

Development of 50kW, 2-3kHz Induction Heating Inverter for WIP, Trombay

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Induction Heating Inverters are required for five-zone induction furnace of Waste Immobilization Plant (WIP), Trombay; used for nuclear waste immobilization through vitrification process under Indian Nuclear Waste Management Programme. The electrical power to each zone is supplied by individual 50kW, 2-3kHz Induction Heating Inverter. This inverter has been designed by Advanced Technology Systems Section (ATSS), E&I Group, BARC and mass-produced at ECIL, Hyderabad. Involving ECIL in mass-production of these inverters would serve long-term strategic requirements of Indian Nuclear Waste Management Programme including maintenance for their operating-life.

After satisfactory Factory Acceptance Tests (FAT) at ECIL, ten units of these inverters have been delivered to WIP, Trombay.

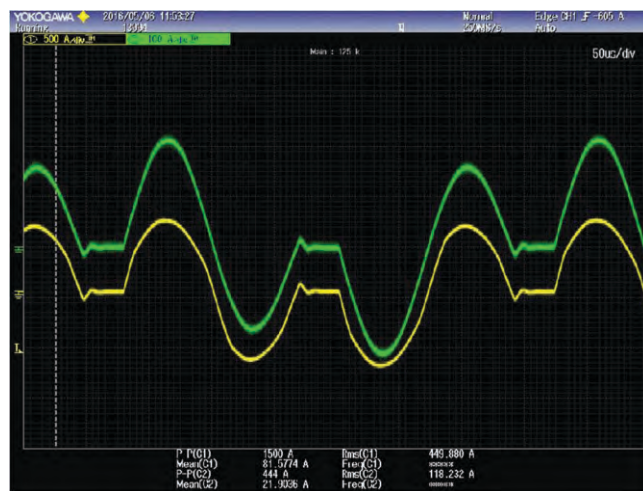


Induction Furnace Heating (~925°C)

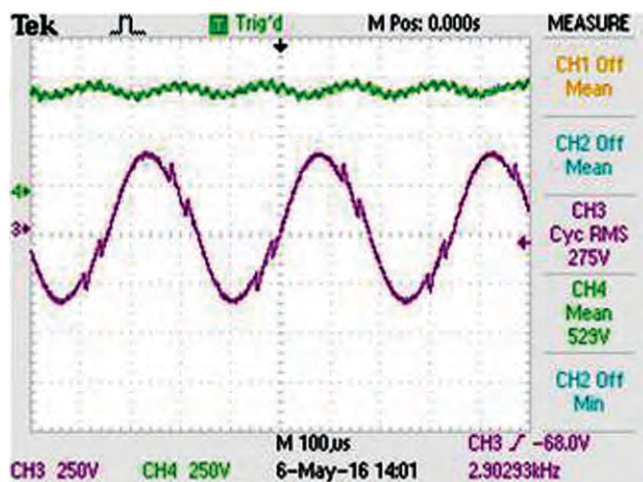


50kW Induction Heating Inverter

SCR based half-bridge inverter configuration having 3-phase diode rectifier at its front end and current transformer at rear end is used in these inverters for DC to AC conversion; resulting most reliable system. These are designed with state-of-art technology and with all relevant control & protections required for such power electronics systems. All major heat-generating components (e.g. diode-bridge, DC filter capacitor, commutation capacitor & choke, inverter SCR & diode, current transformer etc.) of these inverters are water-cooled; resulting very compact packaging.



Primary (yellow) & Load (green) Current



Load (pink) & DC-bus (green) Voltage