Hi.wire® induction furnaces

AUTOMAT®

The induction furnaces manufactured by Automat cover the power range of 25 to 150 kW, operating in the frequency range of 1 to 300 kHz.

The furnace range include the two technologies, MOSFET (tension source, matching transformer) and current source with parallel coil.

Automat's furnaces have been designed for heat treatment of continuously moving parts, like i.e. wires or cables, at pre- and post-curie temperatures. The furnaces are suitable for magnetic and diamagnetic materials.

The difficulty of heat treating these small size parts, heated and soaked in a very short time (less than 48 milliseconds) is optimally resolved with these furnaces.

The optimized design of coils and heating tank, and an advanced DSP based digital control permits electric-thermal efficiency of 90% and above.

Automat's Hi.wire® multiple-strand technology allows placement of coils at distances as short as of 60 mm (2 1/3 inch) without interferences. This way, multiple-strand furnaces of 50 or more furnaces can be set up in parallel.

The advanced control system, based on the most modern DSP technology, running at a frequency of 150 MHz, provides response times of microseconds on sudden changes in the parameters of the moving part being treated (crossing the curie temperature, breaking of the strand, earth leakage because of the strand touching the coil, etc.).

Fastest and latest solid-stage IGBT technology, together with a robust active safety system, protects the furnace even against earth leakage cuts without galvanic isolation (parallel case).

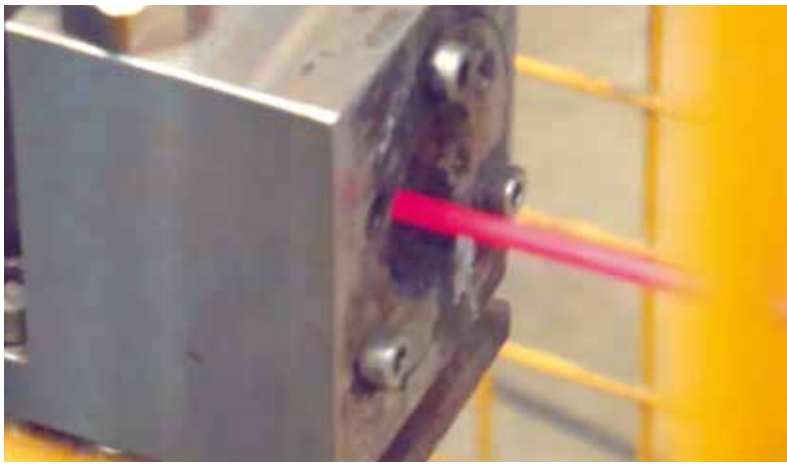
The split high frequency of the furnace directly on the coil, permit overcoming long distances (more than 100 m) between the electrical cabinet room and the production line (heating coil), without performance or features losses.

A unique fast and easy tank exchange system permits adjusting the heating coil to the piece size, increasing the energy efficiency in a multiple strand line.

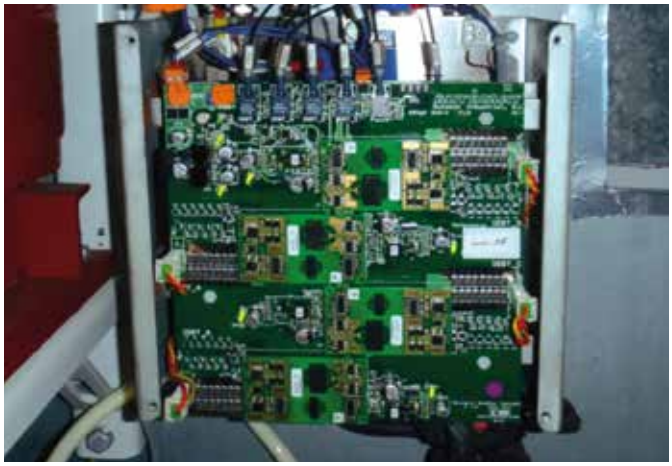
The unique Power building in a Block technology structures the power modules in separate units. Several basic modules can be lined up in big power structures easily and cost efficient.

The equipment's communication interface includes CAN, RS-485 and Profibus, fitting almost any communication requirements with existing production line elements.

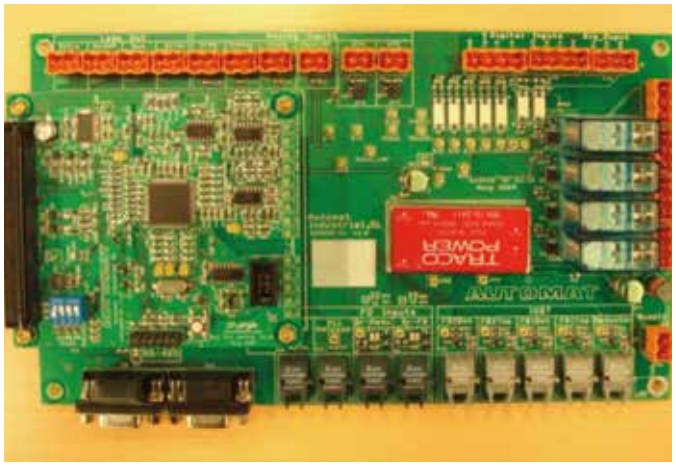
Highest process quality by control, best operation efficiency by technology equals big profit.



Wire at 760 °C (1400 °F), 2.5 mm (0.10 in.), 180 m/min (590 fpm).



Drivers of highest technology with 20 W per channel and frequency up to 300 kHz.



Control board based on DSP.

Multiple strand furnace (for 12 wires).

Voltage-current signal of the tank in parallel at 80 kW and 65 kHz.

Technical characteristics

Power	25 to 150 kW
Supply voltage	380 to 480 Vrms, 3F+T, 50-60 Hz
Efficiency	90%
Power factor (cosφ)	0.95
Protection grade	IP54
Frequency	1kHz to 150kHz (IGBT) 100kHz to 300kHz (MOSFET)
Resonant tank system	Serie (MOSFET) Parallel (IGBT)
User interface (HMI)	Touch-screen
Communications interface	CAN, RS-485, Profibus
Control	DSP digital system (150 MHz clock)
PLL resolution	6.66 nanoseconds
Data transmission	by optical fibre
Control loop	Voltage tank Current tank Delivered power Frequency tank Equivalent resistance Piece temperature
Cooling system	Water (12 L/min, 3.2 gal/min)
Water temperature	Max 35 °C (95 °F), min 17 °C (63 °F)
Protection system	Overload (fuses) Short circuit between power supply contacts (tank) Earth leakage (response time <200 nanoseconds) Overvoltage in power supply Overvoltage in tank (strand break) Overcurrent load Curie temperature crossing
Max Distance between supply and tank	100 m (330 ft) (MOSFET serial) 200 m (660 ft) (IGBT parallel)

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