CERAMIC
BAND HEATERS

APPLICATIONS

Injection Molding, Blow Molding, Extruders, Laboratory Equipments,
Rubber Industry & Various Other Plastic Processing Machinery.

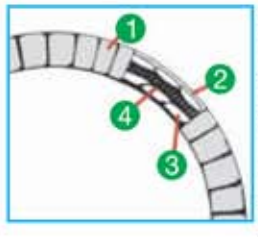
3 CONSTRUCTION STYLES TO CHOOSE FROM

PHP QUALITY CONSTRUCTION with Power packed features

Available in SS Sheathing with Power Saving Options.
Conserves Energy with Improved Heating Efficiency.
Upto 55 Watts per square inch.
Special High Grade Steatite Insulators for Superior Thermal Conductivity.
Designed for Higher Temperature up to 650 Deg C.
Engineered for Longer life with Superior quality Nichrome wire for Uniform Temperature & Maximum Amperage carrying capacity.
Efficient Heat Transfer even on irregular surfaces in comparison to Mica Band.
Robust Terminal Junction with Specially Designed Protection Cap.
Available in Various Lead Terminations & Clamping.
Expandable to fit around the Barrel O.D. Easy installation and removal.
Reduces Down time for replacements.
Power Saving up to 30%

PREMIUM HEAT CONSTRUCTION

Suggested Watt Density 35 to 40 watts/sq. in
SS 304 Sheathing with 4mm thick Heat saving Thermal insulation.
Single Piece Construction.
500 mm long Insulated Metal Braided Flexible Leads.
Allen Key Barrel Nut clamping with Terminal Protection Box.
Total wall thickness 12mm (approx.)
Min Requirement : I.D. 60mm width 35mm



Standard Features for all PREMIUM HEAT Ceramic Heater bands:
1. Stainless Steel (304) sheathing. Stainless Steel housing with serrated edges provides maximum flexibility for ease of installation.
2.Thermal insulation. Built-In heat saving Thermal Insulation standard (4mm) on all Ceramic Bands –"Premium Heat" will reduce power consumption. Further reduction can be obtained by using power saver and power saver plus.
3. High Grade Ceramic Insulators. Interlocking Steatite bricks designed for best combination of physical & dielectric strength, good thermal conductivity to heat cylindrical parts, good for sheath temperature upto 650 Deg C. provides flexibility for ease of installation on the barrel.
4. Ni-chrome Heating coil. Helically wound superior quality (60/16 , 80/20) Nickel-Chrome resistance wire designed for maximum current carrying capacity is strung through specially designed ceramic insulating bricks providing even heat distribution, thus eliminating hot spotting that can cause premature heater failure.

POWER SAVER CONSTRUCTION

Suggested Watt Density 40 to 45 watts/sq in.
SS 304 Sheathed with 16mm thick Twin Insulated Cover
Single Piece Construction
500 mm long insulated Metal Braided Flexible Leads
Allen Key Barrel Nut clamping with Terminal Protection Box
Total Wall thickness : 25 mm (approx.)
Min requirement : Dia 75mm, Width 75mm

To meet the increasing demand to conserve energy by reducing power consumption, PHP has engineered an Exclusive design with Twin Thermal Insulation which helps increase lower the external sheath temp by 40-50%. The built in insulation (as shown in sketch) which not only helps minimize heat dissipation but also produce a better working atmosphere. For eg ; If the Inside surface temp is approx 280 deg C then the outer Sheath Temp will be approx 145 Deg C.

Standard Feature for all POWER SAVER Ceramic Heater bands:

1. Stainless Steel (304) sheathing.Stainless Steel housing with serrated edges provides maximum flexibility for ease of installation.

2. Thermal insulation In addition to the Built-In 4mm thick heat saving insulation an extra 12mm thick flexible insulation is affixed on the external sheath to reduce power consumption. Further reduction can be obtained by using "POWER SAVER PLUS"

3. High Grade Ceramic Insulators. Interlocking Steatite bricks designed for best combination of physical & dielectric strength, good thermal conductivity to heat cylindrical parts, good for sheath temperature upto 650 Deg C. provides flexibility for ease of installation on the barrel.

4. Nickel-chrome heating coil - Helically wound Nickel-Chrome resistance wire designed for maximum current carrying capacity is strung through specially designed ceramic insulating bricks providing even heat distribution, thus eliminating hot spotting that can cause premature heater failure.

POWER SAVER PLUS CONSTRUCTION

Suggested Watt Density 50 to 55 watts/sq in.

SS 304 Sheathed with Heat Optimizing Insulated Cover

Single Piece Construction

500 mm long insulated Metal Braided Flexible Leads

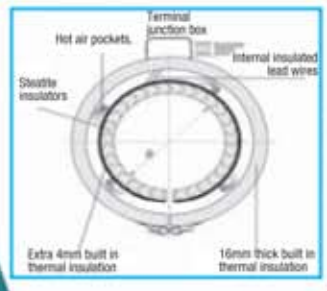
Allen Key Barrel Nut clamping with Terminal Protection Box

Total Wall thickness : 45mm (approx.)

Min requirement : I.D.-100mm, Width-100mm

PHP has engineered a Robust Design to meet the increasing demand for Improved Heating Efficiency, Faster Productivity and at the same time Conserve's Energy by Reducing Power Consumption.

Based on the principle of radiation, conduction & convection this exclusive design comes with an Additional External HEAT OPTIMIZING Thermal Insulation apart from the Standard built in 4mm thick Insulation. The heat generated will remain inside the gap between the heater and the Additional insulation (as shown in sketch) which not only helps conserves energy up to 30% and MORE but also helps minimize heat dissipation & lowers the external sheath temp by 60-70% dramatically improving the working atmosphere. For eg ; If the Inside surface temp is appx 280 deg C then the outer Sheath Temp will be appx 95 Deg C. in comparison to other Ceramic Heater Bands.



Standard Feature for all POWER SAVER PLUS Ceramic Heater bands:

1. Stainless Steel (304) sheathing. Stainless Steel inner housing as well as External Insulated housing with serrated edges provides maximum flexibility for ease of installation.

2. Additional Heat Optimizing Thermal insulation: Apart from the in built 4mm Insulation A Special Additional HEAT OPTIMIZING Thermal Insulation (16mm) along with an AIR POCKET which preserves the heat inside producing a uniform hot air layer between the Heater & the outer Insulation (as shown in sketch above) This helps reduce power consumption upto 30% AND MORE (subject to working conditions) & prevents heat loss thereby lowering energy costs, improves Heating Efficiency for faster productivity and simultaneously also helps improve working atmosphere.

3. High Grade Ceramic Insulators. Interlocking Steatite bricks designed for best combination of physical & dielectric strength, good thermal conductivity to heat cylindrical parts, good for sheath temperature upto 650 Deg C. provides flexibility for ease of installation on the barrel.

4. Nickel-chrome heating coil - Helically wound Nickel-Chrome resistance wire designed for maximum current carrying capacity is strung through specially Designed ceramic insulating bricks providing even heat distribution, thus eliminating hot spotting that can cause premature heater failure.

Steel Terminal Box Construction

SS 304 Terminal Box with Screw Post Terminals & 10" Cable Steel screw terminals connected to solid Brass/nickel pins designed for max Amp capacity.

STANDARD FEATURES

Terminal Junction Box.

A Specially Designed Robust Stainless Steel Terminal Junction box, (for Heater ID 100mm & above) with Hot Air Ventilators is as Std feature in all Ceramic bands that offers safety & excellent protection to exposed terminals against hazards. To simplify electrical wiring, the box has Fibre Glass Insulated - Metal Braided flexible cable mounted on Steel screw terminals connected to solid Brass bars/ nickel wire designed to provide maximum amperage carrying capacity.

Other Options available.

2PIN Male Plug Recommended up to 10 amps / 2250 W. 2. Screw Post terminals.

CLAMPING

Inner SS Sheath Protection Lining

Robust Clamping: Specially designed mounting brackets with M-6 x 45mm socket cap screw are used to securely draw the heating element assembly against the cylinder evenly & tightly across its entire width, located at 180°C from the screw terminals.
Allen Key Barrel Nut Std. size M6 x 45mm

OPTIONAL FITTINGS & ACCESSORIES

(subject to dimensional restrictions)

To avoid contamination with the element & also provide even heat transfer on to the cylinders, inner SS sheathed Protection sleeve can be provided at an extra cost if required.

Perforated Outer sheathing for heat ventilation.

TWO PIECE CONSTRUCTION

Available on any screw and lead termination or clamping variation.
Two piece band heaters are normally rated at half the total wattage & full line voltage.

HOW TO ORDER

Specify - Model(type of construction), Inner Diameter, Width, Watts, Volts, Model, Type of Clamping, Type of terminal & location, Size & Location of thermocouple holes & "U" slots (if any), Wattage and voltage on 2 piece (per half), Inner Protection sleeve (if required), Quantity.

You can also log on to www.phpheat.com and order online.

IMP: In case of "U" Slots & more than one Thermocouple / Mounting holes, please provide dimensional sketch.

TECHNICAL DATA

Sheath material:	Stainless Steel 304
Insulators :	High Grade Steatite Ceramic Insulators (High Temperature)
Heat Saving Thermal Insulation:	Ceramic Fibre (std.)
Heating Elements (coil):	NiCr 60:16, NiCr 80:20
Nominal Wall Thickness:	Premium Heat: 12mm Power Saver: 25mm Power Saver PLUS: 45mm
Connection:	Fiber Glass Insulated- Metal Braided Flexible Cable (std. 500mm long) mounted on rigid screw post terminals
Voltage Range:	110V - 440V
Surface Loading:	35-55W / In^2 (depending upon model & application)
Power Rating:	Depending upon application
Power Tolerance:	± 10%
HV Testing:	1.5 Kv between heating element and sheath
Insulation Resistance (Cold):	< 20 M Ohms
Sheath Temperature:	Upto 650°C maximum (SS sheath)
Gap Between the Clamping Edge :	5 – 10mm.
Resistance:	+/- 10%
Width :	Minimum 35mm and there after multiples of 15mm. Minimum 75mm in case of Power saver & 100mm for Power Saver PLUS
Inner Diameter :	Minimum 60mm in case of Premium 75mm in case of Power saver & 100mm for Power Saver PLUS

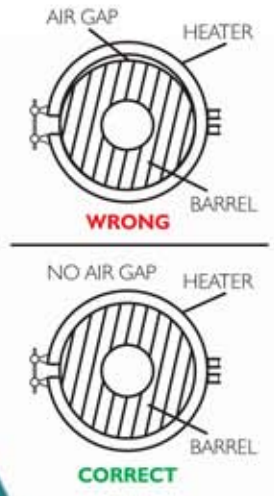
MICA BAND HEATERS: Precautions & Installation

1. Incorrect wiring and loose contacts leads to sparks resulting in fire or heater failure. Keep all electrical connections properly protected to avoid electrical hazards to machine operators. **2.** Use of voltage stabilizers and circuit breakers ensures smooth supply of voltage to heaters resulting a longer life. **3.** Ensure that the junction box is technically engineered to withstand the ampere load as well as the shocks and jerks due to movements. Appropriate connection leads (insulated) to withstand the required ampere load also reduce the risk of heater failure. **4.** Improper installation of heaters on the barrel (lose fitting) that leads to hot spots. Band & Strip heaters are designed for contact heating & therefore must be tightly clamped to the object to be heated. The reason for this is that, as the heater heats up, it expands away from the surface to be heated causing air gaps resulting to poor heat transfer. Care should be taken to see that the heaters are placed squarely against the surface to be heated. In case of ceramic band heaters, take up all the slack by tightening outer housing until the serrated edges are firm and get uniform in contact with the cylinder. Do not over tighten where the edges begin to collapse which decrease the insulation value. **5.** Ensure that the terminals are well insulated and protected since the heater terminals are prone to attracting moisture. Combustable gases & vapours also leads to deposits of carbon on the terminals resulting in failure of heaters. **6.** Raw materials (polymers) spilling on the terminals & contamination (oil/grease) penetrating into the windings of the heaters. Prior to installation, the surface of the cylinder must be cleaned & should be free of all contamination that might liquefy under heat and penetrate into the windings thereby carbonizes & becomes conductive. The smallest amount of contamination can cause electrical shorts and result to heater failure.
7. Overheating that leads the heater to operate beyond the max capacity can be a cause for destroying an entire heating zone. **8.** Defective temperature sensors and controllers. Choose the correct type of heaters , ie: Mica Insulated Band Heaters for applications upto max 400°C. The wattage should be calculated as close as possible to operating wattage to minimize on-off cycle resulting to power saving. Ensure that the tips of the sensors (Thermocouples) are clean and free from any contamination and should be checked for good response to temperature changes.9. Use of substandard raw materials & manufacturing defects is also one of the common cause of heater failure.

CERAMIC BAND HEATERS: Precautions & Installation

1. Reduce the amount of narrow or two piece bands, Ceramic Bands are very flexible & can be made in large widths and one piece construction for easy installation, eliminating heat losses between narrow bands & sharply reducing costly labour in installation. **2.** Calculated wattage should be as close as possible to operating wattage to minimize on-off cycling. **3.** When replacing any other type of non-insulated band heater with PHP Ceramic Band Heaters, you can decrease your total operating wattage by approximately 25%. **4.** To prevent overheating & heater failure, adequate temperature controls should be installed. Thermocouples must be kept free of contaminations and checked for good response to temperature changes. A bad thermocouple can be the cause for destroying an entire heating zone. For selecting temperature controls and thermocouples, PHP offers technical assistance for best results. **5.** Avoid using heaters in an atmosphere containing combustible gases or vapours. **6.** Prior to installation, the surface of the cylinder must be clean and free of all contamination. During operation, the band heaters and cylinder surfaces must be kept free of all contamination that might liquify under heat and find their way into the windings, carbonising and becoming conductive. The least amount of contamination can cause electrical shorts, creating heater failure. **7.** Take up all the slak by tightening the low thermal expansion outer housing until the serrated edges become firmly in direct contact with the cylinder. A raw hide mallet can be used to lightly tap the outer edges only to get uniform contact. As you tighten the clamping screw, do not over tighten, as to the point where the serrated edges begin to collapse and thrust outwards. At this point, you are compressing the ceramic insulation & decreasing its insulation values. **8.** Keep all electrical connections properly protected to avoid electrical hazards to machine operators. Exposed live parts are in direct violation of safety electrical codes. **9.** Never perform any type of service on heaters prior to disconnecting all electrical power. **10.** Electrical wiring on band heaters or any other type of heaters should be done by a qualified person complying with local electrical codes. Incorrect wiring is common cause in heater burn-out.

How to install



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Our heaters can now be ordered online. Log on today!