

The ULTRAMIC® ceramic heaters from Watlow® are designed for thermal applications where the high performance of an advanced ceramic heater is required to ensure optimal effectiveness of the equipment and process.

ULTRAMIC ceramic heaters are constructed of aluminum nitride (AlN) and incorporate a thermally matched proprietary heating element that provides maximum performance in challenging applications. AlN is especially suitable for applications requiring a clean, non-contaminating heat source.

Additionally, the excellent geometric stability ensures consistent part-to-part thermal contact during heating cycles. Watlow AlN ceramic heater can operate up to 400°C or 600°C (752°F or 1112°C) depending on lead construction with an ultra-fast ramp rate of up to 150°C (270°F) per second depending on the application, heater design and process parameters.

In addition to excellent thermal characteristics, ULTRAMIC ceramic heater have high electrical isolation and typically provides superior chemical resistance as compared to traditional metal heaters.

The pins are typically made out of a silver-plated copper conductors and then crimped to the Teflon leads, if required.

For vacuum, Watlow recommend keeping it only as pins and ceramic beads.

The pins are connected to the resistance circuit with Watlow patented bonding processes. The bonded connection is verified in production via burn-in and resistance-shift screening to ensure a stable, low-resistance joint.

For vacuum, and especially UHV, avoid PTFE-insulated leads due to contamination concerns commonly raised in vacuum systems.

Use bare pins or ceramic beads on the pins.

If the heater must be energized during pump-down, observe Paschen-curve effects; operating in the 1–10 torr region is risky, while deep UHV ($\sim 10^{-7}$ torr) is not.

If higher voltage must operate in the “danger zone,” greater pin spacing may be required as a custom to maintain dielectric strength.