Power Cube® SA/400 series

Wideband Medium-High Frequency
50 kW/**25** kW/**12.5** kW Green Generators

Energy Saver

Features / Benefits

4.0 READY

- **High power output**
- **High level of performance** with minimal operating costs
- **Automatic tracking & best optimization to load**
- **Constant, repeatable power generation** via microprocessor control
- **Minimum cooling water flow required**
- **High Safety:** output insulation from the mains
- **Highly integrated** with a small footprint
- **User Friendly Operations** through graphical touch-screen interface
- **Stainless Steel casing**
- **Compliant** with Electrical Safety and Electromagnetic Compatibility Regulations

POWER CUBE **50SA/400** GENERATOR

CEIA® USA

www.ceia-usa.com

The **Power Cube SA/400 Generator Series** is a high power Induction unit in a very compact size with embedded advanced microprocessor based control software and state-of-the-art electronics.

This allows very **high efficiencies (>96%) under a wide variety of workload conditions** while maintaining precise, stable and repeatable output power.

SA/400 Generators Series

For more than 40 years CEIA has been manufacturing Inductive Heating Systems, achieving great experience in the field, and carrying out continuous R&D activities.

The ***SA/400 Generators*** and **Network Matching (Heating Head) hardware design** combined with a state-of-the-art power and control electronics allow an **extremely high conversion efficiency and therefore a high reliability and low operating costs**.

The embedded microprocessor control system is based on a wide feedback signals network, that allows a fine coil voltage and current control, and guarantees the consistency and accuracy of output power generation, suitable for highly repeatable production processes.

All the CEIA Generators are equipped with an isolation transformer that separates the coil output from the power supply line guaranteeing a high level of operator safety.

Automatic Output Matching to Wide Load Impedance

The *SA/400 Generators* adaption system to the load is fully automatic. The operator does not have to carry out any type of mechanical operation on the Generator or on the Heating Head.

This function selects the best Generator parameters, maximizing conversion efficiency at each set point power. This reduces the set up time and associated costs. Furthermore, during operation, a continuous and real time automatic tracking of the output matching is carried out in order to always meet the set point power even in case of workload condition changing. (i.e. heating temperature over curie point). This provides for the greatest possible efficiency during the entire heating cycle.

The SA Series Generators are therefore ideal for industrial production processes, where the maximum reliability, repeatability and output power accuracy are required together with wide load matching flexibility, fast set-up and low operation costs.

Friendly Human Machine Interface

A wide 7" high-resolution touch screen panel allows the operator to access programming function parameters quickly. All the process parameters are continuously displayed on the Main screen:

- Coil Voltage
- Coil Current
- Output Power Setting and Real time Reading
- Temperature Setting and Real time Reading
- Cooling Water Temperature and Flow
- Working Cell (Recipe)
- Generator Status (Alarm)

▸ ***MAIN SCREEN***

Modular and Configurable System

The Power Cube SA/400 Generator Series, due to its unique modular design, is available in **several configurations to satisfy different user requirements**.

Energy Saver

Models

Configurations

Models	Configurations
Power Cube **12.5 SA/400**	**12.5 kW generator** with single heating head output
Power Cube **12.5 SA/400-2H**	**12.5 kW generator** with dual alternative heating heads output
Power Cube **2x12.5 SA/400**	**Double 12.5 kW generators** with dual simultaneous heating heads output
Power Cube **25 SA/400**	**25 kW generator** with single heating head output
Power Cube **25 SA/400-2H**	**25 kW generator** with dual alternative heating heads output
Power Cube **2x25 SA/400**	**Double 25 kW generators** with dual simultaneous heating heads output
Power Cube **50 SA/400**	**50 kW generator** with single heating head output

POWER CUBE **25SA/400** GENERATOR

Advanced Control and Interface Functions

The Power Cube SA/400 Generator Series, **equipped with advanced built-in controller**, includes the following CEIA accessories/options **for an accurate control of the process.**

WIRE FEEDER DISPENSERS (2)
for completely automated brazing process

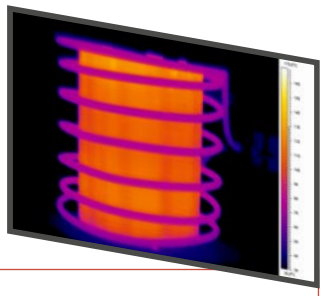
ANTI-OXIDIZING GAS DIFFUSER (2)

POWER CUBE
SA/400 SERIES

FIELD BUS READY

FIELD BUS INTERFACE
for an easy and fast implementation into automation lines

CEIA OPTICAL PYROMETERS
provide precise temperature measurement and control



THERMO CAMERA CONTROL
for management of up to two independent heating zones

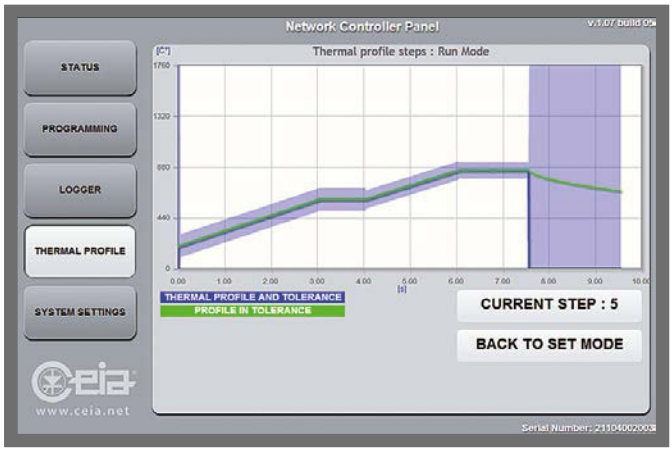
THERMO PROFILE SOFTWARE
for precise temperature adjustment at your fingertips

WEB SERVER & DATA LOGGER
for remote service and quality control

Thanks to the **Thermal Profile Monitoring** software, coupled with the **SH/SLE Optical Pyrometers**, the user is now able to set specific temperature profiles, monitor and certify the heating process of each production item.

Thermal Profile Management and Monitoring

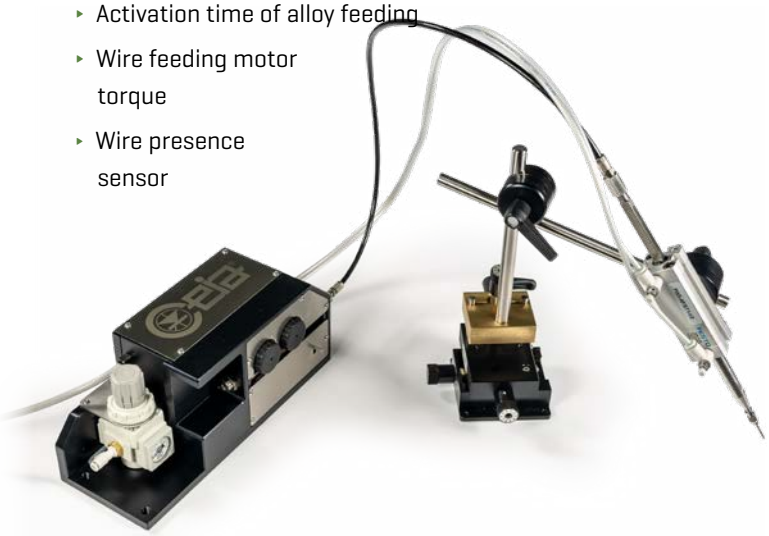
- Up to 20 Programmable Temperature and Time Segments per Process
- Up to 100 different storable processes
- Maximum Power Output Programmable for Each Individual Segment
- Temperature Tolerance Window Programmable for Each Individual Segment
- Out-of Tolerance and End-of-Cycle Outputs for Each Process



Real-time Thermal Profile screen, combined with Web server and Data Log option.

Wire Feeder Control

- Control up to two independent Wire Feeders, one for each heating station
- Control parameters:
  - Quantity and speed of wire feeding
  - Quantity and speed of wire rewind
  - Activation time of alloy feeding
  - Wire feeding motor torque
  - Wire presence sensor



Tin Soldering Control

- Optimized version for tin soldering
- Same features as the wire feeder control with the added special features

Special Features

- Management of the automatic use of two wire feeders on the same piece to braze.
- Management of emissivity change (emissivity A and B) during the heating process
- Management of the brazing process without temperature control (heating time and two levels of programmable power)
- Management of the automatic use of two Wire Feeders on the same piece to braze, during the working mode "Thermal Profile" (only if the TP option is active).

The Power Cube SA/400 Series is equipped with **integrated Data Log and Web Server system.** It is possible to perform automatic data storage, for a proper process quality control, monitoring heating temperatures, output power, frequency, voltage and inductor current.

An Ethernet TCP/IP port allows access to the internal web server of the generator for remote programming settings and interface with SCADA / DCS systems.

Integrated Web server and Data Log System

- Integrated Webserver with 2-port 100base-T Ethernet switch
- No client software required, only a web browser
- Zero configuration network for simple setup
- Built-in Rich Internet Application (RIA) for Status Monitoring, Remote Programming, Logging and Thermal Profile Management
- Internal storage capacity for more than 100,000,000 data samples

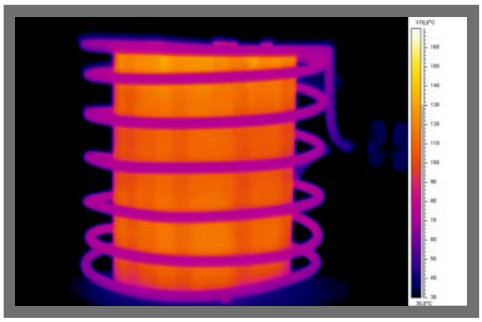
▸ ***Data Logger screen.***

Field Bus Management

- Management and control of the heating process via Field Bus protocol:
  - Profinet
  - EtherCAT
  - EtherNet / IP
  - Others upon request (DeviceNet, Profibus, CANopen, CC-Link, CompoNet, ControlNet, Modbus-RTU or TCP, SERCOS III)
- Field Bus and Network compliance certification available upon request

Thermocamera Control

- Interface with Thermocamera via a direct Ethernet connection
- Management of up to two independent zones of interest (ROI # 1 and ROI # 2).
- Ideal for temperature control on large surfaces or in applications where the location of the hot spot moves during the heating process (Max Temperature Spot Automatic Tracking)
- Simultaneous measurement and control of two different areas used to prevent over heating



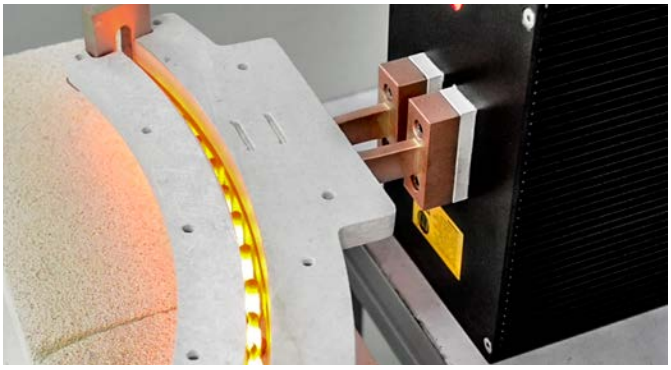
The Power Cube SA/400 Series is equipped with two standard connectors which allow **easy and reliable connections of all the INPUT and OUTPUT signals** of the generator.

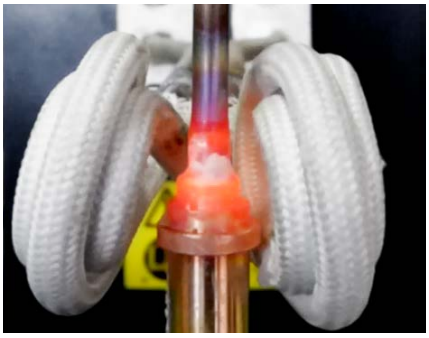
Input / Output Connections

The Power Cube SA/400 Series is equipped with two standard connectors which allow easy and reliable connections of all the INPUT and OUTPUT signals of the generator:

- Pyrometers
- Digital I/O
- Analog I/O
- Ethernet
- Field Bus
- Wire feeders

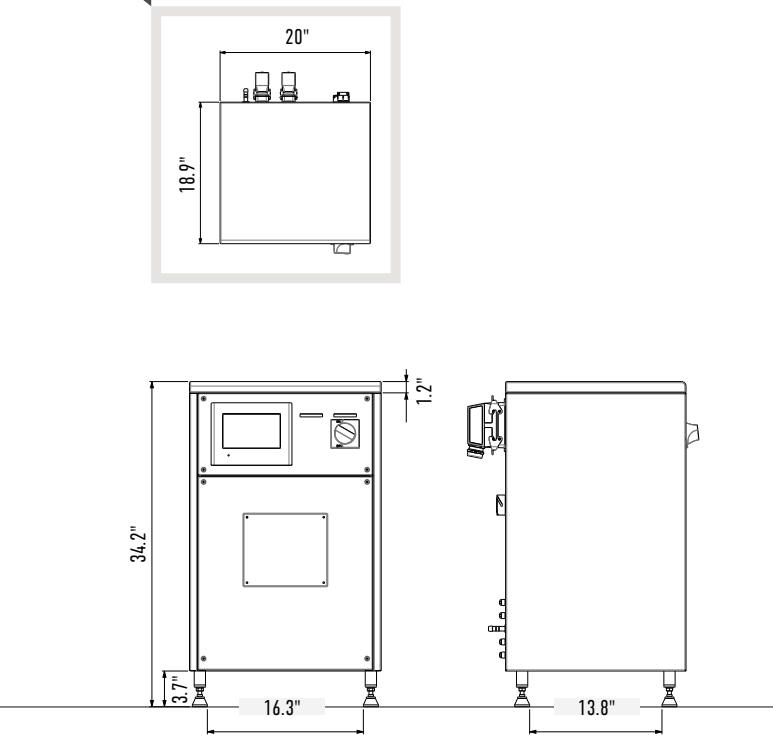
Examples of Application





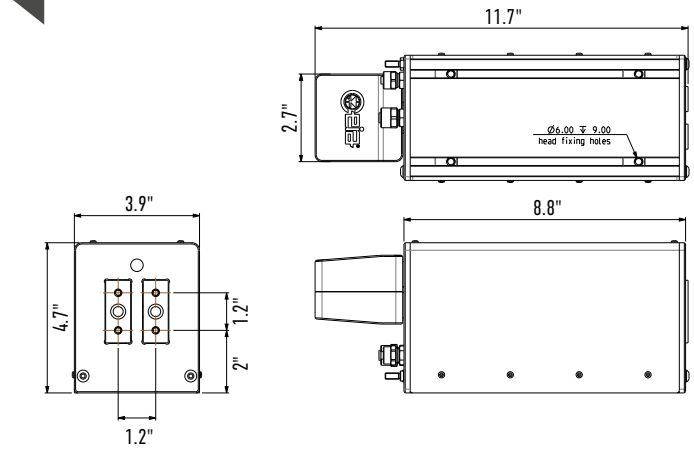
Generators & Heating Heads
Dimensions

12.5-SA/400 & 25-SA/400

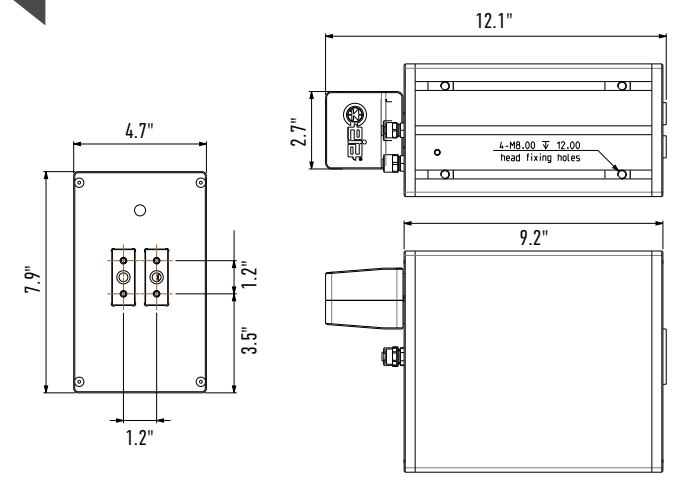


2 x 25 SA/400 & 50-SA/400

PWH-800



PWH-1600



Generators & Heating Heads
Specifications

GENERATOR		12.5 SA/400	12.5 SA/400-2H	2 x 12.5 SA/400	25 SA/400	25 SA/400-2H	2 x 25 SA/400	50 SA/400
POWER SUPPLY AND POWER	Max. input power	12.5 kW	12.5 kW	2 x 12.5 kW	25 kW	25 kW	2 x 25 kW	**50** kW
	Max. power at inductor	1000 kVAR	1000 kVAR	2x 1000 kVAR	2000 kVAR	2000 kVAR	2x 2000 kVAR	**2000** kVAR
	Power supply	400 Vac ±10%, three-phase - 50 Hz / 60 Hz, no neutral						
	Input current	23A max; external conductors 10 mm² (min)		46A max; external conductors 10 mm² (min)			85A max; external conductors 10 mm² (min)	
FREQUENCY RANGE		100 kHz... 400 kHz						
COOLING	Water cooling system	Direct off-take from mains at recommended pressure of approx. 58 psi [4 bar] (min. 29 psi [2 bar], max.116 psi [8 bar])						
		Minimum flow rate: • Generator: 0.66 GPM • Heating coil: 0.52 to 2.6 GPM, depending on the coil used						
		Water temperature at inlet: from ambient temperature to 113°F (non condensing)						
OPERATING MODE		Continuous operation						
CONTROL MODE		Automatic (controlled by a CEIA control and monitoring unit)						
CONTROL AND MONITORING		Automatically stabilized heating power (not influenced by power supply voltage variations)						
SELF-DIAGNOSTICS	Visual and acoustic fault signal	Monitoring of cooling water temperature and flow						
		Monitoring for short-circuits in the heating conductor						
		Internal fault						
		Monitoring of inductor dimensioning						
		Monitoring of the heating head connection						
		Monitoring of the power supply voltage value						
OPERATING CONDITIONS		Operating temperature: 41°F to 131°F • Storage temperature: - 4°F to 158°F • Relative humidity: 0 - 95% (non condensing)						
IP PROTECTION DEGREE		IP54						
WEIGHT		163 lbs (74 kg)	174 lbs (79 kg)	216 lbs (98 kg)	213 lbs (97 kg)	233 lbs (106 kg)	375 lbs (170 kg)	
SAFETY FEATURES		Galvanic isolation from the mains supply voltage						
		Complies with applicable international standards for Electrical Safety (EN 60204-1) and Electromagnetic Compatibility (EN 61000-6-2, EN 61000-6-4)						

HEATING HEAD	PWH-800	PWH-1600
WEIGHT	14.5 lbs	27.7 lbs
IP PROTECTION DEGREE	IP54	IP54

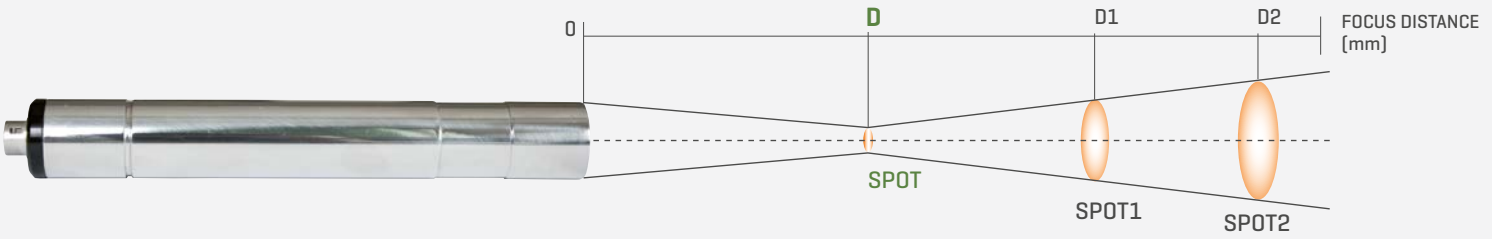
SH/SLE Compact Optical Pyrometers

CEIA offers a wide range of infrared optical sensors, equipped with low-intensity LED aiming, which covers an **operating temperature range from 176°F to 3992°F (80°C to 2200°C)**.

Features

- Adjustable emissivity from 0.1 to 1 [SH15/SLE series]
- High Accuracy
- High-Speed
- Very Compact design
- Temperature measurement independent from metal emissivity [SH2C/SLE series]
- Available with different focus distance and aiming spot size
- LED aiming light
- Supplied with Calibration Report traceable to Certified International Standards
- AISI 304 Stainless Steel Construction

	SH15/SLE	SH2C/SLE	
		Single-color mode	Dual-color mode
TEMPERATURE RANGE	176... 3632°F (80... 2000°C)	572... 3992°F (300... 2200°C)	1112... 3992°F (600... 2200°C)
TEMPERATURE RESOLUTION	0.1 °C (up to 999.9 °C) 1 °C (above 1000 °C)	0.1 °C (up to 999.9 °C) 1 °C (above 1000 °C)	0.1 °C (up to 999.9 °C) 1 °C (above 1000 °C)
EMISSIVITY RANGE	0.1-1.0	0.1-1.0	N/A
RESPONSE TIME	100 uS Time Constant		
UNCERTAINTY	± 0,3% of reading in °C. All Pyrometers are supplied with calibration report traceable to certified International Standards		
MEASUREMENT SPOT AIMING	High Definition, 620 nm wavelength led beam		
INTERNAL DIGITAL CONTROLS	Offset and Range Calibration Parameters		
	Environmental Temperature Measurement and Correction		
	Automatic Gain Range Selection		
POWER SUPPLY	+/-15 V - +10/-5 mA, directly supplied by CEIA Controllers		
CONNECTION CABLE	Diameter 0.19" (4.8 mm) x Length 4.9 ... 13 ... 19.6 ... 29.5 ft (1.5 ... 4 ... 6 ... 9 m)		
HOUSING	AISI 304 Stainless Steel		
WEIGHT	100 g		
PROTECTION CLASS	IP54 (IP65 upon request)		
OPERATING TEMPERATURE	32°F to 149°F (0 °C to + 65 °C)		
STORAGE TEMPERATURE	-13°F to 158°F (- 25 °C to + 70 °C)		
CONFORMITY	Complies with international standards currently applicable for Electrical Safety and Electromagnetic Compatibility (EMC)		



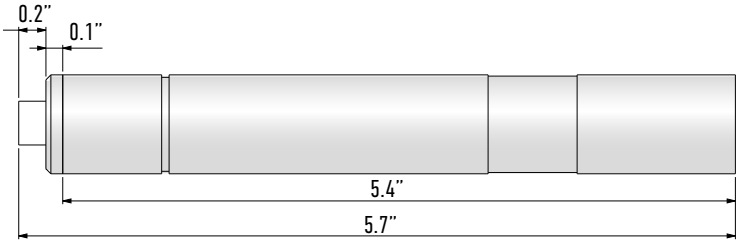
MODEL	*Close-up lens*	D distance (mm)	Spot diameter (mm)	D1 distance 1 (mm)	Spot 1 diameter (mm)	D2 distance 2 (mm)	Spot 2 diameter (mm)
SH15/SLE-550-D1 176... 1292°F (80... 700°C) 212... 1292°F (100... 700°C) with emissivity ≤ 0.5	none	**550**	**12.5**	1000	36	2000	86
	CL240/SH15	**240**	**4.5**	500	24	1000	63
	CL120/SH15	**120**	**2.5**	250	19	500	52
	CL60/SH15	**60**	**0.5**	150	18.5	300	51
SH15/SLE-550-D2 248... 1652°F (120... 900°C)	none	**550**	**4.5**	1000	21	2000	57
	CL240/SH15	**240**	**1.5**	500	18	1000	51
	CL120/SH15	**120**	**1**	250	17	500	46
	CL60/SH15	**60**	**<0.4**	150	19	300	50
SH15/SLE-550-D3 392... 2912°F (200... 1600°C)	none	**550**	**2**	1000	16.5	2000	47
	CL240/SH15	**240**	**0.6**	500	16	1000	47
	CL120/SH15	**120**	**<0.4**	250	15	500	44
SH15/SLE-550-D4 932... 3632°F (500... 2000°C)	none	**550**	**2**	1000	16.5	2000	47
	CL240/SH15	**240**	**0.6**	500	16	1000	47
	CL120/SH15	**120**	**<0.4**	250	15	500	44
SH2C/SLE 572... 3992°F (300... 2200°C)	none	**550**	**12.5**	1000	36	2000	86
SH2C/SLE-240 572... 3992°F (300... 2200°C)	none	**240**	**4.5**	500	24	1000	63

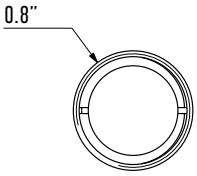
SH15/SLE Applications

- ANNEALING
- BONDING
- BRAZING
- CAP SEALING
- CURING
- FORGING
- HARDENING
- HOT FORMING
- LOCALIZED HEATING
- MELTING
- METAL GLASS SEALING
- NORMALIZING
- PREHEATING
- SINTERING
- SHRINK FITTING
- TEMPERING
- TIN SOLDERING

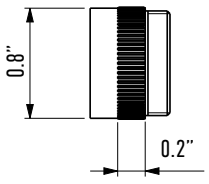
SH2C/SLE Applications

- HARDENING, FORGING, BRAZING, SOLDERING
- NOBLE METALS MELTING AND PURIFYING
- WIRE/ROD MILL
- SILICON PROCESSING
- GLASS INDUSTRY - GOB TEMPERATURE MEASUREMENT
- CEMENT INDUSTRY - CLINKER TEMPERATURE IN ROTARY KILNS



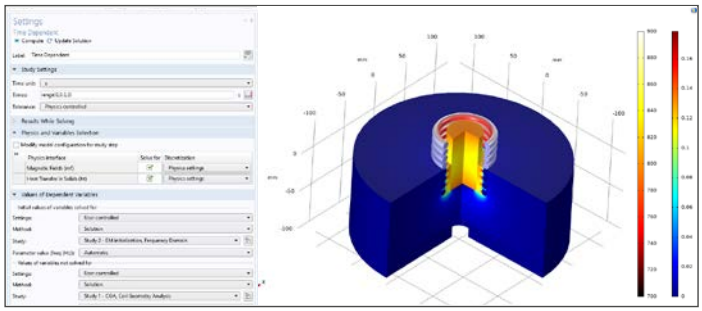


▸ Additional lens



The CEIA Difference

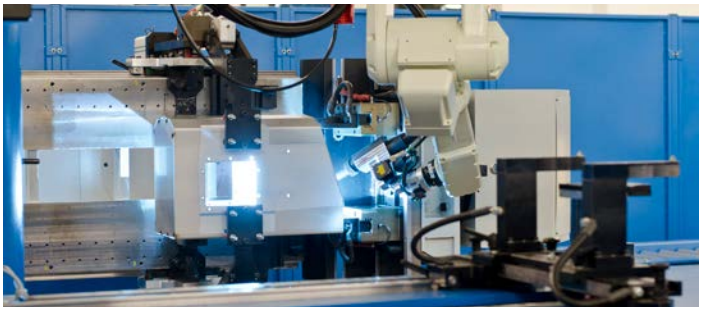
Constant market share growth thanks to the recognized outstanding quality and reliability of the installed equipment



- **Consolidated electromagnetic coil design and engineering capability**

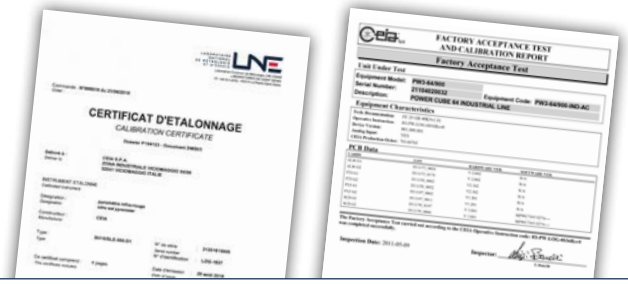
- **ISO 17025 accreditation on Electromagnetic Testing**

- **Complete control and execution of the electronics manufacturing**



- **Highly automated and repeatable mechanical manufacturing processes**

- **Digital Factory Testing, accurate automated calibration and final individual certification of the delivered equipment**



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