

50+
Years of Legacy

IGBT POWER SUPPLY FOR

Melting & Holding Furnaces, Coating Pots and Billet Heaters

Our state-of-the-art IGBT inverter technology for Melting & Holding Furnaces, Coating Pots and Billet Heaters, designed specifically for non-ferrous metals, has revolutionized the industry with its superior and consistent performance, ease of maintenance and intelligent control features.



DirectMOD

Pioneer[®]
DFO DYNAMIC
FLOW
OPTIMIZATION

PRECIZONE

Pioneer Furnaces is a trusted name in the field of induction melting and heating technology, designing and manufacturing advanced induction furnaces for the non-ferrous metal melting, heating, heat-treatment, and coating industries since 1972. With an engineering legacy spanning over five decades, Pioneer is recognized for delivering robust, energy-efficient and highly reliable furnace systems backed by prompt and committed service support. The company is ISO 9001:2015 certified, reflecting its strong process discipline, quality orientation and customer-centric approach.

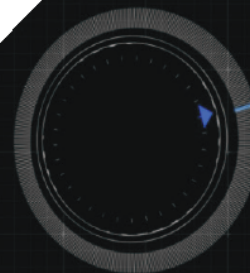
Reliability | Precision | Performance

▪ Precise Temperature Control through Stepless Power Regulation:

The power supply utilizes IGBT-based Pulse Width Modulation (PWM) technology for stepless and linear power control. This allows precise temperature regulation for Melting & Holding Furnaces, Coating Pots and Billet Heaters. Smooth power variation minimizes overshoot and ensures uniform heating, resulting in improved metallurgical consistency and stable process performance.

▪ Advanced Embedded Controller:

The system employs a Digital controller integrated with an adaptive control algorithm. The controller continuously analyses process parameters and adjusts inverter operation for faster response, optimal efficiency, and enhanced stability. The system adapts to dynamic load conditions, ensuring longer IGBT life and superior control accuracy.



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PRECISE
POWER CONTROL

▪ DirectMOD Inverter Technology:

The DirectMOD Inverter eliminates the need for a conventional LC resonant tank circuit, reducing system complexity and losses. The simplified design responds instantaneously to load changes, improve efficiency, and reduces maintenance, making it ideal for continuous industrial heating applications with rapid thermal transitions.

▪ High Input Power Factor (near to unity) at any Load Condition:

This ensures efficient grid utilization, minimal and reactive current. The feature ensures better transformer loading, lower energy costs.

▪ IGBT Technology for Channel Furnace – Enhanced Efficiency and Control:

For channel-type induction furnaces, the IGBT inverter technology provides a significant upgrade over traditional Contactor based step power control.

The key advantages include:



Higher efficiency with fast-switching, low-loss IGBTs



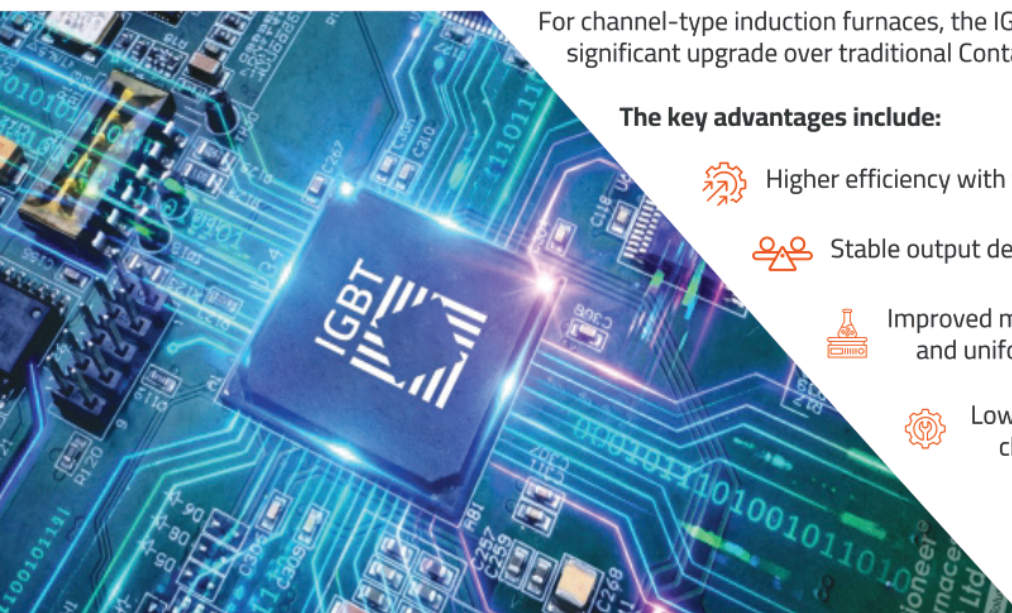
Stable output despite molten metal level variation



Improved magnetic stirring and uniform bath temperature



Low maintenance due to elimination of tap changers and resonant circuit components. This enhances furnace performance, increases melting throughput, and ensures better energy utilization and longer channel life



Automation and Remote Connectivity:





Fully compatible with Industry 4.0 standards, the system offers Ethernet, Modbus TCP/IP, and RS-485 communication interfaces. Users can remotely monitor, control, and diagnose equipment securely via cloud or plant network. Integration with SCADA or PLC systems allows real-time data exchange, centralized supervision, and predictive maintenance through online analytics.

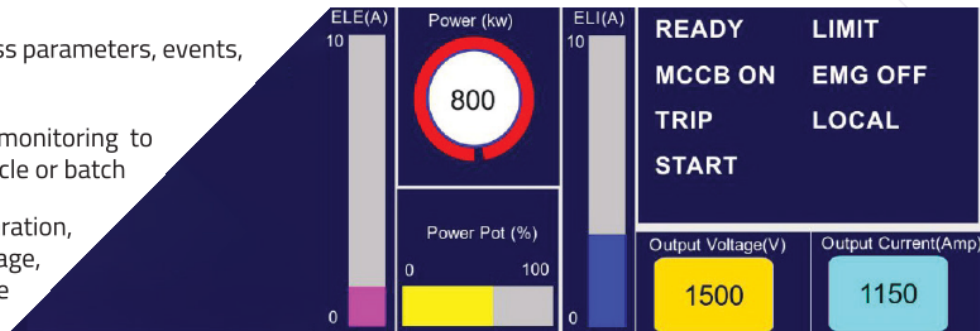
The integration of IoT, AI, ML, and Big Data Analytics transforms our IGBT inverter-based melting and heating system into an intelligent, high-performance solution, enhancing its efficiency, consistency, and maintainability while significantly reducing human intervention.

Advanced HMI with Long-Term Data Storage and Reporting:

The power supply is equipped with a 7-inch or 10-inch industrial-grade touch HMI, offering intuitive operation and process visualization.

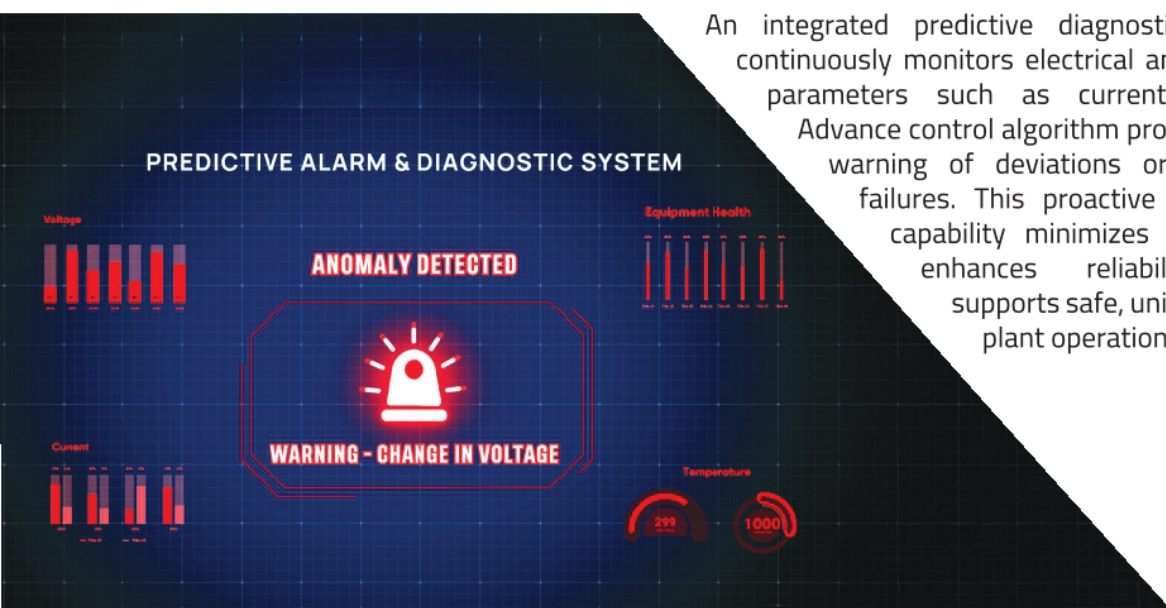
The key features include:

-  Long-term data storage for process parameters, events, and performance trends
-  Heat-wise energy consumption monitoring to record energy used per heating cycle or batch
-  Automatic daily heat report generation, summarizing total energy usage, operating hours, temperature trends, and efficiency statistics
-  USB and Ethernet data export for offline analysis or integration with plant energy management systems. These features enable complete process traceability, power optimization, and production reporting for energy-efficient operation



Predictive Alarm and Diagnostic System:

An integrated predictive diagnostic system continuously monitors electrical and thermal parameters such as current, voltage. Advance control algorithm provides early warning of deviations or potential failures. This proactive diagnostic capability minimizes downtime, enhances reliability, and supports safe, uninterrupted plant operation.



Product Portfolio:

- ▶ **Coreless & Channel Type Induction Melting and Holding Furnaces**
for aluminium, copper, and copper alloys (like brass, bronze, etc.) and zinc & zinc alloys
- ▶ **Custom-designed Induction Heating Systems**
specially for non-ferrous extrusion applications
- ▶ **Heat-treatment Furnaces**
for a wide spectrum of metallurgical applications
- ▶ **Coating Solutions**
Pre-melt furnaces
Launders
Pots with inductors for GI | GL | GA | ZAM | Al-Si | Galfan

Our Key Clientele:



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