

Product	Description	Page
Fittings	A variety of sensor mounting fittings are available such as fixed, adjustable, non-adjustable, compression and bayonet style.	83
Thermowells	Thermowells are manufactured from drilled bar stock and provide a pressure-tight connection at the point of installation. These thick-wall thermowells are sturdy enough to handle high pressure, high velocity and corrosive environments. Suited for applications where the sensors are not compatible with the environment.	87
Protection Tubes	Constructed of ceramic or metal. The metal protection tubes are suited for high thermal conductivity for fast, precise readings. The ceramic tubes resist deformation, corrosion, abrasion and oxidation.	96
Connectors	Many varieties of connectors are available such as standard, quick-attach, high-temperature, three-pole and miniature connectors. All Watlow® connectors meet the ASTM E1129 requirement and are color coded.	97
Connection Heads and Blocks	Watlow offers standard cast iron or aluminum, explosion proof and polypropylene heads. Terminal blocks are available to complement the connection heads.	104
Transmitters	Watlow's temperature transmitters offer accurate measurement and improved reliability, which reduces downtime and costs. The two-wire signal conditioner is constructed using surface mount and digital technology.	106



Fittings

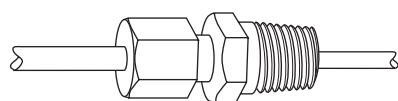
Sensor Mounting Fittings - Non-Adjustable

Non-Adjustable Compression Type

Non-adjustable compression type fittings allow the exact immersion length to be set in the field during sensor installation. Since the compression sleeve and sheath are deformed in application, the fitting cannot be relocated along the sheath after tightening. When ordered as a

part of a sensor for mounting the thermocouple, all compression type fittings are shipped finger-tight on the sheath.

Brass Compression Fitting, Non-Adjustable



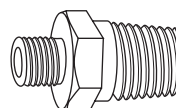
Brass Compression Fitting, Assembled



Cap



Sleeve

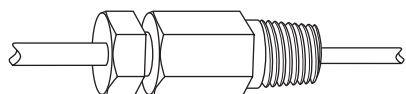


Body

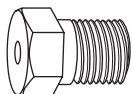
Part No.	Sheath O.D. in.	Material	Bore +0.10, -0.000 in.	Male NPT in.	Length in.
TH-185-2	0.125	Brass	0.130	1/8	1
TH-185-3	0.188	Brass	0.192	1/8	1 1/8
TH-185-4	0.250	Brass	0.256	1/8	1 3/16
TH-185-5	0.250	Brass	0.256	1/4	1 3/8
TH-185-6	0.313	Brass	0.318	1/4	1 3/8
TH-185-7	0.375	Brass	0.380	1/4	1 7/16
TH-185-9	0.250	Brass	0.256	1/2	1 3/4

Stainless Steel Compression Fitting, Non-Adjustable

Made entirely of 303 stainless steel



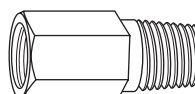
Single Threaded



Cap



Ferrule



Body

Single Threaded		Sheath O.D. in.	Bore ±0.001 in.	Male NPT in.	Hex Across Flats in.
Part No.	Length (in.)				
TH-2745-063	1 1/4	0.063	0.067	1/8	1/2
TH-2745-125	1 1/4	0.125	0.129	1/8	1/2
TH-2745-188	1 5/16	0.188	0.194	1/8	1/2
TH-2745-250	1 5/16	0.250	0.257	1/8	1/2

Note: All accessories are subject to minimum purchase quantities.

Fittings

Sensor Mounting Fittings - Adjustable

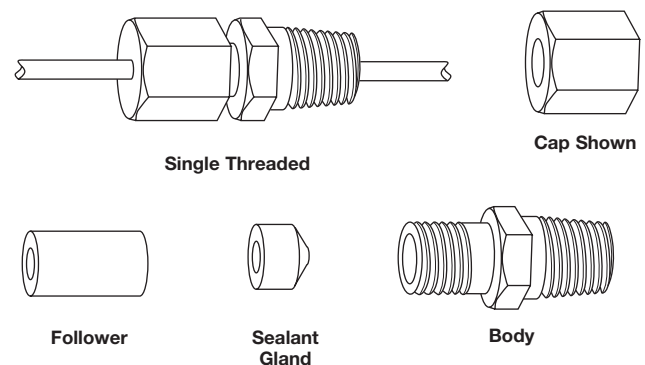
Adjustable Compression Type

Adjustable compression type fittings can be relocated at different positions along the sheath whenever changes in the immersion length are necessary. To relocate an adjustable compression fitting, simply loosen the cap, slide the fitting to the new location and retighten the cap. It is

recommended that lava sealant glands be replaced after each tightening. Tetrafluoroethylene (TFE) sealant glands should withstand several relocations before replacement is necessary.

Stainless Steel Adjustable Compression Fitting

Except for their sealant glands, these fittings are made entirely of 303 stainless steel. Sealant glands are available in TFE, -300 to 500°F (-184 to 260°C). Fittings are pressure rated up to 3,000psi depending on temperature and sheath diameter.

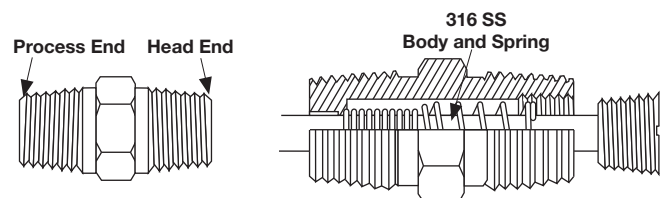


Single Threaded		Sheath O.D. in.	Bore +0.002 in.	Male NPT in.	Hex Across Flats in.	Replacement Sealant Glands, Neoprene
Part No.*	Length in.					
TH-2747-T-063	1 ¹ / ₄	0.063	0.067	1 ¹ / ₈	1 ¹ / ₂	TH-279-T-063
TH-2747-T-125	1 ¹ / ₄	0.125	0.136	1 ¹ / ₈	1 ¹ / ₂	TH-279-T-125
TH-2747-T-188	1 ¹ / ₄	0.188	0.193	1 ¹ / ₈	1 ¹ / ₂	TH-279-T-188
TH-2748-T-250	2 ⁷ / ₁₆	0.250	0.257	1 ¹ / ₄	7 ⁷ / ₈	TH-280-T-250
TH-2748-T-313	2 ⁷ / ₁₆	0.313	0.316	1 ¹ / ₄	7 ⁷ / ₈	TH-280-T-313
TH-2748-T-375	2 ⁷ / ₁₆	0.375	0.386	1 ¹ / ₄	7 ⁷ / ₈	TH-280-T-375

*If lava sealant glands are desired, substitute L in place of T in the part number.

Adjustable Spring-Loaded Hex Fitting

The adjustable spring-loaded fitting has a stainless steel body, end cap and spring and is designed for use with 0.250 inch O.D. sheath thermocouples and RTDs. This fitting is not intended for use in pressurized applications.



Part No.	Sheath			Male NPT in.	Hex Across Body Flats in.	Hex Across Cap Flats in.
	Length in.	O.D. in.	Material			
6556-250	2	0.250	316 SS	1 ¹ / ₂	7 ⁷ / ₈	9 ⁹ / ₁₆

Note: All accessories are subject to minimum purchase quantities.

Fittings

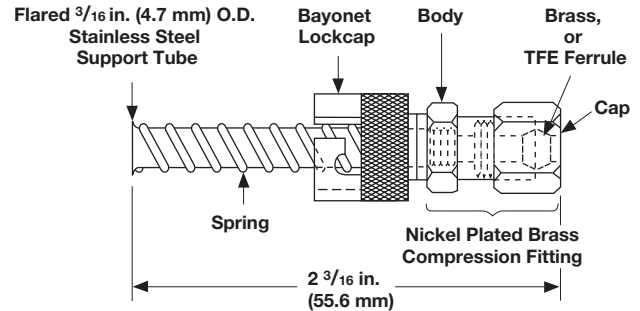
Bayonet Fittings

Adjustable Bayonet Compression Fitting

This fitting combines features of the fixed bayonet fitting in a compact unit that does not require brazing to assemble.

The fitting is designed for 0.125 inch O.D. sensor and is available with either brass or TFE ferrules.

For TFE ferrules, the fitting may be relocated at different positions along the sheath if changes in the immersion length are necessary. Brass ferrules cannot be relocated once they are set.

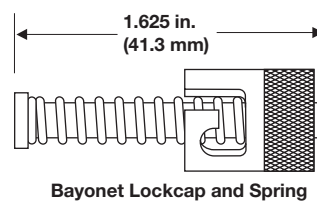


Part No.	Description
TH-2762-BR	Adjustable bayonet fitting with brass ferrule
TH-2762-T	Adjustable bayonet fitting with TFE ferrule

Fixed Bayonet Fitting

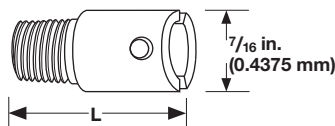
When used together, a bayonet fitting and bayonet adapter act as a spring-loading device for bottoming a thermocouple hot junction in a hole. The fitting is designed for use on an 0.188 inch O.D. sensor. The TH-2760 fitting includes a lockcap, spring and spring stop, which requires brazing for assembly.

The adapter requires a tapped 1/8 inch NPT or 3/8 24 hole for mounting. All components are nickel plated steel.



Part No.	Description
TH-2760	Lockcap, spring and spring stop

Bayonet Adapter



Part No.	Description	Length in.	Thread in.
TH-295-1	Bayonet Adapter	7/8	1/8 NPT
TH-295-2		1	1/8 NPT
TH-295-3		1 1/2	1/8 NPT
TH-295-4		2	1/8 NPT
TH-295-5		2 1/2	1/8 NPT
TH-298-1		7/8	3/8-24 SAE
TH-298-2		1 1/2	3/8-24 SAE

Note: All accessories are subject to minimum purchase quantities.

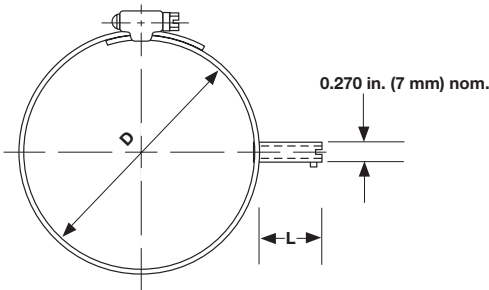


Fittings

Bayonet Fittings (Continued)

Pipe Clamp with Bayonet Adapter

The pipe clamp band with bayonet adapter is designed for use in conjunction with a bayonet style thermocouple. It allows temperature measurement without drilling or tapping. Thermocouple replacement is extremely fast and simple and is accomplished without disturbing surroundings, such as pipe insulation.



Ordering Information

Part Number

① ②	③	④
Const. Part	"D" Clamp Band Dia.	"L" Bayonet Adapter Length

① ②	Construction Code
90 =	Pipe clamp band with bayonet adapter

③	"D" Clamp Band Diameter Range (in.)
A =	1 ¹ / ₁₆ to 1 ¹ / ₄
B =	1 ¹ / ₄ to 2 ¹ / ₄
C =	2 ¹ / ₄ to 3 ¹ / ₄
D =	3 ¹ / ₄ to 4 ¹ / ₄
E =	4 ¹ / ₄ to 5
F =	5 to 6
G =	6 to 7

④	"L" Bayonet Adapter Length (in.)
1 =	1 (use with thermocouple that has "B" dimension = 2 in.)
2 =	2 (use with thermocouple that has "B" dimension = 3 in.)

Note: All combinations are available for next day shipment.

Note: All accessories are subject to minimum purchase quantities.

Thermowells

Manufactured from drilled bar stock, Watlow thermowells provide a pressure-tight connection at the point of installation. With thick walls, thermowells are sturdy enough to handle high pressure, high velocity and corrosive environments. They are frequently used in petrochemical and power plant applications.

Highly critical or demanding applications may require thermowells not only for protection of the temperature sensor, but also to withstand high pressure, erosion or both, caused by material flows through vessels.

Features and Benefits

Bar stock used to manufacture thermowells

- Provides protection against corrosion
- Round bar with wrench flats is substituted when hex is not available

Typical Applications

- Petrochemical
- Chemical
- Oil refineries
- Power plants
- Storage tanks and lines



	Manufacturing Standards
Bar Stock	Mill standards (± 0.010 inch approximately)
Process Connection	Threaded: Inspected with standard ring gauge Flanged: Front J groove welds are $\frac{1}{4}$ inch wide by $\frac{1}{4}$ inch deep. Welds are machined, leaving $\frac{1}{8}$ inch radius. Rear welds are $\frac{1}{8}$ inch wide by $\frac{1}{8}$ inch deep. Welds are machined, leaving $\frac{1}{4}$ inch radius. Full penetration welds are available upon request. Must be specified.
Stem O.D.	Straight: ± 0.015 inch Tapered: ± 0.015 inch (minor dimension)
U Dimension	$\pm \frac{1}{8}$ inch
Overall Dimension	$\pm \frac{1}{8}$ inch
End Thickness	$\frac{1}{4}$ inch $\pm \frac{1}{16}$ inch
Finish	63 RMS
Bore	+0.005 inch -0.003 inch
Tapered Wells	The maximum taper on all thermowells is 16 inches +0.5 - 1.0.

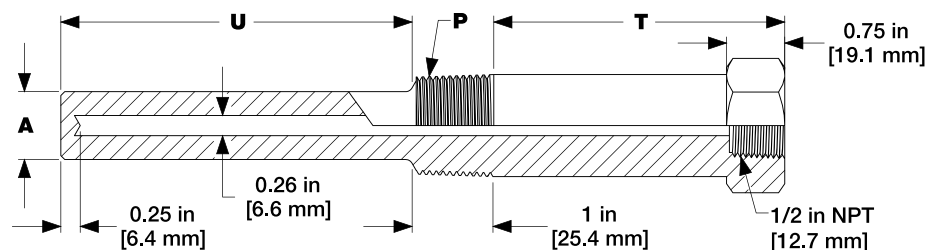
Specifications listed are for standard thermowells or for thermowells manufactured where no other specifications prevail.

Note: All accessories are subject to minimum purchase quantities.



Thermowells

Threaded Type—Straight



Standard Bore Size: 0.260 inch

Standard Materials: 304/304L SS,
316/316L SS

Typical Dimensions

Process Conn. NPT P in.	A in.
1	7/8
3/4	3/4
1/2	5/8

Ordering Information

Part Number

①	②	③	④ ⑤ ⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮
T	T'Well Style	Stem Config.	"U" Dim. (fract in.)	T'Well Material	Process Conn. Size "P"	Flange Rating	Flange Face Type	Flange Material	Lag "T" (in.)	Lag "T" (fract. in.)	Bore Dia. "M"	Special Options
T	T	S							0	6		

②	Thermowell Style
T =	Threaded

③	Stem Configuration
S =	Straight

④ ⑤	"U" Dimension (in.)
Whole inches:	02 to 22.

⑥	"U" Dimension (fractional in.)
0 =	0
4 =	1/2
Note: For "U" lengths not specified, contact factory.	

⑦	Thermowell Material
A =	304/304L SS
C =	316/316L SS

⑧	Process Connection Size "P" (in.)
D =	3/4 NPT
E =	1 NPT
C =	1/2 NPT

⑨	Flange Rating
0 =	No flange

⑩	Flange Face Type
0 =	No flange

⑪	Flange Material
0 =	No flange

⑫	Lag "T" (in.)
Whole inches:	0* to 4

⑬	Lag "T" (fractional in.)
0 =	0
1 =	1/8
2 =	1/4
3 =	3/8
4 =	1/2
5 =	5/8
6 =	3/4
7 =	7/8

⑭	Bore Diameter "M" (in.)
A =	0.260

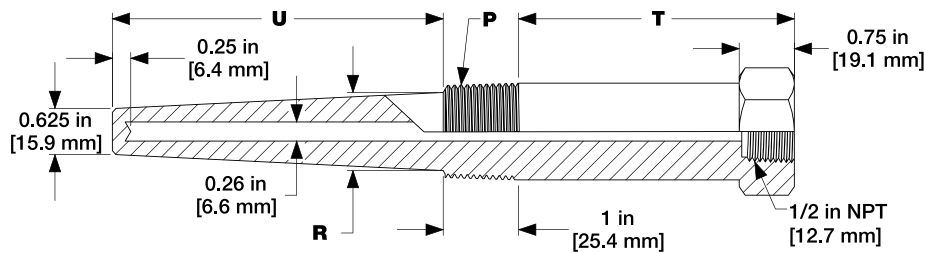
⑮	Special Options
0 =	None

*Minimum lag "T" dimension is 3/4in.

Note: All accessories are subject to minimum purchase quantities.

Thermowells

Threaded Type—Tapered



Standard Bore Size: 0.260 inch
Standard Materials: 304/304L SS, 316/316L SS

Typical Dimensions

Process Conn. NPT P in.	R in.
1	1 1/16
3/4	7/8
1/2	11/16

Ordering Information

Part Number

①	②	③	④ ⑤ ⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮
T	T'Well Style	Stem Config.	"U" Dim. (fract in.)	T'Well Material	Process Conn. Size "P"	Flange Rating	Flange Face Type	Flange Material	Lag "T" (in.)	Lag "T" (fract. in.)	Bore Dia. "M"	Special Options
T	T	T							0	6		

② Thermowell Style
T = Threaded

③ Stem Configuration
T = Standard taper

④ ⑤ "U" Dimension (in.)
Whole inches: 02 to 22.

⑥ "U" Dimension (fractional in.)
0 = 0
4 = 1/2
Note: For "U" lengths not specified, contact factory.

⑦ Thermowell Material
A = 304/304L SS
C = 316/316L SS

⑧ Process Connection Size "P" (in.)
D = 3/4 NPT
E = 1 NPT
C = 1/2 NPT

⑨ Flange Rating
0 = No flange

⑩ Flange Face Type
0 = No flange

⑪ Flange Material
0 = No flange

⑫ Lag "T" (in.)
Whole inches: 0* to 4

⑬ Lag "T" (fractional in.)
0 = 0
1 = 1/8
2 = 1/4
3 = 3/8
4 = 1/2
5 = 5/8
6 = 3/4
7 = 7/8

⑭ Bore Diameter "M" (in.)
A = 0.260

⑮ Special Options
0 = None

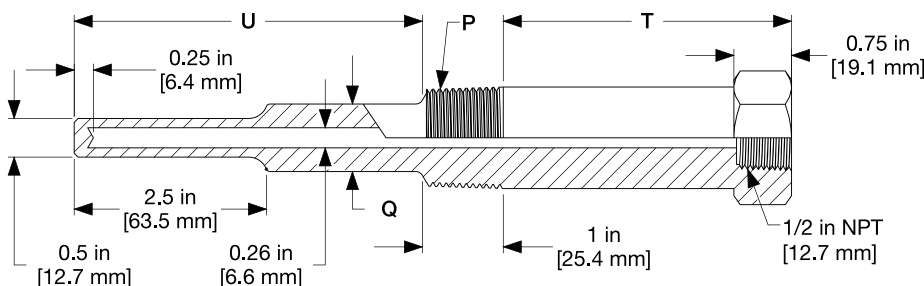
*Minimum lag "T" dimension is 3/4in.

Note: All accessories are subject to minimum purchase quantities.



Thermowells

Bimetallic Thermometer Wells—Threaded Type



Standard Bore Size: 0.260 inch

Standard Materials: 304/304L SS,
316/316L SS

Typical Dimensions

Process Conn. NPT P in.	Q in.
1/2 *	5/8
3/4	3/4
1	7/8

*On 1/2 inch NPT external threaded wells, the 1 inch thread allowance and 3/4 inch wrench allowance dimensions are reversed to accommodate the 1/2 inch NPT female thread.

Ordering Information

Part Number

①	②	③	④ ⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮
T	B	D	"U" Dim. (in.)	"U" Dim. (fract. in.)	Thermo- well Mat'l	Process Conn. "P" (in.)	Flange Rating	Flange Face Type	Flange Material	Lag "T" (in.)	Lag "T" (fract. in.)	Bore Dia "M" (in.)	Special Options

④ ⑤	"U" Dimension (in.)
Whole inches: 03 to 22	

⑥ "U" Dimension (fractional in.)	
0 =	0
4 =	1/2

⑦ Thermowell Material	
A =	304/304L SS
C =	316/316L SS

⑧	Process Connection "P" (in.)
C =	1/2 NPT
D =	3/4 NPT
E =	1 NPT

9	Flange Rating
0 =	No flange

⑩	Flange Face Type
0 =	No flange

⑪	Flange Material
0 =	No flange

⑫	Lag "T" (in.)
Whole inches: 0* to 4	

⑬	Lag "T" (fractional in.)
0	= 0
1	= 1/8
2	= 1/4
3	= 3/8
4	= 1/2
5	= 5/8
6	= 3/4
7	= 7/8

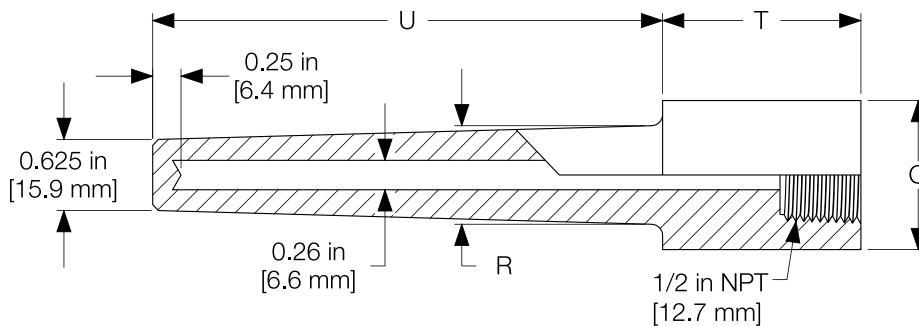
14 Bore Diameter "M" (in.)	
A =	0.260

15	Special Options
0 =	Standard options

*Minimum lag "T" dimension is 3/4in.

Thermowells

Socket Weld Type



Standard Bore Size: 0.260 inch
Standard Materials: 304/304L SS, 316/316L SS

Typical Dimensions

Stock Size/Hex Size O in.	R in.
1.315	1
1.050	7/8

Ordering Information

Part Number

①	②	③	④ ⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮
T	Thermo- well Style	Stem Config.	"U" Dim. (in.)	"U" Dim. (fract. in.)	Thermo- well Mat'l	Process Conn. "O" (in.)	Flange Rating	Flange Face Type	Flange Material	Lag "T" (in.)	Lag "T" (fract. in.)	Bore Dia "M" (in.)	Special Options
T	S	T											

②	Thermowell Style
S =	Socket weld

③	Stem Configuration
T =	Standard taper

④ ⑤	"U" Dimension (in.)
	Whole inches: 02 to 22

⑥	"U" Dimension (fractional in.)
0 =	0
4 =	1/2

⑦	Thermowell Material
A =	304/304L SS
C =	316/316L SS

⑧	Process Connection "O" (in.)
L =	1.050 O.D.
M =	1.315 O.D.

⑨	Flange Rating
0 =	No flange

⑩	Flange Face Type
0 =	No flange

⑪	Flange Material
0 =	No flange

⑫	Lag "T" (in.)
	Whole inches: 1* to 4

⑬	Lag "T" (fractional in.)
0 =	0
1 =	1/8
2 =	1/4
3 =	3/8
4 =	1/2
5 =	5/8
6 =	3/4
7 =	7/8

⑭	Bore Diameter "M" (in.)
A =	0.260

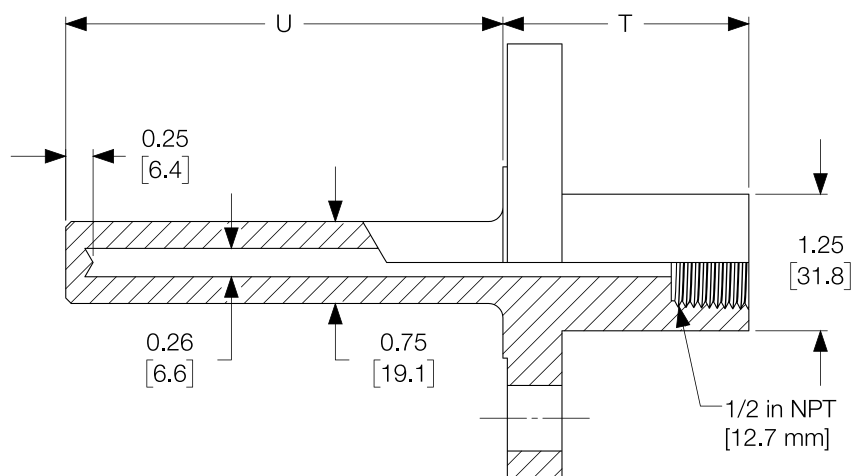
⑮	Special Options
0 =	Standard options

* Minimum lag "T" dimension is 1 3/4 in. per industry standards



Thermowells

Welded Flange - Straight



Standard Bore Size: 0.260 inch

Standard Materials: 304/304L SS,
316/316L SS

Ordering Information

Part Number

①	②	③	④ ⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮
T	F	S	"U" Dim. (in.)	"U" Dim. (fract. in.)	Thermowell Mat'l	Process Conn. "P" (in.)	Flange Rating	Flange Face Type	Flange Material	Lag "T" (in.)	Lag "T" (fract. in.)	Bore Dia "M" (in.)	Special Options

②	Thermowell Style
F =	Welded

③	Stem Configuration
S =	Straight

④ ⑤	"U" Dimension (in.)
Whole inches:	02 to 22.

⑥	"U" Dimension (fractional in.)
0 =	0
4 =	1/2

⑦	Thermowell Material
A =	304/304L SS
C =	316/316L SS

⑧	Flange Size (NPS)
2 =	1
3 =	1 1/2
4 =	2
5 =	3

⑨	Flange Rating
A =	Class 150
B =	Class 300
C =	Class 600
D =	Class 900
E =	Class 1500

⑩	Flange Face Type
1 =	Raised face
2 =	Flat face
3 =	Ring joint

⑪	Flange Material
0 =	No flange

⑫	Lag "T" (in.)
Whole inches:	2* to 4

⑬	Lag "T" (fractional in.)
0 =	0
1 =	1/8
2 =	1/4
3 =	3/8
4 =	1/2
5 =	5/8
6 =	3/4
7 =	7/8

⑭	Bore Diameter "M" (in.)
A =	0.260

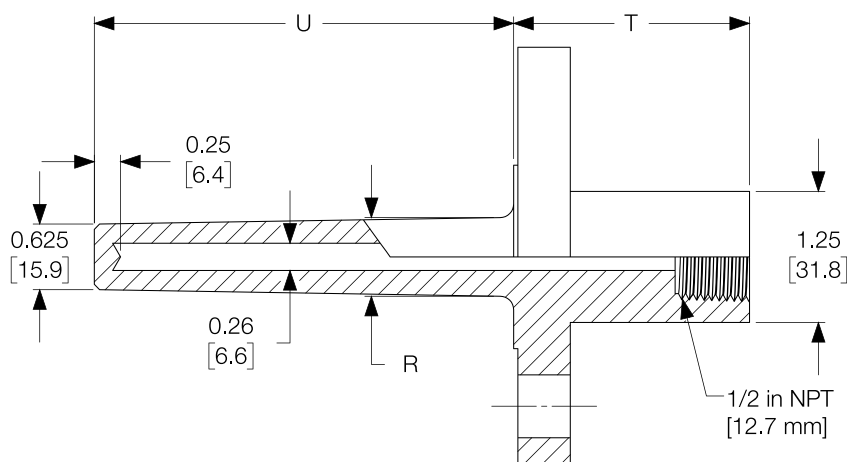
⑮	Special Options
0 =	Standard options

* Minimum lag "T" dimension is 2 1/4 in.

Note: For additional dimensional details see page 95

Thermowells

Welded Flange - Tapered



Standard Bore Size: 0.260 inch

Standard Materials: 304/304L SS,
316/316L SS

Typical Dimensions

Flange in.	R in.
1	$\frac{7}{8}$
1 1/2 thru 3	1 1/16

Ordering Information

Part Number

①	②	③	④ ⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮
T	F	T	"U" Dim. (in.)	"U" Dim. (fract. in.)	Thermo- well Mat'l	Process Conn. "P" (in.)	Flange Rating	Flange Face Type	Flange Material	Lag "T" (in.)	Lag "T" (fract. in.)	Bore Dia "M" (in.)	Special Options

②	Thermowell Style
F =	Welded flange

③	Stem Configuration
T =	Standard taper

④ ⑤	"U" Dimension (in.)
Whole inches:	02 to 22.

⑥	"U" Dimension (fractional in.)
0 =	0
4 =	$\frac{1}{2}$

⑦	Thermowell Material
A =	304/304L SS
C =	316/316L SS

⑧	Flange Size (NPS)
2 =	1
3 =	$1\frac{1}{2}$
4 =	2
5 =	3

⑨	Flange Rating
A =	Class 150
B =	Class 300
C =	Class 600
D =	Class 900
E =	Class 1500

⑩	Flange Face Type
1 =	Raised face
2 =	Flat face
3 =	Ring joint

⑪	Flange Material
0 =	No flange

⑫	Lag "T" (in.)
Whole inches:	2* to 4

⑬	Lag "T" (fractional in.)
0 =	0
1 =	$\frac{1}{8}$
2 =	$\frac{1}{4}$
3 =	$\frac{3}{8}$
4 =	$\frac{1}{2}$
5 =	$\frac{5}{8}$
6 =	$\frac{3}{4}$
7 =	$\frac{7}{8}$

⑭	Bore Diameter "M" (in.)
A =	0.260

⑮	Special Options
0 =	Standard options

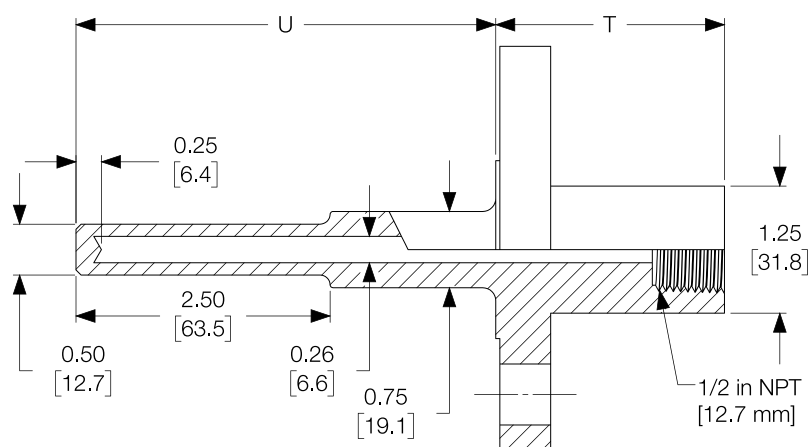
* Minimum lag "T" dimension is 2 1/4 in.

Note: For additional dimensional details see page 95



Thermowells

Bimetallic Thermometer Well - Flanged Type



Standard Bore Size: 0.260 inch

Standard Materials: 304/304L SS,
316/316L SS

Ordering Information

Part Number

①	②	③	④ ⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮
T	F	D	"U" Dim. (in.)	"U" Dim. (fract. in.)	Thermo- well Mat'l	Process Conn. "P" (in.)	Flange Rating	Flange Face Type	Flange Material	Lag "T" (in.)	Lag "T" (fract. in.)	Bore Dia "M" (in.)	Special Options

④ ⑤	"U" Dimension (in.)
Whole inches: 03 to 22.	

⑥ "U" Dimension (fractional in.)		
0	=	0
4	=	1/2

⑦ Thermowell Material	
A =	304/304L SS
C =	316/316L SS

⑧	Flange Size (NPS)
2	= 1
3	= 1 ¹ / ₂
4	= 2
5	= 3

⑨	Flange Rating
A =	Class 150
B =	Class 300
C =	Class 600
D =	Class 900
E =	Class 1500

⑩	Flange Face Type
1 =	Raised face
2 =	Flat face
3 =	Ring joint

⑪	Flange Material
0 =	No flange

⑫	Lag "T" (in.)
0	= Whole inches: 0 to 9

⑬	Lag "T" (fractional in.)
0	= 0
1	= 1/8
2	= 1/4
3	= 3/8
4	= 1/2
5	= 5/8
6	= 3/4
7	= 7/8

⑭ Bore Diameter "M" (in.)	
A =	0.260

⑮	Special Options
0 =	Standard options

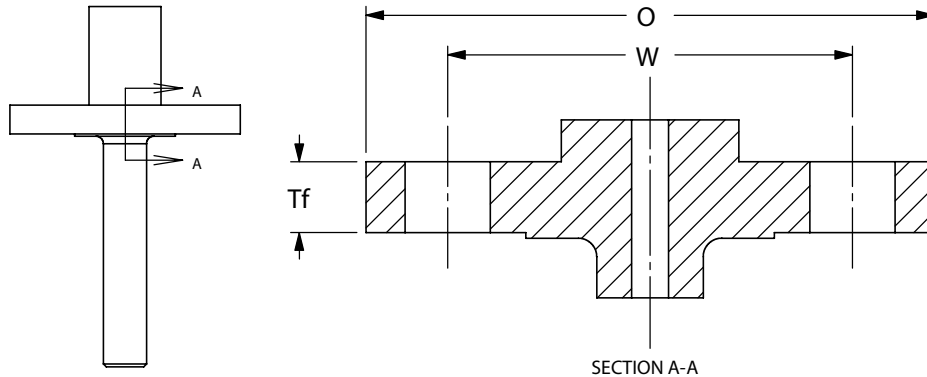
Note: For additional dimensional details see page 95

* Minimum lag "T" dimension is 2 1/4 in.

Thermowells

Flanged Type Thermowell - Additional Dimension

Flanges dimensions and tolerances in compliance with ASME B16.5 standards.



Tolerances (in.)	
Outside diameter of flange, O	+0.08 -0.04
Diameter of bolt circle, W	±0.06
Diameter of bolt holes	±1/16
Minimum thickness of flange, Tf	±0.12

Class 150 Flanges Dimensions					
Nominal Pipe Size	Outside Diameter of Flange, O (in.)	Diameter of Bolt Circle, W (in.)	Diameter of Bolt Holes (in.)	Number of Bolts	Minimum Thickness of Flange, Tf (in.)
1 (25 DN)	4.25	3.12	5/8	4	0.38
1 1/2 (40 DN)	5.00	3.88	5/8	4	0.50
2 (50 DN)	6.00	4.75	3/4	4	0.56
3 (80 DN)	7.50	6.00	3/4	4	0.69

Class 300 Flanges Dimensions					
Nominal Pipe Size	Outside Diameter of Flange, O (in.)	Diameter of Bolt Circle, W (in.)	Diameter of Bolt Holes (in.)	Number of Bolts	Minimum Thickness of Flange, Tf (in.)
1 (25 DN)	4.88	3.50	3/4	4	0.62
1 1/2 (40 DN)	6.12	4.50	7/8	4	0.75
2 (50 DN)	6.50	5.00	3/4	8	0.81
3 (80 DN)	8.25	6.62	7/8	8	1.06

Class 600 Flanges Dimensions					
Nominal Pipe Size	Outside Diameter of Flange, O (in.)	Diameter of Bolt Circle, W (in.)	Diameter of Bolt Holes (in.)	Number of Bolts	Minimum Thickness of Flange, Tf (in.)
1 (25 DN)	4.88	3.50	3/4	4	0.69
1 1/2 (40 DN)	6.12	4.50	7/8	4	0.88
2 (50 DN)	6.50	5.00	3/4	8	1.00
3 (80 DN)	8.25	6.62	7/8	8	1.25

Class 900 Flanges Dimensions					
Nominal Pipe Size	Outside Diameter of Flange, O (in.)	Diameter of Bolt Circle, W (in.)	Diameter of Bolt Holes (in.)	Number of Bolts	Minimum Thickness of Flange, Tf (in.)
1 (25 DN)	5.88	4.00	1	4	1.12
1 1/2 (40 DN)	7.00	4.88	1 1/8	4	1.25
2 (50 DN)	8.50	6.50	1	8	1.50
3 (80 DN)	9.50	8.00	1	8	1.50

Class 1500 Flanges Dimensions					
Nominal Pipe Size	Outside Diameter of Flange, O (in.)	Diameter of Bolt Circle, W (in.)	Diameter of Bolt Holes (in.)	Number of Bolts	Minimum Thickness of Flange, Tf (in.)
1 (25 DN)	5.88	4.00	1	4	1.12
1 1/2 (40 DN)	7.00	4.88	1 1/8	4	1.25
2 (50 DN)	8.50	6.50	1	8	1.50
3 (80 DN)	10.50	8.00	1 1/4	8	1.88

Protection Tubes

Coated Protection Tubes for Molten Aluminum, Zinc and Galvanizing Applications

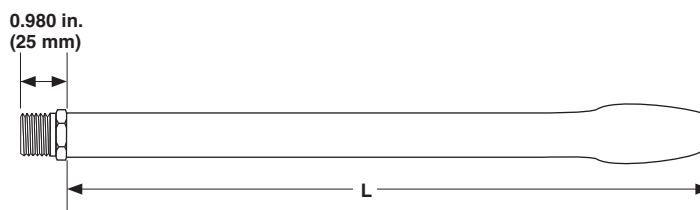
SERIES 1100 Protection Tube

With a tough refractory laminated coating, SERIES 1100 protecting tubes resist erosion from molten aluminum, zinc or galvanizing baths. They stay strong, even at high temperatures and require no washing or maintenance to prolong their service life. A special protective cap at the tip provides fast response time, permitting thermal expansion without damage to the refractory laminate.

The 0.600 inch I.D. easily accommodates up to an 8-gauge beaded thermocouple and is stocked for immediate shipment. The maximum operating temperature for the SERIES 1100 is 1400°F (745°C).

Order - Part No. Code - Length

Example: 1100-24



Part No.	I.D. in.	Nominal O.D. in.	Fitting in.	Tube Length in.
1100	0.600	1 1/2 Max.	3/4 NPT	12, 18, 24, 30, 36, 42, 48

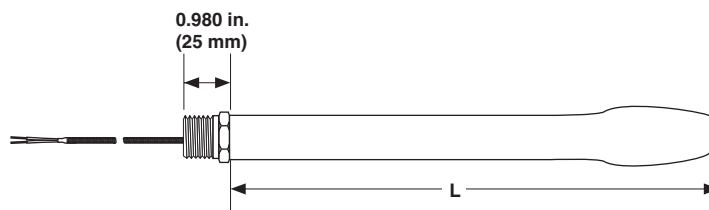
SERIES 1101 Protection Thermocouple

Watlow's SERIES 1101 protected thermocouple assemblies incorporate a mineral-insulated stainless steel sheathed XACTPAK® thermocouple hermetically sealed within a refractory laminated SERIES 1100 protection tube. Standard calibration is Type K, complete with 36 inches of high temperature insulated thermocouple wire.

As with the SERIES 1100 protection tube, the SERIES 1101 assembly requires no washing or maintenance to prolong its service life. It delivers fast, accurate readings in molten aluminum, zinc and galvanizing baths.

Order - Part No. Code - Length

Example: 1101-12



Part No.	Calibration	Nominal O.D. in.	Fitting in.	Lead Length in.	Tube Length in.
1101	K	1 1/2 Max.	3/4 NPT	36	12, 18, 24, 30, 36

Note: All accessories are subject to minimum purchase quantities.



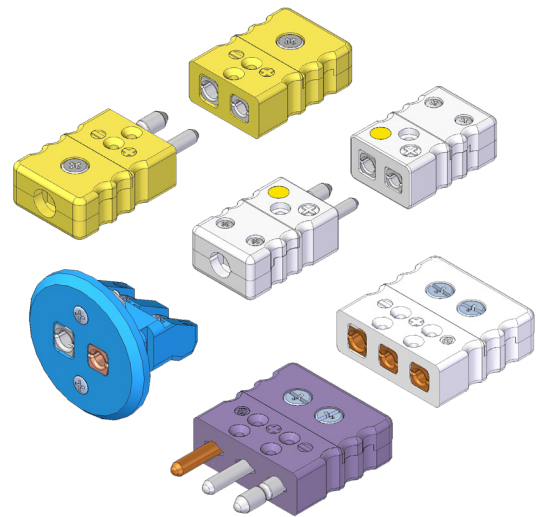
Connectors

Many varieties of thermocouple connectors are available from Watlow®. Watlow's broad offering includes benefits such as high impact strength, fast installation and high temperature capabilities.

Listed below are the various connectors and systems from which to choose:

- Standard thermocouple connectors
- Quick-attach thermocouple connectors
- High temperature connectors
- Three-pole connectors for RTD applications
- Miniature thermocouple connectors

Watlow's standard line of connectors are lightweight, rugged and accurate. Color coded to easily identify calibration type, these connectors also have larger cap screws for easier assembly.



Features and Benefits

ASTM color coded

- Ensures easy identification

Compensated alloys

- Provides accuracy in readings

Glass-filled thermoplastic

- Provides high impact strength

Captive cap screws

- Ensures a secure connection

Connection hardware

- Eliminates several components

Meets requirements for ASTM E1129

- Ensures adequate pin spacing, dimensions and contact resistance

Rated to 425°F (215°C)

- Fits high-temperature applications

Note: All accessories are subject to minimum purchase quantities.

Connectors

"S" SERIES Standard Connectors 425°F (215°C)

Ordering Information

Part Number

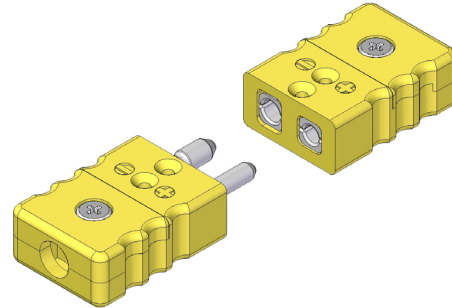
① ②	③	④	⑤	⑥ ⑦
SC	Style	Calibration	Name Plate	Color Code

③	Style
M =	Male (plug)
F =	Female (jack)

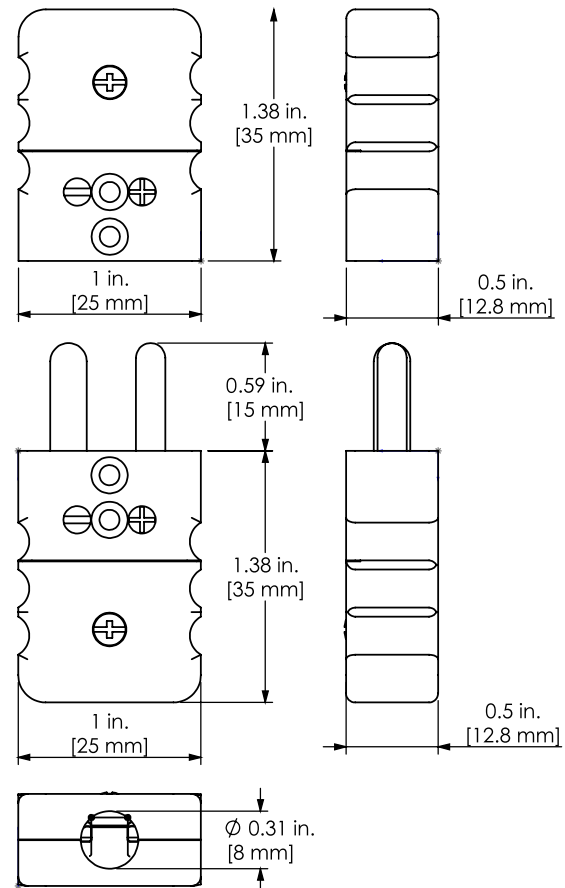
④	Calibration
E =	Type E
J =	Type J
K =	Type K
S =	Type S / Type R
T =	Type T
U =	Uncompensated

⑤	Name Plate
N =	Without name label

⑥ ⑦	Color Code
AT =	ASTM E 230 color code



Standard Connector

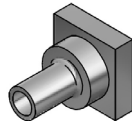


Crimp/Nickel Plated Brass Style

Ordering Information

Part Number

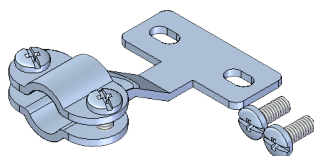
① ② ③	④ ⑤ ⑥
SAB	Style



④ ⑤ ⑥	Style
040 =	0.040 in.
063 =	0.063 in.
090 =	0.090 in.
125 =	0.125 in.
188 =	0.188 in.
250 =	0.250 in.
30M =	3.0 mm
60M =	6.0 mm

Cable Clamp Style for Male or Female

Part Number: **SAC-220**



Note: All accessories are subject to minimum purchase quantities.



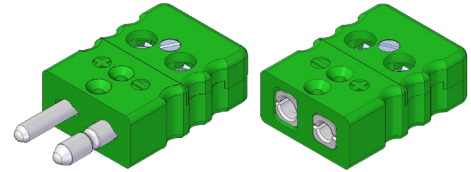
Accessories

Connectors

Quick-Attach Thermocouple Connectors, 425° F (215°C)

Watlow's time-saving thermocouple connectors are quick and convenient to use because there are no loose parts and there is no need to remove caps or wrap wires around terminal screws. Stripped wire ends are simply inserted into a plug or jack then tightened with two terminal screws.

Thermocouple connectors accept solid or stranded wires up to 16 gauge, are available in Type J, K and T calibrations and are ASTM E 230 color-coded. The connector is made with high-impact strength, 425°F (215°C) rated glass filled thermoplastic with matching thermocouple materials.



Ordering Information

Part Number

1 2	3	4	5	6 7	8 9 10 11
SK	Style	Calibration	Name Plate	Color Code	Assembly
SK			N	AT	ASSY

3	Style
M =	Male (plug)
F =	Female (jack)

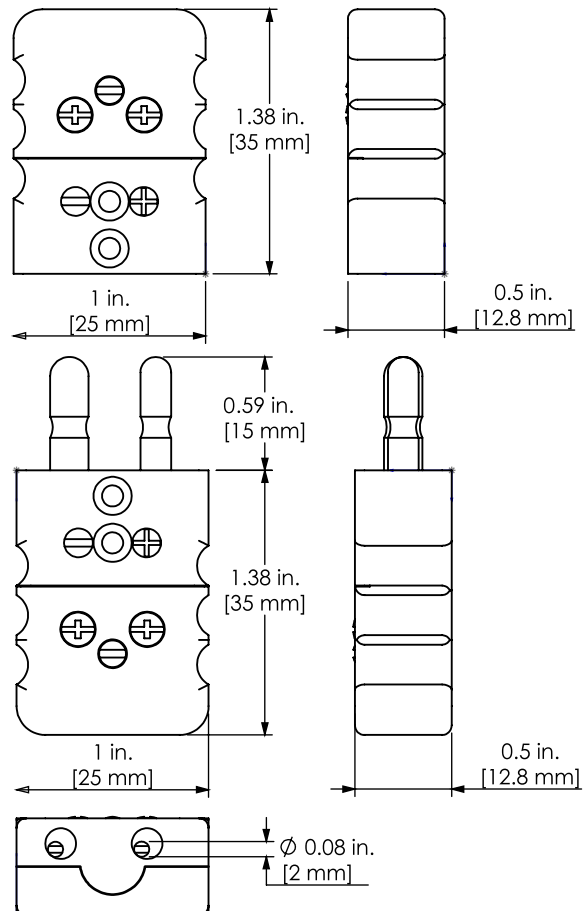
4	Calibration
J =	Type J
K =	Type K
T =	Type T

5	Name Plate
N =	Without name label

6 7	Color Code
AT =	ASTM E 230 color code

8 9 10 11	Assembly
ASSY =	Comes with cap assembly on body

Standard Quick Attach Connector



Note: All accessories are subject to minimum purchase quantities.

Connectors

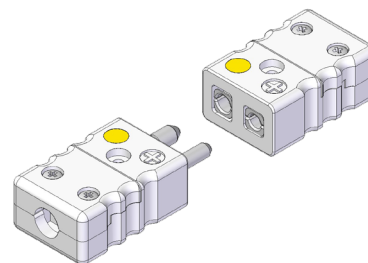
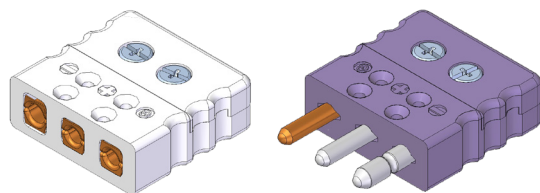
High-Temperature Connectors 1000°F (540°C)

The ASTM E 230 color-coded bodies of these high temperature ceramic connectors are practical for temperatures up to 1000°F (540°C). Colors are permanent and will not fade even after exposure to temperature. The positive-locking screw type terminals are captive for easy assembly. Hollow plug pins and collet inserts are made of thermocouple alloys (except Type R/S, which is compensated).

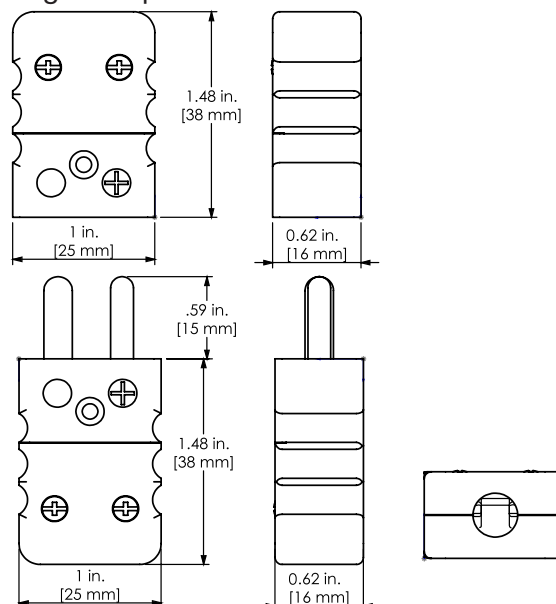
Calibration must be specified when ordering. Both plug and jack are marked for polarity and standard $\frac{7}{16}$ inch pin spacing.

Part Number	Description
912-*	Ceramic plug (specify calibration J, K, R/S or E)
913-*	Ceramic jack (specify calibration J, K, R/S or E)
925-125	XACTPAK® adapter for plug or jack (0.125 inch sheath O.D.)
925-188	XACTPAK adapter for plug or jack (0.188 inch sheath O.D.)
925-250	XACTPAK adapter for plug or jack (0.250 inch sheath O.D.)
926	Cable clamp for ceramic plug or jack

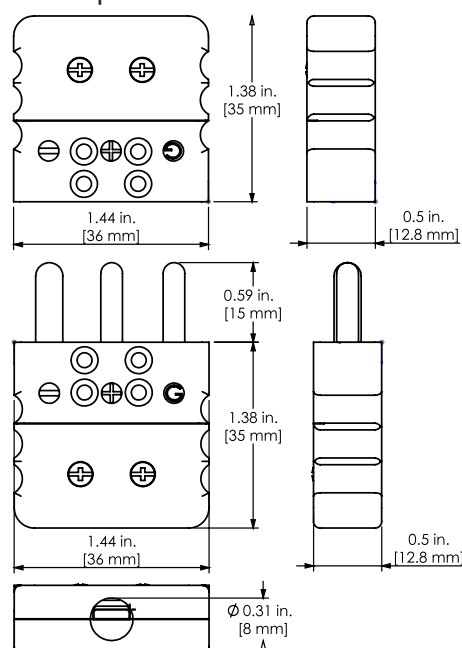
*Insert calibration letter for full part number 912-J



High Temperature Connector



Three-pole Connector



Three-Pole Connectors for RTD Applications, 400°F (200°C)

- Three pins to accommodate most RTD sensor applications
- Rated up to 400°F (200°C) continuous
- Jacks have spring-loaded inserts for positive contact
- Larger diameter negative pin prevents user from reversing polarity

Part Number	Description
TH-335	3-pole connector plug with copper pins
TH-336	3-pole connector jack with copper inserts
TH-337-125	Compression-type adapter for 0.125 inch tube
TH-337-188	Compression-type adapter for 0.188 inch tube
TH-337-250	Compression-type adapter for 0.250 inch tube
SAC-220	Cable clamp for 3-pole connector

Note: All accessories are subject to minimum purchase quantities.

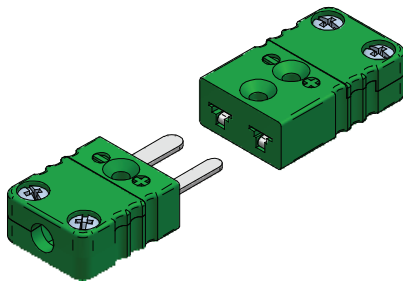


Accessories

Connectors

Miniature Thermocouple Connector System, 400°F (200°C)

Watlow's new miniature connector is for both thermocouple and RTD circuits. This connector is suited for small wires or small diameter mineral insulated cables. The connector features a glass filled high quality thermoplastic body that makes for a more rugged and durable connector. Matching thermocouple alloys and spring loaded pin inserts ensure an accurate and strong signal. Captive terminal screws and molded polarity signals make for faster and easier wire termination with less error. Watlow's new miniature plugs and jacks will mate with previous Watlow miniature connectors and any other ANSI spec miniature connector.



Ordering Information

Part Number

① ②	③	④	⑤	⑥ ⑦
MC	Style	Calibration	Name Plate	Color Code
			N	AT

③ Style

M =	Male (plug)
F =	Female (jack)

④ Calibration

E =	Type E
J =	Type J
K =	Type K
N =	Type N
R =	Type R
S =	Type S
T =	Type T
U =	Uncompensated

⑤ Name Plate

N =	Without name
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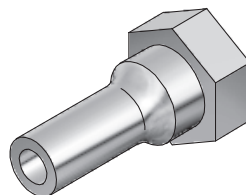
⑥ ⑦ Color Code

AT =	ASTM E230 color code/uncompensated = white
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Accessories

Crimp/Braze Adapter

These adapters are designed for brazing, soldering or crimping on mineral insulated cable or crimping onto insulated wire.



Ordering Information

Part Number

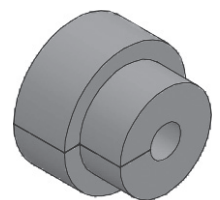
① ② ③	④ ⑤ ⑥
MHX	Sheath Size

④ ⑤ ⑥ Sheath Size

032 =	0.032
040 =	0.040
063 =	0.063
125 =	0.125

Grommets

Grommets can be fitted in the entrance hole of the connector to prevent moisture and dirt from entering the connector. All grommets are constructed from silicone with a maximum temperature of 400°F (200°C) and are pre-slit to allow for easy installation. These grommets will compress on the wire once the cover is fitted.



Ordering Information

Part Number	Description
71305601	Grommet with 0.12 in. (3.0 mm) diameter
71305602	Grommet with 0.02 in. (0.5 mm) diameter
71305603	Grommet with 0.06 in. (1.5 mm) diameter

Note: All accessories are subject to minimum purchase quantities.

Connectors

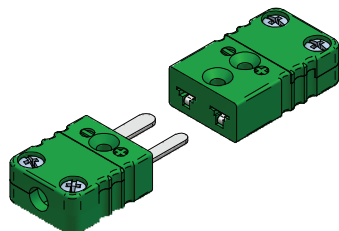
Miniature Thermocouple Connector System, 400°F (200°C)

Ordering Information

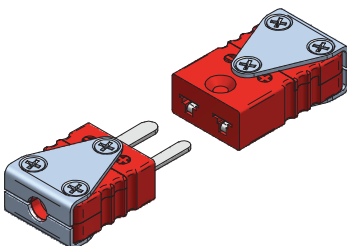
Description	① ② Connector Type	③ Style	④ Available Calibration	⑤ Name Plate	⑥ ⑦ Color Code
Locking connectors that prevent plug and jack separation in high vibration environments	ML	M, F	E, J, K, N, R, S, T, U	N	AT
High temperature connectors rated for 800°F (427°C)	MH	M, F	E, J, K, N, R, S	N	AT*
Three pin connectors for grounded/shielded thermocouples and RTD circuits	MT	M, F	E, J, K, N, R, S, T, U	N	AT
Panel inserts suitable for instrumentation cases	MP	C, R **	J, K, T	N	AT

*High temperature connectors are stamped with the calibration type.

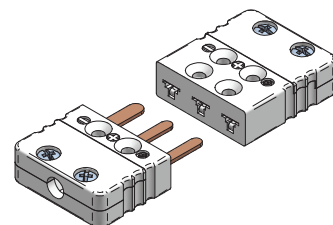
**Panel inserts are available in both circular and rectangular configurations.



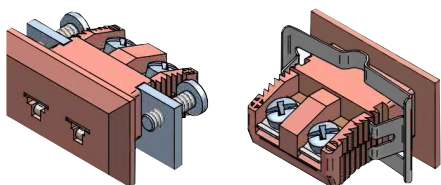
Locking Miniature Connectors



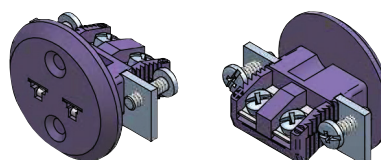
High Temperature Miniature Connectors



Miniature Three Pin Connectors



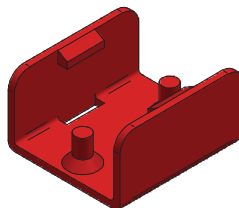
Rectangular Miniature Panel Inserts



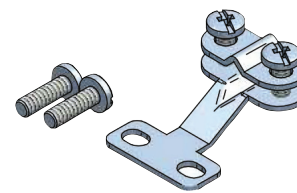
Circular Miniature Panel Inserts

Additional Accessories

Part Number	Description
80441501	Locking clips are a cost effective way to prevent accidental plug and jack separation
80441301	Wire clamp bracket provides optimum strain relief with a large range of maximum and minimum wire diameters



Miniature Connector Locking Clips



Wire Clamp

For dimensional drawings of all connector types please review Watlow's **"Miniature Connector Spec Sheet."**

Note: All accessories are subject to minimum purchase quantities.

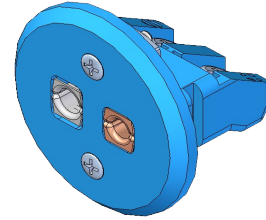


Accessories

Connectors

Single Panel Mount Hardware, 425°F (218°C)

Rugged one-body design using thermocouple materials and spring loaded inserts, these units fit panels up to $\frac{7}{16}$ inch thick. Panel cutout: $1\frac{1}{8}$ inch to $1\frac{5}{32}$ inch hole. Units fit into standard $\frac{3}{4}$ inch knockouts.



Ordering Information

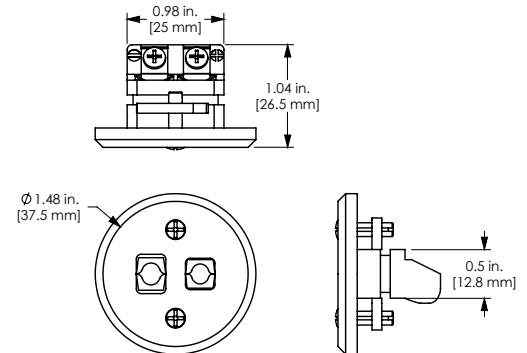
Part Number

① ② ③	④	⑤	⑥ ⑦
	Calibration	Name Plate	Color Code
SKP			

Calibration	
J =	Type J
K =	Type K
T =	Type T

Name Plate	
N =	Without name label

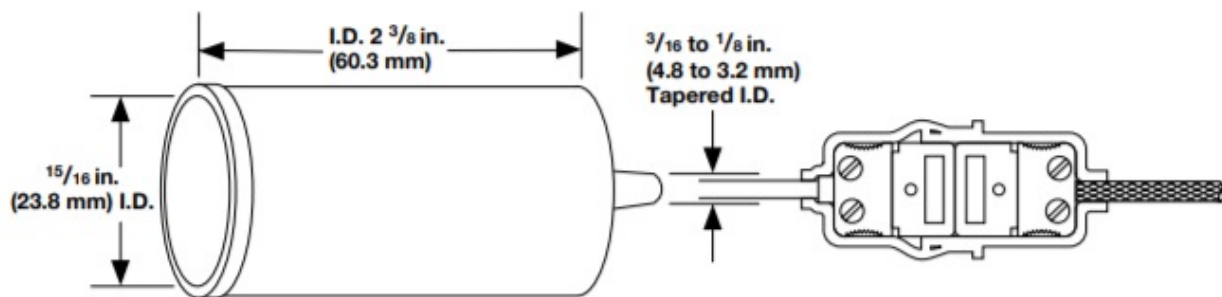
Color Code	
AT =	ASTM E 230 color code/uncompensated = white



Weather Resistant Boots

Used in pairs as illustrated, these flexible neoprene rubber boots add moisture protection to standard plug-to-jack connections.

Part Number: **943**



Note: All accessories are subject to minimum purchase quantities.

Connection Heads and Blocks

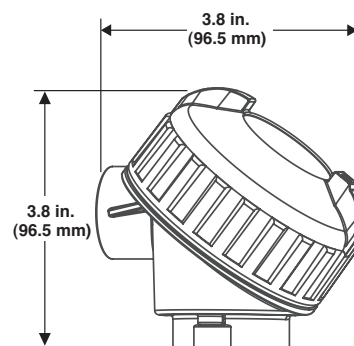
Standard Thermocouple Connection Heads

(Assembly ordering options D or E)

Watlow's standard heads are made of cast iron or aluminum. A plated chain attaches the gasketed cover to the body. Flats are provided for tightening. The connector block, held in place with two screws, can be single, duplex or triplex. These heads have 1, $\frac{3}{4}$ or $\frac{1}{2}$ inch NPT openings for protecting tubes or drilled wells. The conduit outlet is $\frac{3}{4}$ inch NPT. Epoxy coating is available on the aluminum head. Maximum operating temperature is 825°F (441°C). Approved for NEMA 4X, IP66.

Cast Iron Head Only Part No.	Aluminum Head Only Part No.	Sensor Opening (NPT) in.	Conduit Connection in.
70900201	—	1	$\frac{3}{4}$
70900202	—	$\frac{3}{4}$	$\frac{3}{4}$
70900203	70900301*	$\frac{1}{2}$	$\frac{3}{4}$

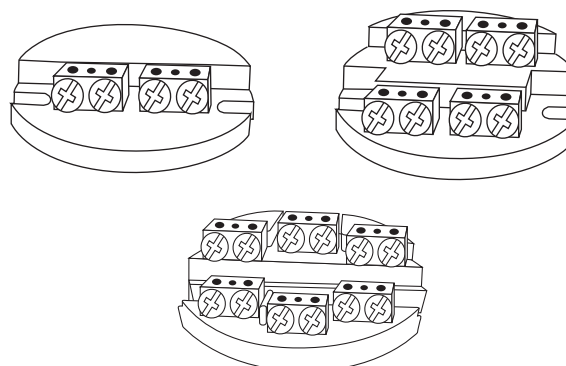
*Available with epoxy coating (70900302)



Approximate Assembled Dimensions:
3.8 in. (96.5 mm) H x 3.8 in. (96.5 mm) L x
3.8 in. (96.5 mm) W

Terminal Blocks for Standard Connection Heads

Part No.	Description
50500401	Single element, max. operating temperature 1000°F (540°C)
50500501	Dual, max. operating temperature 1000°F (540°C)
50500601	Triplex, max. operating temperature 1000°F (540°C)



Note: All accessories are subject to minimum purchase quantities.

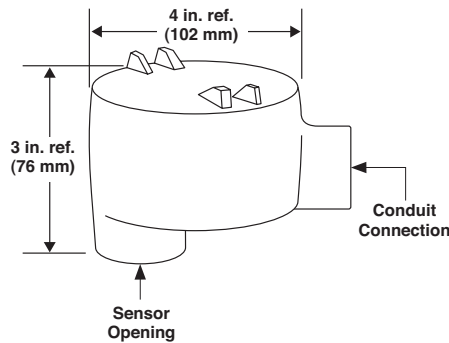


Accessories

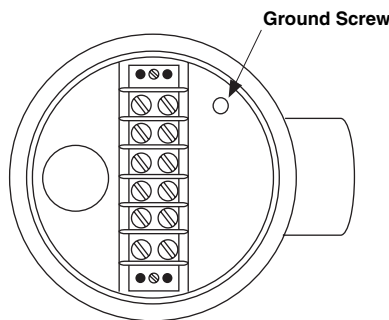
Connection Heads and Blocks

Explosion Proof Thermocouple Connection Heads

(Assembly ordering option H)



Approximate Assembled Dimensions:
4 in. H x 2 1/4 in. L x 3 in. W



XP Head Shown with TH-615 Block

Part No.	Sensor Opening in.	Conduit Connection in.
XP-11	3/4	3/4
XP-12	1/2	3/4

For hazardous locations. Underwriter's Laboratories Listed Class 1, Groups C, D; Class 2, Groups E, F, G; Class 3, all Groups.

All XP explosion-proof heads use a TH-615 (six terminal) block.

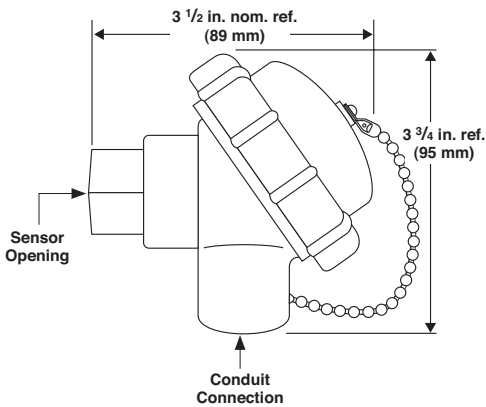
Order separately.

Also approved for CSA Class I, Groups C and D; Class II, Groups E and F; and Class III.

PT Polypropylene Head and Connector Blocks

(Assembly ordering option C)

The polypropylene head is the answer to many of the corrosion problems facing connection heads. The U.V. stabilized polypropylene head is impervious to practically all corrosive media and is rated for continuous operation up to 220°F (105°C). The PT-20 and PT-30 are colored black and the RT-30-WHT is white.



PT Polypropylene Heads

Part No. Head Only	Sensor Opening in.	Conduit Connection in.
PT-20	1/2	1/2
PT-30	1/2	3/4
RT-30-WHT	1/2	3/4

Terminal Blocks for PT Heads

Part No.	Description
50500701	Single element block
50500801	Dual element block

Note: All accessories are subject to minimum purchase quantities.

Transmitters

SERIES 5750

The SERIES 5750 temperature transmitter from Watlow offers remarkably accurate temperature measurement and improves reliability to reduce downtime and costs.

The SERIES 5750 offers new measurements with resistance temperature detectors (RTDs) in three and four-wire connections. It is designed to fit directly inside connection heads type DIN B or larger.

The transmitter is programmed using a separate connection cable and an easy-to-use Windows®-based software program configures the transmitter in seconds.

The SERIES 5750 provides linearization between temperature sensor input signals and the 4-20mA output signal to ensure accurate temperature measurements across a broad range.

Contact Watlow's customer service department to integrate this transmitter into a Watlow Style AR or AT thermocouple sensor or with a Style RR or RT RTD sensor.



Features and Benefits

Accepts three and four-wire RTD and thermocouple sensor inputs

- Standardizes transmitter for various sensors and applications

Designed for harsh conditions

- Withstands high vibration and high humidity applications

Sensor error compensation function

- Provides convenience for adjusting the sensor/transmitter combination, or the transmitter alone, ensuring accurate temperature measurement within a specific range

Large center hole and robust terminals with test connections and low height

- Enables easy mounting

Configuration without external power

- Allows configurations to be edited or read offline by connecting to a personal computer (PC) universal serial bus (USB) port

Easy-to-use Windows® configuration software

- Parameters such as sensor type, measuring range, filter activation, cold junction compensation, sensor failure and error corrections are set in one window

Note: All accessories are subject to minimum purchase quantities.

Transmitters

SERIES 5750

Specifications

Input RTD

- Pt100 (IEC 60751, $\alpha = 0.00385$)
-328 to +1832°F (-200 to +1000°C)
- Pt100 (JIS C 1604, $\alpha = 0.003916$)
-328 to +1832°F (-200 to +1000°C)
- Pt1000 (IEC 60751, $\alpha = 0.00385$)
-328 to +392°F (-200 to +200°C)
- 3-, 4-wire connection
- Sensor current ~ 0.4mA
- Max. sensor wire resistance 25Ω/wire

Input Thermocouples

- Range Type: B, C, E, J, K, N, R, S, T
- Max. sensor wire resistance 500Ω (total loop)

Monitoring

- Sensor failure monitoring upscale or downscale action

Adjustments

- Zero adjustments for all inputs at any value within temperature range limits
- Min. spans: Pt input 18°F (10°C)
T/C 2mV

Output

- Analog 4-20mA, temperature linear
- Resolution 5μA
- Min. output signal measurement/failure 3.8mA/3.5mA
- Max. output signal measurement/failure 20.5mA/21.6mA
- Permissible load, see load diagram 725Ω @ 24VDC

Temperature

- Ambient, storage and operation
-40 to +185°F (-40 to +85°C)

General Data

- Selectable dampening time ~ 2s
- Update time ~ 1.5s
- Isolation in - out non-isolated
- Humidity 0 to 100% RH
- Vibration acc. to IEC 60068-2-6, test Fc, 60-500Hz, 10g
- Output limitations and fail currents are NAMUR compliant

Power Supply

- Polarity protected
- Supply voltage 8 to 32VDC
- Permissible ripple 4V p-p @ 50/60Hz

Accuracy

- Linearity RTD $\pm 0.1\%$ ^①
T/C $\pm 0.2\%$ ^①
- Calibration RTD max. of $\pm 0.4^\circ\text{F}$ / $\pm 0.2^\circ\text{C}$ or $\pm 0.1\%$ ^①
T/C max. of $\pm 20\mu\text{V}$ or $\pm 0.1\%$ ^①
- Cold junction compensation (CJC) T/C $\pm 0.9^\circ\text{F}$ ($\pm 0.5^\circ\text{C}$)
- Temperature influence^③ All inputs max. of $\pm 0.25^\circ\text{C}/25^\circ\text{C}$ or $\pm 0.25\%/25^\circ\text{C}$ ^{① ②}
- Max. of $\pm 0.5^\circ\text{F}/50^\circ\text{F}$ or $\pm 0.28\%/50^\circ\text{F}$ ^{① ②}

Housing

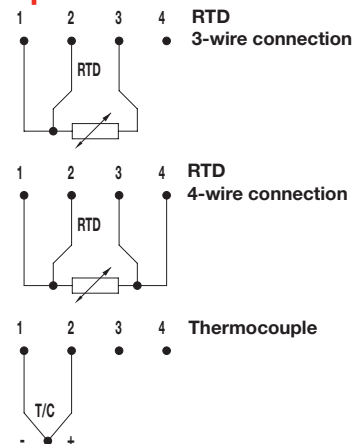
- Material, Flammability (UL®) PC/ABS + PA, V0
- Mounting DIN B-head or larger, DIN rail (with mounting kit)
- Connection single/stranded wires max. 1.5 mm², AWG 16
- Weight 32g
- Protection, housing / terminals IP 65/IP 00

^①Of input span

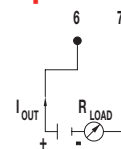
^②If zero-deflection >100% of input span: add 0.125% of input span/
25°C or 0.14% of input span/50°F per 100% zero-deflection

^③Reference temperature 68°F (20°C)

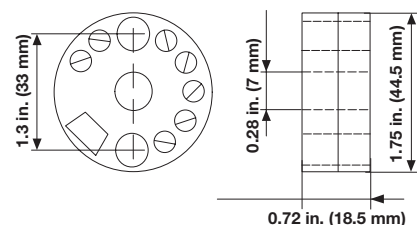
Input Connections



Output Connections



Dimensional Drawing



Note: All accessories are subject to minimum purchase quantities.



Transmitters

SERIES 5750

Ordering Information

Part Number

① ② ③ ④	⑤	⑥	⑦ ⑧ ⑨	⑩	⑪ ⑫ ⑬ ⑭	⑮
SERIES	Sensor Type	Low Temp. Sign	Low Temp.	High Temp. Sign	High Temp.	Unit of Measure
5750						

① ② ③ ④	SERIES
5750 =	Linearized T/C or RTD

⑤	Sensor Type
B =	Type B T/C
C =	Type C T/C
E =	Type E T/C
J =	Type J T/C
K =	Type K T/C
N =	Type N T/C
R =	Type R T/C
S =	Type S T/C
T =	Type T T/C
0 =	PT100 (IEC 60751, $\alpha = 0.00385$) 3-wire
1 =	PT100 (JIS C 1604, $\alpha = 0.003916$) 3-wire
2 =	PT100 (IEC 60751, $\alpha = 0.00385$) 4-wire
3 =	PT100 (JIS C 1604, $\alpha = 0.003916$) 4-wire
4 =	PT1000 (IEC 60751, $\alpha = 0.00385$) 3-wire
5 =	PT1000 (IEC 60751, $\alpha = 0.00385$) 4-wire

⑥	Low Temperature Sign
	Enter + or - sign

⑦ ⑧ ⑨	Low Temperature
	Enter lower limit temperature required

⑩	High Temperature Sign
	Enter + or - sign

⑪ ⑫ ⑬ ⑭	High Temperature
	Enter higher limit temperature required

⑮	Unit of Measure
	Enter °F or °C

Program cable and software part #5750-CABLE (required for optional future changes)

Note: All accessories are subject to minimum purchase quantities.

Transmitters

SERIES 5950

The SERIES 5950 temperature transmitter from Watlow offers remarkably accurate temperature measurement and improves reliability to reduce downtime and costs.

The SERIES 5950 is a universal, isolated, temperature transmitter with additional voltage and resistance input. Its robust design and high quality gives excellent performance and accuracy under harsh conditions.

The SERIES 5950 supports communication via NFC® (Near-field communication) and Bluetooth®, which makes it possible to configure and monitor the transmitter remotely.

The transmitter is programmed using a separate connection cable and an easy-to-use Windows®-based software program to configure the transmitter in seconds.

The SERIES 5950 provides linearization between temperature sensor input signals and the 4-20mA output signal to ensure accurate temperature measurements across a broad range.

Contact Watlow's customer service department to integrate this transmitter into a Watlow Style AR or AT thermocouple sensor or with a Style RR or RT RTD sensor.



Features and Benefits

Accepts RTD, thermocouple, mV and resistance inputs

- Standardizes transmitter for various sensors and applications

Designed for harsh conditions

- Withstands high vibration (tested for 10g vibrations) and high humidity applications

Sensor error compensation function

- Provides convenience for adjusting the sensor/transmitter combination, or the transmitter alone, ensuring accurate temperature measurement within a specific range

Large center hole and robust terminals with test connections and low height

- Enables easy mounting

Configuration without external power

- Allows configurations to be edited or read offline by connecting to a personal computer (PC) universal serial bus (USB) port or NFC without power

Easy-to-use Windows® configuration software

- Parameters such as sensor type, measuring range, filter activation, cold junction compensation, sensor failure and error corrections are set in one window

Password protection and date of changes logged

- Increases level of security

Hour counter

- Enables monitoring of elapsed operational time



Note: All accessories are subject to minimum purchase quantities.

Transmitters

SERIES 5950

Specifications

Input RTD

- Pt100 (IEC 60751, $\alpha = 0.00385$)
-328 to +1562°F (-200 to +850°C)
- Pt100 (JIS C 1604, $\alpha = 0.003916$)
-328 to +1562°F (-200 to +850°C)
- Pt1000 (IEC 60751, $\alpha = 0.00385$)
-328 to +392°F (-200 to +200°C)
- 2-, 3-, 4-wire connection

Input Thermocouples

- Range Type: B, C, E, J, K, N, R, S, T

Input Resistance / Potentiometer

- 0 to 10000Ω / 100 to 10000Ω

Input mV

- -10 to +1000mV

Monitoring

- Sensor failure monitoring upscale or downscale action

Adjustments

- Zero adjustments for all inputs at any value within temperature range limits
- Min. spans: Pt input 18°F (10°C)
T/C 2mV

Output

- Analog 4-20mA, temperature linear
- Resolution 5μA
- Min. output signal measurement/failure 3.8mA/3.5mA
- Max. output signal measurement/failure 20.5mA/21.6mA
- Permissible load, see load diagram 725Ω @ 24VDC

Temperature

- Ambient, storage and operation
-40 to +185°F (-40 to +85°C)

General Data

- Selectable dampening time ~ 2s
- Update time ~ 1.5s
- Isolation in - out non-isolated
- Humidity 0 to 100% RH
- Vibration acc. to IEC 60068-2-6, test Fc, 60-500Hz, 10g
- Output limitations and fail currents are NAMUR compliant

Power Supply

- Polarity protected
- Supply voltage 8 to 36VDC
- Permissible ripple 4V p-p @ 50/60Hz

Typical Accuracy

- +/- 0.08°C or +/-0.08% of Span

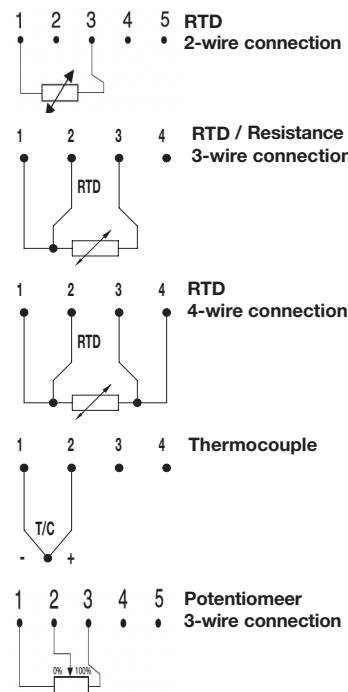
Intrinsic Safety

- ATEX: II 1 G Ex ia IIC T6... T4 Ga
- IECEx: Ex ia IIC T6... T4 Ga
- FM US: CL I, Div 1, GP A, B, C and D/CL I, Zn 0, Ex ia IIC Ga
- FM CA: CL I, Div 1, GP A, B, C and D/CL I, Zn 0, Ex ia IIC Ga

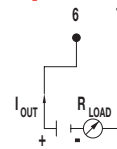
Housing

- Material, Flammability (UL®) PC/ABS + PA, V0
- Mounting DIN B-head or larger, DIN rail (with mounting kit)
- Connection single/stranded wires max. 1.5 mm², AWG 16
- Weight 32g
- Protection, housing / terminals IP 65/IP 00

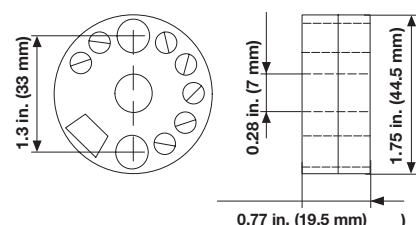
Input Connections



Output Connections



Dimensional Drawing





Transmitters

SERIES 5950

Ordering Information

Part Number

① ② ③ ④	⑤	⑥	⑦ ⑧ ⑨	⑩	⑪ ⑫ ⑬ ⑭	⑮
SERIES	Sensor Type	Low Temp. Sign	Low Temp.	High Temp. Sign	High Temp.	Unit of Measure
5950						

① ② ③ ④	SERIES
5750 =	Linearized T/C or RTD
⑤	Sensor Type
B =	Type B T/C
C =	Type C T/C
E =	Type E T/C
J =	Type J T/C
K =	Type K T/C
N =	Type N T/C
R =	Type R T/C
S =	Type S T/C
T =	Type T T/C
M =	mV
0 =	PT100 (IEC 60751, $\alpha = 0.00385$) 3-wire
1 =	PT100 (JIS C 1604, $\alpha = 0.003916$) 3-wire
2 =	PT100 (IEC 60751, $\alpha = 0.00385$) 4-wire
3 =	PT100 (JIS C 1604, $\alpha = 0.003916$) 4-wire
4 =	PT1000 (IEC 60751, $\alpha = 0.00385$) 3-wire
5 =	PT1000 (IEC 60751, $\alpha = 0.00385$) 4-wire
6 =	Ni 100 (DIN 43760), Ni 120 (Edison no.7)
7 =	Ni 1000 (DIN 43760)
8 =	Cu 10 (Edison no.15)
9 =	0 to 10000 Ω / 100 to 10000 Ω

⑥	Low Temperature Sign
	Enter + or - sign
⑦ ⑧ ⑨	Low Temperature
	Enter lower limit temperature required
⑩	High Temperature Sign
	Enter + or - sign
⑪ ⑫ ⑬ ⑭	High Temperature
	Enter higher limit temperature required
⑮	Unit of Measure
	Enter °F or °C

Programming module with USB cable kit part number 2223-1400 and free downloadable software required for any future program changes.

Note: All accessories are subject to minimum purchase quantities.

Transmitters

SERIES 5900 (Isolated)

Watlow's SERIES 5900 temperature transmitter delivers remarkably accurate temperature measurement and improves reliability to reduce downtime and costs.

The 5900 SERIES two-wire signal conditioner uses surface mount and digital technology with non-volatile memory. It is designed to fit directly into universal aluminum or universal iron connection heads with a separate mounting kit.

The transmitter is programmed using a separate connection cable and an easy-to-use Windows®-based software program. There is no need to use a separate thermocouple/RTD calibrator or individual resistors.

The SERIES 5900 is isolated to 1500VAC and features full linearization between temperature sensor input signal and the 4-20mA output signal. Isolated transmitters provide isolation from input to output thus eliminating ground loops and signal integrity.

Additional options include insulation resistance monitoring between sensor and ground to prevent inaccurate measurements due to insulation breakdown.

Contact Watlow's customer service department to integrate this transmitter into a Watlow Style AR or AT thermocouple sensor or a Watlow Style RR or RT RTD sensor.



Features and Benefits

Full temperature to thermocouple signal linearization throughout the complete operation temperature span

- Ensures signal accuracy

Full isolation from input to output

- Eliminates ground loops for high data integrity

Fits directly into connection head

- Easy to install

Programmable

- Ensures greater convenience for future changes and inventory efficiency

User selectable input types

- Thermocouple calibration Types B, C, E, J, K, N, R, S and T; RTD Pt100 and Pt1000 including four-wire

Optional insulation resistance monitoring

- Prevents inaccurate measurements due to insulation breakdown

CE marked

- Compliant to electromagnetic interference

Note: All accessories are subject to minimum purchase quantities.

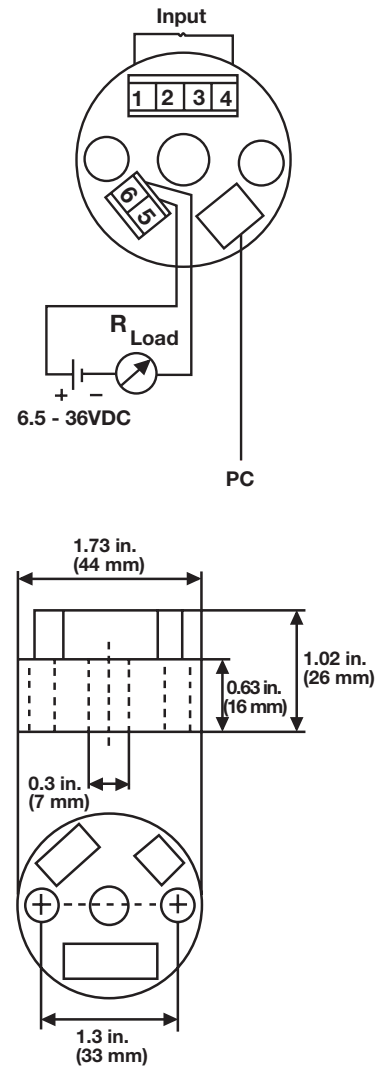
Transmitters

SERIES 5900 (Isolated)

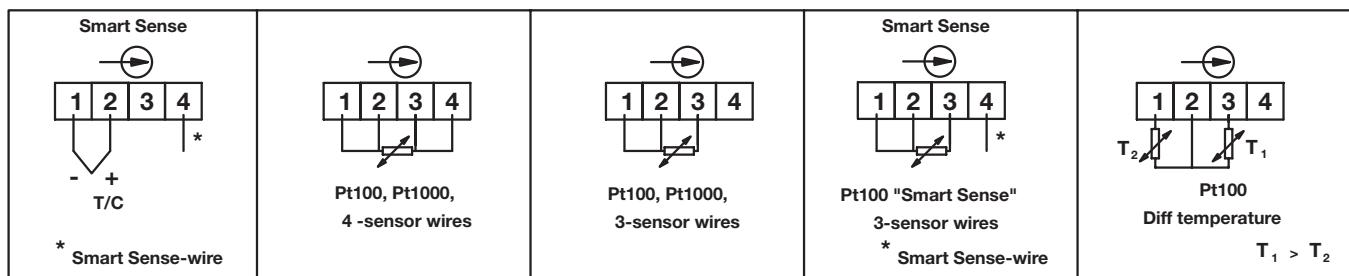
Specifications

- Isolation: 1500VAC for one minute
- Operating voltage: 6.5 to 36 volts (the 5900 is protected against voltage surges and reverse polarity)
- Sensor burn out protection: A pulsed current continuously checks all sensor leads for disconnect; the output will go upscale or downscale
- Minimum input signal: RTDs: 10°C, thermocouples: 2mV
- Operating temperature: -40 to 85°C
- Response time approximately: 0.5 seconds
- RFI sensitive: 20 - 1000 MHz, 10V/m typical <0.1% (of end value)
- Permissible ripple of supply: 4V p-p
- Long-term stability: 0.1% per year
- Calibration inaccuracy, thermocouples: Max. of 20μ volts or 0.01%
- Temperature effect: Cold junction compensation 0.02% C/C
- Housing: PC, ABS/VO connection polyamid / V2
- Mounting: DIN B

Dimensional Drawings



Wiring Diagram



Note: All accessories are subject to minimum purchase quantities.



Transmitters

SERIES 5900 (Isolated)

Ordering Information

Part Number

① ② ③ ④	⑤	⑥	⑦ ⑧ ⑨	⑩	⑪ ⑫ ⑬ ⑭	⑮
SERIES	Sensor Type	Low Temp. Sign	Low Temp.	High Temp. Sign	High Temp.	Unit of Measure

① ② ③ ④	SERIES
5900 =	Linearized T/C or RTD
5901 =	1000Ω RTD
5902 =	Isolated, linearized with insulation resistance monitoring

⑤	Sensor Type
B =	Type B T/C
C =	Type C T/C
E =	Type E T/C
J =	Type J T/C
K =	Type K T/C
N =	Type N T/C
R =	Type R T/C
S =	Type S T/C
T =	Type T T/C
0 =	PT100 (IEC 60751, $\alpha = 0.00385$) 3-wire
1 =	PT100 (JIS C 1604, $\alpha = 0.003916$) 3-wire
2 =	PT100 (IEC 60751, $\alpha = 0.00385$) 4-wire
3 =	PT100 (JIS C 1604, $\alpha = 0.003916$) 4-wire
4* =	PT1000 (IEC 60751, $\alpha = 0.00385$) 3-wire
5* =	PT1000 (IEC 60751, $\alpha = 0.00385$) 4-wire
* Only valid options for 5901 SERIES	

⑥	Low Temperature Sign
	Enter + or - sign

⑦ ⑧ ⑨	Low Temperature
	Enter lower limit temperature required

⑩	High Temperature Sign
	Enter + or - sign

⑪ ⑫ ⑬ ⑭	High Temperature
	Enter higher limit temperature required

⑮	Unit of Measure
	Enter °F or °C

Program cable and software part #5900-CABLE

Note: All accessories are subject to minimum purchase quantities.

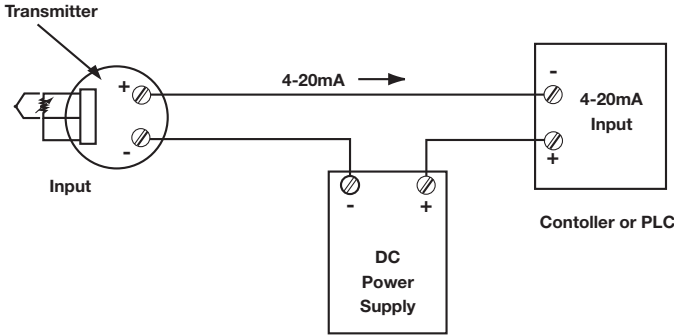


Transmitters

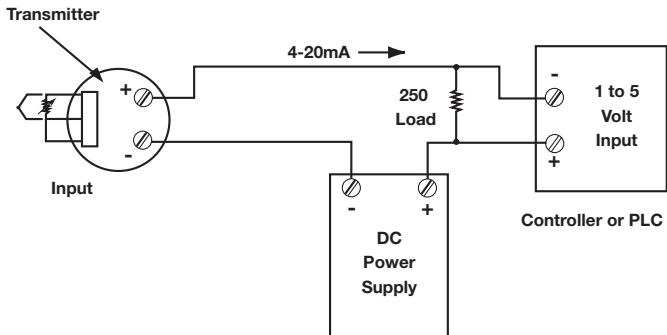
System Components

Typical Wiring Diagrams for Two-Wire Signal Conditioners

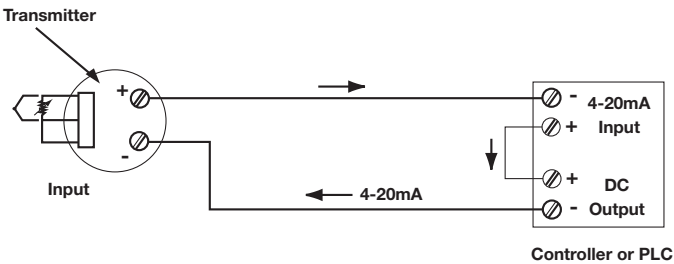
Controller or PLC with 4-20mA Input



Controller or PLC with 1 to 5 Volt Input



Controller or PLC with Integral Power Supply



Transmitter and Connection Head Mounting Options

Signal Conditioner Model and Description	Connection Heads			
	Cast Aluminum	Cast Iron	Explosion XP SERIES	Poly Heads Pt SERIES
5750, Non-isolated, Non-linearized	Mount with kit 81501901	Does not fit	Mount with kit 81501301	Mount with kit 81501201
5900, 5901 and 5902, Isolated, Linearized	Mount with kit 81501901	Does not fit	Mount with kit 81501301	Mount with kit 81501201

Note: All accessories are subject to minimum purchase quantities.