

# RoMan Manufacturing Inc.

## Electrical Furnace Power Delivery Systems



**R**oMan Manufacturing was founded in 1980 with a singular corporate commitment to manufacture water-cooled, high-current, low-voltage power sources, controls and power delivery systems used in resistance welding and in vacuum and atmospheric furnace OEM builds and retrofits. This commitment has made this new IHEA member an industry-leading manufacturer of AC and DC power sources and related specialty products.

The Wyoming, Mich.-based company uses innovative application-centric engineering and ISO-certified and efficient lean manufacturing to produce the highest quality products from three manufacturing facilities. RoMan Manufacturing – with over 7,000 designs – has the flexibility to customize a product to any configuration, specification or application requirement. The company also offers value-added services such as technical and application support.

There is a consumer-driven, cultural sea

change toward materials and technologies that are, or are perceived to be, environmentally friendly. In most places, it is still environmentally cleaner (on a global emission basis) to burn fossil fuel than to use it to generate electricity. However, fossil-fuel combustion technologies' rate of improvement in energy efficiency has all but flat-lined. The contribution of electric renewal

energy in the reduction of emissions is increasing rapidly, and Western Europe will have made a major move to renewables, along with the rest of the world, within 10 years.

RoMan Manufacturing's value offering is aligned to the needs of today's furnace original equipment manufacturers (OEMs) and heat treaters by offering standard and custom product and system solutions that improve processes and lead times and reduce material and maintenance costs. This helps deliver significant energy efficiencies and utility savings.

The company's IGBT/MFDC power delivery system replaces outdated SCR and VRT technologies. The IGBT/MFDC is an inverter system that creates 1,000 Hz output coupled with a DC transformer to the furnace. It utilizes a three-phase input to a rectified bridge, which acts as a "shield" from load imbalances.

The IGBT (insulated-gate bipolar transistor) is able to rapidly turn on-off high current at 1,000 Hz, creating a high-current DC output. DC heating is more efficient than AC heating since the displacement power factor with IGBT/MFDC is close to unity at most setpoints. The operating frequency of the water-cooled DC power supply allows RoMan Manufacturing to build very compact units that can be mounted directly on the furnace at the heating-element terminals, eliminating the need for long water-cooled cable runs and secondary cable inductance. The IGBT control provides a balanced three-phase input and precise, multi-zone power control, as well as strong analytics capabilities communicated via Modbus and other protocols.

For the furnace OEM, power delivery systems from RoMan Manufacturing provide a high level of value to you and your customers, including:

- Compact footprint virtually eliminates overhead scaffolding and other VRT support structures
- Compact, lighter DC power supplies and close coupling design reduce shipping, maintenance and material costs
- Precise power control and analytics capabilities brings furnace power to the 21st century

