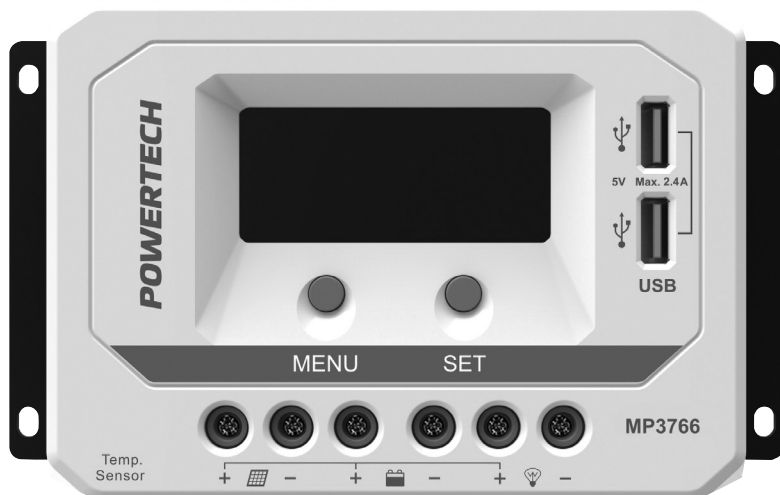


POWERTECH

MP3766

PWM Solar Charge Controller with LCD display

for Lead Acid Batteries



Instruction Manual

OVERVIEW:

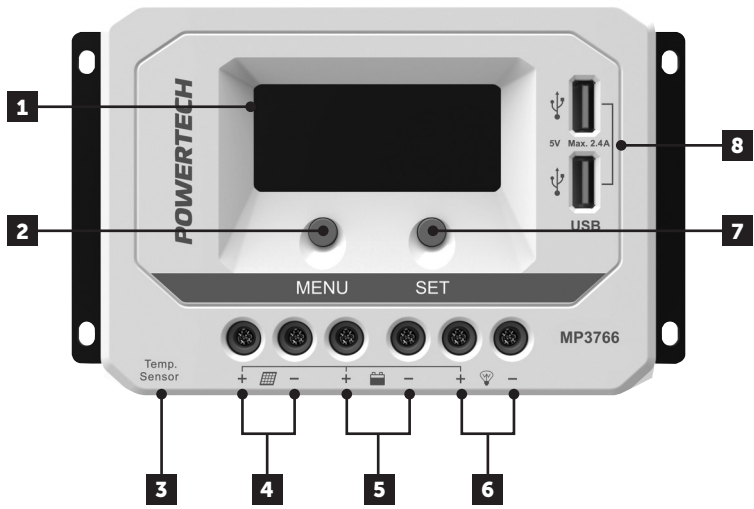
Please reserve this manual for future review.

The PWM charge controller with built in LCD display that adopts multiple load control modes and can be widely used on solar home systems, traffic signal, solar street light, solar garden lamps, etc.

The features are listed below:

- High quality components of ST and IR
- Terminals have UL and VDE certification, the product is safer and more reliable
- Controller can work continuously at full load within an environment temperature range from -25°C to 55°C
- 3-Stage intelligent PWM charging: Bulk, Boost/Equalize, Float
- Support 3 charging options: Sealed, Gel, and Flooded
- LCD display design, dynamically displaying device's operating data and working condition
- Double USB output
- With simple button settings, operation will be more comfortable and convenient
- Multiple load control modes
- Energy statistics function
- Battery temperature compensation function
- Extensive Electronic protection

PRODUCT FEATURES:

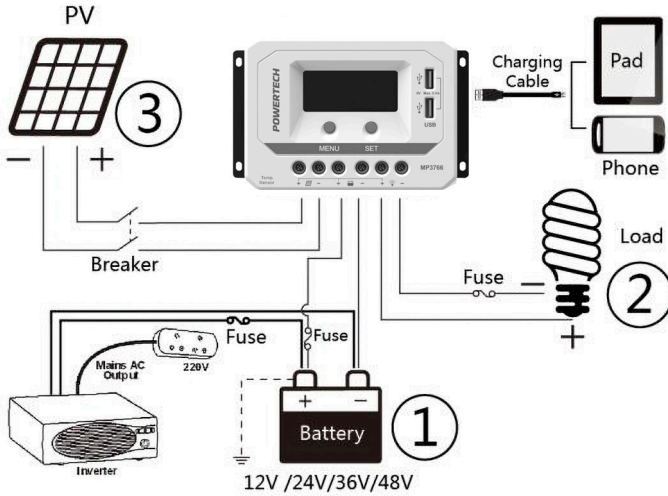


1	LCD
2	MENU Button
3	RTS Port
4	PV Terminals

5	Battery Terminals
6	Load Terminals
7	SET Button
8	USB Output Ports*

*USB output ports provide the power supply of 5VDC/2.4A and have the short circuit protection.

CONNECTION DIAGRAM:



1. Connect components to the charge controller in the sequence as shown above and pay attention to the "+" and "-". Please don't insert the fuse or turn on the breaker during the installation. When disconnecting the system, the order will be reserved.
2. After powering on the controller, check the LCD on. Always connect the battery first, in order to allow the controller to recognize the system voltage.
3. The battery fuse should be installed as close to battery as possible. The suggested distance is within 150mm.
4. This regulator is a positive ground controller. Any positive connection of solar, load or battery can be earth grounded as required.



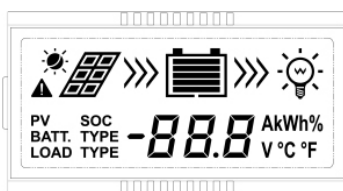
NOTE: Please connect the inverter or other load that it has the large start current to the battery rather than to the controller, if the inverter or other load is necessary.

OPERATION:

- Battery Function**

Button	Function
MENU button	<ul style="list-style-type: none"> Browse interface Setting parameter
SET button	<ul style="list-style-type: none"> Load ON/OFF Clear error Enter into Set Mode Save data

- LCD Display**

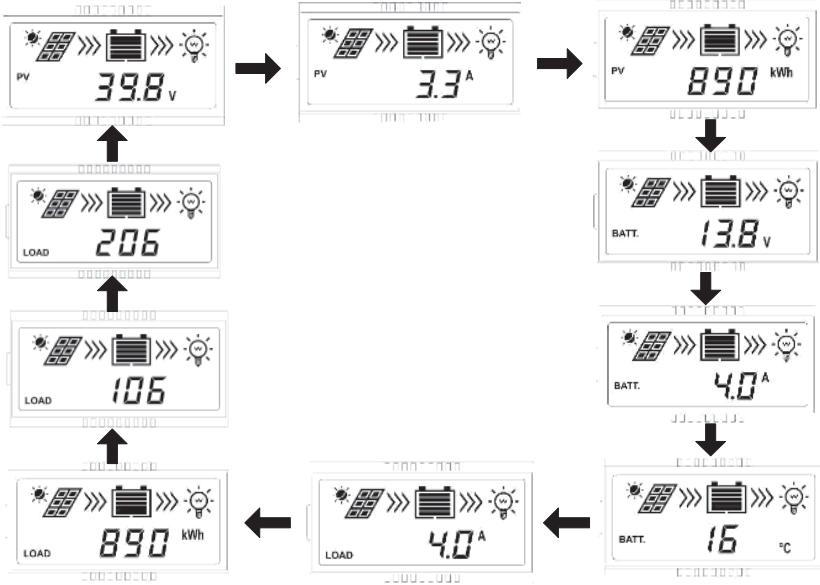


- Status Description**

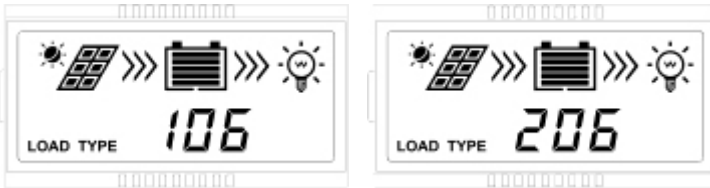
Name	Symbol	Status
PV array		Day
		Night
		No charge
		Charging
	PV	PV array's voltage, current, and generate energy
Battery		Battery capacity, In Charging
	BATT.	Battery Voltage, Current, Temperature
	BATT. TYPE	Battery Type
Load		(Load) dry contact connected
		(Load) dry contact disconnected
	LOAD	Load Voltage, Current, Load mode

OPERATION:

• Browse Interface







1. When no operation, the interface will be automatic cycle, but the follow two interfaces not be display.



2. Accumulative power zero clearing: Under PV power interface, press SET button and hold on 5s then the value blink, press SET button again to clear the value.
3. Setting temperature unit: Under battery temperature BATT. interface, press SET button and hold on 5s to switch.

OPERATION:

• Fault Indication

Status	Icon	Description
Battery over discharged		Battery level shows empty, battery frame blink, fault icon blink
Battery over voltage		Battery level shows full, battery frame blink, fault icon blink.
Battery overheating		Battery level shows current value, battery frame blink, fault icon blink.
Load failure		Load overload ¹ , Load short circuit

¹When load current reaches 1.02-1.05 times, 1.05-1.25 times, 1.25-1.35 times and 1.35-1.5 times more than nominal value, controller will automatically turn off loads in 50s, 30s, 10s and 2s respectively

• Load Mode Setting

Operating Steps:

Under load mode setting interface, press SET button and hold on 5s till the number begin flashing, then press MENU button to set the parameter, press SET button to confirm.

1**	Timer 1	2**	Timer 2
100	Light ON/OFF	2 n	Disabled
101	Load will be on for 1 hour since sunset	201	Load will be on for 1 hour before sunrise
102	Load will be on for 2 hours since sunset	202	Load will be on for 2 hours before sunrise
103~113	Load will be on for 3~13 hours since sunset	203~213	Load will be on for 3~13 hours before sunrise
114	Load will be on for 14 hours since sunset	214	Load will be on for 14 hours before sunrise
115	Load will be on for 15 hours since sunset	215	Load will be on for 15 hours before sunrise
116	Test mode	2 n	Disabled
117	Manual mode (Default load ON)	2 n	Disabled

NOTE: Please set Light ON/OFF, Test mode and Manual mode via Timer1. Timer2 will be disabled and display "2 n".

OPERATION:

- **Battery Type**

Operating Steps:

Under Battery Voltage interface, press SET button and hold on 5s then enter into the interface of Battery type setting. After choosing the battery type by pressing MENU button, waiting for 5s or pressing SET button again to modify successfully.











NOTE: Please refer to the battery voltage parameters table for the different battery type.

PROTECTION:

Protection	Conditions	Status
PV Reverse Polarity	When the battery is correct connecting, the PV can be reversed.	The controller is not damage
Battery Reverse Polarity	When the PV is not connecting, the battery can be reversed.	
Battery Over Voltage	The battery voltage reaches to the OVD	Stop charging
Battery Over Discharge	The battery voltage reaches to the LVD	Stop discharging
Battery Overheating	Temperature sensor is higher than 65°C	Output is OFF
Controller Overheating	Temperature sensor is less than 55°C	Output is ON
	Temperature sensor is higher than 85°C	Output is OFF
	Temperature sensor is less than 75°C	Output is ON
Load Short Circuit	Load current ≥ 2.5 times rated current One short circuit, the output is OFF 5s; Two short circuit, the output is OFF 10s; Three short circuit, the output is OFF 15s; Four short circuit, the output is OFF 20s; Five short circuit, the output is OFF 25s; Six short circuit, the output is OFF	Output is OFF Clear the fault: Restart the controller or wait for one night-day cycle (night time > 3 hours).
Load Overload	Load current ≥ 2.5 times rated current 1.02-1.05 times, 50s; 1.05-1.25 times, 30s; 1.25-1.35 times, 10s; 1.35-1.5 times, 2s	Output is OFF Clear the fault: Restart the controller or wait for one night-day cycle (night time > 3 hours).
Damaged RTS	The RTS is short-circuited or damaged	Charging or discharging at 25°C

TROUBLESHOOTING:

Faults	Possible Reasons	Troubleshooting
The LCD is off during daytime when sunshine falls on PV modules properly	PV array disconnection	Confirm that PV wire connections are correct and tight.
Wire connection is correct, LCD not display	1) Battery voltage is lower than 9V 2) PV voltage is less than battery voltage	1) Please check the voltage of battery. At least 9V voltage to activate the controller. 2) Check the PV input voltage which should be higher than battery's.
  Interface blink	Battery over voltage	Check if the battery voltage is higher than OVD point (over voltage disconnect voltage), and disconnect the PV.
  Interface blink	Battery over discharged	When the battery voltage is restored to or above LVR point (low voltage reconnect voltage), the load will recover
  Interface blink	Battery over heating	The controller will automatically turn the system off. But while the temperature decline to be below 50°C, the controller will resume.
  Interface blink	Over load or Short circuit	Please reduce the number of electric equipment or check carefully loads connection.

SPECIFICATIONS:

Model:	MP3766
Nominal system voltage	12/24VDC, Auto
Battery input voltage range	9V~32V
Rated charge/discharge current	30A@55°C
Max. PV open circuit voltage	50V
Battery type	Sealed(Default) / Gel / Flooded
Equalize Charging Voltage [^]	Sealed:14.6V / Gel: No / Flooded:14.8V
Boost Charging Voltage [^]	Sealed:14.4V / Gel:14.2V / Flooded:14.6V
Float Charging Voltage [^]	Sealed / Gel / Flooded:13.8V
Low Voltage Reconnect Voltage [^]	Sealed / Gel / Flooded:12.6V
Low Voltage Disconnect Voltage [^]	Sealed / Gel / Flooded:11.1V
Self-consumption	≤9.2mA/12V; ≤11.7mA/24V; ≤14.5mA/36V; ≤17mA/48V
Temperature compensation coefficient	-3mV/°C/2V (25°C)
Charge circuit voltage drop	≤0.29V
Discharge circuit voltage drop	≤0.16V
LCD temperature range	-20°C~+70°C
Working environment temperature	-25°C~+55°C(Product can work continuously at full load)
Relative humidity	≤95%, N.C.
Enclosure	IP30
Grounding	Common Positive
USB output	5VDC/2.4A(Total)
Dimension(mm)	181x100.9x59.8
Mounting size(mm)	172x80
Mounting hole size(mm)	Φ5
Terminals	16mm2/6AWG
Net weight	0.55kg

[^]Above the parameters are in 12V system at 25°C, twice in 24V system.