

# MASTER CONTROLLER V3+

## Multifunction Heating Process Controller

NEW  
GENERATION



### 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
- High-definition graphic display
- Internal memory and removable SDC Card containing up to 100 work programs
- Multiple interface Capability including:
  - >> Industrial current/voltage I/O
  - >> Field Bus
  - >> RS-232
  - >> up to 22 input and 22 output
- Validation and Reporting of each heating cycle for Production Quality Control and Certification
- "STATUS" key for immediate reading of main Generator working parameters
- "QUICK ACCESS" key for fast programming of user defined parameters



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## MASTER CONTROLLER V3+ Multifunction Heating Process Controller

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

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. CEIA's unique technological solutions allow the manufacturing of power equipment with compact size, extremely high-energy efficiency and long-term reliability.

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

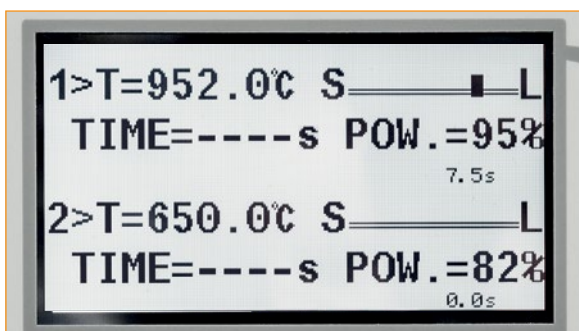
The Standard Controller version comes with a set of predefined programs. All operating parameters for each phase of the heating cycle can be programmed within a wide range of values.

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 fieldbus 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.

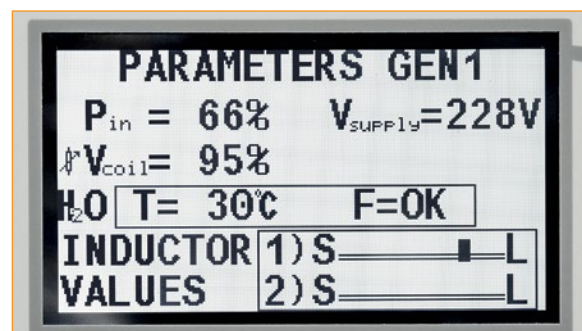
The isolated inputs have programmable P/N logic, while the isolated outputs use a programmable auxiliary voltage of 12/24 V.

#### HIGH-DEFINITION GRAPHIC DISPLAY




**Master Controller V3+**  
Advanced Power Cube Management Unit

 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.



**Master Controller V3+**  
Advanced Power Cube Management Unit

 A service menu, accessed by pressing the STATUS key, displays a summary of the internal generator operating parameters

## Advanced Control and Interface Functions

Power Cube Generator (2)



Wire Feeder Dispensers (2)



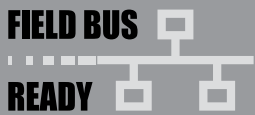
Anti-Oxidizing Gas Diffuser (2)



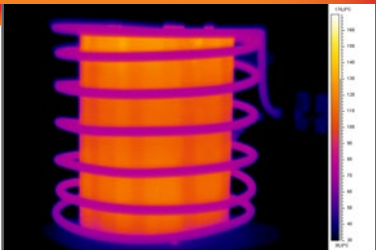
Compact Pyrometers (2)



Field Bus Interface



Thermo Camera Control



Thermal Profile Control



Web Server & Data Logger

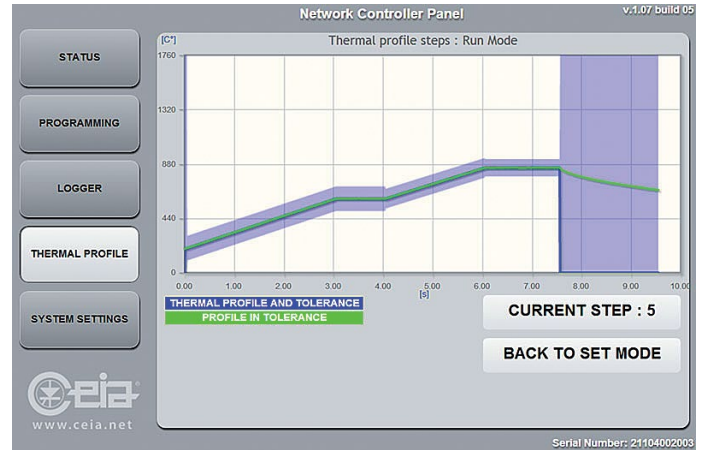


# MASTER CONTROLLER V3+

## Multifunction Heating Process Controller

### ✓ 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

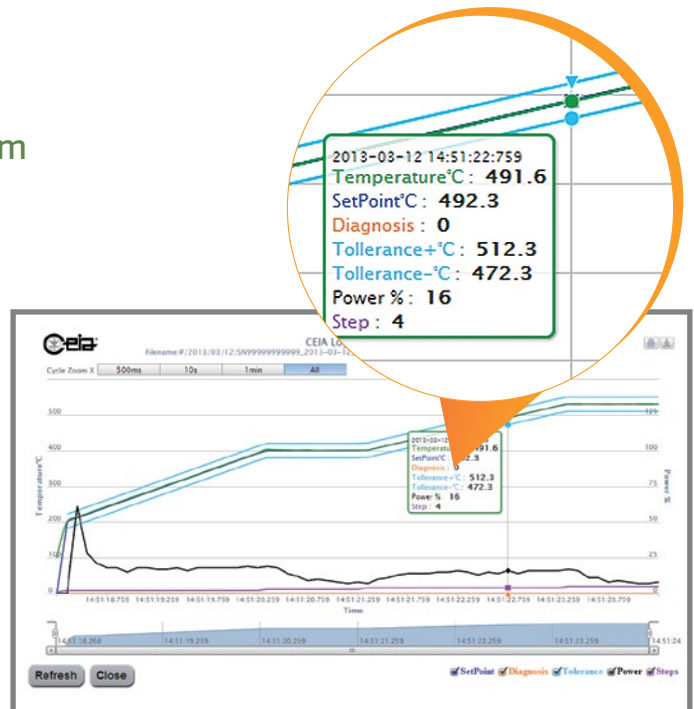


Thanks to the Thermal Profile Monitoring software, coupled with the new CEIA SH15/SLE Optical Pyrometers, the user is now able to set specific temperature profiles, monitor and certify the heating process of each production item.

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

### ✓ 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

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.

## ✓ 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

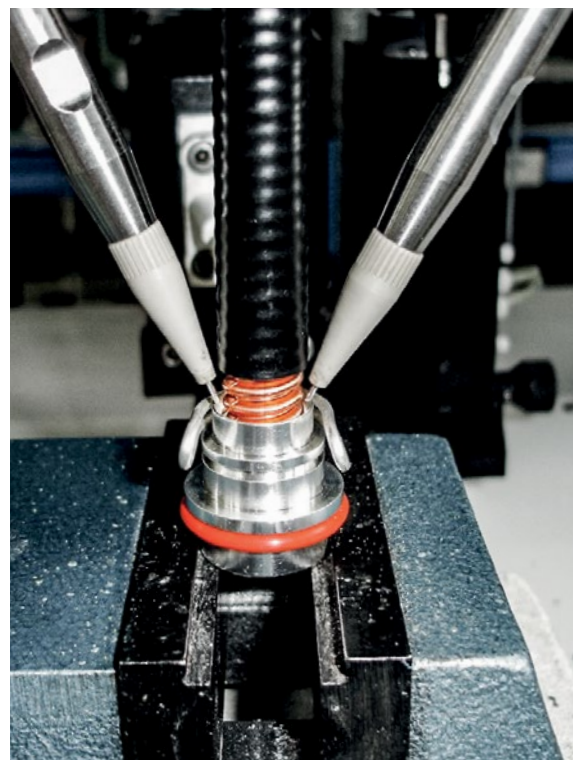


## ✓ Tin Soldering Control

- 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).



# MASTER CONTROLLER V3+

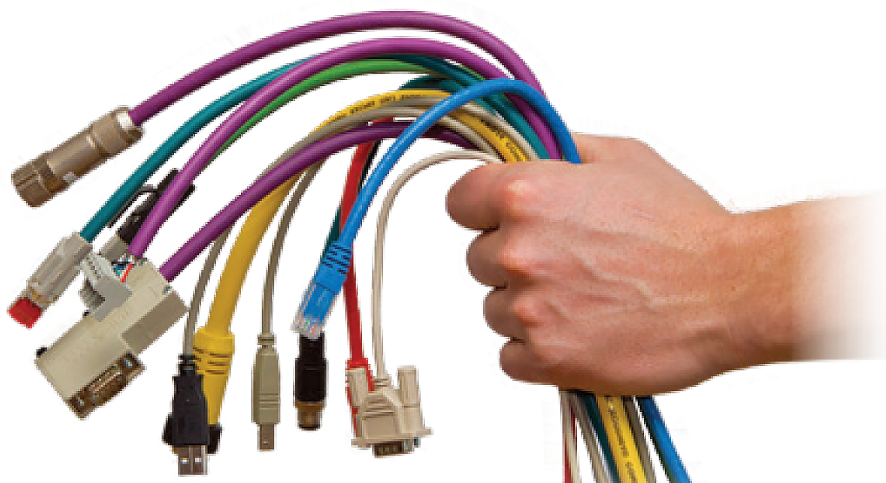
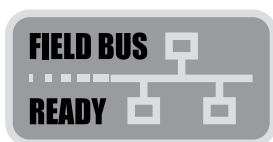
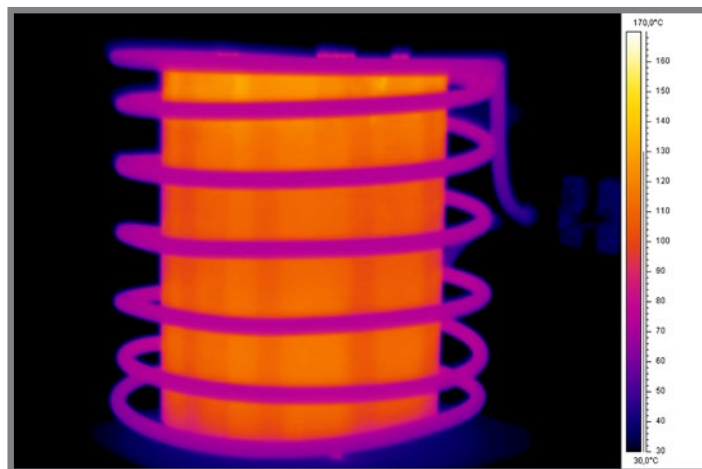
## Multifunction Heating Process Controller

### ✓ 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+		MASTER-C-V3+	
OPTIONS		Code	
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		Code	
	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	S6100
		Cooling and Anti-oxidizing gas diffusion system	S6101
	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

Compact Pyrometers for Measurement of metallic surfaces  
between 80°C and 2200°C

### SH/SLE series

- >> SH15/SLE Single-color Series  
80°C to 2000°C
- >> SH2C/SLE Dual-color Series  
600°C to 2200°C

### Features

- Emissivity adjustable from 0.1 to 1 [SH15/SLE series]
- Temperature measurement independent from metal emissivity [SH2C/SLE series]
- High Accuracy
- High-Speed
- Very Compact design
- 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

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.

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.

## ✓ SH/SLE Pyrometers Selection

MODEL	TEMPERATURE RANGE
SH15/SLE-550-D1	80... 700°C
SH15/SLE-550-D2	120... 900°C
SH15/SLE-550-D3	200... 1600°C
SH15/SLE-550-D4	500... 2000°C
SH2C/SLE	300... 2200°C



CEIA SH/SLE Pyrometer mounted on ES3M micrometric optical sensor base

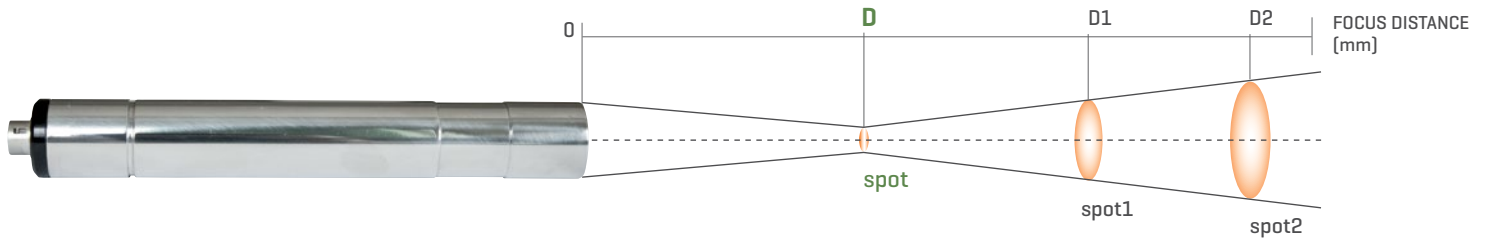
## ✓ Specifications

	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
READING SPOT DIAMETER	see table	see table	see table
FOCUS DISTANCE	see table	see table	see table
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 5 ... 1.5 ... 4 m		
HOUSING	AISI 304 Stainless Steel		
WEIGHT	100 g		
HOUSING PROTECTION CLASS	IP65		
OPERATING TEMPERATURE	0 °C to + 65 °C		
STORAGE TEMPERATURE	- 25 °C to + 70 °C		
CONFORMITY	Complies with international standards currently applicable for Electrical Safety and Electromagnetic Compatibility (EMC)		

# SH/SLE

## Compact Optical Pyrometers

### ✓ 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	Included	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	Included	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	Included	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	Included	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	Included	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

### TYPICAL APPLICATIONS

#### SH15/SLE model

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

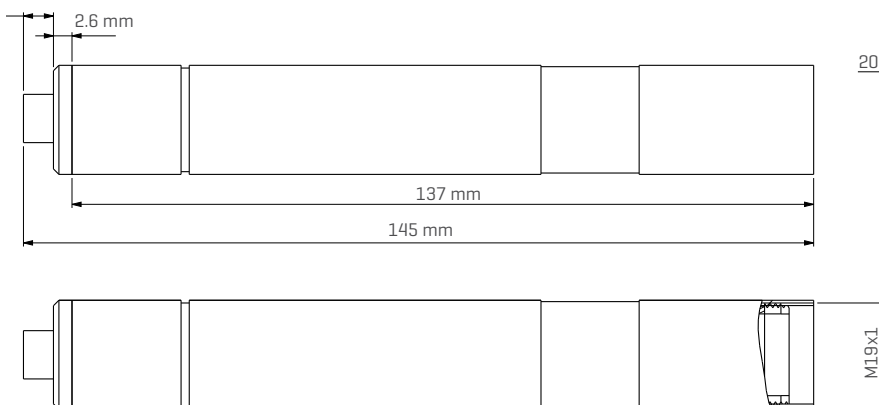
#### SH2C/SLE model

- 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

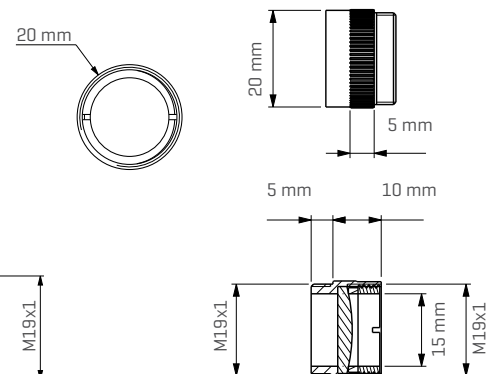
ACCESSORIES	Description	Focus distance	Code
	CLOSE-UP LENS SH15-FOCUS	240 mm	CL240/SH15
		120 mm	CL120/SH15
		60 mm	CL60/SH15
	COOLING JACKET UNIT WITH INTEGRATED AIR PURGE		SLE-PURGE-COOL
	90° VIEW MIRROR SYSTEM		SLE-90D-BD
	AIR PURGE UNIT		SLE-PURGE
	CONNECTION CABLE	Length: 1.5 m	49438
		Length: 4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

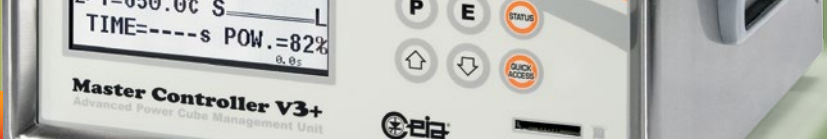
## DIMENSIONS

### Pyrometer



### Additional lens





## 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)	
MANAGEMENT AND CONTROL	Capable of driving Power Cube generators in continuous operation	
	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	
FUNCTIONING MODES	SH15/SLE sample rate: 0.5 milliseconds	
	SH15/SLE time constant: 0.1 milliseconds	
	Manual	
	<b>TIMER A:</b> fully time-programmable cycle phases with controlled-temperature holding time	
	<b>TIMER B:</b> fully time-programmable cycle phases with programmable heating time and optional temperature control	
	<b>TIMER C:</b> fully time-programmable cycle phases, heating programmable with two times and two power levels	
	<b>SYNCHRONISED:</b> as TIMER A with holding time synchronised by an external event	
	<b>FULL AUTO:</b> as TIMER A, with management of the automatic solder wire feeder	
	<b>FULL AUTO 2 WIRES:</b> as Full auto, with the possibility of applying two independent solder wire feeders at the same soldering point (available only with -TS option)	
	<b>THERMAL PROFILE:</b> functioning with thermal profile (available only with -TP option)	
CONTROL INPUTS	<b>THERMAL PROFILE 2 WIRES:</b> 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)	
	2 inputs for the connection of CEIA optical temperature sensors	1 plug for a Field Bus module (accessory)
OUTPUTS FOR ACTIVATION OF EXTERNAL SLAVE DEVICES	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
	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
SELF-DIAGNOSIS	2 outputs for activation of rapid cooling gas diffusers	2 auxiliaries open collector outputs
	2 outputs for "End of cycle" signals	
	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 Power Cube Generators)	
INTERNAL MEMORY	Reading/writing malfunction of Program Card memory cells	Programming access control through a password
	100 sets of working parameters	
REMOVABLE DATA FLASH CARD	100 different storable thermal processes made of up to 20 segments per process (TP versions)	
	100 sets of working parameters storable on each card	
POWER SUPPLY AND POWER	100 different storable thermal processes made of up to 20 segments per process (TP versions)	
	Power supply voltage: 195-255 Vac, 1~ 50/60 Hz	
OPERATING CONDITIONS	Maximum absorbed power: 60 W	
	Operating temperature: + 5 to + 55 °C	
CONTAINER	Storage temperature: - 25 to + 70 °C / Relative humidity: 0-95% (without condensation)	
	Stainless steel construction	
SAFETY FEATURES	Dimensions (WxDxH): 275 mm x 265 mm x 140 mm / Weight: 6 kg	
	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)	



COSTRUZIONI ELETTRONICHE INDUSTRIALI AUTOMATISMI

Zona Ind.le 54/G, 52041 Vicinomaggo - Arezzo [ITALY]

Tel. +39 0575-4181 Fax +39 0575-418287

E-mail: powercube@ceia-spa.com

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