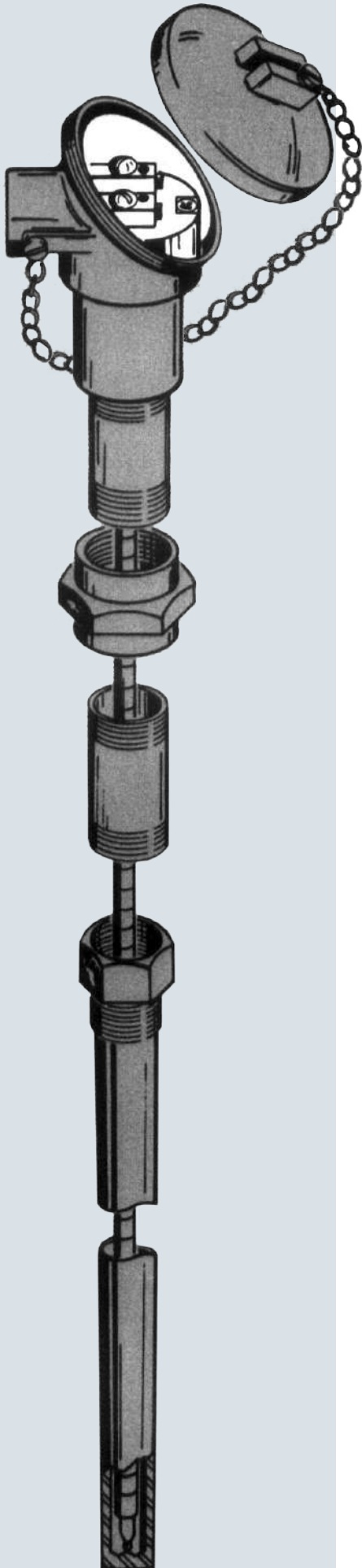




# TEMPERATURE SENSORS



## PROFILE

- We are in the field of manufacturing entire range of Temperature Sensors, Thermowells, Thermocouple Grade Extension and Compensating Cables, RTD Signal Cables and Accessories since 1989.
- The sales of more than 11,50,000 Sensors throughout India and even abroad is the testimony of Quality of our Products and Services.
- The custom-built instrumentation and Sensors is what we like the most and we can cater to any of your applicational requirements.
- We have a wide Sales/Service Network (our all Associates are Engineers) to support you throughout the country within the shortest time span.
- Our manufacturing bases are well equipped with necessary testing facilities like Calibrators, mV source, RTD source, precision multimeters, insulation/HV testers, constant temp. oil bath, high temp. furnace, gauges, dimension measuring instruments etc... They are traceable to N.P.L., Delhi and tested at E.R.T.L. / I.D.E.M.I.

## FEATURES

- Sensors in any type, size, shape and M.O.C. Each Sensor is tested and Calibrated with E.R.T.L. / I.D.E.M.I. certified Calibrators.
- Very high accuracies and very small time constants due to improved manufacturing process like Argon Welding, Brazing and High Quality Imported Components.
- Special Sensors like Duplex, Glass Embedded, skin type, multipoint assemblies, Pt46, group IIC etc... can be supplied.
- Entire Digital Instrumentation Range manufactured by us support these Sensors.
- Thermowells to suit any size and shape of Sensors.
- EX-STOCK DELIVERIES OF STANDARD PRODUCTS,
- SHORT DELIVERIES FOR CUSTOM BUILT SENSORS and THERMOWELLS.
- Sold more than 11,50,000 sensors (March 2010).

## TIPS FOR SELECTION

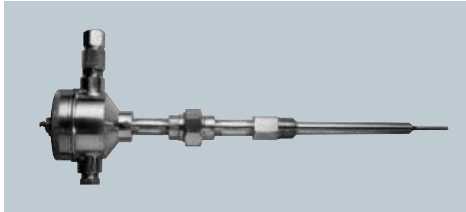
- 1 Thermocouples are preferred due to :
  - a. Faster response
  - b. Wide Temperature Range
  - c. Lower Costs
  - d. Flexibility in Designing
  - e. Higher Mechanical Strengths
- 2 RTD's are preferred due to :
  - a. Better Accuracies
  - b. Better Stability
  - c. Repeatability
- 3 Smaller Sheath Diameters will give faster response. We can offer sheath dia. as low as 1.5 mm.
- 4 Ungrounded Junctioned Sensors, though electrically isolated have sluggish response time. Electrical Isolation better than 700 M W at 500 V DC.
- 5 RTD's with 3-Wire Configuration compensates lead Length Resistance Effect on temperature measurements as compared to 2-Wire Configuration.



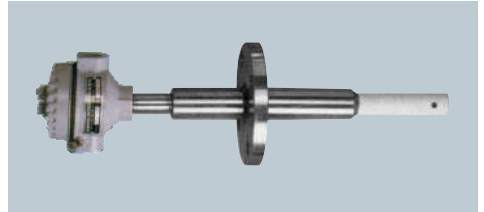
## Thermocouple and RTD Assemblies



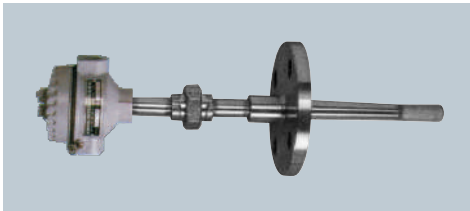
Sensor with built-in 2-Wire Transmitter



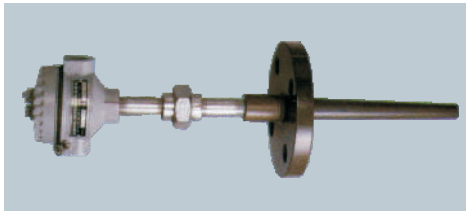
Complete assembly in stainless steel. Including head, nipple-union-nipple and thermowell



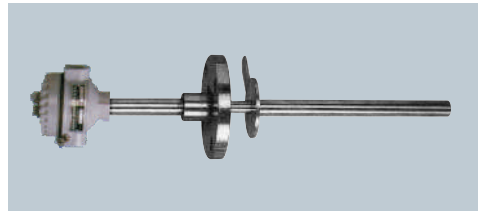
Flanged thermowell, with open end ceramic tube having two drilled hole



Coted with cobalt base alloy Tungsten carbide



Coated with PTFE



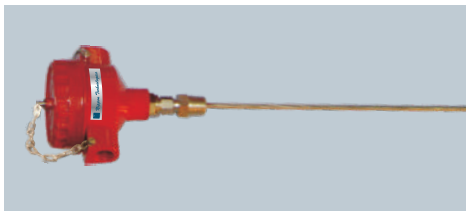
Metal sleeve in Monel / Nickel / Titanium / Tantalum etc...

## Mineral Insulated Thermocouple, RTD's



- Flexible
- SS316 / Inconel
- Simplex / Duplex
- Grounded / Ungrounded
- Flameproof (IIA, IIB, IIC)
- Non Flameproof / Weatherproof
- Available upto 15 mtrs

## Sensors for II-C Hazardous Group



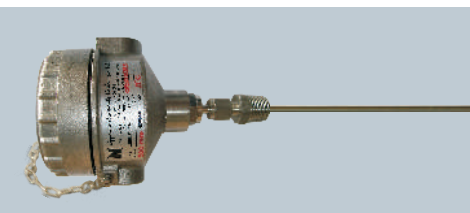
- RTD's and Thermocouples
- II-C Head, individual certification
- II-C cable glands
- Widely use in Hydrogen generation plants
- 150 installation

## RTD's with Triclover



- RTD's with class A elements
- Simplex / Duplex designs
- SS 316 design
- Widely used in Pharma Industries

## RTD's with Flameproof STEEL Heads



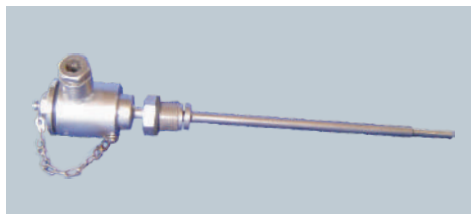
- SS316/SS304 Thermocouple Heads
- Flameproof certification IIA, IIB, IIC
- Widely used in Pharmaceutical Industries

## L-type Thermocouple



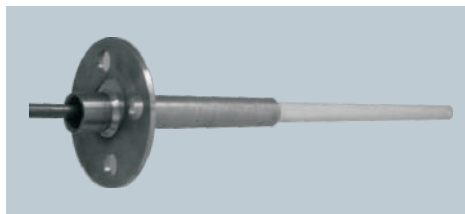
- 1250 °C
- Hot Arm Re-crystallised Alumina Ceramic tube Cold Arm SS316
- Used in High temperature furnaces

## Sensors with STEEL Heads



- SS 316 Thermocouple heads
- Machined or Die Cast process
- Widely used in Pharmaceutical Industries

## High Temperature Sensors



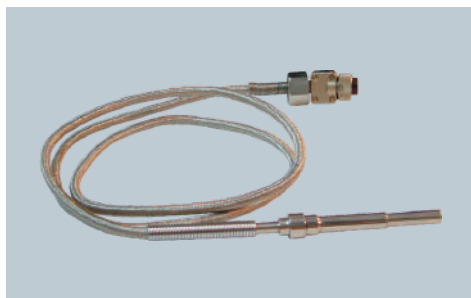
- Pt/RH thermocouples
- 26 / 25 / 24 SWG Pt/RH elements
- High Temperature Re-Crystallised Alumina Ceramic Tube
- Widely used in Furnaces, Glass, etc

## Disposable Tips



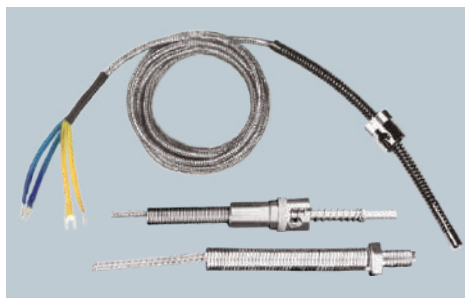
- R, S, B Type thermocouple tips
- Temperature upto 1800°C
- 5 - 6 readings / Tip
- Provided with extension / hold pipe
- Widely used in steel plants
- Peak Temperature indicators provided

## Ship Applications



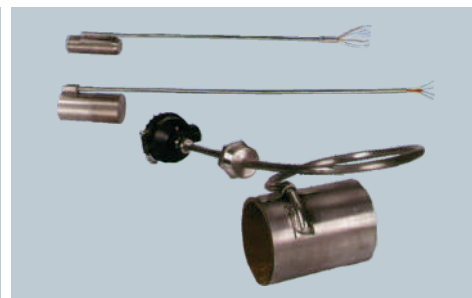
- Thermocouple and RTD's
- Heavy duty design
- SS 316 / Inconel Sheath
- Heavy Duty, 14/32 SWG, FG/SS Braided extension cable
- Heavy duty Male / Female quick disconnect connector
- Widely used in Coast Guard, War Ships and Submarines

## Bayonet Thermocouples



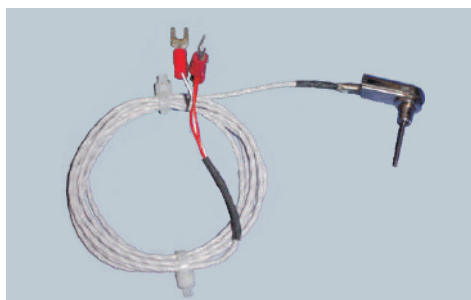
- J (Fe/K) or K (Cr/Al) or T
- Wide variety of Immersion Lengths, Shapes, Sizes, Styles and Mounting Arrangements
- Single and Dual Element Probes
- Measures Temperatures at cross head, die and barrels
- Also Available for Direct Plastic-melt Temperature measurement

## Skin Thermocouple, RTD's



- Surface Temperature Measurement
- MI Thermocouple / RTD's with Welding Pad, Threaded Process Connection
- Simplex / Duplex
- Grounded / Ungrounded

## RTD's for Textiles



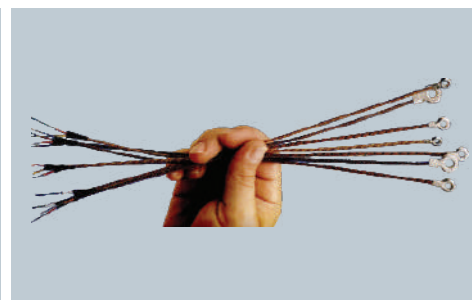
- Quick response
- 1.5 mm dia
- Pin type structure
- Long lasting
- Approx. 3500 installations in textile machineries

## Custom Engineered Sensors



- Pt46 RTD
- Steel Head
- Flanged Head
- PCB Termination
- Widely used in WarShip

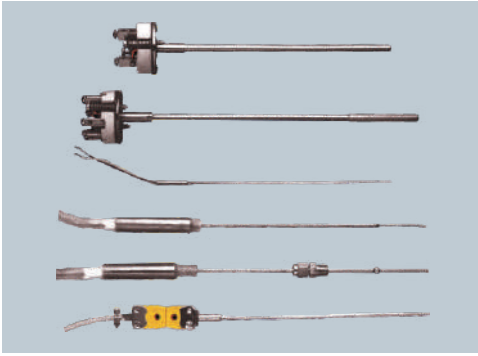
## Washer Thermocouples



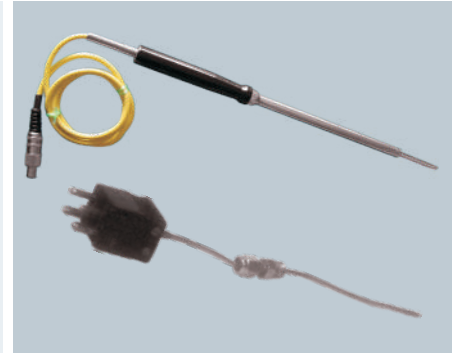
- J or K
- Fibre Glass Sleeves
- S.S. Braided Sleeves
- Suitable for 1/4" Screw Size, Other Sizes on request
- Suitable upto 400 °C



## Standard Termocouple, RTD's



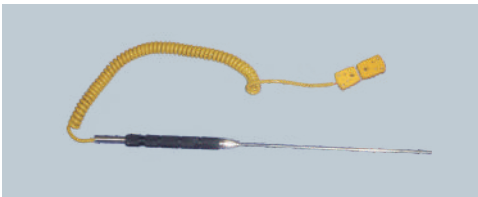
- J / K / T / E
- RTD's I R / S for High Temperature
- Simplex / Duplex
- Potseal / Transition Joint / Plug Socket / Ceramic Block / Flying Leads
- Fast Response, Accurate
- Grounded / Ungrounded
- SS304 / SS316 / Inconel Sheaths
- High Temperature Ceramic Tubes Sheaths



## Handle Probes



- CHROMEL/ALUMEL THERMOCOUPLE  
Immersion, Air, Needle, Teflon Coated Immersion, Heavy Duty Leaf (800 °C), Standard Leaf, Heavy Duty Immersion, Fast Response Exposed Type, Fast Response Immersion, Smithy, Penetration and Bow Probes
  - RTD TYPE Pt100  
Immersion, Teflon Coated Immersion, Fast Response Immersion, Needle, Penetration and Air Probes
- These Handle Probes are Designed for Pocket Thermometers (e.g. nippon 1000)



- Export Quality Handle probes
- Powder Coated Handle
- Spiral Extension cable
- Quick disconnect thermocouple grade Male/Female plug socket
- Widely used in Pocket thermometers, Infra-red Pyrometers, Multi-Meters

## Process Fittings, Glands



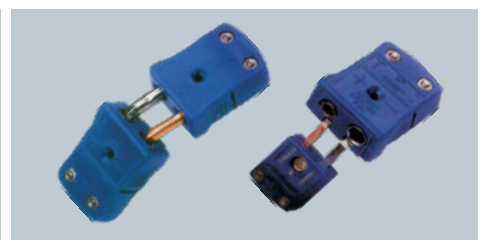
- Fixed & Adjustable Process Fittings (1/4", 1/2", 3/4", 1" Standard, Others on request)
- Nipple - Union - Nipple
- Cable Glands, FLP Glands

## Thermocouple Head



- Simplex / Duplex
- Flameproof / Weatherproof
- II-C Heads
- Steel Casted Heads

## Male/Female Plug Sockets



- Quick Disconnect Mating Connectors
- Colour Coded
- Heavy Duty
- High Purity Thermocouple, Alloy Pins and Sockets

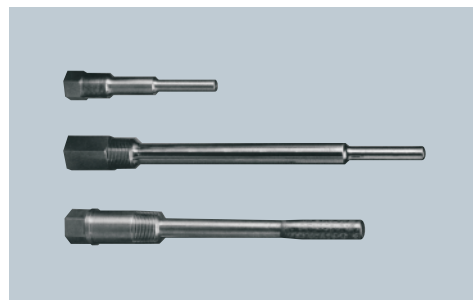
## Cable



- Compensating Grade
- Extension Grade
- Wide Variety of Insulation

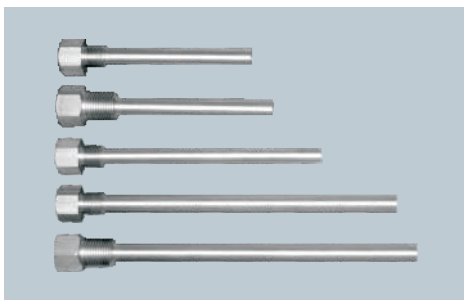


## Custom Engineered Thermowells



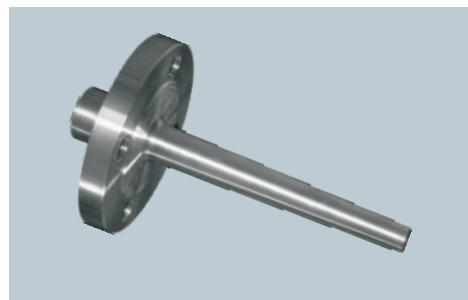
- Complex designs
- Barstock designs upto 6 feet
- Steps and threading as per process
- Socket weld designs available

## Threaded Well Thermowells



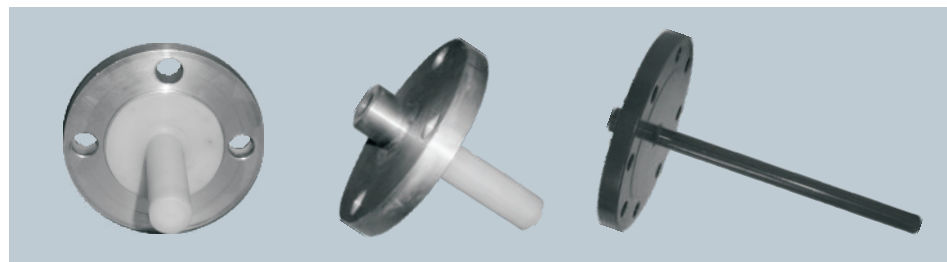
- Direct Mounting, Heavy duty
- SS316 / SS 304 design
- 1/2", 3/4" and 1" NPT are standard. Other thread sizes are available on request

## Tapered Thermowells



- Tapered design
- Fast response for RTDs, thermocouples
- Flange as per requirement
- SS 316 / SS 304 construction

## Teflon Coated



- Protective coatings for Thermowell
- Teflon Coating on well and Wetted parts
- Long lasting
- SS flange
- Quick deliveries

## Characteristics

Limits of Error for Thermocouples			
THERMOCOUPLE TYPE	TEMPERATURE RANGE °C	STANDARD Whichever is Greater	SPECIAL Whichever is Greater
T	0-350	±1 °C or ± 0.75%	±0.5 °C or ± 0.4%
J	0-750	±2.2 °C or ± 0.75%	±1.1 °C or ± 0.4%
E	0-900	±1.7 °C or ± 0.5%	±1 °C or ± 0.4%
K	0-1250	±2.2 °C or ± 0.75%	±1.1 °C or ± 0.4%
R or S	0-1450	±1.5 °C or ± 0.25%	±0.6 °C or ± 0.1%
B	800-1700	±0.5%	---
Reference Junction 0 °C		As per ANSI MC 96.1 (1982)	

Limits of Error for Platinum-RTD Elements				
MEASURING TEMPERATURE °C	PERMISSIBLE DEVIATIONS			
	CLASS A		CLASS B	
	Ω	°C	Ω	°C
-200	± 0.24	± 0.55	± 0.56	± 1.3
-100	± 0.14	± 0.35	± 0.32	± 0.8
0	± 0.06	± 0.15	± 0.12	± 0.3
100	± 0.13	± 0.35	± 0.30	± 0.8
200	± 0.20	± 0.55	± 0.48	± 1.3
300	± 0.27	± 0.75	± 0.64	± 1.8
400	± 0.33	± 0.95	± 0.79	± 2.3
500	± 0.38	± 1.15	± 0.93	± 2.3
600	± 0.43	± 1.35	± 1.06	± 3.3
As per DIN 43760, BS 1904				



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