

PowerFusion 2.0 Maintenance & Inspection Guide

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1. Cabinet Maintenance

1.1 Touch-up Guidance

The surface of the shell can be scratched with minor scratches, serious scratches, and large-area scratches.

1. Minor scratches: The surface has small scratches, no underlying material is exposed, and the scratched area is small (scratched area $S < 20\text{mm}^2$). For example: a thin line, intermittent scratches, and a chipped corner.
2. Severe scratches: Touching with hand feels scratched, and the scratch marks are visible on the bottom surface of the board, clearly seen from a distance of 500mm or more.
3. Large area scratches: more than 1 scratches on an area of cm^2 . Such scratches are usually accompanied by leakage.

When the cabinet shell has minor or severe scratches, it is recommended to use R AL9016 (Traffic White) spray paint for repair. Alternatively, you can use paint with color code: R AL9003 for repairs.

When the cabinet has large scratches that need to be repaired, it is necessary to hire a professional painter for the repair. During the repair, the scratched area needs to be sanded smooth, and then a layer of chestnut powder should be applied to make it level with the other normal paint surfaces. After it dries, the recommended paint mentioned above should be used for the repair. (After the repair is completed, there may be slight color differences compared to the original paint surface.)

When repairing serious scratches, use 80 sandpaper to lightly sand the scratched area with 00 sandpaper to smooth it out, and then proceed with the touch-up work. If there is any exposed base, a large area scratch repair method will be needed for the repair.



1.2 Sealant Strip Repair

When the sealing strip of the cabinet is damaged, it is recommended to use the model ALST071A sealing strip for replacement. It is recommended to use Aoxin Da oil-based original glue for adhesion during the replacement.

Performance parameters of sealing strips:

Material requirements: flame-retardant EPDM rubber + steel belt.

Color: Black.

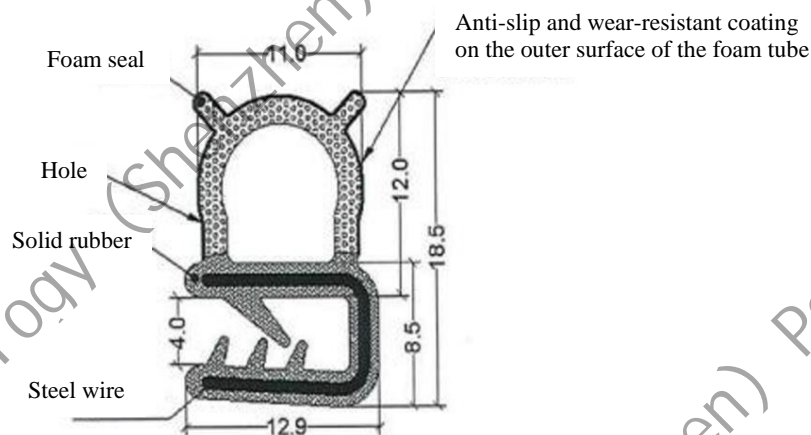
Hardness of the dense rubber: 70 ± 5 degrees (Shore A)

Foam adhesive hardness: 25 ± 5 degrees (Shore A)

Material characteristics: The processing technology of the rubber strip is microwave vulcanization extrusion. The material is Ethylene Propylene Diene Monomer (EPDM), which is a copolymer of ethylene, propylene, and a small amount of a third monomer non-conjugated diene, internationally named Ethylene Propylene Diene Methyiene, abbreviated as EPDM.

The basic components and dimensions are shown in the figure below:

When replacing the sealing strip, first install the entire ring of the strip, then partially open the strip,



apply the oily raw rubber to the surface of the casing, and finally press the strip back in place. After installation, press it down.3~5 seconds. Then repeat this operation successively until the entire circle of adhesive strip is installed.

1. When storing materials, measures should be taken to prevent rain and moisture, the stacking height should not exceed 5 layers, and the storage period should not exceed 1 year.

2. The product should be stored in a clean and dry environment, with temperature and relative humidity meeting the storage requirements of the product. (Optimal storage conditions: 6 °C ~ 34 °C

/ 0 ~ 65% RH stored in the packaging box)

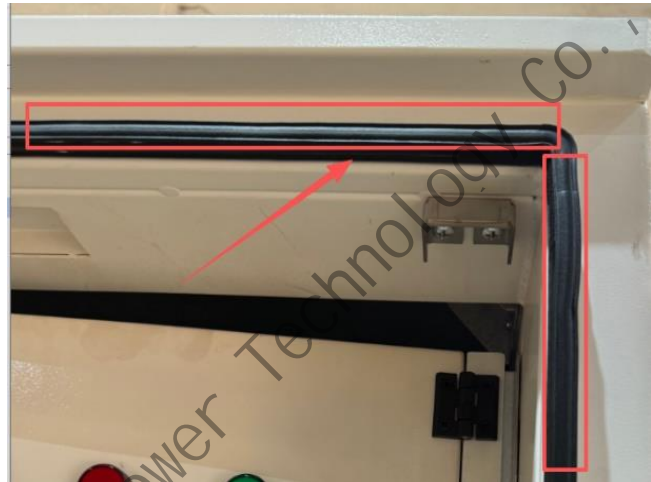
3. The storage environment should be free of media that can cause corrosion to the product.

Material reference as shown in the figure below:

Oily raw rubber



Rubber strip



Glue application Press to assemble



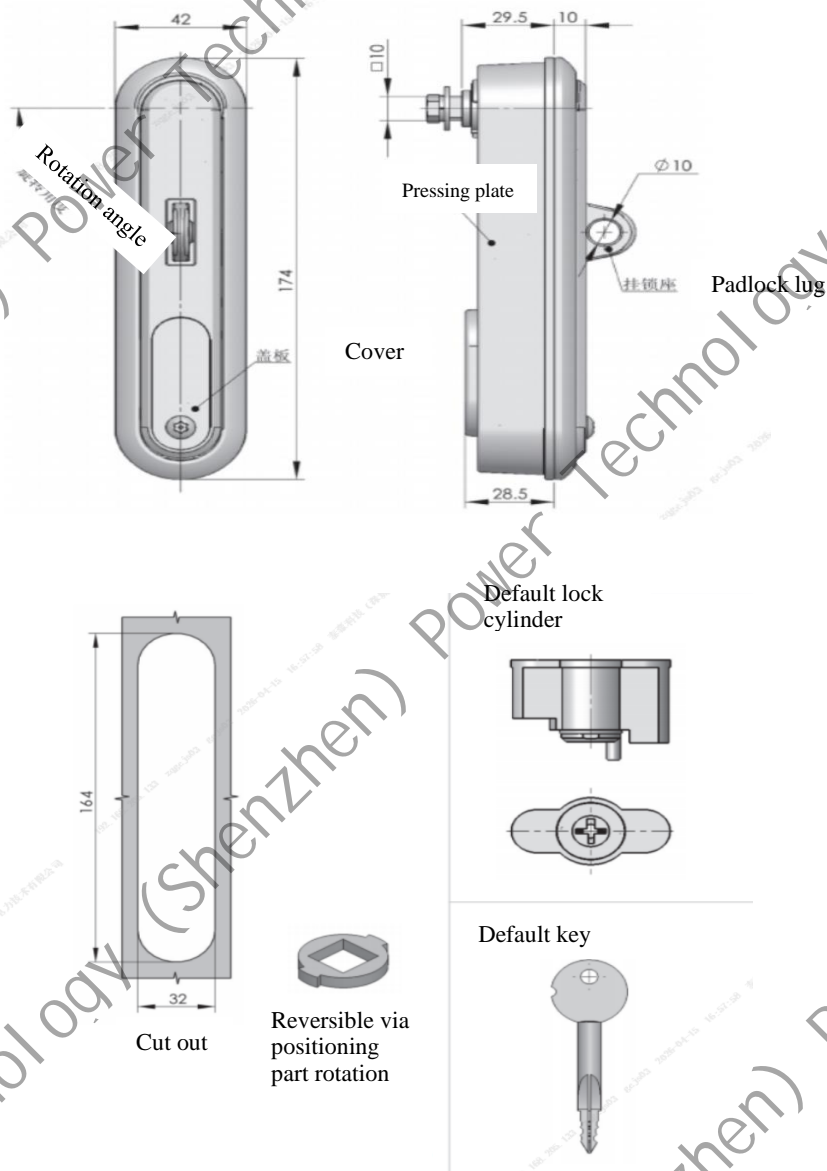
1.3 Door lock maintenance

Recommended door lock model: M S829-1A, Brand: Shengjiu.

Material: Zinc alloy handle and base. Surface treatment: Spraying (black matte). Handle load tensile strength: $\leq 690\text{N}$. Handle load torque value: $\leq 45\text{N.m}$. Note: Tightening the protective cover helps to protect the lock head. Maximum static load: 600N.

Structural description: Rotate the handle 90° to open and lock, change the orientation of the positioning piece to achieve left and right opening, equipped with a padlock.

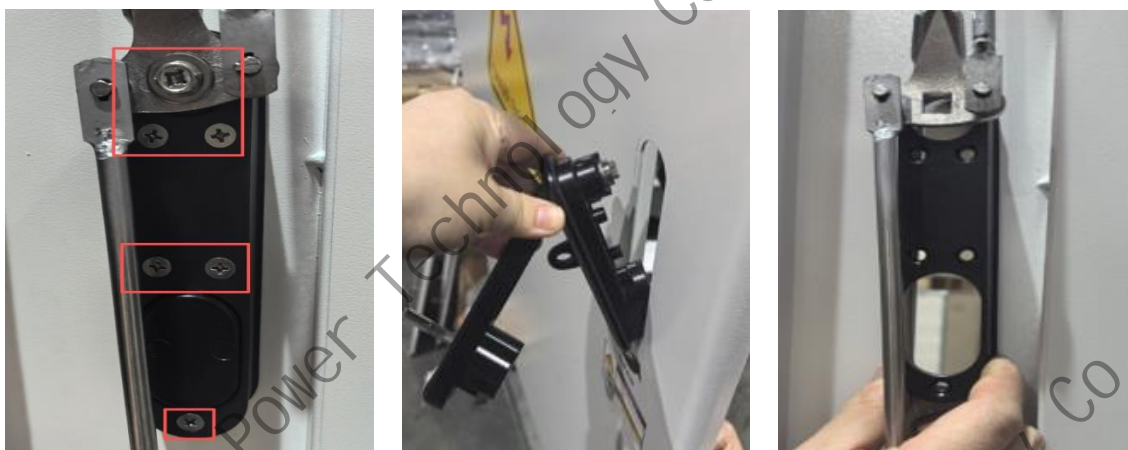
The dimensions are as follows:



The door lock is damaged and needs to be directly replaced. The steps are as follows:

1. Remove the door lock with a cross screwdriver 6 screws, (when removing the last one, you need to support the lower door lock. The door lock will fall off when the last one is removed), then take off the old door lock.
2. Insert the new lock into the lock hole and secure it tightly using the original screws removed earlier.
3. After installing the door lock, test to see if the lock is functional.

Operation Reference The following figure:



1.4 Cable Sealing Hole

When the sealing putty loses its sealing performance, it needs to be replaced.

The selected sealing putty must have the following properties:

Flexible organic fireproof sealing material, made of butyl rubber / polyisobutylene as the matrix, compounded with aluminum hydroxide, calcium carbonate, chlorinated paraffin, and flame retardants; non-curing, flexible and tear-resistant, waterproof and oil-resistant, flame retardant V-0, insulated, suitable for sealing the entry and exit holes of distribution cabinets and metal surfaces.

When replacing the sealing putty, ensure that the putty is tightly adhered to the cable to achieve a gap-free effect.

Refer to the effect in the figure below:



2. Maintenance of easily damaged components

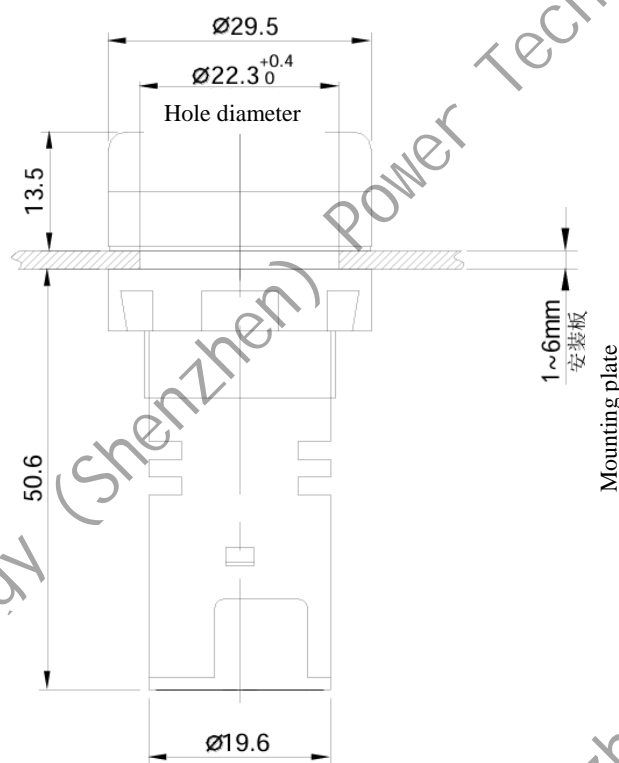
2.1 Maintenance of indicator lights

When the appearance of the indicator light is found to be damaged, the brightness is insufficient, or it is burnt out, it is recommended to directly replace the indicator light.

At this time, it should be noted that the new material model, color, voltage frequency level, and other parameters should be consistent with the original indicator light parameters.

Indicator light models: AD103-22DQK/Y31 (yellow) AD103-22DQK/G31 (green) AD103-22DQK/R31 (red). The AD103-22 series signal lights are suitable for electrical circuits with an AC rated working voltage of 380V and below, and a DC rated working voltage of 220V and below, at 50-60Hz.

The dimensions are as follows:



1. First, disconnect the fuse at the front end of the power supply line of the indicator light circuit.
2. Use a small Phillips screwdriver to press the yellow button in the image and pull out the secondary cable.
3. Rotate the plastic nut indicated by the arrow in the image counterclockwise with your hand. After loosening it, remove the indicator light.

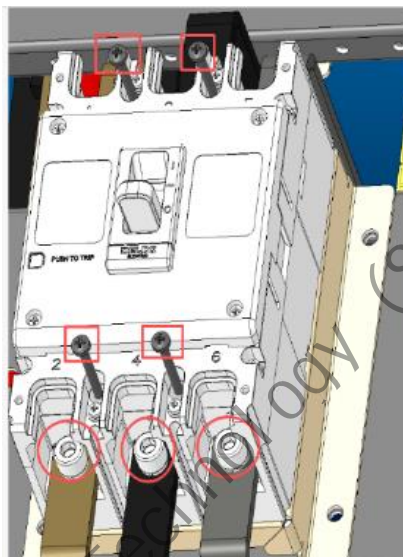
4. Replace it with a new indicator light, reassemble the indicator light and connect the secondary wires in the reverse order of disassembly, and finally power it on to check whether the indicator light functions meet the standards.



2.2 Maintenance of Plastic Shell Switches

When a plastic shell switch is found to be faulty and cannot be repaired, it needs to be replaced. Before replacement, confirm that the new material's model, voltage, frequency, pole number, current specifications, and other parameters are consistent with the original material. The replacement operation is as follows:

- 1、 Use an Allen wrench to first remove the connecting copper bars at both ends of the plastic shell (indicated by the circles).
- 2、 After removing the copper bars, use a Phillips screwdriver to remove the four screws that secure the plastic shell (indicated by the squares).
- 3、 Secure the new correct plastic shell to the metal sheet, then reinstall the copper bars.
- 4、 After all materials are reinstalled, ensure that all screws are tightened and marked.

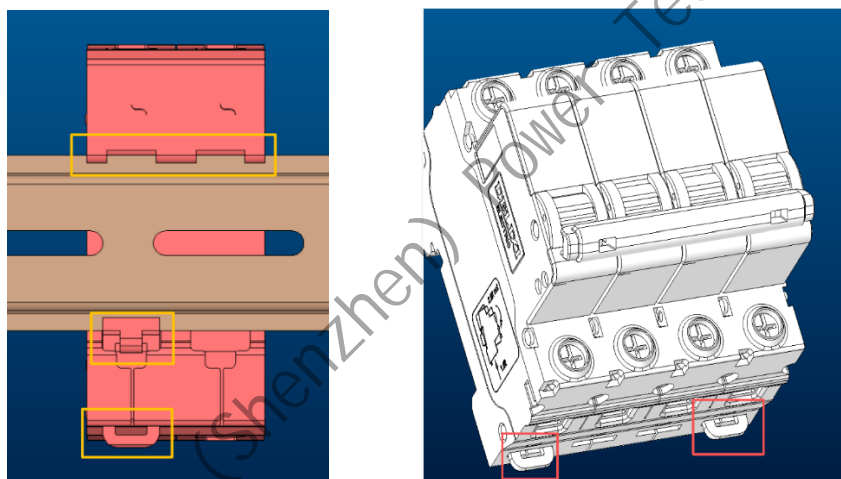


2.3 Replacement of Auxiliary Switch (MCCB)

Special Note: Before replacing the auxiliary switch, ensure that the cables at the switch's incoming terminal are not live.

1. First, use a cross screwdriver to remove the connection cables at both ends of the switch to be replaced.
2. Use a small flat screwdriver to pry into the pull ring under the switch and pull down with force to detach the switch from the rail and remove it.
3. Insert the new switch into the rail: first ensure it is secured at the top, then press down to lock it into the rail.
4. After the switch is locked in, connect the cables to the new switch.

Refer to the position in the image below:



3. Inspection

3.1 Quick Switch Inspection

Quick switch maintenance should be performed once a year under normal operating conditions.

- 1) Operate the switch to make it close and open, cycling 5 times; the switch should reliably perform the closing and opening actions.
- 2) Remove dust from the surface and connections (wipe with a clean, dry cloth).
- 3) Check all connections, remove oxides with sandpaper, clean with a solvent, and tighten bolts and nuts.

3.2 Air Conditioning Inspection

To ensure the normal operation of the air conditioner, please refer to the table below for regular maintenance.

Warning: All maintenance work must be carried out by qualified professionals. Before performing any maintenance, please disconnect the power supply and signal lines of the air conditioner. After the maintenance work is completed, reconnect the power supply and signal lines of the air conditioner.



Inspection Items	Step Content Description	Maintenance Cycle
Wiring	Visually check for any looseness	Every 12 months
Abnormal Fan	Turn the fan to check if it rotates smoothly and if there are any unusual noises.	Every 12 months
Condenser	Check the condition of the condenser and clean the condenser with compressed air.	Every 6 months

3.3 UPS Inspection

Operation Use

The maintenance and replacement of all components in this UPS system must be handled by professionals, and general users should not engage in such operations. If the battery has exceeded its service life (At a temperature of 25°C, please be sure to contact the dealer for replacement after approximately 3-5 years).



Used batteries should be handled by recycling operators, or the packaging of new batteries can be handed over to dealers for processing.

Storage

Before storing this product, please charge it first. 5 Hours. When storing, it should be normally packaged and placed upright in a dry location. During the storage period, please implement charging maintenance according to the table below:

Storage Temperature	Charging Interval	Charging Time
-25°C - 40°C	Every 3 months	1-2 hours
40°C - 45°C	Every 2 months	1-2 hours

Note: Environmental factors can affect battery life. High ambient temperatures, high humidity, low-quality power sources, and frequent short discharges can shorten battery life.

4. Common Fault Handling

4.1 Quick Switch Common Fault Handling

Quick Switch Fault Handling Situations

Serial Number	Alarm and Fault	Switch Performance	Handling Method
1	In the closing state, the main magnetic holding micro-motion signal is received	Red light stays on, Yellow light is always on	It is generally considered a fault of the micro switch. Currently, there is no prohibition on opening and closing the circuit. The alarm will be canceled after the micro switch recovers.
2	In the open state, the main magnetic holding micro signal is lost.	The green light is always on, Yellow light is always on	It is generally considered a fault of the micro switch. Currently, there is no prohibition on opening and closing the circuit. The alarm will be canceled after the micro switch recovers.
3	During the closing action, the main magnetic holding micro signal times out and does not close.	After the action, the green light remains on, and the yellow light is always on.	It is generally considered a fault of magnetic holding or a fault of the micro switch (the software considers it a magnetic holding fault, and the relay does not continue to operate). Currently, there is no prohibition on opening and closing the circuit. It will recover after the next action is normal.

4	When the circuit breaker is tripped, the main magnetic holding micro-motion signal times out and does not disconnect.	After the action, the red light remains on, and the yellow light remains on.	It is generally considered a fault of magnetic holding or a fault of the micro switch (the software considers it a magnetic holding fault, and the relay does not continue to operate). Currently, there is no prohibition on opening and closing the circuit. It will recover after the next action is normal.
5	A feedback signal indicating the relay has opened is received in the closed state.	Red light stays on, Yellow light is always on	It is generally considered a relay drive failure or feedback failure. Currently, there is no prohibition on opening and closing the circuit. After the relay signal is restored, the alarm will be canceled.
6	A feedback signal indicating the relay has closed is received in the tripped state.	The green light is flashing, and the yellow light remains on.	It is generally considered a relay drive failure or feedback failure. Currently, there is no prohibition on opening and closing the circuit. After the relay signal is restored, the alarm will be canceled.
7	When the circuit breaker is tripped, there is no feedback signal indicating the relay has opened.	After tripping, the green light is flashing, and the yellow light remains on.	It is generally considered a relay drive failure or feedback failure. Currently, there is no prohibition on opening and closing the circuit. After the relay signal is restored, the alarm will be canceled.
8	When the circuit breaker is closed, there is no feedback signal indicating the relay has closed.	After closing the switch, the red light stays on, and the yellow light stays on.	It is generally considered a relay drive failure or feedback failure. Currently, there is no prohibition on opening and closing the circuit. After the relay signal is restored, the alarm will be

			canceled.
9	When the circuit breaker is tripped, the A/B/C phase current cutoff fails.	After tripping, the green light is flashing, and the yellow light remains on.	SCR damage or current sampling issues will cause the switch to lock after tripping, and it will no longer respond to any opening or closing commands (even after a restart).
10	Three-phase power failure (effective values are all below 20V).	Yellow light is always on	Check the three-phase wiring.
11	Received a signal indicating that the 24V auxiliary power supply has been lost for more than 1 second.	Yellow light is always on	Check the auxiliary power input.
12	When the internal 48V power supply of the switch is too low, it receives the opening and closing signal but does not actuate.	Yellow light is always on	If this occurs repeatedly after issuing commands, it indicates a 48V drive failure.
13	The mode selection of the two switches is inconsistent; when the two standalone units are interconnected, receiving internal communication will also trigger an alarm.	Double lamp flashing quickly, unable to respond to any opening or closing actions (will not trip even during power failure).	If the settings are confirmed to be correct, it should indicate a selection of the dial or MCU failure.
14	In parallel or interlock mode, internal communication is lost.	In parallel, this will manifest as a double lamp flashing quickly (the circuit does not trip even during power loss), while in interlock, it will manifest as a yellow lamp flashing slowly.	Check the internal communication line. If the internal communication line is confirmed to be connected properly, it is considered that the communication port is damaged. In the case of abnormal communication in parallel mode, if a trip is required, the total current of the dual machines must not exceed the rated current of a single machine, which is 630A, or under the condition of disconnecting from the power grid, press and hold the trip button for 15 seconds and

			then release it to safely trip. If a complete switch replacement is needed, the three-phase power before and after the switch must be disconnected.
15	When the switch operates in parallel mode, the action from the slave machine fails.	Yellow light is always on	Confirm the status alarm of the other switch via 485.
16	Phase N is incorrectly connected to phases A, B, and C.	Double lamp flashing quickly, unable to respond to any opening or closing actions (will not trip even during power failure).	Check the three-phase wiring.
17	The ABC phase sequence is incorrect or there is a phase loss error.	The yellow light is flashing slowly and cannot respond to the closing command.	Check the three-phase wiring.
18	MCU Over Temperature	Yellow light is always on	Disconnect the switch and wait for cooling
19	Inconsistent connection and disconnection between master and slave in parallel	Yellow light is always on	Control the switch to trip to ensure both machines are in the same state
20	Both machines are in the closed state during interlocking	Yellow light stays on, both machines will actively trip	Normal operation can continue after tripping
21	Both control contacts close simultaneously (with a closing interval of less than 250us)	Yellow light is always on	Confirm that there are no simultaneous control contacts, check if the circuits of the two contacts are shorted

4.2 Common Fault Handling for UPS

4.2.1 UUPS Fault Codes

P Fault Code	UPS Alarm Information	BUZZ	LED
1	Rectifier Fault	Continuous Beep	FAULT Light On
2	Inverter Fault (including inverter bridge arm direct connection)	Continuous Beep	FAULT Light On
9	Fan Fault	Continuous Beep	FAULT Light On

12	Power-on initialization failure	Continuous Beep	FAULT Light On
13	Fault of the positive group battery charger	Continuous Beep	FAULT Light On
15	Bus voltage overvoltage	Continuous Beep	FAULT Light On
16	Bus voltage undervoltage	Continuous Beep	FAULT Light On
17	Large positive and negative bus voltage difference	Continuous Beep	FAULT Light On
18	Soft start failure	Continuous Beep	FAULT Light On
19	Environmental overheating/low temperature	2Times / Seconds	FAULT Light On
20	Inverter module overheating/low temperature	2Times / Seconds	FAULT Light On
26	High battery voltage	1Times / Seconds	FAULT Light flashing
27	Input voltage phase sequence reversed	1Times / Seconds	FAULT Light flashing
28	Bypass reverse sequence	1Times / Seconds	FAULT Light flashing
29	Output short circuit	1Times / Seconds	FAULT Light flashing
30	Rectifier overcurrent (input overcurrent)	1Times / Seconds	FAULT Light flashing
31	Bypass overcurrent (bypass load > 125%)	1Times / Seconds	BPS Light flashing
32	Overload	1Times / Seconds	INV Light flashing
33	Battery not available	1Times / Seconds	BAT Light flashing
34	BatteryEOD	1Times / Seconds	BAT Light flashing
35	Low battery voltage warning	1Times / Seconds	BAT Light flashing
36	Overload delay to	1Times/2seconds	FAULT Light flashing
37	Inverter DC component too large	1Times/2seconds	INV Light flashing
39	Utility voltage abnormal	1Times/2seconds	
40	Utility frequency abnormal	1Times/2seconds	
41	Bypass super protection		BPS Light flashing
42	Bypass super tracking		BPS Light flashing
45	EPO	Continuous Beep	FAULT Light On

4.2.2 U PS Troubleshooting

Problem Situation	Possible Causes	Solutions
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The main power supply is normal, but no indicator lights are on, and there is no sound from the buzzer.	The AC input power may be loose or not properly connected;	Check if the input power cable is loose.
	The AC input is incorrectly connected to the output terminal of the UPS.	Correctly insert the AC input power cable into the AC input terminal of the UPS.
The alarm code displays "33", and the battery LED light is flashing.	The connection method for the external or internal battery is incorrect.	Please ensure that all batteries are properly connected.
The alarm code displays "26", and the battery LED light is flashing.	The battery voltage is too high or there is a charger fault.	Please contact the dealer.
The alarm code displays "34", and the battery LED light is flashing.	The battery voltage is too low or there is a charger fault.	Please contact the dealer.
The alarm code displays "32", and the inverter and bypass LED lights are flashing.	The UPS output load is overloaded.	Please remove the appropriate load.
The alarm code shows "29", the fault LED light is on.	UPS output short circuit.	Please check the wiring at the output terminal to confirm if there is a short circuit.
The alarm code shows "9", the fault LED light is on.	Fan Fault	Please contact the dealer.
The alarm code shows 01, 02, 15, 16, 17, or 18.	Internal fault in the UPS.	Please contact the dealer.
Battery backup time is significantly shortened.	The battery is not fully charged.	Please charge for at least 5 hours before checking the battery level. If the battery level is still low, please contact the dealer.
	Battery fault.	Please contact the dealer to replace the battery

4.3 Common Air Conditioning Faults and Their Solutions

4.3.1 Common Faults and Recovery Measures

Phenomenon	Possible Causes	Inspection Items or Handling Methods
Indoor circulation fan does not start	Return air temperature is low, entering energy-saving operation mode	If the indoor fan stop point is set to the cooling point in the operation settings, the indoor fan will not stop.
	Main power supply failure	Check the rated voltage of the input AC power supply phase to see if there is an AC power supply failure or if it exceeds the range of $220V \pm 15\%$
	Fan jammed	Check for foreign objects blocking the fan
	Terminal loose	Check if the fan connection terminal is loose
Fan can operate but control function is not working	Relay not moving	Check if the relay is faulty
		Check if there is AC voltage on the relay coil. If there is voltage, replace the control board
Fan making unusual noise	Fan bearing wear	Replace the fan
	Fan blades scraping against other objects	Check for interference from cables or other objects with the fan blades

4.3.2 Refrigeration system failure

Phenomenon	Possible Causes	Items to check or methods to address
Compressor does not start	Power is not turned on	Check the main power switch and verify if the operation display interface is powered on.
	Loose circuit connections	Tighten circuit connections
	Compressor motor burned out	Check the motor, and if defects are found, replace it immediately.

The compressor is not working.	No cooling requirements.	Check the temperature display inside the cabinet and the output status of the compressor on the operation interface.
	Shutdown delay.	The compressor has the shortest shutdown time under normal conditions. If the temperature rises to the starting point during this period, the compressor will still delay starting.
	The compressor has built-in temperature protection.	Check if there is 220V AC at the relay contacts.
	The high-pressure switch is open.	Refer to the discharge pressure being too high.
High exhaust pressure	Condenser dirty blockage	Clean the condenser
	Condenser fan not operating	Check fan failure operation steps
Compressor noise too loud	Due to refrigerant backflow in the compressor	Check suction overheating
	Due to loss of lubricating oil leading to bearing wear	Replace the compressor
	Compressor or copper pipe line interference	Adjust the angle position of the copper tube
	Broken connecting rod, valve, or other rotating gears	Replace the compressor
The compressor intermittently cycles	Sensor failure	Check if there is a sensor failure alarm displayed
	Insufficient refrigerant in the system	Check for leaks, repair the leak, or add refrigerant
Compressor protector trips or operates in a cycle	Exhaust pressure is too high	Check the condition of the condenser filter for dirt blockage and whether the condenser fan or fan motor is blocked

4.3.3 Controller Failure

Phenomenon	Possible Causes	Check project or processing method
Frequent voltage alarms	Power supply failure	Check external input power supply
	Circuit sensor failure	Replace circuit board