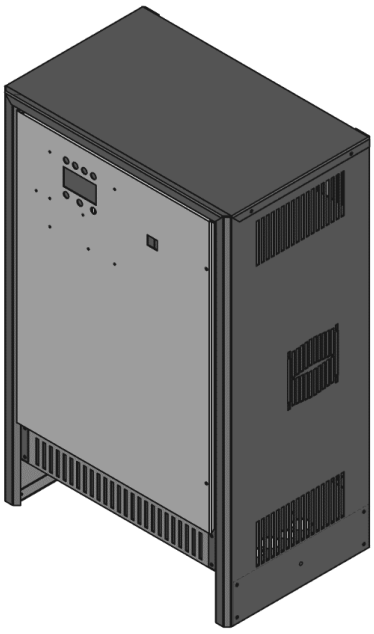
Battery Charger
Service and Programming Manual



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English 'Original instructions'	

English	Francais	Deutsch	Italiano

.HISTORY LOG

The charger is able to estimate the energy saving during the operation.
Push the buttons UP and DOWN, in order to visualize the following data:

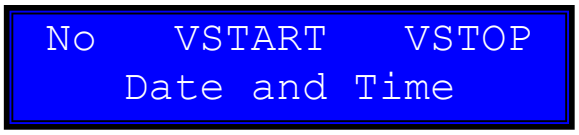
- Energy Saving [kWh]
- History event log
- Firmaware display release

The internal memory of the charger contains a log of the last >250 charge cycles

The 250 most recent cycles can be visualized on the display of the charger.
In order to visualize the 250 most recent cycles, operator needs to scroll the menu using the UP-DOWN buttons, and to press ENTER for 3 seconds in order to entry in the database.

The results of each charge cycle are represented on two pages. Use the UP-DOWN buttons to scroll between each record.

First page:



Where:

No =	Number of cycle (1 is the most recent)
Vstart =	Battery Voltage at the connection
Vstop =	Battery Voltage at the end of the charge
Date and Time =	Date and Time of the BEGINNING of the charge

Second page:

Where:

Date and Time =	Date and Time of the END of the charge
ENDCODE =	Charge termination code (30 different codes identify all the possible situations that determined the termination of the charging cycle, see next paragraph).
Duration =	Total charging time
Ah =	Total capacity returned to the battery

.CHARGER TERMINATION CODES

GROUP 1: CHARGE COMPLETED

A1
Charge completed successfully. [ph1+ph2] Minimum current reached

A2
Charger Unplugged.
Charge completed successfully. [ph1+ph2] + [ph3]
Equalize NOT executed because battery was disconnected.

A3
Charger Unplugged.
Charge completed successfully. [ph1+ph2] + [ph3]
Equalize not started, because battery was disconnected before the Equalize cycle starts.

A4
Charger Unplugged.
Charge completed successfully. [ph1+ph2] + [ph3] + [<ph4]
Equalize started but not completed, because battery was disconnected during equalization

A5
Charge completed successfully because of timeout in phase2

A6
Desulphation cycle completed successfully.

A7
Charger Unplugged.
Charge completed successfully. [ph1+ph2] + [ph3]
Equalize completed successfully. [ph4]

A8
Charger Unplugged.
Charge completed successfully. [ph11+ph2] + [ph3]
Equalize completed successfully. [ph4]+ [<ph5]
Refresh-Cycle started but not completed, because battery during the Refresh

A9
Charge completed successfully. [ph1+ph2] + [ph3]
Equalize completed successfully. [ph4]
Refresh-Cycle completed successfully. [ph5]

B0
Gassing voltage reached successfully. [ph1+ph2]
Full charge NOT executed because time window disabled.

B2
Charge completed successfully. [ph1+ph2] + [ph3]
Equalize completed successfully. [ph4]
Maximum time reached in Eq.

B5
Charge completed successfully. [ph1+ph2] + [ph3]
Equalize completed successfully. [ph4]
Watering procedure interrupted. [Wtr]

B6
Charge completed successfully. [ph1+ph2] + [ph3]
Equalize completed successfully. [ph4]
Watering procedure completed successfully. [Wtr]

GROUP 2: MANUAL STOP

B1
Charge stopped manually, during a generic cooling state

C0
Charge stopped manually, before to reach the gassing voltage. [<ph1]

C1
Charge stopped manually, during the finishing charge. [<ph3]

C2
Charge stopped manually, during eq. [<ph4]

C3
Charge stopped manually, during refresh. [<ph5]

C4
Charge stopped manually, during desulphation.

C5
Charge stopped manually, during Watering procedure

GROUP 3: BATTERY DISCONNECTED

D0
The battery has been disconnected before the begin of the charge, while the charger was waiting for the programmed Start Time window.

D1
The battery has been disconnected during the first part of the charge, before to reach the gassing voltage. [<ph1]

D2
Successful Opportunity charging cycle. [ph1+ph2]
The battery reached the gassing point, the charger entered in stand-by mode waiting for the Full Charge/Overcharge time window, and there, the battery has been disconnected.

D3
The battery has been disconnected during the finishing charge. [ph1+ph2] + [<ph3]

D4
Successful charging cycle to reach the gassing point. [ph1]
The battery reached the gassing point, and later the battery has been disconnected.

D6
Charge never started.
The battery has been disconnected while the charger was communicating with the Battery Identification Module

D7
Charge never started.
The battery has been disconnected while the charger was programming with the Battery Identification Module

D8
Desulphation cycle NOT completed.
The battery has been disconnected, at the beginning of the Desulphation cycle

D9
Desulphation cycle NOT completed.
The battery has been disconnected, before to complete the programming of the Desulphation cycle.

E0
Desulphation cycle NOT completed.
The battery has been disconnected while the Desulphation cycle was in progress.

E1
Battery disconnected during the preparation of the cycle. Charge never started.

E5
Battery disconnected in charge during battery module TX.

GROUP 4: EMERGENCY STOP

G0
Emergency Stop!
Maximum voltage limit exceeded during first part of the charge, before reaching the gassing voltage. [<ph1]

G1
Emergency Stop!
Maximum voltage exceeded during the finishing charge. [ph1+ph2] + [<ph3]

G2
Emergency Stop!
Maximum voltage exceeded during the equalize cycle. [ph1+ph2] + [ph3] + [<ph4]

G3
Emergency Stop!
Gassing voltage not reached within the predetermined time limit. [ph1]

G5
Charge never started.
Battery voltage was too HIGH

G6

Emergency Stop!
Maximum Current Limit Exceeded.

G7
Emergency Stop!
Maximum voltage exceeded during the refresh cycle. [<ph5]

G8
Emergency Stop!
Maximum temperature exceeded before to reach the gassing voltage. [<ph1]

G9
Emergency Stop!
Maximum temperature exceeded during the finishing charge. [ph1+ph2] + [<ph3]

H0
Emergency Stop!
Maximum temperature exceeded during the equalize cycle. [ph1+ph2] + [ph3] + [<ph4]

H1
Emergency Stop!
Maximum temperature exceeded during the refresh cycle. [<ph5]

H2
Emergency Stop!
When a battery is connected, the battery module communicate that the voltage of battery is not compatible with this charger

H3
Emergency Stop!
The charger was not able to keep the battery at constant voltage. [ph1+ <ph2]

H4
Emergency Stop!
Battery temperature exceeded maximum programmed value during the constant voltage phase. [ph1+ <ph2]

H5
Emergency Stop!
Wrong/Unknown Battery.

H6
Emergency Stop!
Maximum temperature exceeded during desulphation.

H7
Emergency Stop!
Battery module Error

H8
Battery Low Voltage
Charge never started. Battery voltage was too LOW at the beginning

GROUP 5: WARNING MESSAGE

I0
Maximum finishing charge time (safety timer) exceeded.

I2
The battery has been disconnected while the charge was in progress, in a generic state.

I3
Critical Issue
- Input AC Fail
- Input fuses aux.transformer
- Output fuse blown.

I5
Communication problem with Battery Module.

I6
Battery temperature probe malfunction

J4
DC output cable reverse or miswiring
Battery module Error

J6
Automatic charging restart caused by detection of wrong voltage battery

J9
Black out of the AC input.

This termination code happened in 2 different cases:
a) The operator interrupt the charger with general interruptor 0-1, normally it is better interrupt the charger with button STOP. But we know that many operators use interruptor 0-1, this is not a problem.

b) external Black out.

Normally it is not a problem, but if we know that the battery was not well charged, this means that the operator unplugged the battery too early. or really there was a black out. (in this case also others chargers had the same termination code at the same time).

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