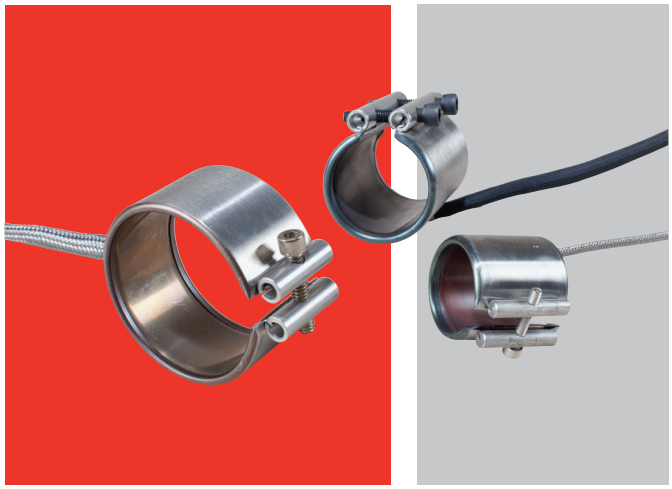
Nozzle Heaters

Mineral Insulated (MI) Nozzle Heaters



The mineral insulated (MI) nozzle heater is a high-performance heater that incorporates Watlow's exclusive mineral insulation technology. This material offers much higher thermal conductivity than mica and hard ceramic insulators that are used in conventional heaters.

A thin layer of the high thermal conductive MI material electrically insulates the element wire from the inside diameter of the heater sheath. A thicker, low thermal conductivity layer backs up the element wire, directing the heat inward toward the heated part. The result is more efficient heat transfer—a performance solution that lowers element wire temperatures and increases heater life.

Performance Capabilities

- Heater operating temperatures up to 1400°F (760°C)
- Watt densities up to 230 W/in^2 (35.6 W/cm^2) are available on small diameter nozzle nozzles
- Maximum voltage up to 240V

Typical Applications

- Extruders
- Blown film dies
- Injection molding machines
- Other cylinder heating applications

Features and Benefits

Operating temperatures up to 1400°F (760°C)

- Melts resins such as PEEK®, Teflon®, Ultem® and Zytel® safely

Higher watt densities

- Contributes to faster heat-up and throughput for increased productivity

High thermal conductivity of MI and low mass construction

- Provides an almost instant response to temperature control
- Eliminates thermal lag and temperature overshoot

Stainless steel cover and side fold design

- Resists contamination by overflow of plastic or other free-flowing materials

Permanently attached clamp bars

- Eliminates cumbersome clamping straps to ease installation

WATLOW®
Better Thermal Solutions...*Faster*

STL-MIN-0611

Applications and Technical Data

General Limitations

- Maximum width of 1 in. (25 mm) diameter heater is 1½ in. wide (38 mm).
- Maximum heater width: 2x heater diameter
- Minimum I.D. for Type B, C, E and H leads: 1 in. (25 mm)
- Minimum I.D. for Type B—90° leads: 1⅛ in. (28.6 mm)
- Maximum lead amperes: 12.5A per pair
- SLE maximum: 17.0A
- Maximum amperes (post terminals): 30A per pair
- Minimum diameter and width for SLE: 4 in. x 1½ in. (102 x 38 mm) width
- 90° leads not available over 250VAC
- Minimum I.D. for post terminals: 1¼ in. (32 mm)

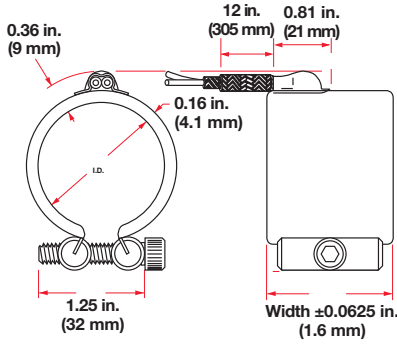
Gaps

- ≤ 3 in. = ⅛ in. nominal
- 3 in. ≤ 6 in. = ¼ in. nominal ±⅛ in.
- 6 in. ≤14 in. = ⅜ in. nominal ±⅛ in.
- >14 in. = ½ in. nominal ±¼ in.

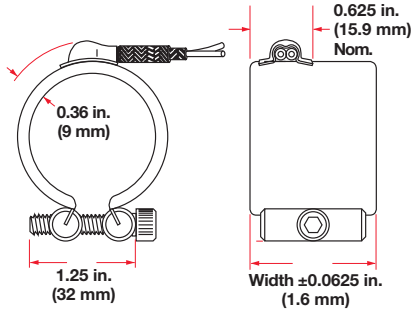
Termination Variations

Leads Type B, Type B - 90° rotation, Type B - 180° rotation or Type C: Two fiberglass-insulated lead wires exit in a single metal braid for good abrasion protection, lead flexibility and wiring convenience. Leads are 2 in. (51 mm) longer than braid and are shipped with 12 in. (305 mm) leads, unless a longer length is specified. To order, specify **type** and **length.**

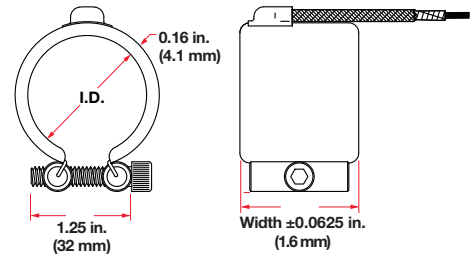
Type B
Stock



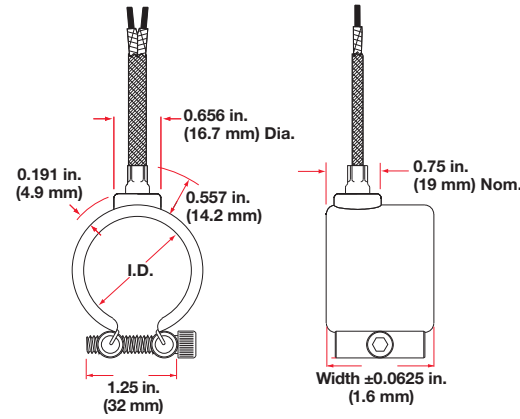
Type B—90° Rotation
Non-Stock



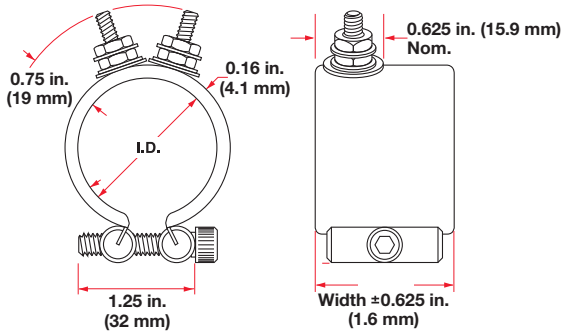
Type B - 180° Rotation
Stock



Type C
Stock



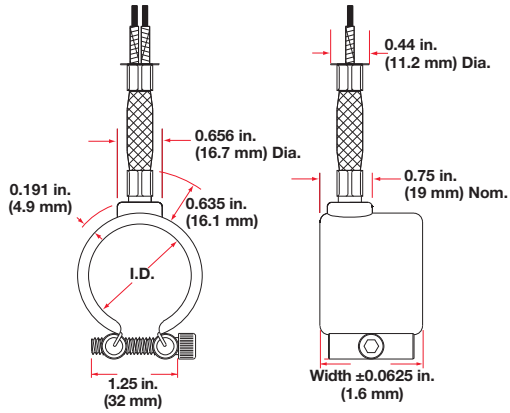
Post Terminals
Stock



Post terminals provide optimum connections. Screw thread is 10-24. To order, specify **post terminals** (metric threads are available).

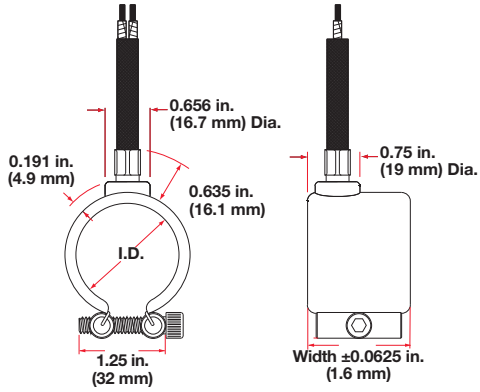
Termination Variations *(Continued)*

Type E
Stock



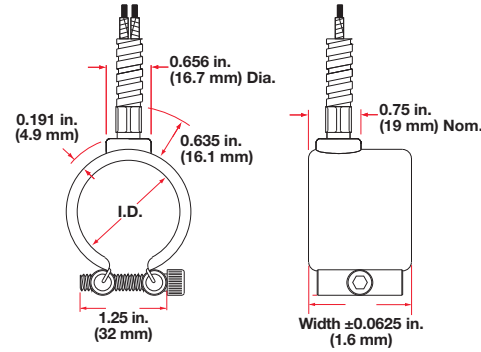
Type E: A loose metal braid encloses two fiberglass leads providing good abrasion protection, lead flexibility and wiring convenience. Leads are 2 in. (51 mm) longer than the braid and are shipped with 12 in. (305 mm) leads, unless a longer length is specified. To order, specify **Type E** and **length.**

Type F
Stock



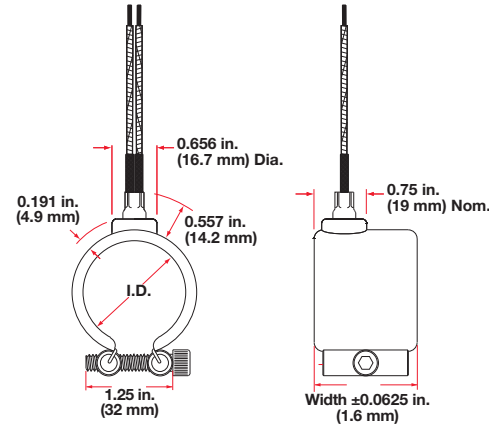
Type F: A loose fiberglass sleeving encloses two fiberglass leads for additional insulation protection where high temperature or minor abrasion is present. Leads are 2 in. (51 mm) longer than the sleeving. To order, specify **Type F** and **length**.

Type H
Stock



Type H: A flexible steel hose encloses the leads for maximum abrasion protection. Leads are 2 in. (51 mm) longer than the hose and are shipped with 12 in. (305 mm) leads, unless a longer length is specified. To order, specify **Type H** and **length.**

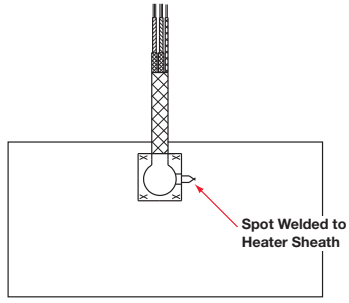
Type K
Stock



Type K: Flexible lead wires exit vertically from the heater and can be bent adjacent to the heater for a quick, easy connection. To order, specify **Type K** and **length**.

Variations

Thermocouple



ASTM Type J or K thermocouples are available on lead Type B with loose braid and fiberglass sleeving. They are also available on E, F and H leads. The thermocouple junction, spot-welded to the heater sheath provides a signal for measuring relative heater temperature. A separate thermocouple is available.

Lead Wire

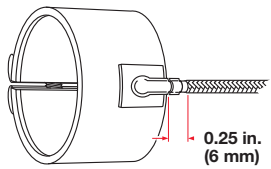
Heaters rated at less than 250VAC use UL® approved lead insulation for operations to 480°F (250°C) as standard. Lead insulation UL® rated for operation up to 840°F (450°C) is available for high-temperature applications where leads are shrouded or enclosed with the heater. These leads are available in any of the Type B variations with loose braid as well as with Types E, F and H lead configurations. All heaters rated at more than 250VAC use this wire. When ordering, specify **850°F (450˚C) wire.**

Ground Wire

Contact a Watlow representative for information on ordering insulated ground wire.

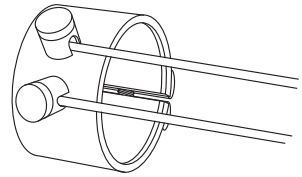
Variations *(Continued)*

Heavy Duty Strain Relief



Heavy duty strain relief is recommended for applications where there is great stress or continued flexing of the leads. Strain relief is available on Type B, Type B—90° and Type B—180° leads only. To order, specify **heavy-duty strain relief. Note:** not available with loose braid or fiberglass sleeving.

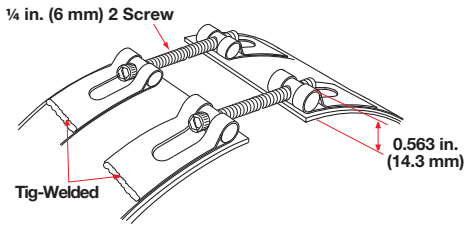
Ceramic Terminal Cover



Ceramic covers, with openings for leads, are screwed on to post terminals, providing a convenient, economical insulator. To order, specify code number **Z-4918** and **quantity.** For metric sizes, specify the thread. **Note:** Ceramic terminal covers will not fit onto some stock expandable MI nozzles. Contact a Watlow representative for more information.

Clamping Variations

Tig-Welded Barrel Nuts

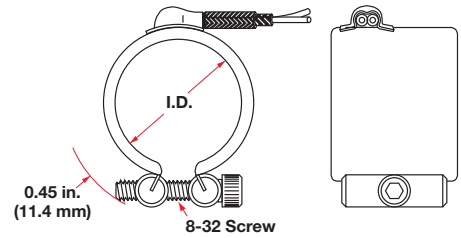


Tig-welded barrel nuts provide access for instrumentation by specifying an oversized gap between the heater ends. If the clamp bar screw interferes with the positioning of the instrumentation device, welded barrel nuts are recommended (tig-welded barrel nuts are standard on 1 in. [25 mm] wide MI nozzle heaters). Specify **tig-welded barrel nuts** and **gap dimension** when ordering.

Low-Profile Tig-Welded Barrel Nuts

Low-profile barrel nuts are available on all widths and provide a clearance of 0.470 in. (12 mm). However, this value can be higher depending on how far the clamp screw extends past the barrel nut. To order, specify **low-profile tig-welded barrel nuts**.

Low-Profile Clamp Bars



Low-profile clamp bars are available on both 1 in. (25 mm) and 1½-in. (38 mm) wide heaters. For wider widths, contact your Watlow representative. Low-profile clamping on diameters and widths greater than 3 in. (76 mm) is not recommended. The bars are ¼ in. (6 mm) diameter with an 8-32 screw. To order, specify **low-profile clamp bars.**

To be automatically connected to the nearest North American Technical Sales Office:

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