

## **GECI™ MOD 2 and 4 USER'S MANUAL**

**Before connecting the battery charger to the mains and to the battery, READ THE FOLLOWING INSTRUCTIONS CAREFULLY.**

### **GENERAL WARNINGS**

- 1) Before each use of the battery charger the instructions set out below must be carefully read and abided by.
- 2) The failure to follow these instructions and /or errors in installing or using the battery charger, could lead to endangering the operator and /or damaging the device, voiding the manufacturer's guarantee.
- 3) The battery charger cannot be used as a component in systems which provide life support and/or medical devices, without explicit written authorization from S.P.E. ELETTRONICA INDUSTRIALE.
- 4) The battery charger must not be used by persons with reduced physical, sensory and mental capabilities or with lack of experience and/or knowledge, unless they are properly supervised and instructed by a person responsible for their safety.

### **CHILDREN**

- 5) The battery charger must not be used by children. The battery charger is not a toy and must not be treated as such.

### **WHERE TO INSTALL**

- 6) Never place the battery charger in the immediate vicinity of the battery in order to prevent gases produced and/or emitted by the actual battery during charging corroding and/or damaging the battery charger. Place the battery charger as far away from the battery as the length of cables permits.



### **>>>WARNING!<<<**

This is an EMC complying product in class A+B as defined by the CEI EN 61000-6-2, CEI EN 61000-6-3 and CEI EN 61000-6-4 regulations, in other words both for use in **RESIDENTIAL ENVIRONMENTS** and in **INDUSTRIAL ENVIRONMENTS**

- 7) Do not install the battery charger in a closed space or in such a way as to somehow prevent ventilation. For units equipped with fans, at least 30 mm clearance must be left around the vents. In order to facilitate the heat exchange of the battery charger it must be positioned vertically, exploiting the fixture holes (where provided).
- 8) Do not use the battery charger outdoors.
- 9) Do not expose the battery charger to rain, water splashes or steam.
- 10) Do not install the battery charger in caravans and / or similar vehicles.
- 11) Do not install the battery charger near any heat sources or in areas with high concentrations of dust.
- 12) Do not install the battery charger near any potential sources of flammable material, for example methane gas pipes or fuel depots (petrol, kerosene).
- 13) Do not place and/or fit the battery charger onto surfaces manufactured out of combustible materials, like wooden shelves or walls.

## **BATTERIES**

- 14) Follow the specific safety instructions provided by the battery manufacturer carefully, for example, whether or not to remove cell caps during charging and the recommended charge rates.
- 15) Working in the vicinity of a lead-acid battery is dangerous, as batteries generate explosives gases during charging. Therefore smoking and/or generating open flames and/or sparks must be avoided.
- 16) Never charge a frozen battery.
- 17) Batteries must be charged in specific, well-ventilated areas.
- 18) In order to reduce risk of injury only charge Lead-Acid, GEL or AGM type, Lithium Polymer or Lithium Ion batteries. Do not charge other types of rechargeable or non-rechargeable batteries as they could explode causing damage and/or injury.

## **FURTHER SPECIFICATIONS FOR LITHIUM BATTERIES**

- 19) In order to charge Lithium Polymer and Lithium Ion batteries, a BMS (Battery Management System) must always be used, comprising an active and passive safety system, in compliance with safety regulations in force.
- 20) The possibility of the BMS acting directly on the battery charger operation during cell balancing phases rules out, for any reason whatsoever, that the battery charger is held directly responsible should damage caused to the battery, or even a fire or an explosion, be due to an error in the BMS software.
- 21) The faculty offered by the materials produced by S.P.E. ELETTRONICA INDUSTRIALE to select different levels of voltage for charging, is entrusted to the control and supervision of the end user and S.P.E. ELETTRONICA INDUSTRIALE is not liable for any consequences resulting from the selection of the incorrect level of voltage. If in doubt, the user should ask a qualified professional for clarification.
- 22) The battery charger tolerance thresholds, as far as levels of over-voltage and overcharging are concerned, are used only for the safeguarding of the systems of the same and have no safety functions for the battery itself, the safety of which depends solely on the BMS, even when the battery charger is connected to the battery, whether the latter is being charged or not.
- 23) Should the client want to use the battery charger on a specific on-board system and in general in any cases of special usage, it is the client's responsibility to inform S.P.E. ELETTRONICA INDUSTRIALE, so that the latter can draw up any necessary recommendations. In this case, the client must provide S.P.E. ELETTRONICA INDUSTRIALE with all designs, diagrams and descriptive material necessary. S.P.E. ELETTRONICA INDUSTRIALE cannot be held responsible for any damage resulting from the use of the battery charger after opening it and/or modifying it and/or inserting it into other systems.
- 24) Under no circumstances can S.P.E. ELETTRONICA INDUSTRIALE be held responsible for the malfunctioning of the batteries or the incineration/explosion of these, in so much as the safety of the battery is the task of the BMS and not of the battery charger.

## **CHECKING CABLES, GRID, EARTHING**

- 25) Do not transport the battery charger by pulling on the cables as they could be damaged. Use the handles, if provided.
- 26) Before using the battery charger, check that the sleeving on the mains cable and battery cables is in good condition. Should one of the cables be damaged, have it replaced by a S.P.E. ELETTRONICA INDUSTRIALE qualified technician.
- 27) Check that the input voltage of the battery charger given on the data plate is in line with the voltage available.

- 28) Check the compatibility of the mains plug supplied with the battery charger: the use of adapters is not recommended (in Canada it is against the law).
- 29) The battery charger must be plugged into a socket fitted with an earth wire. Should the socket not be equipped with an earth connection, do not use the device before having a suitable socket installed by a qualified technician.
- 30) The power socket to which the battery charger is to be connected must be protected by an electrical device by law (fuse and/or automatic cut-out), capable of absorbing an electrical current equaling the absorption of current stated on the matriculation number of the battery charger, increased by 10%.
- 31) Do not open the battery charger as there are no parts which can be serviced and/or replaced by the user. Only specialized personnel, authorized by S.P.E. ELETTRONICA INDUSTRIALE may carry out servicing which involves opening the actual device. Electrical/electronic components inside may cause electric shocks even if the device is not plugged in.

#### CHECKING BATTERY CHARGER OPERATION and CURVE

- 32) Before charging, make sure that the battery charger is in line with the voltage of the battery, that the charging current suits the capacity of the battery and that the selected charging curve (for lead-acid batteries, or for airtight GEL or AGM type batteries, Lithium Polymer or Lithium Ion batteries) is correct for the type of battery to be charged.
- 33) We recommend fitting a fuse between battery charger and battery. The fuse must be installed along the connection to the positive terminal of the battery. The rating of the fuse must be proportionate to the nominal output current of the battery charger, the diameter of cable used and the environment in which it is to be installed.
- 34) We recommend unplugging it from the mains supply before connecting and disconnecting batteries.
- 35) During normal operation of the battery charger, the external surface may become hot and may remain so for a certain period of time after it has been switched off.
- 36) The battery charger needs no special maintenance, only regular cleaning procedures, to be carried out according to the type of working environment. Cleaning procedures should only be carried out on the external surface of the battery charger. Before starting any cleaning procedures, the mains supply cable and battery cables must be unplugged. Do NOT use water and/or detergents in general and/or pressure washers of any kind when carrying out cleaning.

#### LACK OF USE

- 37) If safe operation of the battery charger can no longer be ensured, stop the device and ensure that it cannot be put back into operation.
- 38) The specifications set out in this manual are subject to change without any notice. This publication replaces any previously supplied information.

## GECI™ MOD 2 and 4 IDENTIFICATION LABEL

- A MODEL
- B INPUT VOLTAGE
- C OUTPUT VOLTAGE AND CURRENT
- D BATTERY CHARGER SERIAL NUMBER
- E MAINS ABSORPTION
- F CHARGING CURVE
- G BATTERY CHARGER MANUFACTURE DATE
- H MAINS FUSE VALUE
- I BATTERY CAPACITY RANGE
- L PRODUCT CERTIFICATION STAMPS
- M NUMBER OF CELLS

<b>S.P.E. ELETTRONICA INDUSTRIALE</b>		<b>L</b>	<b>CE</b>
M. <b>A</b>	IN. <b>B</b>	OUT. <b>C</b>	
SER. <b>D</b>	IN. <b>E</b>	C. <b>F</b>	
DAT. <b>G</b>	F. <b>H</b>	BATT. <b>I</b>	
N° CELLS. <b>M</b>			

Storage temperature: from -20°C to +50°C  
 Relative humidity: 0 - 80% up to 50°C  
 Operating temperature: from 0°C to 40°C

# GECI™ MOD 2 and 4 USE AND OPERATION

In order to use the battery charger, safety norms contained in laws and regulations and provisions issued by local authorities must be complied with.

User obligations: as per these operating instructions, the user is any natural or legal person who directly uses S.P.E. ELETTRONICA INDUSTRIALE charging devices or whomsoever uses them on behalf of the aforementioned person. Under special circumstances, for example, leasing, rental, the user is the person who, as per the agreements stipulated between the owner and the user of the S.P.E. ELETTRONICA INDUSTRIALE charging devices, assumes the following obligations.

The user shall be responsible for the installation site of the device. He shall check whether particularly sensitive equipment is disturbed by the influence of the battery charger. The installation site shall be chosen so that usage (a high direct current produces magnetic interference) does not affect the operation of electromagnetic devices and magnetic data carriers (for example pace makers, monitors, magnetic disks and diskettes, magnetic tapes, watches etc.).

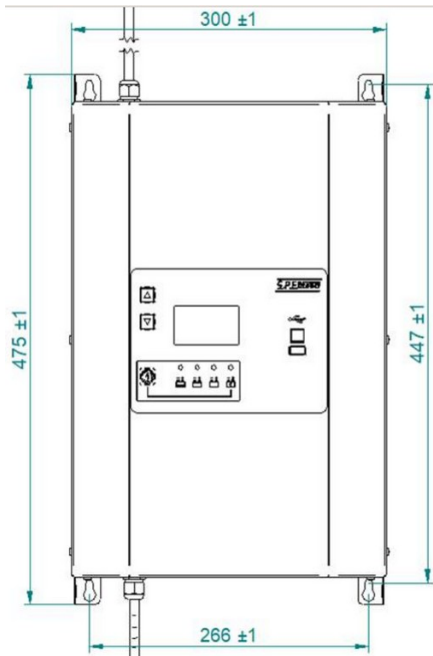
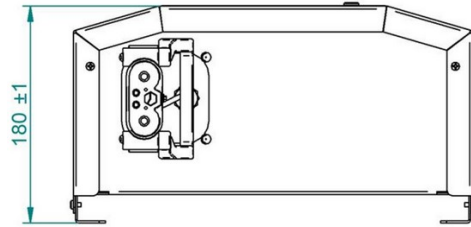
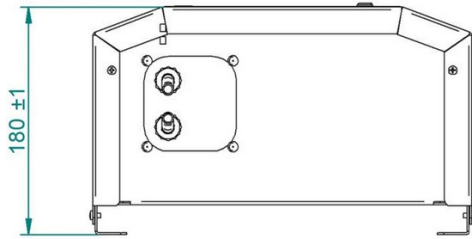
The user shall ensure that the use of S.P.E. ELETTRONICA INDUSTRIALE charging devices complies with regulations in force and that any action which could endanger the life and health of the user or of third parties is prevented, as well as the prevention of damage to property. The user shall ensure that users and operators have read and understood these instructions and that they comply with accident-prevention rules, technical safety rules, and use and maintenance directives.

## GECI™ MOD 2 and 4 INSTALLATION

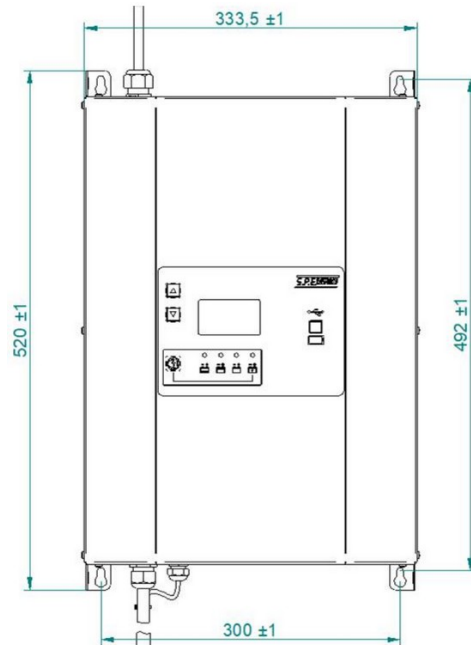
Before connecting the battery charger to the mains and to the battery, read the following instructions carefully.

- In order for the Battery Charger to operate correctly and perform at its best it must be installed on a wall the right way and fixed with rawplugs using the loops provided; ensure the ventilation slits are not obstructed.
- Only specialised, authorised personnel shall be allowed to carry out work requiring the battery charger to be opened.
- Before starting-up the battery charger check insulation on the mains cable and battery connection connectors.
- Only skilled personnel should intervene on electrical equipment.
- Disconnect from mains before connecting or disconnecting the battery.
- The rating label must be visible after installation.
- CHILDREN: The battery charger must not be used by children. The battery charger is not a toy and not be treated as such. Children being supervised not to play with the appliance.
- The appliance is not to be used by persons with reduced physical, sensor or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction.
- WARNING !! Charging batteries produce explosive gas, it is therefore strictly forbidden to smoke in the vicinity; naked flames and/or sparks and proximity to other equipment which could endanger people or property are to be prevented.
- This battery charger contains electrical components which can produce voltaic arcs and sparks, therefore if it is used in confined spaces, it must be installed in a suitable location; in any case the standard battery charger (IP 20) must be used indoors, in well-ventilated spaces, which are not exposed to rain and/or water splashes and be positioned on solid, level flooring, in particular dusty areas or areas where water, heat and humidity originate are to be avoided. Furthermore, the battery charger must not be positioned on support structures and/or shelves made of wood or other flammable material, materials must not be stocked in the vicinity of the battery charger and no kind of object or container for liquids must be placed on the cover. Batteries must be charged in specific, well-ventilated areas.
- In order to reduce the risk of injury only charge Lead - Acid, GEL, AGM types, Lithium Polymer or Lithium Ion batteries. Do not charge other types of rechargeable or non - rechargeable batteries as they could explode causing damage and / or injury.
- In order to prevent risk of electrocution, the battery charger must be connected to an earthed socket, furthermore the socket which the battery charger is connected to must be proportionate in power to the charger and be protected by an appropriate compliant electrical device (fuse or automatic cut-out switch). In order to obtain sufficient selectivity, the protection must have a calibration at least 10% higher than the power absorption of the device, furthermore the device must be protected from excessive high contact voltage in compliance with Local Authority provisions.

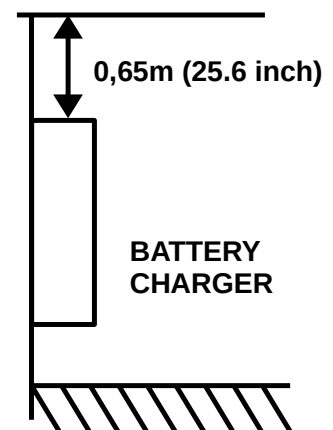
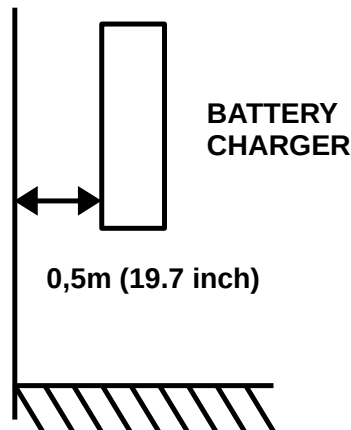
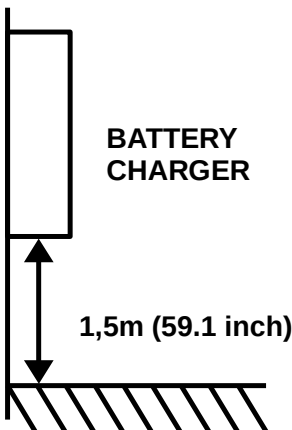
- We recommend using appropriate bipolar connectors.
- The use of extension leads to lengthen existing electrical connections must be avoided at all costs.
- Do not use additional cables to extend the existing electrical connections. Before using the battery charger, check that the sleeving on the mains cable and battery cables is in good condition. Should one of the cables be damaged, have it replaced by a S.P.E. ELETTRONICA INDUSTRIALE qualified technician.
- The S.P.E. ELETTRONICA INDUSTRIALE charging device needs no special maintenance, apart from regular cleaning procedures, to be carried out periodically according to the type of working environment. Before starting to clean the device, the mains supply cable and battery cables must be unplugged.
- Where to install: **SUGGESTED MOUNTING HEIGHT: WALL MOUNT** - at least 1,5m from the bottom side of the charger, 0,5m from the side wall and at least 0,65m from the top. This to avoid dust and moisture sucked up from the ground level.

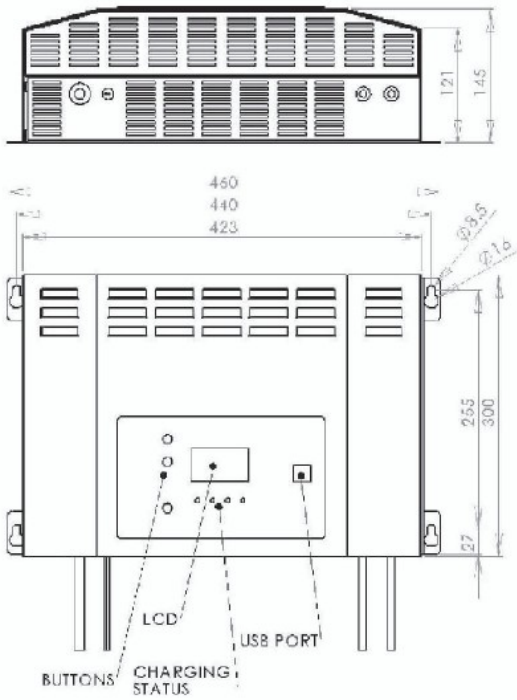


**GREEN2 V**

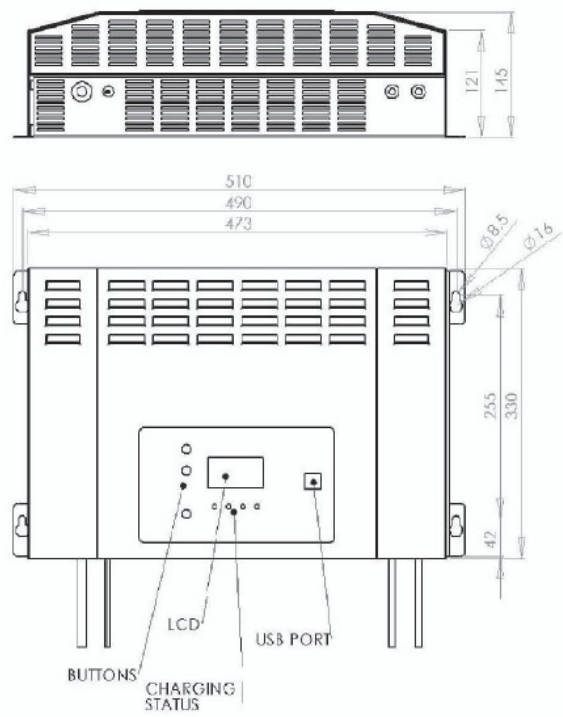


**GREEN4 V**





**GREEN2**



**GREEN4**

## MAINS CONNECTION

The installed battery charger must be connected to a socket proportionate in power to the charger, check the data given on the serial number label:

MODEL GREEN2 SERIES		ACTIVE POWER	ABSORBED CURRENT (230Vac)	FUSE AC	MAINS CABLE
(V)	(A)	(W)	(A)	(A)	(mmq)
12	50	857	3,7	GG12	3x1,5
12	60	1029	4,5	GG12	3x1,5
12	70	1200	5,2	GG12	3x1,5
24	50	1714	7,4	GG12	3x1,5
24	60	2057	8,9	GG12	3x1,5
24	70	2400	10,4	GG12	3x2,5
36	30	1543	6,7	GG12	3x1,5
36	40	2057	8,9	GG12	3x1,5
36	45	2314	10,0	GG12	3x2,5
48	25	1714	7,4	GG12	3x1,5
48	30	2057	8,9	GG12	3x1,5
48	35	2400	10,4	GG12	3x2,5
48	40	2743	11,9	GG12	3x2,5
72	15	1543	6,7	GG12	3x1,5
72	20	2057	8,9	GG12	3x1,5
72	25	2571	11,2	GG12	3x2,5
80	10	1143	5,0	GG12	3x1,5
80	15	1714	7,4	GG12	3x1,5
80	20	2286	9,9	GG12	3x2,5

MODEL GREEN4 SERIES		ACTIVE POWER	ABSORBED CURRENT (230Vac)	FUSE AC	MAINS CABLE
(V)	(A)	(W)	(A)	(A)	(mmq)
24	80	2743	11,9	GG25	3x2,5
24	90	3086	13,4	GG25	3x2,5
24	100	3429	14,9	GG25	3x4,0
24	120	4114	17,9	GG25	3x4,0
36	50	2571	11,2	GG25	3x2,5
36	60	3086	13,4	GG25	3x2,5
36	70	3600	15,6	GG25	3x4,0
36	80	4114	17,9	GG25	3x4,0
48	50	3429	14,9	GG25	3x4,0
48	60	4114	17,9	GG25	3x4,0
48	75	5143	22,3	GG25	3x6,0
72	30	3086	13,4	GG25	3x2,5
72	40	4114	17,9	GG25	3x4,0
72	50	5143	22,3	GG25	3x6,0
80	30	3429	14,9	GG25	3x4,0
80	40	4571	19,8	GG25	3x6,0

## BATTERY CONNECTION

We recommend using appropriate compliant bipolar connectors which do not allow polarity reversal of the battery; ensure that the cables are correctly connected to the contacts of the connectors too. Only specialized personnel should carry out this procedure.

## VISUAL SIGNALS

This paragraph describes the displays of the 4 status LEDs during the different operational phases of the battery charger.

REF	DESCRIPTION	DL4 LED (green)	DL3 LED (yellow)	DL2 LED (green)	DL1 LED (red)	DISPLAY
S1	Only battery power supply	OFF	OFF	OFF	OFF	OFF
S2	Only mains power supply	OFF	OFF	OFF	OFF	ON
S3	Both mains and battery power supply	ON	OFF	OFF	OFF	ON
S4	Perform Autostart	BL	BL	BL	BL	ON
F1	Phase 1 – Initial charge CI	BL	OFF	OFF	OFF	ON
F2-F7	Phase 2 – Phase 7	BL	ON	OFF	OFF	ON
F8	Equalisation period	ON	ON	ON	OFF	ON
EQU ON	Equalisation charge ON (in progress)	BL	BL	ON	OFF	ON
					OFF	ON
EQU OFF	Equalisation charge OFF (paused)	ON	ON	ON	OFF	ON
M	Maintenance	BL	BL	ON	OFF	ON
END	Charge Finished	ON	ON	ON	OFF	ON

Where:

OFF = the led is off

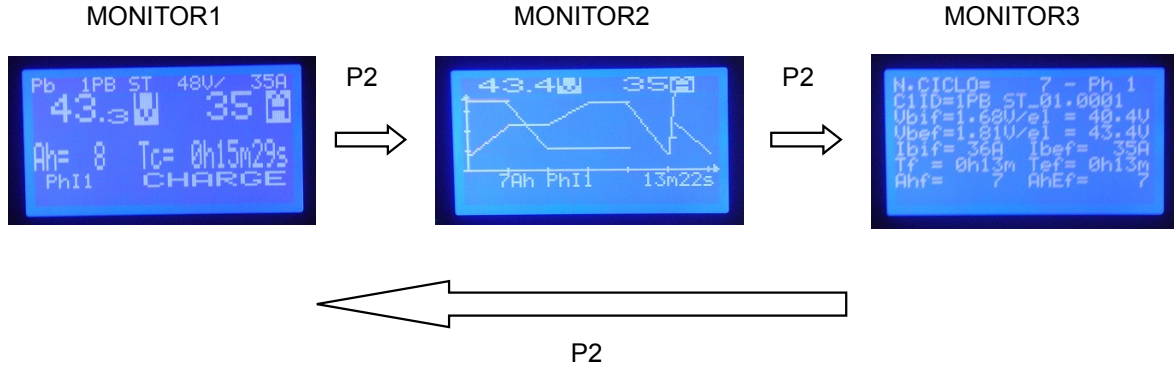
ON = the led is constant

BL = the led is blinking (Blink, T=1 second)

-- = the led can be in any condition

## LCD DISPLAY

During charging, the battery charger offers 3 monitor menus, which you can move between by pressing the P2 button, and whose detailed meaning was previously illustrated.



Below is a summary of the information given respectively on the 3 MONITOR displays.

### MONITOR 1

LINE	EXAMPLE	DESCRIPTION
(1)	Pb 1Pb ST 48V / 35A	Battery Technology, Type of Curve, Battery Charger Rating
(2)	43,3 V 35A	Battery voltage and current
(3)	Ah= 8 Tc= 0h 15m 29s	Ah charged, Charging Time in hours, min, sec
(4)	Ph11 CHARGE	Current charging phase, battery charger STATUS
(5)	-- Messages	(e.g. phase = auto start A0, Status= BATTERY NOT CONNECTED)

### MONITOR 2

LINE	EXAMPLE	DESCRIPTION
(1)	43,3V 35A	Battery Voltage and Current Supplied
(2)		Active charge profile with indication: <ul style="list-style-type: none"> <li>• Phases complete (thick line)</li> <li>• Phase in progress (flashing line)</li> <li>• Phases to execute (thin line)</li> </ul>
(3)	7Ah Ph11 13m22s	Ah charged, Charging time in hours, min, sec
(4)	-- Message	Possible fault or status messages



### MONITOR 3

LINE	EXAMPLE	DESCRIPTION
(1)	N.CYCLE= 7 – Ph 1	Number of charge cycle and current charge phase E.g. : charge cycle 5 and Phase 3
(2)	C1ID=1PB ST_01.0001	Charging curve unique identification
(3)	Vbif=1.68V/el = 40.4V	Battery voltage at start of phase (Vbif) expressed first as element voltage (V/el), then as absolute voltage (V)
(4)	Vbef=1.81V/el = 43.4V	Battery voltage at end of phase (current) (Vbef) expressed first as element voltage (V/el), then as absolute voltage (V)
(5)	Ibif= 36A Ibef= 35A	Current at start of phase (Ibif) and current at end of phase (Ibef)
(6)	Tf =0h13m Tef=0h13m	Single phase time (Tf) and Overall charge time at end of phase (Tef)
(7)	Ahf= 7 AhEf= 7	Ah supplied in the selected phase (Ahf) and overall charge Ah (AhEf)
(8)	-- Message	Indicates any faults occurring during the charge cycle

### GUARANTEE

- The machine is guaranteed 12 months from the date of installation.
- The guarantee covers parts found to be defective in manufacturing or assembly.
- The guarantee does NOT cover damage caused by incorrect usage and/or installation.
- The guarantee lapses if any tampering is discovered.
- For any problems, please refer to an AUTHORIZED RETAILER or directly to S.P.E. Elettronica Industriale

