceramic	8	.500 x .286
	11	.375 x .218
	14, 18	.313 x .288

Insulator	Wire gauge	OD Single	Duplex
R = Round Ceramic	8, 11	.465	.500
	14, 18	.250	.320
	20	.150	.188

Noble Metal Thermocouples



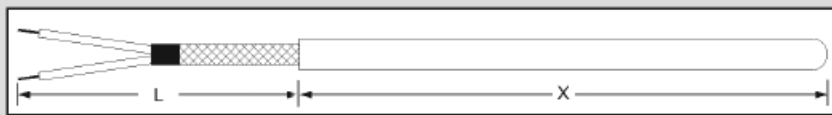
Element	1	2	3	4	5	6
RE	R	24	R	12	R	F1.5

- Type**
 - R = Pt - Pt/13% Rh
 - S = Pt - Pt/10% Rh
 - B = Pt/6% Rh - Pt/30% Rh
 - RR = Duplex R
 - SS = Duplex S
 - BB = Duplex B
- Wire Gauge**
 - 24 AWG
 - 26
- Insulator**
 - R = Round Alumina (std.) (.188" o.d.)
 - B = Bare (no insulator)
- Length (x)**
 - 12 = 12"
 - 18 = 18"
 - 24 = 24"
 - Other, specify
- Hot Junction Style**
 - R = Recessed in Slot (std)
 - P = Plain (exposed junction)
 - C = Plain, with Collar
 - D = Recessed, with Collar
- Leads**
 - F1.5 = 1.5" Long with fish spine insulators and copper crimp (std)
 - F4 = 4" etc.

Cut-to-Length Sensors

Thermocouples & RTD's

REOTEMP
INSTRUMENTS

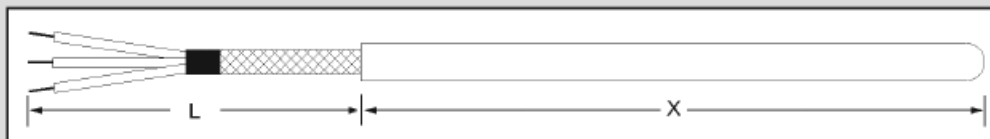


- For on-the-spot replacements
- Order your max length and keep on shelf
- Simply cut shorter for your other lengths
- Use standard tube cutter. Minimum length 3".
- Spring loaded bushing kits, heads, terminal blocks available (see p. 19)

THERMOCOUPLES

Std Element: 18" long, 1/4" dia., 304 S.S., single, grounded. 900°F max fiberglass wire, 400°F max teflon wire.

Sensor Type	TC Type	Grounded	Element Length (X) in Inches	Alloy	Lead Length (L)	Options
T3	J	G	18	F	L6	(T1)
T3 = Thermocouple	Single (std) J K E T Duplex JJ KK EE TT	G = Grounded U = Ungrounded	18 = 18" (std.) 24 = 24" 36 = 36"	F = 304SS (std.) S = 316SS	L6 = 6" (std.) L12 = 12"	
			Wire/Insulation (if not std. solid fiberglass) F2 = Stranded, Fiberglass T1 = Solid, Teflon T2 = Stranded, Teflon	Stem Dia. (if not std. 1/4") D18 = .188" (3/16") D37 = .375" (3/8") Wire Gauge (if not 20 AWG) G4 = 24 gauge		



RTD's

Std Element: 18" long, 1/4" dia., 316 S.S., single, 3-wire RTD. 400°F max.

Sensor Type	# Sensors	# Wires per Sensor	Length in Inches (X)	Alloy	Lead Length (L)	Options
R3	S	3	18	S	L6	D18
R3 = RTD (type B)	S = Single D = Dual	3 = 3-Wire (std) 4 = 4-wire (N/C)	18 = 18" (std.) 24 = 24" 36 = 36"	S = 316SS (std.) F = 304SS	L6 = 6" (std.) L12 = 12"	
			Stem Dia. (if not std. 1/4") D18 = .188" (3/16") D37 = .375" (3/8")	Wire Gauge (if not 24 AWG) G0 = 20 gauge G2 = 22 gauge		

Plastic Industry Thermocouples & RTD's

1. Type

Adjustable Bayonet
AB = Adj. Bayonet on Armor
SB = Adj. Bayonet on Spring
Fixed Bayonet
FB = Fixed Bayonet
Compression Ftg/ Armor
C8 = 1/8 NPT
CP = Plain, no fitting
Direct Connect/ no Armor
FBD = Fixed Bayonet/ no Armor
C8D = with 1/8 NPT
CPD = Plain

2. Sensor Type

Thermocouples Single Sensor
JS = J single sensor
KS = K single
ES = E single
TS = T single
Duplex Sensor
JD = J dual sensor
KD = K dual sensor
TD = T dual sensor
ED = E dual sensor
RTD's (100 ohm/.00385)
RS = RTD 3-wire single
RD = RTD 3-wire dual

3. Sensor Grounding

Thermocouples
G = Grounded
U = Ungrounded
RTD's
RTD - leave blank

Plastics
Sensor

P — 1 AB 2 JS 3 G 4 1 5 12 6 S 7 B4

7. (optional) Bend Angle (fixed only)

B4 = 45 deg. Bend

B9 = 90 deg. Bend

6. Terminations

S = Stripped leads
L = Spade lugs
F = Std. Male Plug
G = Std. Female Jack
C = Mini Male Plug
D = Mini Female Plug
B = BX connector with Spade lugs.

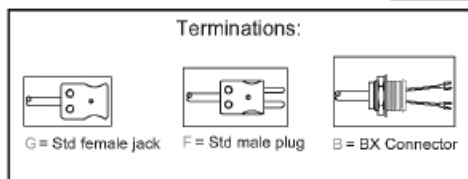
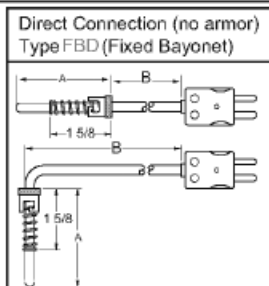
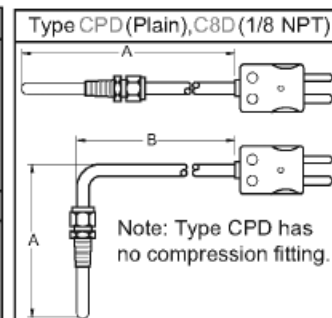
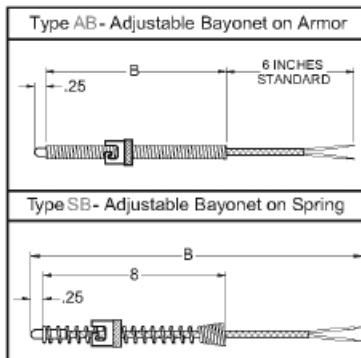
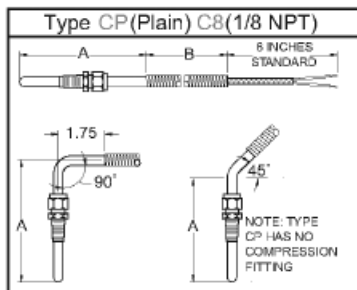
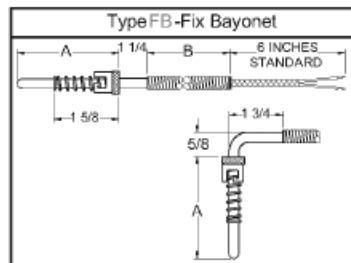
5. "B" Length in inches

12 = 12"
24 = 24"
(insert any length)
Leave blank if none.

4. Probe Length "A" (fixed only)

1.0 = 1"
1.2 = 1 1/4"
1.5 = 1 1/2"
1.7 = 1 3/4"
2.0 = 2"
2.5 = 2 1/2"
2.7 = 2 3/4"
(insert any length)
Enter "NA" for styles AB, SB

General Specs: Stems: 304SS, 3/16" dia. (.188)
Wire: Stranded, w/fiberglass insulation

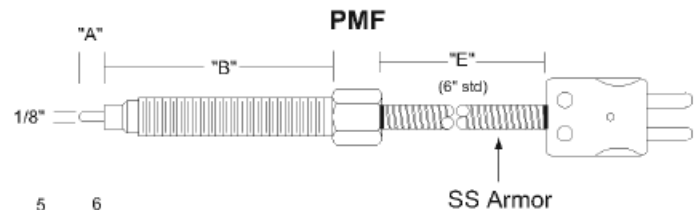


Melt Bolt Thermocouples

REOTEMP
INSTRUMENTS



- Extruder Heads
- Die Adapters
- Tip goes directly into plastic melt



1 2 3 4 5 6
PMF JG 4 03 6 F

1. Style

PMF = Flexible style

PMR = Rigid style

2. TC Type

Grounded

JG = Type J

KG = Type K

EG = Type E

TG = Type T

Ungrounded

JU = Type J

KU = Type K

EU = Type E

TU = Type T

3. Tip Length (A)

4 = 1/4" (std.)

8 = 1/8"

F = flush

2 = 1/2"

3 = 3/4"

1 = 1"

6. Termination

For Rigid Type

F = Std. size Male Plug (std.)

G = Std size Female Jack

For Flex type

F = Std. size Male Plug (std.)

G = Std size Female Jack

C = Male Mini Plug

D = Female Mini Jack

5. (E) Dim

For Flex Style (F)

6 = 6" (std.)

12 = 12"

specify other

For Rigid Style (R)

2 = 1/2" (std.)

specify other

4. Bolt Length (B)

03 = 3"

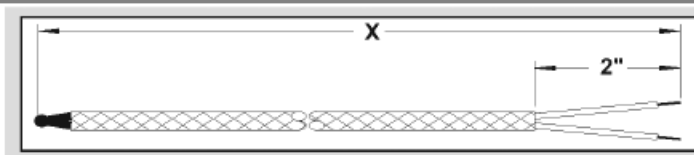
04 = 4"

06 = 6"

08 = 8"

12 = 12"

Plain Wire - with Beaded Junction Thermocouples



1. Thermocouple Type

Standard Wire	Special limits of error
J	JS
K	KS
T	
E	

2. Wire Length "L"

Insert length in inches

3. Insulation Type (inner/outer)

Code	Insulation	Max Temp
Solid Wire		
F1	fiberglass	900°F
T1	Teflon	400°F
Stranded Wire (J, K only)		
F2	fiberglass	900°F
T2	Teflon	400°F

6. Options

Wire Protection

A = S.S. Armor
P = PVC coated S.S. Armor
T = Teflon coated S.S. Armor
O = S.S. Overbraid (omit if no armor)

Tip

W () = Washer welded to tip for surface mount with screw. Put screw size in parenthesis. Ex: W (1/4")

5. Wire Termination

S = Stripped Leads



C = Mini Male Plug



F = Std. Male Plug



L = Spade Lugs



T = Terminal Pins



4. Wire gauge

20 = 20 gauge

24 = 24 gauge

Bulk Wire For Thermocouples

Thermocouple Type

K

Wire Gauge

20

Insulation Type

F1

Options

P

Std Calibration Wire

J
K
T
E

Std Calibration Wire

20 = 20 gauge
24 = 24 gauge

Std Calibration Wire

Code	Insulation	Max Temp
Solid Wire		
F1	fiberglass	900°F
T1	Teflon	400°F
Stranded Wire (types J, K only)		
F2	fiberglass	900°F
T2	Teflon	400°F

Std Calibration Wire

P = Special Limits of error

Extension Wire

JX TX
KX EX

Extension Wire

16 = 16 gauge
20 = 20 gauge

Extension Wire

P1 = PVC, solid 221°F



Note: Consult factory for other options or wire types

Digital Thermometers

Hand-Held Thermometers

REOTEMP
INSTRUMENTS

Thermistor Sensor

Durable, shock resistant ABS plastic carrying case



Easy-to-read, blacklighted LCD displays both °F and °C

Features

- All Solid State
- High Accuracy
- Detachable Probes
- Wide Temperature Ranges

Model TM99A
(with disposable battery)

Model TC100A
(with rechargeable battery)

Thermocouples Sensor



Model HI 9063

Water Resistant Min - Max, °F/°C



Model 701K - Pocket Size
Magnet on back - stick it anywhere in Stock in °F; Also available °C.

Features

- All Solid State
- High Stability
- Cold Junction Compensation
- Wide Temperature Ranges

Specifications	TM99A TC100A	HI 9063	701KF
Range & Resolution	-40°F to +300°F (-40°C to +150°C) 0.1°F or °C Resolution	C/O Mode: -50 to 150°C with 0.1°C Resolution C/HI Mode: -50 to 950°C with 1°C Resolution F/O Mode: -58 to 302°F with 0.1 Resolution F/HI Mode: -58 to 1742°F with 1°F Resolution	-50 to 1,000°F with 1°F Resolution
Accuracy	Greater of +0.3°F, or +0.5% of reading	±0.3% Full Scale / ±3°C (hi), ±0.6°C (lo)	±0.25% (±1 Digit)
Ambient Range	0 to 150°F max, RH -90%, noncondensing	-10 to 50°C (14 to 122 F) RH 100%	32 to 104°F
Display	Backlighted, 4" LCD		
Probe	#1075 10K Thermistor, detachable	Type K thermocouple (optional)	Type K Thermocouple (Optional)
Power	TM99A - 9V alkaline battery (provided) TC100A - 9V NiCad battery with 110V charger	4 - 1.5V AAA batteries	1 - 9V battery
Size	9 1/2" x 6 1/2" x 2 1/2" (case closed)	7.7" x 3.1" x 2.4" (196 x 80 x 60mm)	3.1" x 2.4" x 1.1" (80 x 60 x 33.5mm)

How to Order

1. Specify Model #
2. Specify Probe.

Model #

701K

Probe

SPK1

Probes for Models:

TM99A and TC100A

10K Thermistor Probes

All but 2010 and 7041 have 3" handle and 48" coiled lead.

Model	Description	Probe Dimensions
1075	S/S Immersion (comes standard)	.142" x 4"
1052	S/S Piercing Tip Probe	.041" x 2.8"
4040	Fast Surface Probe	
5005	Air Probe	.125" x 4"
2010	General Purpose Probe	.18" x 6"

Probes for Models: HI9063 and 701K

Thermocouple Probes (intermediate sizes, or industrial configurations available on application) Probes have 4" handle and min. 36" lead, except where noted.

Model	Description	Probe Dimensions
LPK5	Immersion/General Purpose	.156" x 5"
XPK2	Fast Response (no handle)	1/16" x 12"
FRK4	Fast Response	1/16" x 4"
HPK2	Piercing Tip	.156" x 4"
REK1	Soft-wire Disposable (no handle)	exposed tip 48"
SPK1	Surface Temperature	
LPKA	Gas Temperature	
LPK12	Heavy Duty General Purpose	1/4" x 12"
MRK36, 48, 60	Heavy Duty Penetration (pointed)	.40" x 36", 48" or 60"

Hand-Held Thermometer Models

Thermistor Models

TM99A Disposable Battery
TC100A Rechargeable Battery

"K" Thermocouple Models

701K Compact
HI9063 Full Functioned

REOTEMP's Sanitary RTD's are designed for temperature sensing in food, dairy, beverage and pharmaceutical applications where sensor corrosion and product contamination are critical factors.

A³



Features:

- Ideal for CIP (Clean-in-Place) or SIP
- All Wetted Parts Highly Polished to Exceed 3A Requirements
- Quick-Connect Tri-Clamp Design
- Fast Response Tip Available
- Variety of Stem and Termination Options

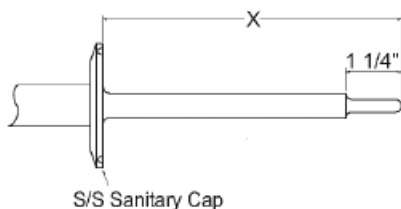
Table (A)

Stem Options

Standard 1/4" Dia. stem (Type A)



Reduced Tip Stem (Type B, C, E)



Mini-Stem (Type D)

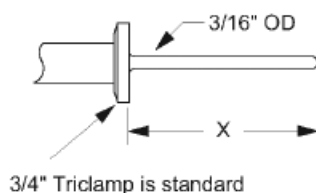
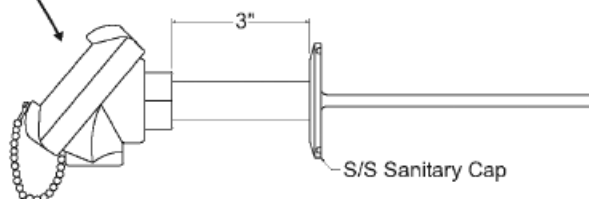


Table (B)

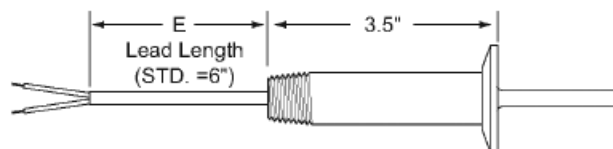
Termination Options

Type S = FDA Compliant
White Polypropylene
Screw Cover
Head (standard)

Connection head-Type S, Y, or T



Type L (with Teflon Leads)



CIP Sanitary Thermocouples & RTD's

REOTEMP
INSTRUMENTS

How to Order

R — **L3** — **030** — **A** — **T 15** — **L 12**

Sensor Type

RTD - 100 ohm; .00385 α ; 3 wire
Accuracy # Elements

L3	= 0.10%	1
H3	= 0.01%	1
L6	= 0.10%	2
H6	= 0.01%	2

Maximum temperature: 400°F (204°C)

Thermocouples

JG	Type J	Grounded
JU	Type J	Ungrounded
KG	Type K	Grounded
KU	Type K	Ungrounded

Immersion Length (X)

Length	Length
020 = 2"	060 = 6"
030 = 3"	090 = 9"
040 = 4"	120 = 12"

Long or intermediate lengths OK
Please specify length

Stem Style

(See table (A), p. 16)

Description
A = 1/4" Diameter
B = Reduced Tip (3/16" tip OD x 3/8" sheath OD)
C = Reduced Tip (1/4" tip OD x 1/2" sheath OD)
D = 3/16" Diameter Tip (Single Element Only)
E = Special HTST Fast Response Reduced Tip (3/16" tip OD x 3/8" sheath OD, response time 3 to 3.5 sec.) Available in H3 & H6 RTD Type Only.
F = 3/8" dia. stem

Termination

(See Termination table (B), p. 16)

Description
S = Std. White Polypropylene Connection Head (FDA Compliant)
T = White Polypropylene Connection Head with 4-20mA Transmitter
Y = White Epoxy Coated Aluminum Head
L = 1/2" NPT 316SS threads with "E" Teflon Leads (Specify Length, e.g. 12" = L12)

Sanitary Cap

Tri-Clamp Caps (Triclover 16 AMP Type)

Description
T15 = 1.5" (Standard)
T20 = 2"
T30 = 3"
T75 = 3/4" Fractional (with "D" stem only)
Other Cap Styles Available - Please Specify

All wetted parts meet or exceed 3-A standards

Other Available Options:

- Alternate Wire Termination
- Alternate Sanitary Cap Styles
- Digital Indicating Meters (Suitable for Washdown)
- Thermocouple Sensors (Sanitary & Industrial)
- RTD's/TC with CIP Sanitary Connected Wells
- Penetration Probes
- Chemical Resistant Thermocouples
- Stainless Steel Tags

Other REOTEMP CIP Sanitary Products



Sanitary Pressure
Gauges



Sanitary Thermowells



Sanitary Bimetal
Thermometers



Sanitary Pressure
Transmitters

Biopharmaceutical: ReoClick Sanitary Sensor

Customer:

A biopharmaceutical company in Southern California.

Background:

Many BioTech & Pharmaceutical companies test their temperature sensors with in-house calibration baths in order to ensure sensor accuracy. Accurate temperatures are so critical to ensuring a consistent product, that calibration checks are required before each batch is started.

Problem:

The existing temperature sensors had a threaded connection which would twist and tangle the extension wires when unthreaded for calibration. The only alternative to unthreading the connection was to disconnect the wires from the terminal. This wasted time and complicated the calibration process.

Also, the company's current supplier was located in Europe, making for long lead times and poor customer service.

Issues

- Twisted/tangled lead wires (wasted time and frustration)
- Long lead time
- Inadequate customer service

Solution:

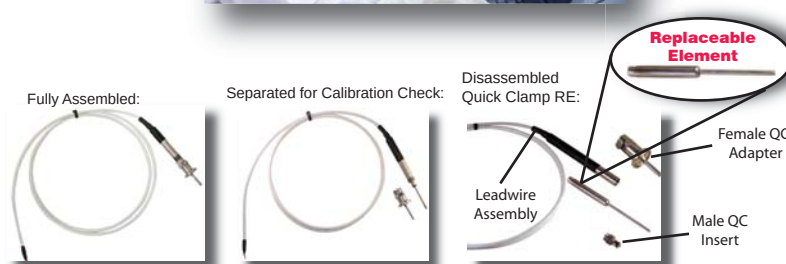
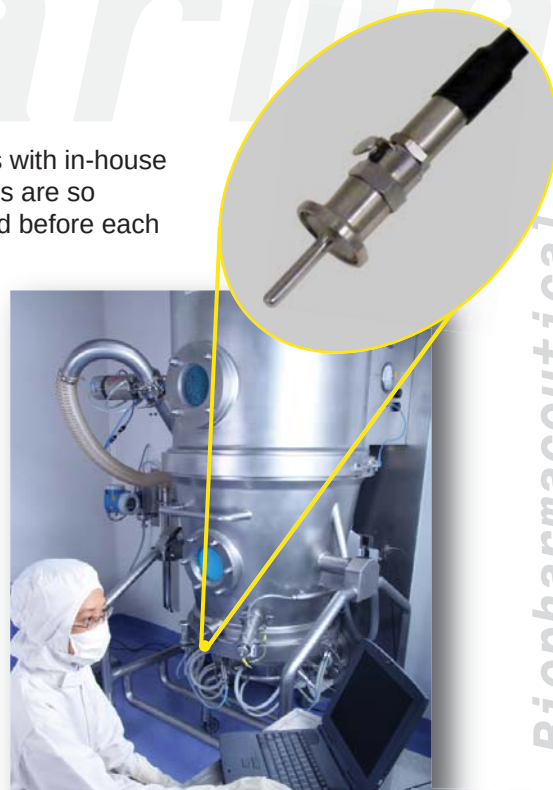
Within 2 months, REOTEMP's engineers developed a new product called the ReoClick to address the customer's issues.

The ReoClick made disconnecting and re-connecting the sensor from the process easy. With the click of a button, the temperature sensor was released from the the process, leaving the female adapter in place (see diagrams). The sensor was then placed into a temperature bath for a quick calibration check and snapped back into service in a matter of seconds.

To make the design even better, REOTEMP incorporated a replaceable temperature element. The element can be easily removed when sensor replacement is eventually needed. This allows the customer to reuse their existing leadwire assembly, male insert, and female adapter (see diagrams). Along with those cost savings, the customer has avoided the usual headache associated with replacing a competitor's elements: disconnecting wires, terminal blocks, reconnecting components, etc..

Results:

The customer immediately recognized the value of the ReoClick design and placed an order the same day. Shortly after the first order, the customer placed a second order to replace all of the sensors in their plant.



"Thanks for all the hard work. REOTEMP has shown the ability to create and deliver custom quality products. I'm very satisfied with the quality of the probes."

-Lead Master Mechanic
Biopharmaceutical Process Sciences

Distributed by:

Ultra-Thin Sanitary Temperature Sensor

Customer:

A Biotech company located in the Western U.S..

Background:

This company develops and commercializes living cell therapies that repair damaged human tissue. In order for this dermal substitute to be cultured successfully, the "biobag" in which they're grown must remain within strict temperature limits during the production and storage processes. As part of their quality control procedure, a certain percentage of the biobags must be continuously monitored with a temperature sensor. If the temperature reading was to fall outside the temperature limits, even for a short period of time, the cell therapies would have to be discarded: wasting time, resources, and money.

Sensor Requirements/Application Challenges

- **Extremely small diameter (.050")**
- **Nearly instant response time**
- **Flexible**
- Cryogenic environment down to -80°C.
- Custom sanitary fitting (must rotate and seal to the biobag)
- High Accuracy
- Must follow a custom temperature profile oscillating between 30°C & -80°C

Problem:

A competitor's sensor was not meeting the strict requirements mentioned above. Their sensor was not able to flex into the biobag without damaging the temperature element. It was also unable to meet the accuracy and response time requirements needed throughout the entire process temperature range.

Solution:

REOTEMP was called upon by the customer to develop a sensor that would meet all of their requirements. REOTEMP's sales and engineering teams designed a new probe and **within 3 weeks a prototype was built with a .050" diameter stem!** The stem was able to flex into the biobag without damaging the sensor, while still maintaining the high accuracy and **nearly instant response time** needed in this application.

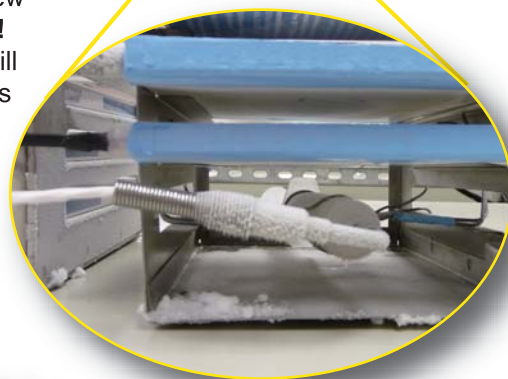
Results:

Less than a month after the prototype was sent out, an order for 10 pieces was placed and plans to replace every sensor in the facility were underway. The customer was blown away with REOTEMP's design. Their expectations for response-time, accuracy, and flexibility were all greatly exceeded.

"The probes were outstanding!! I had excellent results the first run with your newly designed probe! Thank you again for your quick work! It's awesome!!!"

-Manufacturing Support Engineer

Distributed by:



Frac Trucks: Slim Line Temp. Transmitter

Customer:

Frac Truck manufacturer

Location:

Texas, USA

Background/Operations:

Frac Trucks pump nitrogen gas into natural gas wells and oil wells to purge remaining fossil fuels that may be imbedded in well bores, slurries, and bedrock. The purged fuels can then be used for commercial use.

Frac Trucks require a variety of sensors to monitor internal components: liquid nitrogen tanks, heat exchangers (used to convert liquid nitrogen to gas), and pumps. Temperature sensors are especially critical on Frac Trucks, because they are used to ensure safe, efficient operations.

Problem:

The temperature sensors are subjected to continuous shock & vibration during truck operations, from traveling over unpaved roads, and on long highway drives. This shock & vibration was damaging the internal components of the competitor's transmitters.

The transmitters also operate in a harsh environment, which exposes them to water, mud, and oil. During washdown, the truck is sprayed clean with high pressure water, often causing water to leak into the transmitter's housing. The water then shorts out the internal components and results in transmitter failure.

Application Challenges

- Continuous vibration & shock
- Harsh environment: oil, water, mud
- High pressure washdown

With frustration, replacements, and downtime increasing, the customer contacted REOTEMP's local distributor to see if REOTEMP could design a product that would satisfy their needs.

Customer's Needs:

- Hermetically sealed: enclosure must not leak under harsh conditions
- Compact size (space restrictions on truck)
- Durability: components must withstand continuous shock & vibration

Solution:

REOTEMP designed and engineered a new product called the Slim-Line Transmitter that met all of the customer's needs. The new product incorporated an all-welded enclosure and re-inforced seals to protect against leaking. A cushioned interior component design ensured the Slim-Line was up to the challenge of the harsh Frac Truck application. This product is now used in a variety of applications that require a very durable, compact, and accurate temperature transmitter.

Distributed by:

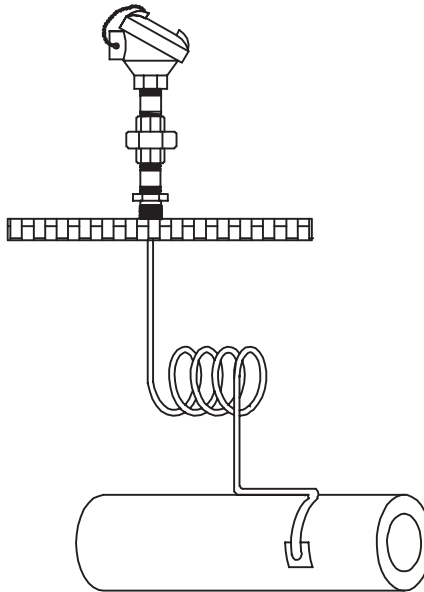


Weld Pad (Tube Skin) Thermocouples/RTD's

REOTEMP manufactures a full line of standard and custom weld pad thermocouples & RTD's. The weld-pad (tube skin) termination allows a temperature sensor to be welded directly onto piping or other metal surfaces to sense the surface temperature.



Std. Flat Pad



Applications/Markets:

- Fired Heater Tubes
- Steam Super Heaters, Cokers, Re-Heaters & Drums
- Boilers & Furnaces in Refineries, Power Plants & Processors
- Industrial Boilers & Heat Exchangers
- Vessel Surfaces

Features/Benefits:

- Std. Delivery 3-5 Days
- Variety of Junction Styles, Materials, Stem Lengths, & More
- Custom Designs
- Made in U.S.A

The REOTEMP Difference...

- Custom designs

Your Product Here
Call us, we're here to help.

- Application assistance
- Exceptional customer service
- Lead time: 3-5 days standard
- Same day expedites available



Fired Heater Tubes



Gas Burner in Fire Box

Part builder on back →

Distributed by:

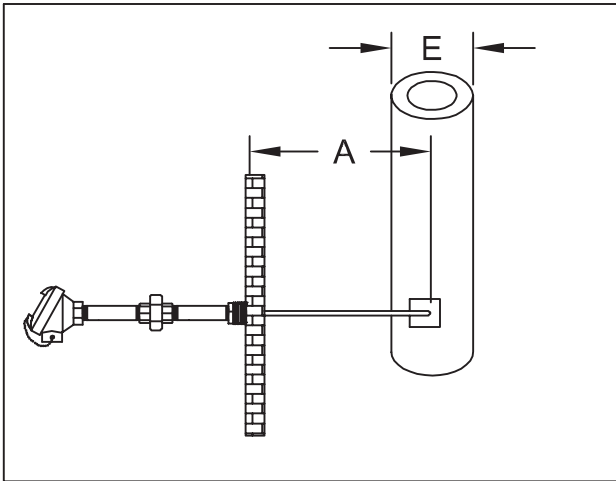
Since 1965

REOTEMP Instruments
Ph (800)648-7737
Fx (858)784-0720

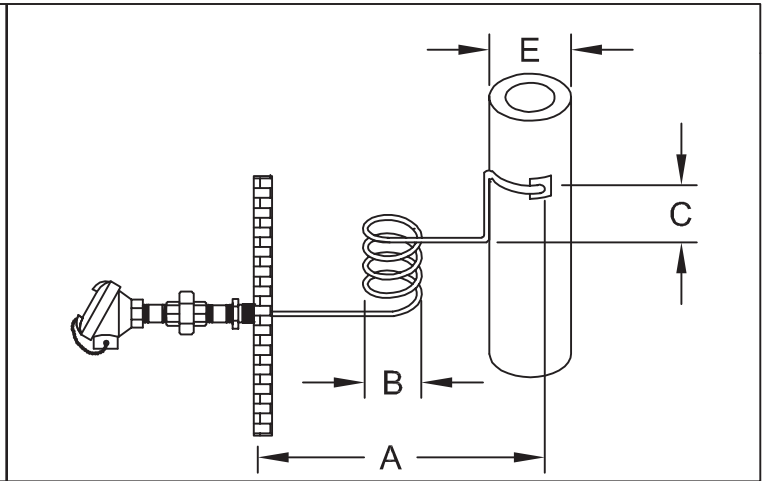
San Diego, CA U.S.A.
sales@reotemp.com
www.reotemp.com

Weld Pad (Tube Skin) Thermocouples/RTD's

Basic Weld Pad Configuration



Weld Pad Configuration with Options



Thermocouple P/N#
(ex. B1TM25K1ASG)

1 2 3 4 5 6 7 8 9 10
10 1 06 90 10 90 4 F S 1

1. Stem Length

"A" Dim. in inches

10 = 10 in.
15 = 15 in.
20 = 18 in.
25 = 24 in.
30 = 30 in.
35 = 36 in.
Other - specify

2. Number of expan.
loops "B"

1 = 1 exp. loop
2 = 2 exp. loops
3 = 3 exp. loops
4 = 4 exp. loops
5 = 5 exp. loops
Other - specify
N = None

3. Expansion loop "B"
diameter in inches

06 = 6 in.
08 = 8 in.
10 = 10 in.
12 = 12 in.
14 = 14 in.
16 = 16 in.
18 = 18 in.
20 = 20 in.
Other - specify
N = None

4. Bend "C" angle in
degrees (45°, 90°, etc)

Specify your
degrees needed.
Put "N" for none.

5. Bend "C" length
in inches

10 = 10 in.
15 = 15 in.
20 = 20 in.
25 = 25 in.
Other - specify
N = None

9. Insulated heat
shield

S = Straight
C = Curved
N = None

8. Weld pad style

F = Std. Flat
C = Std. curved

7. "E" pipe size
(nominal) inch diameter

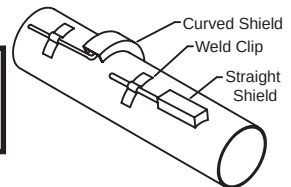
Specify your
diameter needed.
Put "N" for none.

6. Pipe Wrap-around
angle "D" in degrees

Specify your
degrees needed.
Put "N" for none.
(ex. 90° or 180°)

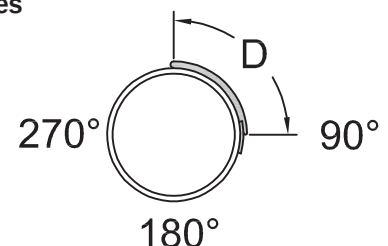
10. Weld clip amount

1 = 1
2 = 2
3 = 3
4 = 4
Other - specify
N = None



Standard Flat

Standard Curved



Weld Pad Thermocouples

Customer:

Major Power Plant located in Ohio, U.S.A..

Background:

This power plant was in the middle of a maintenance shut down and needed a large number of weld pad thermocouples to monitor a variety of equipment: steam drums, downcomers, headers of superheaters, and headers on re-heaters. The weld pads are welded onto the outside of steam pipes which see temperatures of 750°F or higher.

Problem:

While the weld pads were fairly standard in design and layout, **the customer needed over 5 miles of sensors in less than 2 weeks.** The maintenance engineer responsible for the equipment involved contacted REOTEMP to see if they could meet the tight delivery deadline.

Solution:

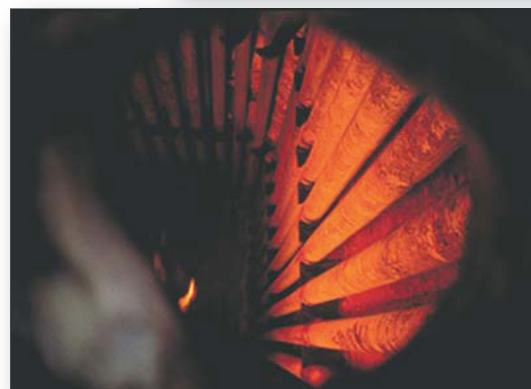
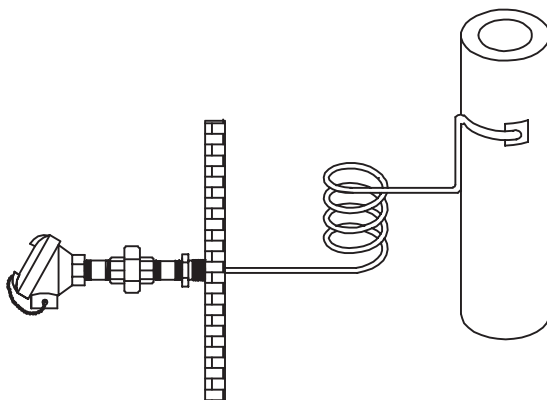
REOTEMP's thermocouple & RTD product manager determined that all of the components needed for the order were in-stock and immediately began manufacturing the weld pads. In order to make all of the sensors before the maintenance shutdown ended, REOTEMP worked overtime on multiple days.

Results:

The customer received all 5 miles of their sensors in time. The REOTEMP sensors were welded to hundreds of steam pipes throughout the plant. The customer was relieved to have the sensors in place and was extremely satisfied with the quick delivery REOTEMP was able to provide!



Power Generation



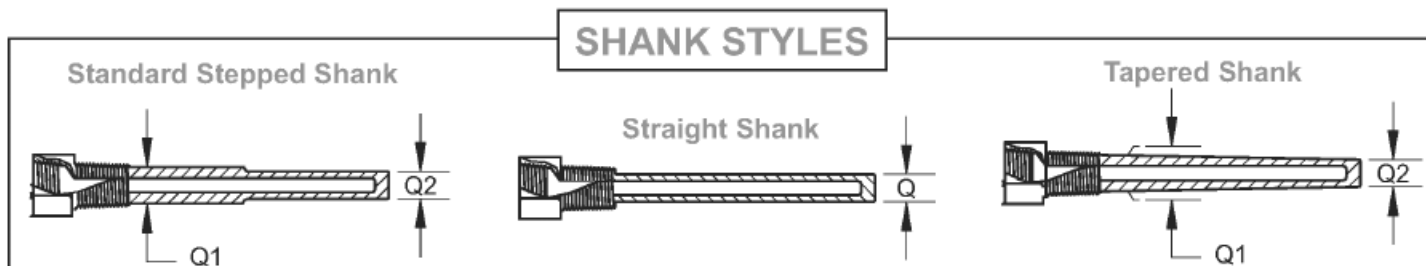
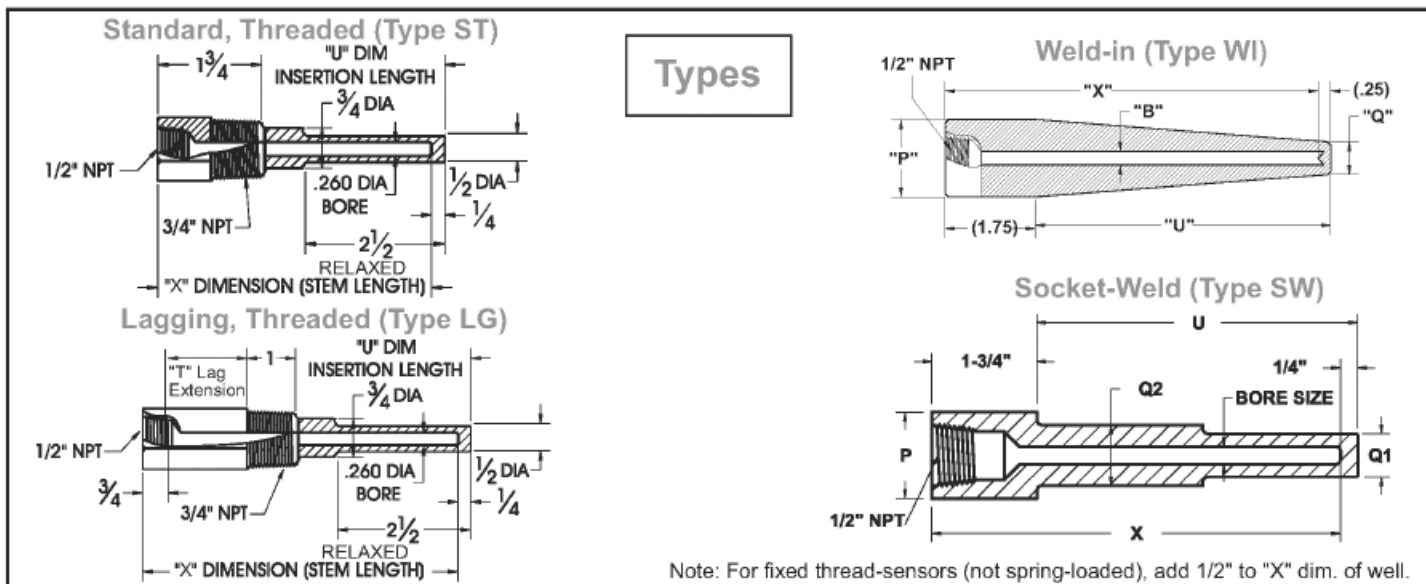
Distributed by:

Thermowells

Thermocouples & RTD's

Thermowells are mated with spring loaded RTD's and Thermocouples.

Each stainless Thermowell is die stamped with the type of material from which it is made.



How To Order					
ST 4 304					
Type	Stem Length "X"	Material	External Thread	Shank	Bore
ST = Threaded LG = Threaded Lagging SW = Socket Weld SWL = Socket Weld w/ lag WI = Weld-in WIL = Weld-in w/lag	2 = 2.5" 4 = 4" 6 = 6" 9 = 9" 12 = 12" 2.0 = 2"	304 = 304 SS 316 = 316SS/316L B = Brass C = Carbon Steel (1018) G = Hast B H = Hast C M = Monel/A400 T = Titanium Y = Inconel A = Alloy 105 Carb. Stl. 2 = Alloy 20 5 = F5 Alloy P = PRFE Coated 316SS N = F22 Alloy **For other Materials, use flanged well codes.	For Threaded Wells Blank for std. (3/4" NPT) " " = 3/4" NPT (std) -1 = 1" NPT H = 1/2" NPT 4 = 1/4" NPT 44 = 1/4" ext. x 1/4" int. NPT -2 = 1.5" NPT For Socket Weld and Weld-in wells Blank for std. (3/4" pipe) " " = 3/4" pipe nominal (1.050" OD)-std P1 = 1" pipe nominal (1.315" OD)	Blank for std. (stepped) " " = Stepped (std.) T = Tapered S = Straight	Bore Diameter Blank for std. (.260 Bore) " " = .260 (std.) B3 = .385 B5 = .515
Standard Dimensions					
Stem "X" Dim.	Std. "U" Dim.	Lagging "U" Dim.	Overall Length		
2 1/2"	1 5/8"	---	2 7/8"		
4"	2 1/2"	---	4 1/4"		
6"	4 1/2"	2 1/2"	6 1/4"		
9"	7 1/2"	4 1/2"	9 1/4"		
12"	10 1/2"	7 1/2"	12 1/4"		

Thermowells Flanged Types

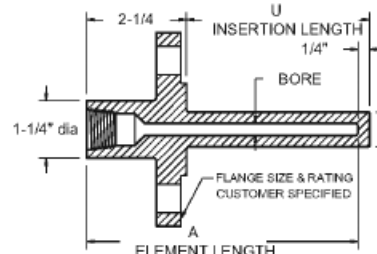
REOTEMP
INSTRUMENTS



How To Order

05 — 1 — R — 2 — S — T — U020 — L042

Flange Size	Flange Rating	Sealing Face	Bore Diameter	Material	Shank Style	"U" Dimensions	Overall Length
05 = 1/2" 10 = 1" 15 = 1.5" 20 = 2" 25 = 2.5" 30 = 3" 07 = 3/4"	1 = 150# 3 = 300# 6 = 600# 9 = 900 - 1500# 5 = 2500# V = VanStone	R = Raised Face F = Flat Face J = RTJ (Ring type joint) Q = Other (Specify)	2 = .260" (for 1/4" stem) 3 = .385" (for 3/8" stem) Q = Other (Specify)	S = 316SS F = 304SS C = Carbon Stl. D = Carp. 20 G = Hast B H = Hast C (276) L = F 11 Alloy M = Monel Y = Inconel (600) U = Tantalum Lined Z = Zirconium (316 flg) V = 317SS T = Titanium	T = Tapered S = Straight P = Stepped R = Tapered w/ support ring Q = Other	U020 = 2" U040 = 4" U070 = 7" U100 = 10" U130 = 13" U160 = 16" U220 = 22" U225 = 22.5" M250 = 250mm	L042 = 4.25" L062 = 6.25" L092 = 9.25" L122 = 12.25" L152 = 15.25" L182 = 18.25" L242 = 24.25" L247 = 24.75" M307 = 307mm



Note: std. overall length for a given "U" is on same line.

Accessories RTD's & Thermocouples

Terminal Blocks



2 pole TCX001T2



3 pole TCX001T3



4 pole TCX001T4



6 pole TCX001T6

Plugs & Jacks



Std. Male Plug
TCX * PLUG



Std. Female Jack
TCX * JACK

TCXSTDCLA = clamp set
for std. plug/jack



Mini Male Plug
TCX * PLUG MINI



Mini Female Jack
TCX * JACK MINI

TCXMINCLA = clamp set
for Mini plug/jack

* = Enter JKTE

Heads



TCX006 *

* = Enter letter code from p. 3 table (A)

Spring Loaded Kit



TCXBSL22

In-Head Transmitters



TCXT4 = 4-20mA transmitter

TCXT4-Q = 4-20mA Hart transmitter

TCXT4D = 4-20mA transmitter with digital display

TCXT4-DQ = 4-20mA Hart transmitter with digital display