



QUARTZ IMMERSION HEATERS WITH METAL HEATING ELEMENTS

Installation, Operation and Maintenance Instructions

1.0 HANDLING

- 1.1 Unpack and handle heater assemblies carefully. Quartz tubes are fragile and may be damaged by impact, dropping, twisting or excessive force.
- 1.2 Inspect all quartz tubes, terminal enclosures and accessories immediately upon receipt.
- 1.3 Do not support, suspend or lift the heater assembly by electrical terminals, wiring or quartz tubes.
- 1.4 Store heaters indoors in a clean, dry environment protected from moisture and contamination.
- 1.5 Prior to startup, insulation resistance should be verified using a minimum 500 VDC megohm meter. Insulation resistance should exceed 10 megohms at room temperature.
- 1.6 Protect quartz tubes from contact with baskets, racks, tools and workpieces during handling and installation.

2.0 SAFETY

- 2.1 **WARNING:** Disconnect and lock out electrical power before installation, inspection or maintenance.
- 2.2 Wiring must comply with all applicable electrical codes and be performed by qualified personnel.
- 2.3 Install a lockable disconnect device within sight of the heater.
- 2.4 Quartz tubes and heater surfaces may remain hot after power is removed.
- 2.5 Never energize a heater unless quartz tubes are fully submerged in liquid.

2.6 Use appropriate personal protective equipment when working around heated process liquids.

3.0 INSTALLATION AND OPERATION

Protection of heater elements from over-temperature conditions is strongly recommended.

3.1 Verify supply voltage matches heater nameplate voltage.

3.2 Properly ground heater prior to operation.

3.3 Ensure all electrical connections are properly tightened.

3.4 Keep terminal enclosures and electrical connections dry.

3.5 Install heater to permit unrestricted liquid circulation around all quartz tubes.

3.6 Quartz tubes must remain completely submerged during operation.

3.7 Maintain adequate liquid level above the heater assembly at all times.

3.8 Install independent low-liquid-level protection whenever possible.

3.9 Avoid sludge accumulation around quartz tubes.

3.10 Agitation or circulation generally improves heat transfer and temperature uniformity.

3.11 Avoid direct contact between quartz tubes and tank walls, baskets, racks or workpieces.

3.12 Verify compatibility of process solutions with quartz, seals, gaskets and metallic sheath materials.

3.13 Follow heater wiring diagrams supplied with equipment.

3.14 Do not exceed 105% of rated voltage.

3.15 Use low-level cutoffs, flow switches and over-temperature safety devices where appropriate.

4.0 MAINTENANCE

- 4.1 Disconnect power prior to maintenance.
- 4.2 Inspect quartz tubes regularly for cracks, chips, scratches or breakage.
- 4.3 Inspect all wiring, terminals and conduit fittings.
- 4.4 Tighten loose electrical connections as required.
- 4.5 Inspect quartz tubes for scale, mineral deposits and process contamination.
- 4.6 Clean quartz surfaces using non-abrasive cleaning methods only.
- 4.7 Do not use wire brushes or abrasive tools on quartz surfaces.
- 4.8 Verify operation of temperature controls, flow switches and low-level cutoffs.
- 4.9 Replace damaged quartz tubes immediately.

5.0 QUARTZ TUBE BREAKAGE AND REPLACEMENT

- 5.1 Quartz tube damage may result from mechanical impact, thermal shock or improper installation.
- 5.2 If a quartz tube becomes cracked or broken, disconnect power immediately.
- 5.3 Remove heater from service until repairs are completed.
- 5.4 Replace damaged quartz tubes with approved replacement components.
- 5.5 Inspect seals, gaskets and electrical components before returning the heater to service.
- 5.6 Never operate a heater with damaged quartz tubes.

6.0 TROUBLESHOOTING

- 6.1 Verify supply voltage is present and correct.

6.2 Check all control circuits, relays, contactors and safety devices.

6.3 Check heater resistance and continuity.

6.4 Infinite resistance indicates an open heating circuit.

6.5 Slow heat-up may be caused by failed elements, scale buildup, poor circulation or improper sensor placement.

6.6 Poor temperature control may result from inadequate circulation or improper sensor location.

6.7 Repeated quartz tube failures may indicate vibration, mechanical interference or thermal shock.

IMPORTANT OPERATING PRECAUTIONS

- Never operate heater unless quartz tubes are fully submerged.
- Inspect quartz tubes regularly.
- Maintain proper liquid circulation.
- Use low-level protection devices.
- Use over-temperature safety controls.
- Verify chemical compatibility before installation.
- Replace damaged quartz tubes immediately.

NPH Recommended Inspection Checklist

Daily:

- Verify liquid level
- Check operating temperature
- Inspect for leaks

Weekly:

- Inspect quartz tubes
- Verify safety controls

Monthly:

- Inspect wiring and terminals
- Check scale buildup
- Verify heater mounting hardware

Customer Service and Technical Support

For assistance regarding installation, operation, replacement quartz tubes, heater sizing or troubleshooting, contact:



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