

HFYD

HFXD

HFZD

User Manual

Manuale d'uso e manutenzione

Manuel d'utilisation et d'entretien

Manual de uso y mantenimiento

Gebrauchs- und Wartungsanleitung

1. WARNINGS - SAFETY



- **Battery charger is designed to recharge both conventional flooded lead acid batteries (PzS) and sealed batteries (PzV, Gel, AGM).**
- **WARNING: battery charger is pre-set for a specific battery type. Do not use a charger set for flooded lead acid batteries to recharge sealed batteries and vice versa.**

In order to reduce risks of explosion of the battery, please follow these instructions and those reported on the battery.



- **Study all battery manufacturer's specific precautions.**
- **Before charging the battery read carefully the instruction**
- **Keep the documents in a clean and dry place for future consultations**
- **Perform periodic routine and extraordinary maintenance**
- **In case of failure: identify the reason, act accordingly and use only original spare parts.**
- **Working in proximity of a lead acid battery is dangerous. batteries generate explosive gases during normal operation. it is therefore of utmost importance that each time, before using the charger, you read and follow the instructions provided.**
- **Explosive gases! avoid flames and sparks and provide proper ventilation of rooms.**
- **The battery charger is a device that can cause electric shock. it must be used only by personnel trained on electrical hazards.**



1.1 Safety and Reference Rules

The battery charger is made in accordance with the following rules: Low voltage (2014/35/EU) and Electromagnetic compatibility (2014/30/EU). Electrical safety rules applied are EN60335-1 and in particular 60335-2-29. The charger is manufactured under ISO9001 norms.

1.2 Electrical information



Read the electric data on the charger identification plate and check they are in conformity with your electric system and the battery it should recharge. Here below you can find a typical ID label (serial number sticker) of a charger.



If the charger electric data were not in accordance with your electric system or your battery, you must NOT connect the charger. In case of malfunctions or failures, turn off the charger and do not try to arrange any repairing. Please call our technical department or closest service centre. Be as precise as possible in describing the problem occurred and always report the serial number of the charger. Any reparation or replacement of parts must be authorised in writing by our technical office.

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CHARGERS

CE EAC
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READ THE INSTRUCTIONS BEFORE USE

Type HFYD 12-24/ 20 - G1	P00	Vout 24 V	Iout 20 A
Sn 260381 HFY 920		Vac 230 V	Iac 4,49 A
Vs. Cod.	Power 1033	VA 50-60	Hz

260381 HFY 920

Type: HFYD model and nominal values: voltage **12-24 V** and current **20 A**, followed by colour **G1** (grey) and charging profile **P00**

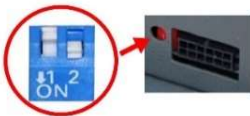
SN: unique charger identification serial number

DC output: nominal voltage of the battery (Vout 24V) and current supplied at nominal voltage (Iout 20A)

AC input: it shows nominal AC mains voltage (**Vac 230V**), current draw (**4,49A**), power (**1033VA**) and related operating frequency (**50-60Hz**)

Charging profiles: P00 refers to a specific couple of charging profiles selectable **with DIP switches (see figure)***. For further details on the charge curve set on the charger, check the label above the communication port.

*=Only for HFX and HFY, absent in the HFZ model.



P00 indicates
 dipB upwards= curve 227 (gel)
 dipB downwards = curve 17 (Pb) (def = factory set signals),
 dipA upwards=12V
 dipA downwards=24V

P00 X-Y	A	B
0 ↑ 12V		227 Gel
1 ↓ 24V		17 Pb (def)

SW - S3B
FW - 3.31

The data circled in red indicates the software version required to perform the tuning/diagnosis of the computer.

DO NOT connect the charger to the computer without first checking the correct correspondence between the FW version set on the charger (and indicated on the label) and the software version to be installed on the computer.

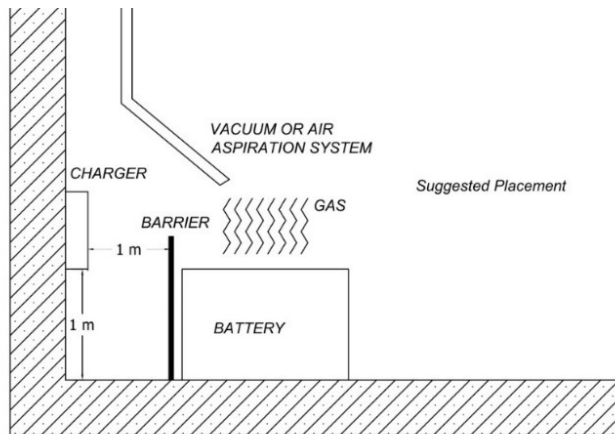
	FW= charger version	SW= software version to use
Correspondence 1	REV.3	Sw_3.13
Correspondence 2	3.31 (or more recent)	SW_S3B

2. INSTALLATION AND POWERING



Please, read carefully the chapter "**Warnings and safety**"

2.1 Choosing the place



- Put the battery charger in a suitable place to allow an adequate air circulation, far from any heat source.
- For indoor use. Provide adequate ventilation. Do not expose to rain. Refer to the drawing to the side for positioning.
- Install preferably in a horizontal position HFX and HFY models. Install the HFZ model vertically so that air enters from sides and flows downwards.
- The air vents must not be obstructed. Ensure that there is enough clearance around the charger to ensure proper air circulation. Do not place it near heat sources.
- Place the cabinet on a non-inflammable surface such as stone, concrete or metal.
- Chargers are electrical devices and must be well secured to prevent accidental drops.
- Make sure the charger switch-off command (OFF) is clearly visible and easily accessible.

2.2 Checking the electrical system line

- Make sure the electrical system line has been created in accordance with related electric standards in force.
- The electrical connections must be made by qualified personnel. We suggest to involve staff in a position to issue a "declaration of conformity" of the work performed. The declaration must include the efficiency of the connection to the ground, the control of the input electric plug rate and of system to which it is connected.
- The electrical safety is guaranteed only when the power plug is correctly connected to an efficient ground system.
- Check that the electrical system can withstand the power of the battery charger (VA) and the mains voltage and frequency are in agreement (Volt and Hz) with the charger nameplate data.
- Make sure the charger is protected with appropriate delayed fuses. In case, please refer to our tables.

2.3 Checking the charger and the battery

- Check that the input Vac cables and the output battery ones are intact and perfectly insulated. Do the same with both input and battery plugs.
WARNING: The installation or replacement of the battery and charger plugs must be performed by qualified personnel.
- Ensure good ground insulation of the battery and the power cables.
- Make sure the "polarity" of the battery cables respects those of the battery charger.
- Check that the battery is suited to the charger in terms of both voltage (V) and capacity (Ah).
- The battery must be ready to be charged, clean and with proper electrolyte level (PzS).

3. OPERATION

3.1 Charger powering and battery recharge

Procedure:

1. Connect the charger to the battery.
2. Connect the charger to the mains. Do not use extensions, spiral cables, reducers, etc. as they can cause damage to the charger.
3. Press the on/off button (HFX and HFZ models only).

NOTE: HFX and HFY turn on when connected to AC mains and battery (>5 sec.), while HFZ turns on only when connected to AC mains. In the latter case the LED will be solid red, which means "waiting for the battery connection".

3.2 Charging stop and battery disconnection

STANDARD PROCEDURE FOR WALL MOUNTED CHARGER:

1. Wait until charging is complete or the charger is in floating stage.
2. Disconnect the battery plug.

NOTE: If charging is complete or the charger is in floating stage, the charger can remain connected to the mains and the battery can be disconnected without risk of electric arcs.

Before connecting a new battery, wait 2-3 seconds for the charger to reset (the HFX and Y indicator light turns off while the HFZ indicator light turns flashing red and then steady red).

STOP PROCEDURE FOR WALL MOUNTED CHARGER DURING THE CHARGE (without risk of electric arcs)

1. Press the OFF button (HFX and HFZ models only).
2. Disconnect the AC mains.
3. Disconnect the battery plug.

WARNING: for on board chargers, it is sufficient to disconnect the mains socket.

4. VISUALISATION



FANS: the fans only work when the internal temperature of the charger reaches 40°C, so at the beginning of the charging process the fans do not spin.

1.Red	In rapid sequence		Start	AC mains is in ON position. The battery charger checks the correct functionality of the LED.
2.Yellow				
3.Green				
4.Red	Flashing (3 sec)			
Yellow	Steady light	20-80%	Charging	Stage 0 - the current starts to increase. Stage 1 - at max output current (90-100%).
	Flashing (slowly)	80-90%	Charging	Stage 2 - constant voltage and decreasing current.
	Flashing	90-99%	Charging	Stage 3 - low and constant current.
Green	Steady light	100%	Stop	Charging completed (absent if floating is active).
	Flashing	100%	Floating	Stage 4 - This stage is not active in all charging curves. Additional phase that provides a constant or intermittent voltage at the end of the charge.

Flashing (slowly) = one light every 4 seconds

Flashing = one light every second

5. TROUBLE SHOOTING



In case of failure or malfunction, stop the unit and do not attempt to make any repairs. Please contact our technical department or the closest technical service centre.

Be as precise as possible in describing the problem, indicating when and how the red LED lights up. Here is a list of information describing some typical examples.

LED	Possible Cause	Ref.	Description/remedies
--	Ac Mains is missing: charger is powered when both AC and DC are present.	1	Battery is not connected to the charger or it has a very low voltage level (7V).
		2	AC mains is not connected or ON-OFF switch is in OFF position (valid for HFX and HFZ).
		3	AC Fuse protecting diode bridge is burnt (see related table).
		4	The battery plug is damaged, a battery cable is interrupted or damaged. Alternatively, AC plug and related cable are damaged.
		5	Electronic board not powered or faulty.
Steady Red	Immediate - DC under voltage Battery is below the min threshold	6	Battery is connected to the charger but voltage is below min threshold (7-10V). It is necessary to raise voltage using external power supplies.
	Immediate - DC over voltage: Battery is above the max threshold	7	The connected battery has a higher nominal voltage than the charger.
	After 1 minute - wrong voltage or damaged battery	8	Dips managing voltage 12/24V is in the wrong position. Dip A pos.0 = 12V, Dip A pos.1 = 24V.
		9	The connected battery has a lower nominal voltage than the charger.
	During the charge Thermal or timer intervention	10	Dips managing voltage 12/24V is in the wrong position. Dip A pos.0 = 12V, Dip A pos.1 = 24V.
		11	Battery is too big in respect to charger output nominal current. Check battery status.
		12	If charger is too hot please check that correct ventilation is present and that air fences are not blocked. Check the fan is working correctly.
		13	AC Mains is too low.
Flashing Red	During the charge - low current level. Charger try to restart every minute	14	Possible false contact, AC or DC connection problem. Check battery plug or any related loose contacts. Check the socket, the switch, fuses and related cables.
		15	Battery is sulphated. Charger will restart every minute trying to restore the normal charge.

6. MAINTENANCE



The maintenance operations have to be made by specialised personnel, in compliance with safety rules. At our offices, you can find the "Routine and extraordinary maintenance forms".

WARNING: If you detect a problem and you cannot take immediate action to solve it, please make sure the charger is identified as not working and "NOT to be used".

6.1 Preliminary recommendations

- Please read carefully the section "WARNING AND SAFETY" at the beginning of this manual and 1.2 section referring to electrical information.
- Before performing maintenance or repairs make sure the power plug and the battery are both disconnected.

6.2 Routine Maintenance

Perform maintenance every 3 months or any time it is necessary.

- Clean carefully the AC and battery cables. Check they are not damaged or burnt. In this case, replace them immediately.
- Check the AC mains and battery plugs. If they are crushed or burnt or damaged, replace them immediately.
- Electrical equipment must not be exposed to dust and humidity. Clean the battery charger. Should it be too dirty or damp, put it in a safer place. The same is valid for the battery.

6.3 Extraordinary Maintenance

Perform maintenance every year or when a problem occurs (i.e. burning fuse) or you notice a fault.

- Follow the checklist of "Routine maintenance".
- Open the Battery Charger. Clean carefully the dust on each component: the printed circuits by a clean brush, on the other components by a blow of compressed air; stay at 20 cm (8 inch) at least.
- Check the screws and electrical connections are well tightened. The use of a thermal imaging camera is an excellent way to understand if there are loose connections or weak points where you must intervene. The charger should be on for at least 10 minutes before you make measurements.
- Check the fuses, the fuse holders and the moving mechanical parts (contactor).
- Request in advance replacement parts that are not available at your site.

7. WARRANTY

Duration	A.T.I.B. Elettronica guarantees these products for one year. Extended guarantee must be defined in advance.
Starting date	The delivery date from A.T.I.B. Elettronica is considered the starting date of the warranty.
Covering	<ul style="list-style-type: none"> • Defective components will be repaired or replaced free of charge. • Labour is free of charge nearby our factory. If carried out nearby at customer/users's site it will be on chargeable basis. • Delivery costs of replacement components are at consignee's expense.
Loss of right	Warranty is not valid in case of: <ul style="list-style-type: none"> • Instructions stated in this manual and on the charger front panel are not observed. • Improper use, violation or modification of the charger. • Charger being used out the permitted ranges specified. • Charger being used outside the defined parameters in accordance with product specifications. • The number of charging cycles exceeds 600 per year. • Evidence that both ordinary and extraordinary maintenance were not carried out on the charger.



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