

Thermocoax Pressurizer Heaters

The Solution for Enhanced Performance

AREVA and Thermocoax have teamed together to provide technologically superior pressurizer heaters. Thermocoax has applied their extensive mineral-insulated cable and heater manufacturing experience for an enhanced design. Add in the manufacturing expertise, industry-leading nuclear engineering and ASME Code design of AREVA, and the results are second to none.



Superior Heat Transfer and Efficiency

Exceptional heat transfer characteristics are achieved by our design. It features a heating element wound helically on a copper core, ensuring uniform heating along the length of the heater. Our design also features a cold section with a Monel core. The entire assembly is inserted into a stainless steel sheath and swaged to ensure outstanding thermal transfer and durability. The heaters employ a thinner layer of insulation of magnesium oxide (MgO), which in turn increases thermal conductivity. In fact, this compact insulation is rated to withstand heat flow as high as 100 W/cm^2 with outstanding integrity, easily accommodating the system's maximum heat flow of 50 W/cm^2 .

The heaters are more efficient because they reduce the temperature difference between the resistance wire and the external tubing. Computer analysis shows a temperature variation between the resistance wire and the external tube of less than 250°C for a specific power of 40 W/cm^2 — as much as 66% less variation than conventional systems.

Increased Reliability and Durability

Our heaters provide increased reliability compared to conventional pressurizer heaters. When subjected to demanding aging tests (1E qualification process according to IEEE Std 323) that simulate temperature, vibration and radiation stresses over a 20-year lifespan, as well as seismic tests and loss of coolant accident (LOCA) tests, these pressurizer heaters suffered no failures.

Superior durability is achieved by our design and manufacturing processes. Our heaters are designed, welded, inspected and NPT-stamped under AREVA's ASME Code Program and constructed of high-quality materials in Thermocoax's ISO and NQA-1 certified manufacturing facility. We add a special, thermally-treated outer stainless steel sheath and a second sheath over the heating element. These two barriers between the primary system and the MgO, as well as the reduced amount of MgO, ensure our heaters do not swell in the unlikely event of water ingress.

Thermocoax has more than 8,000 heaters in service outside North America, and AREVA has manufactured more than 1,000 ASME Code heaters with no pressure boundary failures.

Features and Benefits:

- Rugged construction
- Qualified 1E according to IEEE Std 323
- Superior temperature uniformity
- Reduced MgO content
- Double barrier to MgO
- Not sensitive to Primary Water Stress Corrosion Cracking (PWSCC)
- No swelling; easily removed if necessary
- Higher wattage heaters may allow fewer nozzle penetrations

Technical Design Features and Options

- Available as single- or three-phase with power ratings from 12.5 kW to 50 kW
- Connector configurations available to accommodate high temperature environment and existing plant cabling
- Optional engineering support can help you implement design changes or provide welding services for field installation of replacement pressurizer heaters
- Applicable for all PWR designs
- Can be designed and manufactured as replacements for installed heaters — with the same electrical and mechanical interface
- Can be provided as part of a plant upgrade or pressurizer replacement

The Nuclear Parts Center Advantage

In-stock Parts 24/7/365

- Manufacturing, engineering and ASME Code design expertise
- Technologically superior pressurizer heater product
- Manufacturers audited and approved by AREVA
- ISO 9001 and 18001 certified
- ASME Code Parts and Equipment

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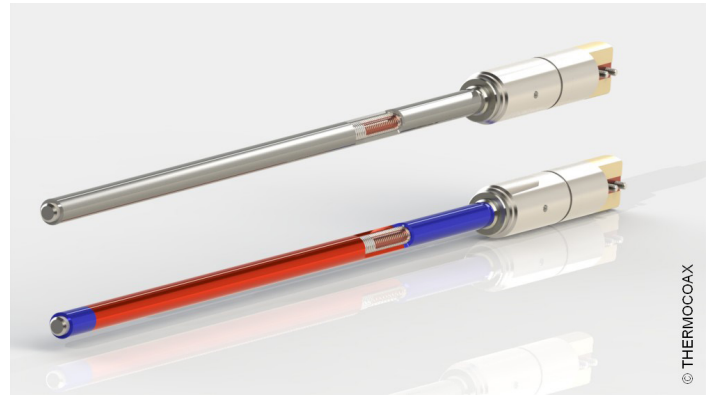
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