

Charging process

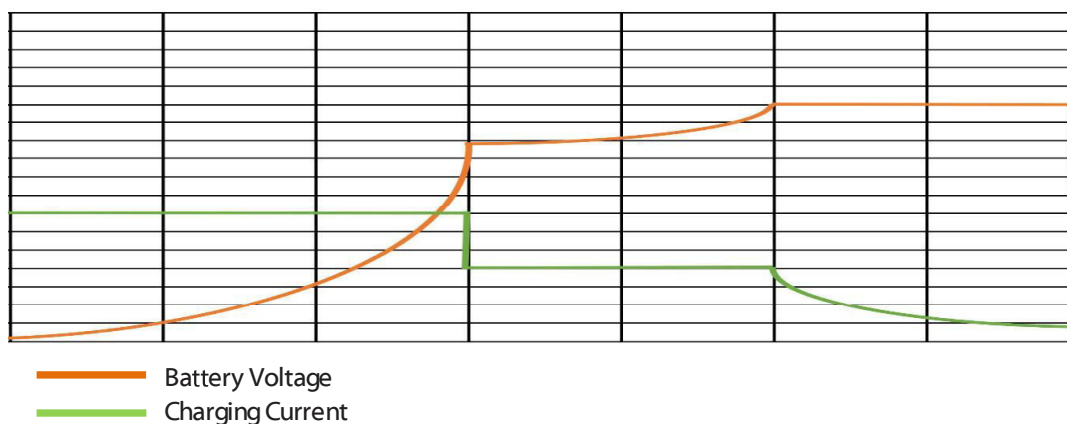
- Once the battery is connected to the charger, if the battery voltage is inside an allowed range, the charge will automatically begin
- The red light will start to glow to indicate the battery is connected and below 80%. Above 80% the yellow light will start to glow. Upon reaching 100% the green light will start to glow and it will be possible to de-attach the charger from the battery
- When the battery is fully charged, the charging process will be automatically interrupted
- In case of values outside the allowed range or in case the charge reaches the safety timer, the charge will automatically be interrupted
- In case of power failure during the charging phase, the charger will automatically resume the charge when the power failure is over

Charging curve

The standard charging curve installed inside the chargers of the WP Series is divided in different stages. In every stage, the charging current is subject to variations predetermined by the charging curve installed based on the typology of the battery (Lead Acid, AGM, GEL, Lithium, etc etc).

The charging curve stages are:

- S1 – The current rises slowly (soft start) upon reaching the maximum nominal current
- S2 – The maximum nominal current is kept until the predetermined voltage of the battery type (for example 2,4V/C ell for lead acid batteries) is reached
- S3 – Upon reaching the predetermined soil, the current drops to 2/3 of the maximum nominal current until reaching the second predetermined voltage (for example 2,55 V/C ell for lead acid batteries)
- S4 – Upon reaching the second threshold, the current drops to 1/3 of the maximum nominal current until the final charging current is reached (for example 2,68 V/C ell for lead acid batteries)
- S5– The charger keeps the voltage constant and variates the current until the charge is completed



Final charging voltages

Battery Type	Final charging voltage
WET	2,4 V/Cell
GEL	2,35 V /Cell
AGM	2,38 V/Cell

TECHNICAL DATA SHEET

AQHF WP-series

LED colors

<u>LED Color</u>	<u>Description</u>	
Green/Red alternate flash	Battery not connected	Battery Charging Status
Red flash	Battery from 0% to 80%	
Yellow Flash	Battery from 80% to 100 %	
Green flash	Battery at 100%	

Red/ Green/ Red	Over voltage / Over current	Anomalies and faults
Red/ Green/ Red/ Green	Environment temperature too high or too low	
Green/ Red	Charger overheating	
Red/ Green	Output under voltage	
Red/ Green/ Red/ Green/ Red	Input AC anomaly	

Troubleshooting

LED Color	Description	Solutions
Green/Red alternate flash	Battery not connected	Check if the connection between battery and charger is loose, if there is reverse polarity or if the battery voltage too low
Red/ Green/ Red	Over voltage / Over current	If this error occurs often, return to factory for repair/inspection
Red/ Green/ Red/ Green	Environment temperature too high or too low	Check the environment temperature and make sure the ventilation is good. Also check the temperature sensor location.
Green/ Red	Charger overheating	Check if the environment temperature is too high and if ventilation is good
Red/ Green	Output under voltage	Return to factory for repair/inspection
Red/ Green/ Red/ Green/ Red	Input AC anomaly	Check the input voltage to match the charger specifics and plug connection



**CAREFULLY READ THE FOLLOWING INSTRUCTIONS BEFORE CONNECTING THE DEVICE TO THE MAINS VOLTAGE AND/OR TO THE BATTERY.
ALSO MAKE SURE THAT THE SIZE OF THE DEVICE IS ADEQUATE TO THE BATTERY CONNECTED TO IT.**

Carefully read these instructions to use the device at its best and avoid potential problems in future.

We strongly advise to carefully follow all information and advice mentioned to guarantee a safe use of the device

The correct utilization of the device will increase its working life and maximize efficiency.

In case of suggestions, advices or error noticed in this manual, your notifications will be very much appreciated to improve the quality of our service.

Preparation

- Make sure that the power supply connector and charging connector are installed. If not, contact a technician to install the connectors properly dimensioned for the device and for the mains voltage network
- Make sure that the mains voltage plug where the device is connected is properly grounded and protected by adequate safety devices
- Make sure that the size of the device is adequate for the battery connected to it (check attached label)
- Make sure that the device is located in an adequate location for a proper use
- Avoid the placing of the device in areas with sparks and/or flames because the battery generates explosives gases during the charge
- Make sure that the battery cells are in good condition and verify the presence of short circuits
- Make sure that there are no objects on top of the battery cells before starting the charging cycle

Network and battery connection

- Before connecting the charger to the mains voltage, make sure that the voltage of the network is adequate for the device:
 - o Input 220Vac $\pm 15\%$ or 110Vac $\pm 15\%$
 - o 50 / 60 Hz
- Connect the charger to the battery pack before connecting the charger to the AC outlet
- Make sure that the AC plug is firmly connected to the AC outlet
- It is suggested to use the proper bi-polar connectors without the possibility of reverse polarity on the battery. Verify also the correct connection of the cables in the connector's contacts