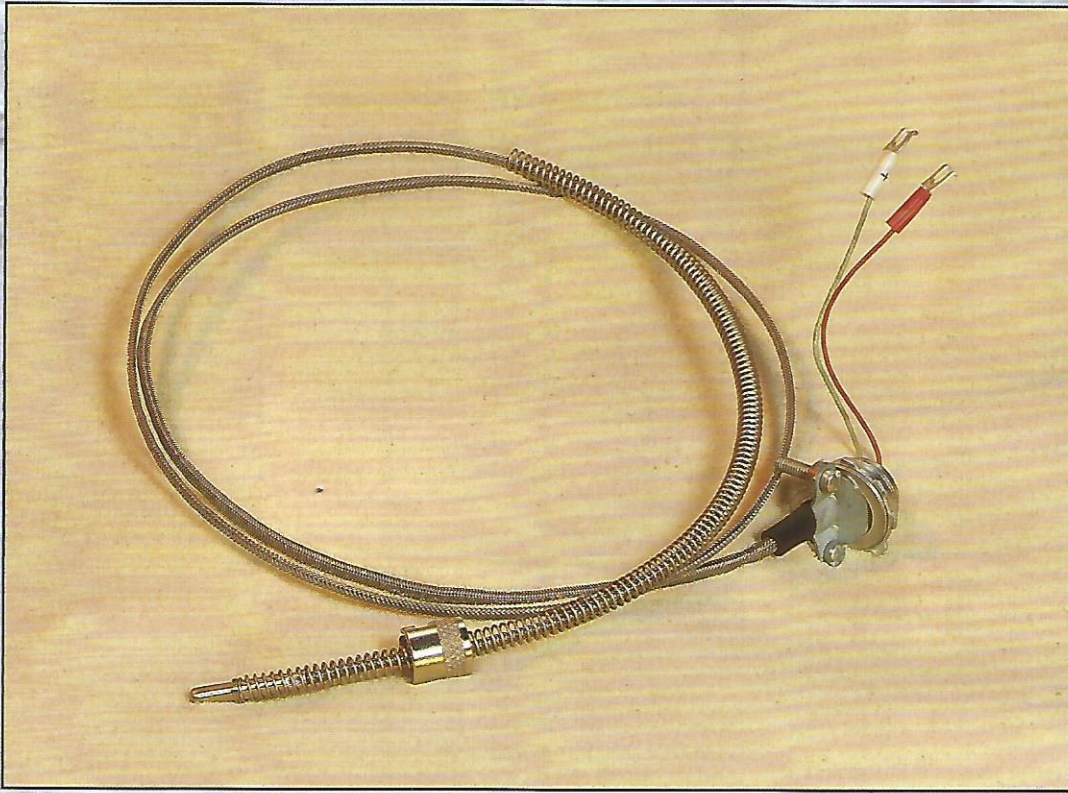


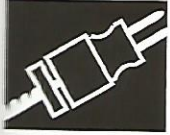
# TEMPERATURE SENSORS



Precision manufacturing for  
demanding applications.  
Fast Heat's thermocouples are meticulously  
made to ensure reliability, quick response  
and accurate sensing.

***fast***  ***heat***®

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# THERMOCOUPLE TEMPERATURE SENSORS

## QUICK RESPONSE, ACCURATE SENSING

Fast Heat's proven reliability in the manufacture of thermocouples is evident in the many applications in which they're being used.

## SPECIFICATIONS

An infinite variety of combinations can be designed to suit all temperature sensing applications.

Type J is the most commonly requested thermocouple wire, followed by type K. Both are readily available, and other types are available by special request.

All popular thermocouple probes are available, with many available from stock. These include Adjustable Bayonet, Compression Fitting, Nozzle, Manifold, Extruder, Washer and Surface Mounted styles.

Thermocouples for the plastics industry and other medium duty applications are made using thermocouple grade wires. Each leg of the thermocouple wire is insulated with color-coded fiberglass (primary insulation),

and both wires together have another layer of fiberglass (secondary insulation). These wires, at the junction point and beyond, are protected by a rigid stainless steel tubing. This protection tube is generally  $\frac{3}{16}$ " (4.8 mm) in diameter. However, it can be supplied in either  $\frac{1}{8}$ ",  $\frac{1}{4}$ " or  $\frac{3}{8}$ " (3.2, 6.4 or 9.5 mm) diameter.

Fiberglass-insulated flexible lead wire coming out of this protection tube can be further protected against abrasion by either stainless steel braid, stainless steel flexible armor or fiberglass sleeving. Rigid stainless steel protection tube can be provided with the proper mounting hardware as shown on the following pages.

Even though thermocouple grade wires are capable of operating at higher temperatures, there is a limitation of about 900° F (482° C) (continuous operation) on the fiberglass insulation.

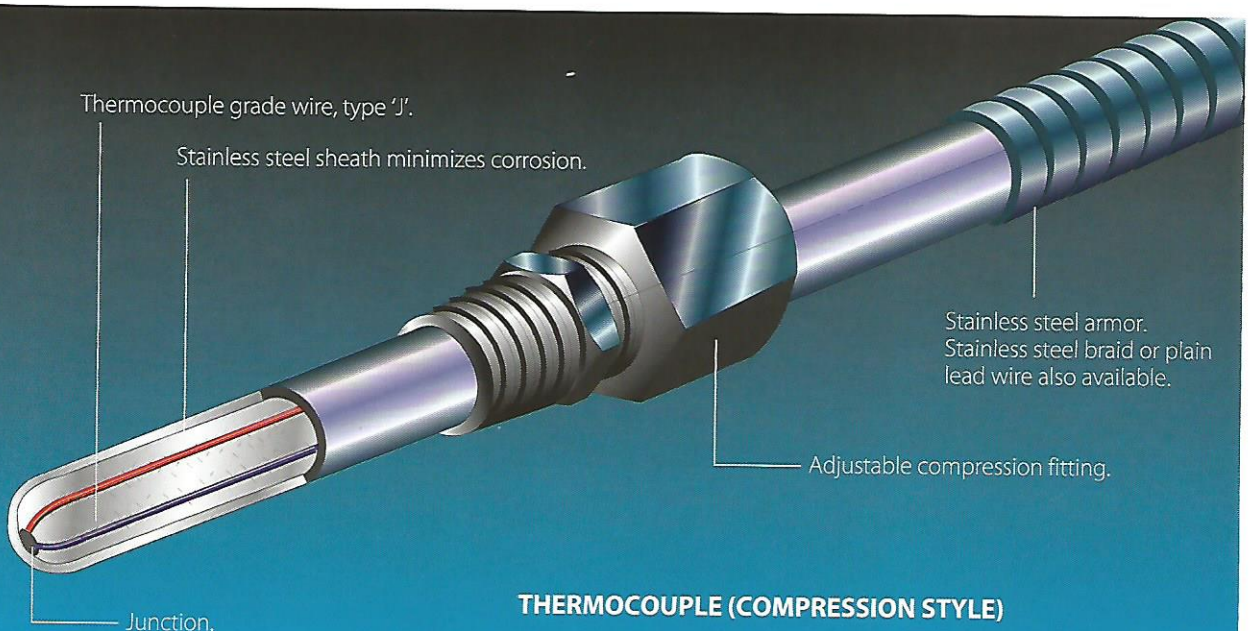
All thermocouple shown are for grounded junction. Ungrounded junction thermocouples can be special ordered – contact Fast Heat.



## HOW DOES A T/C WORK?

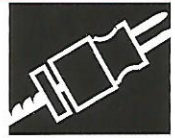
When a heat source is brought near the junction of two dissimilar metals, a voltage is generated. This voltage is directly proportional to the junction temperature and can be read and related to the junction temperature by an electronic instrument.

The most common domestically used thermocouple is the "J", which consists of an iron and a constantan wire. The "J" is recommended for temperatures of 32° F (0° C) to 1382° F (750° C).



**THERMOCOUPLE (COMPRESSION STYLE)**

# COMPRESSION FITTING THERMOCOUPLES



## COMPRESSION FITTING THERMOCOUPLE

Thermocouples with compression fittings allow easy installation on existing drilled and tapped holes.

Compression fitting is shipped finger tight on thermocouple sheath. *Note that once compression fitting is in place, it cannot be relocated.*

Compression fitting and the ferrule inside are made of brass.

Probe style available as standard, straight, 45° and 90°. Grounded thermocouple junction positioned at balled end.

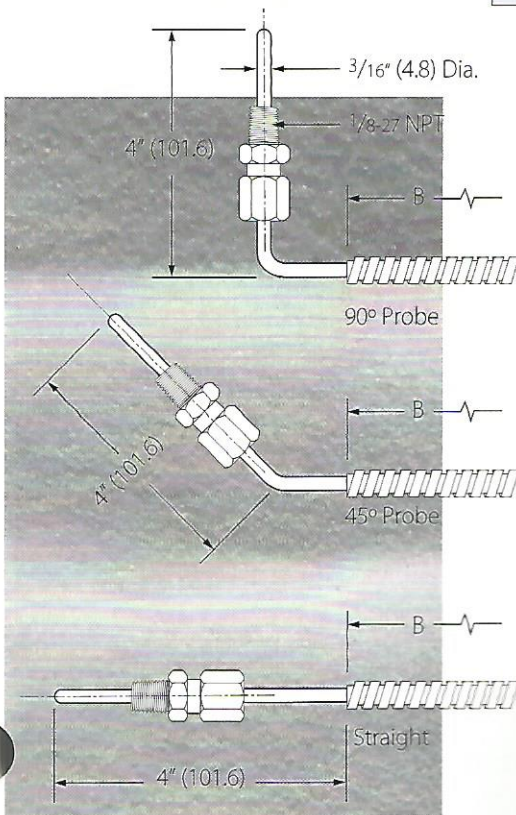
Choose one style from each of the three columns: probe, lead wire and terminal. Any combination is possible.

NOTE:  
Dimensions in parenthesis are millimeters.  
Do not scale drawings.

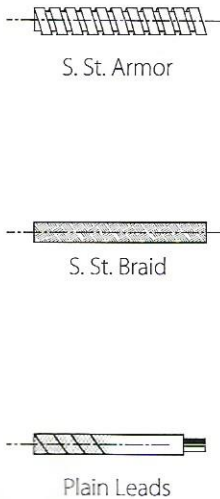
## COMPRESSION FITTING T/C

STAINLESS STEEL ARMOR LEADS	STAINLESS STEEL BRAID LEADS	PLAIN WIRE LEADS	"B" (IN)	"B" (CM)	PROBE STYLE	TERMINAL STYLE
◆	◆	◆	48	122	straight	1
◆	◆	◆	72	183	straight	1
◆	◆	◆	96	244	straight	1
◆	◆	◆	48	122	straight	2
◆	◆	◆	72	183	straight	2
◆	◆	◆	96	244	straight	2
◆	◆	◆	48	122	straight	3
◆	◆	◆	72	183	straight	3
◆	◆	◆	96	244	straight	3
◆	◆	◆	48	122	45°	1
◆	◆	◆	72	183	45°	1
◆	◆	◆	96	244	45°	1
◆	◆	◆	48	122	45°	2
◆	◆	◆	72	183	45°	2
◆	◆	◆	96	244	45°	2
◆	◆	◆	48	122	45°	3
◆	◆	◆	72	183	45°	3
◆	◆	◆	96	244	45°	3
◆	◆	◆	48	122	90°	1
◆	◆	◆	72	183	90°	1
◆	◆	◆	96	244	90°	1
◆	◆	◆	48	122	90°	2
◆	◆	◆	72	183	90°	2
◆	◆	◆	96	244	90°	2
◆	◆	◆	48	122	90°	3
◆	◆	◆	72	183	90°	3
◆	◆	◆	96	244	90°	3

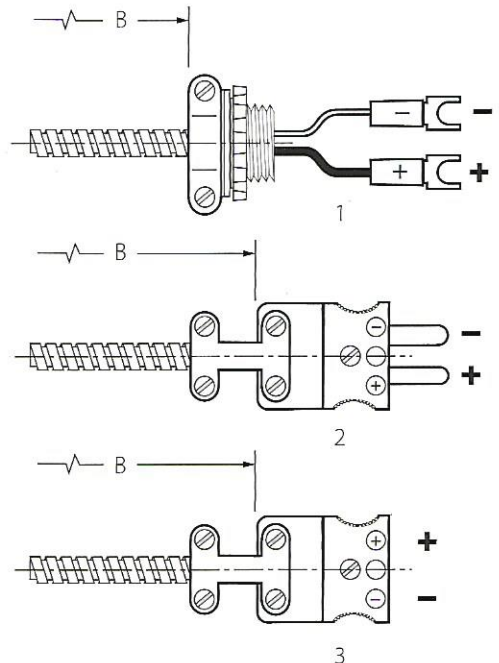
### PROBE STYLES

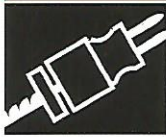


### LEAD WIRE STYLES



### TERMINAL STYLES





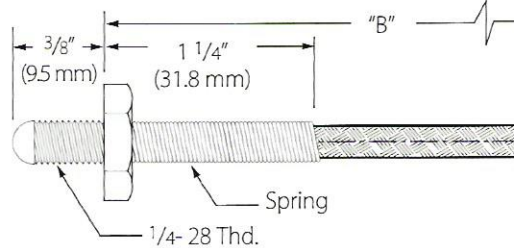
# THERMOCOUPLE TEMPERATURE SENSORS

## NOZZLE T/C

The nozzle thermocouple has a short installation depth and a low profile.

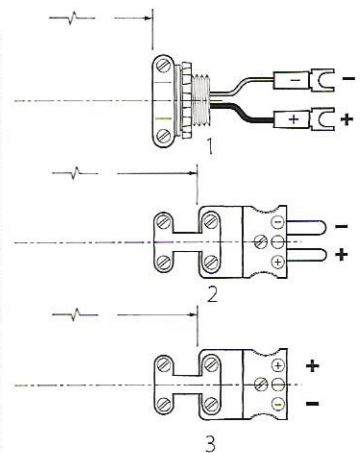
Maximum hole depth is 3/8" (9.5 mm).

"B"		TERMINAL STYLE
IN	CM	
48	122	1
72	183	1
96	244	1
48	122	2
72	183	2
96	244	2
48	122	3
72	183	3
96	244	3



NOTE:  
Dimensions in parenthesis are millimeters.  
Do not scale drawings.

### TERMINAL STYLES

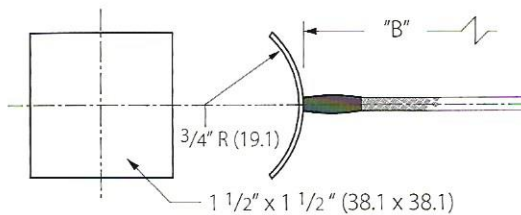


## CURVED SURFACE THERMOCOUPLE

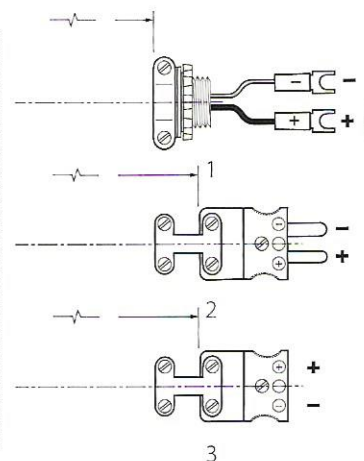
Use to conform to cylindrical surfaces.  
Available with 3 types of terminations.

For special surface or configuration, contact Fast Heat.

"B"		TERMINAL STYLE
IN	CM	
48	122	1
72	183	1
96	244	1
48	122	2
72	183	2
96	244	2
48	122	3
72	183	3
96	244	3



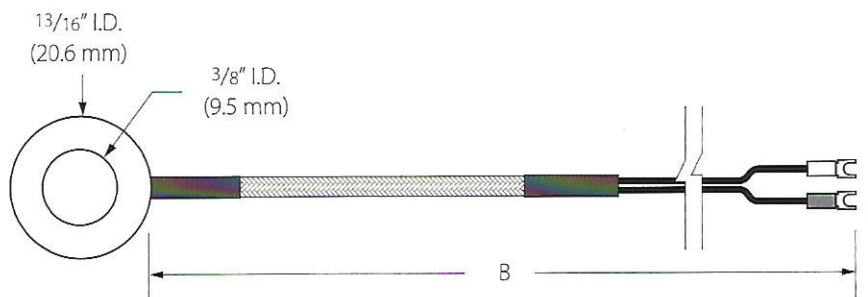
### TERMINAL STYLES



## WASHER TYPE THERMOCOUPLE

Uses 20 gage duplex thermocouple wire.

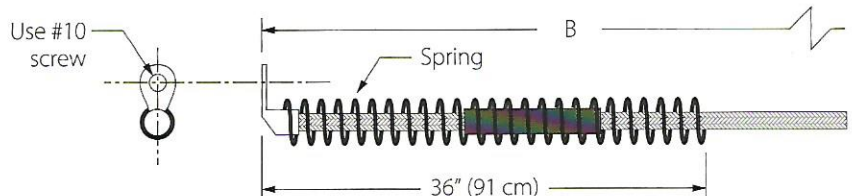
"B"	
IN	CM
48	122
72	183
96	244

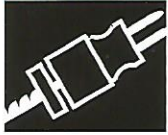


## MANIFOLD THERMOCOUPLE

Attach with a no. 10 screw on surface required.

"B"	
IN	CM
72	183





# RTD SENSORS

## RTD'S FOR ACCURATE, LINEAR & STABLE SYSTEMS

Fast Heat's proven reliability in the manufacture of RTD's is evident in the many applications in which they're being used. An infinite variety of combinations can be designed to suit all your temperature sensing applications.

## SPECIFICATIONS

The Resistance Temperature Detector (RTD) is built on the principle that most metals have a positive change in electrical resistance with a change in temperature. Platinum is widely used for RTD construction, since it can withstand high temperatures while maintaining excellent stability. As a noble metal, it shows limited susceptibility to contamination. Typically, fine platinum wire is wound on a glass or ceramic bobbin and then insulated with glass or ceramic.

A newer construction technique involves a platinum or metal-glass slurry film which is deposited or screened on a small flat ceramic layer, etched and sealed.

This RTD film cuts assembly time and increases resistance. This technology reduces the size of the device and translates into a quicker response in temperature fluctuations.

An infinite variety of combinations can be designed to suit all temperature sensing applications.

All popular RTD probes are available. These include Adjustable Bayonet and Compression Fitting.

RTD wires, at the bulb and beyond, are protected by a rigid stainless steel tubing. This protection tube is generally  $\frac{3}{16}$ " (4.8 mm) in diameter. However, it can be supplied in either  $\frac{1}{4}$ " or  $\frac{3}{8}$ " (6.4 or 9.5 mm) diameter.

RTD flexible lead wire coming out of this protection tube can be further protected against abrasion by either stainless steel braid, stainless steel flexible armor or fiberglass sleeving. Rigid stainless steel protection tube can be provided using the proper mounting hardware.

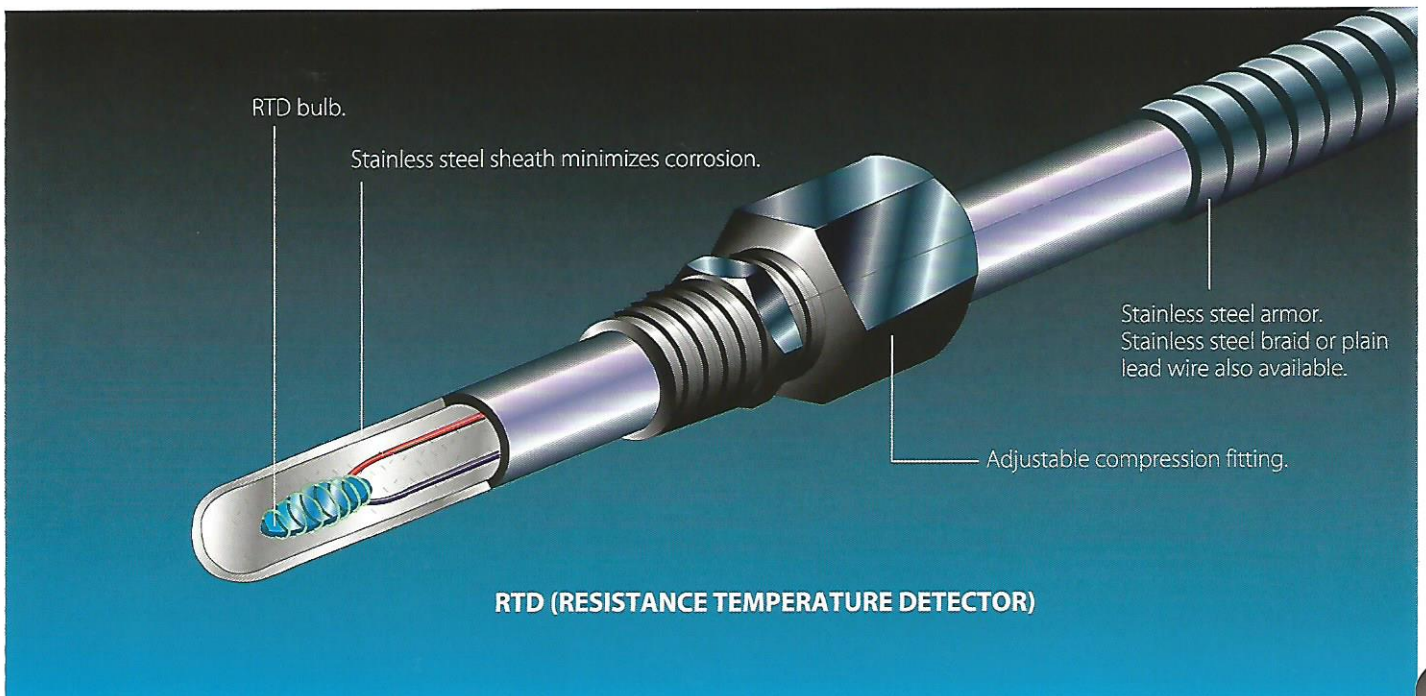


### WHAT IS AN RTD?

RTD stands for Resistance Temperature Detector. The more common construction of this device has been to use a wire wound sensor which will exhibit an increase in resistance as there is an increase in temperature.

Other constructed systems of this device have given way to using different materials and smaller packages, resulting in greater sensitivity.

It should be noted that unlike the thermocouple that generates its own power, the RTD requires instrumentation circuits that have a current passing through them.



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