

JSW-M series
DC power supply module
Operation manual
(Ver1.0)

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1、 Performance characteristics and scope of application

JSW-M series power supply is a rechargeable module power supply which is designed and manufactured by our company. The power supply has the advantages of small size, high conversion efficiency, stable performance, isolation of the primary and secondary edges, and high isolation strength. The product adopts a metal shell and a modular package so that it has dustproof and moisture-proof ability, anti-interference ability; the Input and output terminals form is convenient for connection; this product has strong adaptability to the grid and can work in a wide range of input voltage; this product has the functions of output short circuit, over power, overvoltage protection and so on. In addition, the product has intelligent charge and discharge management capabilities, external battery can be three-phase charging, the battery can uninterrupted supply power to the load when alternating current is interrupted, with the protection effect for preventing over-discharge; with the state display of power supply; with battery activation function, at the same time the battery can online check the capacity to pre-judge whether the battery needs to be replaced, and the product can send out the various state and electrical parameters of the power through the alarm dry contacts and the RS485 interface to facilitate background remote monitoring; automatic battery activation and maintenance manually or through an external signal. The power supply be suitable for power distribution automation system, power smart box change, ring counter and other industries which need uninterrupted direct current power supply, demanding occasions.

2、 Technical Parameters

| | Product model | | JSW-M300(T) | JSW-M500(T) |
|---|---|---------------------|---|-------------|
| Input characteristics | Input voltage (V) | current power 110V | 85 ~ 132 | |
| | | current power 220V | 176 ~ 264 | |
| | Input frequency (Hz) | | 47 ~ 63 | |
| output characteristics | output voltage (V) | DC 24V | 21 ~ 28 | |
| | | DC 48V | 42 ~ 56 | |
| | Float voltage (V) | DC 24V | 27.6 | |
| | | DC 48V | 55.2 | |
| | Constant current charging current (A) | DC 24V | 1.5 | |
| | | DC 48V | 0.75 | |
| | Long-term output power (W) | | 120 | |
| | short-term output power in 45s (W) | | 300 | 500 |
| Instantaneous output power in 100ms (W) | | 800 | 1200 | |
| Battery characteristics | Battery voltage (V) | DC 24V | 24 | |
| | | DC 48V | 48 | |
| | Battery capacity | | 7AH、 12AH、 17AH、 21AH、 24AH、 40AH for option | |
| Safety regulations | Insulation resistance and dielectric strength | Output to the shell | 500V megger test, the insulation resistance is not less than 50MΩ | |
| | | Output to the shell | | |
| | | Output to the shell | Power frequency voltage effective value of 2500V for lasting 60 seconds test, no insulation breakdown or flashover phenomenon | |
| Environmental characteristics | Operating temperature (°C) | | -40 ~ +70 | |
| | Storage temperature (°C) | | -40 ~ +85 | |
| | Relative humidity (%) | | 0 ~ 90 | |
| | Atmospheric pressure (kPa) | | 60 ~ 110 | |
| Mechanical properties | Shape dimensions (mm) | | Width 168 *height 110*depth 43 | |
| Optional features | RS485 communication | | Statute : Modbus baud rate: 9600bps | |

3、 Power supply internal circuit principle

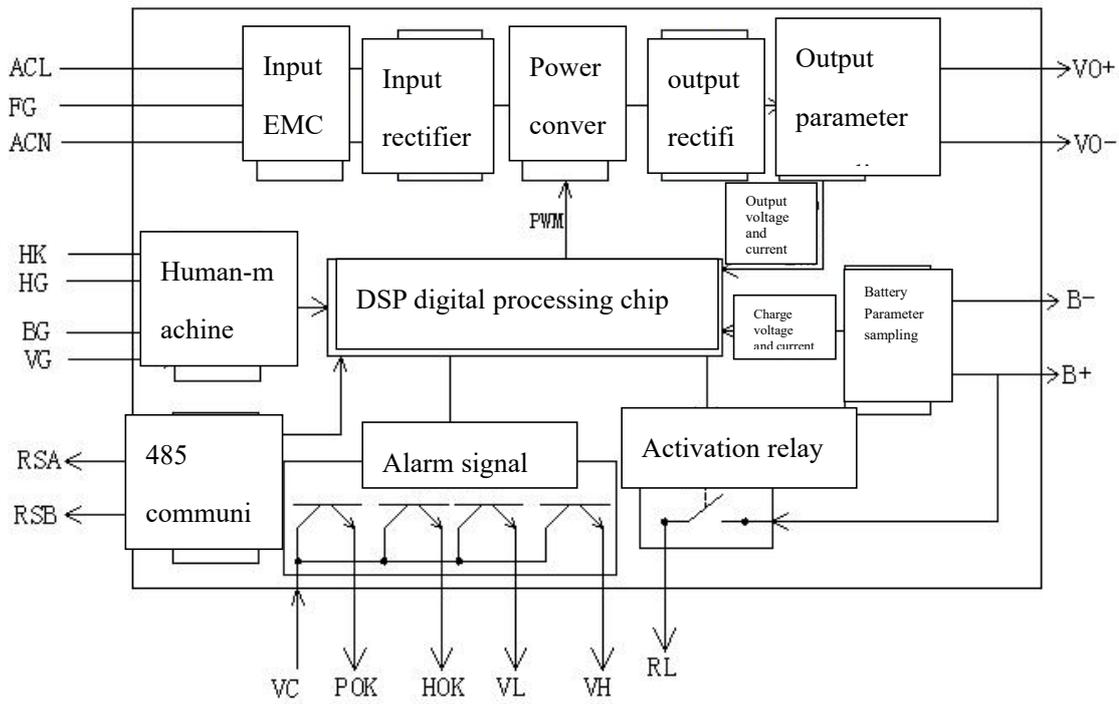


Figure 1 internal schematic of the power

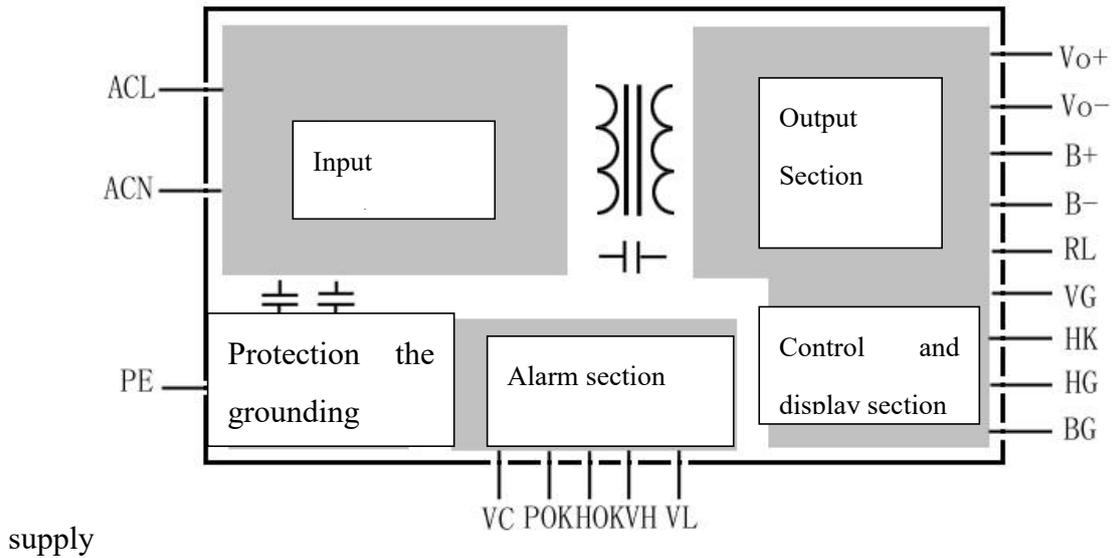


Figure 2 internal isolation diagram of the power supply

4、Panel Description

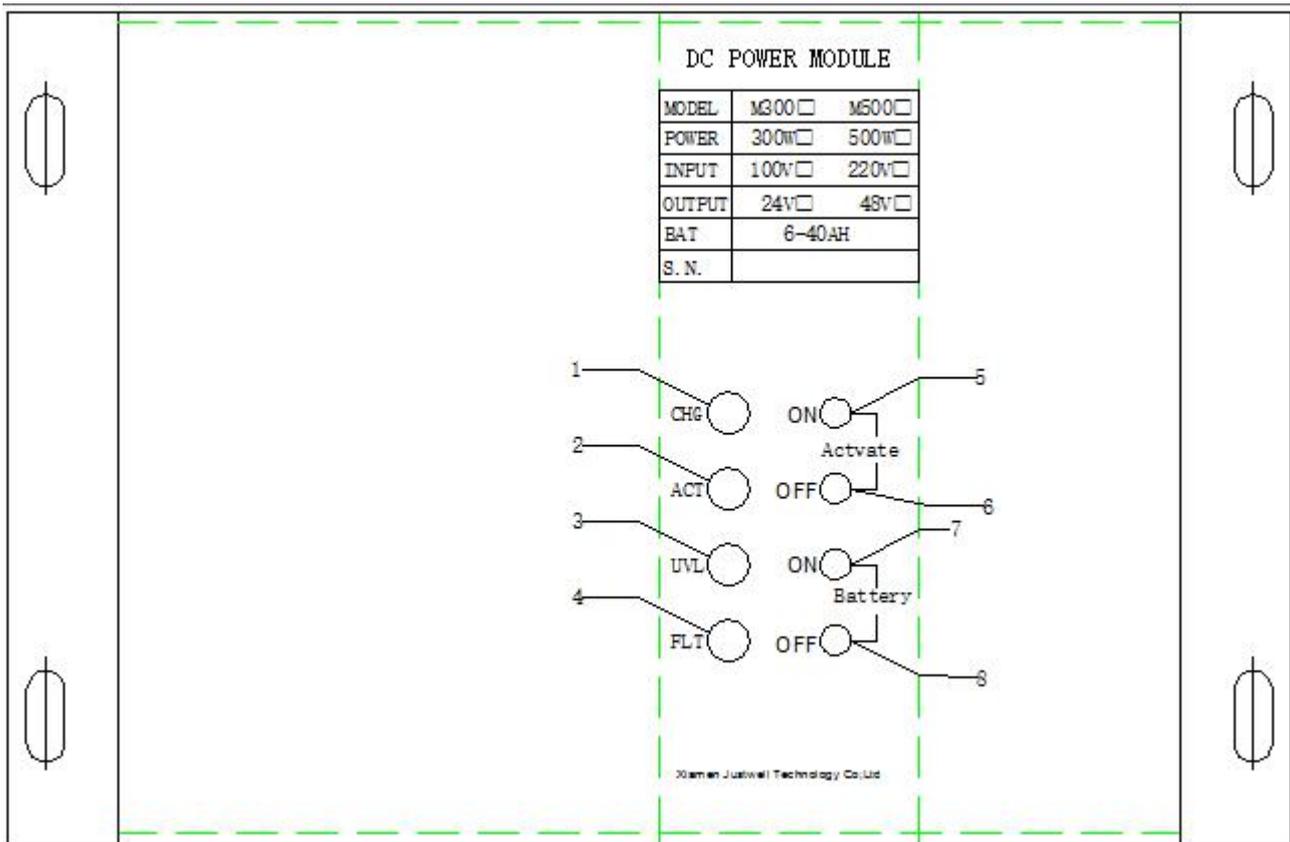


Figure 3 power supply Panel Description

1. Charge and discharge indicator
2. Battery activation indicator
3. Battery undervoltage indicator
4. Power failure indicator
5. Manual activation activation button
6. Manual activation exit button
7. Manual battery input button
8. Manual battery exit button

5、Wiring instructions

5.1 wiring diagram

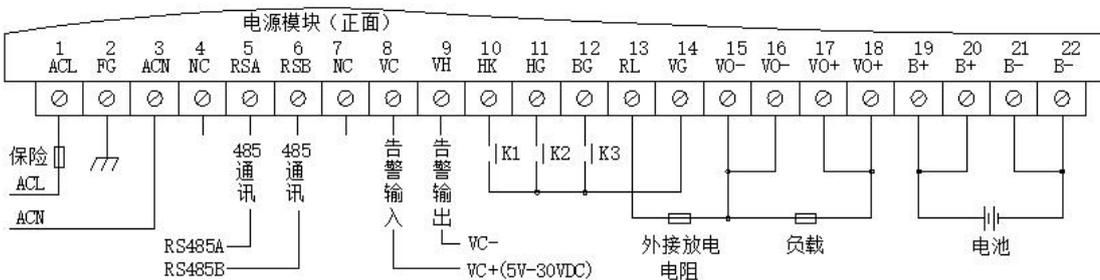


Figure 4 wiring diagram with communication

5.2 Terminal Definition

| Terminal number | Terminal name | definition | Terminal number | Terminal name | definition |
|-----------------|---------------|---------------------------------|-----------------|---------------|---------------------------------------|
| 1 | ACL | AC input L phase | 12 | BG | Remote battery exit |
| 2 | FG | Protective grounding | 13 | RL | Activation discharge load is positive |
| 3 | ACN | AC input N phase | 14 | VG | Remote control public contact |
| 4 | NC | No electrical connection | 15 | Vo- | Negative load output |
| 5 | RSA | RS485 communication is positive | 16 | Vo- | Negative load output |
| 6 | RSB | RS485 communication negative | 17 | Vo+ | Load output positive |
| 7 | NC | No electrical connection | 18 | Vo+ | Load output positive |
| 8 | VC | Alarm input positive | 19 | B+ | Battery access positive |
| 9 | VH | Power failure alarm output | 20 | B+ | Battery access positive |
| 10 | HK | Remote activation activated | 21 | B- | Battery access negative |
| 11 | HG | Remote activated exit | 22 | B- | Battery access negative |

Table 1 terminal definition with communication

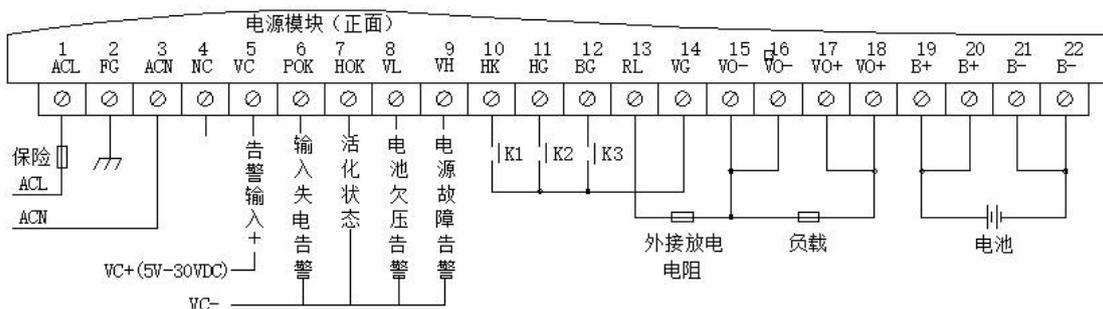


Figure 5 wiring diagram without communication

| Terminal number | Terminal name | definition | Terminal number | Terminal name | definition |
|-----------------|---------------|--------------------------------------|-----------------|---------------|---------------------------------------|
| 1 | ACL | AC input L phase | 12 | BG | Remote battery exit |
| 2 | FG | Protective grounding | 13 | RL | Activation discharge load is positive |
| 3 | ACN | AC input N phase | 14 | VG | Remote control public contact |
| 4 | NC | No electrical connection | 15 | Vo- | Negative load output |
| 5 | VC | Alarm input positive | 16 | Vo- | Negative load output |
| 6 | POK | Enter the power failure alarm output | 17 | Vo+ | Load output positive |
| 7 | HOK | Battery activation status output | 18 | Vo+ | Load output positive |
| 8 | VL | Battery undervoltage alarm output | 19 | B+ | Battery access positive |
| 9 | VH | Power failure alarm output | 20 | B+ | Battery access positive |
| 10 | HK | Remote activation activated | 21 | B- | Battery access negative |
| 11 | HG | Remote activated exit | 22 | B- | Battery access negative |

Table 2 without communication terminal definition

Wiring instructions: K1 K2 K3 is the contactor for relay controlled by the user CPU and so on(contact capacity is not required, but not optocoupler instead), the load is the user normal load, the battery is battery pack of 48V or 24V. Terminal capacity is 300V /15A. Please see the following instructions for the specific use.

6、 Naming rules

JSW-M 500 T – 220 / 48

① ② ③ ④ ⑤ ⑥

- ① Company abbreviation
- ② M power supply module series
- ③ short-time output power
- ④ RS485 communication function
- ⑤ Alternating current input voltage
- ⑥ direct current output voltage

7、 Instructions for use

7.1 Power Status Indication

| Led Name | Colour | Status Definition |
|----------|--------|--|
| CHG | Green | Bright for battery charging |
| | | Flashing for the battery discharging or the battery activation |
| ACT | Yellow | The LED is bright when the battery is activated, otherwise extinguished. |
| UVL | Red | The LED is bright when battery or power output is undervoltage, otherwise off. |
| FLT | Red | The LED is bright or flashing when the power supply is overheated or over-powered, otherwise extinguished. |

7.2 function and use of button

Activate ON, touch-button, manually start battery activation;

Activate OFF, touch the button, manually exit battery activated;

Battery ON, touch-button, manually input battery;

Battery OFF, touch-button, manually exit battery;

the button for activating, press the activation ON button then enter the battery activation status, at the same time the charging indicator flashes, the battery discharge to load and discharge resistance, you can manually press the OFF button to exit the battery activation, otherwise the power supply automatically complete the battery activation.

Battery button, it requires the input voltage triggering to input the external battery into system, or the external battery can not directly supply power for the load in the system. In engineering debugging or initial access to the battery without AC input, click the battery ON button, the battery supply power for

the load, then the discharge indicator is light, you can manually press and hold the battery OFF button for 5 seconds to cut off the battery, or battery discharge to the shutdown point for Undervoltage automatically cut off the battery; press and hold the battery ON button when the battery voltage below the under-voltage shutdown point to emergency force the battery discharge to load.

Note: the battery button function does not work in the exchange of electricity; forced output time should not be too long, so as not to damage the battery.

7.3 The use of power

7.3.1 The power supply can work after inputting AC power, the power supply itself output current to the load, while the battery is charged with constant current and constant voltage, when the battery is charged, the power automatically goes into floating state, then the power supply floating voltage and the battery's normal self-discharge when it is supplemented by current;

7.3.2 When the AC power is off, the battery continuously supplies power to the load, and the switching time is 0. When the battery discharges until the undervoltage alarm point, the battery undervoltage alarm signal is output. When the battery is discharged below the undervoltage protection point, the power supply automatically delays and turn off the load output after 30s; if you need to shut off the battery output in advance, you can manually press the battery OFF button for 5 seconds or remotely control the CPU-controlled relay to exit the battery remote control terminal BG and VG shorted once (not less than 5 seconds) The battery is turned off in advance.

Note: The battery early exit function is disabled when the battery is activated, otherwise it will make the load short-term outage. After the battery is withdrawn ahead of time, the load is powered off. At this time, you can only manually restore the power supply or re-power the AC.

7.3.3 When the load requires large inrush current exceeding the maximum current provided by the power supply, the power supply itself is shut off and the load current is completely supplied by the battery. When the load current is less than the maximum current supplied by the power supply, the power supply automatically starts working.

7.4 Activation of the battery, when the battery is in a standby state for a long time, the battery should be activated to increase battery life. Activation of the user-controlled relay shorts the activation terminals HK and VG of the power supply (not less than 0.5 seconds, but the terminals are not Should be shorted for a long time, otherwise the power supply will lose the automatic function) The power enters the activation state, the power turns off the output, the battery discharges, when the battery discharges to the activation completes the spot, the power source automatically starts the work to supply the load and the battery charge; When exiting activation, you can manually exit the activation by pressing the Activate OFF button on the power panel or the relay contact controlled by the user CPU. The HG and VG terminals of the power supply are shorted once (not less than 0.5 seconds) Manual activation or remote

CPU activation, the module system will automatically activate the timer (the default three months once), such as over manual activation or remote CPU activation module internal chip will automatically detect the latest activation time re-timer periodic activation.

Note: The activation function does not work when the power source is not receiving the battery or the battery voltage is below the activation completion point.

7.5 Activation discharge terminal RL use, see the wiring diagram in Figure 4, this terminal is set when the battery is activated and accelerates the discharge of the battery. The discharge resistance is selected according to the different battery capacity. When the power is working normally, the resistance does not work. Power into the activated state resistance connected to the battery discharge, the choice of discharge current (recommended):

$$\text{Discharge current (A)} = 0.1 \times \text{Battery capacity (AH)} - \text{Recurrent load current (A)},$$

If the calculated discharge current value is negative, you can not add discharge resistor, the discharge resistor hotter should be properly heat and away from the power module.

7.6 Alarm Terminal Usage

The alarm output terminal is an electronic node (see the internal schematic diagram). Input a 5V to 60V DC voltage on the VC terminal. The alarm node is on or off when the alarm is triggered. The alarm node has a carrying capacity of 0-5mA and alarms The junction voltage drop is 0.1~2.0V. This alarm node is not suitable for directly with a larger load power, if necessary, can drive the external power transistor and other load, the alarm node and the power input, output, chassis, protection and other isolation (see Figure 2 isolation diagram) Dielectric strength 2000Vac voltage, insulation resistance 100 M.

The alarm status is as follows:

| Alarm terminals | Alarm name | Normal or non-activated status | Alarm or activated status |
|-----------------|---|--------------------------------|---------------------------|
| VC | VINP alarm | -- | -- |
| VH | Fault alarm (over voltage, over current,short circuit,battery damage) | OFF | ON |

Table 3 Alarm status with communication function

| Alarm terminals | Alarm name | Normal or non-activated status | Alarm (or activated) status |
|-----------------|--|--------------------------------|-----------------------------|
| VC | VINP alarm | -- | -- |
| POK | Input voltage offset alarm | ON | OFF |
| HOK | Activation status | OFF | ON |
| VL | Battery undervoltage alarm | ON | OFF |
| VH | Fault alarm (over voltage, over current,short circuit, battery damage) | OFF | ON |

Table 4 Alarm status without communication function

7.7 Battery use

The power supply can be used with 4 ~ 24AH lead-acid batteries or gel-free maintenance of the battery, the battery connected to the battery terminals (B +, B-), the load current is less than 20A. The load is connected to the power output terminal. When the maximum current of unconventional load exceeds 20A, it can be directly connected to the battery. At this time, the battery discharge protection function of the power supply fails.

7.8 Battery charge and discharge management

The power of the battery smart three-phase charge and battery discharge under-voltage protection prevent over-discharge battery from damage to the battery. The power can not only automatically activate the battery regularly for 3 months, but also can be manually activated by three ways of activating the button, remote communication, dry contact remote control of the battery from time to time. At the same time of activation, the digital dsp chip calculates the discharge capacity of the battery during the entire activation process and compares with the theoretical discharge capacity of the battery to determine the battery life status, and sends an alarm signal in advance through the communication or fault dry contact to prompt the user Change the battery in advance.

7.9 Communication function

The power supply supports RS485 communication, modbus protocol, and the background monitoring system can telemetry, remote information, remote control operation power. Telemetry: battery voltage, output voltage, charging current, output current. Remote signal: fault status, low battery voltage alarm, battery fault, AC input status, DC output status, activation status, three-phase charge status. Remote control: Activation start or stop.

8, shape and installation dimensions
 (Unit: mm Tolerance level: GB / T 1804-2000m)

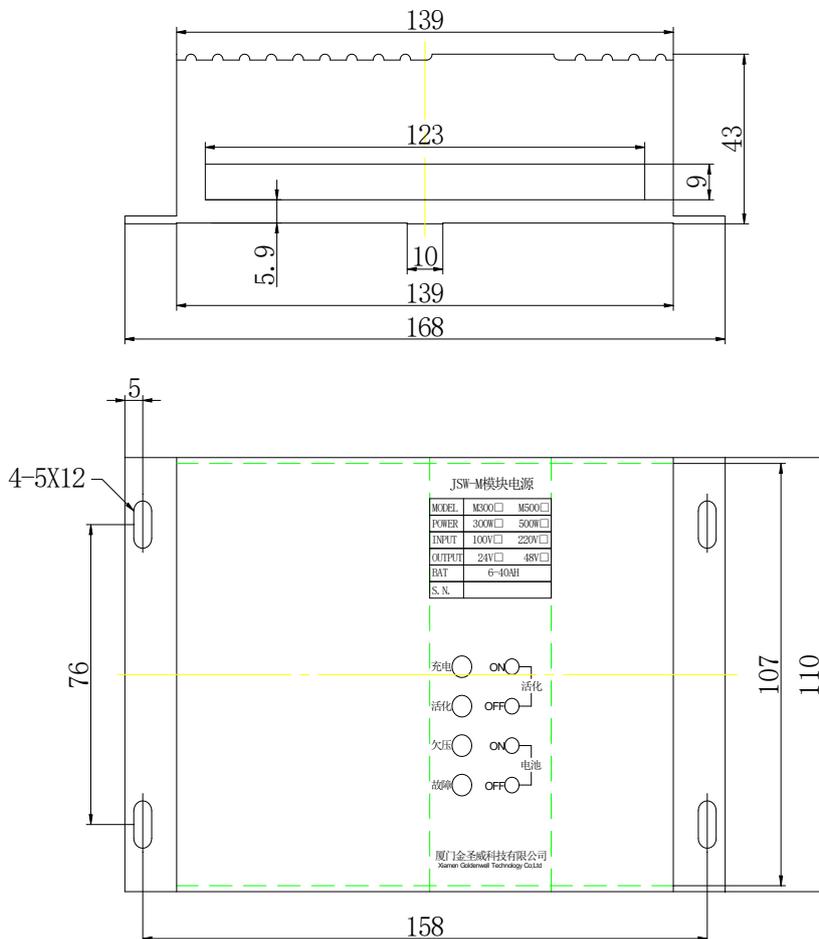


Figure 6: Installation dimensions

9、Precautions for use

- 1, Please use the output wire, which cross-sectional area is more than 2.5mm², 10A / 250Vac insurance should be installed in the input terminal.
- 2, Please refer to Figure 4 wiring, do not connect the wiring error, otherwise it will cause permanent damage to the power supply.
- 3, The label is placed on the front, the terminal down vertical installation to ensure that the heat sink perpendicular to the ground, the installation should be in close contact with the power and crate to help power cooling.
- 4, The terminal capacity is 15A, output and battery terminals should use two terminal wiring. Otherwise, the terminal is easy to burn.
- 5, Alarm terminals prohibit overload and short circuit. Otherwise, the electronic alarm contact will be destroyed.
- 6, In order to further reduce the output ripple noise, the user can parallel output 470UF / 63V electrolytic capacitors and 1μF monolithic capacitors.
- 7, The output of the product does not allow parallel work.
- 8, The machine's PE terminal should be reliable grounding to increase anti-interference ability.
- 9, The power supply case temperature is high, the maximum up to 100°C, please keep a certain gap around the power to keep the air flow conducive to heat, the temperature-sensitive devices or heating elements should be as far away from the power source.
- 10, In long-term storage, the power should be disconnected from the battery avoid damage to the battery.

10, Running and observation

When the power is working, each indicator should indicate normal, if the indicator shows abnormal, or flashing, please read this manual and seek technical support.

11, Maintenance and repair

The device does not require routine maintenance and calibration under normal operating conditions; there should be inspection cycles and duty cycles that ensure reliable operation of the device. At room temperature, the normal battery life of more than six years, if the temperature is too high, the working life will be shortened. The battery should be replaced as soon as possible before failure, in order to ensure the normal operation of the device. When repairing personnel for maintenance, he should ensure that the device is out of operation and cut off the external power supply, remove the device, and replace the spare device, and then for installation and commissioning. To be repaired devices, please send back the maintenance of the company, such as self-repair problems, the company does not assume the corresponding responsibility. Long-term deactivation of the unit shall comply with the storage requirements of 12.2 and 12.3 of this manual.

12, Transportation and storage

12.1 Transportation and handling of products should avoid violent vibration, bump upside down, tumbling, collision, moisture and corrosion.

12.2 Packaged devices should be stored in the warehouse which is ventilated and dry, ambient temperature between -40 °C to 85 °C, the humidity is not more than 75%. Indoor should be no acid, alkali, salt and corrosive, explosive substances and flammable substances, avoid erosion of dust, rain, snow.

12.3 Should ensure that the battery upright.

13, Out of the box and inspection

13.1 After the device arrives, you should check the box is intact, if damaged, promptly let the transport staff confirm and notify the supplier.

13.2 After unpacking, please check the device model, factory label, factory inspection report and packing list, and confirm with the order.

13.3 Please check the packing list items one by one to confirm that the accessories and the list are consistent, no shortage. Otherwise, please contact the supplier as soon as possible.

13.4 Please confirm that the device and the battery are not damaged.

14, Ordering information

14.1 When the user needs to order, the user should fill out the ordering parameters according to the use environment and the specific conditions, such as breaker energy storage, sub-closing power, long-term working load and so on.

14.2 If voltage transformer (PT) input is used, the user shall provide the technical parameters such as the type and capacity of the PT.

14.3 If there are other special requirements, please explain in the ordering contract.

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