

QUASAR LLS SUPERCHARGER USER MANUAL

AUTOMATIC THREE-PHASE HIGH-FREQUENCY MODULAR BATTERY CHARGER
QUASAR charging profile

LLS Box1



LLS Box2



MODELS:

● LLS24120T... (Box1)	● LLS36120T... (Box1)	● LLS48120T... (Box1)	● LLS8080T... (Box1)
● LLS24200T... (Box1)	● LLS36160T... (Box1)	● LLS48160T... (Box1)	● LLS80120T... (Box1)
● LLS24240T... (Box2)	● LLS36200T... (Box1)	● LLS48200T... (Box1)	● LLS80160T... (Box2)
● LLS24400T... (Box2)	● LLS36240T... (Box2)	● LLS48240T... (Box2)	● LLS80240T... (Box2)
● LLS24600T... (Box2)	● LLS36320T... (Box2)	● LLS48320T... (Box2)	● LLS80360T... (Box2)
	● LLS36400T... (Box2)	● LLS48400T... (Box2)	
	● LLS36480T... (Box2)	● LLS48480T... (Box2)	
	● LLS36600T... (Box2)	● LLS48600T... (Box2)	

INDEX

1	GENERAL INFORMATION	<i>pg. 3</i>
1.1	General safety regulations.....	<i>pg. 3</i>
1.2	Battery use rules.....	<i>pg. 3</i>
2	INSTALLATION	<i>pg. 4</i>
2.1	Installation environment	<i>pg. 4</i>
2.2	LLS Box1 installation	<i>pg. 4</i>
2.3	LLS Box2 installation	<i>pg. 5</i>
3	CONNECTIONS	<i>pg. 5</i>
3.1	Main Connections	<i>pg. 5</i>
3.2	Auxiliary Connections	<i>pg. 6</i>
3.2.1	Battery thermal probe function.....	<i>pg. 6</i>
3.2.2	Safe-Off Function	<i>pg. 6</i>
4	OPERATION.	<i>pg. 6</i>
4.1	General Description.....	<i>pg. 6</i>
4.2	Operation limits	<i>pg. 6</i>
5	CHARGE CYCLE ACTIVATION	<i>pg. 7</i>
5.1	Power Supply	<i>pg. 7</i>
5.2	Battery Connection and Charging Start.....	<i>pg. 7</i>
5.3	Charge management	<i>pg. 7</i>
5.4	Equalization	<i>pg. 8</i>
5.5	End of charge	<i>pg. 8</i>
5.6	Interruption of Charging	<i>pg. 9</i>
5.6.1	STOP button	<i>pg. 9</i>
5.6.2	Battery disconnection	<i>pg. 9</i>
5.6.3	Anomalies	<i>pg. 9</i>
5.6.4	Mains absence.....	<i>pg. 9</i>
6	ALARMS	<i>pg. 9</i>
6.1	Errors description	<i>pg. 9</i>
7	DIMENSIONS	<i>pg. 10</i>
7.1	LLS Box1 (Single power module).....	<i>pg. 10</i>
7.2	LLS Box2 (Multiple power modules).....	<i>pg. 10</i>

1 GENERAL INFORMATION

This manual contains important safety regulations for the installation, use and maintenance of battery chargers LLS series. It is therefore necessary to read this manual carefully and follow the instructions contained therein. Keep this manual for possible consultation in case of intervention by the operator.

IMPORTANT: The manufacturer assumes no responsibility in case of damage resulting from incorrect use of the charger or any incorrect installation and/or programming

1.1 General safety rules

For correct use, carefully read all the instructions and warnings relating to the installation of the device and the use of the batteries reported in this manual.

- To reduce the risk of electric shock or fire:
 - Do not expose the charger to rain, snow, splashes, or moisture.
 - Do not install in environments with high humidity or high risk of condensation.
 - Do not cover the ventilation openings under any circumstances.
 - Do not use accessories or spare parts that are not original or not recommended by the manufacturer.
- Carry out all cleaning, maintenance and/or replacement of spare parts operations by turning off and disconnecting the battery charger from any energy source (Mains and Batteries).
- All work on the battery charger MUST be carried out by qualified and trained technical personnel.
- The electrical system must be carried out correctly, in compliance with applicable regulations and standards.
- Use power supply and battery connection cables of suitable length and section (See INSTALLATION).
- Periodically check the good condition of the electrical system and all cable and battery connections: a deterioration of one of these elements can compromise correct functioning and cause serious damage to the system, battery charger, and batteries.
- Avoid shocks and strong vibrations. In case of mechanical damage DO NOT use the battery charger and contact the assistance service
- It is not permitted to open the battery charger to carry out repair work unless previously agreed and instructed by the manufacturer or qualified after-sales service.
- In case of fire, use fire extinguishers suitable for electrical equipment and live parts.

1.2 Battery use rules

To guarantee the safety of user and any possible serious damage to things or people, follow the following instructions:

- Explosive gases are produced when charging lead-acid batteries. IT IS FORBIDDEN TO SMOKE OR GENERATE SPARKS near the batteries; the gases produced during charging could ignite.
- In the case of lead-acid batteries, periodically check the internal liquid level. If necessary, stop charging and top up using distilled water. During these operations ALWAYS wear protective devices for skin, eyes and clothing.

For all batteries:

- Carefully read the safety data sheet in use and scrupulously follow the safety warnings imposed by the manufacturer.
- Avoid short circuits, both with cables during installation or maintenance, and with any metal objects that could accidentally fall on live parts of the batteries.
- While working on batteries, avoid wearing metallic objects (rings, watches or necklaces). Short-circuit currents can melt such objects, causing serious burns.
- Discharge and recharge batteries by applying voltages, currents and charging cycles suitable for the model in use. Consult the battery manufacturer for more information.
- NEVER charge a battery if it is damaged, swollen, deformed or frozen.
- Make sure the batteries are installed in an area large enough to allow sufficient ventilation during charging. Consult the battery manufacturer for more information.

2 INSTALLATION

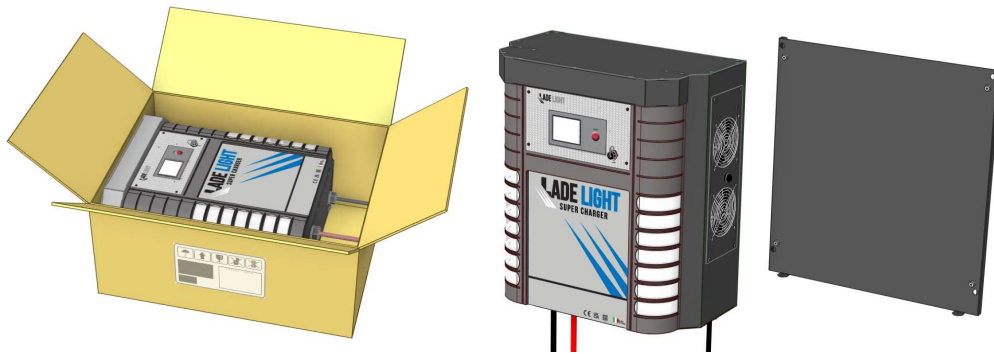
- DURING INSTALLATION, CAREFULLY OBSERVE THE RULES INDICATED IN CHAPTER 1.
- Check that the voltage of the battery voltage corresponds to that of the batteries in use (see nameplate data).

2.1 Installation environment

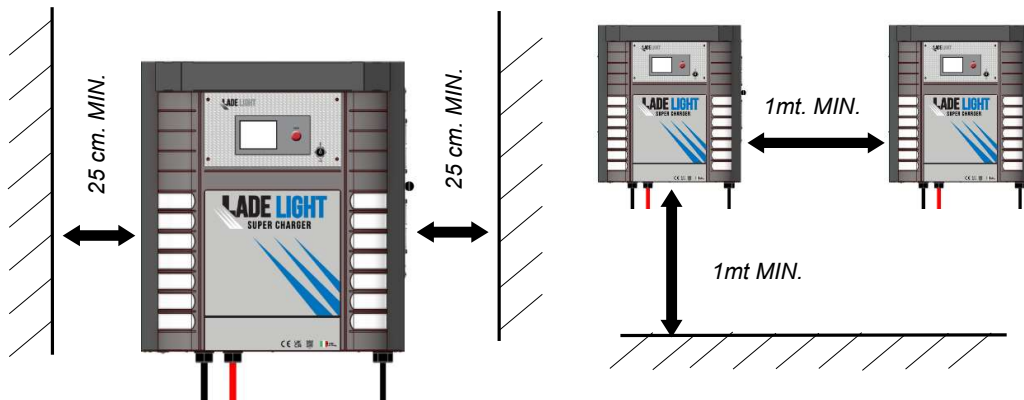
- The charger is designed for indoor use only.
- Operating temperature between -10°C and +50°C.
(Performance reduction with temperatures above 40°C).
- Avoid highly humid environments.
- Avoid environments saturated with dust, environments with strong polluting agents such as solvents, detergents or oils.
- Do not install the battery charger directly above the batteries, if they are not of the hermetic type: the gases produced by the batteries during charging damage the internal parts of the device.

2.2 LLS Box 1 installation

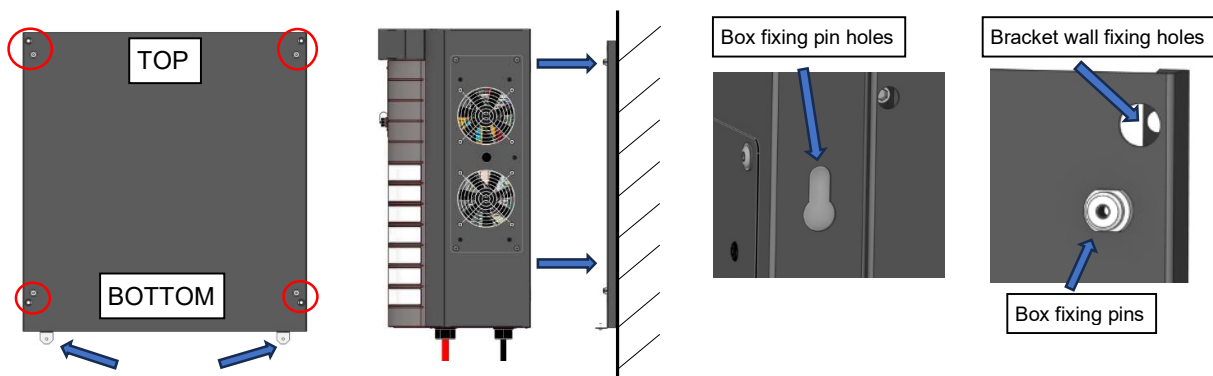
- Open the box and remove the battery charger and the wall fixing bracket on the bottom:



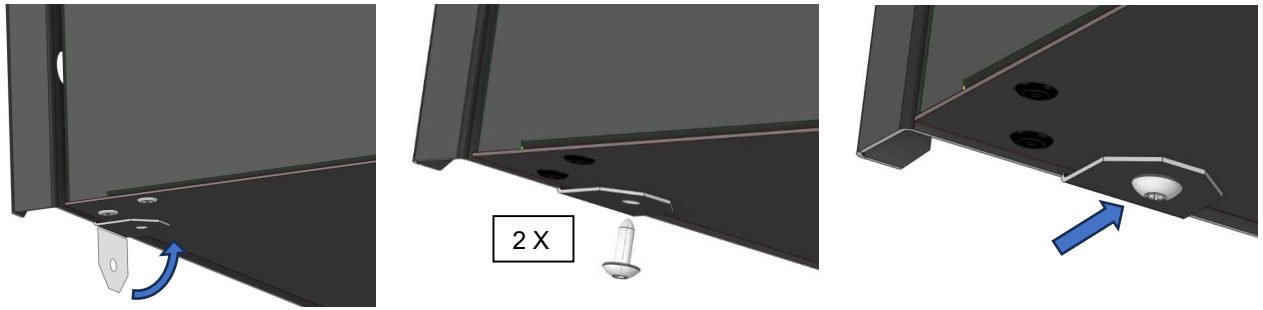
- Positioning and fix the wall bracket observing the indications for the necessary spaces:



- Fix the wall bracket with 4 suitable screws in the 4 holes provided at the corners (see par. 7.1 for dimensions). Hook the battery charger to the 4 specific pins on the bracket

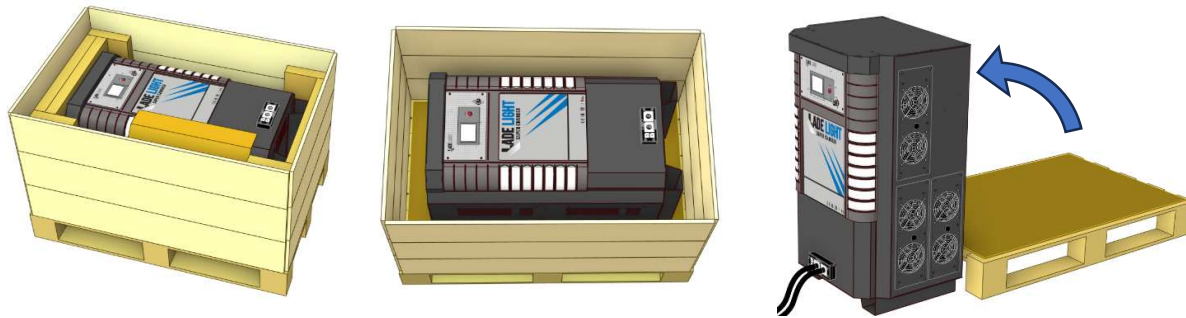


- Remove the two 4.2x13 self-tapping screws present in the holes on the bottom
- Fold the two lower metal flaps until the holes in the flaps match those on the bottom of the box.
- Fix as indicated by retightening the screws previously removed.

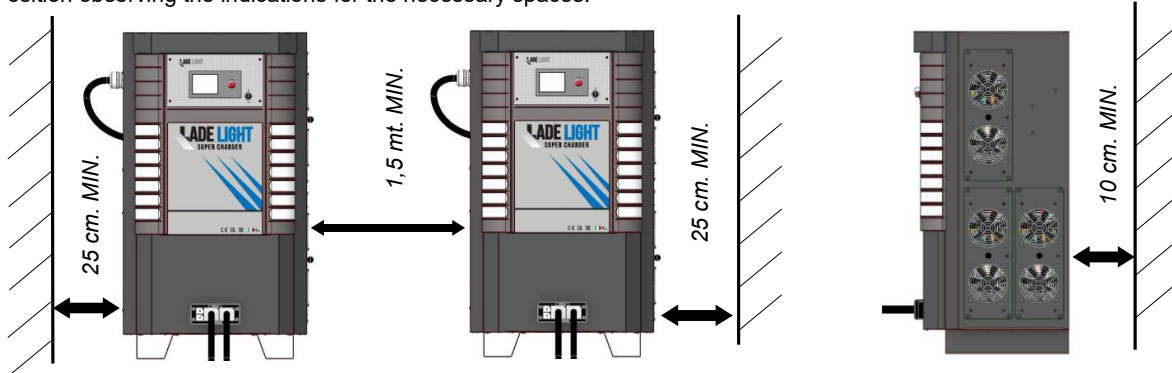


2.3 LLS Box 2 installation

- Remove the crate lid, remove the internal packing material, remove the crate sides.
- Lift the battery charger vertically and place it on the ground near the destination.



- Position observing the indications for the necessary spaces:



MAKE SURE THE COOLING FLOW IS NOT OBSTACLED

3 CONNECTIONS

3.1 Main Connections

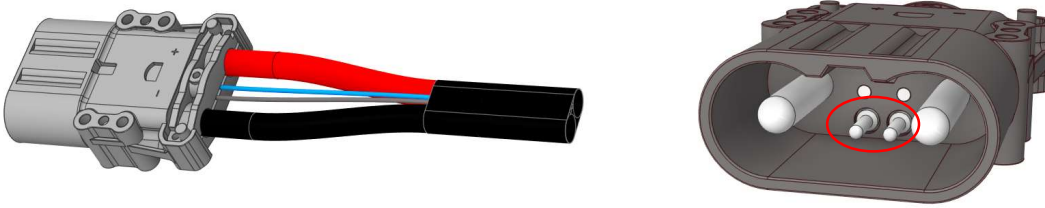
The battery charger is equipped with a THREE-PHASE 3P + PE power cable with a section suitable for the machine's absorption.

If extensions are used, use cables with the same or larger cross-section.

The battery charger is equipped with battery connection cables of the appropriate cross-section for the maximum charging current. The use of extension output cables not authorized by the manufacturer is prohibited.

3.2 Auxiliary Connections

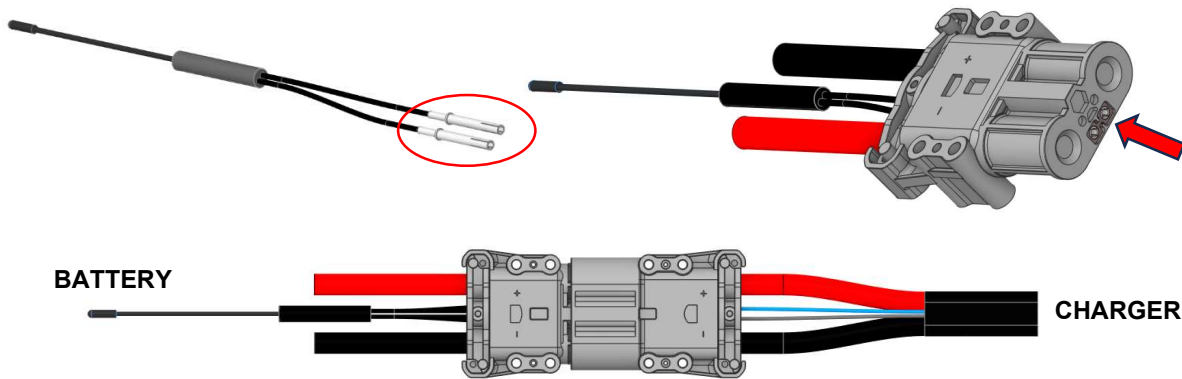
LLS-series battery chargers are supplied with the PILOT auxiliary contact battery connector wired.



With **QUASAR** charging profile programmed, the battery thermal probe must be wired to this contact.

3.2.1 Battery thermal probe function

With LLS programmed with Quasar profile, the battery temperature reading function is active. The thermal probe (cod. 13039055) is supplied together with battery charger and must be wired to the PILOT auxiliary contacts of the battery connector. Follow the assembly instructions included with the probe.



3.2.2 Safe-OFF function

The Safe-OFF function prevents sparks when disconnecting the battery while charging.

In battery chargers programmed with QUASAR profile with wired battery thermal probe the SAFE-OFF function is ACTIVE.

4 OPERATION:

4.1 General Description

The LLS series battery charger is a fully automatic charger and its operation is linked to the programming settings. Specifically, LLS battery charger is programmed with the **QUASAR** high-performance free lead-acid battery charging profile.

The charger is equipped with a display interface.

During charging, the display shows the charging status, end of charging status and any errors or anomaly statuses.

4.2 Operating limits

The charger works regularly with a three-phase mains supply between 340V and 460V 47/63Hz.

The charger works regularly at temperatures from -10°C to +50°C.

In case of temperatures above 40°C the battery charger limits its performance to avoid internal damage.

5 CHARGE CYCLE ACTIVATION

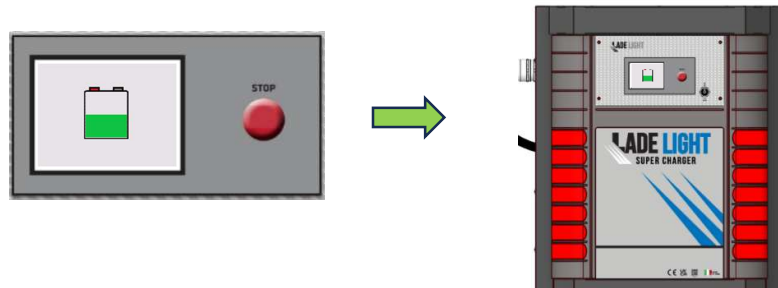
5.1 Power Supply

By powering the battery charger without connecting the battery, the display shows the following screen



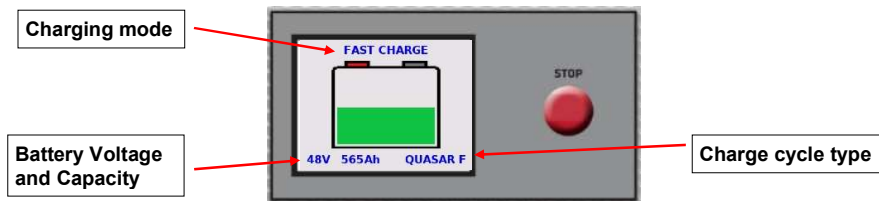
5.2 Battery connection and charging start

The display presents the CHARGING IN PROGRESS screen which can take on different aspects depending on the charging status. When the charging cycle is activated, the RED lights come on



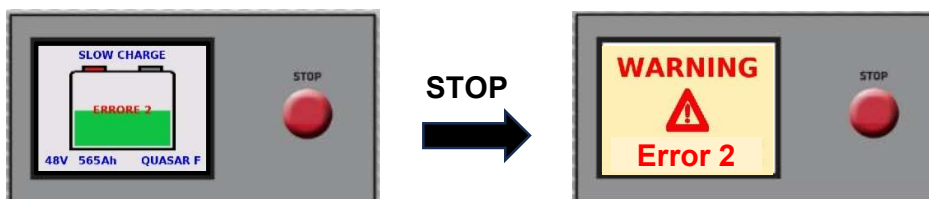
5.3 Charge management

With **QUASAR** profile programmes, the display shows **FAST CHARGE** screen in progress. Information relating to the battery and charging status are presented on the display:

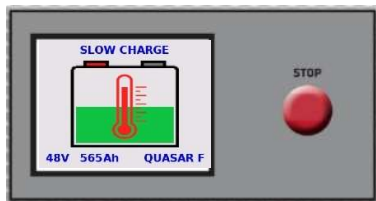


Charge cycle type	FAST CHARGE time (80% Battery discharge)
QUASAR42	4 / 4,5 hrs
QUASAR35	4,5 / 5 hrs
QUASAR25	5,5 / 6 hrs
QUASAR18	6,5 / 7 hrs
QUASAR16	7,5 / 8 hrs

If anomaly is detected in the battery thermal probe upon departure, the device will carry out **SLOW CHARGE** indicating **Error 2** code on the display. The entire charging cycle will be carried out with limited charge current and its duration will be longer than expected (up to max 13 hrs). At the end of charge **WARNING Error 2** screen will be displayed.



If a high battery temperature is detected during charging, the device switches to **SLOW CHARGE** indicating a high battery temperature. Charging will be completed with a limited current and its duration may be longer than expected.

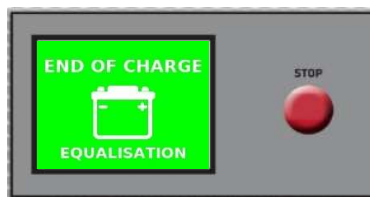
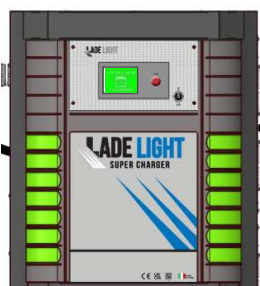


5.4 Equalization

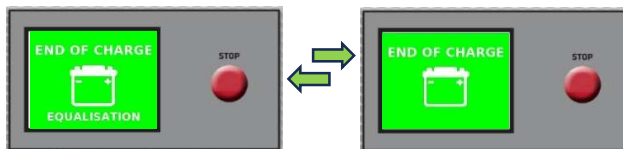
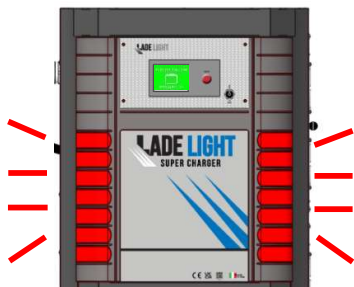
Equalization is foreseen in the **QUASAR** charging profile. EQUALIZATION is a charging phase composed of a WAIT time after the automatic STOP, a several number of charging pulses (ACTIVE phases) and pauses (PASSIVE phases) of programmable duration:

Standard parameters for EQUALIZATION in QUASAR charge profile			
WAIT after STOP	N. of pulse	ACTIVE phase duration	PASSIVE phase duration
12 hours	12	5 minutes	55 minutes

After automatic STOP and during all PASSIVE EQUALIZATION phases, the EQUALIZATION Waiting screen will be presented and green lights will be on.

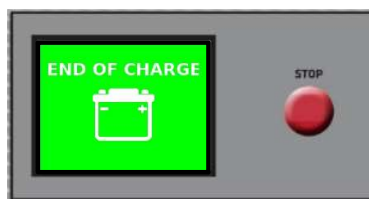


During the ACTIVE Equalization phases, the active Equalization screen is presented with EQUALIZATION on the display and the flashing RED lights:



5.5 END of charge

At the end of all charging phases foreseen by the **QUASAR PROFILE**, the battery charger switches OFF. The steady GREEN lights come on and the display shows the END OF CHARGE screen:



5.6 Interruption of charging

5.6.1 Stop button

To STOP charging before AUTOMATIC STOP, push the STOP BUTTON for 2-3 seconds. The battery charger stops charging and displays the END OF CHARGE condition described in paragraph 5.5. No other charging phase will be performed.

5.6.2 Battery disconnection

It is also possible to directly disconnect the battery connector, the SAFE-OFF system allows for safe disconnection avoiding any dangerous sparks. The battery charger stops charging and displays the WAIT FOR BATTERY condition described in paragraph 5.1.

5.6.3 Anomalies

If an anomaly occurs during charging the battery charger stops charging and displays the relevant alarm. See paragraph 6 for a detailed description of the alarms.

5.6.4 Mains absence

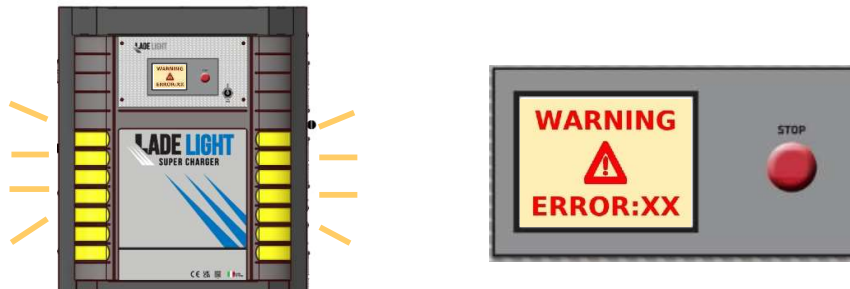
If the mains power supply fails during charging, the battery charger switches off completely.

When the mains return, if the battery being charged has not been disconnected, the interrupted charging cycle will resume. The display will return to the current charging display described in paragraph 5.2.

NOTE: In multiple modules models, depending on the phase being executed, it is normal for not all modules to be active.

6 ALARMS

By ALARM we mean a malfunction that can cause the interruption of charging or prevent it from starting. In these cases the flashing YELLOW lights come on and the ALARM screen appears with the error code encountered.



6.1 ERROR Description

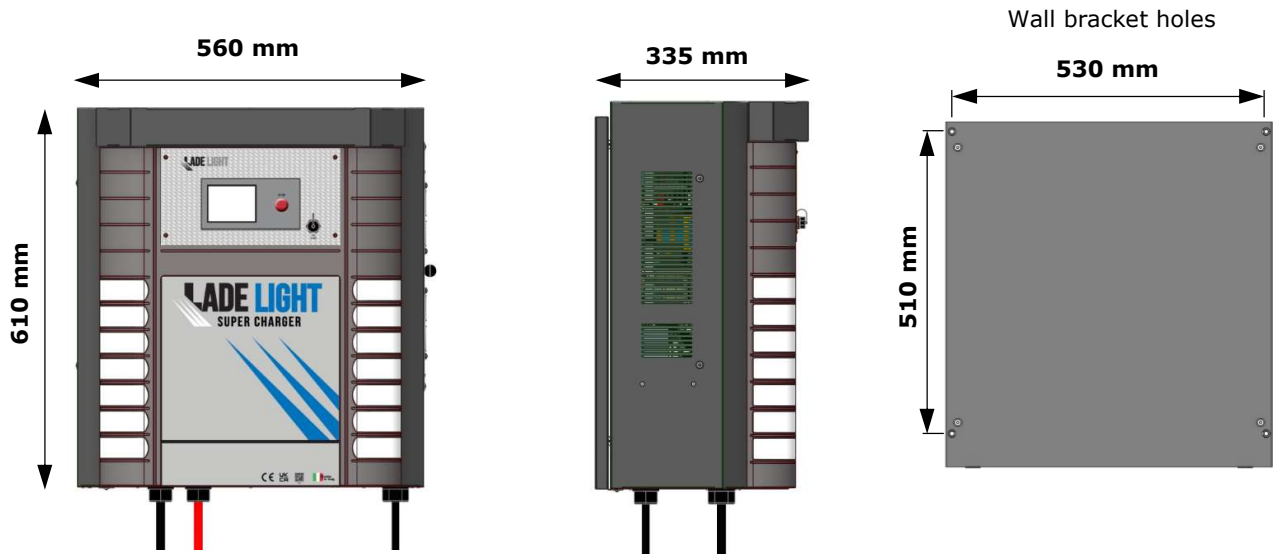
Errors determine the definitive interruption of charging. It is possible to reactivate charging, but if the error condition persists it will be signalled again and the battery charger will go OFF again with the ALARM displayed.

Below is a list of possible ERRORS that can be detected and their possible causes

ERRORS	MEANING	POSSIBLE CAUSES
Error 1	Battery voltage not compatible with battery charger voltage	Check that the voltage of the connected battery matches that of the charger
Error 2	Battery thermal probe not detected at start	Battery Temperature < -20°C Check the condition of the thermal probe and its connection
Error 3	Battery thermal probe failure	Check the condition of the thermal probe and its connection
Error 5	Safety timer expired Vbat < Vnominal	Check the battery. Possible faulty cells
Error 6	Safety timer expired, does not increased battery voltage	Check the battery. Possible wear or aging.
Error 7	Anomaly of a power module	Module faulty or on standby. Disconnect and reconnect the battery. If the alarm persists, contact the assistance service

7 DIMENSIONS

7.1 LLS Box1 (Single power module)



7.2 LLS Box2 (Multiple power modules)

