NDS®

All the Energy you Need

Power Charger Pro

Professional Power Chargers

Operation Manual

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INTRODUCTION

This manual contains important operating and safety instructions, before starting to use the battery charger it is important to read and understand the safety instructions in this manual.

Safety notes

- Before each use please check the battery charger, the connection cable and the connector. If any malfunction is detected do not use it! It is strictly forbidden to open the device. Repairs may only be carried out by qualified technicians using original spare parts. A charger, a cable and / or a damaged connector increases the risk of fatal electric shocks.
- Do not place the charger on highly flammable surfaces or environments (ex .: paper, cloth etc ...). The overheating of the device during the charging phases can increase the risk of fire.
- During operation the device should be placed in a well-ventilated place.
- If the power supply cable is damaged it must be replaced by a qualified technician to eliminate the risk of accidents.

WARNING

- Never charge a cold or non-rechargeable battery!
- Keep the device out of the reach of children
- The device must be protected from sunlight or direct heat sources to prevent overheating.
- To reduce the risk of malfunctions do not block the ventilation bores.
- DO NOT install the unit in a sealed environment, otherwise it may overheat.
- To avoid the risk of electric shock and / or fire, make sure that the power supply system is in good condition.
- DO NOT use the charger with damaged cables and / or with inadequate section.
- DO NOT use the battery charger in an environment with high humidity or in direct contact with splashes of water and / or other liquid or in the rain.

FEATURES

The photos of the product in this manual are only for reference with the purpose of explanation; the product you have purchased may be different.
This smart battery charger can be used to charge flooded, Gel and AGM batteries. 15Amp & 20Amp models are also suitable for LiFePO4 (lithium) batteries. Please read carefully the label on the product and verify that the default settings of the charging algorithm are appropriate for the type of battery to be charged.
Always keep this user manual near the charger for easy reference on essential safety, use and maintenance information.
The information in this manual may be subject to modifications without any prior notification.
NDS Energy reserves the right to make changes and improvements to the product at any time without notice and without obligation to relate these changes to previously distributed devices.

Smart battery charger (main features):

- High frequency and high-tech battery charger
- Universal Input 100 to 240VAC with a highly advanced PFC
- Charging curves entirely controlled by micro controller
- Designed to have high efficiency in all operating conditions
- Thermal protection against overheating
- Operating status indicated by 3 LED (Green - Yellow - Red)

OPTIONAL

- LEDs extension for a remote indication
- Soft start and automatic reset of the charging curve when a new battery is connected.
- Ability to change the charging curves by DIP-SWITCHES
- Ability to change the charging current by DIP-SWITCHES
- Equipped with a Normally Open (NO) relay for main line presence warning.

NOTES

All options can be added and are available on the charger only upon request.
Check the label of the product to verify the features and options in your device.

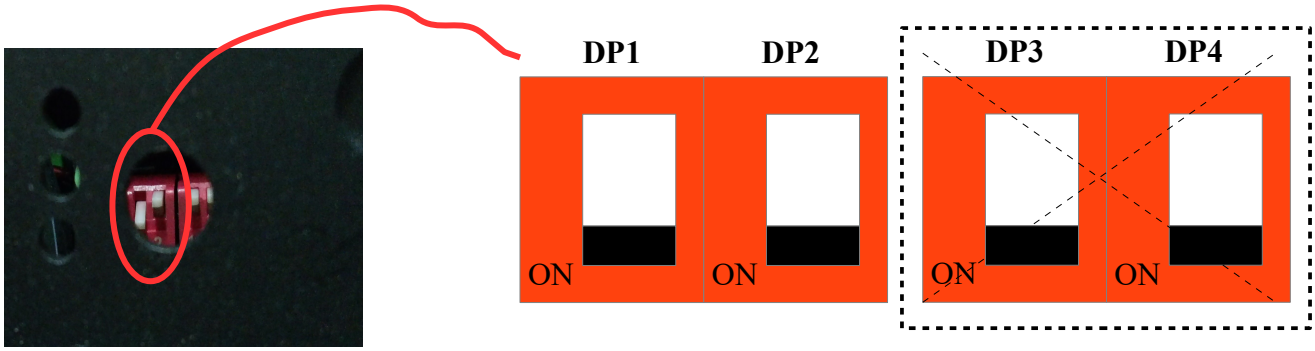
All NDS smart Battery Chargers have the PFC circuit with universal input.

CHARGING CURVE SELECTION

Before installing and using the charger, please set the most suitable charging curve for the type of battery to be charged. The charger is equipped with DIP-SWITCHES to select various charging curves, as shown in the following table:

DP1	DP2	PHASES	DESCRIPTION
OFF	OFF	**IUIa - AGM**	For AGM batteries
OFF	**ON**	**IUIa - Acd**	For Lead Acid Flooded traction batteries
ON	OFF	**IUUa**	Generic curve for GEL and AGM batteries (Default setting)
ON	**ON**	**IU - LiFePO4**	For LiFePO4 lithium battery
ON	***ON***	***IUIa - GEL***	*For GEL batteries and all Lead Acid Flooded (Only for model 12V - 10A)*

The DIP-SWITCHES are behind a black plastic cover on the front panel of the device, so in one of the two shorter sides.
In some models, there are 4 DIP-SWITCHES but only the two switches on the left are used



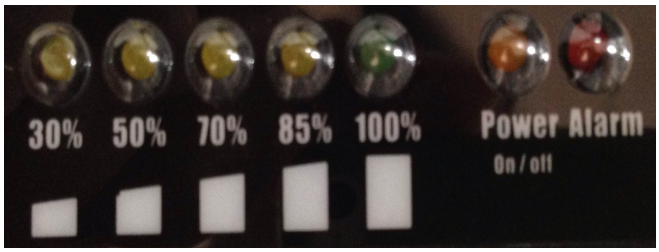
FUNCTIONING

After setting the DIP-SWITCHES of the charger, by connecting it to the battery and to the mains, the device signals the operating status with LEDs of different colors. According to the model there are 3 or 5 LED indicators, as shown in the following pictures:
The LEDs on the charger have the following meanings:

Battery charger with 3 LEDs

LED status	Indication
Constant or flashing **RED**	Battery with inverted poles or too high voltage
Constant **YELLOW**	On charge
Flashing **YELLOW**	Battery disconnected or too low voltage
Constant **GREEN**	Battery charged

Battery charger with 5 LEDs



LED status	Indication
Flashing **RED**	Battery with too high voltage
Constant **RED**	Battery with inveted poles
Constant **ORANGE**	Battery disconnected
Flashing **ORANGE**	Self-diagnosis of the charger failed
Constant **ORANGE + YELLOW**	On charge
Constant **YELLOW**	Capacity of the battery on charge
Constant **GREEN**	Battery charged

Some devices have two pairs of output cables that may also have the same color but of different section: **The pair of cables of larger section is the power output of the charger, which must be connected to the battery, while the other pair consists of a dry contact of a NORMALLY OPEN relay**. Connecting one cable to the battery voltage, the Normally Open contact, can be used to turn on a 12V lamp (or LED) when the main line is connected.

If the pair of cables with the larger section is BROWN-BLUE color, the POSITIVE is the BROWN cable.

The cooling fan/fans are electronically controlled by the microcontroller which decides the power and speed according to the conditions of the internal and environment temperatures.

PF12CH25S – 12V 25A

Description	Technical Features
Input voltage	100VAC – 240VAC ±10% Universal
Frequency	50Hz - 60Hz
Output - Boost Charge	14,4V (2,4V/Cell)
Output - Float Charge	13,5V – 13,9V (2,27V/Cell)
Output current	25A ±0,5A
Short-circuit protection	Auto reset at the end of short-circuit condition
Reverse polarity protection	Auto reset at the end of reverse polarity condition
Additional protections	Safe connection without sparking on output and input Thermal protection against over temperature
Dimensions	L223.2 x W128 x H56.5 mm
Weight	2,12kg (cables excluded)

PF12CH12S – 12V 15A

Description	Technical Features
Input voltage	100VAC – 240VAC ±10% Universal
Frequency	50Hz - 60Hz
Output - Boost Charge	14,4V (2,4V/Cell)
Output - Float Charge	13,5V – 13,9V (2,27V/Cell)
Output current	15A ±0,5A
Short-circuit protection	Auto reset at the end of short-circuit condition
Reverse polarity protection	Auto reset at the end of reverse polarity condition
Additional protections	Safe connection without sparking on output and input Thermal protection against over temperature
Dimensions	L223.2 x W128 x H56.5 mm
Weight	2,12kg (cables excluded)

SYMBOLS

	Warning, handle this device very carefully
	Read carefully and follow the instructions for use, maintenance and safety before using the battery charger. A use other than that indicated in the manual or not following these instructions may result in electric shock, fire and / or serious injury.
	Device for use in enclosed spaces protected from rain and splashes of water and liquids in general. The introduction of liquids into the battery charger may result in electric shock.
	The battery charger contains dangerous substances for the environment, so it is not allowed the free product disposal, but it is necessary to use the appropriate collection centers organized by the local municipalities or contact the manufacturer directly. Respecting this rule protects the environment.
	Do not use the device in flammable environments where a spark could cause a fire or the spreading of flames.
	Do not open the device, electric shock hazard
	CE marking certifying the conformity of the device
	Conformity marking obteined by TUV SUD
	ETL Conformity obtained for the standards UL1012, UL1564 e CSA C22.2 e NO.107.

WARRANTY

The manufacturer guarantees the proper functioning of the Power Charger Pro and undertakes to make the free replacement of parts that deteriorate for construction defects within 24 months from the date of purchase, as evidenced by the validation card (to be filled in all its part and send back to the manufacturer). The defects resulting from improper installation, use, tampering or negligence shall not be covered by warranty.
Furthermore, we assume no liability for any direct or indirect damages. The Power Charger Pro returned, even if under warranty, will have to be shipped "Freight paid" and shall be returned on as "Freight collect".
The certificate of warranty shall be valid only if accompanied by a official receipt or delivery document.

Mod.....**Serial n.**.....

Purchase date .....

Stamp and signature of the reseller