

Product Description

SOLAR CONTROLLER

Model:HC-HM60A

Please connect the battery first, set the system voltage properly, and then connect the photovoltaic panel.

If the operation is not carried out in sequence, the battery will be damaged.

If lithium batteries are used, set the battery voltage first, and then set the corresponding battery type (for operation instructions, refer to page P8 -3.8/3.9).

FCC Warning Statement

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

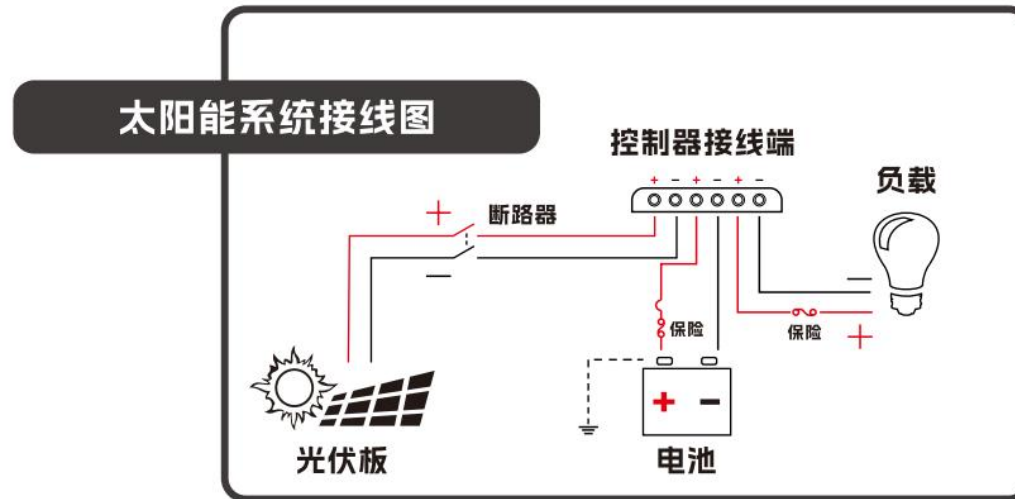
- - Reorient or relocate the receiving antenna.
- - Increase the separation between the equipment and receiver.
- - Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- - Consult the dealer or an experienced radio/TV technician for help.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation.

RF Exposure Statement

To maintain compliance with FCC's RF Exposure guidelines, This equipment should be installed and operated with minimum distance of 20cm the radiator your body. This device and its antenna(s) must not be co-located or operation in conjunction with any other antenna or transmitter.

1. System wiring instructions



Please follow the steps below to connect and install the cables



Step 1: Connect the battery

Step 2: Connect the load

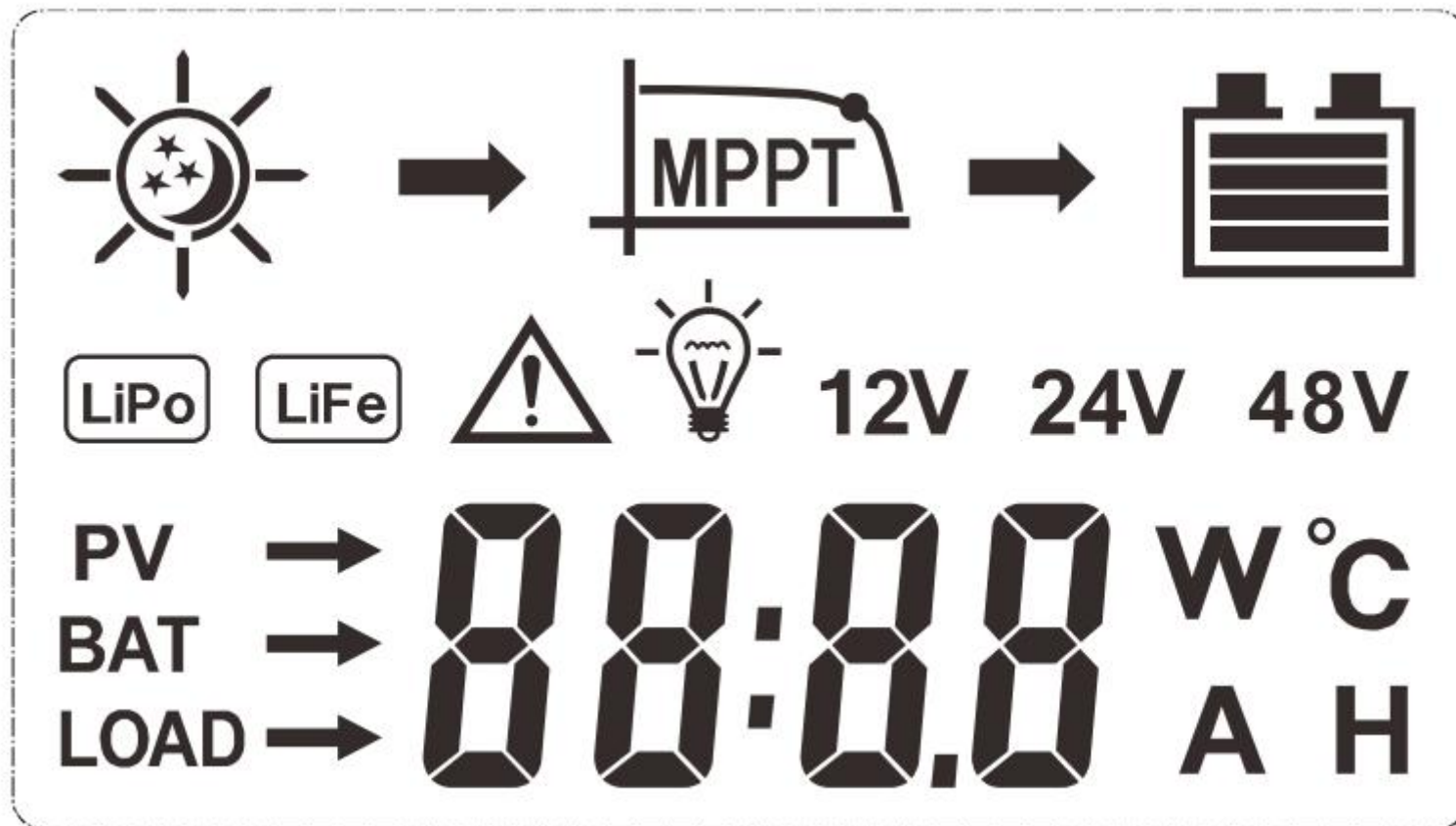
Step 3: Connect the photovoltaic panels

2. Precautions

- a. This series of MPPT is a commonly used positive pole controller. The positive poles of the photovoltaic array, battery and load can be grounded simultaneously.
- b. If there is an inverter or other starting current in the system, please connect the inverter directly to the battery and not to the load terminal of the controller.
- c. If lithium batteries are used, please set the system voltage first and then the battery type. (For details, see 3.8/3.9 on page 8)

3. Interface Description and operation

3.1 Display Screen



3.2 Meanings of ICONS

Type	ICON		State	
Photovoltaic array			Day	Night
			Charge	
Battery			Uncharged/Battery capacity	
			Type of battery	
Load			Load on	Load off

3.3 Meanings of Keys

Key definition

Key symbol

Function of the key

MENU



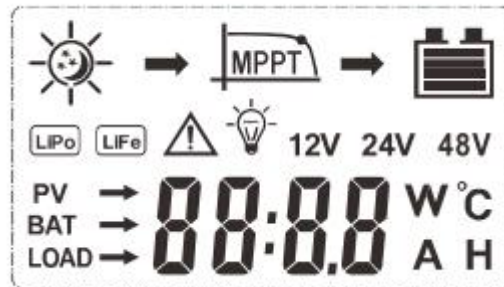
Press briefly to turn down the page or increase the value. Press and hold for 3 seconds to enter the next interface. Press and hold again to save the data

SET



Press briefly to turn up the page or reduce the value. Press long for 3 seconds to exit without saving. In the temperature interface, press long to set the initialization parameters

3.4 System startup

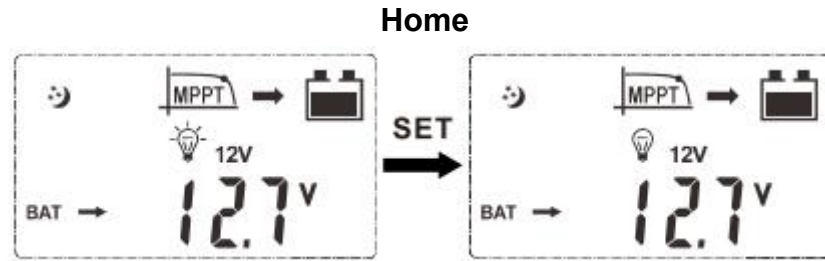


Boot screen

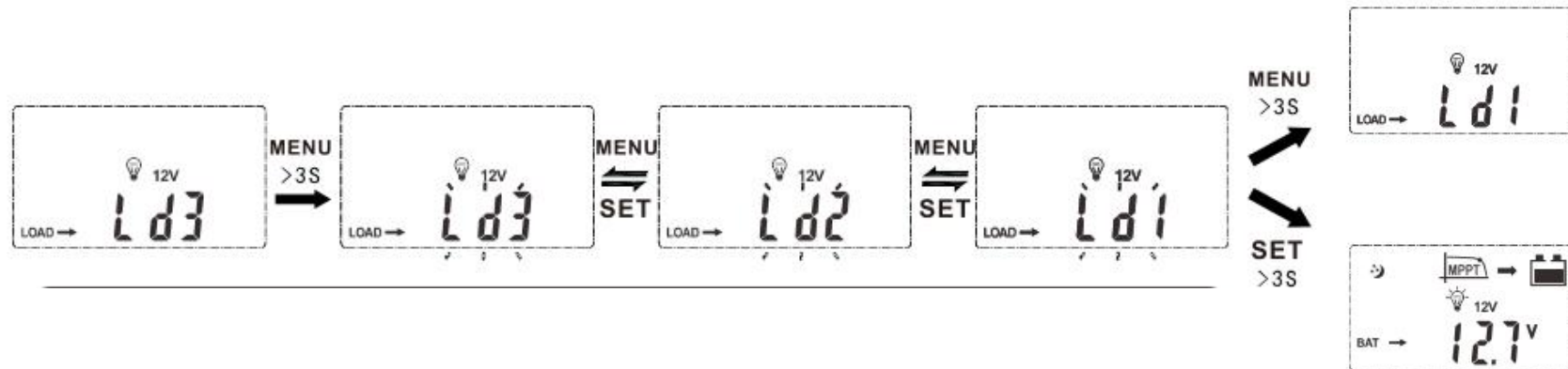
System voltage

Long press the "MENU" key on the main interface to enter the next level of interface. In the setting state, if no operation is performed, it will automatically return to the main interface after 15 seconds.

3.5 Load Turn-off Operation and Settings

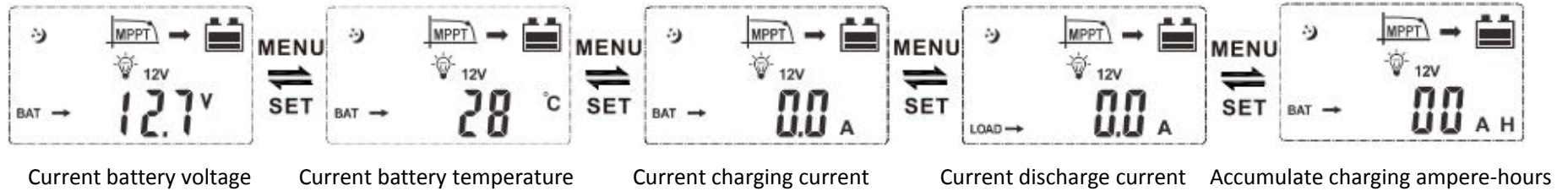


3.5.1 Press the "SET" key briefly to switch on and off the load.

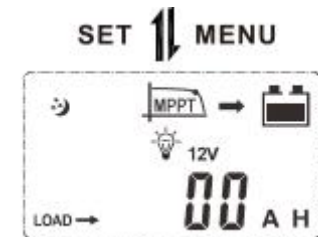


3.5.2 On the home page, long press "MENU" for 3 seconds to enter the Settings. Press "MUNE" to switch to the load mode interface (Ld1). Long press "MENU" again to enter the Settings. Tap "MENU" and "SET" to switch modes. After confirming, long press "MENU" to save and exit. In any Settings interface, long press "SET" to not save and exit.

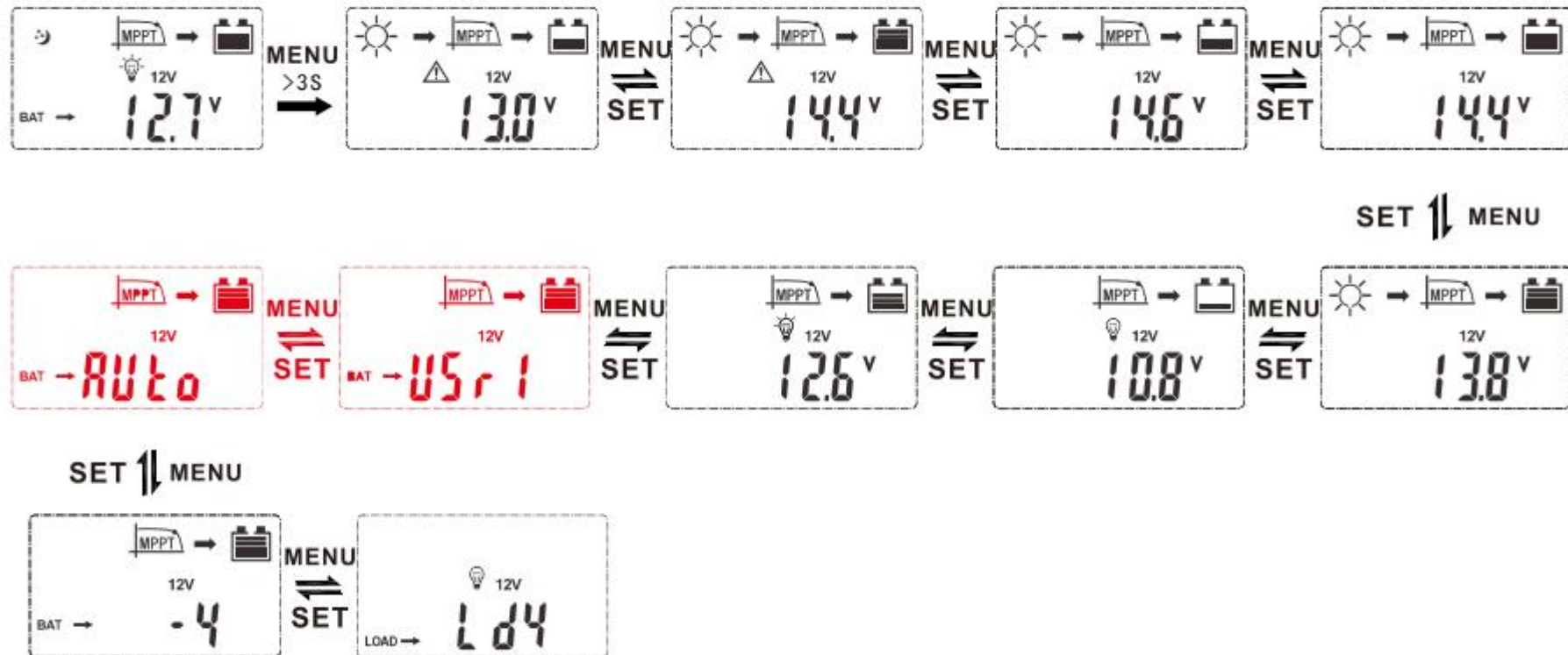
3.6 Main interface loop switching



After connecting the battery, the LCD screen enters the main interface. Press "MENU" or "SET" briefly to loop and switch between the main pages.

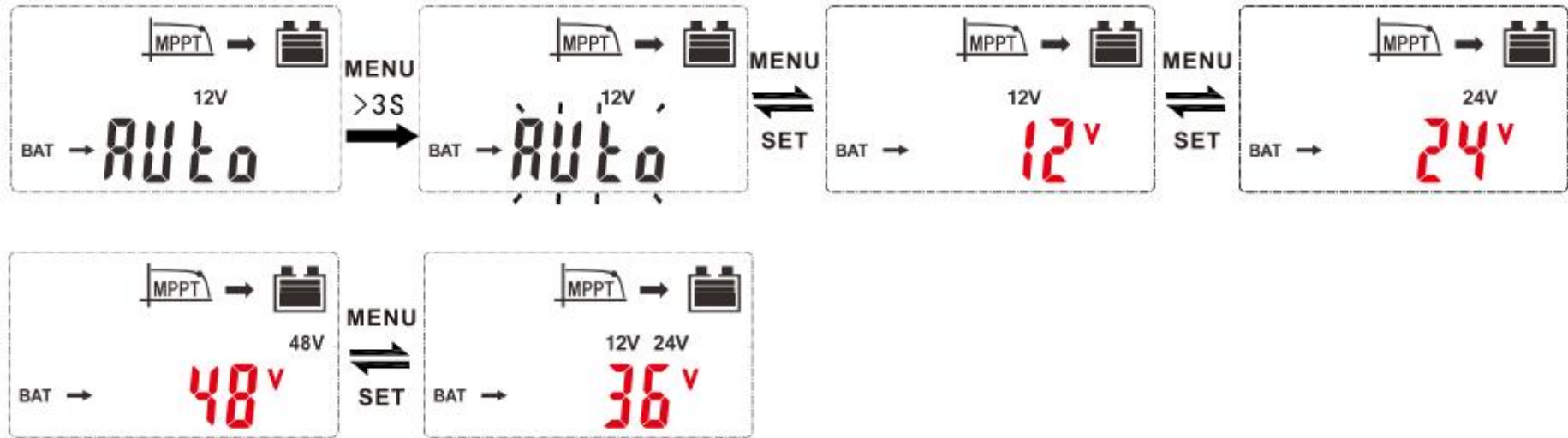


3.7 Settings Interface



On the main interface, long press "MENU" for 3 seconds to enter the Settings page. Tap "MENU" or "SET" to switch and select the corresponding interface between Settings pages. Long press "MENU" again to enter the next level of Settings interface.

3.8 System Voltage Settings



On the home page, long press "MENU" to enter the Settings page, switch to the system voltage page, and long press "MENU" for 3 seconds until "auto" starts to flash. Then press "MENU" or "SET" to adjust the system voltage to 12V, 24V, 36V or 48V, and long press "MENU" again to save and exit.

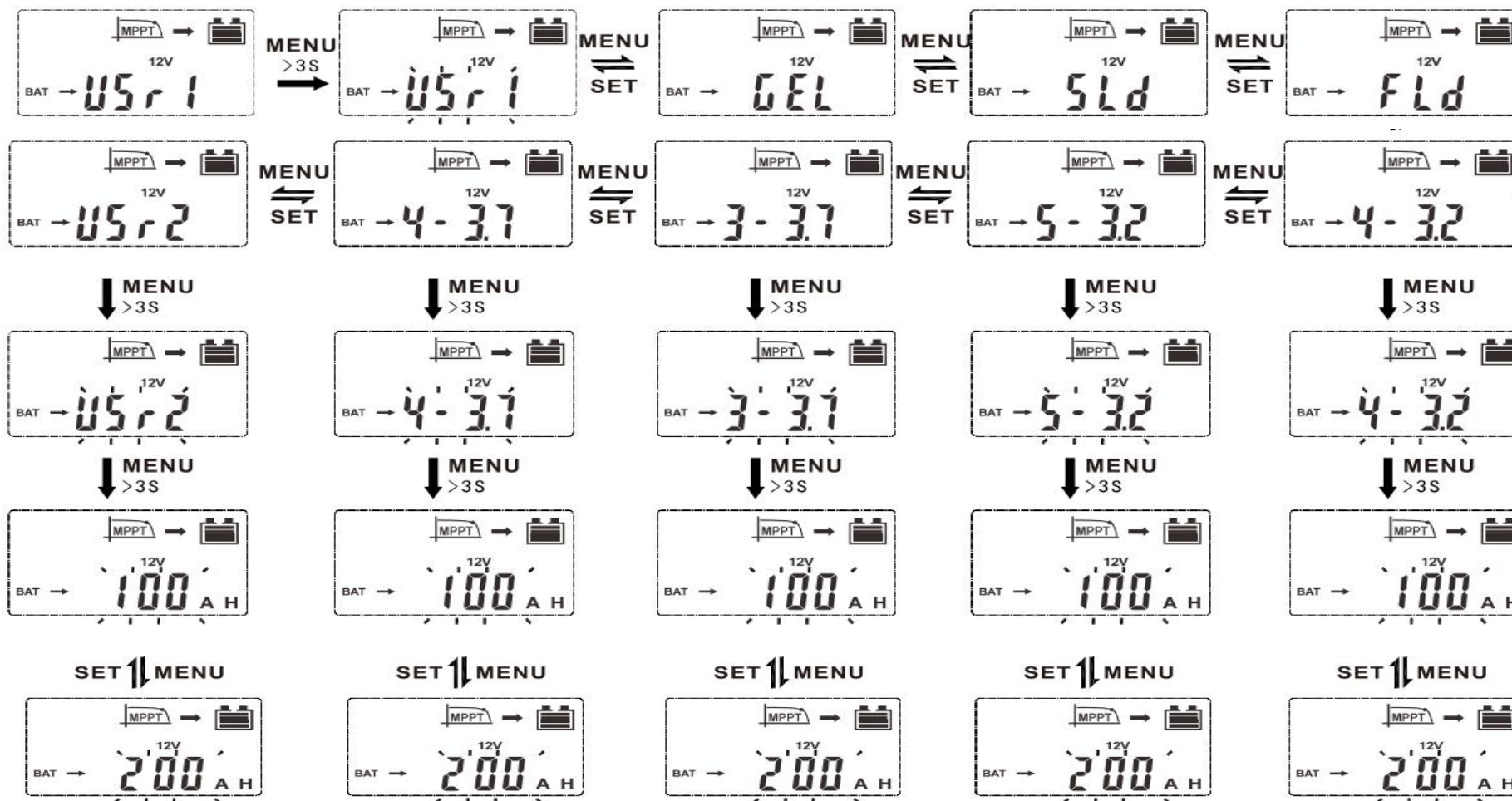
※36V cannot be automatically recognized and must be set to a fixed system voltage.

3.9 Battery Type Settings

On the main interface, long press "MENU" for 3 seconds to enter the Settings page, and tap "MENU" to switch to the battery type page (Usr1). Press and hold "MENU" for 3 seconds to enter the Settings. "Usr1" will flash. Tap "MENU" or "SET" to switch between gel batteries, sealed batteries, rich liquid batteries and lithium batteries. Select and long press "MENU" to save.

After selecting each type of lithium battery, you also need to SET the capacity of that battery. Tap "MENU" or "SET" to adjust the current capacity of the lithium battery in use. After the Settings are completed, long press "MENU" to save.

The battery type is displayed for graphic comparison



3.10 Load Working Mode Settings and Instructions

The default load working mode is 24 hours, and there are 4 load working modes to choose from:

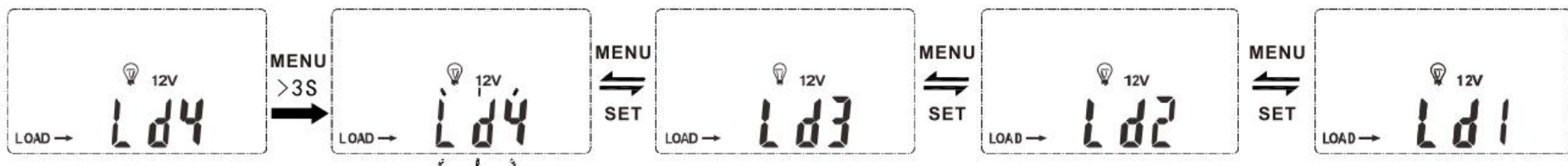
Ld1 (LD1)
Ld2 (LD2)
Ld3 (LD3)
Ld4 (LD4)

LD1: Operates throughout the day and can be manually turned on or off

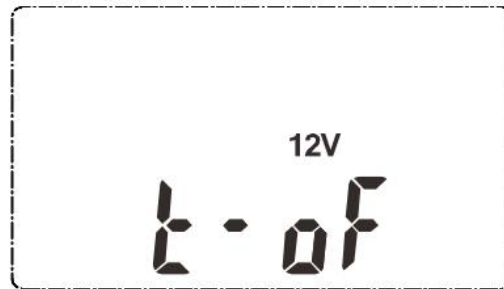
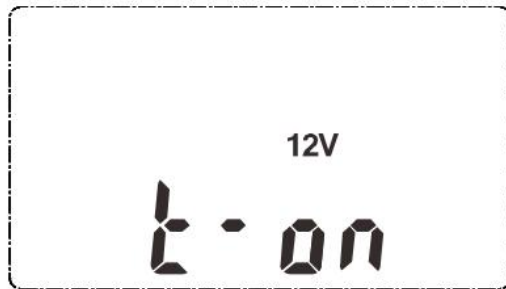
LD2: Automatically turns on when it gets dark and automatically turns off when it gets light.

LD3: Automatically turns on when it gets dark and automatically turns off before dawn. (Automatically identify light and dark according to the local environment)

LD4: Automatically turns on at dawn and automatically turns off at dusk.

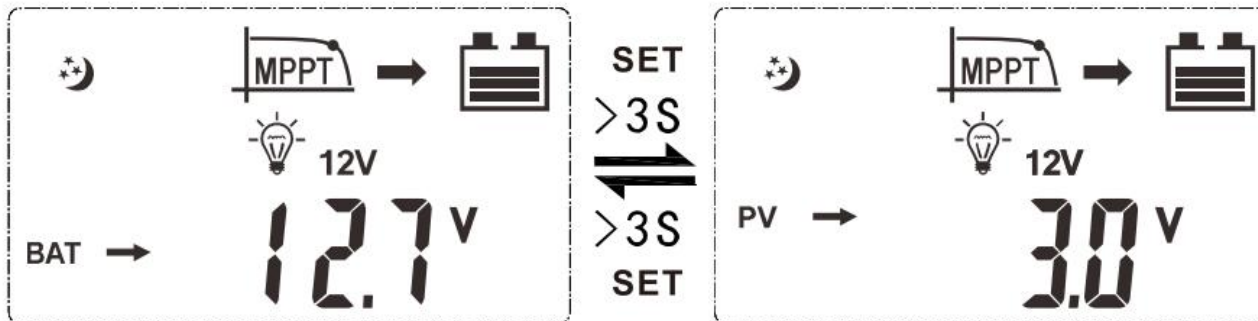


When the "LD3" mode is selected and the duration (hours) of the two working segments are set, if testing is required, "T-on" can be selected. At this time, the duration unit of hours changes to minutes. If testing is not needed, "T-of" can be selected to turn off the test. The working hours have been restored to hours



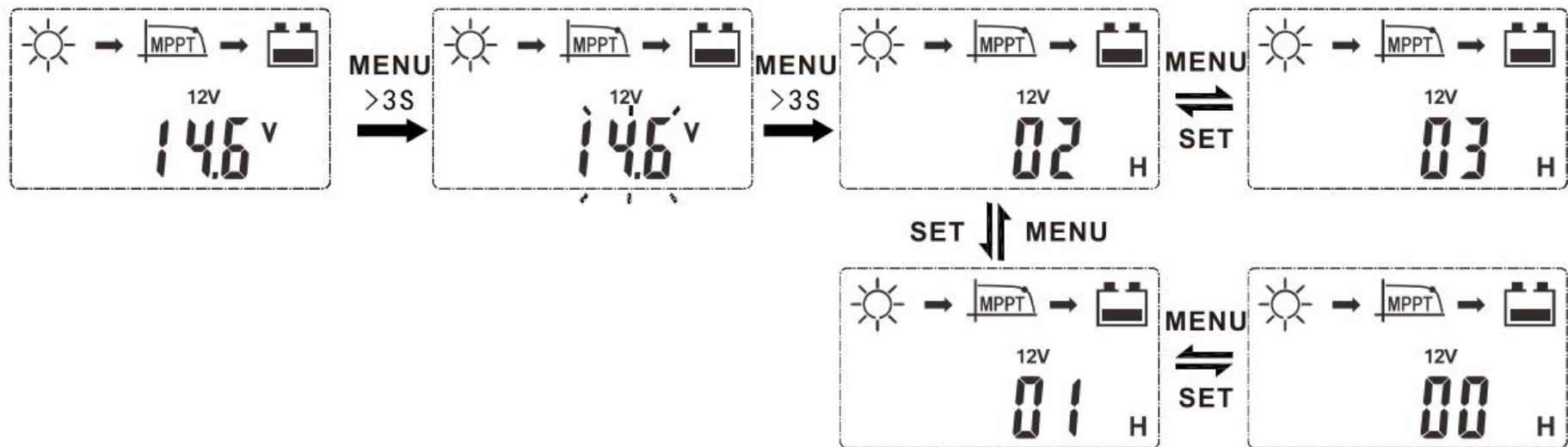
3.11 Photovoltaic Panel Voltage

On the battery voltage interface of the home page, long press and hold the "SET" key to switch between the battery voltage and the photovoltaic panel voltage for viewing



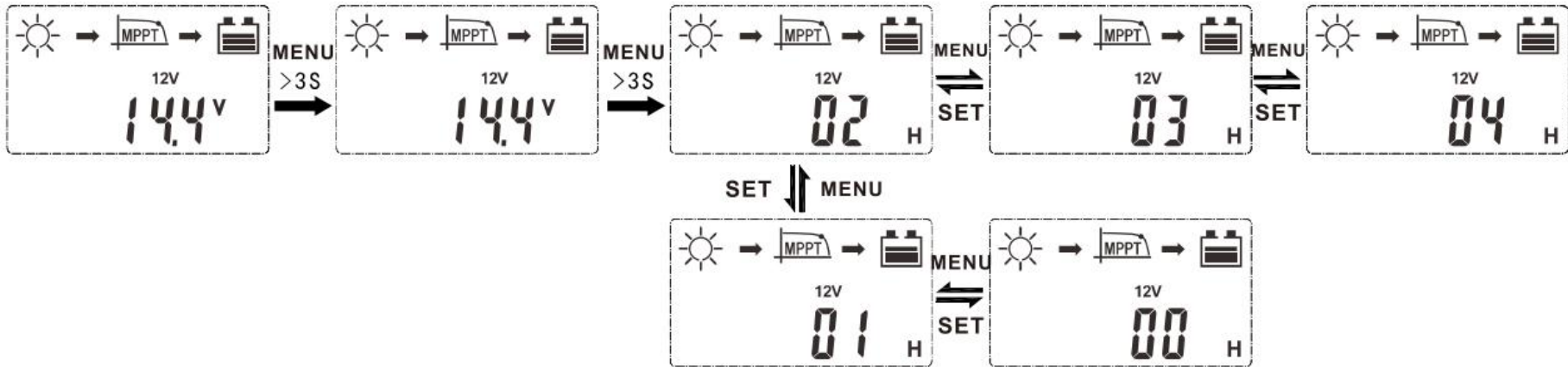
3.12 Equalization charging duration setting

To switch from the main interface to the equalization charging page, press and hold "MENU" for 3 seconds. The interface will flash. Press and hold for 3 seconds to switch to the equalization charging duration setting page. Press "MENU" or "SET" briefly to increase or decrease the time.



3.13 Increase the charging time setting

To switch from the main interface to the charging enhancement page, press and hold "MENU" for 3 seconds. The interface will flash. Press and hold for 3 seconds to switch to the charging enhancement duration setting page. Press "MENU" or "SET" briefly to increase or decrease the time.

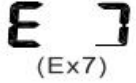


4. Protection function

Type	Condition	Status
Reverse connection protection for photovoltaic panels	When the photovoltaic panels were connected in reverse, the battery was not connected	The controller will not be damaged.
Battery reverse connection protection	When the batteries were connected in reverse, the photovoltaic panels were not connected	
Battery overvoltage protection	The battery voltage has reached the overvoltage point	Stop charging and stop discharging
Battery over-discharge protection	The battery voltage drops to the undervoltage point	Stop discharging
Overload protection	The load current exceeds the rated current	Output off

5.Fault code description

Error code	Reason	Treatment method
The sun is shining brightly, but the display screen shows no information	The photovoltaic panels are not connected	Please check whether the wiring of the photovoltaic panel is correct and whether the connection is tight
The wiring connections are all correct, but the display screen shows no information	1. The battery voltage is lower than 8V 2. The photovoltaic voltage is lower than the battery voltage	1. Please check the battery voltage. The controller will only start when the battery voltage is greater than 8V. 2. The voltage of the photovoltaic panel must be higher than that of the battery
E 1 (Ex1)	Battery over-discharge	When the battery power is sufficient, the load output will automatically shut off and resume
E 2 (Ex2)	Battery overvoltage	Check whether the set battery voltage exceeds the overvoltage protection point and disconnect the photovoltaic wiring
E 3 (Ex3)	Overload of load	Please reduce the load or check the wiring of the load
E 5 (Ex5)	Overheating	The controller will automatically restart working after cooling down

 E 6 (Ex6)	The input voltage of the photovoltaic panel is too high	Check the voltage of the photovoltaic panels and reduce the number of photovoltaic panels connected in series
 E 7 (Ex7)	After setting the battery voltage, it will automatically restart	