

POWERTECH



**50A
MPPT Solar Charge Controller
for Lithium or SLA Batteries
MP3745
User Manual**

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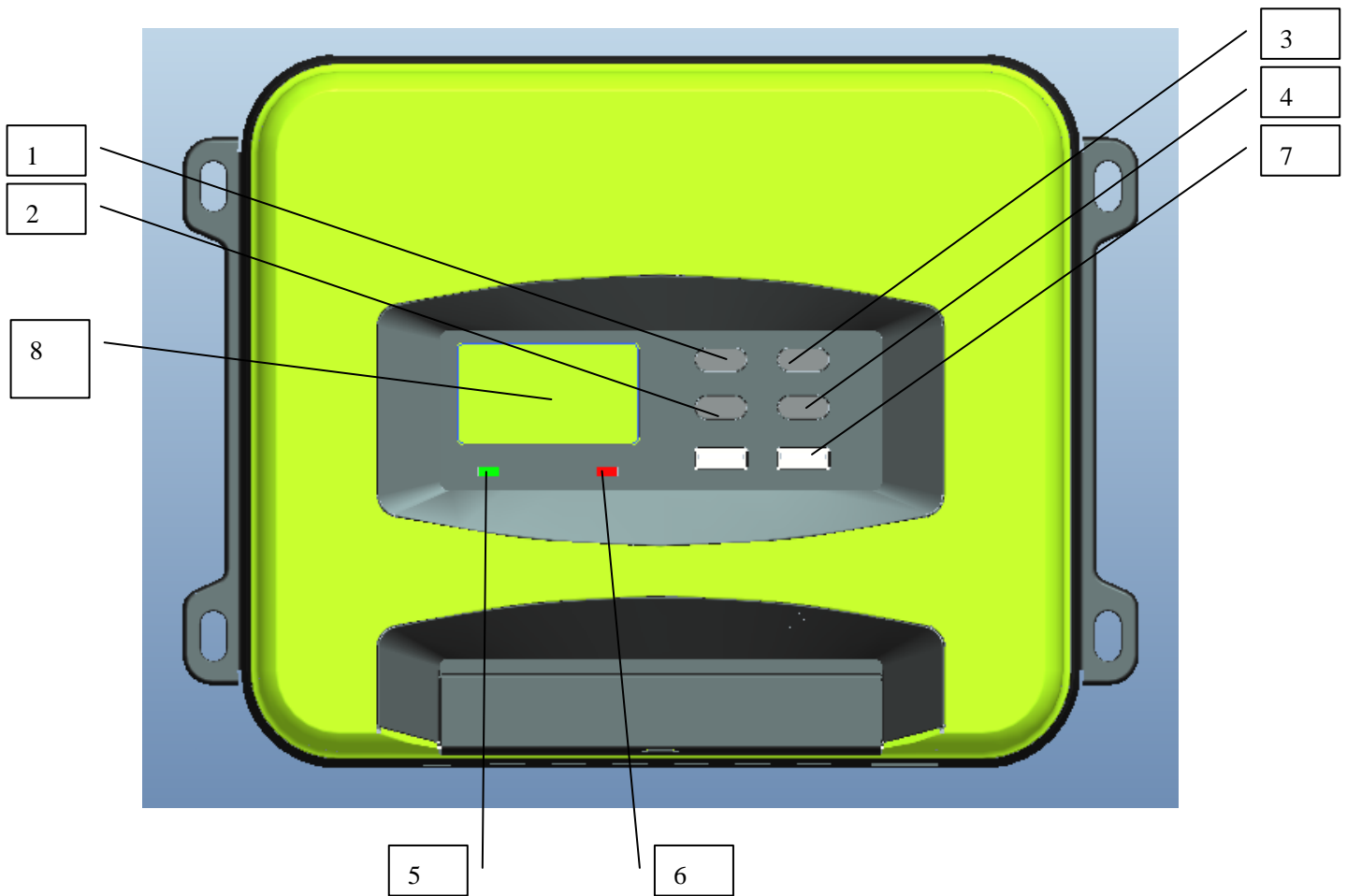
I. Matters needing attention

1. Keep the product out of reach of children to avoid using it as a toy and causing personal injury.

Note!

2. Only use the accessories approved by the company or fully comply with the requirements of the company for the specifications of the accessories, or else it may cause danger.
3. Operating voltage range of the charger: 12/24/36/48V battery; it will damage the internal discharge circuit if the voltage exceeds 75V, so do not use batteries over 60V, or else it may damage the charger.
4. The maximum open circuit voltage of PV is 135V. Do not exceed the range during use, or else the charger may be damaged.
5. Do not touch the heat sink in the process of product operation to avoid hot hands. It is recommended to use the product on the wall.
6. Operating temperature: -10~+40°C.
7. It is strictly forbidden to use in an environment that may be exposed to rain, which may cause danger.

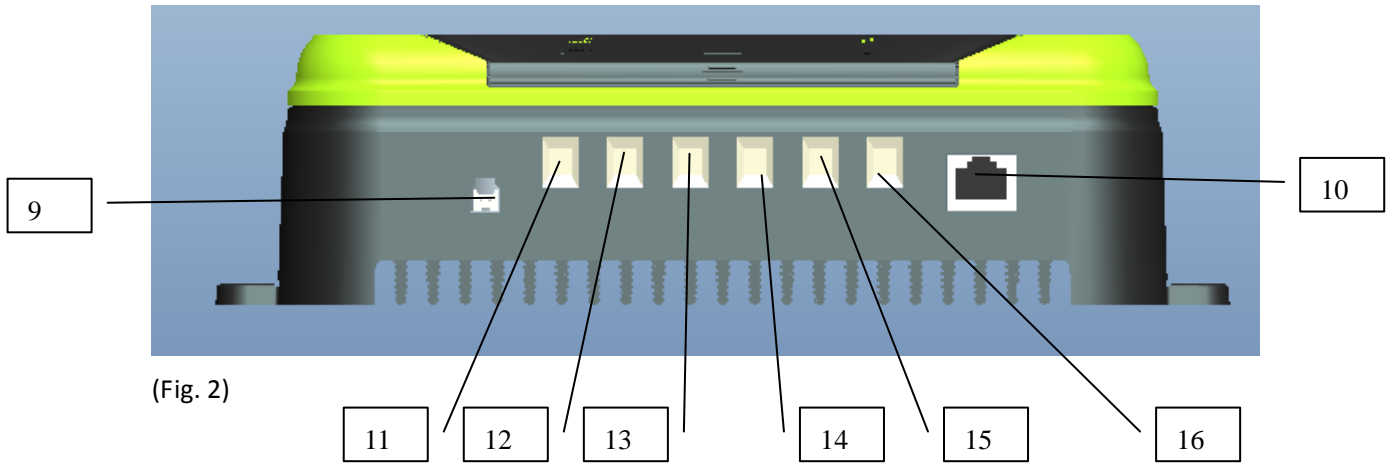
Product picture (Fig. 1)



II. Functional description of each part of the panel (refer to Fig. 1 & 2):

1. UP (up button)
2. Down (down button)
3. MENU (main menu button)
4. Enter (OK button)
5. Green LED light (off when no charging, flashing during charging, stay on when fully charged).
6. Red LED light (Red LED light (off when no error , error alarm when the light is long on, lithium battery only has 12V gear, other gear flashing red light error)
7. 2*3A USB output
8. LCD screen

Remark: (The operations of panel items 1-4 are explained below).



(Fig. 2)

9. External temperature probe

10. RJ45 port, connected to the remote control board through the network cable and synchronized with the LCD screen (this port is reserved and the remote control board is optional)

11. PV+ (connected to the positive electrode of the solar panel)

12. PV- (connected to the negative electrode of the solar panel)

13. B+ (connected to the positive electrode of the battery)

14. B- (connected to the negative electrode of the battery)

15. L+ (connected to the positive electrode of the load)

16. L- (connected to the negative electrode of the load)

III. Description of basic functions

1. PV (solar panel input):

- a. The maximum open circuit voltage of PV is 135V.
- b. PV integrates anti-reverse (reverse connection alarm E8, no charging, please eliminate the fault).
- c. 12V battery, PV input voltage range is 16-108V; 24V battery, PV input voltage range is 32-108V
- d. 36V battery, PV input voltage range is 48-108V; 48V battery, PV input voltage range is 64-108V.

2. Battery output function

- a. Identify 12/24/36/48V battery automatically; the maximum charging current is :12/24V/50A,36V/35A,48V/25A.
- b. Anti-reverse connection (E1 alarm).

3. Load output function (default OFF).

- a. Rated maximum output current 50A (12/24/36/48V).
- b. Overcurrent protection >55A.
- c. Short circuit protection (E4 alarm; please eliminate the fault).
- d. Load output over/undervoltage protection, recovery voltage; refer to the set voltage.

4. Over-temperature protection

- a. Reduce load in case of over-temperature: the charging current is always 28-30A when the heat sink temperature $\geq 75^{\circ}\text{C}$.
- b. Recover when load is reduced: resume normal charging(50A) when the heat sink temperature is $<70^{\circ}\text{C}$.
- c. Stop charging when the heat sink temperature is $\geq 90^{\circ}\text{C}$; resume charging when the heat sink temperature is $<60^{\circ}\text{C}$.

5. External temperature compensation function (only for AGM/STD battery)

a. 1. The system will automatically adjust the float voltage according to the ambient temperature. The external temperature probe is preferred. If the external temperature probe is not connected (or the external temperature is $<40^{\circ}\text{C}$), use (temperature $\geq 20^{\circ}\text{C} - 5^{\circ}\text{C}$) by default. 2. The voltage may vary when the input energy is insufficient to stabilize the energy required for the float charging.

b. For 12/24/36/48V batteries, when the external probe temperature $\leq 0^{\circ}\text{C} \sim 40^{\circ}\text{C}$, the float charging voltage is 14.1/28.2V/42.3V/56.4V

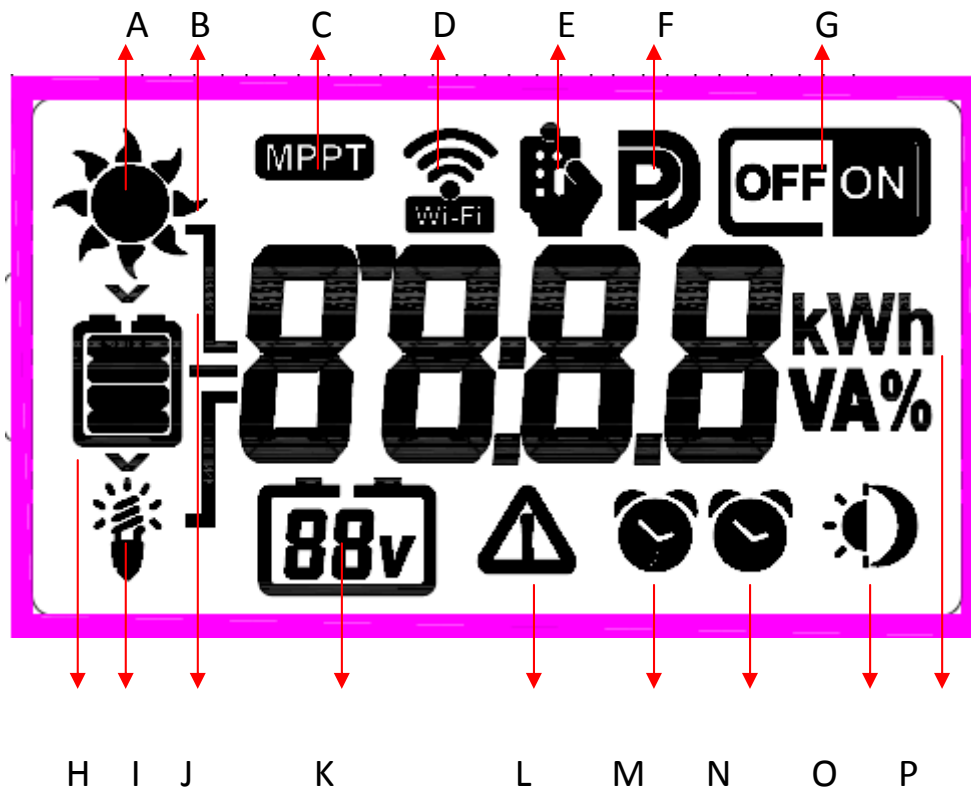
For 12/24/36/48V batteries, when the external probe temperature is $0^{\circ}\text{C} \sim 20^{\circ}\text{C}$, the float charging voltage is 13.8/27.6V/41.4V/55.2V

For 12/24/36/48V batteries, when the external probe temperature $\geq 20^{\circ}\text{C}$, the float charging voltage is 13.5/27V/40.5V/54V.

6. WIFI networking function

- a. The product may integrate WIFI module or not.
 - b. If the product integrates a WIFI module, you can install the mobile APP, control the load switch through the APP and view the MPPT charger data in real time, such as battery voltage, charging current, etc.
- 7. The LCD backlight is turned off if there is no button operation in 1 minute; any button operation will automatically activate the LCD backlight.**
- 8. **a. USB battery input undervoltage/overvoltage protection (10.5V/60V), battery input undervoltage/overvoltage recovery (11V/59V);**
 - c. **USB output 2*5V/3A.**

III. Description of LCD screen:

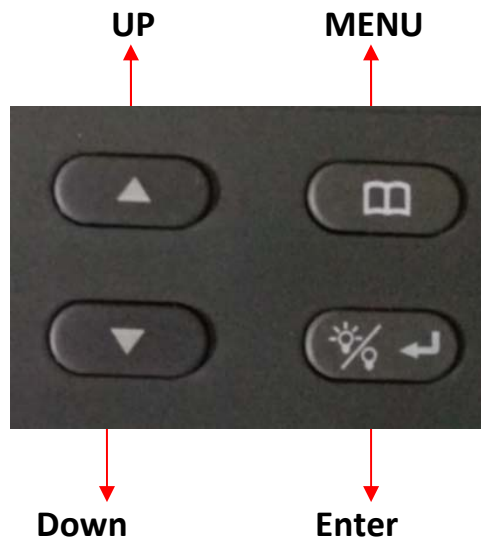


- A. Sun icon, displayed when solar panel is connected.
- B. Sunlight icon, 8 in total, display according to the charging current
- C. MPPT icon indicates the MPPT charger.
- D. WIFI icon; turn on WIFI through button settings, read product data and control load output through APP.
- E. Remote control icon; displayed when the remote control is connected (remote control optional).
- F. Settings icon; turn on when entering the setting parameters, and turn off when exit.
- D. WIFI icon; WIFI ON/OFF optional, default ON.
- F. Battery level icon; display the corresponding icon according to the battery voltage.
- I. Load icon; turn on when the load is turned on, synchronized with the load switch ON.
- J. Connector, three, up corresponding to PV, middle corresponding to battery, down corresponding to load.
- K. Currently identified battery type (12/24/36/48V).
- L. Protection icon. When this icon appears, it indicates that the machine has some protection, such as load overcurrent, short circuit protection, undervoltage protection, etc. (Refer to the fault code).
- M. Load timing clock 2.
- N. Load timing clock 1.

O. Daytime and night icons; PV>12V, display daytime icon ☀; PV<12V, display night icon 🌙 after 5 minutes. PV < 5V display night icon 🌙 immediately .


P. Numerical display (8888 characters). The current data of the machine can be switched by the MODE button, such as battery voltage / load voltage / PV voltage / time.



IV. The operation of machine buttons is described below



1. MENU button description:

a. Press in default interface after power-on: Switch among battery voltage, load voltage, PV voltage and time interface in turn.

b. Press and hold MENU to enter the parameter setting interface  . Then, press to switch among the 8 interfaces in turn.

- (1. Battery type selection S (STD), default level /L (LI) / A (AGM));
- (2. WIFI switch ON/OFF, default ON)
- (3. Load undervoltage protection setting: setting range of 12V batteries: 10-11.5V, default 10V; setting range of 24V batteries: 18-23V, default 21V; setting range of 36V batteries: 30-34.5, default 30V; setting range of 48V:40-46, default 40V).
- (4. Load undervoltage recovery setting: setting range of 12V batteries: 12-13V, default 12.5V; setting range of 24V batteries: 24-26V, default 25V; setting range of 36V batteries:36-39V,default 37.5V;setting range of 48V:48-55V,default 50V).
- (5. Time setting: 24-hour system, hour/minute can be set).
- (6. LO mode: a. Clock 1  setting range 0-120 minutes, default 60 minutes. b. Clock 2  setting range 0-120 minutes, default 30 minutes. c. Clock 1 trigger condition, when PV voltage <10V, output turns on after N minutes load delay. d. Clock 2 trigger condition,

when PV>10.5V, the output turns off after N minutes load delay, so the loop is repeated)
(7. LD mode: The clock setting range is 0-12 hours. a. Clock 1 trigger condition: When PV<10V, clock 1 turns on the load for N minutes (clock 1 is set to 3 hours by default), and clock 2 executes following clock 1. b. Clock 2 turns off the load for N minutes (clock 2 is set to 4 hours by default); c. After clock 2 executing, the load is always on until PV>10.5V, so the loop is repeated)

(8. TO mode: Set the load timer on/off time; the setting range is 0-24 hours.

a. for example, the default setting: turn on load at 18:00, turn off load at 6:00. The program automatically turns on/off the load at set time).

Remark: The load switch mode of items 6-8 is OFF by default. Please turn it on as needed, and set the required time

c. Press and hold MENU to enter the parameter setting

interface  :

1. Press MENU to switch among the 8 interfaces in sequence. 2 Press MENU to cancel the data that has been modified but hasn't been saved.

d. Restore the default settings: first press and hold the MENU button, then turn on the power of the battery, and the FFFF icon will be displayed on the screen.

2. UP button description

Enter the parameter setting interface: press: UP / (time plus 1 / voltage plus 0.1V); press and hold: (time / load voltage) values can be accumulated.

Press in default interface after power-on: switch among (battery voltage/current), (load voltage/current) and (PV voltage/current).

3. Down button description

Enter the parameter setting interface and press: DOWN / (time minus 1 / voltage minus 0.1V); press and hold: (time / load voltage) value can be reduced cumulatively.

Press in default interface after power-on: Switch among battery current, load current, and PV current.

4. Enter button description

Press: a. In the parameter setting interface: enter to modify parameters / confirm the modification

b. In the battery voltage interface: load ON/OFF.

V. Wire diameter requirements:

Battery output line: (50A MAX) 6AWG--8AWG; at least 8AWG copper wire, less than 2m.

PV input line: 8AWG--10AWG; professionals can select the appropriate electronic line according to the actual output PV voltage.

VI. Electrical Parameters:

PV input	Parameters
PV maximum open circuit voltage (VDC)	135V
MPPT voltage (VDC)	16~108V
Maximum PV input power (W)	12V battery \leq 700W; 24 -48Vbattery \leq 1500W;
Maximum MPPT current	(12/24V) /50A; 36V/35A;48V/25A
DC output	
Battery voltage (VDC)	12//24/36/48V
Battery capacity (AH)	\geq 50AH
Output current (A)	50A
Constant voltage charging voltage	STD:14.4V/28.8V/43.2V/57.6V LI:14.5V AGM:14.6V/29.2V/43.8V/58.4V
Load output	
Output voltage (VDC)	12/24/36/48V
Output current (A)	50A/55A
USB output	
Output voltage (VDC)	5
Number of USB ports	2
Maximum output current (A)	3.4A Max
Standby current	
Separate MPPT charger	< 60 mA
MPPT charger + WIFI module	< 160 mA
Protective function	
PV/battery input high/low voltage protection	Yes
PV/battery reverse connection protection	Yes
Load overcurrent / short circuit protection	Yes
Temperature protection	Yes (90°C)
Mechanical dimensions	
Length X width X height (mm)	238*177*73
Weight	2.3 KG
General data	
Operating temperature (°C)	-10~ +40
Cooling method	Heat sink
Insulation class	CLASS 1
Protection level	IP30

VII. Fault Codes

E1	Battery reverse connection (please correct)
E2	Battery open circuit protection (battery not connected / or low battery voltage)
E3	Battery overcurrent protection (circuit has constant current function; the machine may be damaged if there is an error)
E4	Load overcurrent /short circuit protection (error 10S, turn on the load after eliminating the error)
E5	Battery overvoltage (battery damaged or high battery voltage)
E6	PV (solar) input overvoltage protection (PV>135V)
E7	Over-temperature protection, stop charging when heat sink temperature $\geq 90^{\circ}\text{C}$; resume when temperature $\leq 60^{\circ}\text{C}$
E8	PV reverse connection (please correct)

Battery over and under voltage protection range		
Battery Capacity:12V/24V/36V/48V	low-voltage protection LCD display:E2	<8/18/27/36V
Battery Capacity:12V/24V/36V/48V	Over voltage protection LCD display:E5	>15/31/45/60V

Remark: Please eliminate the fault according to the error code. If the machine still does not respond after the error is eliminated, it may be damaged and need after-sales service.

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