




Battery Charger

EagleMatic-MVD

Service and Programming Manual



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1. INTRODUCTION

This manual contains important safety instructions, cautions and warnings, to be followed by qualified personnel responsible for the installation, maintenance and operation of battery chargers.

We recommend this manual to be read and understood entirely, to ensure safe and reliable operation of this equipment. Inspect and understand all warning labels located on the charger. Order and replace labels if they cannot be easily read.

In case of doubts, please contact our service department.

Keep printed and electronic copies of this manual readily available for future needs. Please contact our service department if you need a new copy.

PRODUCTS

CLASS 5311 04 - POWER SUPPLIES - Battery Chargers

CLASS 5311 84 - POWER SUPPLIES - Battery Chargers - Certified to US Standards



APPLICABLE REQUIREMENTS

CSA Std C22.2 No. 107.2-01-R2011 - Battery Chargers

UL 1564 4th Ed. 2015 - Industrial Battery Chargers

CEC LBSC SPECIFICATIONS - Industrial Battery Chargers

	AC input	DC output	output Power	output at 80V	Battery Capacity
	Vac 60Hz	A	kW	A	AH
HYB.12.NA	3x480	200	12	120	700
HYB.12.US	3x480	200	12	120	700
HYB.15.NA	3x480	250	15	140	920
HYB.20.NA	3x480	320	20	200	1200
HYB.24.NA	3x480	400	24	240	1450
HYB.30.NA	3x480	500	30	300	1960
HYB.36.NA	3x480	600	36	360	2300



2. IMPORTANT SAFETY INSTRUCTION

2.1 IMPORTANT SAFETY INSTRUCTION

- (a) THIS MANUAL CONTAINS IMPORTANT SAFETY AND OPERATING INSTRUCTIONS
- (b) WORKING IN THE VICINITY OF A LEAD-ACID BATTERY IS DANGEROUS. BATTERIES GENERATE EXPLOSIVE GASES DURING NORMAL BATTERY OPERATION. FOR THIS REASON IT IS OF THE UTMOST IMPORTANCE THAT EACH TIME BEFORE USING YOUR CHARGER, YOU READ AND FOLLOW THE INSTRUCTIONS PROVIDED EXACTLY
- (c) TO REDUCE RISK OF BATTERY EXPLOSION, FOLLOW THESE INSTRUCTIONS AND THOSE MARKED ON THE BATTERY
- (d) NEVER SMOKE OR ALLOW AN OPEN SPARK OR FLAME IN THE VICINITY OF THE BATTERY OR ENGINE
- (e) USE CHARGER FOR CHARGING A LEAD-ACID BATTERY ONLY. IT IS NOT INTENDED TO SUPPLY POWER TO AN EXTRA-LOW-VOLTAGE ELECTRICAL SYSTEM OR TO CHARGE DRY-CELL BATTERIES. CHARGING DRY-CELL BATTERIES MAY CAUSE THEM TO BURST AND CAUSE INJURY TO PERSONS AND DAMAGE TO PROPERTY
- (f) NEVER CHARGE A FROZEN BATTERY
- (g) IF IT IS NECESSARY TO REMOVE BATTERY FROM VEHICLE TO CHARGE IT, ALWAYS REMOVE GROUNDED TERMINAL FROM BATTERY FIRST. MAKE SURE ALL ACCESSORIES IN THE VEHICLE ARE OFF IN ORDER TO PREVENT AN ARC
- (h) STUDY ALL BATTERY MANUFACTURER'S SPECIFIC PRECAUTIONS SUCH AS REMOVING OR NOT REMOVING CELL CAPS WHILE CHARGING AND RECOMMENDED RATES OF CHARGE
- (i) FOR A CHARGER HAVING AN OUTPUT VOLTAGE SELECTOR SWITCH, REFER TO THE CAR OWNER'S MANUAL IN ORDER TO DETERMINE THE VOLTAGE OF THE BATTERY AND TO MAKE SURE THE OUTPUT VOLTAGE IS SET AT THE CORRECT VOLTAGE. IF AN OUTPUT VOLTAGE SELECTOR SWITCH IS NOT PROVIDED, DO NOT USE THE BATTERY CHARGER UNLESS THE BATTERY VOLTAGE MATCHES THE OUTPUT VOLTAGE RATING OF THE CHARGER
- (j) NEVER PLACE THE CHARGER DIRECTLY ABOVE OR BELOW THE BATTERY BEING CHARGED; GASES OR FLUIDS FROM THE BATTERY WILL CORRODE AND DAMAGE THE CHARGER. LOCATE THE CHARGER AS FAR AWAY FROM THE BATTERY AS DC CABLES PERMIT
- (k) DO NOT OPERATE CHARGER IN A CLOSED-IN AREA OR RESTRICT VENTILATION IN ANY WAY
- (l) CONNECT AND DISCONNECT DC OUTPUT CLIPS ONLY AFTER SETTING ANY CHARGER SWITCHES TO THE OFF POSITION AND REMOVING AC CORD FROM THE ELECTRIC OUTLET. NEVER ALLOW CLIPS TO TOUCH EACH OTHER
- (m) FOLLOW THESE STEPS WHEN BATTERY IS INSTALLED IN VEHICLE. A SPARK NEAR BATTERY MAY CAUSE A BATTERY EXPLOSION. TO REDUCE RISK OF A SPARK NEAR BATTERY:
 - (m.1) POSITION AC AND DC CORDS TO REDUCE RISK OF DAMAGE BY HOOD, DOOR, OR MOVING ENGINE PART;
 - (m.2) STAY CLEAR OF FAN BLADES, BELTS, PULLEYS, AND OTHER PARTS THAT CAN CAUSE INJURY TO PERSONS;
 - (m.3) CHECK POLARITY OF BATTERY POSTS. A POSITIVE (POS, P, +) BATTERY POST USUALLY HAS A LARGER DIAMETER THAN A NEGATIVE (NEG, N, -) POST;
 - (m.4) DETERMINE WHICH POST OF BATTERY IS GROUNDED (CONNECTED) TO THE CHASSIS. IF NEGATIVE POST IS GROUNDED TO CHASSIS (AS IN MOST VEHICLES), SEE ITEM (v). IF POSITIVE POST IS GROUNDED TO THE CHASSIS, SEE ITEM (m.6);

-(m.5) FOR A NEGATIVE-GROUNDED VEHICLE, CONNECT THE POSITIVE (RED) CLIP FROM BATTERY CHARGER TO POSITIVE (POS, P, +) UNGROUNDED POST OF BATTERY. CONNECT THE NEGATIVE (BLACK) CLIP TO VEHICLE CHASSIS OR ENGINE BLOCK AWAY FROM BATTERY. DO NOT CONNECT CLIP TO CARBURETOR, FUEL LINES, OR SHEET-METAL BODY PARTS. CONNECT TO A HEAVY GAUGE METAL PART OF THE FRAME OR ENGINE BLOCK;

-(m.6) FOR A POSITIVE-GROUNDED VEHICLE, CONNECT THE NEGATIVE (BLACK) CLIP FROM BATTERY CHARGER TO NEGATIVE (NEG, N, -) UNGROUNDED POST OF BATTERY. CONNECT THE POSITIVE (RED) CLIP TO VEHICLE CHASSIS OR ENGINE BLOCK AWAY FROM BATTERY. DO NOT CONNECT CLIP TO CARBURETOR, FUEL LINES, OR SHEET-METAL BODY PARTS. CONNECT TO A HEAVY GAUGE METAL PART OF THE FRAME OR ENGINE BLOCK;

-(m.7) CONNECT CHARGER AC SUPPLY CORD TO ELECTRIC OUTLET;

-(m.8) WHEN DISCONNECTING CHARGER, TURN SWITCHES TO OFF, DISCONNECT AC CORD, REMOVE CLIP FROM VEHICLE CHASSIS, AND THEN REMOVE CLIP FROM BATTERY TERMINAL

(n) FOLLOW THESE STEPS WHEN BATTERY IS OUTSIDE VEHICLE. A SPARK NEAR THE BATTERY MAY CAUSE A BATTERY EXPLOSION. TO REDUCE RISK OF A SPARK NEAR BATTERY:

-(n.1) CHECK POLARITY OF BATTERY POSTS. A POSITIVE (POS, P, +) BATTERY POST USUALLY HAS A LARGER DIAMETER THAN A NEGATIVE (NEG, N, -) POST;

-(n.2) ATTACH AT LEAST A 60 CM 6-GAUGE (AWG) INSULATED BATTERY CABLE TO A NEGATIVE (NEG, N, -) BATTERY POST;

-(n.3) CONNECT THE POSITIVE (RED) CHARGER CLIP TO THE POSITIVE (POS, P, +) POST OF BATTERY;

-(n.4) POSITION YOURSELF AND THE FREE END OF CABLE AS FAR AWAY FROM BATTERY AS POSSIBLE, THEN CONNECT THE NEGATIVE (BLACK) CHARGER CLIP TO FREE END OF CABLE;

-(n.5) DO NOT FACE BATTERY WHEN MAKING FINAL CONNECTION;

-(n.6) CONNECT CHARGER AC SUPPLY CORD TO ELECTRICAL OUTLET;

-(n.7) WHEN DISCONNECTING CHARGER, ALWAYS DO SO IN REVERSE SEQUENCE OF CONNECTING PROCEDURE AND BREAK FIRST CONNECTION WHILE STANDING AS FAR AWAY FROM BATTERY AS PRACTICAL

(o) USE OF AN ADAPTER IS NOT ALLOWED IN CANADA. IF A GROUNDING TYPE RECEPTACLE IS NOT AVAILABLE, DO NOT USE THIS APPLIANCE UNTIL THE PROPER OUTLET IS INSTALLED BY A QUALIFIED ELECTRICIAN

(p) CERTIFIED DC OUTPUT CONNECTOR, SUFFICIENTLY RATED IN VOLTS AND AMPERES, SHALL CONNECTED TO FREE ENDS OF OUTPUT CABLE WITH ATTENTION TO MARKED POLARITY

2.2 IMPORTANT NOTES

- Only experienced and qualified personnel, knowledgeable on batteries and safety requirements involved, most perform installation and maintenance.
- Installation and wiring must comply with all the applicable local and the national electrical codes.
- Protection devices as fuses or circuit breakers, must be located on the AC mains where the charger is connected. Check the product nameplate for voltage and phase requirements.
This charger can only charge motive power batteries of flooded lead-acid type. Strictly follow all setup and operating instructions to prevent damage to the battery and hazardous conditions.



DANGER! High Voltage

- Dangerous AC and DC voltages and currents are present in these systems even when external indicators and LEDs are completely off. Before performing any maintenance, make sure that the AC power and battery are disconnected.



DANGER! Explosive Gases

- Lead-Acid batteries generate an explosive mixture of oxygen and hydrogen during the normal charging process. Never smoke or allow sparks or flames in the vicinity of batteries. Ensure a sufficient ventilation to prevent explosive gases buildup.



DANGER! Corrosive Substances

- Lead-Acid batteries contain a sulfuric acid (H_2SO_4) solution, which is capable of causing very severe skin burns and can induce permanent blindness if splashed onto eyes. Always wear correct eye and body protection when near batteries. In case of contact with eyes, flush immediately with clean water for at least 15 minutes, and seek professional medical attention immediately.



DANGER! High Temperature

- The internal parts of the machine are not accessible during normal operation. To access these parts it is necessary to open the front and / or rear doors, closed by screws. Avoid prolonged contact with hot surfaces could cause discomfort or burns. Keep this in mind if you have a physical condition that affects your ability to feel heat on your skin.
- The weight of battery chargers can crush hands and feet if care is not taken when installing and handling them. Use adequate handling equipment and install chargers in a stable location.
- This charger has been designed for indoor use only. It must be installed in a well ventilated, cool, dry and clean place. Do not expose to rain, snow, moisture, dust and corrosive substances.
- To reduce the risk of fire, install chargers on a floor of non-combustible material.
- Never place the charger directly above or below the battery being charged; gases or fluids from the battery may damage the charger. Locate the charger as far away from the battery as DC cables permit.
- The shipping pallets and all packaging materials must be removed for proper and safe operation.
- Do not block the ventilation openings of the charger.
- Do not install or operate charger if it has been dropped during transport or damaged in any way.
- Never charge a frozen battery.

- Inspect AC and DC cables for damage to the insulation. Replace damaged cables immediately, with cables of the same type and length. Do not extend the DC charging cables, as it may cause improper operation of the charger, and damage the battery.
- The manufacturer is not responsible and the warranty is void if the product is damaged due to negligence, abuse, misuse, accident, modification, alteration, tampering and faulty installation.

3. DESCRIPTION AND THEORY OF OPERATION

Battery chargers receive energy from the main AC source (three-phase or single-phase), and provide a controlled and isolated DC (direct current) output, suitable for charging batteries.

The DC output voltage and current follow pre-defined characteristics (usually called “charging curves” or “charging profiles”), depending on the battery type and state of charge.

The battery chargers are designed to charge motive power batteries of flooded Lead Acid type, using conventional profiles according to the standard (“IEI”) IULa, IUoU characteristics, according to the standard DIN 41774.

The operation is controlled by microprocessor.

4. INSTALLATION



CAUTION!

The charger can be installed, configured and serviced by qualified personnel only



CAUTION!

Read and understand Chapter 2 “Important Safety Instructions” before installing, configuring, servicing or using the charger.

PRELIMINARY INSPECTION

- Unbox the charger and remove all packaging materials.
- Inspect the unit for potential damages, loose screws and missing parts.
- Ensure that the ventilation openings are not obstructed.

OPERATING CONDITIONS

Storage Temperature:	-25°C to 55°C
Operating Temperature:	-25°C to 40°C
Humidity:	0% to 70%

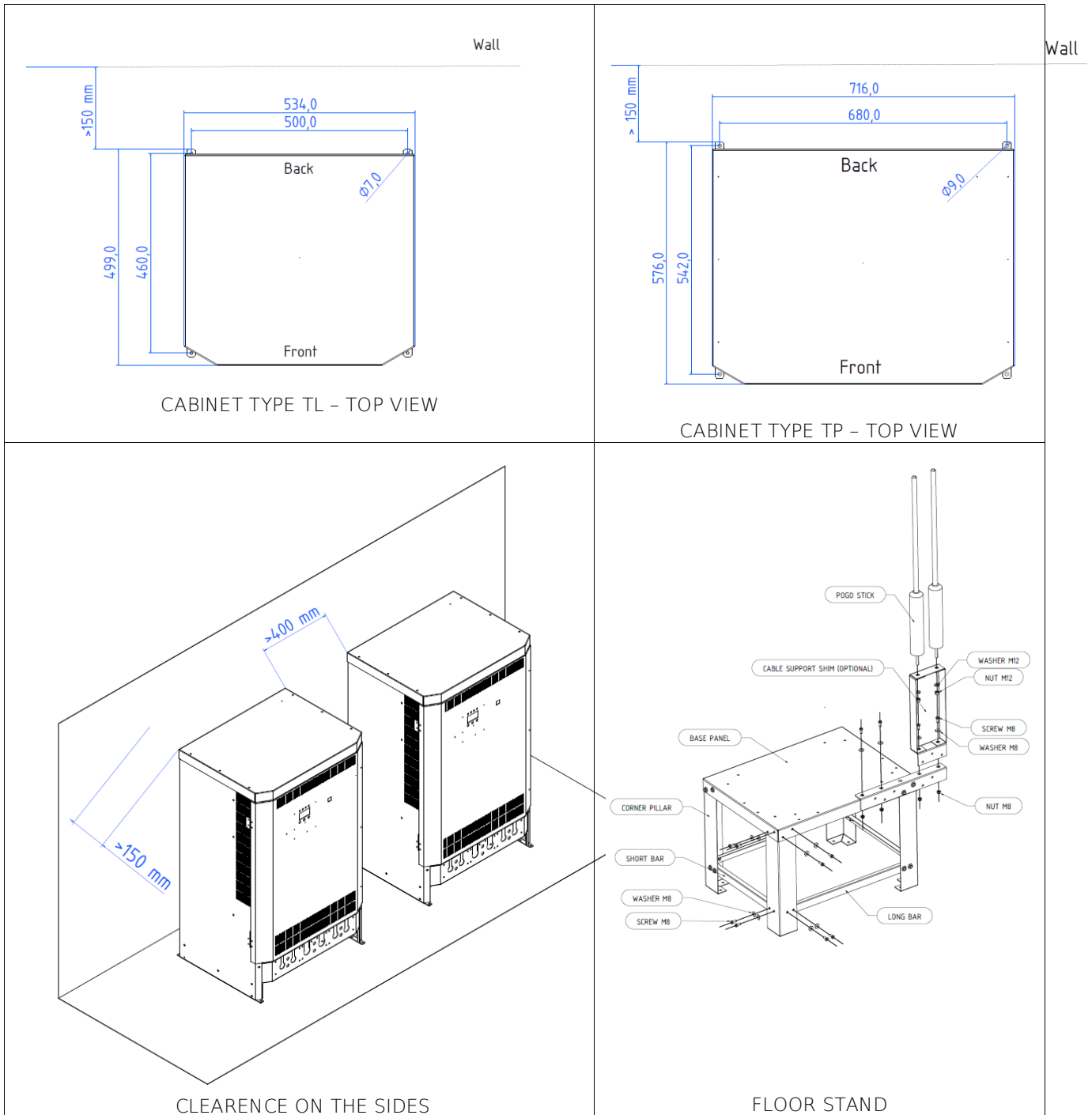
The charger has been designed for indoor use only. It must be installed in a well ventilated, cool, dry and clean place. Do not expose to rain, snow, moisture, dust and corrosive substances.

To reduce the risk of fire, install chargers on a floor of non-combustible material.

PHYSICAL INSTALLATION

Choose your installation location to:

- Avoid temperature and humidity extremes.
- Minimize moisture and dust.
- Provide adequate air circulation to prevent the buildup of fumes.
- Install on a cement pad minimum 15 cm above surrounding curbing or walkways for water flood control,
- Maintain a minimum of 40 cm of clearance on the sides of the unit for proper ventilation.
- Maintain 40 cm minimum clearance on Front and Back for servicing as required by local codes.
- Do not install unit where it will be exposed to direct sunlight.



INSTALLATION OF DC OUTPUT PLUG

Certified DC Output connector, sufficiently rated in volts and amperes, must be installed in the field by a qualified technician.

INSTALLATION OF AC INPUT CABLE and PLUG

Depending on the applicable local regulations and the electrical ratings of the chargers, certain units are supplied with AC input cable & plug included (plug-in models) and others are supplied without AC input cable and/or plug (cord connected models).

In cord-connected models, the AC input cable and plug should be installed by a qualified electrician, in accordance to the local and national electrical code, together with the proper fuses, breakers and disconnect switches.

INPUT VOLTAGE SETTINGS

The battery chargers are equipped with two adjustment blocks for AC input nominal voltage selection and charging curve optimization.

1. NOMINAL VOLTAGE SELECTION 3-phase

This setting is present on chargers designed to operate at different nominal AC input voltages, for specs. 3x400/415 VAC, 3x230/400 VAC, 3x440 VAC, 3x208/240/480 VAC or 3x480/600 VAC (North American specs).

A screw type terminal block is used for this setting in certain chargers, while a bar-type (delta-wye) standard terminal block is used in other chargers.

RECOMMENDED OPERATING SEQUENCE

- Disconnect the charger from the AC input and from the battery.
- Measure the AC input voltage, using an adequate voltmeter.
- Open the cabinet.
- Find the terminal blocks for NOMINAL VOLTAGE SELECTION.
- Make the necessary adjustments at the NOMINAL VOLTAGE SELECTION section.
- Double check that all connections are properly tightened.
- Close the cabinet.
- Connect the charger to the AC input.
- Connect the battery to the charger and verify the correct operation, by measuring the DC output current and DC output voltage.

3-PHASE MODEL LIST

model	Pin max (kVA)	Pout max (kW)	Voltage nom.range	max current	cabinet
XMV.12	14 kVA	12 kW	12-180V	200Amp	TL
XMV.15	17.5 kVA	15 kW	12-180V	250Amp	TL
XMV.20	22.5 kVA	18 kW	12-180V	320Amp	TP
XMV.24	28 kVA	24 kW	12-180V	400Amp	TP
XMV.30	34 kVA	30 kW	12-180V	500Amp	TP
XMV.36	42 kVA	36 kW	12-180V	600Amp	TP

TL cabinet mm (inches)

L483 (19.0) x W530 (20.9) x H929 (36.6)

TP cabinet mm (inches)

L560 (22.0) x W712 (28.0) x H1210(47.6)

AC INPUT PROTECTION AND INSTALLATION DEVICES - NorthAmerica

TYPE TIPO	Mains Rate	Phase Current P _{max} @208Vac	Phase Current P _{max} @240Vac	Phase Current P _{max} @480Vac	Phase Current P _{max} @600Vac	HOUSING TYPE	POWER			MAINS PROTECTION					MAINS PLUG @208/240	MAINS PLUG @480	MAINS PLUG @600
							P _{out} (MAX)	P _{in} (app)	P _{in}	BREAKER	FUSE	RATE @208/240	RATE @480	RATE @600			
							KW	KVA	KW	TYPE	TYPE	A	A	A			
XMV.12.US	208/240/480	39.0	34.0	17.0	-	TL	12.0	14.0	12.0	Curve D	Gr	50	25	-	50Amp	20Amp	-
XMV.12.NA	480/600	-	-	17.0	13.5	TL	12.0	14.0	12.0	Curve D	Gr	-	25	20	-	20Amp	20Amp
XMV.15.NA	480/600	-	-	21.0	17.0	TL	15.0	17.5	15.0	Curve D	Gr	-	32	25	-	25Amp	20Amp
XMV.20.NA	480/600	-	-	27.0	21.6	TP	19.2	22.5	19.2	Curve D	Gr	-	40	32	-	30Amp	30Amp
XMV.24.NA	480/600	-	-	33.8	27.0	TP	24.0	28.0	24.0	Curve D	Gr	-	50	40	-	50Amp	30Amp
XMV.30.NA	480/600	-	-	41.7	33.8	TP	28.8	35.0	28.8	Curve D	Gr	-	50	40	-	50Amp	50Amp
XMV.36.NA	480/600	-	-	50.0	40.5	TP	36.8	42.0	36.8	Curve D	Gr	-	63	50	-	50Amp	50Amp

Installation requires an upstream Listed UL / CSA Certified fuses of Type CC, J or RK5		
MODEL	AC INPUT	AC FUSES
XMV.12-US	AC Input 208V 3~60Hz AC 39 A	50A, 200kA
	AC Input 240V 3~60Hz AC 34 A	50A, 200kA
	AC Input 480V 3~60Hz AC 17 A	25A, 200kA
XMV.12-NA	AC Input 480V 3~60Hz AC 17 A	25A, 200kA
	AC Input 600V 3~60Hz AC 13.5 A	20A, 200kA
XMV.15-NA	AC Input 480V 3~60Hz AC 21 A	30A, 200kA
	AC Input 600V 3~60Hz AC 17 A	25 A, 200kA
XMV.20-NA	AC Input 480V 3~60Hz AC 27 A	40A, 200kA
	AC Input 600V 3~60Hz AC 21.6 A	30A, 200kA
XMV.24-NA	AC Input 480V 3~60Hz AC 33.8 A	45A, 200kA
	AC Input 600V 3~60Hz AC 27 A	40A, 200kA
XMV.30-NA	AC Input 480V 3~60Hz AC 42 A	60A, 200kA
	AC Input 600V 3~60Hz AC 34 A	45 A, 200kA
XMV.36-NA	AC Input 480V 3~60Hz AC 50 A	60A, 200kA
	AC Input 600V 3~60Hz AC 40.5 A	50A, 200kA

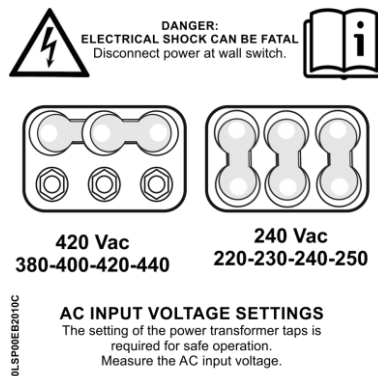
AC INPUT PROTECTION AND INSTALLATION DEVICES - Europe/Asia/Australia

TYPE TIPO	Mains Rete	Phase Current P _{max} @400Vac	HOUSING	POWER			MAINS PROTECTION			MAINS PLUG
				P _{out} (MAX)	P _{in} (app)	P _{in}	BREAKER	FUSE	RATE	
	±10% Vac	±10% A	TYPE	kW	kVA	kW	TYPE	TYPE	A	
XMV.12.EU	400/415	20.2	TL	11.5	14.0	12.0	Curve D	gG	25.0	32Amp
XMV.15.EU	400/415	24.6	TL	14.4	17.0	15.0	Curve D	gG	32.0	32Amp
XMV.20.EU	400/415	32.0	TP	18.1	22.5	19.2	Curve D	gG	40.0	32Amp
XMV.24.EU	400/415	40.5	TP	23.0	28.0	24.0	Curve D	gG	50.0	63Amp
XMV.30.EU	400/415	46.7	TP	28.8	32.0	28.8	Curve D	gG	65.0	63Amp
XMV.36.EU	400/415	60.7	TP	34.6	42.0	36.8	Curve D	gG	65.0	63Amp

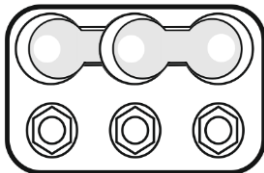
4.1 INSTALLATION 3-phase 3x230/400Vac 50Hz

4.1.1 NOMINAL VOLTAGE SELECTION

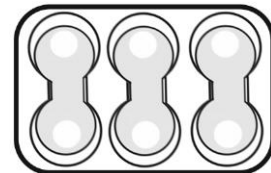
Remove screws from the top and left/right sides in order to open the top cover of the charger.
 If the charger model is designed for AC Multi Input. Please set the internal terminal board according to the nominal AC Mains provided from the grid



AC Mains
400 Vac




AC Mains
230 Vac




4.2 INSTALLATION 3-phase 3x208/240/480Vac 60Hz

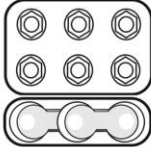
4.2.1 NOMINAL VOLTAGE SELECTION

Remove screws from the top and left/right sides in order to open the top cover of the charger.
 If the charger model is designed for AC Multi Input. Please set the internal terminal board according to the nominal AC Mains provided from the grid

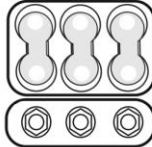


DANGER:
ELECTRICAL SHOCK CAN BE FATAL
 Disconnect power at wall switch.
HAUTE TENSION
 Assurez-vous que alimentation AC
 e la batterie sont déconnectées





480 Vac
455-480-510

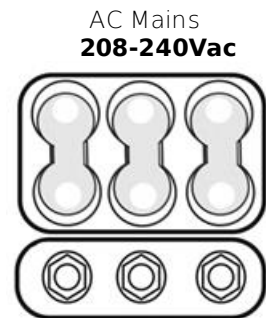
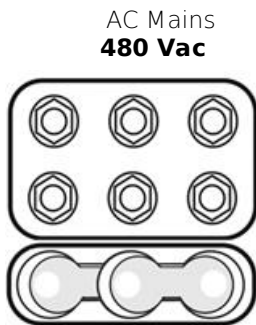


240 Vac
208-225-240

AC INPUT VOLTAGE SETTINGS
 The setting of the power transformer taps is required for safe operation.
 Measure the AC input voltage.

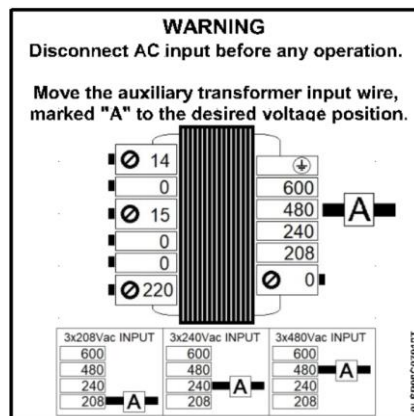
SELECTION DE LA TENSION NOMINAL
 Reglécé bar delta-wye

0LSPP00EC2010C



4.2.2 AUXILAIRY TRANSFORMER SETTING

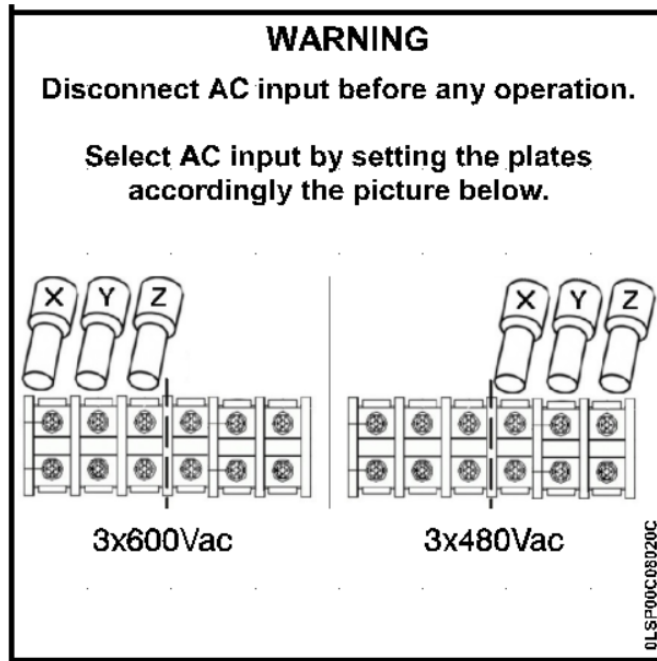
Please set the auxiliary transformer primary input, according to the AC input mains incoming
 3x208 → A need to be set 208
 3x240 → A need to be set 240
 3x480 → A need to be set 480



4.3 INSTALLATION 3-phase 3x480/600Vac 60Hz

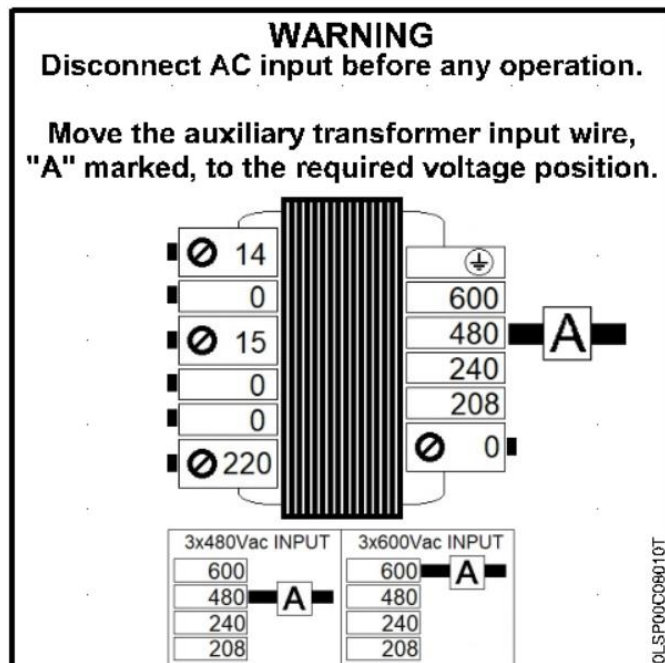
4.3.1 NOMINAL VOLTAGE SELECTION

Remove screws from the top and left/right sides in order to open the top cover of the charger.
 If the charger model is designed for AC Multi Input. Please set the internal terminal board according to the nominal AC Mains provided from the grid



4.3.2 AUXILAIRY TRANSFORMER SETTING

Please set the auxiliary transformer primary input, according to the AC input mains incoming
 3x480 → A need to be set 480
 3x600 → A need to be set 600

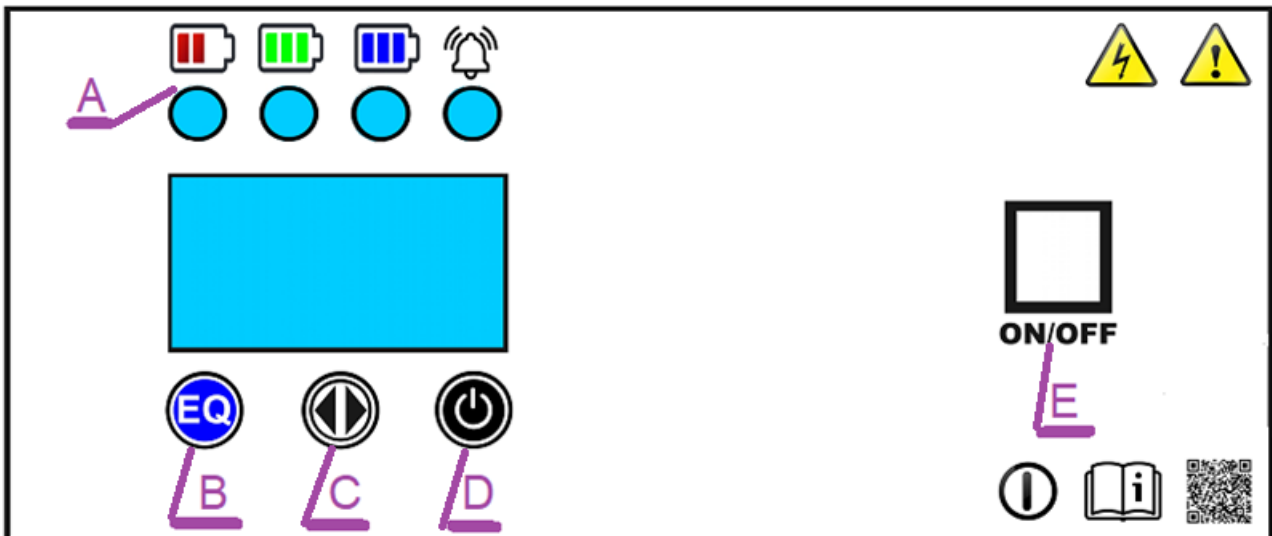


5. PROGRAMMING

HMI HUMAN MACHINE INTERFACE

The charger interface contains:

- A) 4x LEDs
 - a. Red
 - b. Green
 - c. Blue
 - d. Alarm/Warning
- B) 1x Push Button → button (EQ) EQUALIZE
- C) 1x Push Button → button (<>) SPECIAL FUNCION
- D) 1x Push Button → button (O) STOP/RE-START
- E) ON/OFF Switch
- F) Internal Buzzer
- G) Optional. Serial communication line (RS232)
- H) Optional. USB communication line
- I) Optional. Can bus#1 communication line
- J) Optional. Can bus#2 communication line



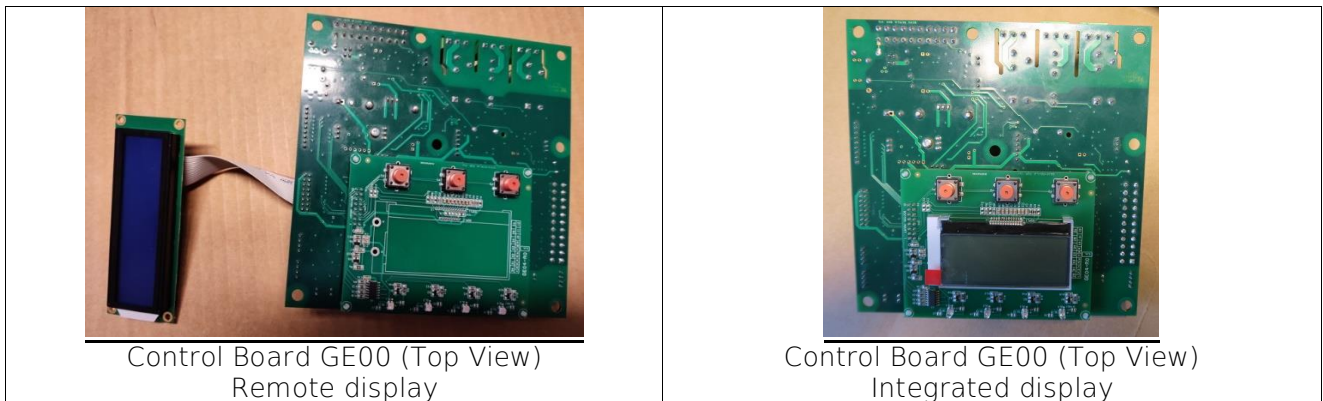
CONTROL BOARD

The charger is controlled by the new "GE00" Control Board.

This board is built in different configurations, depending on the presence of certain key components.



Control Board GE00 (Bottom View)



Control Board GE00 (Top View)
Remote display

Control Board GE00 (Top View)
Integrated display

Board Configurations:

- GE00/E/ * model ECO, it is not managing communication with external devices
- GE00/B/ * model BASIC, it is managing communication with external devices like Rs232 and USB
- GE00/P/ * model PRO, it is managing communication with external devices like Rs232,USB, CANBUS#1, special analog signals
- GE00/F/ * model FULL, it is managing communication with external devices like Rs232,USB, CANBUS#1, special analog signals, CANBUS#2.

- (*) Display definition
- 2L Remote display. Like i.e GE00/E/2L
- 4D Integrated display. Like i.e GE00/E/4D

PRELIMINARY INSPECTION

Before connecting a battery and proceeding with the programming sequence, make sure that the Charger has been installed by a qualified electrician, according with the instructions reported in this manual.

Before using the charger, it's necessary to control that the ventilation openings are not obstructed, and that all the safety precautions reported in this manual are respected.

STARTUP SEQUENCE

When a battery is plugged to the charger, the display of the control board shows "BATTERY CONNECTED" and the internal buzzer beeps. The microprocessor performs a leds colour sequence that allows the user to identify that the charger is going to start to charge.

PROGRAMMING MODES

HOW TO ACTIVATE USER PROGRAMMING MODE

Press the button STOP/RE-START and keep it pressed for 5 seconds, the display shows "PASSWORD", press EQ button's 4 times

HOW TO ACTIVATE MFG/SERVICE PROGRAMMING MODE

Press the button STOP/RE-START and keep it pressed for 5 seconds, the display shows "PASSWORD", press SPECIAL FUNCTION button's 4 times

HOW TO MODIFY A VALUE

Scroll between parameters using the STOP/RE-START button and/or EQ button. Press button SPECIAL FUNCTION and keep it pressed for 3 seconds, the cursor will blink. Now it is possible to modify the value with buttons STOP/RE-START and/or EQ, and keep pressed 3 secs the button SPECIAL FUNCTION in order to save the new value.

HOW TO RETURN TO NORMAL MODE

Press the button STOP/RE-START and keep it pressed for 5 seconds.

PARAMETER A-B-C-D-E-F-G-H: CHARGING PROFILE SETTINGS

For each program "PRG" (Smart Name) = A-B-C-D-E-F-G-H it's available the setting of 6 charging.steps, and for each step it's possible set the

- TYPE of the step: (constant current I=K, constant voltage V=K, pause P),
- MAXIMUM TIME of charging
- OUTPUT DC CURRENT (Constant current in the step I=K or minimum limit current in the step V=K)
- VOLTAGE LIMIT (Maximum voltage in the step I=K or Constant voltage in the step V=K).

PARAMETER 1: V.MAX-MAX LIMIT

Programmable values: 1.0, ..., 3.54 V/Cell, with step 0.01V/cell or DISABLED

Default value: 3.20 V/Cell

NOTE: This parameter sets a maximum limit for the cell voltage. If this limit has reached, the charge is finished and a specific error message is given.

PARAMETER 2: TEMPERATURE.MAX-MAX LIMIT

Programmable values: 40 °C, ..., 70 °C, with step 5°C or DISABLED

Default value: DISABLED

NOTE: This parameter sets a maximum limit for the temperature detected from a sumergible temperature sensor installed in the battery.

PARAMETER 3: NOMINAL VOLTAGE [only in ADMINISTRATOR MODE]



NOTE

Usually it's not necessary to change these parameters.
Please contact the manufacturer for more details

Programmable values: 12, 24, 36, 48, 60, 72, 80, 96 Vdc

Default value: Nominal voltage of the charger

NOTE: This parameter may need to be adjusted after replacing the control board

PARAMETER 4: NOMINAL CURRENT [only in ADMINISTRATOR MODE]



NOTE

Usually it's not necessary to change these parameters.
Please contact the manufacturer for more details

Programmable values: 200, ..., 600 Amp

Default value: Nominal current of the charger

NOTE: This parameter may need to be adjusted after replacing the control board

6. OPERATION

CONTROL BOARD OPERATION

At the connection of the battery, if the battery and the AC input are properly connected, the charger cycle starts automatically.

According to the internal settings, the charge DC current follows the programmed curve.

When the charger output is active and a DC output current is present, LEDs blink.

Colour RED (blink)

During the Constant current step

Colour GREEN (blink)

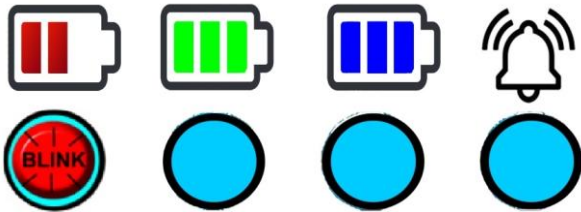
During the Constant Voltage step

Colour BLUE (fix)

During the Pause step

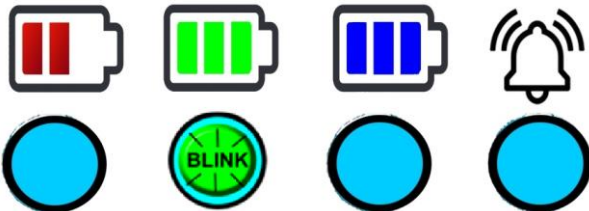
During the first phase of charge, the LED RED blinks and the Alarm/Warning LED is off.

In this condition the battery voltage is still low, and the output current of the charger is high.



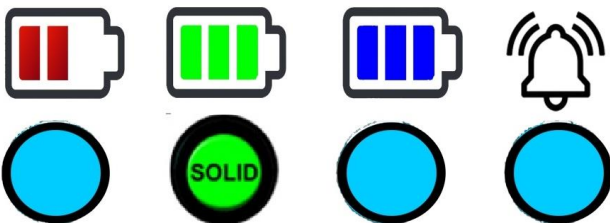
Constant Current Step

During the constant voltage phase of charge, the LED RED is fixed and LED GREEN blinks, the Alarm/Warning LED is off.



Constant Voltage Step

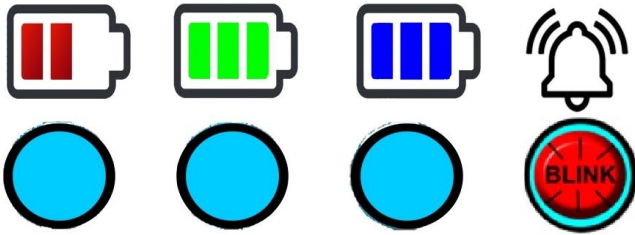
When the Final Charge is completed the control board stops the charge process. The LED GREEN is solid; the charge process is successfully completed.



End of the charge process

WARNING SIGNALS

The ALARM/WARNING RED LED will start blinking in these cases: Manual Stop



Warning Events

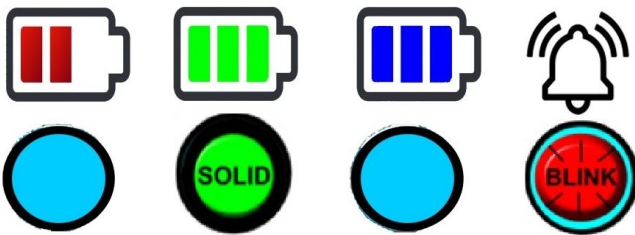
MANUAL STOP



DANGER!

Do not disconnect the battery while it's being charged! RISK OF EXPLOSION!
 Always stop the charger by pushing the STOP button, before disconnecting the battery.
 The ALAMR/WARNING LED needs to be in solid light, before to disconnect the battery.

Before to disconnect the battery, please check that leds RED, GREEN or BLUE are not blinking.
 If the charger is providing current, it is recommended to press button "STOP/RE-START" in order to interrupt the charging.
 When the ALARM/WARNING LED blinks and the GREEN LED is solid, it means that the user has properly interrupted the charging or the equalization cycle by pressing the button "STOP/RE-START".
 If the user will press again the button "STOP/RE-START", the charger will restart the cycle from where it left off.



Stop Push-button pressed during the charge cycle or during an equalization cycle

HOT DISCONNECTION



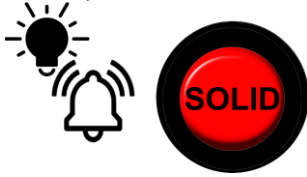
DANGER!

Do not disconnect the battery while it's being charged! RISK OF EXPLOSION!
 Always stop the charger by pushing the STOP button, before disconnecting the battery.

When the RED, GREEN or BLUE led blinks, the charger is active. Do not disconnect the battery!
 When the RED, GREEN or BLUE led shows a SOLID colour, it is possible to disconnect the battery.

7. CONTROL BOARD ALARMS AND TROUBLESHOOTING

If the Alarm/Warning LED is solid means that the charge cycle or an Equalization cycle has been interrupted due to an alarm.



The display shows the cause of the alarm:

- Battery voltage too high
- Exceeded charging Time Out
- Battery Temperature too high
- Battery type mismatch, Charging current too low or wrong AC Input setting, Charging current too high

7.1 BATTERY VOLTAGE TOO HIGH

The battery voltage reached during the charging cycle or during the equalization cycle is too high, the charge cycle is terminated.

In order to fix this issue, it will be important check the battery status, evaluate voltage of every cell and check intercell connections.

It is recommended to check also the power connections in the DC Plug and DC Socket and in the charger inner parts, in order to identify if the torque of a power connection is insufficient.

The display shows:

CHARGING STOP
HIGH VOLTAGE

<i>ISSUE</i>	<i>CAUSES</i>	<i>FIX</i>
Alarms appear. During the charging cycle	Battery sulphated	Repair battery.
	Battery nominal voltage is not correct	Check compatibility between battery voltage and charger voltage
	One or more cells are shorted.	Repair battery.

7.2 EXCEED CHARGING TIME OUT

The battery voltage hasn't reached the gassing point within 12 hours of charge. Please check the battery nominal voltage and the charger nominal matching. Please check the AC input mains value and check the internal AC input setting of the charger. it will be important check the battery status, evaluate voltage of every cell and check intercell connections.

The display shows:
CHARGING STOP
80% NOT REACHED

<i>ISSUE</i>	<i>CAUSES</i>	<i>FIX</i>
Alarms appear. During the charging cycle	Wrong AC input settings.	Adjust AC input settings to lower voltage.
	Battery nominal voltage is not correct	Check compatibility between battery voltage and charger voltage
	Output fuse blown.	Replace output fuse and adjust AC input setting.
	One or more cells are shorted.	Repair battery.

7.3 TEMPERATURE TOO HIGH

CASE A) Temperature sensor installed on the battery

If a temperature sensor has been installed on the battery. During normal operation, if the control board detects an high temperature condition on the battery sensor, the charger will interrupt the charge and apply a cooling pause, at the end of the pause, the charger will restart from the point where it stopped.

CASE B) Temperature sensor installed on the charger

If a temperature sensor has been installed inside or outside the charger. During normal operation, if the control board detects an high temperature condition on the NTC100 sensor, the charger will interrupt the charge and apply a cooling pause, at the end of the pause, the charger will restart from the point where it stopped.

The display shows:
CHARGING STOP
HIGH TEMPERATURE

<i>ISSUE</i>	<i>CAUSES</i>	<i>FIX</i>
Alarms appear. During the charging cycle	AC input mains is too high or it is too low	Please check AC mains and the charger AC input setting
	Charger ventilation slots obstructed or bad location	Please check charger installation and location, in order to allow ventilation. Remove objects which may obstruct slots.
	Battery high temperature	Please check battery installation and battery location, in order to allow ventilation. Please evaluate to reduce the charger current

7.4 BATTERY TYPE MISMATCH

CASE A) BATTERY NOMINAL VOLTAGE LOW

The battery voltage is too low: the charge cycle doesn't begin.

CASE B) BATTERY NOMINAL VOLTAGE HIGH

The battery voltage is too high: the charge cycle doesn't begin.

CASE C) BATTERY NOMINAL VOLTAGE ERROR

The charge current is too high: the charger shuts down immediately.

The display shows:

CHARGING STOP

NOMINAL VOLTAGE, CURRENT TOO HIGH, HIGH VOLTAGE, LOW VOLTAGE, CHECK OUTPUT FUSE

<i>ISSUE</i>	<i>CAUSES</i>	<i>FIX</i>
Alarms appear. The charger is not starting	Battery not connected properly.	Check battery connectors/harness.
	Output cables reversed.	Check charger, connectors and battery polarities. Output fuse is probably blown.
	Battery nominal voltage is not correct	Check compatibility between battery voltage and charger voltage