

# THERMON

WORLD LEADER IN INDUSTRIAL PROCESS HEATING SOLUTIONS

## ELECTRIC IMMERSION HEATER INSPECTION & MAINTENANCE CHECKLIST



CAUTION

**ELECTRIC SHOCK HAZARD.** All electric heating equipment installations and maintenance must be performed by qualified personnel in accordance with the local electrical codes and standards and must be effectively grounded to eliminate shock hazard.

**FIRE/EXPLOSION HAZARD FOR HAZARDOUS LOCATION HEATERS.** This heater shall be used with protection controls as follows:

- a. liquid level control to maintain all the heating elements totally immersed at all times, or
- b. high temperature sheath controls to limit the maximum allowable sheath design temperature.



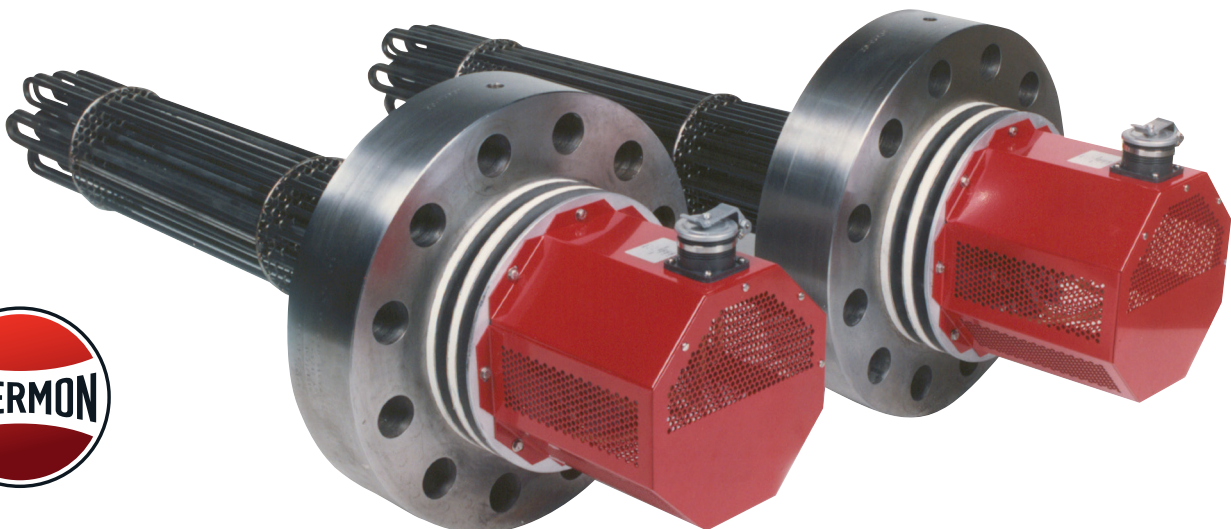
WARNING

**FIRE/EXPLOSION HAZARD.** Do not exceed the ratings of the flange as listed in ANSI B16.5. Do not operate the heater in the presence of combustible gases, vapors, dusts or fibers unless the heater is specifically marked for the hazardous location and heater operating temperature does not exceed the temperature code rating. Corrosion of the sheath could result in a ground fault which, depending upon the fluid being heated, could cause a fire or an explosion.

**FIRE HAZARD.** If a thermostat is provided, it is designed for temperature control service only. Since the thermostat does not fail safe, it should not be used for temperature limiting duty. Wiring to this device is the users responsibility.

**Heaters are capable of developing high temperatures, therefore extreme care should be taken to:**

- a. use explosion-proof terminal enclosures in hazardous locations;
- b. maintain distance between heater and combustible materials.



# ELECTRIC IMMERSION HEATER INSPECTION & MAINTENANCE CHECKLIST

Proper and timely maintenance is critical to ensure your electric immersion heater is functioning correctly and to maximize heater life. A routine and proactive maintenance schedule will improve performance and efficiency, and will ensure your heater is available for use at all times. The checklist below is intended to provide basic inspection and diagnostic testing information.

## PLEASE KEEP THE FOLLOWING CHECKLIST FOR FUTURE USE

- All maintenance and servicing must only be performed by qualified personnel in compliance with local codes.
- Prior to servicing heater, disconnect all power supplies and lock/tag prior to servicing.
- Check all electrical connections for signs of damage or overheating, and repair or replace as necessary.
- Check electrical connections for tightness, and retighten if necessary.
- Check to ensure the supply voltage matches the heater rating nameplate. Never operate the heater at voltages other than the rating specified on the heater nameplate.
- Check element resistance between each phase using an ohmmeter and record values for future use. The measured resistance values are particular to each heater design and can be calculated using Ohms Law.  
  
Circuit #1  
Phase L1-L2\_\_\_ Phase L1-L3\_\_\_ Phase L2-L3\_\_\_  
  
Circuit #2  
Phase L1-L2\_\_\_ Phase L1-L3\_\_\_ Phase L2-L3\_\_\_
- Check ground continuity using an ohmmeter between the element sheath and the grounding lug. (Typical values should be close to 0 Ohms).
- Check insulation resistance using a 500VDC megger (insulation resistance tester). Levels above 500,000 Ohms are acceptable.
- If insulation resistance values are below acceptable test values, this may be a sign of moisture ingress. The insulation resistance can normally be restored by using a dryout procedure. Please check factory for recommendations.
- At a frequency of at least 1 year, check dielectric strength using a hipot (dielectric strength) tester. Typical test values are (Voltage Rating x 2) +1000V for 1 minute duration without trip.
- Check heater mounting for any signs of leakage and replace any seals or gaskets as needed. Do not try to reuse used gaskets or seals.
- Check any bolted connections and retighten as necessary after 10 heater cycles.
- Check thermal protection device to ensure proper function.
- Check heaters used for liquid heating service are always completely immersed in liquids to avoid element overheating that could lead to fire or damage of the heater.
- For stilted heaters, check to ensure that there are no obstructions to air flow around stilted element sections. Do not insulate over the stilted element sections.
- For hazardous location heaters, check to ensure that all terminal box covers are tightened prior to use.
- Check flow switch, if used, to ensure proper function.
- Check liquid level control, if used, for proper function.
- Check ground fault protection equipment, if used, for proper function.

## THE FOLLOWING INSPECTIONS WILL REQUIRE HEATER REMOVAL TO COMPLETE:

- Check for signs of scaling and clean as needed to remove scaling.
- Check for signs of corrosion and replace if needed.
- Check for damage to element sheath. If outer sheath is damaged, the heater should be replaced.
- Check sheath for signs of overheating, and replace if necessary.
- Always replace the gasket or seal if the heater is removed. Do not try to reuse used gaskets or seals.

Visit [www.thermon.com](http://www.thermon.com) to contact a Thermon representative near you.

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