



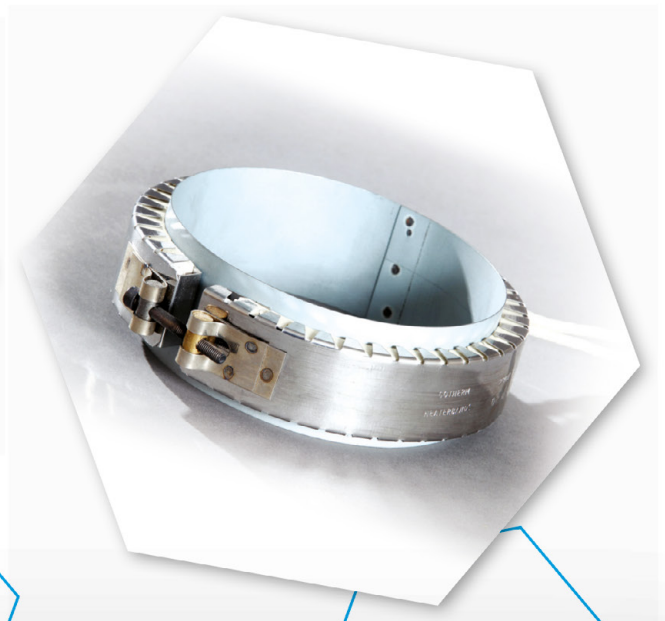
heaterbands | cartridge heaters | thermocouples and controls



www.heaterbands.ltd.uk

Index

1. Mica Nozzle Heaters
2. Mica Band Heaters
3. Alternative Heater Types
4. Rubber Matt & Coil Heaters
5. Miniature Spirals & Cartridge Heaters
6. Immersion Heaters & Standard Drum Heaters
7. Additional Drum Heating & Insulating
8. Specialist Elements
 - Tubular
 - Cast Aluminium
 - Heater Coolers
9. Thermocouples
10. Temperature Controllers, Plugs & Sockets
11. OHMS Law Help Sheet



Mica Band Heaters (Nozzle Types)

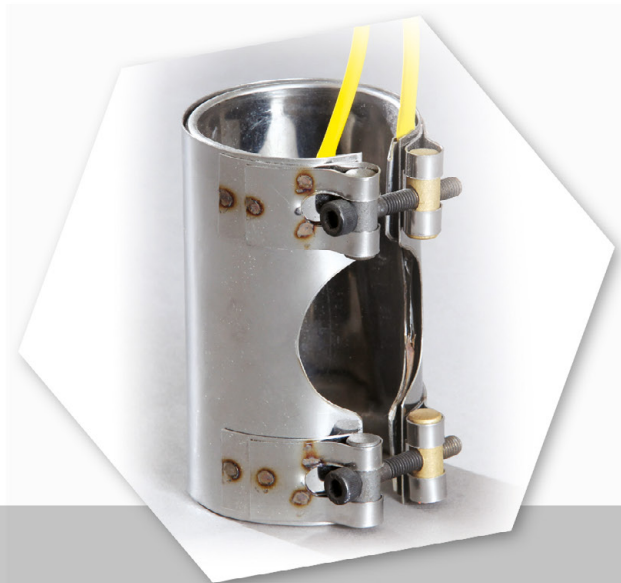
Mica type heaters are suitable for most plastic processing applications at temperatures up to 400°C, and are the most competitively priced of the various alternatives available.

Type N1

Our type N1 (low profile) types, as shown have the leads entering the band through the back edge, which with the unusually low clamping flanges gives a heater which is ideal for those applications where others are too bulky.

Leads:-

Glass or Metal Braided
500mm unless otherwise specified



Type N2

Our type N2 nozzle heater provides a useful alternative for applications where the heater is fitted against a shoulder, since the lead can be brought vertically up and over any obstruction.

Leads;

Glass with outer metal braided protection.
Earth lead included.
500mm leads unless otherwise specified.



Type NS (Sealed Type)

These nozzle heaters are made from a flattened tube (brass or stainless steel) to provide a heater which is sealed against the ingress of liquids or molten plastic.

Leads;

1000mm metal braided with earth included.

The Type NA (armoured)

Mica Band fulfills the demand for a heavy duty nozzle heater. The design features a pressed steel turret with stainless steel flexible conduit protection and earth leads as standard. Substantial roller-bolt clamping is also standard.

Leads

500mm long unless otherwise specified, and may be angled at 45° as shown or can exit vertically if preferred.

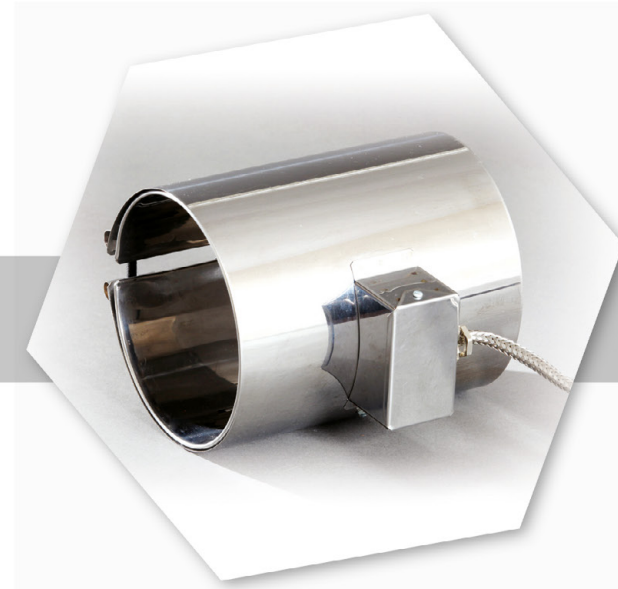


Type NA/B (armoured with Braid)

Our type NA/B retains the advantages of the armoured nozzle heater, but the galvanized metal braided protection over the leads will reduce cost and give greater flexibility.

Leads:

500mm long unless otherwise specified, and may be angled at 45° (as shown) or can exit vertically if preferred.



Mica Band Heaters

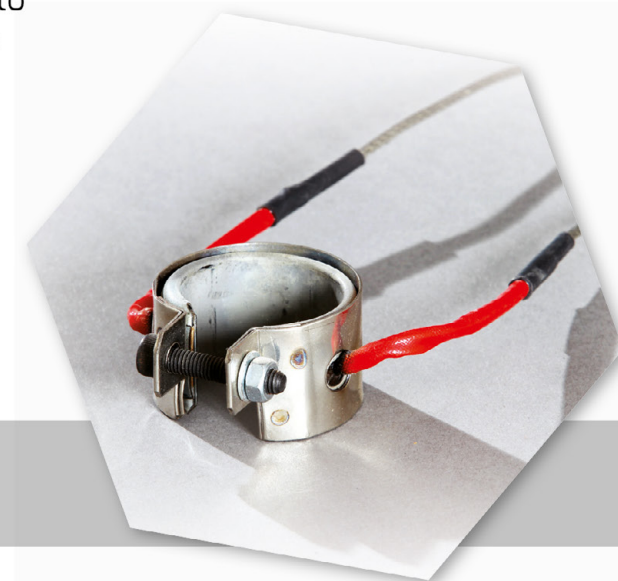
Standard Barrel Type

The larger Mica heaters are of a similar internal construction to the nozzle types and have a similar temperature range. These larger types however have a separate clamping band with reinforced flanges and large (5mm) socket screws to provide the secure clamping required on heaters which may be rated up to 3,800W. Even higher wattages may be achieved with multiple windings.

Holes for thermocouples or other projections can be incorporated in any barrel type heater if required. Roller-Bolt fastening is available as an optional extra.

Leads:

Fibreglass insulated
500mm unless otherwise specified

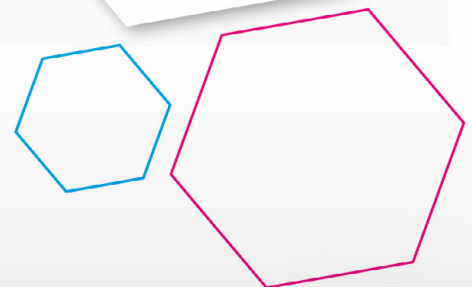


Barrel Heaters with Protected Outlet

A small metal shroud over the lead exit is provided to protect the leads in this vulnerable area, and provide a cable clamp to anchor the leads preventing them from being strained.

Heavy Duty Insulated Type

The clamping band of our heavy duty insulated type is made from a coated steel with excellent heat reflecting properties. This material together with the ceramic fibre insulating layer have shown a reduction in outer surface temperature of up to 100°C over the equivalent standard heater under test conditions. The robust roller-bolt fastening arrangement features 6mm socket screws and brass rollers to ensure easy fitting and good solid clamping.



Alternative Barrel Types With Terminal Boxes

The terminal box as shown is available on any barrel type heater of 60mm width or above, and a tangential lead to exit is also offered.

Flexible

Designed to spring open to enable fitting over the barrel without sliding off other heaters or removing extrusion die heads etc..

With Sockets

Two pin scraping earth or three pin sockets are often used on extrusion equipment for easy die change.

Matching plugs can also be supplied - see details on page 10.

Flat Mica Heaters

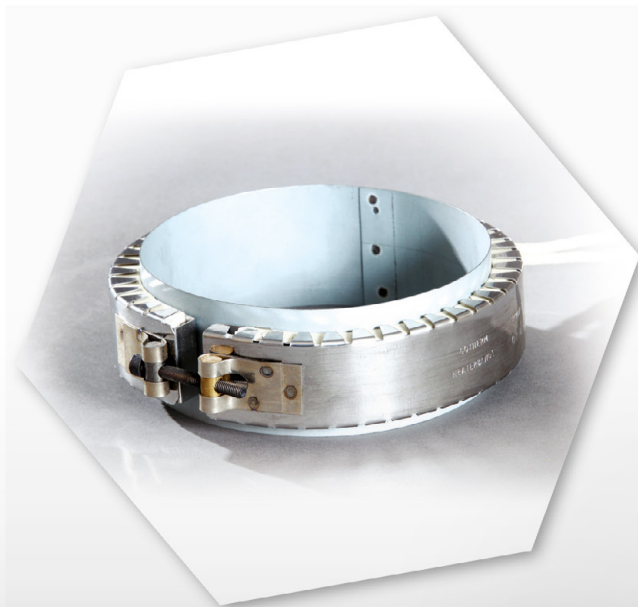
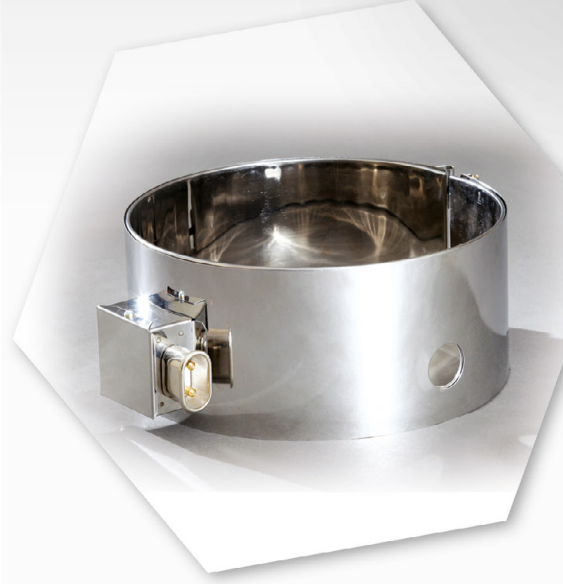
These heaters can be supplied unsheathed with stapled and taped edges, or metal sheathed. Flat Mica heaters will operate at temperatures up to 350°C provided that they are securely clamped with a substantial clamping plate. For very low temperature applications it is sometimes possible to dispense with the clamp.

Flat Mica Heaters are made to order. Our standard termination is 500mm fiberglass insulated leads at each end, however special types of outlets etc.. can be provided as can clearance holes and cut-outs. Virtually any size can be manufactured up to a maximum of 36" square.

Ceramic 'Knuckle' Type Heaters

Ceramic types are capable of working at higher temperature ranges than Mica Insulated heaters, and can be rated higher watt densities if required. The Knuckle Type (as shown) have the advantage of being flexible which enable easy fitting, and are more tolerant of poor contact surfaces and air gaps than Mica types.

Standard termination is a terminal box, although leads can be added if required.



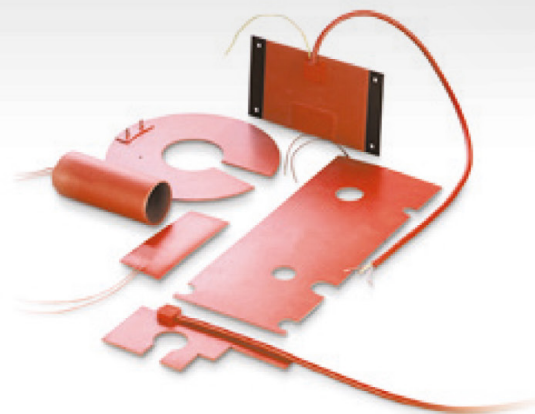
Rubber Mat Heaters

Silicone Rubber Matt heaters are very flexible and are ideal for low temperature (up to 180°C) applications where heat needs to be applied to any surface.

Other advantages include splash proof bonded construction, and ease of fitting by use of suitable adhesive.

Unusual shapes, irregular winding patterns and holes etc... can all be incorporated if required, as can eyelets for lacing onto cylindrical objects.

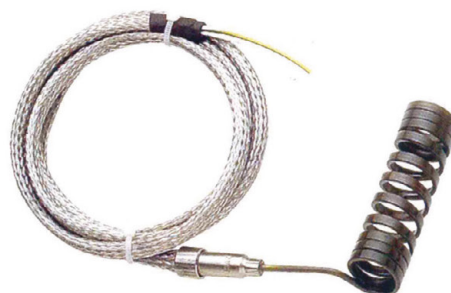
All rubber matt heaters are made to order.



Spiral Type Nozzle Heaters

Our spiral type nozzle heaters are formed from a 5mm mineral insulated element with a very ductile sheath material which allows the production of diameters down to 25mm and also allows the customer to form the cold tails to suit the application if necessary. The heaters are a 'Push-On' fit.

Spiral heaters will happily operate at temperatures in excess of 400°C and will do so in the face of severe abuse such as deluge of molten plastic or mechanical damage, which would almost certainly destroy the equivalent mica-type heater. Our policy is to hold large stocks of straight elements in various lengths and loadings, so that we can form and complete heaters very rapidly using our stock range of elements. The loadings of our stock elements are calculated to give a higher wattage than the equivalent mica types.



Standard Types

Standard types have cold tails at 45°C between 75mm and 150mm in length, and are fitted with 500mm leads. It is advisable to use a clamping band as shown below on the larger diameters, particularly where constant re-fitting of the heater is likely. These can be supplied at a small extra cost.

Our single ended version reduces overall size and gives a more compact lead arrangement with stainless steel conduit protection. An earth lead is standard.

This type may be used on external moulding machine nozzles and on certain hot-runner systems.



Miniature Spiral Type Nozzle Heaters (For Hot Runner Systems)

These elements are also single ended which enable a much more compact spiral to be produced. The elements sheath is smaller in diameter than the standard type (no more than 4mm dia.) and high wattages are available to satisfy the requirements of plastic hot runner systems. The element sheath is therefore made from a form of stainless steel which will operate at red heat if necessary. Flat section elements (as shown) are now available offering improved surface contact.

Miniature spirals are supplied with built in thermocouples.



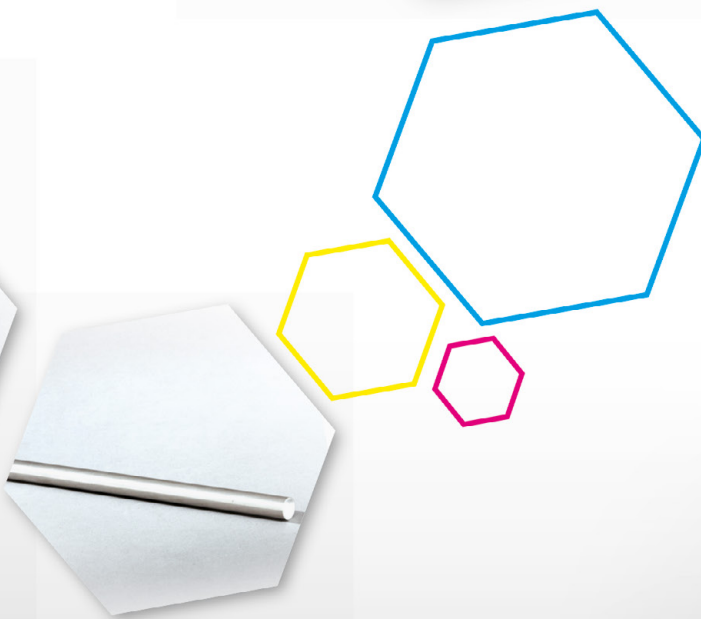
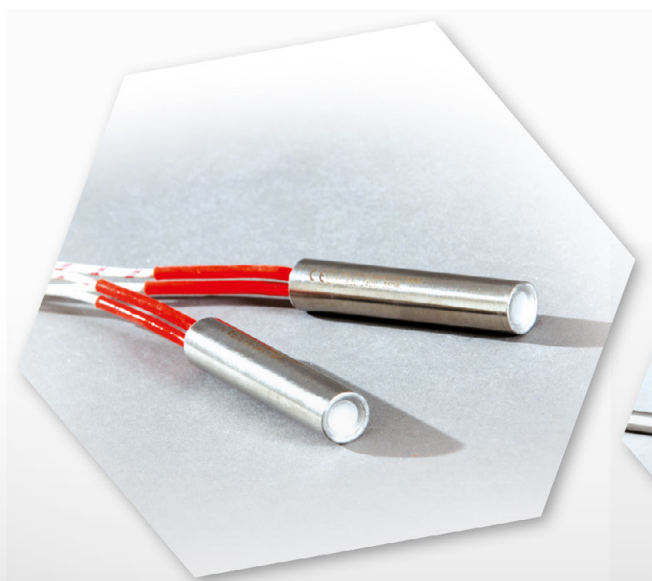
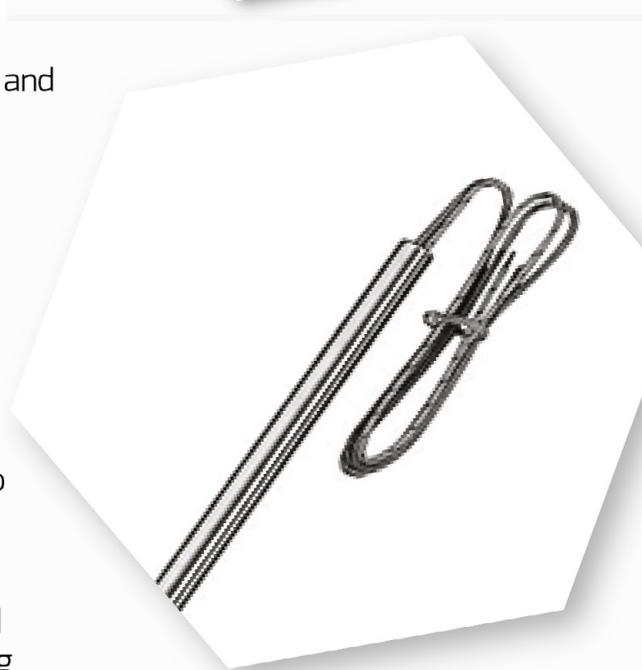
Cartridge Heaters

Cartridge type heaters are ideal for the heating of tools, dies and press platens etc. or anywhere that heat is required at the centre of a mass of metal. Certain special variations may also be used for air heating or immersion in liquids.

Stainless Steel Cartridge Heaters can be supplied in most commonly used sizes, both imperial and metric.

Specials can be made to order in a wide range of voltages and loadings. A variety of lead styles and special fittings can be supplied including 90° angled outlets, extraction collars, armoured leads etc.. Thermocouples can be built into cartridge heaters and this type are often specified for plastic hot-runner systems.

All cartridge types are intended for use in accurately reamed holes. A precise fit essential for good heat transfer and a long heater life.



Immersion Heaters

We supply Industrial Immersion Heaters with either threaded or flanged heads and with element sheath materials to suit application. The most common thread size is 2 1/4" BSP although 1 1/2", 2" and 2 1/2" are also available. Threaded heads are usually of brass but stainless steel is also an option. Elements sheath materials range from Incoloy 800 to stainless steel 316, copper, or even titanium. Single and 3 phase configurations can be supplied and pockets for thermostats or sensors can be incorporated as can terminal covers to 'IP' standards if required.

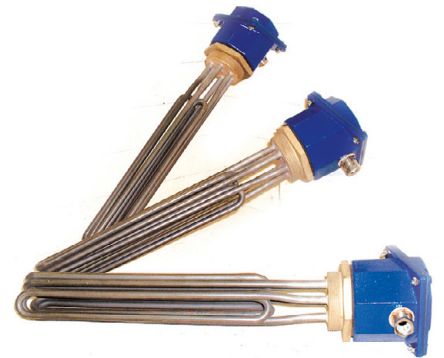


Miniature Immersion Types

- Compact 1" B.S.P Head
- Copper, Mild Steel or stainless Steel Elements
- Complete with Moulded Cap and 1000mm Lead

Contact us to discuss your special requirements.

Heaters for Standard 200 Litre Drums



Metal Band Type

Ideal for heating non-volatile liquids, solids and viscous materials such as greases, fats, gelatine, asphalt, jelly, tar and heavy oils.

The standard heater incorporates a thermostatic control with a range of 0°-120°C.

The all metal construction incorporating mica heating elements is tough and long lasting in hostile situations. The band heater is hinged and easily clamped by means of two snap action over-centre clamps. Each heater is complete with 2 metres of high temperature rubber cable. Several heaters can be fitted simultaneously for rapid results if required. Special versions for 110v etc.. can also be made to order.



Optional Lagging Jacket for Metal Band Type

Our lagging jacket is tailored to fit the metal drum heater as shown. The thermal insulation improves efficiency of the heater by reducing heat lost to atmosphere. The jacket also provides additional protection against knocks and spills.

Constructed from top quality high temperature materials the jacket will tolerate temperatures up to 300°C. Fixing is by means of two simple velcro straps.



Flexible Silicone Rubber Type

The rubber drum heater is smaller and lighter than heavy duty metal alternatives, and is rated at 240v 1500w. Due to its sealed construction it is moisture proof, and the adjustable thermostat is bonded into the heater.

Fixing is simple as the single tension spring allows the heater to be stretched over the top of the drum. A 2m rubber lead is fitted.

Alternative sizes for smaller containers can be supplied to order as can specials for non-standard voltages etc..

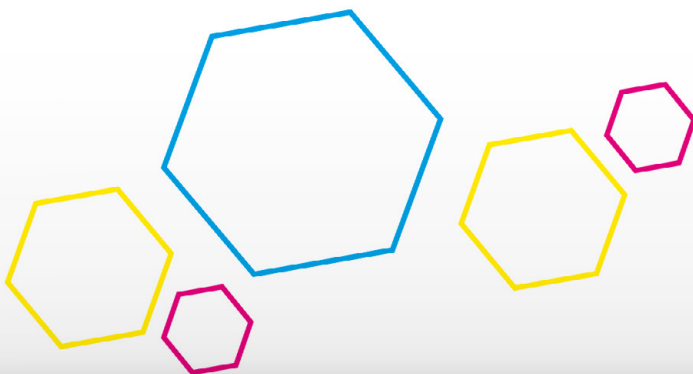
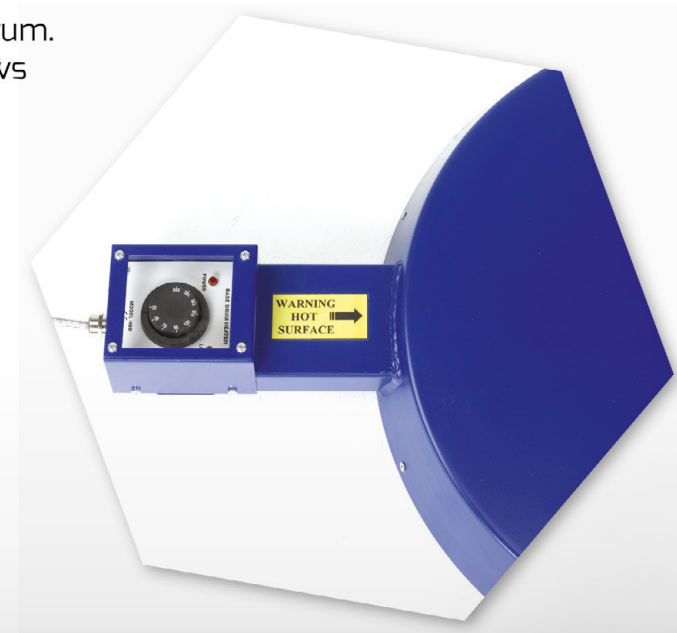


Drum Base Heater

This unit is fabricated from heavy gauge steel and is designed to fit within the lip of a standard drum to ensure good surface contact. Reliable tubular heating elements are completely enclosed in the fabrication and are rated at 230v 1200w.

Temperature control is via 0°-120° capillary thermostat located in a steel enclosure at a safe distance from the drum. The control knob is accessible by removing the four screws from the lid.

The base heater has a painted finish, and is supplied with 2000mm of metal braided cable.



Heaters for other Cylindrical Containers

Other popular drum sizes can be heated with mica bands.

Mica type band heaters can be manufactured to heat cylindrical containers of any size, with or without a thermostat.

Very large cylinders may require several segments which bolt together to form circular band.

A smooth surface is required to ensure good contact with the heater to give efficient thermal transfer and a long heater life.

Methods of clamping and types of termination are varied, with terminal boxes, flexible leads or plug & socket options available.

**We will be happy to quote for complete packages with control equipment to suit the application. Contact our sales staff for further assistance.*

Formed Tubular Heating Elements

Various sheath materials available. Diameters from 4mm to 1/2" formed to suit your particular application. Commonly used for radiant heating, immersion heating, clamping to metal dies etc..

Various types of termination and fixing glands available.

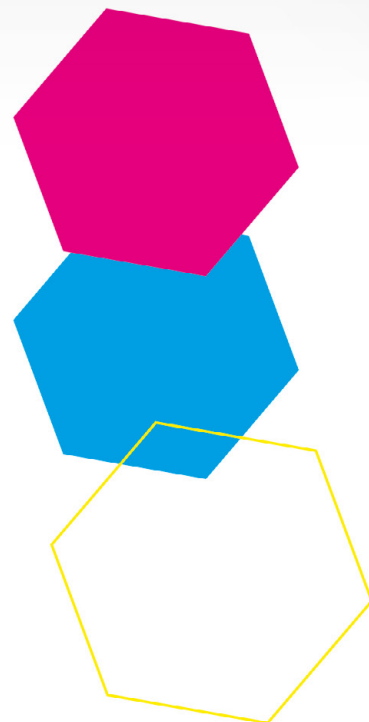
Tubular Element Assemblies

Tubular rod elements can be supplied separately in a variety of sheath materials or built into custom made assemblies such as immersion heaters, radiant heaters, or hot air duct heaters.

We welcome the opportunity to discuss new process heating applications at the design stage when our technical staff can advise on suitable heating elements, thermocouples and control equipment. If delivery is crucial we can often use our stock range of tubular elements to construct a special assembly without waiting for elements to be made from scratch.

Cast Aluminum Heaters

Cast Aluminum heaters are based on tubular elements cast in solid metal to provide excellent heat transfer via a machined contact surface. High wattages are possible and bronze can be used if exceptionally high working temperatures are required. Holes for clamping bolts etc.. can usually be incorporated, and various types of terminations are available.



Thermocouples

We are manufacturers and stockist of a wide range of thermocouples. The most popular types are shown here:

Plain Probe Type

Available in various diameters. From 3mm upwards. Length as required. (For smaller diameters we can supply mineral insulated types). Compression fittings are available for securing probe type thermocouples. Stainless steel flexible conduit lead protection can be fitted as an alternative to the usual metal braid.



Spade or Leaf Type

Our standard flat leaf is stainless steel and measures 25mm x 6mm wide. Any type of lead can be fitted to the standard leaf, and for special application, larger shim types can be produced in brass.



Spring Adjustable Bayonet Type

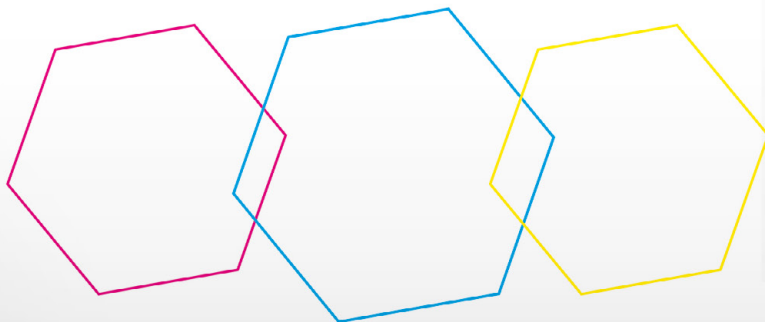
The bayonet cap winds up or down the spring to provide some adjustment for the depth of the probe. Various tip diameters and lengths are available. Cap diameters may vary but the 11.5m inside diameter single slot cap is most popular. Stainless steel flexible protection can be fitted as an alternative to the usual metal braid.

Bayonet Adaptors

The standard adaptors for single slot types are threaded 1/8" B.S.P. All other thread sizes and pin configurations are available on request.

Thermocouple Plugs and Sockets

Many standard types from stock.



Temperature Controllers

Digital, Shinko Model JCS

The JCS model is microprocessor based and is P.I.D with auto tuning and fuzzy logic. Input voltage is variable, and sensor type together with temperature range can be set at our works prior to dispatch.

Large Format 96 x 96 Analogue Temperature Controller with Digital Display, Type BTC

Various types are available, but the 96 x 96 version has proved reliable and popular. The 0°-400°c version for "J" type thermocouple input is normally available from stock.

Continental High Temperature Plugs



The two pin scraping earth types shown above will fit most European plastics machinery as well as our own heaters with two pin plug in connections. They are designed to accept 3 core cable, and we recommend our 2.5sqm silicone rubber cable which is available from stock.

Latest Din standard 3 Pin Plug

We stock the ceramic/plastic version as shown above which has a high temperature rating and will fit all new European sockets of this type.

Plastic Din Standard 3 Pin (10 amp only)

These smaller plugs and sockets are not interchangeable with the high temperature version above, but may be specified for extending heater leads etc.. away from the heat source. We recommend our 1.0msq silicone rubber cable, which is available from stock, for use with these connectors.

Ohms Law Help Sheet

A potential difference of 1 Volt will force a current of 1 Ampere through a resistance of 1 Ohm, or
Voltage (V—Volts) = Current (I—Amps) x Resistance (R—Ohms) or more simply:

$$V = I \times R$$

Power (W—Watts) = Voltage (V—Volts) x Current (I—Amps)
or more simply:

$$W = V \times I$$

The diagram shows the variations on these formulae.

Examples:

A heater in a tool measures 30 Ohms. Assuming a voltage of 240V, what is the expected wattage of the heater?

$$W = V \times V / R = 240 \times 240 / 30 = 1920W.$$

A controller has a fused output of 13A on a voltage of 240V. What would be the expected maximum output wattage of the controller?

$$W = V \times I = 240 \times 13 = 3120W.$$

A 240V tip is rated at 250W. What would the expected current demand be?

$$W = V \times I, \text{ or } I = W / V = 250 / 240 = 1.042A$$

If the connecting cable to the 240V tip is rated at 0.1R per meter and is 3m long, how much heat will be dissipated by the cable?

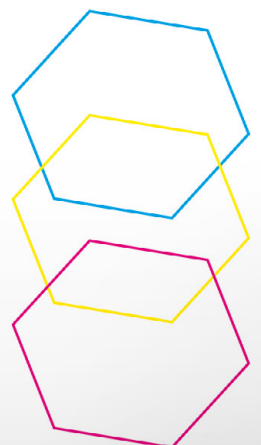
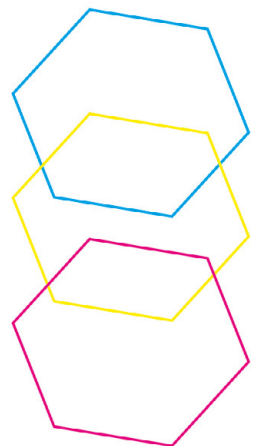
$$\text{Total R of cable} = 3 \times 0.1R = 0.3R. \quad W = I^2 \times R = 1.042 \times 1.042 \times 0.3 = 0.3257W \text{ per cable.}$$

If the system is changed to a 24V tip, all other parameters remaining the same, what will the current demand be and how much heat will be dissipated by the cable?

$$I = W / V = 250 / 240 = 10.42A$$

$$\text{Total R of cable} = 3 \times 0.1R = 0.3R.$$

$$W = I^2 \times R = 10.42 \times 10.42 \times 0.3 = 32.572W \text{ per cable.}$$





H_b heaterbands

Phone 0121 772 0033 or **Email** dan@heaterbands.ltd.uk
www.heaterbands.ltd.uk