

## Thermocouple Designs Ideal For Medium Duty Processes



Over 90 years of manufacturing, research and design makes Watlow a world class supplier of temperature measurement products. We have designed and manufactured millions of thermocouples for industrial and commercial equipment. People involved in critical process control of food, plastics and metal rely on our sensors.

We are ready to meet your sensing needs with our extensive offering of thermocouples. However, if the variations listed in this catalog are unable to satisfy your requirements, Watlow can custom manufacture sensors to your exacting specifications. Contact your Watlow representative for details.

### Applications

- Plastic injection molding machinery
- Food processing equipment
- Deicing
- Plating baths
- Industrial processing
- Medical equipment
- Pipe tracing control
- Industrial heat treating
- Packaging equipment
- Liquid temperature measurement
- Refrigerator temperature control
- Oven temperature control

### Tolerances

Tube diameters:  $\pm 0.003$  in. (0.08 mm)

Hose lengths: +2 in. / 0 (+51 mm / 0)

Lead wire lengths: +2 in. / 0 (+51 mm / 0)

Tube lengths:

0.375 in. O.D.  $\pm 0.25$  in. (10 mm O.D.  $\pm 6$  mm)

All others  $\pm 0.125$  in. ( $\pm 3$  mm)

### Performance Capabilities

Fiberglass insulated thermocouples are capable of temperatures up to 480°C (900°F) for continuous operation.

### Features and Benefits

#### Fast delivery

- Over a million thermocouple variations are part of the Rapid Ship program.

#### Custom-tailored" standard products, including:

- 32 standard sheath lengths
- Lead lengths from six to 360 inches
- Stainless steel braid or hose protection
- J, K, T and E calibrations
- Grounded, ungrounded and exposed junctions
- Flat and drill point
- Epoxy sealed cold ends
- Adjustable depths
- Flexible extensions
- Washers, nozzles and clamp bands
- Custom diameters
- PFA coated and stainless steel sheaths
- Straight, 45° bend or 90° bend
- Locking bayonet caps in standard, 0.47 in. (12 mm) and 0.59 in. (15 mm)

#### • Custom manufactured thermocouples

- Units designed and built to your specifications



## WATLOW

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Registered Company  
Richmond, Illinois USA



## Construction

Thermocouples feature flexible SERV-RITE® wire insulated with woven fiberglass or high temperature engineered resins. For added protection against abrasion, products can be provided with stainless steel wire braid and flexible armor. ASTM E 230 color-coding identifies standard catalog thermocouple types.

The addition of a metal sheath over the thermocouple provides rigidity for accurate placement and added protection of the sensing junction. Mounting options include springs, ring terminals, specialized bolts, pipe style clamps and shims.

## Options:

- **Adjustable Spring Style Construction**  
Adjustable spring style thermocouple fits a large range of hole depths. Bends to any angle, eliminating the requirement to stock numerous styles.
- **Adjustable Armor Style Construction**  
Adjustable armor thermocouple fits a large range of hole depths. Bends to any angle, eliminating the requirement to stock numerous styles. Stainless steel hose offers additional lead protection in demanding applications.
- **Rigid Sheath (½ and ¾ in. diameter)**  
Rigid sheath provides protection and accurate placement through bulkheads or platens. Use with a compression fitting for water tight immersion applications. Bent rigid tube offers protection and accurate lead placement around machinery.
- **Rigid Sheath with Threaded Fitting (½ and ¾ in. diameter)**  
Rigid sheath with threaded fitting provides accurate placement in process applications.
- **PFA Encapsulated Style**  
The rigid sheath is covered with a 0.010 in. (0.25 mm) wall of PFA for corrosion resistance in acid environments. An epoxy seal improves moisture resistance of sensor and provides a barrier for migrating fumes in corrosive applications.
- **Flanged Style**  
The flanged thermocouple allows rapid assembly and low profile when going through bulkheads.
- **Rigid Sheath Fixed Bayonet Style**  
Bayonet fittings allow rapid attachment. Spring pressure on the junction tip assures fast response time. This style of bayonet fitting is quick connecting and allows leads to exit with a protective sheath.
- **Large Diameter Rigid Sheath Style (¼ and ¾ in. diameter)**  
Rigid sheath provides protection and accurate placement through bulkheads or platens. Use with a compression fitting for water tight immersion application. Bent rigid tube offers protection and accurate lead placement around machinery.
- **Flexible Extensions**  
Flexible extensions allow the disconnecting of thermocouples from a system without disturbing the remaining wiring.
- **Insulated Wire Thermocouple Style 61 and Style 62**  
Constructed with SERV-RITE® insulated thermocouple wire. Styles 61 and 62 are economical and versatile thermocouples with the option of an exposed or protected measuring junction.
- **Ring Terminal Style**  
The nickel terminal can be placed beneath existing screws or bolts to permit surface temperature measurement.
- **Nozzle Style**  
The nozzle thermocouple has a short installation depth and a low profile thus allowing control of thin sections of platens.
- **Pipe Clamp Style**  
The stainless steel clamp allows temperature measurement without drilling or tapping. It is perfect for the measurement of pipe temperatures.
- **Grommet Style**  
Extremely low profile of the stainless steel grommet provides fast response time.
- **Brass Shim Style**  
The shim stock thermocouple has low profile and can be placed between components for measurement of surface temperature. Also available in other shim dimensions.
- **Stainless Steel Shim Style**  
The shim stock thermocouple has low profile and can be placed between components for measurement of surface temperature. Available in other shim dimensions.
- **Melt Bolt Thermocouple**  
Watlow plastic melt bolt thermocouples are designed so that the sensitive closed end portion of the tip can be inserted directly into the plastic stream of an extruder or injection molding machine. The measuring junction is thermally isolated from the metal bolt mass, assuring accurate reading of the melt temperature up to 260°C (500°F) continuous. Available in J or K calibration only. Bolt is 300 series stainless steel. Other calibrations are available on special order.
- **Kapton® Bracket Thermocouple**  
The Kapton® thermocouple, when used with the aluminum bracket, has been designed primarily to measure roller temperature. By putting a light pressure on the roller, the Kapton® thermocouple measures roller surface temperature without using slip rings. This type of set-up greatly reduces lag time and eliminates the cost of slip rings and their associated maintenance problems. It can also be used to measure conveyor belt temperatures or any other moving part by riding gently on the part surface.
  - Continuous use at 200°C (400°F), 260°C (500°F) for limited periods
  - Low mass
  - Fast response
  - Totally insulated construction
  - Available in Type J or K
- **Low Profile Kapton® Thermocouple (without Bracket)**  
When used without the bracket it can be placed between heated parts for accurate temperature measurement. At the thermocouple junction, the overall thickness is only 0.016 in. (0.4 mm), so that it doesn't interfere with fit or thermo conductivity.
- **Kapton® Peel and Stick Thermocouple**  
This sensor needs no bracket and no special mounting. Simply peel away the backing and this self-adhesive film will bond to almost any surface. Temperature ratings for continuous use is 200°C (400°F).
- **Newbury Nozzle Style**  
A direct replacement for OEM Type J nozzle thermocouples held in place with a set screw. The sheath is ¼ inch diameter with a 90° bend and a spring strain relief.

Kapton® is a registered trademark of E. I. du Pont de Nemours & Company.

## How to Order

Ordering information differs for different options. Please consult factory for details.

## Availability

Most thermocouples listed are available for next day shipment. Consult factory for details.

**To be automatically connected to the nearest North American Technical and Sales Office call:**

# 1-800-WATLOW2

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