

Master Controller V3+

Multifunction Heating Process Controller

Feature Highlights

- **PROGRAMMING AND MANAGEMENT OF UP TO TWO INDEPENDENT HEATING STATIONS** consisting of:
  - CEIA Power Cube Generator
  - CEIA SH/SLE series non-contact temperature sensor or external thermocouples
  - Automatic solder dispenser
  - Antioxidant gas diffuser
- **INTERNAL MEMORY AND REMOVABLE SDC** card containing up to 100 work programs
- **MULTIPLE INTERFACE CAPABILITY** including
  - Field Bus
  - RS-232
  - Up to 22 input and 22 output
- **VALIDATION AND REPORTING** of each heating cycle for Production Quality Control and Certification
- **"QUICK ACCESS" KEY** for fast programming of user defined parameters

For more than 30 years CEIA has been manufacturing Generators and Control units for induction heating processes characterized by very high efficiency and minimum operating costs.

Thanks to the experience achieved in the field, and to the continuous R&D activities, CEIA is proud to introduce the **Master Controller V3+**.

Multifunction industrial control unit

The Master Controller V3+ is a multifunction industrial control unit, designed for automatic management of programmable heating processes.

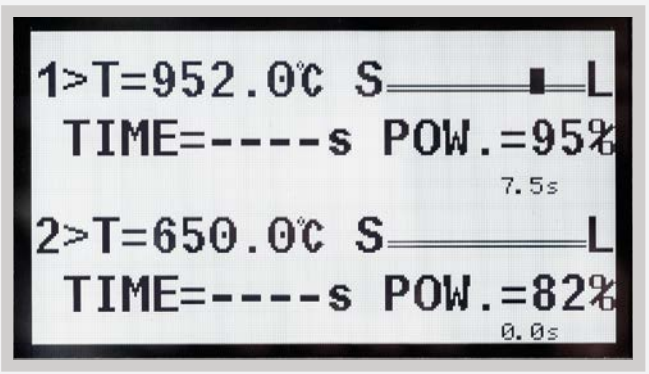
The Standard Controller version comes with a set of predefined programs. All operating parameters for each phase of the heating cycle can be programmed within a wide range of values.

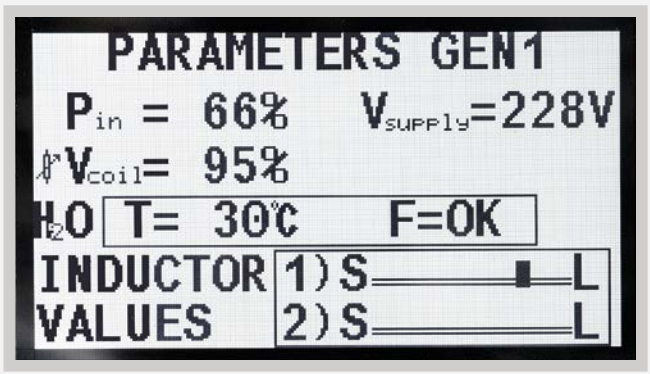
This allows maximum flexibility in setting the heating and cooling times, the power supplied by the induction generators, the operating temperatures for the piece being worked on and the quantity and feed speed of the soldering wire.

A wide range of digital and analog I/O signals, a field bus and an RS-232 serial interface allow connection to PLC, PC or external logic for remote loading and running of pre-set and user-defined heating programs.

The isolated inputs have programmable P/N logic, while the isolated outputs use a programmable auxiliary voltage of 12/24 V.

High-definition graphic display





- ***THE MAIN PROGRAMMING PARAMETERS** of the two heating stations are shown on the display of the CEIA Master Controller.*
- ***A BAR-GRAPH INDICATOR** shows the correct matching of the inductor. Changes in operating conditions, such as load variations, are displayed in real time.*
- ***A SERVICE MENU, ACCESSED BY PRESSING THE STATUS KEY**, displays a summary of the internal generator operating parameters.*

The Master Controller V3+ is a multifunction industrial control unit, designed for automatic management of programmable heating processes.

Advanced Control and Interface Functions

Wire Feeder Dispensers (2)

Power Cube Generator (2)

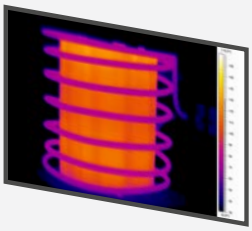
Anti-Oxidizing Gas Diffuser (2)

FIELD BUS READY

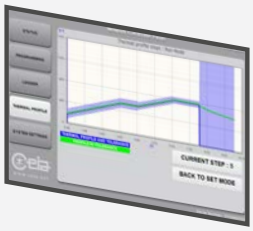
Field Bus Interface

MASTER CONTROLLER V3+

Compact Pyrometers (2)

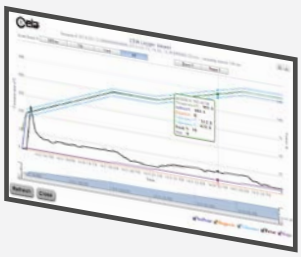


Thermo Camera Control



Thermal Profile Control

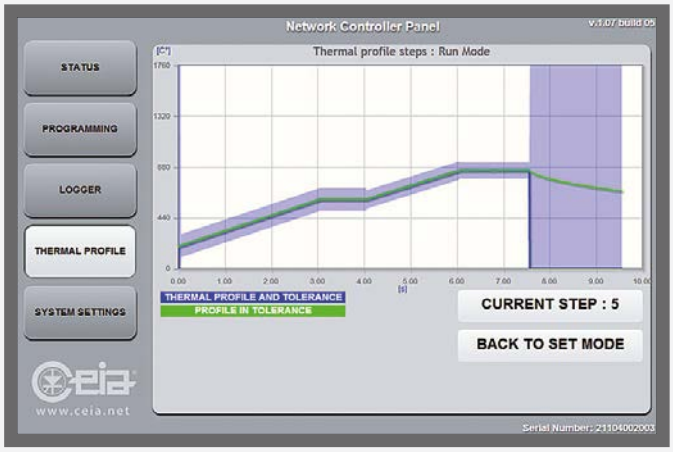
Web Server & Data Logger



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

The Master Controller V3+ 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 Master Controller 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

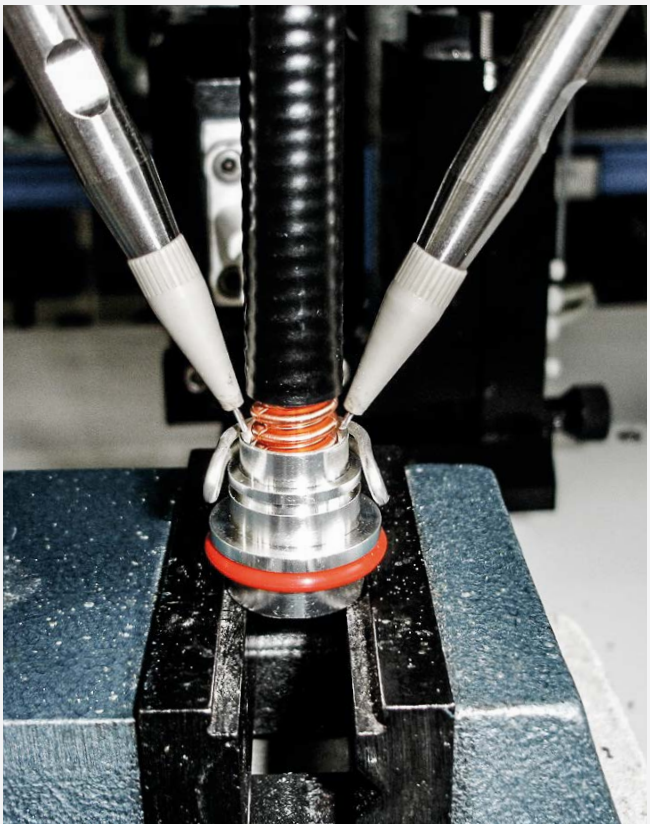
▸ ***Data Logger screen.***

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).



A wide range of digital and analog I/O signals, a **Field Bus** and an **RS-232 serial interface allow connection to PLC, PC or external logic** for remote loading and running of pre-set and user-defined heating programs.

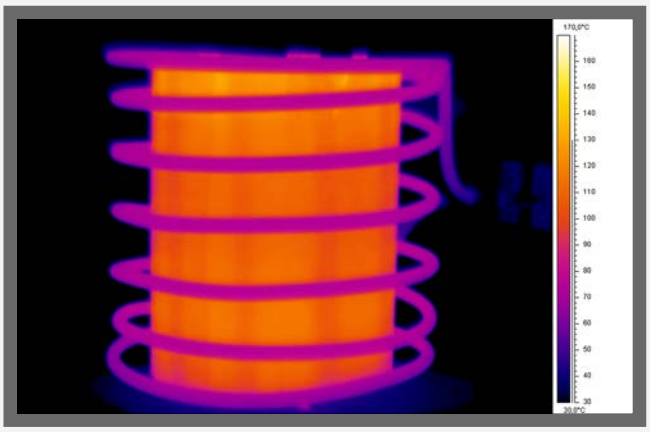
Field Bus Management

- 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)

- Main Master Controller functions managed:
  - Start / Stop cycle
  - Abort / Reset cycle
  - Set Point Power
  - Temperature measured in real time
  - Set Point Temperature
  - Power output in real time
  - Thermal profile step in progress
  - Generator diagnosis
- Field Bus and Network compliance certification available upon request

Thermocamera Control

- Interface with Thermocamera via a direct Ethernet connection on the Master Controller v3+
- 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



Model Configuration

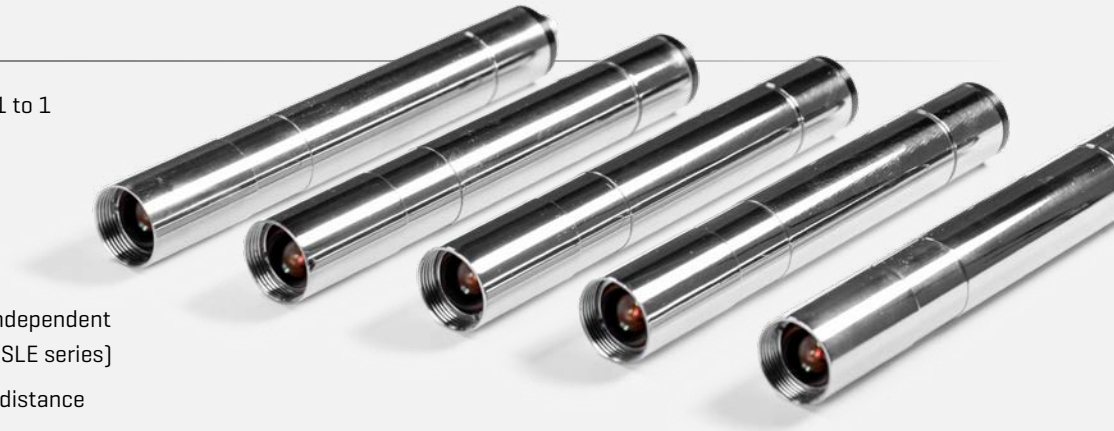
BASE UNIT			CODE
MASTER CONTROLLER V3+	*Multifunction Heating Process Controller*		MASTER-C-V3+
OPTIONS			
WIRE FEEDER CONTROL	*Management of two independent wire feeders (one for each soldering point)*		V3+/WF
THERMAL PROFILE CONTROL	*Thermal profile working mode*		V3+/TP
ETHERNET BOARD INTERFACE	*Web Server & Data Logger*		V3+/IXC
ETHERCAT FIELD BUS INTERFACE			V3+/FB -ETHERCAT
PROFINET FIELD BUS INTERFACE			V3+/FB-PROFINET
ETHERNET/IP FIELD BUS INTERFACE			V3+/FB-ETHERNET/IP
TIN SOLDERING CONTROL	*Version optimized for Tin Soldering. Includes the V3+/WF option*		V3+/TS
THERMOCAMERA CONTROL	*Includes the V3+/IXC option*		V3+/DIAS
ACCESSORIES			
	PROGRAM CARD	*SDC Card to save / load up to 100 work programs*	55265
	CONTROLLER TO OPTICAL PYROMETER CONNECTION CABLE	*1,5 m length*	49438
		4 m length	49439
	WIRE FEEDERS	*0.3 to 0.65 mm silver wire feeder*	PW3-WF/0.5
		0.7 to 1.1 mm silver wire feeder	PW3-WF/1
		0.8 to 1.2 mm tin wire feeder	PW3-WF/ST1
		1.3 to 1.7 mm tin wire feeder	PW3-WF/S1,5
	GAS DIFFUSERS	*Anti-Oxidizing gas diffusion system*	SG100
		Cooling and Anti-oxidizing gas diffusion system	SG101
	ACTIVATING PEDAL	*1,5 m*	3457
		4 m	46059
	RS-232 CABLES	*RS-232 cable (M-F) for the connection between the Controller and the Generator (1 m length)*	19623
		RS-232 cable (M-F) for the connection between the Controller and the Generator (3 m length)	23243
		RS232 cable (F-F) for the connection between the Controller and a Computer (3 m length)	50086

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 80°C to 2200°C**.

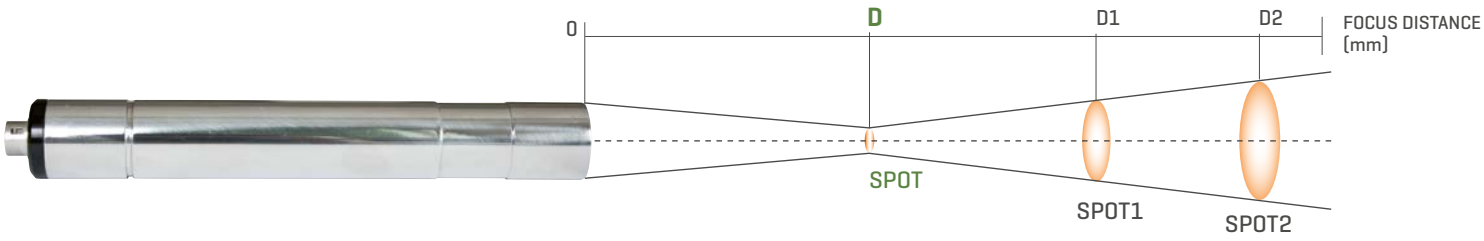
Features

- 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-550-D1 SH15/SLE-550-D2 SH15/SLE-550-D3 SH15/SLE-550-D4 SH2C/SLE

	SH15/SLE	SH2C/SLE	
		Single-color mode	Dual-color mode
TEMPERATURE RANGE	80... 2000°C	300... 2200°C	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 4.8 mm x Length 1.5 ... 4 ... 6 ... 9 m		
HOUSING	AISI 304 Stainless Steel		
WEIGHT	100 g		
PROTECTION CLASS	IP54 (IP65 upon request)		
OPERATING TEMPERATURE	0 °C to + 65 °C		
STORAGE TEMPERATURE	- 25 °C to + 70 °C		
CONFORMITY	Complies with applicable international standards for Electrical Safety and Electromagnetic Compatibility (EMC)		



Model Configuration and Optics Data

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 80... 700°C	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 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 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 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 300... 2200°C	none	**550**	**12.5**	1000	36	2000	86
SH2C/SLE-240 300... 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

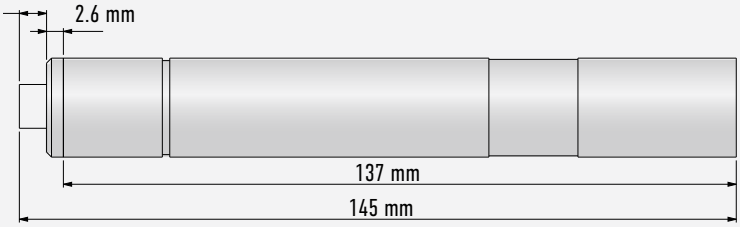
SH2C/SLE Applications

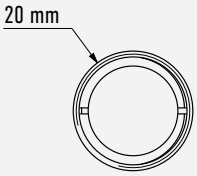
- HARDENING, FORGING, BRAZING, SOLDERING
- NOBLE METALS MELTING AND PURIFYING
- WIRE/ROD MILL
- SILICON PROCESSING
- GLASS INDUSTRY - GOB TEMPERATURE MEASUREMENT
- CEMENT INDUSTRY - CLINKER TEMPERATURE IN ROTARY KILNS

The SH/SLE sensors allow high quality management of the heating process according to the set temperature values. The reduced overall dimensions allow an easy integration of the pyrometer in automatic production systems.
Up to two optical sensors for temperature measurement can be connected to the generator.

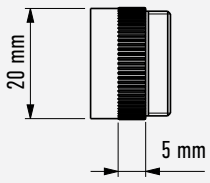
ACCESSORIES	DESCRIPTION		FOCUS DISTANCE	CODE
	CLOSE-UP LENS SH15-FOCUS		240 mm	CL240/SH15
			120 mm	CL120/SH15
			60 mm	CL60/SH15
	COOLING JACKET UNIT WITH INTEGRATED AIR PURGE			SLE-PURGE-COOL
	90° VIEW MIRROR SYSTEM			SLE-90D-BD
	AIR PURGE UNIT			SLE-PURGE
	CONNECTION CABLE	SH15/SLE	Length: 1.5 m	49438
			Length: 4 m	49439
		SH2C/SLE	Length: 1.5 m	63272
			Length: 4 m	63273
	ES3M MICROMETRIC OPTICAL SENSOR BASE			23497
	SH23 OPTICAL SENSOR BASE			21871

Dimensions





▸ Additional lens



Master Controller V3+ - Technical Data

HEATING SYSTEM SET-UP	Alternating between the two heads (if connected to a single Power Cube generator)		
	Simultaneously on two heads (if connected to two Power Cube generators)		
	Capable of driving Power Cube generators in continuous operation		
MANAGEMENT AND CONTROL	Activation of cycle: via external contact, RS-232 or Fieldbus interface		
	Control and Time Programming of 2 antioxidant gas diffusers, 2 heating heads and 2 wire dispensers		
	Available Settings: heating power; heating temperature (resolution 0,1°C); wire quantity and speed; antioxidant gas supply times; maximum solder force; wire feeder; piston advance delay		
	Control of the temperature of the article being processed: via optical temperature sensors, thermocouple or external sensors		
	SH15/SLE sample rate: 0.5 milliseconds		
	SH15/SLE time constant: 0.1 milliseconds		
FUNCTIONING MODES	Manual		
	TIMER A: fully time-programmable cycle phases with controlled-temperature holding time		
	TIMER B: fully time-programmable cycle phases with programmable heating time and optional temperature control		
	TIMER C: fully time-programmable cycle phases, heating programmable with two times and two power levels		
	SYNCHRONISED: as TIMER A with holding time synchronised by an external event		
	FULL AUTO: as TIMER A, with management of the automatic solder wire feeder		
	FULL AUTO 2 WIRES: as Full auto, with the possibility of applying two independent solder wire feeders at the same soldering point (available only with -TS option)		
	THERMAL PROFILE: functioning with thermal profile (available only with -TP option)		
	THERMAL PROFILE 2 WIRES: as THERMAL PROFILE, with the possibility of applying two independent solder wire feeders at the same soldering point (available only with -TS and -TP option)		
CONTROL INPUTS	2 inputs for the connection of CEIA optical temperature sensors		1 plug for a Field Bus module (accessory)
	2 insulated digital inputs for connecting the cycle activation pedals		6 insulated auxiliary digital inputs
	2 insulated digital inputs for halting the operating cycle		2 solder wire dispenser encoder inputs
	4 0-10V (or 0-20 mA, or 4-20mA) inputs (2 used for power control and 2 for temperature control)		2 "wire present" inputs
	2 insulated inputs (RS232) for connection to external programmable units		2 insulated digital inputs for starting a special cycle in manual mode
OUTPUTS FOR ACTIVATION OF EXTERNAL SLAVE DEVICES	2 serial outputs for connecting and managing two independent Power Cube generators		2 output for system ready signal (relay output)
	2 outputs for activation of antioxidant gas diffusers		2 0-10V (or 0-20 mA, or 4-20mA) outputs for temperature reading
	2 outputs for "Generator ON" signals		2 0-10V (or 0-20 mA, or 4-20mA) outputs for power reading
	2 outputs for "Temperature reached" signals		2 solder wire dispenser driver outputs
	2 outputs for activation of rapid cooling gas diffusers		2 auxiliaries open collector outputs
	2 outputs for "End of cycle" signals		

Master Controller V3+
Technical Data

SELF-DIAGNOSIS	Check of temperature and on the cooling water presence	Power Cube missed connection
	Correct inductor dimensioning check	Generators parameter screenshot
	Internal malfunction	Supply voltage too low
	Working cycle malfunction	Supply voltage too high
	Reading/writing malfunction of internal memory cells	Soldering wire presence
	Inductor short circuit	Phase missing (if connected to 90, 180, 360 and 720 Generators)
	Reading/writing malfunction of Program Card memory cells	Programming access control through a password
INTERNAL MEMORY	100 sets of working parameters	
	100 different storable thermal processes made of up to 20 segments per process (TP versions)	
REMOVABLE DATA FLASH CARD	100 sets of working parameters storable on each card	
	100 different storable thermal processes made of up to 20 segments per process (TP versions)	
POWER SUPPLY AND POWER	Power supply voltage: 195-255 Vac, 1~ 50/60 Hz	
	Maximum absorbed power: 60 W	
OPERATING CONDITIONS	Operating temperature: + 5 to + 55 °C	
	Storage temperature: - 25 to + 70 °C	
	Relative humidity: 0-95% (without condensation)	
CONTAINER	Stainless steel construction	
	Dimensions (WxDxH): 275 mm x 265 mm x 140 mm / Weight: 6 kg	
SAFETY FEATURES	Insulation from the mains voltage	
	Low operating voltage; no risk for the operator	
	Complies with international standards currently applicable for Electrical Safety (EN 60204-1) and Electromagnetic Compatibility (EN 61000-6-2, EN 61000-6-4)	

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