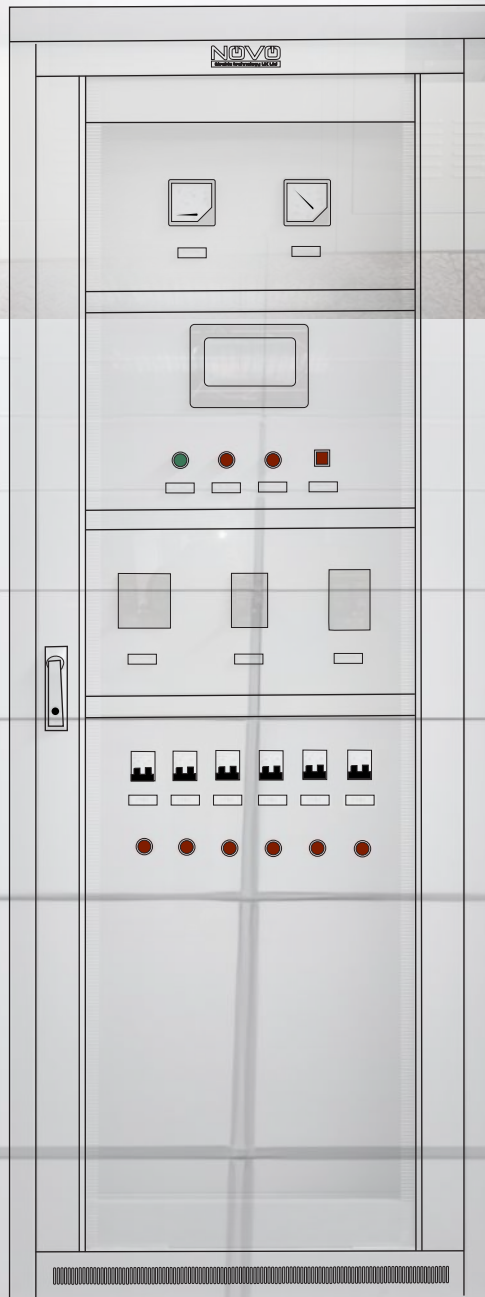# NOVO
Electric technology UK Ltd

110V 150A BATTERYCHARGER UNIT

NJR - 3P

Preface

Thank you very much for choosing our company's products.

This manual includes operation instructions and precautions for the use of DC power supply.

Incorrect use may cause damage to equipment and lead to unpredictable accidents.

Before using this equipment, please read this manual carefully and use the equipment correctly.

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Content

1. General

This DC Power Supply is a charging device specifically designed for nickel cadmium battery bank, The device uses the programmable controller (PLC) as the main control unit, 7 inch LCD touch screen as man-machine interface, charging current and voltage, the digital time can be set; real-time recording of the charging voltage and the charging current curve. The main circuit adopts single-phase full bridge control circuit, trigger circuit with programmable integrated circuit, pulse width and phase shift from all digital modulation, and trigger part does not need any adjustment, but also has the advantages of high reliability, high pulse symmetry, strong anti-interference ability, fast response etc.. The whole set of device is easy to operate, reliable, complete protection, high degree of automation.

1.1 Rated parameters

1, Input voltage: 3AC380V AC + 10% +1N
2, Output voltage range : 99-150VDC

Float charging: 138V(DC20-160V adjustable)

Battery charging Current 65A DC

DC outputvoltage:DC110V

3, Output current: DC 0~ 150 A

4, Voltage accuracy: less than 1% (In the case of with battery)

5, Noise: less than 60dB (before and after the closure of the door 1 meters)

6, Cooling mode: self cooling + air

7, Working mode: automatic operation and manual charging

8, Dimension: high 2260mm * width 800mm * Deep 600mm

9, IEC standers 60146
8, Protection class IP 21
9, Include protection, control and annunciator

1.2 Conditions of use

1, Altitude is not higher than 2000m.
2, The ambient temperature is not less than 0 ℃ , not higher than +50℃.
3, The maximum relative humidity of the air is not more than 90% (equivalent to an air temperature of 20 + 5 ℃)
4, The operation place no conductive and explosive dust, no corrosion of metal and damage the insulation of gas or steam, no strong electromagnetic interference.
5, A better place for air circulation.
6, No severe vibration and impact, the vertical inclination of not more than 5 degrees.

2 Working principle

The main circuit of the device adopts single phase thyristor full bridge rectifier circuit, and the digital trigger circuit is adopted. After the 380V AC is changed to DC power and the control center sends out

the command to charge the battery bank.

The SCR trigger circuit in digital circuit based on the output voltage and current feedback signal to the isolation amplifier and the given signal after comparing the error signal for analog-to-digital conversion into digital signal input to the logic processing unit and other control signal to logic control, timely calculate the final trigger pulse, so as to ensure the accuracy and reliability. Because the industrial control computer (PLC) is used as the control center, the user can use the touch screen man-machine interface to indicate the device to easily complete the charging task of the battery bank.

3 Install

3.1 install

When the charger arrive installation site, open the case carefully. Attention not to damage the device and the screen surface, with special attention to the glass material. Check the packing list, check whether the accessories are complete. Check whether the device is loose, **with special attention to the fastening screws of the live part.**

The device should be placed in a cool, dry and ventilated place and has sufficient room for maintenance, and at the same time should be far away from the heat source and easy to produce sparks.

3.2 Connection

After installation, open the front and back door to inspection equipment internal wiring and fasteners whether loose and fall off, if there is, please tighten or connect up.

Before and the battery connection should check the battery's total voltage and positive, negative polarity, to ensure the correctness of the battery connection.

Open the back door, and connect the AC input wiring and DC output wiring to the corresponding positions according to the marks. Don't reverse connection or wrong connection, otherwise it will not be able to start normally.

4 Operation instructions

The device is operated by programmable logic controller (PLC) to control, through the corresponding touch panel to achieve the parameters of the setting and state information display. Provides two working modes: automatic operation and manual charging; manual charging mode of general application was first used in battery, battery maintenance and recovery capacity, this mode is the main charging voltage is high (up to 160V), **so the work in this mode must ensure that all user load in the off state**.The automatic operation mode is that the charger connects the battery bank to provide the stable 110V DC power supply for users, in this mode the user can connect with the electric load, the charger automatically equalize charge and float charge the battery bank.

4.1 Power up operation

Open the front door, close the corresponding AC input switch and battery bank switch, as shown in figure 1. In this picture, click on the lower right corner of the language switch button to select the operating language of the system: English and chinese. By clicking on the mode selection button to select the operating mode (must be carried out in the charger stop state.)
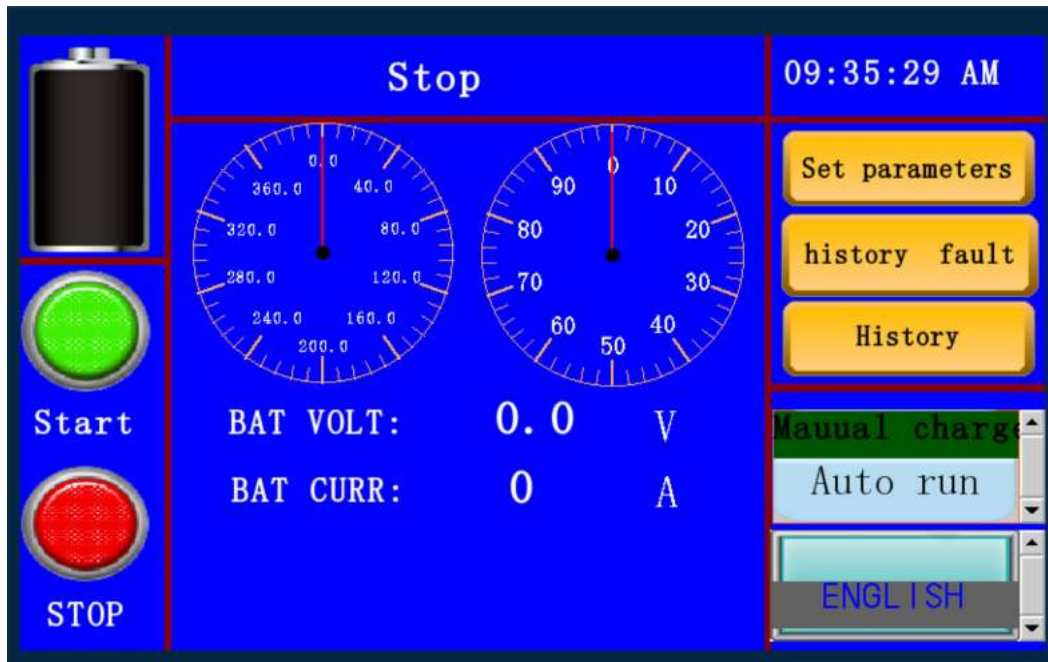
Chart1   Operation interface

4.2 Parameter setting

he working parameters must be set in order to enter the running state. Under the charging interface (Figure 1), touch the "Parameter Setting" button to enter the display interface 2 for setting and modifying various working parameters of the system. In this interface, you can set parameters such as charging current, average charging voltage, float charging voltage, manual charging voltage, charging time, float charging to average charging current, charging overcurrent, overvoltage alarm value, undervoltage alarm value, local address, and baud rate; Calibrate the clock.

Chart 2 Parameter setting

Note: the key parameters of the set requires the user to confirm, click "yes" ; the system keyboard and the function of the above key is shown below:
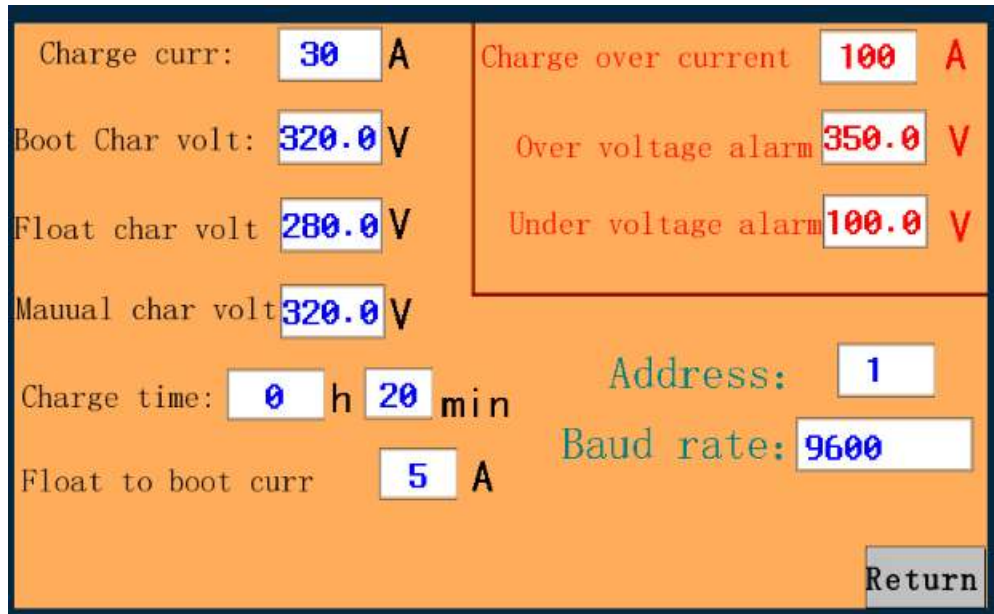

Chart 3 System keyboard

4.3 Manual charging

Battery bank is used for first time, battery maintenance and capacity recovery is using manual charging mode. In this mode, make sure all electricity loads are off before starting. Set the manual charging voltage (provide by battery manufacturer), charging time (6~8 hours) and the charging current value (0.2C5); manual charging mode; such as photo 4. Press the "start" button to manually start charging, In the whole charging process, first constant current charging, and then constant voltage charging. When the charging time is up, it convert to the floating charge, the battery is full, at this time, if want to turn into the automatic operation, first must stop, and then replace the operating mode.
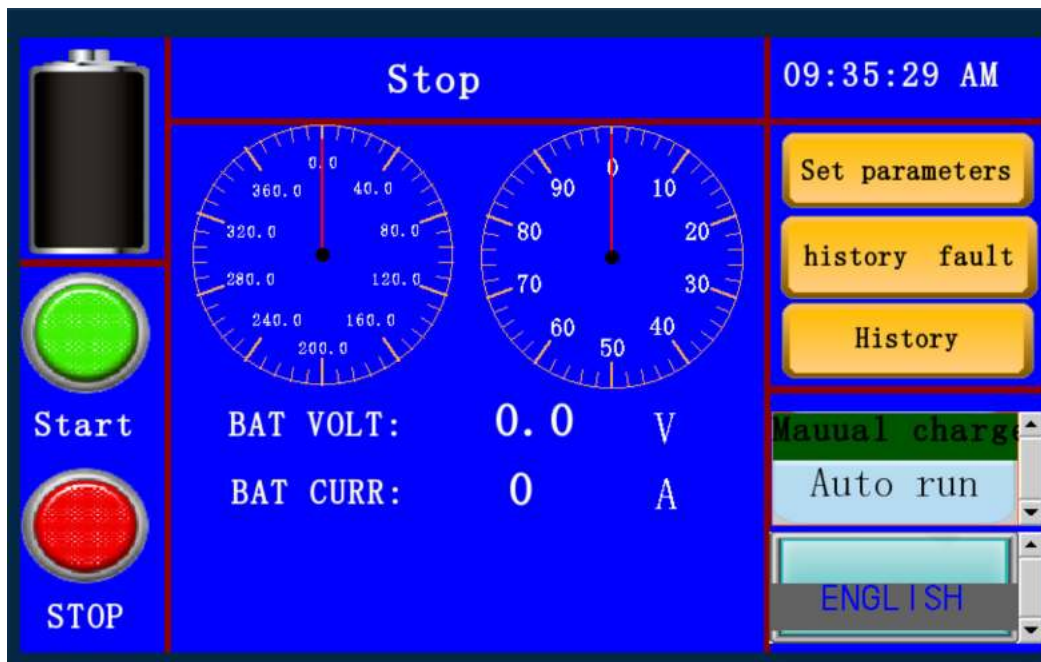

Chart4 Manual charging interface

4.4 Automatic operation

After the battery bank is fully charged, the automatic mode can be entered for a long time with load operation. Set the parameters after touching the "back" button, enter the charging interface (Figure 1), press the "start" to start charging, the charging process has two stage, equalize charging and and float

charging (the value of equalize charging voltage 156V and the value of the floating voltage138V, please refer to battery manufacturers data). First equalize charging (constant current limit voltage), when the equalize charging time is greater than the set value or the charging current is less than 1/10 of the set value, the battery is full charged, automatically transferred to the floating charge (constant voltage charging), long-term operation. If in the float charging operation, when the floating current is greater than the set value are automatically transferred to the equalize charging, to ensure the battery normal operation; When the AC power failure and then power on, the charger automatically equalize charging. The charger support power on self starting function (only in automatic mode). The capacity value displayed on the interface is the capacity value charged by the equalized charge, which is not recorded during floating charge. Charging time is equal charging time value, floating charging is not timed.

5 Fault

Fault Phenomenon	Fault Reason	Exclusion method
Touch screen communication failure	Loose communication line between touch screen and PLC	Insert the connecting wire tightly
Charger does not start	Input phase sequence incorrect	Swap input lines A and C with each other
AC power outage	AC input circuit breaker disconnected or no AC input	Closed AC input circuit breaker or input AC
Bus grounding		Excluding grounding points
Overvoltage	Insulation fault in busbar connection	Reduce the output voltage or increase the overvoltage alarm value
Undervoltage	The output voltage is higher than the set overvoltage value	Increase the output voltage or decrease the undervoltage alarm value

6 Calendar

The device has a clock function, because the internal with backup battery, so even in the case of the device is shut down, the clock to continue to run. Man machine interface can display year, month, day, and week. If the clock is wrong, the user can set calibration; specific methods: in the parameter setting interface of touch "calibration clock" to enter the interface 6 then touch "clock settings" button will pop up "clock" Settings dialog box as shown in figure:

Chart5   Clock setting

The operation method is the same as the parameter setting.

7 Charging curve

During the charging process in the charging interface touch "charging curve" view the entire charging process voltage and current trend diagram as shown below:

Chart6 Charging curve

The data is automatically stored in the disk after charging finished, to generate "CSV" file, it can be

open by excel to print and archive, etc. In the work process can also be in Figure 6 in the "save to U disk" button at any time for data storage and transmission. Voltage and current values are recorded for 5

8 Historical data

During the charging process, touch the "historical data" in the main menu of the system to view the whole charging process voltage and current value, record once every 5 minutes.

Chart7 Charging information

9 RS485 communication

Communication protocol (MODBUS)

Using RS485, character format 10 bits (1 start bit, 8 bit data bits, no parity bit, 1 stop bit).

1. remote measurement (functional code 03H) and remote control (function code 06H)

Write command:

address	Function code	START ADDR	Data length	CRCcheck
01	06H	0007	0008H	CRC 16

Read command:

address	Function code	START ADDR	Data length	CRCcheck
01	03H	0001	0008H	CRC 16

Data definition：(32 bytes)

MODBUS Address	Define	Type	data format	Remarks	state	Function code
00000	Charging voltage	Word	No signBIN	After the decimal point 1	read-only	03H
00001	Charging current	Word	No signBIN		read-only	03H
00002	A value of electric	Word	No signBIN		read-only	03H

	charge						
00003	All in charge	Word	No signBIN			read-only	03H
00004	System operating status	Word	No signBIN	0=Stop、1=Fault、2=、equalizing charge 3= floating charge		read-only	03H
00005	control	Word	No signBIN	"1" - start-up "0" -Stop		Just write	06H
00006	Spare	Word					
00007	Spare	Word					
00008	Spare	Word					

Note: BIT15=1 represents a negative number.

10 Matters needing attention

Touch screen provided by the touch sensitive operating elements, their operation is essentially the same as conventional ANJAN. Touch with your fingers or appropriate objects to touch the elements.

Do not use a hard tool to operate the touch panel, so as not to damage the touch screen.

Only one touch panel screen element can be touched at a time, otherwise it may cause involuntary action

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