



Cast-in Heaters Installation Recommendations

INSTALLATION

1. Allow adequate space for thermal expansion when mounting. The required space depends on the Cast-In Heater size, operating temperature and alloy. We recommend minimum ½in (12mm) space.
2. The contact surface being heated must be free of any foreign materials and have a smooth finish.
3. Half round Castings are machined as matched pairs and numbers are stamped on the edge. We strongly recommend installing matched pairs on the barrel.
4. Heat transfer paste or any chemical substances are not recommended for machined and smooth barrel surfaces.
5. Make sure that the casting is properly seated. The clamping devices used should be tightened down to the correct recommended torque. After initial heat-up, retighten fasteners to the correct recommended torque. Recommended Torque: 10N.m for M8 & M10 bolts.
6. Thermal insulation can be used to reduce heat losses and increase efficiency.
7. Avoid mounting heaters in an atmosphere containing combustible gases and vapors unless specifically manufactured for use in such conditions.
8. Liquid Cooled Cast-In Heater fittings must be securely tightened to prevent leaks and tested before use.
9. To prevent overheating and heater

failure, the use of an adequate temperature control is highly recommended.

WIRING

1. For connections at the heater terminals, use high temperature nickel conductor or nickel clad copper lead wire or alloy bus bar. Keep all electrical connections properly protected to eliminate electric shock to machine operators.
2. Always have a qualified electrician perform all wiring and connection of heaters and control components. Terminals must be tightened to the correct torque. Nuts or screws on the terminals should not be tightened more than necessary. Recommended torque is 2N.m.
3. Heater installations must be properly grounded to eliminate electric shock hazard, and wiring must comply with electrical safety codes.
4. If the cast-in heater includes a thermocouple, according to its color-coded leads, it should be properly wired to the temperature controller. Thermocouple wires should not be mistaken with power wires of the heater.
5. Exposed electrical wiring on cast-in heater installation is a violation of Electrical safety codes.
6. Castings are not designed to be lifted or carried by the terminations, leads or connectors.



OPERATION

Important: Do not allow moisture to accumulate in the terminals or enclosure. Moisture could lead to electrical shorts! This could result in a fire, damaged equipment or injury.

To prevent moisture accumulation in cryogenic applications or when the heater is exposed to freezing temperatures:

- A. Slope conduit away from enclosure (drip loop).
- B. Seal all conduit openings to moisture/explosion resistant terminal enclosure.
- C. Insulate terminal enclosure.

Moisture accumulation in the element refractory material, element over-temperature, or sheath corrosion can cause ground fault to the element sheath, generating arcing and molten metal. Make sure that grounding is properly made.

1. It is recommended to slow(soft) start the process during first initial use after shutting down system.
2. Do not operate above rated voltage. Excess voltage will result in heater failure in short time.
3. Do not operate Cast-In Heaters above recommended temperatures. Heater temperature must be monitored and controlled. Use of over-temperature T/C is strongly recommended for higher temperature applications. Excess temperatures will result in heater failure and/or melting and damage nearby components.
4. Electrical terminals must be kept free of contaminants, as spillage of plastic, water, oils, and their vapors can cause

5. electric shorts, resulting in heater failure. The water used on Liquid Cooled Cast-In Heaters must be properly treated. Hard water contains corrosive media that will contaminate the tubing, producing stress corrosion cracks and resulting in shorter heater life. Presence of minerals in water can cause clogged tubes that can result in poor heat transfer and eventually heater failure.
6. **Low Megohm Condition** — The refractory material used in electric heaters may absorb moisture during transit, storage or when subject to humid environments that will reduce the cold insulation resistance (low megohm). Low megohm may result in high leakage current to ground and nuisance trips of ground fault protection equipment. Normally, the megohm value increases after heat-up. Typical insulation values are 5 megohm or greater on complete assemblies of unsealed elements. It is recommended that heaters with 1 megohm or less be dried out before applying full power. If dried properly low megohm will not affect heater life or efficiency. To correct a low megohm condition, remove terminal enclosure cover, gaskets, and terminal hardware. Bake heaters in an oven at 175-200°C (350-390°F) for several hours or preferably overnight. If baking is not an option, an alternate procedure is to cycle the heater in 10-to-15-minute periods at low voltage until megohm values are normal. Sheath temperatures should not exceed 175°C (350°F).

Note: Low megohm on heating elements with epoxy or hermetic seals cannot be serviced in the field. Typical resistance values when sealed



are 200 megohm or greater. Contact manufacturer for service.

MAINTENANCE

1. Never perform any type of service on heaters before disconnecting all electrical power.
2. To ensure good surface contact, periodically check clamping. Retighten clamping to the correct torque when required.
3. Repeat cycling of temperature controls can indicate poor surface contact or a burned-out heater
4. Heater terminals must be kept free of plastics, oil, water, and any other foreign matter. As these materials carbonize, they create electrical shorts.
5. Heater terminal electrical connections must be kept tight. Loose connections can overheat and eventual destroy the connection, terminals, or may short out and result in heater failure.
6. Water lines must be periodically checked for leaks. Water on heater terminals can be harmful to the entire heating system.
7. Thermocouples must be kept free of contaminants and be checked for good response to temperature changes. Our recommendation is to change them periodically, as a bad thermocouple can be the cause of destroying an entire heating zone.
8. Check the temperature controllers, check its wiring, and make sure its settings are correct.
9. Check the fuses, contactors, relays for loose wiring, tighten them if needed.
10. Relays & contactor coils may get stuck over long period of usage. Make sure they are functioning as it should. Replace them

if it has been used for a long time. Stuck relay switches or contactor coils may cause overheat which may result in damaging the equipment.

11. Check if there is any sort of damage on the heater. In case of any damage, impact, tear or puncture, remove and avoid using it.
12. If the heater is to be operated in the presence of explosive vapors or dust, an explosion resistant terminal enclosure must be provided.

For more information, please contact your sales representative or send an e-mail to sales@isinrezistans.com