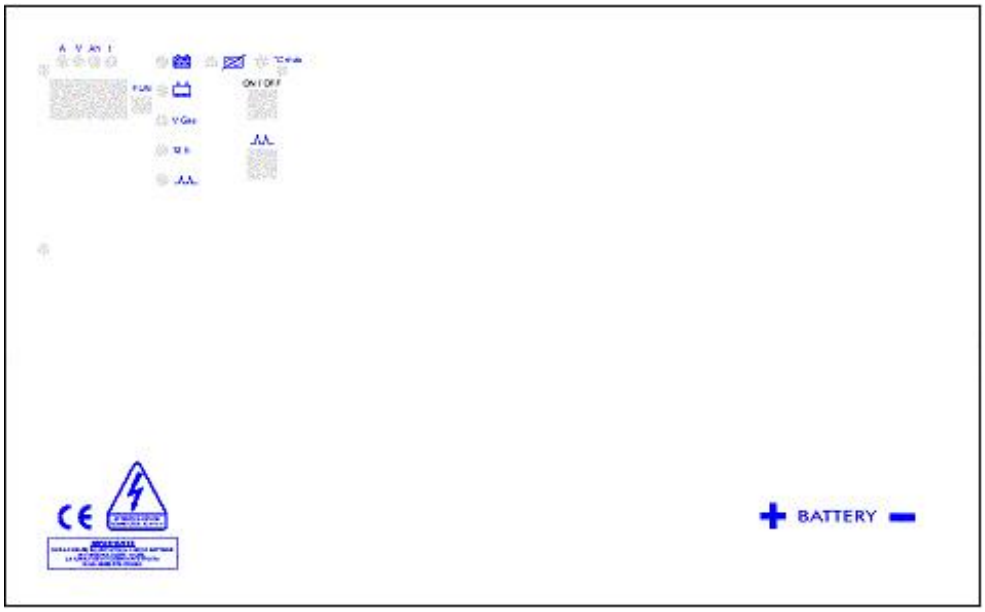
TECHNICAL DATA SHEET

LAD/AQ48M100-L

GENERALITIES

This device is a traditional three-phases battery charger, power supplied 230Vac, with WA charge cycle type, so with decreasing current and increasing voltage.
Its reduced sizes make easier the utilization in case of lack of space, in reduced spaces.
The charge process is completely automated, since that the device has an electronic controller board that controls the whole charge cycle, showing various phases or anomalies by LED.



TECHNICAL FEATURES

- CPU controller board
- Automatic start settable by dip-switch
- Automatic turn-off after disconnecting the battery connector, settable by dip-switch
- Post charge time settable by dip-switch
- Voltage threshold for the post-charge start settable by dip-switch
- It is possible to set the equalization and the buffer charge
- Visual and acoustic signal
- Intelligent post-charge
- It is possible to choose the voltage from the board, for a fixed voltage
- Charge status shown by LED
- Charge curve “WA”
- Power supply 230Vac
- Visual and acoustic anomalies signals
- Improved accuracy of the current measurement

IMPORTANT:

If the charge stops after few seconds from the beginning, disconnect the battery connector, connect it again and press the ON button. This operation must be done until the battery charger works normally, going on with the charge.

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This operation is necessary when the battery is completely discharged or when it has been discharged over its normal limit.

USER WARNINGS

- The battery charger's been built to work closed, DO NOT open it in any case.
- DO NOT introduce any kind of objects into the battery charger
- The battery charger is NOT created and sized for do repeated charge cycles, even if they are short, that maintain a constant current consumption equal to the maximum value.
- If the power supply wire is damaged, DO NOT repair it with improvised reparations, DO NOT use the battery charger and don't leave it connected to the power supply. It is necessary to replace the wire, and this must be done only from the battery charger producer or from expert technical support

INSTALLATION

- Place the charger on a flat horizontal surface, so that it is stable and on all the four feet. The surface must be able to bear the charger's weight, indicated on the table 2 on page 3.
- It must be placed so that it has at least 20cm on the sides and 1m above it
- Room temperature must not exceed 40°C.
- DO NOT place the battery charger in a place subject of acid vapours
- It's been built to work indoor, not exposed to the rain and in a well-ventilated place
- It must not be soaked with water ot other liquids, since that it has a protection grade IP20

POWER SUPPLY CONNECTION

- The charger must be connect only to plugs with ground tap.
- The charger is meant to work with Single-Phase supply.
- Before connecting it, check the correct voltage on net supply. In case the measured value is different from the nominal value, please contact your technical service.
- Check that the feeding line is correctly protected and compliance to the laws in force in order to grant protection against over feeding and short circuits (see table 2, page 3 for input current values).

CONNECTION TO THE BATTERY

- Connect the charger to the battery paying attention to the correct wires polarisation:
  battery positive = red (+)
  battery negative = black (-)
- Use the charger only with lead batteries with number of elements and nominal capacity compliance to TABLE 1 pag 3
- Avoid to charge not rechargeable batteries.
- During the charging cycle, the battery must be placed in a well ventilated place and caps must be opened

ATTENTION: if the charger is a model with automatic start, the charging cycle begins automatically connecting the batteries.

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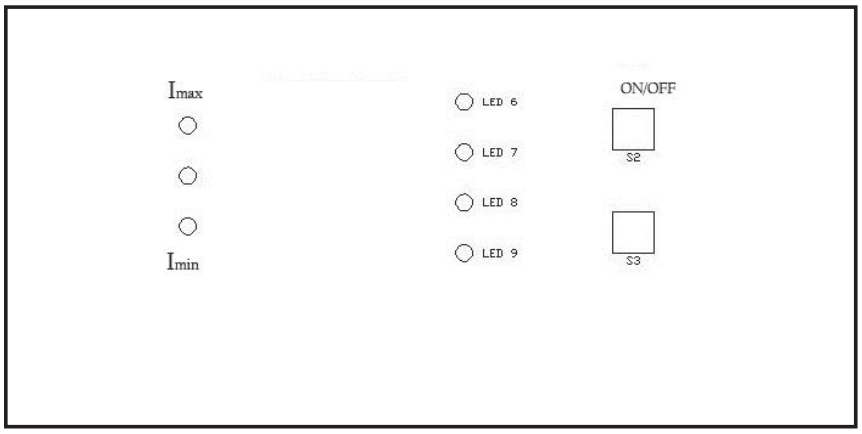
TABLE 1
ELEMENTS NUMBER AND BATTERY CAPACITY

NOMINAL RECTIFIER VOLTAGE	BATTERY ELEMENTS
24 V	12
36 V	18
40 V	20
48 V	24
NOMINAL RECTIFIER CURRENT	**BATTERY CAPACITY A/h 5 HOURS**
40 A	195-250
50 A	255-315
60 A	320-375
80 A	380-500
100 A	505-625
120 A	630-750
140 A	755-875
160 A	880-1000

TABLE 2
ABSORPTIONS AND WEIGHT OF THE BATTERY CHARGER

Single-Phase 230Vac	POWER [kVA]	CURRENT (A) @ 230Vac	WEIGHT [Kg]
24V 80A	**2.4**	**11**	**39**
24V 100A	**3**	**13**	**41**
24V 120A	**3.6**	**16**	**44**
24V 140A	**4.2**	**19**	**49**
36V 80A	**3.6**	**16**	**40**
36V 100A	**4.5**	**20**	**42**
36V 120A	**5.4**	**25**	**42**
48V 60A	**3.6**	**16**	**40**
48V 80A	**4.8**	**22**	**45**
48V 100A	**6**	**27**	**50**
48V 120A	**7.2**	**33**	**55**

BUTTONS AND INDICATION POSITIONS



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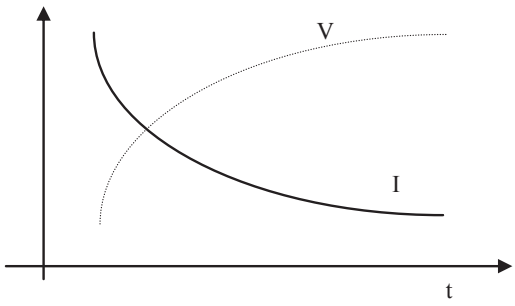
LED 6 (V) Blinking during charge – Led ON end charge
LED 7 (Y) Lit when post-charge phase is acting
LED 8 (R) When blinking means that the charging cycle has lasted more than the maximum 12 hours (anomaly).
When steady lit shows anomaly in feeding or activation of thermal protection
LED 9 (V) When ON means that the equalisation charging is allowed
When FLASHING means that equalisation charging is taking place
S2 ON/OFF button
S3 Equalisation button

(G) The colour of the led is GREEN
(Y) The colour of the led is YELLOW
(R) The colour of the led is RED

WA CHARGE

The charging current decreases automatically according to the peculiar working of the transformer (stray flux) with consequent voltage increase.

CARATTERISTICA WA



BATTERY CHARGER FUNCTIONING

The battery charger mounts an electronic PCB with microprocessor control, double timing and equalisation charge.

When pushing the S2 button, the PBC begins feeding the battery and signals the taking place of the charging cycle by flashing LED 6; at the same time it controls that the tension arrives at the post-charging level. When the post-charging level is exceeded, the PCB begins counting the post-charging time and signals the end of the process by LED 7

After the counting of the post charging time, the charging cycle can be considered regularly finished.

The charging cycle ends also if the battery tension exceeds a maximum value.

Should the whole cycle last more than 12 hours, the PCB interrupts it and signals the anomaly by flashing LED 8.

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BUTTONS FUNCTION

The S2 button allows to begin and stop the charging cycle. The beginning of the charging cycle is shown by the flashing of LED 6.

The S3 button allows the taking place of equalisation function at the end of the charging cycle. This phase can be activated simply by pushing the S3 button and is shown by LED 9. When LED 9 is ON it means that the function is allowed (button S3 pushed); when LED 9 flashes it means that the equalisation process is taking place.

EQUALIZATION CHARGE DESCRIPTION

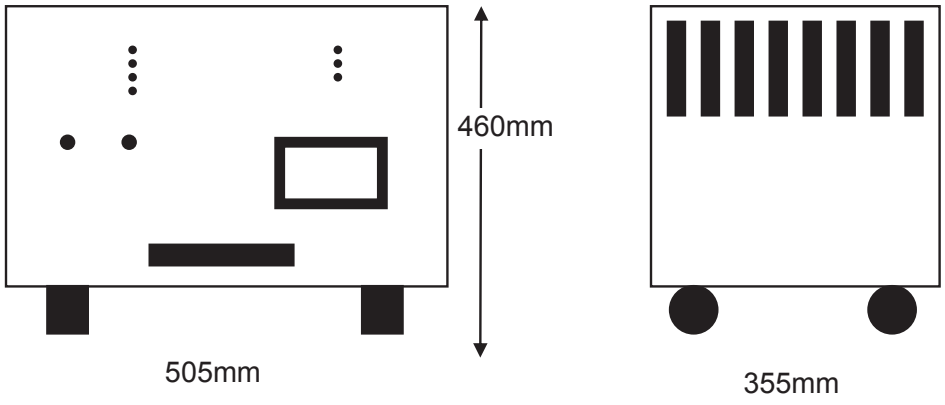
Equalization charge can be enabled by pressing S3 button during the charge or post charge phase.
When enabled, the equalization starts after the normal charge finished and it last for 48 hours. This procedure means to activate the charge phase for 5 minutes and keep it turned off for the 55 munites after, cyclically until the 48 hours expire.

PROTECTIONS

On the battery charger are implemented the following protection:

- The electronic board automatically stops the charge if it lasts more than 12 hours
- An output fuse is implemented to protect against accidental inversion of battery polarity or output protracted overload current

DIMENSIONS



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COMMON ANOMALIES AND SOLUTIONS:

THE BATTERY CHARGER DOESN'T CHARGE:

Control if the board turns on:

If the board does not turn on, control on the 2 external pins of the 3-ways connector (on the right side of the board) if there is the power supply from the batteries. If there is not any supply control every connection that goes from those 2 pins until the batteries. Control also that the fuse is not faulty.

If there is the power supply on board's connector it means that the board is faulty and it must be replaced.

If the board turns on, push the "ON" button and see if the green LED indicating the working charge starts to flash.
After it control by a multimeter if on the three diode bridge's terminals (where the wires coming out from the transformer arrive) there is power supply. (PAY ATTENTION TO NOT SHORT-CIRCUITING ANYTHING)

If the power supply arrives to the diode bridge, control if the fuse is whole. If the fuse is not faulty then the diode bridge must be replaced.

If the power supply doesn't arrive to the diode bridge control the following:

-control if there is power supply on the three COM relays pins on the board, if it doesn't arrive control the power supply wire, the plug and the power panel
-In the case that there is the power supply on the three COM terminals, with board indicating the working charge (green led flashing) verify also that on the NA relay's terminals there is power supply – if NOT the board must be replaced.
-in the case that also on NA relays terminals there is power supply – then control if the power supply arrives also to the transformer's terminal, both on the power supply wires input side (where the wires from the board arrive) and on the other side, where the primary transformer's wires arrive.
If the power supply doesn't arrive to those terminals control that the wires are well-connected to the terminals.

THE BATTERY CHARGER TURNS ON BUT AFTER FEW SECONDS IT TURNS OFF:

This problem is due to the fact that the batteries are too discharged. To solve this problem keep turning on the battery charger every time that it turns off, after some tries usually the charge cycle begins normally.

WARNING:

Before contacting our customer service, be sure that the problem is not among those listed above.

If it is necessary to contact our customer service, it's reccomended that every useful information has been taken, in order to minimize the assistance time.

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ATTENTION!!

THE FOLLOWING PART OF THE MANUAL IS RESERVED TO QUALIFIED PERSONNEL ONLY.

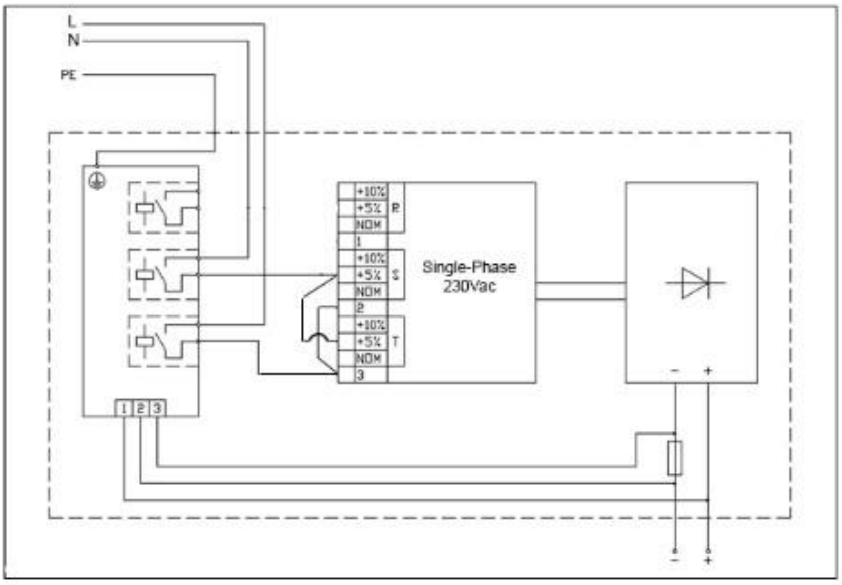
DISCONNECT TENSION BEFORE OPENING THE CHARGER.
DO NOT WORK ON THE OPENED CHARGER WITH TENSION STILL PRESENT

INSTRUCTIONS FOR SUPPLY VOLTAGE CHANGE

Before connecting the charger, get sure that the net supply voltage is correct. If the measured net value is different from the nominal one, it's possible to adapt the transformer supply to the measured tension. This is possible by connecting the supply conductors on the transformer terminal block according to the hereunder schematics.

Use the outlet corresponding to the measured tension/nominal tension ratio; for example, if the net supplies 420Vac, connect the transformer feeding in the 10% position.

WIRING DIAGRAM



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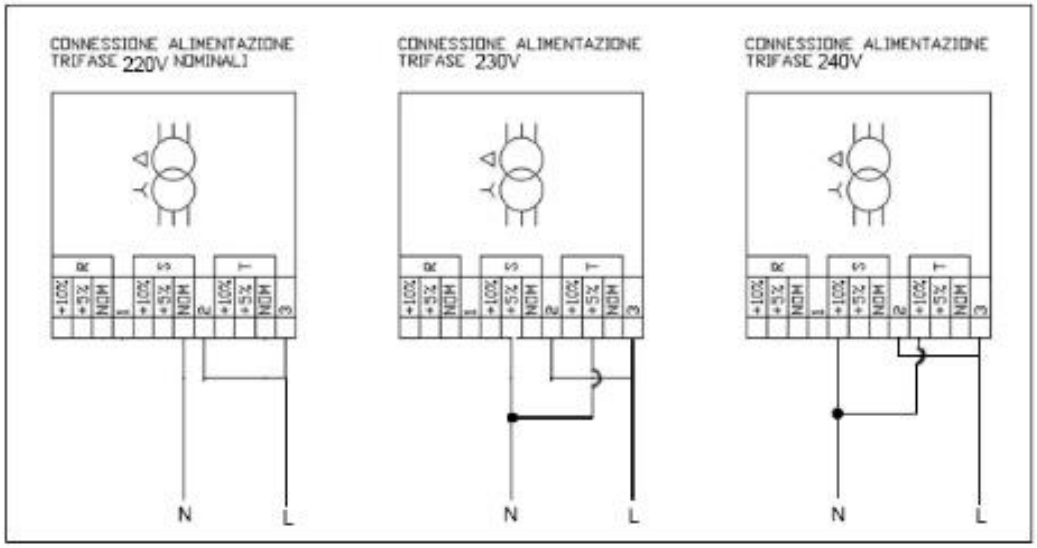
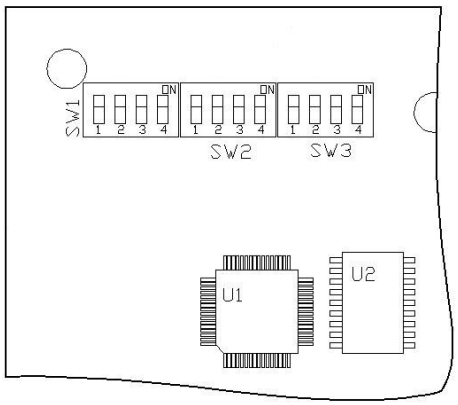
WIRING DIAGRAM 220V/230V/240V



PCB SETTINGS

On the board there are three dip-switches called SW1 SW2 and SW3, and following here it's described their functioning:

SW1 1 – It sets the start mode: dip-switch n-1 in “OFF” the charger starts by pressing S2. If dip-switch n-1 is ON the start is in automatic mode.



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SW1 dip-switch 2, 3, 4 set the maximum current of the charger.
See table below for the dip-switches settings

4	3	2	I max. Charger
ON	ON	ON	60 A
ON	ON	OFF	80 A
ON	OFF	ON	100 A
ON	OFF	OFF	120 A
OFF	ON	ON	140 A
OFF	ON	OFF	160 A
OFF	OFF	ON	180 A
OFF	OFF	OFF	200 A

SW2

In this case the dip-switches 3 and 4 are used to set the maximum protection voltage, indicated as Volt per Element. When they're both set “OFF” the default voltage is selected, and it is 2.70V per element.

4	**3**	**V elem.**
ON	ON	2.65
OFF	OFF	2.70
ON	OFF	2.75
OFF	ON	2.80

Dip-switches 1 and 2 set the post-charge threshold

1	**2**	**Post-charge**
ON	ON	2.30
OFF	ON	2.35
OFF	OFF	2.40
ON	OFF	2.45

SW3 1 – Dip-switch number 4 set the charge interruption in case of the current goes below a certain threshold. If “ON” the function is disabled. If OFF it is enabled

SW3 Dip-switched 1 and 2 set the post-charge lasting time and it is indicated as HOUR:MINUTES. If they're set all “OFF” a time equal to 3:00 hours is selected and it is the default set.

1	2	Tempo
ON	ON	Short time for testing
ON	OFF	240 min.
OFF	ON	180 min.
OFF	OFF	Automatic

SW3 dip-switch 3 OFF: Equalization and ON: Buffer charge
The equalization and the buffer charge lasting time is 48 hours from the finish of the charge.

COMPLIANT STATEMENT

The device here descripted compliant to the following rules and European normative.

EUROPEAN RULES:

Low voltage:
European : 2006/95/CEE

ELECTROMAGNETIC COMPATIBILITY
European: 2004/108/CEE

REFERENCE EUROPEAN NORMATIVE:

LOW VOLTAGE:

EN50178
EN60204
EN60335-1
EN60335-2-29

ELECTROMAGNETIC COMPATIBILITY:

EN55011
EN61000-4-2
EN61000-4-3
EN61000-4-4
EN61000-4-5
EN61000-4-6
EN61000-4-11

WARRANTY :

Battery Supplies grants the product for 12 months after the shipping date. The warranty is valid only if all the rules described in this manual have been respected.
The warranty is limited to the duty to repair or replace without costs all the faulty parts found during the validity of the warranty period. All costs linked to travelling expenses to the customers are excluded.
Reparation/replacement of the faulty parts will be done in the shortest possible time in compliance with the engagements of the building firm and without any obligation to any kind of indemnity and/or compensation for direct or indirect damages.
Warranty will not be recognised on products showing any kind of tempering or external applications.
The beginning of warranty period will start from the date of the shipping documents