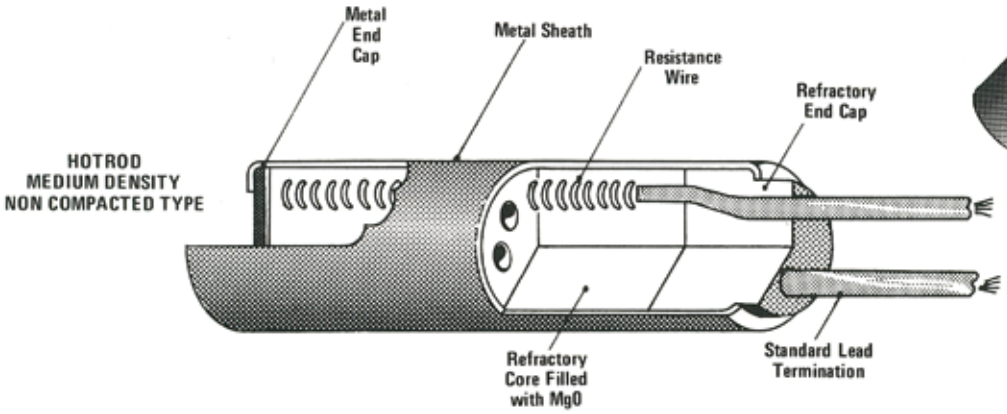
CARTRIDGE HEATERS

HOT ROD PRECISION UNITS - STANDARD WATT DENSITY TYPE

Hotco HOTROD Cartridge Heaters provide a convieniant, dependable and efficient method of applying concentrated heat to solid metal components such as die blocks, moulds platens, heat sealing tools, etc; or practically any application where a compact, insert type heating is desirable.

GENERAL CONSTRUCTION



HOTROD CARTRIDGE FEATURES

* Long trouble free service
* Sheaths of precision dimensions and tolerances for intimate contact with reamed holes
* High watt density units with stainless steel sheaths providing stable, non-oxidising surfaces
* Heating elements positioned close to the outside surface for maximum heat transfer, minimum core temperature and faster heating
* Heating element supported on high temperature ceramic and solidly packed magnesium oxide
* Variety of connections, including plated steel screws with nuts or glass insulated nickel wires
* Where specified, units can be provided liquid tight
* Basic design readily adaptable to a wide variety of special requirements, sizes or ratings.

INSTALLATION

Holes in metal blocks for cartridge installation should be drilled and reamed to listed sizes.

Finished units are sufficiently undersized to provide a slip installation, when expanded by heat, the cartridge will fit snugly to give maximum heat transfer. If air gaps are permitted, due to rough drilling or improper sizing of the bore, ‘hot spots’ on the sheath surface will result in deterioration of the heater. Bore holes must also be free from oil to avoid heater contamination, which can also shorten heater lifespan.

MOUNTING AND EXTRACTION

Heaters can be fitted with flanged or tab mounting lugs to hold the heater firmly in place and lead wires should be supported when in a moving die or platen. Lugs also assist heater removal.

REMOVAL OF UNITS

To facilitate easy removal, where possible it is recommended that a knock-out hole be provided at the back of the bore.

CONTROL POSITION

To prevent overheating when using units rated at a maximum watt density, it is recommended that the control point be located within 12mm (1/2”) of the ‘HOTROD’ unit.

CARTRIDGE HEATERS

HOTCO 'HOTROD' PRECISION HEATERS
STANDARD WATT DENSITY TYPE

240 VOLTS, MAXIMUM WATT DENSITY 62Kw/m2 (40 w/in2)

METRIC RANGE

CM16806	10mmD x 50mmL reamed hole 240V 70W
CM16821	10mmD x 60mmL reamed hole 240V 90W
CM16823	10mmD x 80mmL reamed hole 240V 130W
CM16824	10mmD x 90mmL reamed hole 240V 150W
CM16808	10mmD x 100mmL reamed hole 240V 170W
CM16809	10mmD x 125mmL reamed hole 240V 220W
CM16825	10mmD x 175mmL reamed hole 240V 320W
CM16811	10mmD x 200mmL reamed hole 240V 360W
CM16827	10mmD x 275mmL reamed hole 240V 510W
CM16828	10mmD x 300mmL reamed hole 240V 560W
CM17556	12mmD x 90mmL reamed hole 240V 180W
CM17557	12mmD x 100mmL reamed hole 240V 200W
CM17560	12mmD x 175mmL reamed hole 240V 380W
CM17563	12mmD x 250mmL reamed hole 240V 550W
CM17564	12mmD x 275mmL reamed hole 240V 610W
CM17566	16mmD x 50mmL reamed hole 240V 120W
CM17573	16mmD x 125mmL reamed hole 240V 350W
CM17575	16mmD x 175mmL reamed hole 240V 510W
CM17576	16mmD x 200mmL reamed hole 240V 580W

IMPERIAL RANGE

CM6021	3/8"D x 1.5"L reamed hole 120V 50W
CM13083	3/8"D x 2"L reamed hole 240V 70W
CM10487	3/8"D x 2.5"L reamed hole 240V 90W
CM6061	3/8"D x 3.5"L reamed hole 240V 140W
CM14447	3/8"D x 4"L reamed hole 240V 160W
CM5766	/8"D x 5"L reamed hole 240V 210W
CM10940	3/8"D x 6"L reamed hole 240V 260W
CM13082	1/2"D x 2"L reamed hole 240V 90W
CM12400	1/2"D x 2.5"L reamed hole 240V 130W
CM10105	1/2"D x 3"L reamed hole 240V 160W
CM6066	1/2"D x 3.5"L reamed hole 240V 190W
CM8608	1/2"D x 4"L reamed hole 240V 220W
CM6067	1/2"D x 4.5"L reamed hole 240V 250W
CM6299	1/2"D x 5"L reamed hole 240V 280W
CM6068	1/2"D x 5.5"L reamed hole 240V 310W
CM14725	1/2"D x 6"L reamed hole 240V 350W
CM10981	1/2"D x 7"L reamed hole 240V 410W
CM14865	1/2"D x 8"L reamed hole 240V 470W
CM6020	1/2"D x 10"L reamed hole 240V 600W
CM5350	1/2"D x 12"L reamed hole 240V 720W
CM10757	5/8"D x 4"L reamed hole 240V 270W
CM14567	5/8"D x 5"L reamed hole 240V 350W
CM10942	5/8"D x 6"L reamed hole 240V 430W
CM10977	5/8"D x 8"L reamed hole 240V 590W
CM6298	5/8"D x 9"L reamed hole 240V 670W
CM10807	5/8"D x 10"L reamed hole 240V 750W
CM6023	5/8"D x 12"L reamed hole 240V 900W

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CARTRIDGE HEATERS

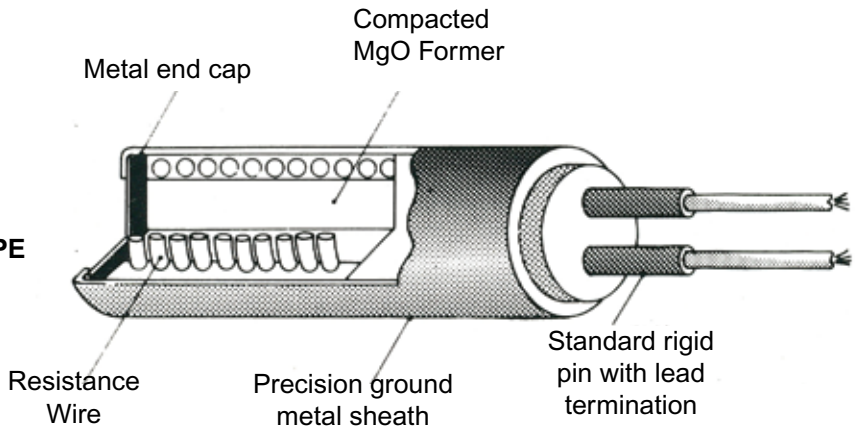
RED HOTRODS - HIGH WATT DENSITY

The efficiency of a sheathed electric heating element is determined by the rate at which the heat developed in the resistance wire can be dissipated from the surface to the sheath.

Employing this principle, the RED HOTROD cartridge unit is of special construction in which the resistance wire is positioned in close proximity to the sheath and insulated by a high grade mineral insulating material which is compacted to rock-like hardness.

GENERAL CONSTRUCTION

RED HOTROD
HIGH DENSITY
COMPACTED TYPE



SIZE AVAILABILITY

These units are available in both imperial and metric diameters, as shown on page 23.

TOLERANCES

Diameters
+0, -0.04". Lengths +- 3mm (1/8")

Wattages
+ - 5%

Heated Surface Length
Sheath length minus 16mm (0.025")

Sheath Material
The REDHOT ROD is manufactured with a stainless steel sheath allowing for continued operation at elevated temperatures.

Lead Wires
Standard length is 250mm (10") of double fibreglass covered stranded nickel wire.

SPECIAL FEATURES

Consult our technicians with complete application details for information regarding:

1. Special terminal assemblies
2. End opposite leads can be sealed
3. Intermediate lengths or ratings, other than those listed

ORDERING

Please specify: diameter, length, voltage, wattage, lead lengths and any special requirements.

CARTRIDGE HEATERS

RED HOT RODS

IMPORTANCE OF CONTACT SURFACE

In selecting a REDHOT ROD unit for a special application it is essential to realise that a good contact surface and provision of a sensing control medium positioned correctly, determine the capacity and type of the unit required. The surface of each RED HOTROD is machined to close specificiations and, since a good heater depends upon the accuracy of fit between the heat and the material being heated, it is imperative to ensure that holes are reamed to exact size and smoothness. This becomes increasingly important with high temperatures and watt densities.

TEMPERATURE CONTROL

It is recommended that a temperature control medium will be used in conjunction with RED HOTROD cartridge heaters. The control point should be located within 12mm (1/2") of the heater to ensure maximum life, particularly when operating at high watt densities and elevated temperatures.

RED HOTROD CARTRIDGE HEATERS.
240V VOLTS, MAXIMUM WATT DENSITY 155 kW^2 (100 w/in.2)

IMPERIAL HI-DENSITY CARTRIDGES

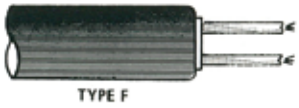
CM21954	1/4"D x 1.5"L reamed hole 230V 160W
CM23254	1/4"D x 1.5"L reamed hole 230V 200W
CM21955	1/4"D x 2"L reamed hole 230V 200W
CM21956	1/4"D x 2.5"L reamed hole 230V 250W
CM21957	1/4"D x 3"L reamed hole 230V 300W
CM21958	1/4"D x 4"L reamed hole 230V 350W
CM22737	3/8"D x 1.5"L reamed hole 230V 100W
CM21962	3/8"D x 1.5"L reamed hole 230V 200W
CM23079	3/8"D x 2"L reamed hole 230V 160W
CM21963	3/8"D x 2"L reamed hole 230V 250W
CM23880	3/8"D x 2.5"L reamed hole 230V 180W
CM21964	3/8"D x 2.5"L reamed hole 230V 350W
CM23255	3/8"D x 3"L reamed hole 230V 250W
CM21965	3/8"D x 3"L reamed hole 230V 400W
CM23080	3/8"D x 4"L reamed hole 230V 350W
CM21966	3/8"D x 4"L reamed hole 230V 500W
CM23256	3/8"D x 5"L reamed hole 230V 500W
CM21967	3/8"D x 5"L reamed hole 230V 750W
CM23081	3/8"D x 6"L reamed hole 230V 500W
CM21968	3/8"D x 6"L reamed hole 230V 750W
CM21969	3/8"D x 6.5"L reamed hole 230V 630W
CM21973	1/2"D x 1.5"L reamed hole 230V 250W
CM21974	1/2"D x 2"L reamed hole 230V 300W
CM21975	1/2"D x 2.5"L reamed hole 230V 400W
CM21976	1/2"D x 3"L reamed hole 230V 500W
CM23082	1/2"D x 4"L reamed hole 230V 500W
CM21977	1/2"D x 4"L reamed hole 230V 630W
CM23260	1/2"D x 5"L reamed hole 230V 600W
CM21978	1/2"D x 5"L reamed hole 230V 750W
CM22437	1/2"D x 6"L reamed hole 230V 600W
CM22741	1/2"D x 6"L reamed hole 230V 800W
CM21979	1/2"D x 6"L reamed hole 230V 1000W
CM23263	1/2"D x 6.5"L reamed hole 230V 500W
CM22738	1/2"D x 7"L reamed hole 230V 1000W
CM23257	1/2"D x 8"L reamed hole 230V 1000W
CM21980	1/2"D x 8"L reamed hole 230V 1500W
CM22739	1/2"D x 9"L reamed hole 230V 1000W
CM23258	1/2"D x 10"L reamed hole 230V 1000W
CM21981	1/2"D x 10"L reamed hole 230V 1500W
CM23259	1/2"D x 12"L reamed hole 230V 1500W
CM21982	1/2"D x 12"L reamed hole 230V 2000W
CM23261	1/2"D x 14"L reamed hole 230V 1200W
CM21986	5/8"D x 1.5"L reamed hole 230V 315W
CM21987	5/8"D x 2"L reamed hole 230V 400W
CM23262	5/8"D x 2.5"L reamed hole 230V 250W
CM21988	5/8"D x 2.5"L reamed hole 230V 400W
CM21989	5/8"D x 3"L reamed hole 230V 500W
CM21990	5/8"D x 4"L reamed hole 230V 600W
CM21991	5/8"D x 5"L reamed hole 230V 750W
CM21992	5/8"D x 6"L reamed hole 230V 1000W
CM21993	5/8"D x 7"L reamed hole 230V 1000W
CM21994	5/8"D x 8"L reamed hole 230V 1250W
CM22740	5/8"D x 9"L reamed hole 230V 1250W
CM21995	5/8"D x 10"L reamed hole 230V 2000W
CM21996	5/8"D x 12"L reamed hole 230V 1800W

CARTRIDGE HEATERS

AVAILABLE LEADS AND TERMINAL CONSTRUCTION

STANDARD TYPE F

Flexible nickel wire leads, double glass insulated and Silicone varnished. Available on all diameters.

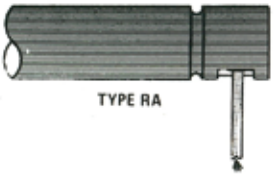


SPECIAL CONSTRUCTION TYPE S

Steel screw and nut connections. Available on units min. diameter 20 mm (1”).

TYPE R.A.

Right angle leads for use on units where straight leads are unsuitable.



TYPE B.W.

Ceramic beaded, solid, or flexible heat resisting nickel condurctors can be supplied for hight temperature applications. Avaible on all diameters. Specify exact requirements.

ABRASION PROTECTION

To protect lead wires against abrasion or mechanical damage, a flexible conduit can be securely fitted to cartridge unit sheath.

This also provides a high safety factor where lead wires are exposed to operator.

MOISTURE PROOFING AND HERMETIC SEALING

Certain operations such as high humidity, prescence of vapours, free oil, wax, or plastics, require that units be sealed. This can be achieved by silver soldering or welding bottom end of unit and similarly attaching to terminal ends a solid or flexible liquid proof tubing. Another method is to employ a silicone rubber seal (where temperature conditions permit) at lead end of unit. Alternatively, for temperatures above 200 ^{o} C (400 ^{o} F) a glass or ceramic to metal seal may be used.

TERMINATION OF SPECIAL DESIGN CAN BE SUPPLIED UPON REQUEST.

NOTE: AS SEALING OF HOTROD UNITS IS A SPECIAL FEATURE, AND CAN ONLY BE CARRIED OUT DURING MANUFACTURE, IT IS ADVISABLE TO CONSULT FACTORY FOR RECOMMENDATION.

GENERAL ORDERING INFORMATION

SPECIFY

Diameter, Volts, Watts, Sheath length and Material, Type of terminal or lead construction, Length of leads.

TOLERANCES

Diameter tolerances are +0.000 - .10 mm (0.004”) for any given size. This sizing is maintained so that units are a slide fit into a standard reamed hole. Thermal action will expand unit to a snug fit for best heat conduction.

Length tolerances are ± 1.6 mm (1/16”) wattage to tolerances are held to ± 5% at voltage specified.

Heated Length is sheath length minus 10 mm (3/8”) from connection end.

SELECTION

Generally in selecting cartridge heaters it is necessary to ensure that the element sheath temperature does not exceed its designed maximum limitation. For a low temperature application choose a unit with a higher watt denisty rating than selected for high temperature application.

HOT ROD SPECIAL UNITS AND APPLICATION (see immersion units Page 10.)