

**INNOVATIVE
HEATING
SOLUTIONS**

科技创新
引领未来



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OUR COMPANY



Vsec designs and manufactures industrial heating elements, temperature sensors, as well as assemblies – all of the components of a thermal system. The company partners with its customers to optimize thermal performance, decrease design time and improve efficiency of their products and applications.

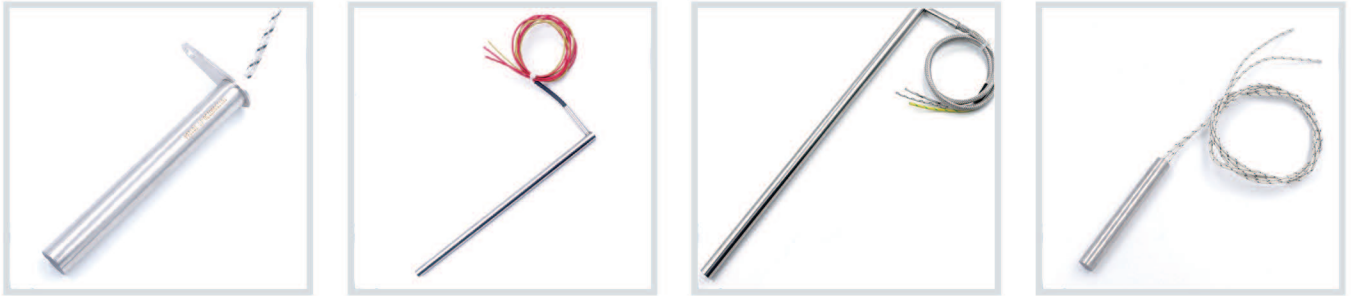
Vsec brings its experience to numerous industries, including semiconductor processing, environmental chambers, energy processes, diesel emissions, medical and food service equipment.

Since 2008, Vsec has grown in product capability, market experience and global reach. The company holds more than 50 patents and employs 300 employees working in two manufacturing facilities in Guangdong, China. The company has passed and strictly implemented the ISO9001, ISO14001 standard management systems. The main products have obtained UL, TUV, CE, ROHS and CQC product safety certifications. The company's products have been exported to more than 50 countries abroad. The company continues to grow, while the commitment remains the same – to provide its customers with superior products and services for their individual needs.

PRODUCT

HEATING ELEMENTS

Cartridge heater



Cartridge heaters provide excellent heat transfer and long life. Cartridge heaters are designed for push fit into holes of nominal diameters and are manufactured from the highest quality materials. Cartridge heaters are used for heating solids such as Dies, Molds, Platens and various other applications demanding localized heating and are suitable for temperatures up to 800 deg C. They are generally not suitable for liquids but the nipple design can be used which provides a water-tight seal, low wattage should be selected.

Cartridge heaters are available in metric and imperial sizes 6.5mm(1/4") to 40mm(1.5") diameters and up to 2m in length.

They are supplied with high watt densities as standard for the most demanding of applications, medium and low are also offered on request.

Below you can see a few selections of terminations we offer, others also can also be easily made.

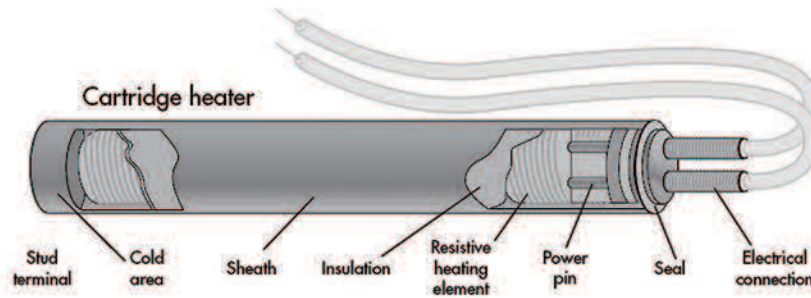
Material Specification

- Welded watertight base (Tig) to withstand pressure up to 60 kg/cm².
- Calibrated stainless steel AISI 304/316/321/ INCOLOY.
- Disc ceramic insulator.
- Pure granulometric magnesium oxide.
- Nickel-chromium 80/20 heater wire. Melting point 1400° C.
- Ceramic core.
- Hard ceramic head.
- Conductor lead.
- Hard refracting paste.
- Conductor without connections.

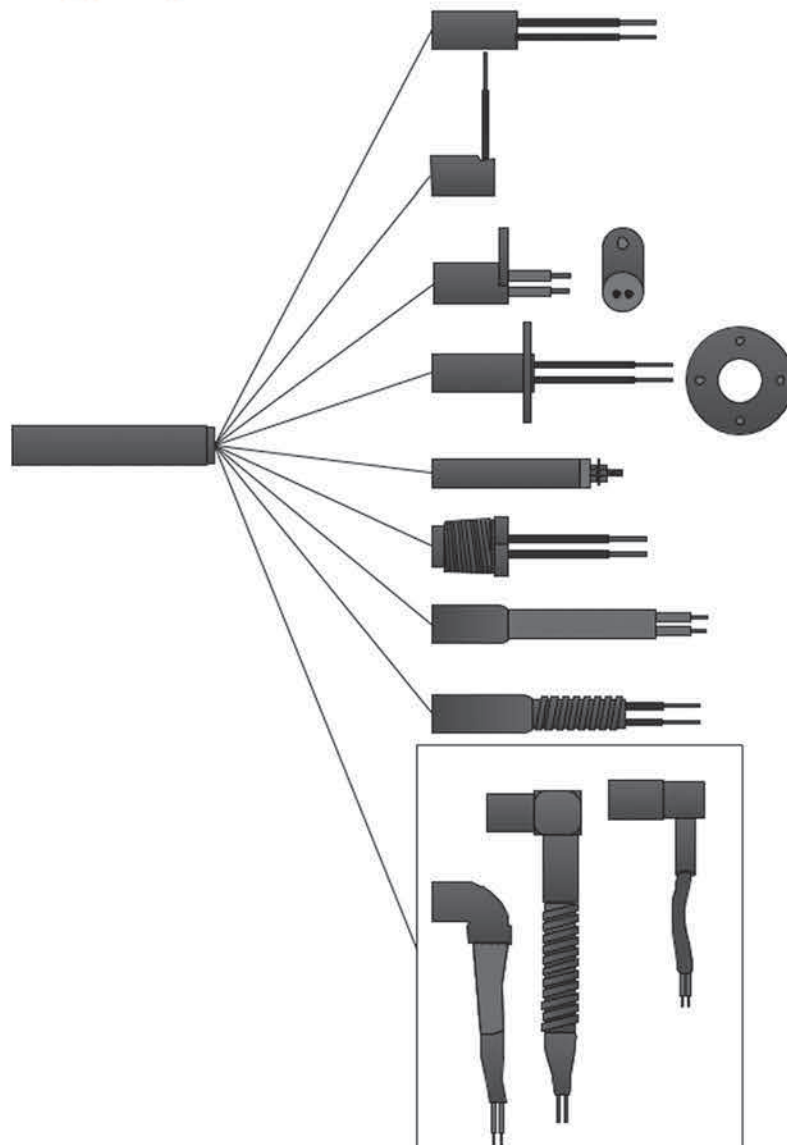
Customized

Cartridge heaters are designed for push fit into holes of nominal diameters. Cartridge heaters are used for heating Dies, Molds, Platens and various other applications demanding localized heating.

Cartridge heaters are available in metric and imperial sizes 6.5mm(1/4") to 40mm(1.5") diameters, Low, Medium, and High watt density.



End termination type options



PRODUCT

HEATING ELEMENTS

Standard stock sizes

Diameter	Length	Wattage	Voltage
1/4"	1"-5"	20w-400w	120v-240v
3/8"	1.5"-6"	100w-500w	120v-240v
1/2"	2"-8"	120w-630w	120v-240v
5/8"	2"-8"	250w-750w	240v

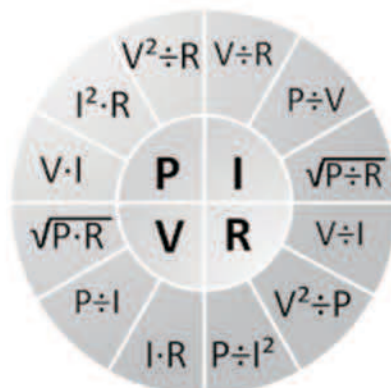
Questions we require for correct Cartridge Heater selection/sizing

- Maximum temperature? (type of heater)
- Are they fitted into a moving tool? (lead selection)
- Termination option? (straight or right angle)
- Time required to get up to temperature? (watt density)
- Any vibration or jerks? (watt density selection)
- Ambient temperature and humidity? (insulation and sealing type)
- Required to be hot at specific positions? (heat zoning)

Use conversion formulae

Ohms formula can be used when two of three variables are known. The relation between resistance, current and voltage can be written in different ways. To remember this, the Ohm triangle calculator might be helpful. Two examples below will show the use of the triangle calculator.

I = is the current in amperes
 V = is the voltage in volts
 R = is the resistance in ohms
 P = Power in watts



Immersion heater



Immersion heaters are used for heating liquids of many kinds, they are very efficient as they transfer all their heat to the heating medium. They are supplied with several different flange and threaded connection joints and immersion depths to suit the tank size.

Commercial

Construction: Copper sheathed heating element, brazed to a Brass flange provided with cap for protection of terminals, Nickel-plated.

Application: Light Duty (intermittent) boilers, washing machines, geysers, sterilizers and other commercial purposes.

Rating	Immersion depth	Fitting
1000KW/230V	220mm	1.1/4" BSPT
1500KW/230V	230mm	1.1/4" BSPT
2000KW/230V	325mm	1.1/4" BSPT
3000KW/230V	425mm	1.1/4" BSPT

Industrial

Construction: Two/Three Copper sheathed heating elements, brazed to a Brass flange provided with metallic cap for protection of terminals, Nickel plated.

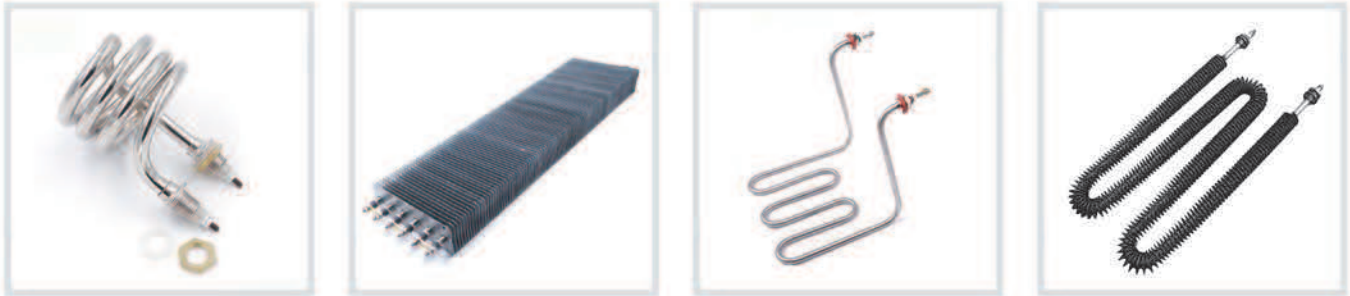
Application: Heavy-duty industrial hot water baths water jacketed apparatus, side arm circulating process tanks etc.

Rating	Immersion depth	Fitting
2000KW/230V	220mm	1.1/4" BSPT
2000KW/230V	220mm	1.1/2" BSPT
3000KW/230V	280mm	1.1/4" BSPT
3000KW/230V/400V	220mm	1.1/2" BSPT

PRODUCT

HEATING ELEMENTS

Tubular heater



Stainless steel or steel sheath materials are available, as well as a large selection of termination styles. Magnesium oxide (MgO) insulation ensures superior heat transfer, and the resistance wire is precision-wound for long heater life.

Applications

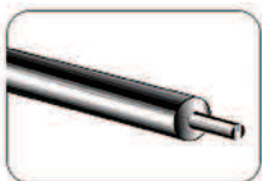
Tubular heaters can be used in almost any application. Straight Tubulars can be clamped to metal surfaces or inserted in machined grooves for conductive heat transfer. Or use a formed Tubular to provide consistent heat in any type of special application.

Features

- Custom-formed to meet specific requirements
- Stainless steel, steel or copper sheath materials available
- Precision wound resistance wire for long heater life
- Superior heat transfer
- Available in .315" and .430" diameters
- Variety of lengths available
- USA or global manufacture.

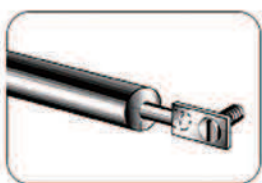


Termination styles



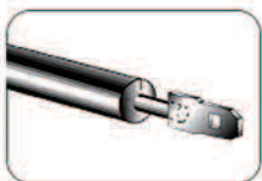
Plain Pins

Customer can finish termination to suit their application. 5/16" (7.9 mm) pin length is standard.



Flag Terminals

With #10-32 screw. Specify direction.



Spade Terminals

Specify direction of spade terminals.



Screw Terminal

Easy to wire screw terminal with mica washer insulation.



Bulkhead Fitting

Brazed to heater. For quick feed-through mounting. Specify round or hex head, stainless steel or brass.



Leads

High-temperature 250° F (121° C) lead wire brazed onto the heater terminals. Insulated with fiberglass sleeving and covered with shrink tubing. Specify length of leads.



Armor

Stainless steel armor to prevent abrasion and wear of leads (Type A). Also available with leak-proof bellows. Specify length of leads and armor.

PRODUCT

HEATING ELEMENTS

Flexible heater



Flexible heating elements also called silicone heaters, etched foil heaters and thin film heaters were developed in order to solve specific problems in advanced market sectors such as the space, aviation, chemical and food fields.

These applications require coverage over uneven surfaces where it would be impossible to use other types of heating elements.

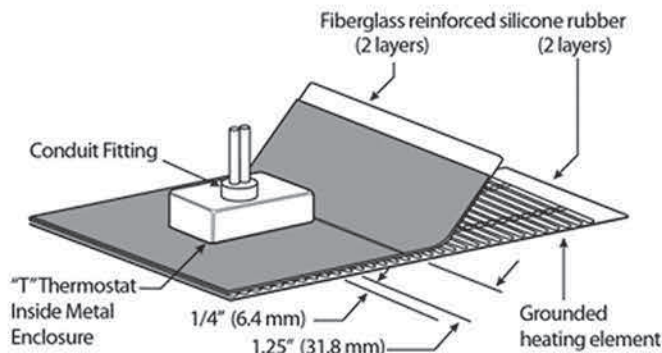
These flexible heating elements have characteristics that solve problems such as limited space, uneven surfaces heating and relatively low tooling cost compared to alternatives heating elements.

They are best suited to applications where it is not possible to heat from the inside or if surfaces are curved or shaped with intricate angles. They can be supplied in various shaped and with holes to suit specific surfaces and are supplied with or without adhesive backed.

Although these heaters are not waterproof they will withstand the odd liquid splashes. The silicone mat heaters have a operating temperature up to 180°C and can be made with watt densities up to 0.8W/cm².

Installation of these heaters are very simple, and in the case of adhesive backing only require the back to be peeled off. The bonding surface should be kept smooth, clean and dry to ensure proper bonding and heat transfer.

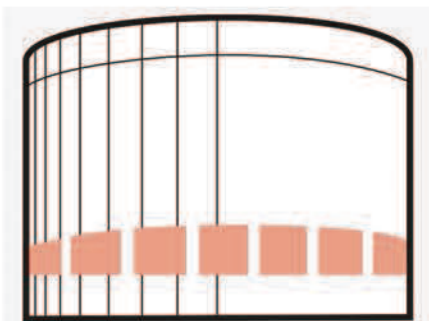
For temperature control we fit the heaters with various options such as sensor pocket, in-built sensor or thermostat.



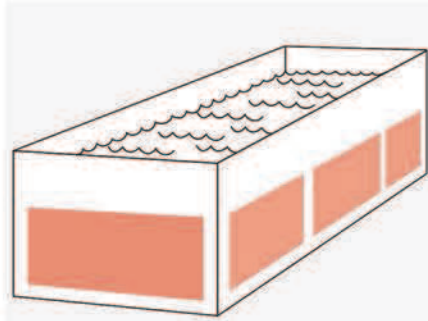
Features

- Can be set to vary heat concentrations to optimize distribution.
- Can be made to any shape or profile.
- Heat's right to edges.
- Thermostats and limiters can be moulded on.
- Easy fitting.
- Up to 3m long.
- Overall economical in many applications.
- Minimum weight and thickness.
- Can be made to fit around pipework and valves.
- Flexibility.
- Made to suit any voltage requirements.
- Working temperatures up to 230°C for short periods, 180°C normally.

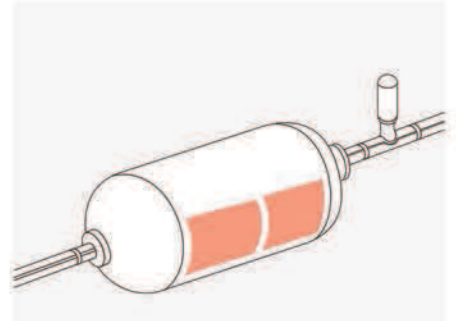
Typical applications



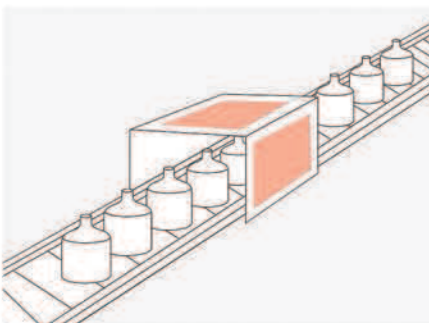
Storage Tanks



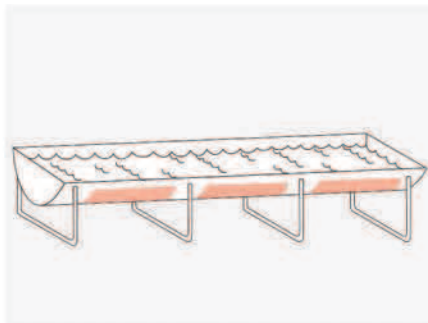
Process Vats and Dip Tanks



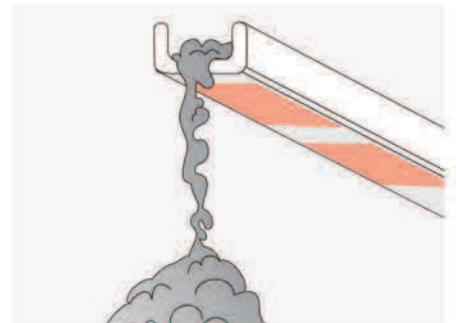
Heat Tracing Systems



Low Temperature Ovens



Water and Feed Troughs



Conveyors

PRODUCT

HEATING ELEMENTS

Band heater

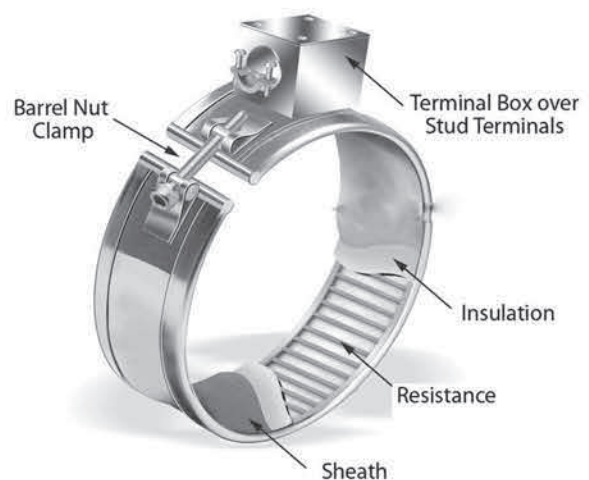
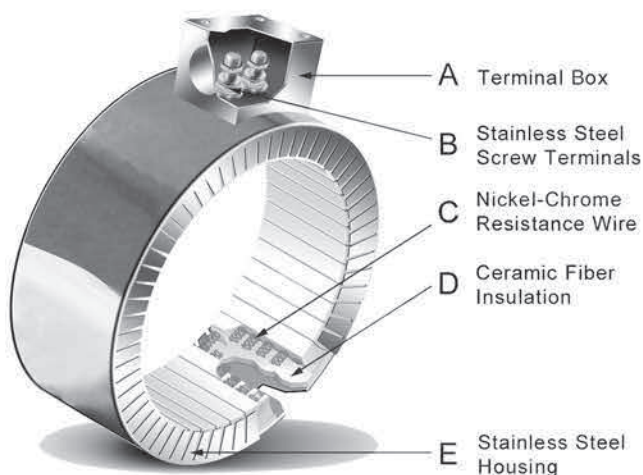


Ceramic band heater

Ceramic band heaters are medium-to-high temperature heaters that have 600°C as a maximum working temperature. They provide long life and use less wattage (because of insulation) in plastics extrusion and injection molding applications. Ceramic band heaters are available with different terminal styles, are fully flexible, and can accommodate holes and cut-outs.

Mica band heater

Made of mica insulation, nickel chrome heating wire and stainless steel sheath, Mica band heaters are the ideal solution for high watt densities and high operating temperature applications, especially for the plastics industry.



Ceramic band heater features

- Inner insulation to minimize unwanted changes in temperature.
- Flexible design for easy installation and removal.
- Reduces heat loss and conserves energy.
- Customized to your requirements.
- Heats through radiation and conduction.
- Reduced overall operating costs and ensure maximum comfort of the operator.
- Number of bands can also be used with a simplified wiring.

Mica band heater features

- Efficient heat transfer without any difficult in operations.
- Design variations for heater protection and convenience.
- Low-mass design for a quick response and heat-up.
- High-quality mica used in the manufacturing of the band heater.
- Excellent strength to withstand even the toughest conditions.
- Variety of applications ranging from injecting mold machines to extrusion line.

Standard stock sizes

	Power Source	Power	Voltage	Available Material
Ceramic	Electric	200-2000W	230 To 440 V	MS, Brass and SS Sheathing
Mica	Electric	900W	220V	SS Sheathing

Advantages

- Reduced power consumption
- Heat conservation
- Flexibility
- Uniform heat distribution
- Several termination options

Applications

- Injection molding
- Blow-molding
- Plastic extrusion
- Container, pipe, or tank heating
- Pharmaceutical applications
- Applications in the food industry

PRODUCT

HEATING ELEMENTS

PTC heater







Characteristics

- The PTC heating component is installed with safety protection device. When it is used abnormally, current will automatically cut off to maintain safety.
- The heating components are integrated together, consist of average heating effect. When used for heaters, it can independently control single PTC (500W,800W) double PTC (1000W,1500W) or triple PTC(1500W,2000W) heating components, effectively saves electricity cost and increases product life.
- The pole and terminal are connected by point welding, preventing electrode loosen causing resistant and temperature to increase when heated, cold contraction or heat inflation.
- The outer edge of the PTC heating component is designed with single and double insulation. When in contact with metal will not cause electric shock or short circuit.
- The heating component is airtight/ tightly sealed, electrode is unexposed. Most suitable for application in bathroom or high humidity locations.
- It is installed with double insulation heating device, can be used underwater, without causing electricity leakage or short circuit. When heated dry, it will not crack or burn down the container.
- No smell, no radiation and will not oxidize or cause oxygen shortage when used for a long time.
- Fast thermal respond time, low inrush current. Will not cause fire sparks or flame by instant/sudden power supply or when in contact with flammable objects such as matches, cotton, paper.
- Temperature control devices are not required for various temperature selections. Static heating, lowers product cost and saves electricity effectively.
- The heating component not only can be used in heater fans, its individual components can also be used for general house ware electricity appliances

Typical Applications

DC can be used on automobile or for warm air, dehumidifying, temperature increasing, temperature maintenance etc. where DC power is supplied.

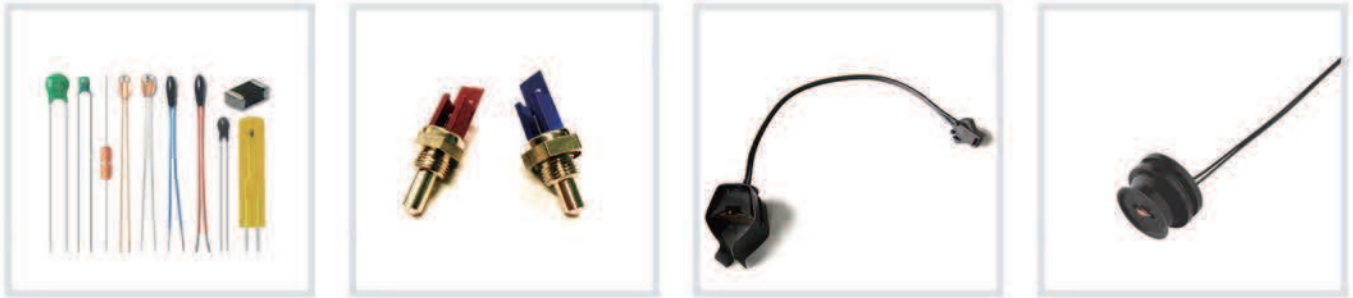
AC can be used for general house electronic appliances for hand drying, dress drying, coverlet drying, shoes drying, bowl drying, humidifying, dehumidifying, air condition, ironing, electronic spoon etc.

Applications	PTCR Thermistor Elements		PTC Heat Conductor	PTC Water Heater	PTC Heater Fan 	PTC Heater Frame 	Integrate with Far Infrared	Technical Details
	Rectangular 	Oval 						
Heater	•				•	•	•	
Heater Fan	•				•	•	•	
Air Conditioner	•				•	•	•	
Air Dryer	•						•	
Cabinet Dryer			•					
Hair Curler	•		•					
Dish Dryer	•				•	•		
Shoe Dryer	•				•			
Hand Dryer	•				•	•	•	
Cloth Dryer	•				•	•		
Toilet Seat Heater		•		•				
Facial Steamer		•	•	•				
Steam Iron	•		•					
Laminator	•	•	•					
Thermostat Cabinet	•		•					
Mosquito Repellent	•	•	•					
Coffee Pot	•	•	•					
Surveillance Camera (Built-in Thermostat Heater)	•		•					
IC-Use Thermostat heater	•		•					
PTC Heated Glue Gun	•		•					
PC Board Protection	•		•					

PRODUCT

TEMPERATURE SENSOR

NTC thermistor

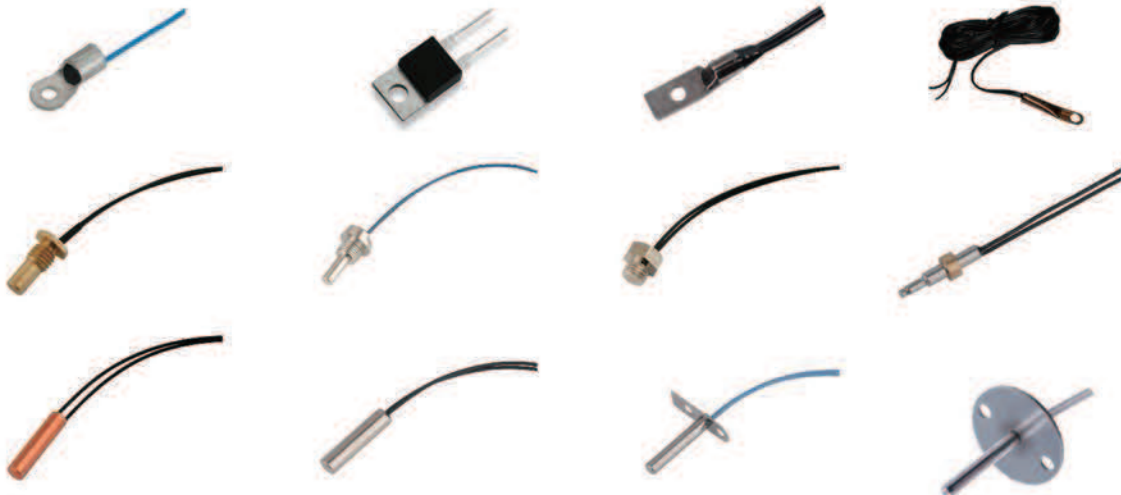


NTC is an acronym for Negative Temperature Coefficient. Vsec is a leading designer and manufacturer of high precision discrete NTC thermistors, probes, and assemblies. An NTC thermistor is a temperature sensor that uses the resistance properties of ceramic/metal composites to measure the temperature. Our NTC sensors offer many advantages in temperature sensing including miniature size, excellent long-term stability, high accuracy and precision.

Applications

NTC thermistors are used in a wide variety of applications. The medical industry relies on NTC's in various applications including catheters, dialysis equipment, and patient monitoring. Appliances from dryers to coffee makers use NTC thermistors to accurately measure temperature. HVAC and refrigeration equipment use NTC sensors to measure temperature in building controls and processes, resulting in increased efficiency and control. Automotive and aerospace industries use NTC thermistors for test and measurement as well as production applications.

Probes



DS18B20

The DS18B20 is a 1-wire programmable Temperature sensor from maxim integrated. It is widely used to measure temperature in hard environments like in chemical solutions, mines or soil etc. The constriction of the sensor is rugged and also can be purchased with a waterproof option making the mounting process easy. It can measure a wide range of temperature from -55°C to $+125^{\circ}\text{C}$ with a decent accuracy of $\pm 5^{\circ}\text{C}$. Each sensor has a unique address and requires only one pin of the MCU to transfer data so it a very good choice for measuring temperature at multiple points without compromising much of your digital pins on the microcontroller.

Power Supply	3V to 5.5V
Current Consumption	1mA
Temperature Range	-55 to 125°C
Accuracy	$\pm 0.5^{\circ}\text{C}$
Resolution	9 to 12 bit (selectable)
Conversion Time	$< 750\text{ms}$

Wire & Connector



Metal braided wire



PVC/PTFE wire



Telfon wire



Silicone wire



Audio jack connector



RJ45 connector



Molex connector



Waterproof DC connector

PRODUCT

TEMPERATURE SENSOR

PT 100/PT 1000

A Pt100 or Pt1000 is a Platinum RTD (Resistance Temperature Detector) with a resistance of 100Ω at 0°C which changes with temperature. They are suitable for applications in the temperature range of -200°C to 600°C but are more commonly used in the range -50°C to $+250^{\circ}\text{C}$. These temperature sensors are reliable and can offer a higher degree of accuracy.

The number relates to the resistance value at 0°C . So a Pt100 probe will have a resistance of 100Ω at 0°C , and it follows that a Pt1000 RTD will be 1000Ω at 0°C .

Custom Built sensors

- Plain Stem c/w Pot seal and cable
- Mineral Insulated c/w either pot seal / cable, connector or head
- Plastics RTD's
- Surface RTD's
- Fixed Process Thread RTD's
- Bearing RTD's
- HVAC & Air Temperature Sensors
- Autoclave RTD's



PRODUCT

PRODUCT LIST

CARTRIDGE HEATER



PRODUCT

PRODUCT LIST

IMMERSION HEATER



TUBULAR HEATER



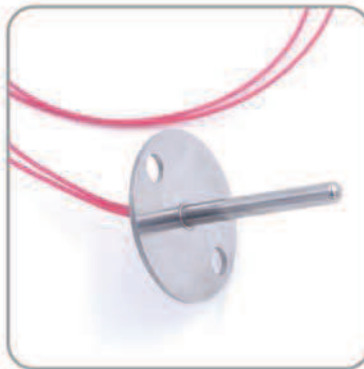
PRODUCT

PRODUCT LIST

BAND HEATER



TEMPERATURE SENSOR



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