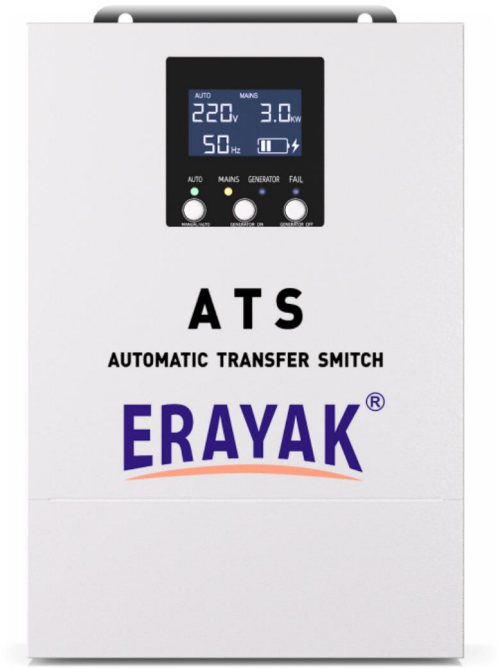
ATS
User Manual

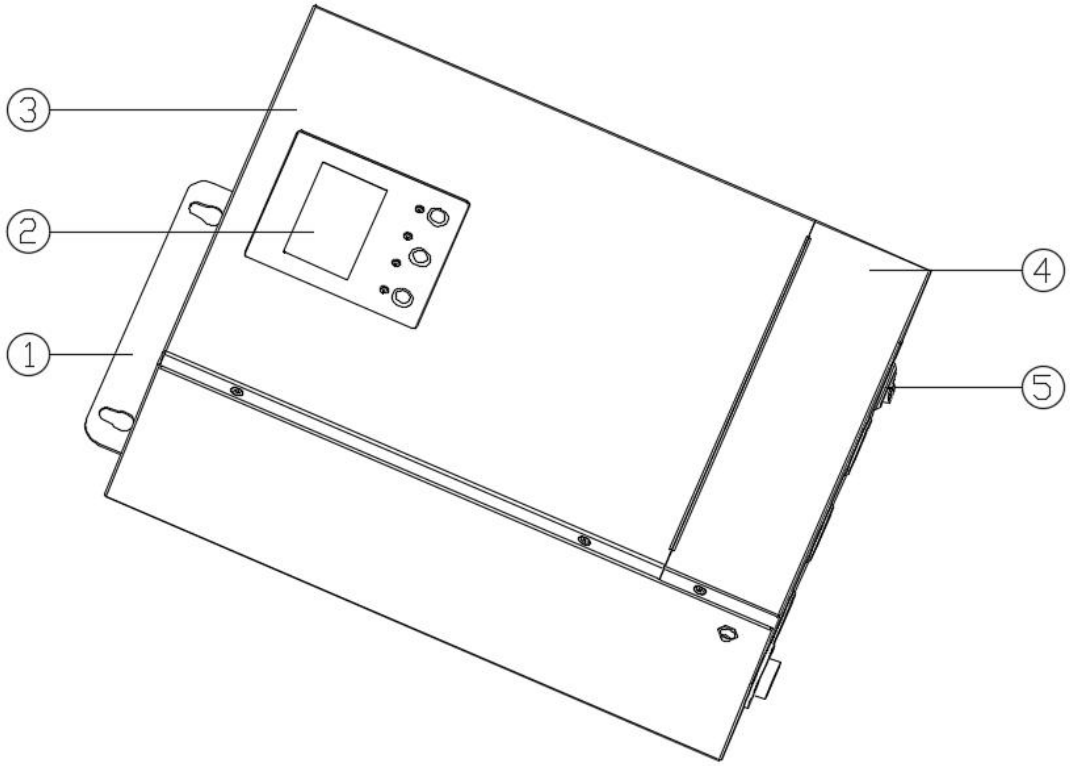


ZHEJIANG LEIYA ELECTRONICS CO ., LTD

Ⅰ.Function Introduction

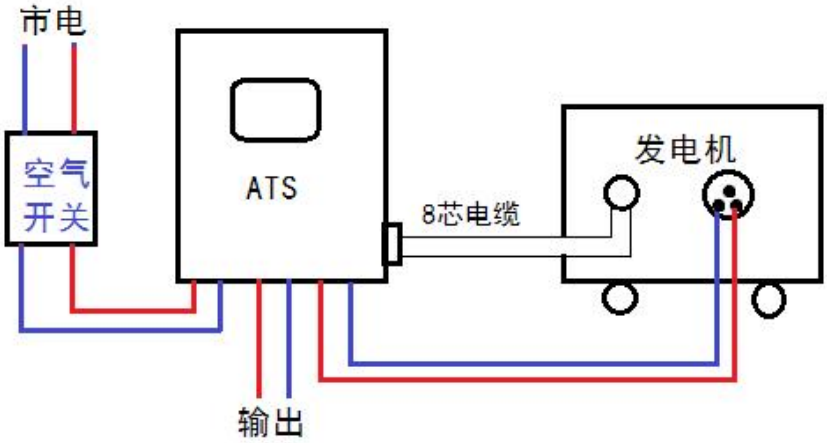
The ATS fully automatic emergency generator set is designed as an emergency security power source for sudden power outages in the city. When the municipal power grid suddenly loses power, the unit can start the generator on its own within 1.5 seconds to 5 seconds and supply power to the user's load; After the external power grid resumes power supply, the unit can switch the user's load to the external power grid on its own and automatically shut down.

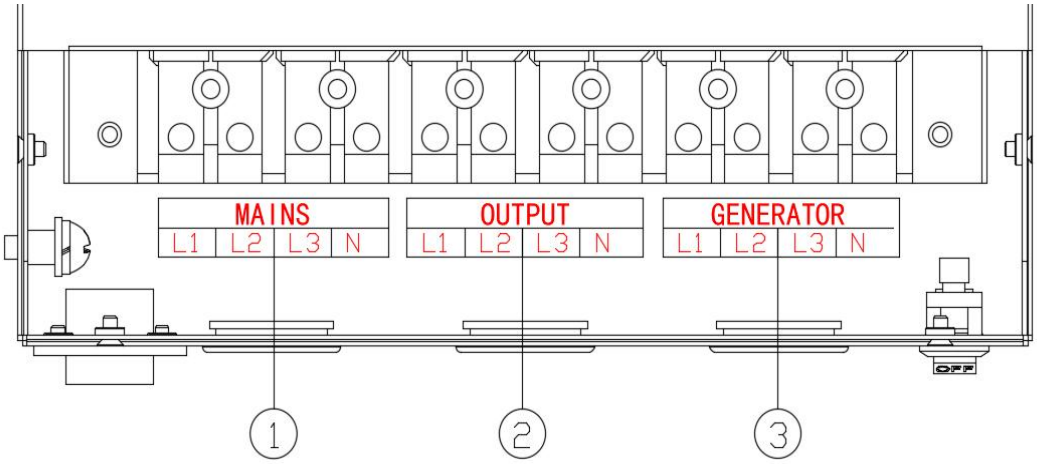
The unit uses a microcontroller as the control core and utilizes digital technology to comprehensively manage and monitor the unit's status, achieving automation throughout the entire process of the unit. The unit is mainly used for radar stations, outposts, barracks, postal and telecommunications, finance, hospitals, and users who need rapid power supply after power outages.



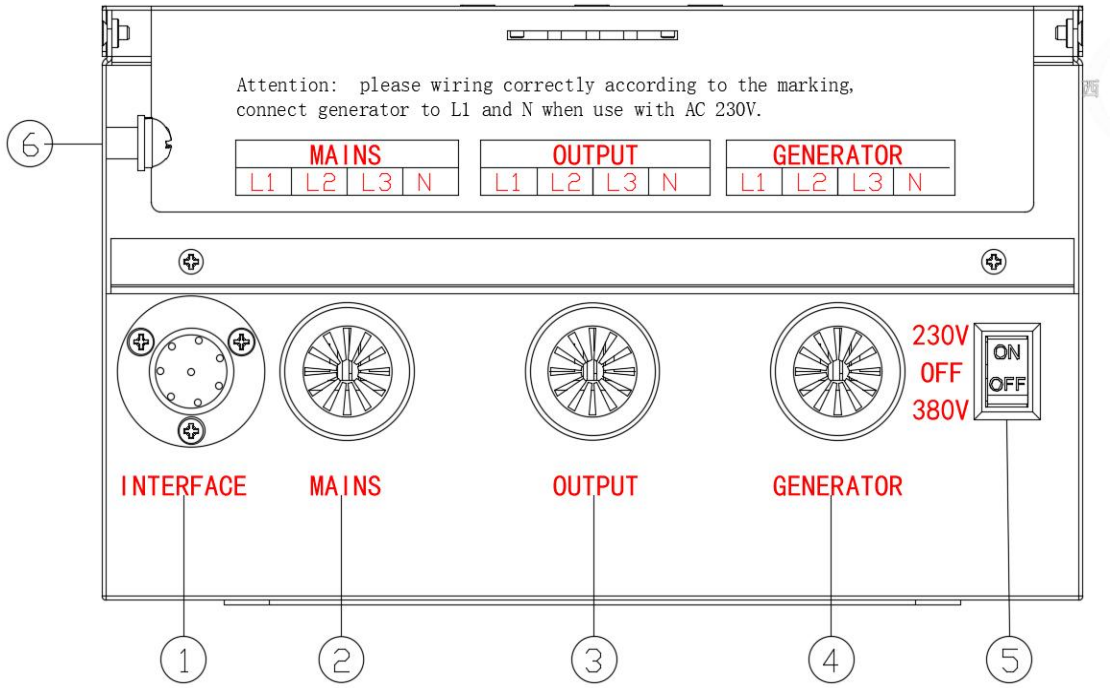
① Hanging Hook	② Display	③ Shell
④ Wiring Cover	⑤ Conversion Switch	

Ⅱ.ATS Wiring Diagram





① Grid input wiring port	② Output wiring port (for electrical appliances and loads)	③ Generator input wiring port

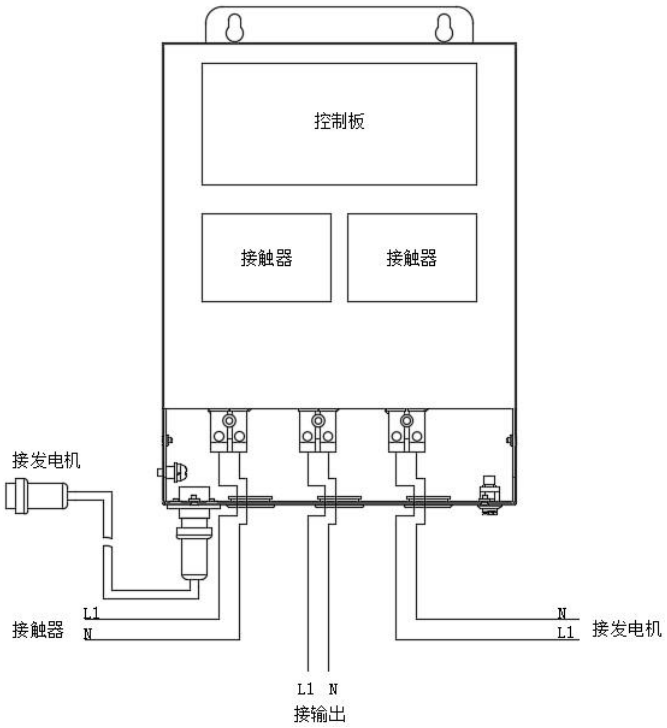


① Generator control line interface	② Grid transmission entrance	③ Output port
④ Power generation input port	⑤ 230V or/380V conversion switch	⑥ Grounding

Wiring steps:

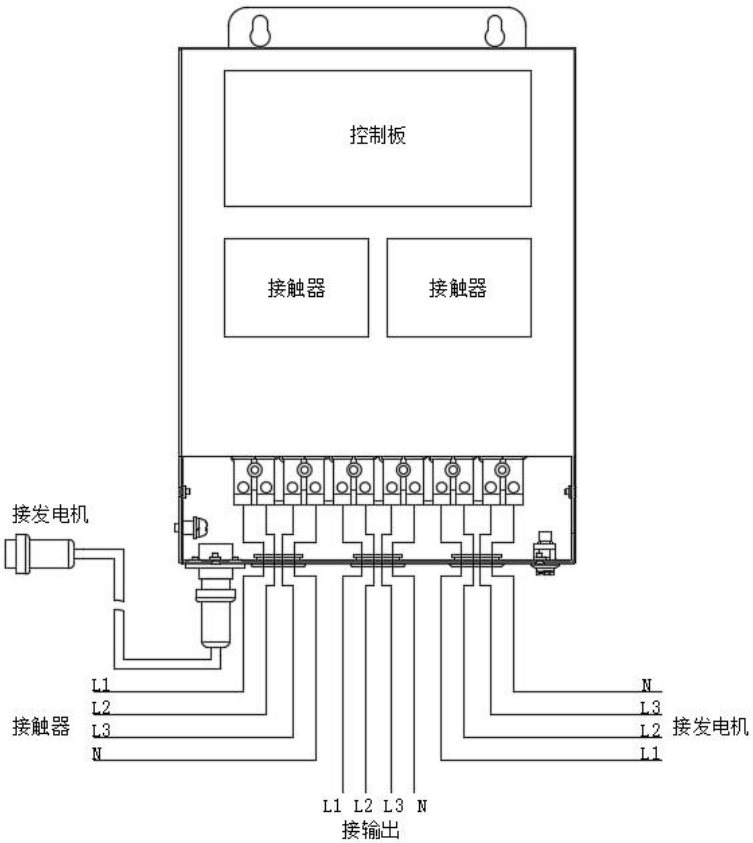
Connect the grid to the ② input terminal of ATS, connect the generator to the ④ input terminal of ATS, and connect the middle terminal to the ③ output terminal. First, turn off the power switch at the bottom of the ATS, and then connect the 8-core cable to the aviation socket of the generator. After all connections are made, close the air switch of the grid, and finally open the power switch ⑤ at the bottom of the ATS to the corresponding gear (220V/380V).

1、Single Phase Wiring Diagram



Note: When connecting single-phase, the input and output must be connected to the terminals of L1 and N

2.Three Phase/Dual Voltage Wiring Diagram



Note: When wiring, the input must connect the N wire to the N wire terminal

Ⅲ. Operation steps

Preparation before use: First, turn off the power switch at the bottom of the ATS, connect the ATS to the generator panel with a cable connection, and turn the electric door lock switch on the generator panel to the ON position (only for gasoline units, please turn the electric door lock to the OFF position for diesel units), then close the air switch of the grid, and finally turn on the power switch at the bottom of the ATS (ensure that the switch voltage is the same as the actual operating voltage). ATS starts working immediately.

•Automatic control

(1) The default startup mode is automatic control. The "AUTO/MANUAL" button on the ATS panel is used to switch between automatic and manual control states. Press once to switch to manual control mode, and then press again to return to automatic control mode, so as to switch alternately. In automatic mode, the "AUTO" light on the panel lights up and the screen displays "AUTO". At this point, the "ATS" operating system is already in automatic control mode.

(2) Operation of ATS

When the ATS system enters automatic mode, if any of the following situations occur with the mains power, the ATS will automatically open the air door controller, start the generator motor within 2 seconds, and after the generator warms up normally for 5 seconds, the system will automatically switch the load to the generator power supply.

grid outage b) grid undervoltage or overvoltage (default is single-phase undervoltage of 160V, overvoltage of 250V, three-phase undervoltage of 280, overvoltage of 430V) c) grid phase loss (three-phase missing one or two phases) d) grid frequency is too high or too low (default is above 60HZ, below 30HZ)

(3) ATS starts three times

When the generator has poor starting performance due to low temperature or other reasons, the ATS control system will perform three cycles of starting, and the starting procedure is as follows:

grid outage → Generator first start time is 5 seconds → Start unsuccessful → Stop for 5 seconds → Second start time is 5 seconds → Start unsuccessful and stop for 5 seconds → Third start time is 5 seconds (if the generator cannot start normally three times, the alarm light "Failures" will flash. The system will switch to manual control mode and wait for management personnel to come and check (ATS can only be restarted after troubleshooting after product protection, refer to "Fault Code and Troubleshooting Method Table" on page 6 for troubleshooting).

(4) Generator shutdown

a) If the unit is running and the grid is restored, and the grid supply is normal for about 10 seconds, the ATS control system will automatically switch the load to the

grid, and the generator will stop after running in an unloaded state for 5 seconds.
b) If under voltage or over voltage, phase loss, high or low frequency occur during the operation of the generator, the ATS control system will stop generating electricity, the alarm light will flash, the screen will display warning signs and fault codes, the system will switch to manual control mode, and wait for the management personnel to come and check (when the product is protected, the fault needs to be eliminated before restarting the ATS, refer to the "Fault Code and Troubleshooting Method Table" on page 6 for troubleshooting).

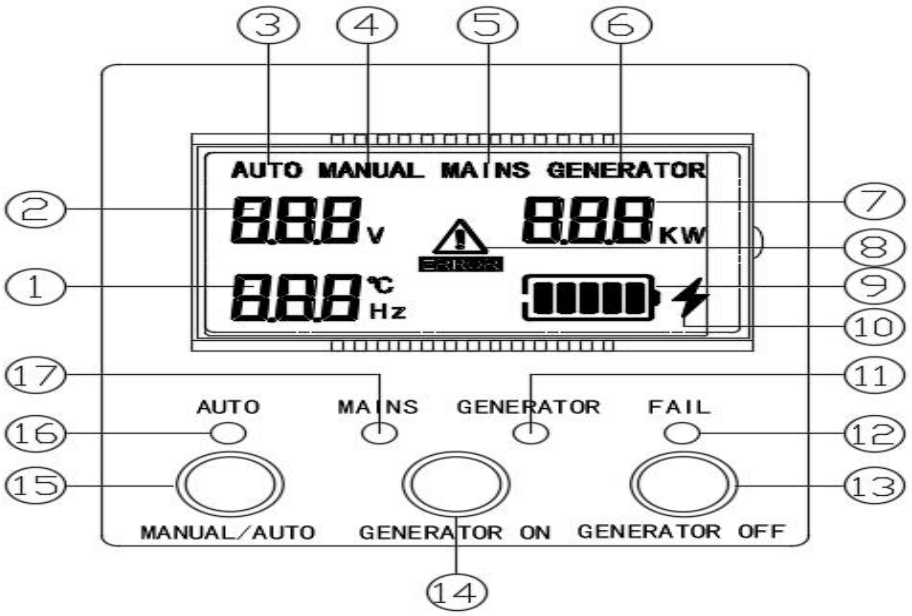
(5) ATS automatic air door control
If the unit is equipped with a damper device, ATS will automatically open the damper controller when the unit is started, and after successful start, the damper device will be automatically closed.

(6) Current overload protection
When the output current exceeds the ATS set value, the output power will be automatically cut off. One situation is when the instantaneous current is too high or short circuited, immediately cut off. Another situation is that if the load exceeds the ATS set value for more than 20 seconds, the output power will be cut off. After the current overload protection, the alarm light flashes, and the screen displays warning signs and fault codes. Wait for the management personnel to come and check (when the product is protected, the fault needs to be eliminated before restarting ATS. Refer to the "Fault Code and Troubleshooting Method Table" on page 6 for troubleshooting).

•Manual Control
1) Press the "AUTO/MANUAL" button on the ATS panel to switch to manual control mode. The "AUTO" light will turn off and the screen will display "MANUAL". At this time, the system is in manual control mode.

2) Press the "GENERATOR START" button to start the generator. Press the 'Generator STOP' button to stop power generation.

Ⅳ.Screen function malfunction display and troubleshooting



① Temperature/Frequency	② AC Voltage Display	③ AUTO(Automatic State)
④ MANUAL(Manual State)	⑤ MAINS(Grid State)	⑥ GENERATOR(Generator status)
⑦ Power/Fault Code Display	⑧ Fault or Failure Flag	⑨ Battery Level Display
⑩ Charging Symbol	⑪ Generator Indicator Light	⑫ FAIL-Fault Alarm Indicator Light
⑬ GENERATOR OFF	⑭ GENERATOR ON	⑮ MANUAL/AUTO
⑯ AUTO Indicator Light	⑰ MAINS Indicator Light	

1)AC voltage, frequency, and power display
When there is an output voltage and a load (power appliance) at the output terminal, the screen displays voltage, frequency, and power, with a voltage error of ± 2% and a power error of ± 5%. Frequency ± 1HZ.

2) The meanings and troubleshooting methods represented by faults and fault codes

Fault codes and troubleshooting methods table

NO.	Fault Indication	Troubleshooting methods
01	Low voltage or lack of one phase of electricity	Check if the AC voltage of the generator (or grid) is normal. If it is an ATS fault, please contact qualified (professional) electrical maintenance personnel for repair or replacement.
02	High voltage	Check if the AC voltage of the generator (or grid) is normal. If it is an ATS fault, please contact qualified (professional) electrical maintenance personnel for repair or replacement.
03	Low or no frequency	Check if the AC voltage frequency of the generator (or grid) is normal. If it is an ATS fault, please contact qualified (professional) electrical maintenance personnel for repair or replacement.
04	Over frequency	Check if the AC voltage frequency of the generator (or grid) is normal. If it is an ATS fault, please contact qualified (professional) electrical maintenance personnel for repair or replacement.
05	Current overload	Check if the load (using electrical appliances) exceeds the power capacity of the ATS. If it is an ATS malfunction issue, please contact qualified (professional) electrical maintenance personnel for repair or replacement.
06	Severe current overload or possible short circuit	Check the power of the load (using electrical appliances) and whether there is a short circuit. If it is an ATS malfunction issue, please contact qualified (professional) electrical maintenance personnel for repair or replacement.
07	Power generation failure	Check if the ATS main switch is in the wrong gear or if the generator is malfunctioning and unable to function properly. If it is an ATS malfunction, please contact qualified (professional) electrical maintenance personnel for repair or replacement.
08	Insufficient battery power	Check if the battery is functioning properly. If the battery is in a state of low power, damaged and unable to charge, or if the battery cable is disconnected or detached, please replace the battery or repair the circuit.
09	Over temperature	If the temperature of the internal components of ATS rises or the components are abnormally heated and damaged after prolonged use, please turn off the power, ventilate and dissipate heat, and then test the power to see if it works normally. If the

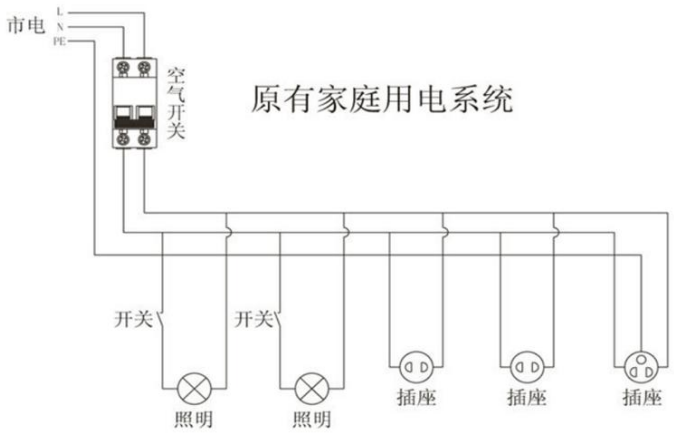
		fault still exists, please contact qualified (professional) electrical maintenance personnel for repair or replacement.

3) The battery level is displayed as 0-5 bars, and if it falls below 2 bars, it will automatically charge. When charging the battery with mains power, the charging symbol "" is displayed.

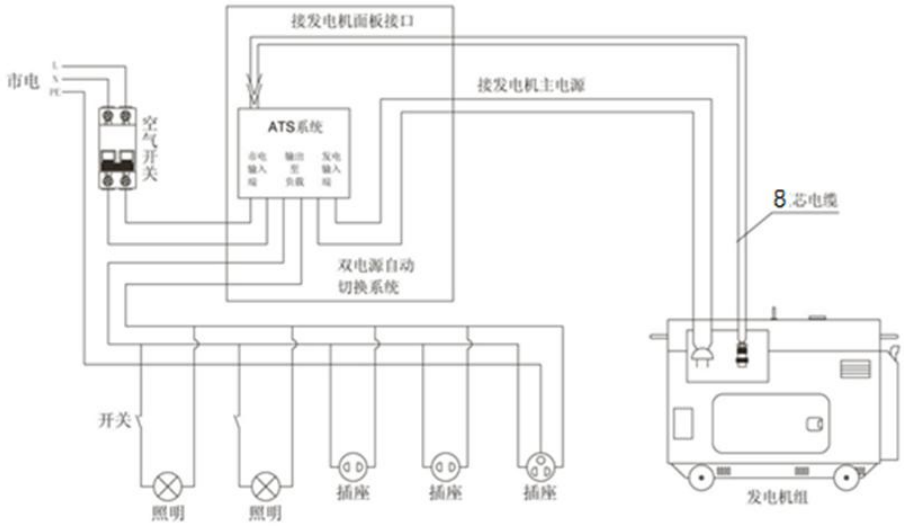
Ⅴ.Battery Maintenance

There is a battery charging and maintenance module inside the box. When there is mains power (voltage 110-250V), if the battery level is low (at least not enough to start 3 times), it will automatically start charging. When the charging is full, the float charging stops after about half an hour. When the device is not powered on for a long time and the battery has been undercharged and depleted, the charger will automatically perform restorative charging until the battery recovers before resuming normal charging, ensuring that the battery has sufficient power to start the unit at any time.

Ⅵ.Schematic Diagram of ATS Access to Power System:



接入ATS系统



Ⅶ.Technical Specification

Working Voltage	**DC8~18V (over voltage protection over 20V)**
Rated Current of Contactor	Single phase: 220V/25A (5KW unit) Single phase: 220V/32A (10KW unit) Single phase: 220V/50A (10KW unit) Single/Three phase: 220V/380V25A (single-phase 5KW/three-phase 5-10KW unit) Single/Three phase: 220V/380V32A (single-phase 7KW/three-phase 10~15KW unit) Single/Three phase: 220V/380V50A (single-phase 10KW/three-phase 20-25KW unit)
Internal Charger	Input voltage: AC110-250V Output voltage: DC13.6V (±2%) Charging current: 1A

Machine Dimension（mm）	250×140×320
Cable Connection Line	6-core chrome plating/diesel 8-core chrome plating/gasoline
Length of External Connecting Wire	Standard configuration 1.5m (can be customized according to customer requirements)
Working Temperature	(-25～60)℃
Storage Conditions	(-15～55)℃

Ⅷ.Note

1. When selecting ATS, please choose the matching power.
2. Do not directly connect the ATS output to the grid.
3. When connecting the grid to ATS, it is necessary to use an air protection switch to ensure safety.
4. Please confirm that the unit is using the automatic ATS function under normal conditions.
5. Be sure to use the generator door lock switch in the OFF position (only for diesel units, please turn the power lock to the ON position for gasoline units);
6. Be sure to turn the air switch on the generator panel to the "ON" position.
7. During ATS operation, it is strictly prohibited to disconnect the battery after the unit has started.
8. The equipment must be placed in a well ventilated, dry, away from high temperatures, high humidity, or easily shaken place.
9. There is high voltage inside ATS. In case of malfunction, qualified electrical maintenance personnel must be consulted for inspection. Ordinary users are advised not to open the casing to prevent electric shock.
10. The ATS shell must be effectively grounded.
11. ATS is only suitable for indoor use.