LLS SUPERCHARGER USER MANUAL

AUTOMATIC THREE-PHASE MODULAR HIGH-FREQUENCY BATTERY CHARGER

CE

MODELS:

- **LLS24400T**
- **LLS24600T**
- **LLS48400T**
- **LLS48600T**
- **LLS80240T**
- **LLS80360T**

MADE IN ITALY by

INDEX

1 GENERAL INFORMATION

This manual contains important safety instructions for the installation, operation, and maintenance of the LLS series chargers. Therefore, you must read this manual carefully and follow the instructions in it carefully. Keep this manual for possible reference in case of operator intervention.

IMPORTANT: ***The manufacturer assumes no responsibility for damage resulting from misuse of the charger or from any incorrect installation and/or programming.***

1.1 General safety regulations

- For proper use, carefully read all instructions and warnings regarding the installation of the equipment and the use of batteries in this manual.
- To reduce the risk of electrocution or fire:
  - Do not expose the charger to rain, snow, splash, or moisture.
  - Do not install in environments with high humidity or high risk of condensation.
  - Do not cover ventilation openings under any circumstances.
  - Do not use accessories or spare parts that are not original or not recommended by the manufacturer.
- Perform all cleaning, maintenance and/or replacement of spare parts by turning off and disconnecting the charger from any power source (Mains and Batteries).
- All work on the charger MUST be performed by qualified and trained technical personnel.
- Electrical installation must be done properly, in accordance with applicable regulations and standards.
- Use power and battery connection cables of suitable length and cross section (See INSTALLATION).
- Periodically check the good condition of the electrical system and all cable and battery connections: a degradation of any of these elements can impair proper operation and cause serious damage to the system, charger, and batteries.
- Avoid shocks and strong vibrations. In case of mechanical damage, DO NOT use the charger and contact the service department
- The charger must not be opened for repair work unless prior agreement and instruction from the manufacturer or qualified service department.
- In case of fire, use fire extinguishers suitable for electrical equipment and live parts.

1.2 Rules of battery use

For best results and safety, the user is required to read and follow these instructions carefully:

- Explosive gases are produced when charging lead-acid batteries. IT IS FORBIDDEN TO SMOKE OR GENERATE SMOKE near to batteries; gases produced during charging may ignite.
- In the case of lead-acid batteries, periodically check the level of the internal liquid. If necessary, stop charging and top up with distilled water. ALWAYS wear protective equipment for skin, eyes and clothing during these operations.
- For all batteries:
- Carefully read the MSDS of the batteries in use and strictly follow the manufacturer's safety instructions.
- Avoid short circuits, either with cables during installation or maintenance, or with metal objects that might accidentally fall on live parts of the batteries.
- Avoid wearing metal objects (rings, watches or necklaces) when working on batteries. Short-circuit currents can melt such objects, causing serious burns.
- Discharge and recharge batteries by applying voltages, currents and charge cycles appropriate to the model in use. Consult the battery manufacturer for more information.
- NEVER charge a battery if it is damaged, swollen, deformed or frozen.
- Ensure that batteries are installed in an area large enough to allow sufficient ventilation during charging. Consult the battery manufacturer for more information.

2 INSTALLATION

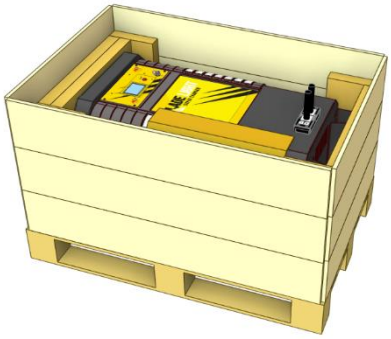
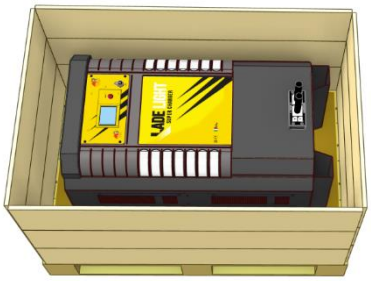
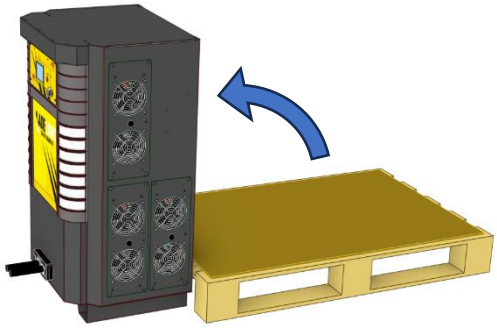
- WHEN INSTALLING, CAREFULLY OBSERVE THE REGULATIONS INDICATED IN CHAPTER 1.
- Check that the charger voltage corresponds to that of the batteries in use (see nameplate data).

2.1 Installation environment

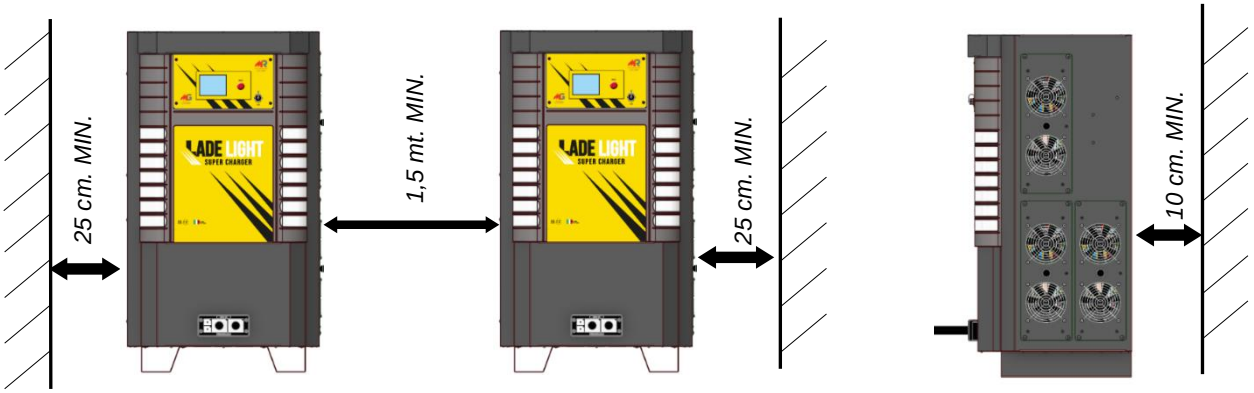
- The charger is designed for indoor use only.
- Operating temperature between -10°C and +50°C.
  (Performance is reduced at temperatures above 40°C).
- Avoid extremely humid environments.
- Avoid dust-saturated environments, environments with strong contaminants such as solvents, detergents or oils.
- Do not install the charger directly above the batteries, unless it is hermetically sealed: the gases produced by the batteries during charging will damage the internal parts of the machine.

2.2 Unpacking

- Remove the cover, remove the inner packing material, remove the sides of the crate:
- Lift the charger upright by placing it on the ground at its destination.

Follow the instructions for the necessary spaces:



ENSURE THAT THE FLOW OF COOLING IS NOT OBSTRUCTED

2.2 Main Connections

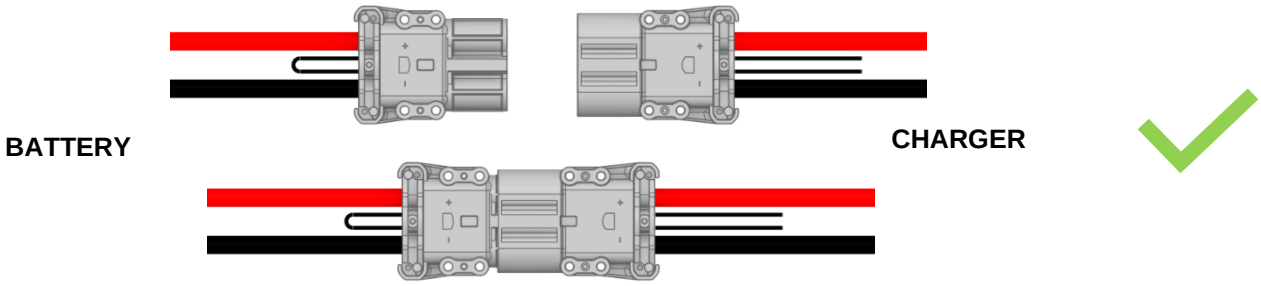
The charger is equipped with a THREE-PHASE 3P + PE power cable with a cross-section suitable for the machine's absorption.
When using extension cables, use cables of the same or greater cross-section.

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

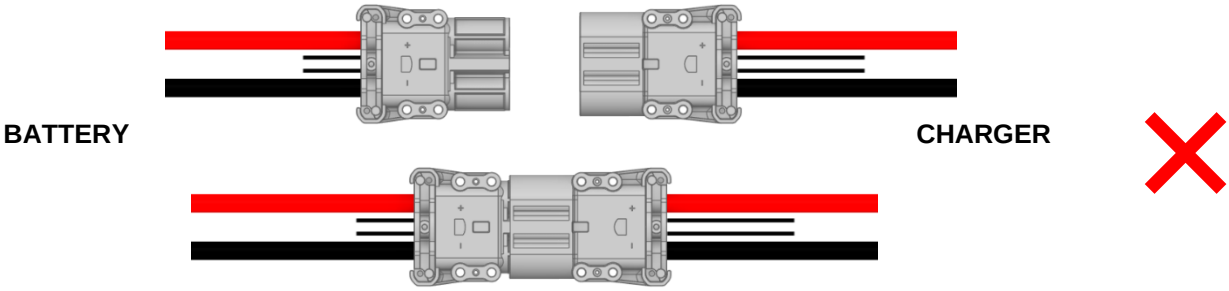
2.3 Auxiliary Connections

LLS-series battery chargers work EXCLUSIVELY with the SAFE-OFF function, which prevents sparks when disconnecting the battery.
The SAFE-OFF function verifies the closure of an auxiliary contact pair wired on the BATTERY SIDE connector.

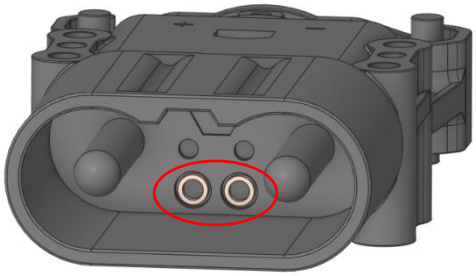
If the auxiliary contact pair on the BATTERY SIDE connector is short-circuited, charging is ACTIVE:



If the auxiliary contact pair on the BATTERY SIDE connector is not wired or is open, charging will NOT start:



Normally the charger is supplied with a pre-wired battery connector in which the wires for the SAFE-OFF contact are connected to the indicated contact pair:



In the case of delivery (on request) without the battery connector already wired, you can use any pair of the two available battery connectors. It will be necessary to wire the battery cable connector using the corresponding cup.

If, when connecting the battery, this contact is NOT seen as closed,
THE CHARGER WILL NOT PERFORM THE CHARGING CYCLE.

The charger will enter an ANOMALY state by displaying error 22 (see paragraph 3.3.5).

3 FUNCTIONING:

3.1 General Description

The charger in your possession is suitable for charging WET Lead-acid, AGM, GEL and LITHIUM batteries.

It is a fully automatic charger and its operation is linked to the programming settings.

The charger is equipped with a display interface.

During charging, the display shows the charging status, end-of-charge status and any errors or faults.

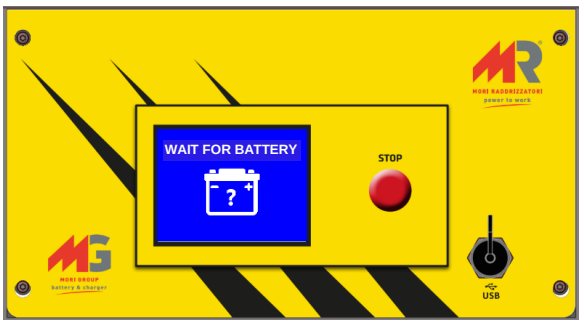
3.2 Operating limits

The charger operates regularly with a three-phase mains supply between 340V and 460V 47/63Hz.
The charger operates regularly at temperatures between -10°C and +50°C.
At temperatures above 40°C the charger limits its performance to avoid internal damage.

3.3 Functions

3.3.1 **Power Supply**

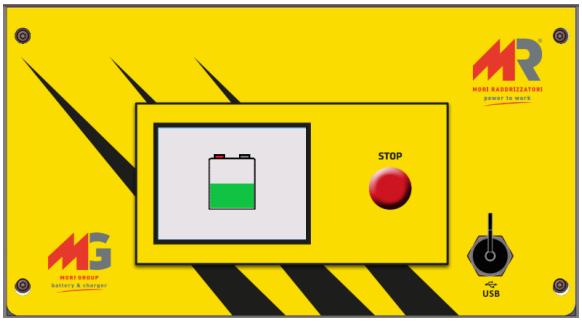
When powering the charger without connecting the battery, the display shows the following screen:



3.3.2 **Battery connection and start of charging**

When the battery is connected (and the SAFE-OFF contact is closed) the charging cycle is activated.

The red lights come on and the display shows the CHARGE IN ACTIVE screen:



If the battery is disconnected during charging the charger reverts to the battery standby state described in section 3.3.1.

If mains power fails during charging, the charger shuts down completely.

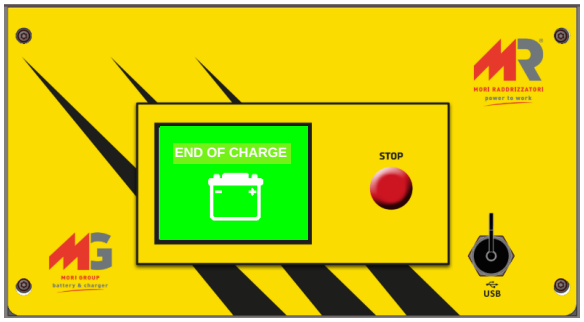
When mains power returns, if the battery being charged has not been disconnected, the interrupted charging cycle will resume.

The display will return to the view described in paragraph 3.3.2.

3.3.3 End of charge

When charging is complete, the charger switches off.

The GREEN leds light up and the display shows the end-of-charge screen:

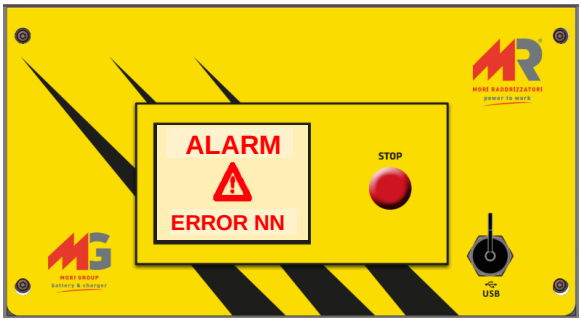


3.3.4 Charge Interruption

If it is necessary to interrupt the charging cycle before the automatic STOP you can disconnect the battery connector, the SAFE-OFF system avoids any sparks.
You can also press and hold the STOP button for 2-3 seconds.
The charger stops charging and displays the end-of-charge condition described in paragraph 3.3.3.

3.3.5 Alarm

ALARM is a malfunction which prevents the start of charging or causes it to be interrupted.
In these cases, yellow flashing lights come on and the ALARM screen appears with the error code encountered.



Charging can be reactivated, but if the error condition persists it will be reported again and the charger will switch off again.

Below is a list of possible ERRORS that can be detected

ERROR
Error 3: Battery Voltage out of range
Error 10: Wrong or missing configuration parameters
Error 19: Safety timer tripping
Error 20: Module failure
Error 22: SAFE-OFF contact absent

4 PROBLEM SOLVING

The charger in your possession is equipped with an internal self-diagnostic system operated by a microprocessor. Abnormal conditions may occur during normal operation.

4.1 ERROR Description

ERROR is a malfunction that causes charging to be interrupted.
Some errors include the possibility of recovery: when the error condition ceases, the charger automatically resumes charging without the need for external intervention.

ERROR	Recovery	Possible causes / Recommended intervention
E3: battery voltage out of range	YES	Check that the voltage of the connected battery matches that of the charger.
E10: Wrong or missing configuration parameters	NO	Contact service.
E19: Safety timer tripping	YES	Check battery charge. Possible wear or ageing.
E20: : Module failure	YES	Try disconnecting and reconnecting the battery. If this error recurs systematically, the defective module must be replaced. Contact the service department
E22: SAFE-OFF contact absent	YES	Check the correct installation of the SAFE-OFF circuit in the battery connection connectors. (See section 2.4)

5 DIMENSIONS