

2003



TETRONIC

2025

TETRONIC SRL is a company specializing in the design and manufacturing of medium and high-frequency induction heating equipment, power electronic converters, and automation solutions.

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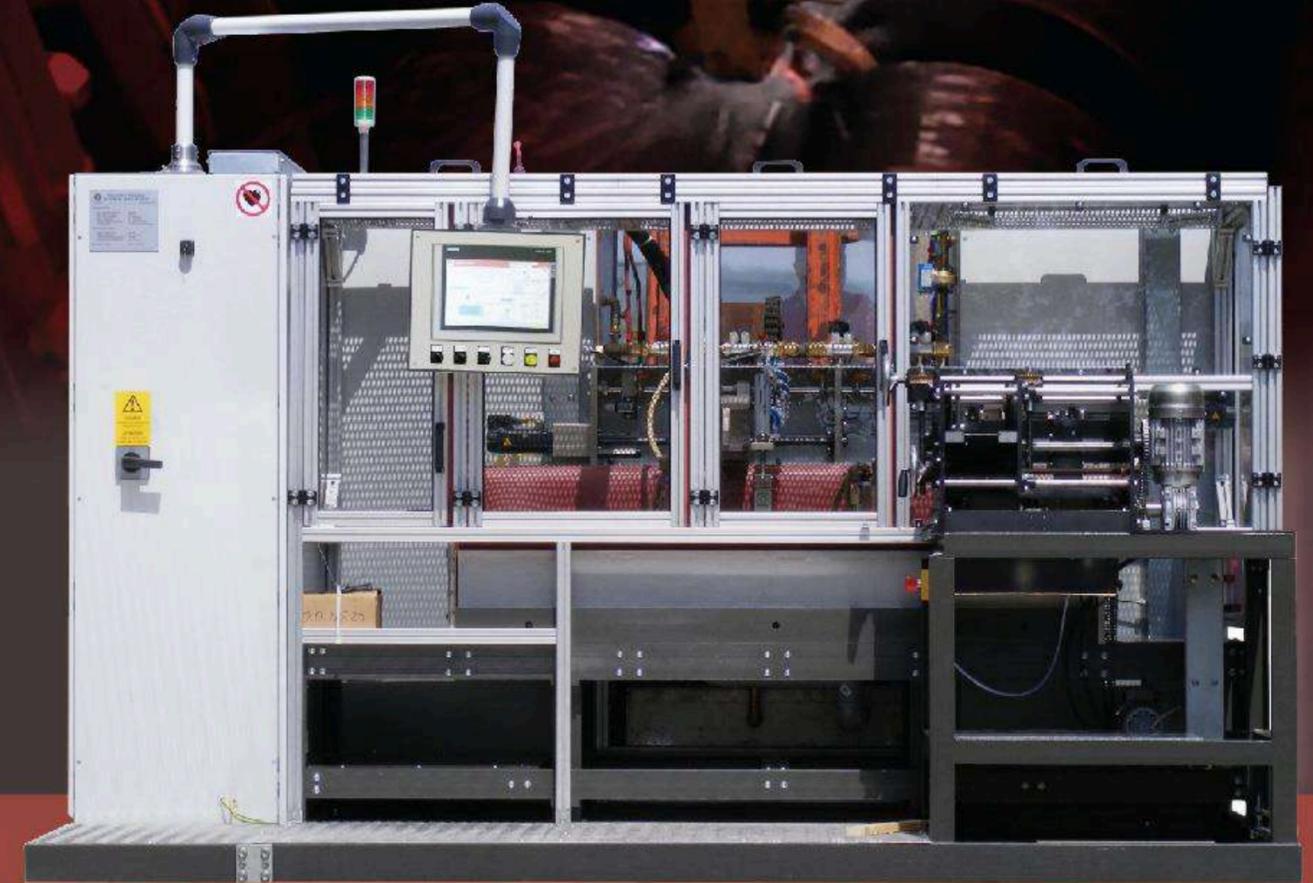
HORIZONTAL HARDENING MACHINES



HORIZONTAL HARDENING MACHINES



HHM Series Compact Hardening Machines – for high productivity and long autonomy. Designed for shaft hardening, the machine is equipped with an automatic feeder, high-frequency converter, servo positioning, quenching, quality monitoring, and part selector units.



HHM-H-T Series – horizontal hardening machine with hardening and tempering converter. The machine performs the complete heat-treatment process having built in an HF converter for hardening and an MF converter for tempering. Features such as automatic feeding, quality monitoring, process data archiving and part selection are included.

VERTICAL HARDENING MACHINES



VERTICAL HARDENING MACHINES



VHM Series – vertical scanner machines, offering a complete hardening system with MF or HF converter, servo positioning, automatic door, safety features, unlimited hardening program storage, quality monitoring, Ethernet connection.

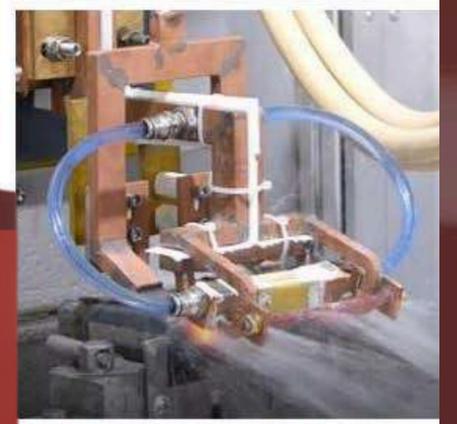
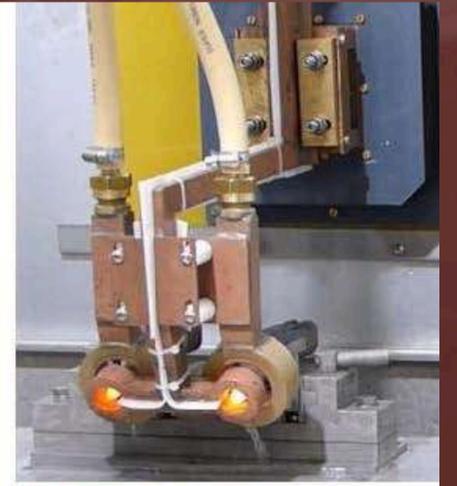


VHM-H-T-RT Series – the vertical hardening machine for complete heat treatment. The machine is equipped with an HF hardening converter, an MF tempering converter, a high-precision rotating table, robot interface for loading/unloading the parts. The machines are designed for high productivity (2 million parts/year) and autonomous operation.

MULTISTAGE HARDENING WITH ROBOT-LOADER



MULTISTAGE HARDENING MF+HF+UNLOADING



VHM with robot-loader – vertical scanner machines, with complete automated loading and unloading, using industrial robots. The machine offers long autonomy, quality monitoring, and data logging in the cloud. Single, dual, or multistage hardening systems are available.



Multi-stage hardening machine – rotating table and 3 hardening stations with 2 parts hardening simultaneously. Combining Tetric HF and MF technology, in one line 3 hardening jobs are solved. Custom machine design for special hardening tasks.

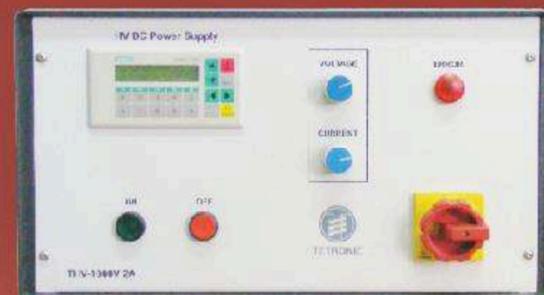
HIGH VOLTAGE POWER SUPPLIES, COMPONENTS



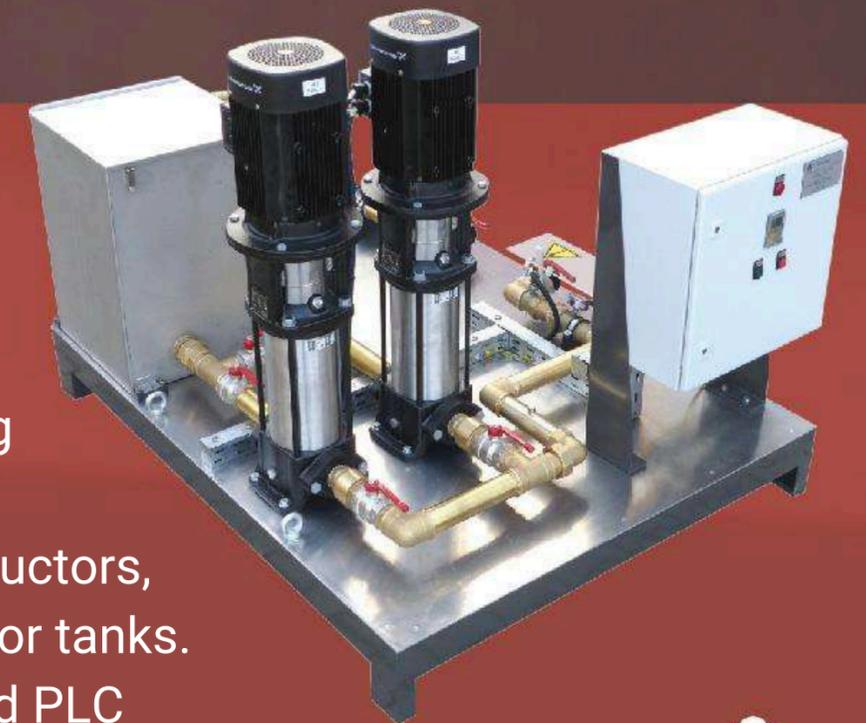
HIGH VOLTAGE POWER SUPPLIES, COMPONENTS



HVPS Series - DC or pulsed power supplies for vacuum, PEO and other special applications, featuring DSP-based control, arc handling, accurate voltage/current/power control, up to 10kV and 120kW, depending on the application.



We offer several components and systems related to induction heating, such as re-cooling units for melting or forging converters, HF transformers and chokes, inductors, melting furnaces and capacitor tanks. Embedded system design and PLC programming is also a part of our activity. We offer microcontroller-or DSP-based digital control boards for various control applications and data acquisition systems.



HF COMPACT CONVERTERS



TIC-HFS-Mini Series - are low cost, high performance converters up to 6kW / 500kHz. The ultra-compact construction provides full functionality without a standard PLC, having standard wired external control interface, industrial communication on demand (Profibus,Profinet,EtherCat,RS485,etc.) and web based configuration and monitoring.

HF COMPACT CONVERTERS



TIC-HFS Ultra-Compact and Compact Series - are built in standard rack cabinets. Standard PLC, industrial communication interfaces and web-based configuration and monitoring are available on demand. In this configuration the maximum power / frequency is 18kW/500kHz.

HIGH POWER AND MULTIPLE OUTPUT HF CONVERTERS



HIGH POWER AND MULTIPLE OUTPUT HF CONVERTERS



TIC-HFS-Single Output Converters – are high power, single output, high frequency converters characterised by modular construction in standard cabinets and a resonant load unit. The usual power and frequency ranges are:
30 kW - 300 kW, 200 kHz - 1 MHz.



TIC-HFS-Multiple Output Converters - are a special family of high frequency converters, where several outputs (inductor) with Independent control is requested, having a single mains supply and a single PLC for the process control. The most common applications are pipe welding or wire hardening.

COMPACT AND HIGH POWER MF CONVERTERS



COMPACT AND HIGH POWER MF CONVERTERS



TIC-MFP Compact Converters - are characterised by relative low power, up to 20kW and frequencies between 10kHz and 50kHz. The load circuit is built in a separate box, connected to the converter with a medium-frequency flexible cable. The converters contain all necessary interfaces for external control and monitoring, including a hard-wired interface and industrial busses.



TIC-MFP Medium Power Converters – compact size up to 300 kW and 100 kHz. The converters are built using IGBT technology in one or two standard cabinets (typically 800x800x2000) on a common base frame. The compensating capacitor tank and the output transformer are accommodated in the converter cabinet.

FORGING LINES AND MELTING CONVERTERS



FORGING LINES AND MELTING CONVERTERS



TIC-MFP Melting Converters - differ from the standard MF converters in terms of the melting process, with the addition of sintering control, ground fault monitoring, water-cooled cables, melting furnaces and tilting units.



TIC-MFP Forging Heaters - are adapted to the forging line of the client, including the layout of the converter cabinets, the closed-loop water cooling system for the converter and the design of the inductors. Special process control is provided to minimize the technological losses (cold or overheated parts).

TILTING FURNACES



COMPACT HARDENING MACHINES



Tilting furnaces – Compact units consisting of medium or high frequency converter and furnace, for melting a small quantity of metal (up to 50kg). Different crucible types are available, depending on the material to be melt (refractory lining, graphite, zirconium-oxide crucible).



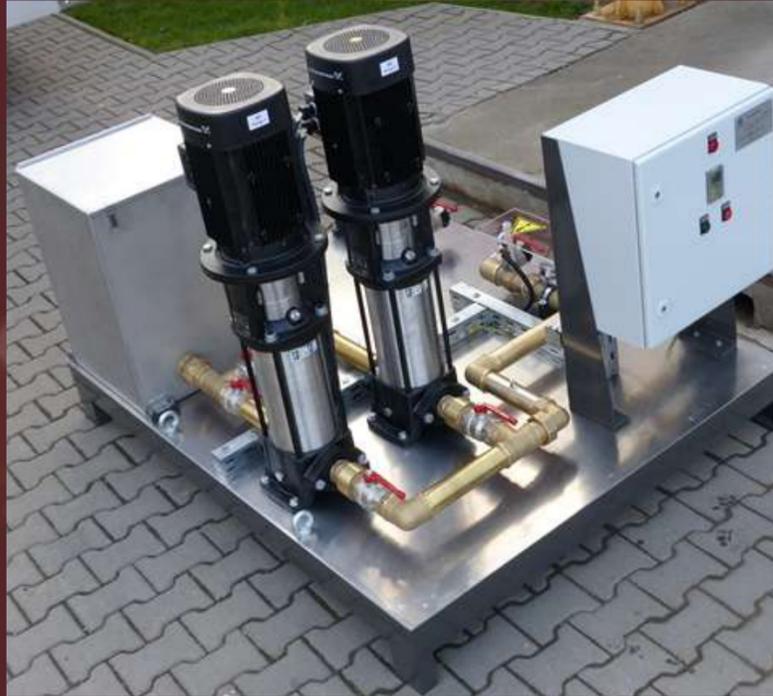
Compact hardening machines – low power, low-cost hardening machines for applications where no scanners are required. Typically, suitable for one shot hardening, offering hardening program editing, storing, heating and cooling, temperature measurement on request. Applications – spring hardening, gear hardening, bushing hardening, etc.



NEW PRODUCT RANGE



RECOOLING UNITS



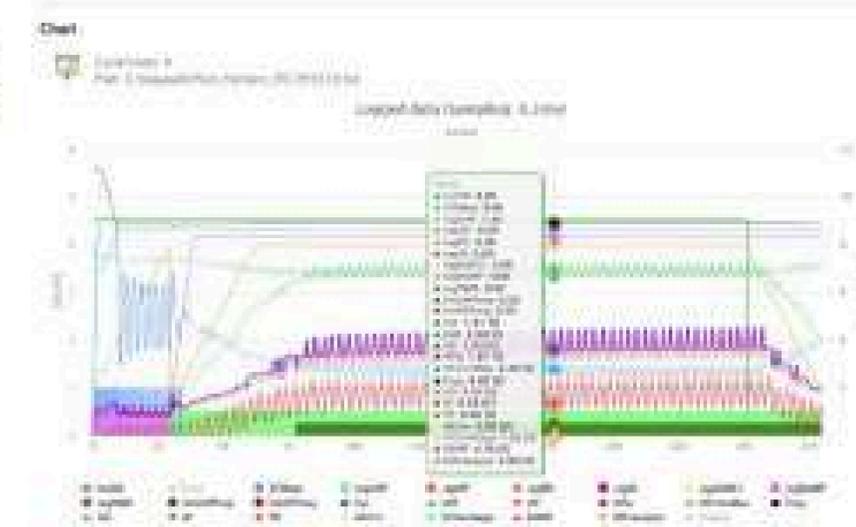
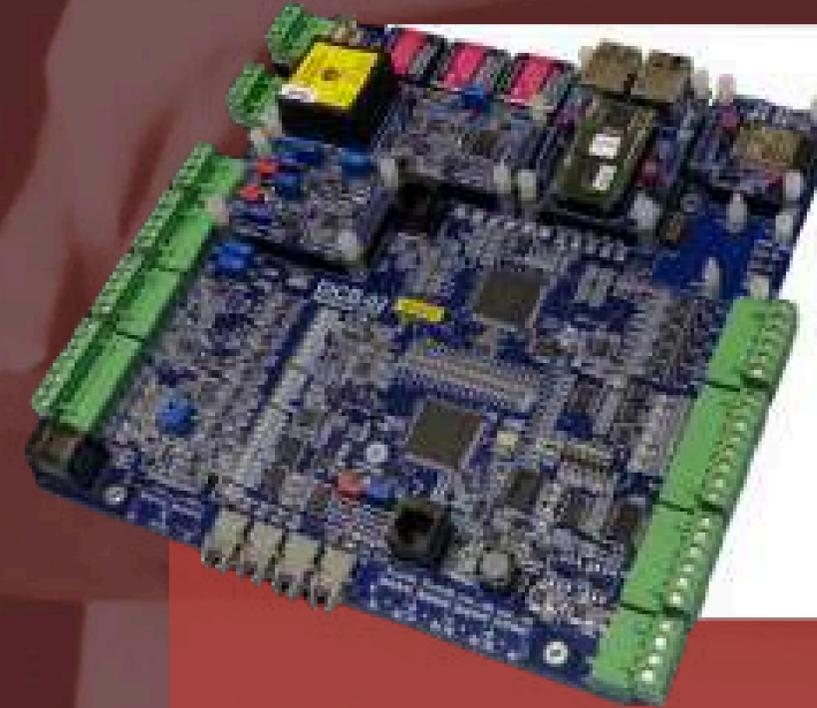
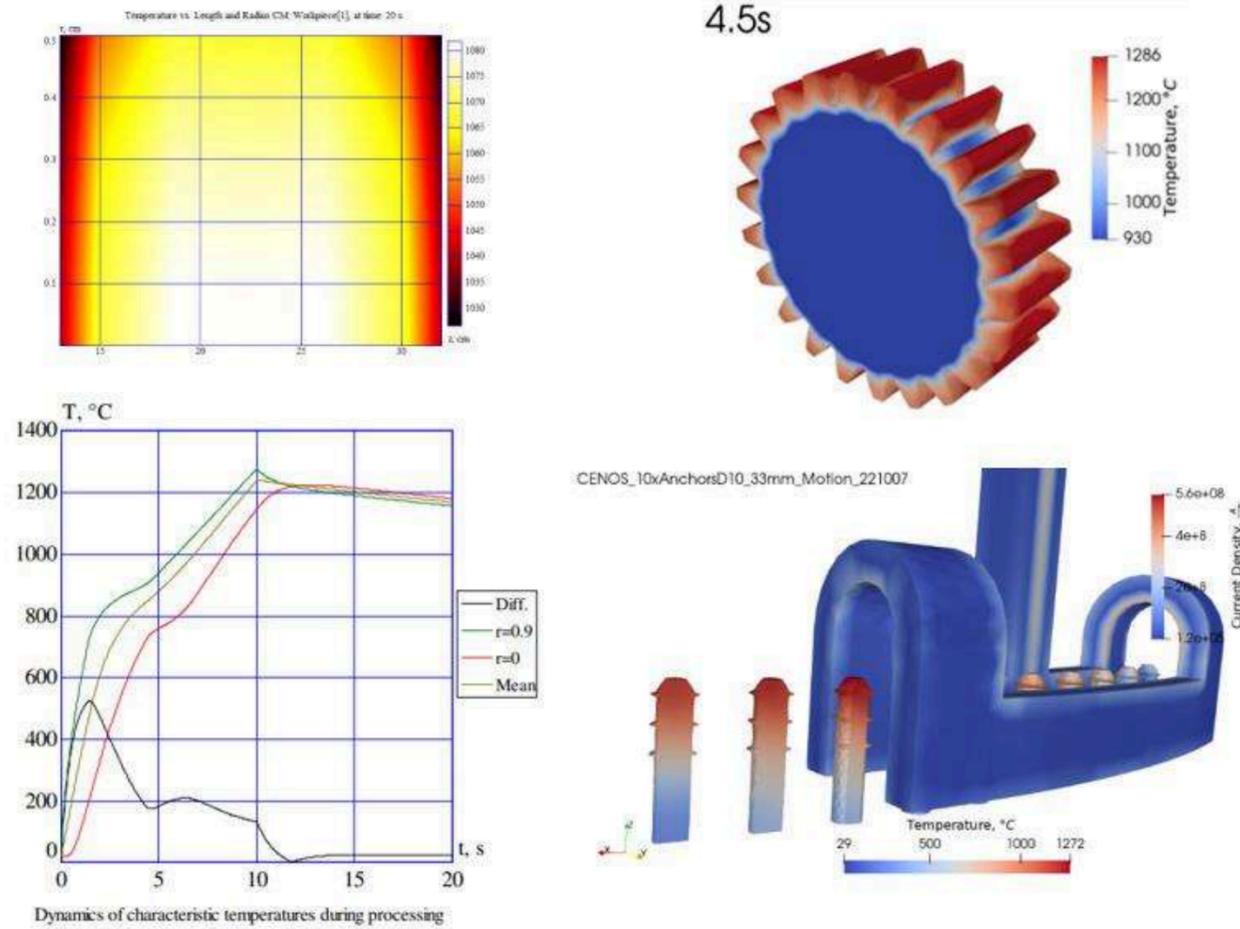
- Recooling units in open frame or standard Rittal cabinets
- PLC control or softstarter version
- With or without emergency water connection



PROCESS ENGINEERING



EMBEDED DESIGN



Process Engineering – we offer modeling and simulation of hardening and forging processes, and other special heating applications, including 2D and 3D temperature and hardening profiles, using high-end software with finite-element analysis.

Embedded system design – a highly qualified engineering team develops electronic boards for the control of power electronic converters, digital control boards with embedded webserver, driver boards, isolation fault monitoring units, inductor energy measurement, etc. Moreover, machine control with PLC and SCADA systems are offered for technology development.

SOFTWARE

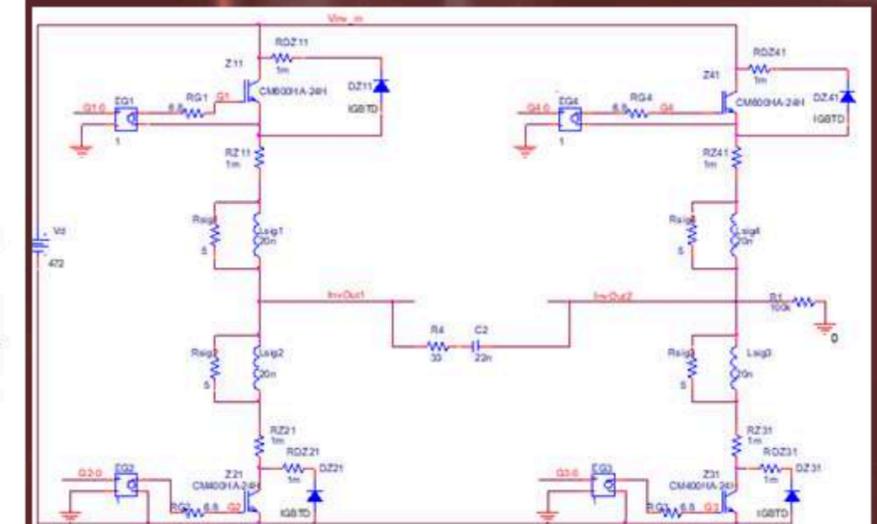
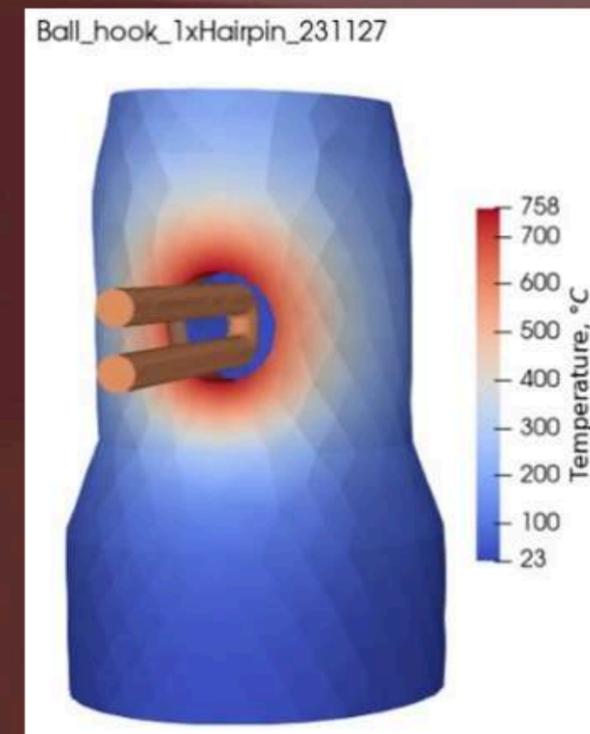
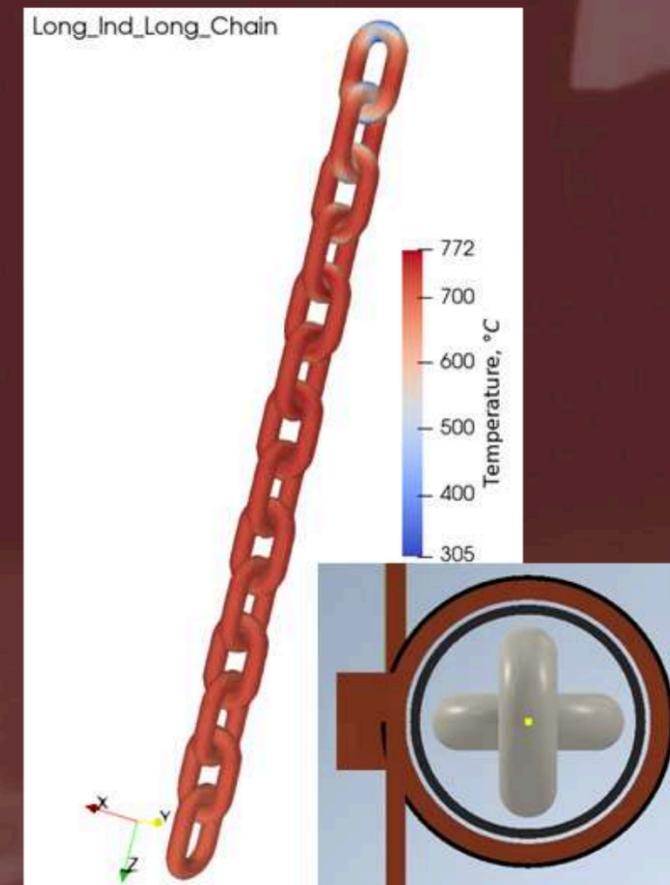
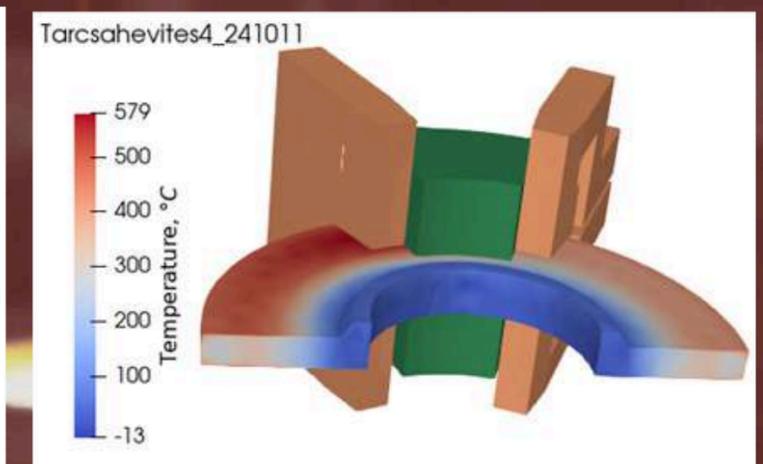
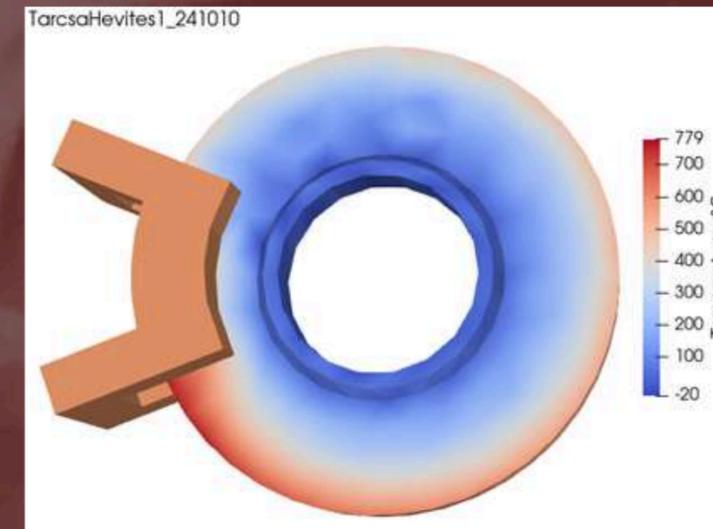
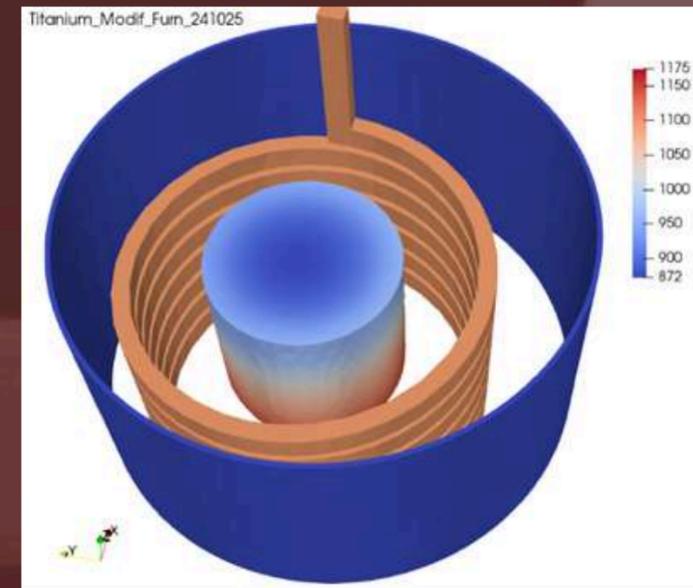


PROCESS SIMULATION

We constantly invest in the latest software tools for process simulations, electronic design, automation, and mechanical design.

Softwares we use at Tetronic:

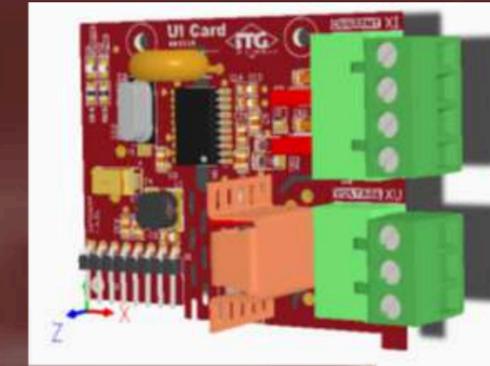
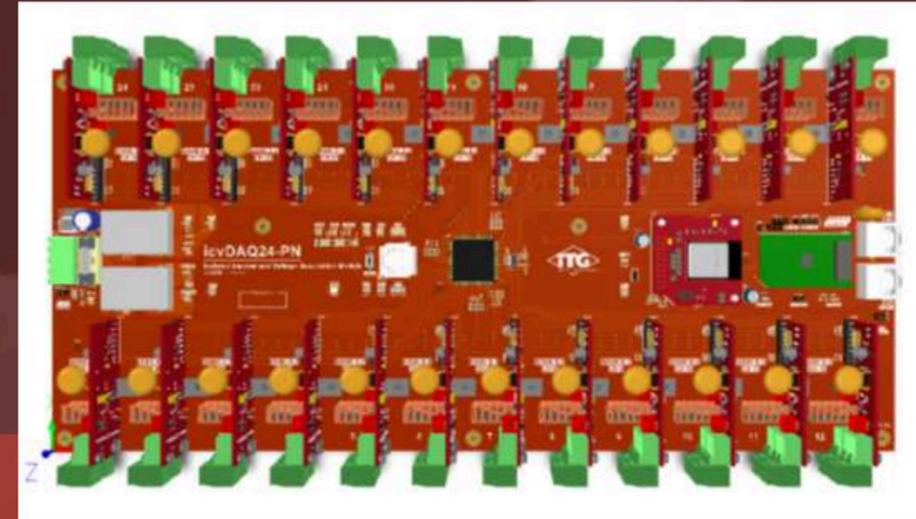
- ◆ Induction heating simulation:
ELTA 2D / 3D
CENOS 3D
- ◆ Converter and automation design:
PSpice
Matlab, Simulink (in the process of acquisition)
- ◆ Electronic design:
Altium Designer
OrCAD
- ◆ PLC programming:
Siemens TIA Portal
- ◆ Mechanical design:
SolidWorks



WIDE RANGE OF PRODUCTS – UNDER DEVELOPMENT



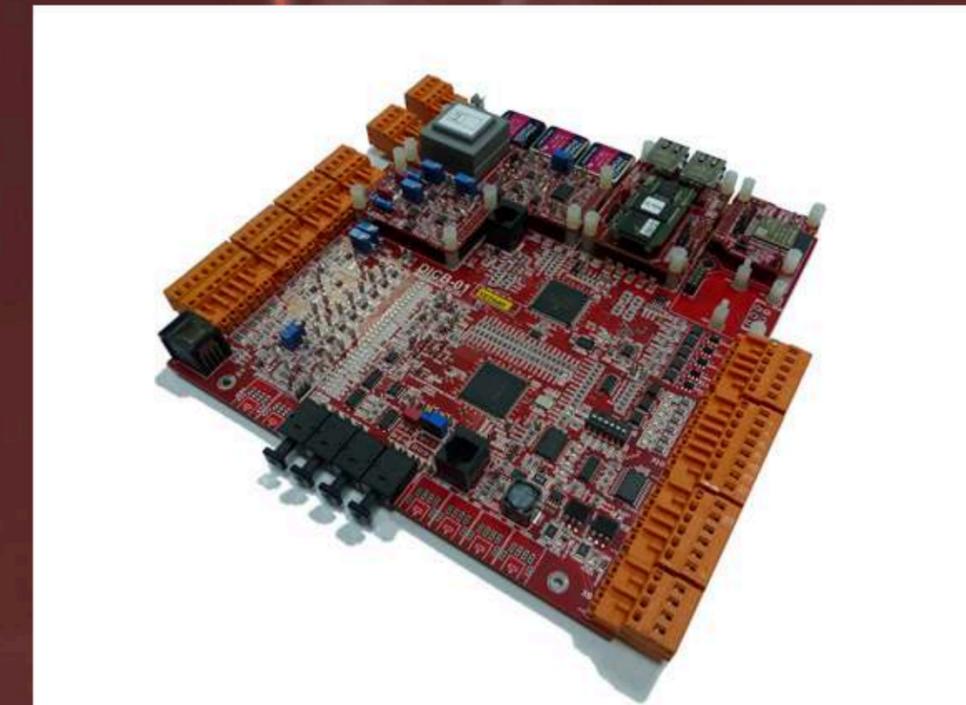
ELECTRONIC DESIGN



Tetronic offers electronic design and embedded systems design services with a highly qualified engineering team.

Our latest developments include:

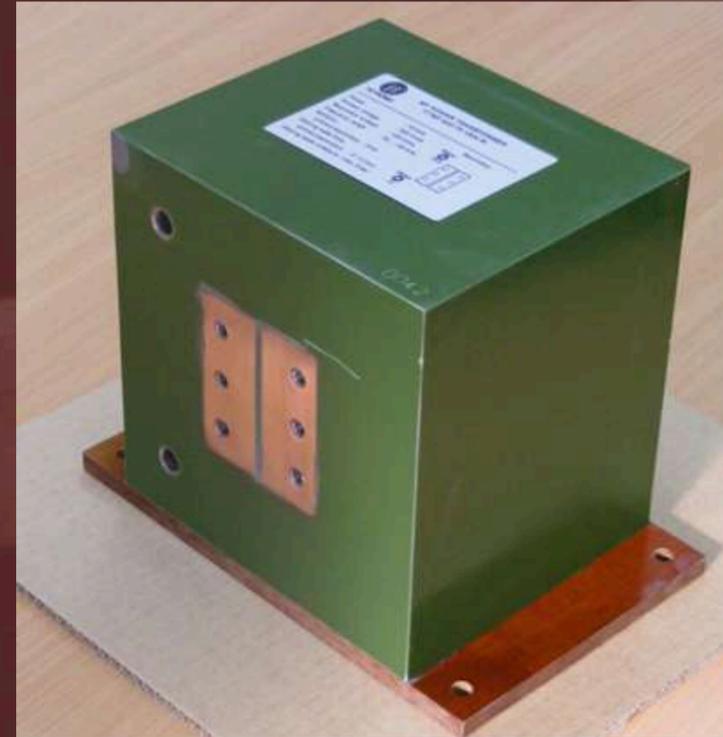
- Digital inverter control board – DICB
- Inductor energy monitoring unit – IEM
- Electrical insulation monitoring unit – IMU
- Gate driver boards for transistors, designed for the new generation of SiC modules
- 24-channel data acquisition board for battery discharge testing
- Profinet connectivity, PLC functions



WIDE RANGE OF PRODUCTS – UNDER DEVELOPMENT



ELECTRONIC DESIGN



Design and implementation of magnetic components for high- and medium-frequency converters (inductors and transformers).



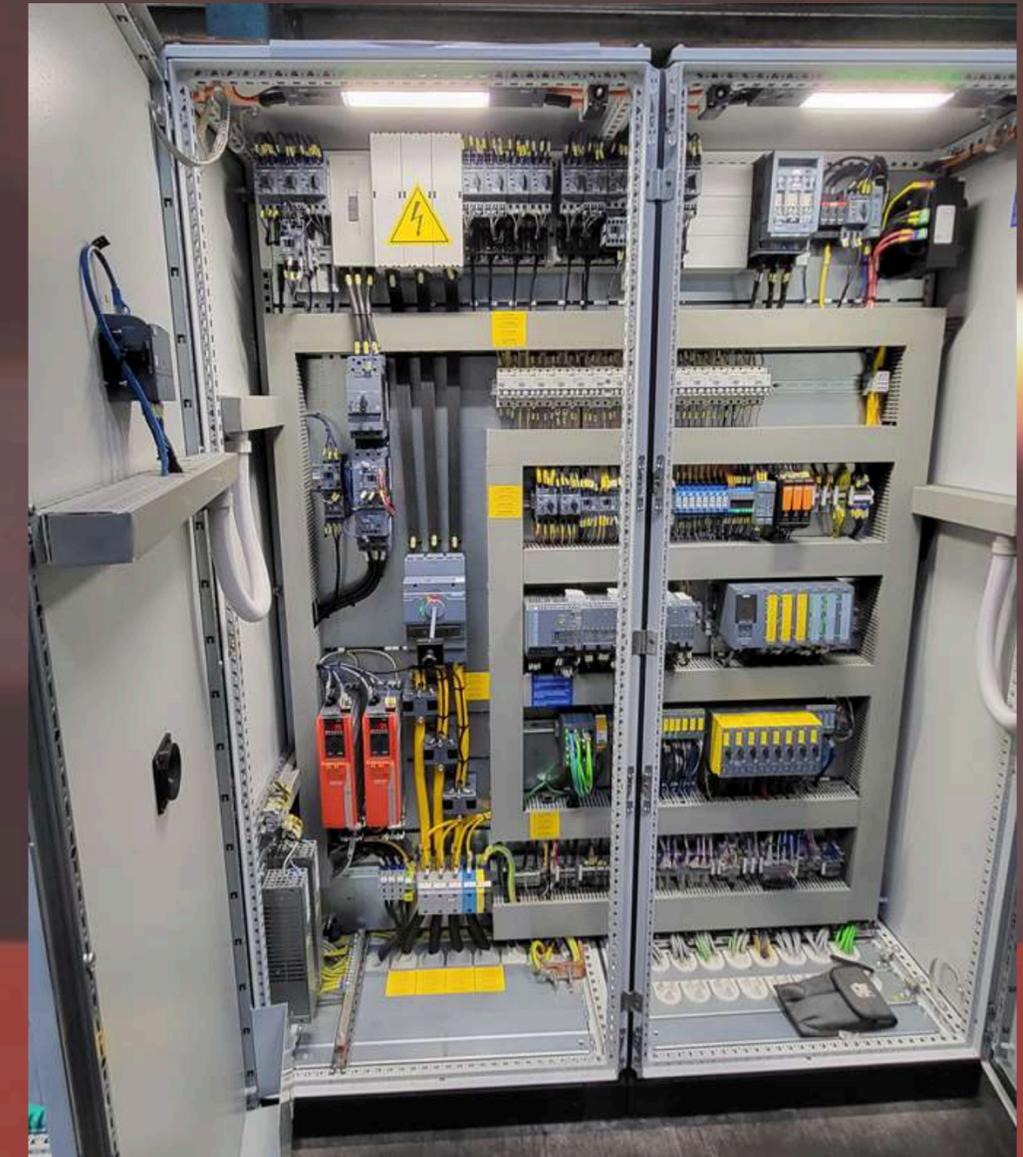
MAINTENANCE PROJECTS



MODERNIZATION PROJECTS



We undertake maintenance and service projects – maintenance of low-, medium-, and high-frequency converters, forging lines, and melting converters. We provide comprehensive maintenance and servicing of induction heat treatment equipment, and if necessary, we also undertake the mechanical servicing of the equipment.



We undertake modernization projects – upgrading the electronics of specialized machines and equipment designed for specific applications. Preparing simple machines for performing more complex processes.

NEW PRODUCTION FACILITY



FROM JANUARY 2025

- Production space of 1,200 square meters
- NC and CNC machines
- Welding room
- Dedicated testing area with high installed electric power, for full equipment testing
- 10-ton overhead crane
- Offices located inside the production hall (no separate office building yet)
- 550 kVA electrical transformer station



NEW EQUIPMENT



NCT CNC MACHINE

WORKING AREA:

- Table size: 950 × 500 mm
- Table load capacity: 600 kg
- Spindle nose to table surface: 140 – 650 mm
- Spindle centerline to column: 556 mm
- Positioning accuracy: < 0.005 mm
- Repeatability: < 0.003 mm

AXES:

- Guideways type (X / Y / Z): linear, 2 / 2 / 2
- X-axis travel: 850 mm
- Y-axis travel: 510 mm
- Z-axis travel: 510 mm
- Rapid traverse speed (X / Y / Z): 36 / 36 / 36 m/min
- Maximum feed rate: 36 m/min

SPINDLE:

- Maximum speed (standard): 24,000 rpm
- Tool system: DIN / BT 30
- Drive (standard): integrated motor spindle

SPINDLE MOTOR:

- Maximum power: 13 kW
- Maximum torque: 7.1 Nm
- Cooling: liquid cooled

TOOL MAGAZINE:

- Magazine type: arm-type
- Number of tool positions: 24
- Maximum tool length: 300 mm
- Maximum tool diameter: 80 mm (150 mm if near pockets are empty)
- Maximum tool weight: 6 kg



NEW EQUIPMENT



ABKANT BENDING MACHINE

- Bending force: 60 tons
- Bending length (A): 2100 mm
- Distance between columns (B): 1700 mm
- Steel sheet bending capacity (with a 50 mm V-die):
 - For $R_m = 42 \text{ Kgf/mm}^2$: 4.9 mm
 - For $R_m = 63 \text{ Kgf/mm}^2$: 4.0 mm
 - For $R_m = 70 \text{ Kgf/mm}^2$: 3.8 mm
- Working speeds:
 - Approach speed: 160 mm/s
 - Pressing speed: 10 mm/s
 - Return speed: 165 mm/s
- Sheet metal support arms:
 - Number of rear supports: 2 pcs
 - Support arm stroke: 800 mm
 - X-axis travel speed: 230 mm/s
- Number of front sheet supports: 2 pcs
- Processing depth along full bending length (E): 410 mm
- Cylinder stroke (C): 275 mm
- Distance from table to moving beam (D): 530 mm
- Main motor power: 7.5 kW



NEW EQUIPMENT



HYDRAULIC GUILLOTINE

- Cutting length (A): 2100 mm
- Maximum sheet thickness: 6 mm
- Materials to be cut:
 - Steel sheet: 6 mm
 - Aluminum sheet: 6 mm
 - Copper sheet: 6 mm
 - Stainless steel sheet: 4 mm
- Hydraulic drive for blades with high cutting force
- Motorized back gauge, travel: 1000 mm
- Front support arms for easy handling of large sheets: 3 pcs
- Motorized back gauge: 1 pc
- Photo-cell protection replaced with (safety door system and safety switch according to CE standards): 1 pc
- Small cutting angle: 1.2°
- Side stops: 3 pcs
- CNC control unit model CybTouch: 1 pc
- High-quality upper and lower blades, set: 1 pc
- Oil tank capacity: 150 L
- Motor power: 11 kW



New Products:

- Stainless steel water tanks
- Doors and panels for cabinets
- Busbars (collector bars)
- Components for hardening machines

NEW EQUIPMENT



WELDING WORKSHOP



Equipped Welding Workshop:

- Welding table
- Equipment for soldering copper components
- TIG and MMA welding

Products:

- Steel frames, base frames
- Copper brazing, inductors
- Stainless steel tanks
- Water-cooled stainless steel frames
- Guide rails for forging inductors