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АЕС IST7 (10-40 кВА) - руководство по эксплуатации. Юниджет

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UPS IST7

10 - 40 kVA

User Manual



Foreword

Thank you for choosing the Uninterruptible Power System UPS IST7 AEC!

This document gives a description of the IST7 series UPS.

Please save the manual after reading, in order to consult in the future.










NOTE

The figures in this manual are just for reference, for details please see the actual product.

Symbol Conventions

The manual quotes the safety symbols, these symbols used to prompt users to comply with safety matters during installation, operation and maintenance. Safety symbol meaning as follows.

Symbol	Description
 DANGER	Alerts you to a high risk hazard that could, if not avoided, result in serious injury or death.
 WARNING	Alerts you to a medium or low risk hazard that could, if not avoided, result in moderate or minor injury.
 CAUTION	Alerts you to a potentially hazardous situation that could, if not avoided, result in equipment damage, data loss, performance deterioration, or unanticipated results.
	Anti-static prompting.
	Be care electric shock prompting.
 TIP	Provides a tip that may help you solve a problem or save time.
 NOTE	Provides additional information to emphasize or supplement important points in the main text.

Contents

1 Safety Description.....	1
1.1 Safety Announcements.....	1
1.1.1 Safety Instructions	1
1.1.2 Use Announcements for Battery	2
1.1.3 Anti-Static Protection.....	3
1.2 Operation and Maintenance Requirements	3
1.3 Environment Requirements.....	3
2 Overview.....	5
2.1 Product Intro.....	5
2.1.1 Features.....	5
2.1.2 Appearance.....	6
2.1.3 Communication.....	9
2.1.4 Fittings Illustration.....	17
2.2 Work Principle.....	17
2.2.1 Work Principle Diagram.....	18
2.2.2 Work Mode	19
3 Installation.....	23
3.1 Announcements	23
3.2 Installation Preparation	23
3.2.3 Install Space	24
3.2.4 Select Breaker & Wires.....	24
3.2.5 Select Input Breaker.....	25
3.2.6 Select Wires	27
3.3 Transport and Unpacking	25

3.3.1 Transport	25
3.3.2 Unpacking	25
3.4 Mechanical Installation	327
3.5 Electrical Connection	28
3.5.1 UPS Wiring Operation	28
3.5.2 Wiring Between UPS and External Battery	31
3.5.3 Wiring of Parallel System	33
4 Touch Screen Operation	37
4.1 Menu Hierarchy	37
4.2 Main Page	38
4.2.1 Icon Meaning	38
4.2.2 Working Status	39
4.2.3 Bypass Information Page	41
4.2.4 Mains Informaiton Page	42
4.2.5 Battery Information Page	42
4.2.6 Output Information Page	43
4.3 Login Page	43
4.4 Information Management Page	44
4.4.1 Run Information Page	61
4.4.2 History Record Page	46
4.4.3 User Log Page	47
4.4.4 Device Infomation Page	647
4.5 Setting Management Page	48
4.5.1 System Manage Page	48
4.5.2 Battery Management Page	52
4.5.3 Battery Test Page	55
4.5.4 Dry Contact Page	55
4.5.5 Communicaiton Setting Page	57
4.5.6 HMI Setting Page	58
4.5.7 Password Setting Page	58

4.5.8 Device Configuration Page	59
4.5.9 Dedust Setting Page	62
4.5.10 Record Manage Page	62
4.6 Current Fault Page.....	64
4.7 Buzzer Control	65
4.8 ON/OFF Operation.....	66
5 Use and Operation	84
5.1 Check Before Startup	67
5.2 Startup Operation	67
5.3 Shutdown Operation.....	68
5.4 Parallel System Operation.....	68
5.4.1 Start Parallel System	68
5.4.2 Shut Down Parallel System.....	69
5.4.3 Exit Parallel System	69
5.5 Periodic Preventative Maintenance	69
5.6 Battery Maintenance	69
5.7 Troubleshooting.....	70
5.7.1 Common Fault	70
6 Package, Transportation and Storage.....	75
6.1 Package	75
6.2 Transportation	75
6.3 Storage	75
A Technical Specifications	76

1 Safety Description

1.1 Safety Announcements

This section introduces the safety announcements that must be complied with and pay special attention while installing, using, maintenance and other relative operations.



CAUTION

Before operating, please read the announcements and operation instructions in this section carefully to avoid accident.

The DANGER, WARNING, CAUTION, etc. in the manual are not all the safety announcements that you must abide by, they are just the supplements for the safety announcements during operating.



NOTE

Our company does not undertake the responsibility caused by violating common safety operation requirements or the safety standard of design, manufacture and use.

1.1.1 Safety Instructions



CAUTION

There exists high temperature and high voltage inside the UPS. During using, please strictly comply with all warnings and operation instruments on the UPS and in the user manual.

**CAUTION**

The UPS is class C3 device. If it is used in residential purpose, it may cause wireless interference. User should take actions to avoid the interference.

- No liquid or other objects are allowed to enter the UPS.
- UPS must be well grounded.
- In case of fire, please use dry power fire extinguisher. If using liquid fire extinguisher, it may cause electric shock.

1.1.2 Use Announcements for Battery

**CAUTION**

Please use specified battery. Non-specified battery will damage the UPS.

- Only authorized professional can replace battery. Do not wear conductive objects, such as watches, bracelets and rings during operating. Wear rubber shoes and gloves and use tools with insulated handle.
- Don't put tools or other conductive objects on the battery.
- It is prohibited to short the positive pole and negative pole of the battery or connect them reversely, which is to avoid fire or electric shock.
- Before connecting or disconnecting the battery terminals, disconnect charger first.
- The battery must be with the same type, model and manufacturer.
- Battery should be kept away from fire source or other electrical equipment that may easily cause spark to avoid human injury.
- Don't open or destroy the battery. The electrolyte in the battery includes some dangerous objects, such as strong acid, which will be harmful to skin and eyes. If it is careless to touch the electrolyte, clean it by a lot of water immediately and then check it in the hospital.
- The waste battery should be disposed according to the local regulations.

1.1.3 Anti-Static Protection



CAUTION

The static generated by human bodies may damage the electrostatic-sensitive components on PCB. Before touching the sensitive component, please wear anti-static rings and well connect the other end of the anti-static rings to ground.

1.2 Operation and Maintenance Requirements



CAUTION

Only authorized professionals are allowed to open the UPS chassis, or it may cause electric shock and the caused UPS fault is out of the guarantee range.

- If UPS needs to be moved, rewired or maintained, disconnect all electrical connection, such as AC power, battery power, etc. to isolate power input. Do not do any work on the UPS until it is powered off completely (≥ 10 min). Otherwise, the output may exist electricity, which may cause electric shock.
- When dismantling fan, do not put fingers or tools into the rotating fan to avoid device damage or human injury.

1.3 Environment Requirements



DANGER

Do not put the UPS in the environment where has inflammable, explosive gas or smog, do not do any operation in this environment.

- Do not use the UPS in the place where has direct sunshine, rain or wet.
 - The normal work temperature of UPS is $-5^{\circ}\text{C}\sim 40^{\circ}\text{C}$, relative humidity: 0%-95%, with no condensation (recommended work temperature is $20^{\circ}\text{C}\sim 25^{\circ}\text{C}$, humidity is about 50%).
-

- Put the UPS in the flat floor without vibration and the vertical gradient is less than 5°. Keep good ventilation around the UPS. The clearance between the rear or the side of UPS and adjacent devices or wall should be at least 300mm~500mm. Poor ventilation will rise temperature inside UPS, which will reduce the service life of inner components and even affect the life span of the UPS.
- The UPS must be used below 2000m. If the altitude exceeds 2000m, it needs to decrease the rated power according to IEC62040-3: 2011 to use.

2 Overview

2.1 Product Intro

IST7 series UPS is whole high frequency, pure online, double-conversion, smart product. The system is perfect power security for file server, enterprise server, center server, micro-computer, concentrator, telecom system, data center and others that require high quality power protection. They are widely used in many key business areas, such as post, finance, network, stock, railway, etc.

2.1.1 Features

Completely digitalized smart control

The UPS support various input and output mode, such as 33/31 and 11 (just for IST7 series 10kVA-20kVA) mode UPS. The UPS can monitor the grid frequency (50Hz/60Hz) and self-adapt the frequency. The output voltage can be set to 220V/230V/240V, which makes the use more flexible.

Energy conservation and high efficiency

Adopts three-level inverter technology and PFC control technology, the output voltage wave is perfect and the whole efficiency can be 96%, the input power factor is greater than 0.99, which greatly improves the use ratio of electric energy and reduces the load of power grid.

Smart fan speed control

The fan speed is adjusted automatically in accordance with the load status, which prolong fan life and reduce noise.

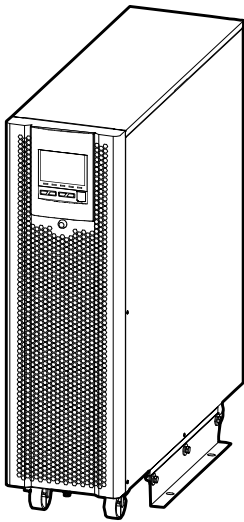
ECO energy conservation mode design

The UPS is designed with ECO energy conservation mode. When the grid is good, if the UPS operating in this mode, the bypass prior to output, and the efficiency can be 99%.When the bypass voltage or frequency out of normal range and cannot satisfy the user's power supply requirement, it will switch to inverter output, which guarantee the reliability of power supply and also, save energy.

Low mains input voltage

Adopt the independent rapid detection technology. When output load is small, even the battery voltage is 80V, which is the mains low limit, the battery still doesn't discharge. Therefore, in the mains mode, all output power gets from the grid, which is to ensure the battery in 100% energy storage status, and at the same time, reduce the battery discharge times and prolong the service life.

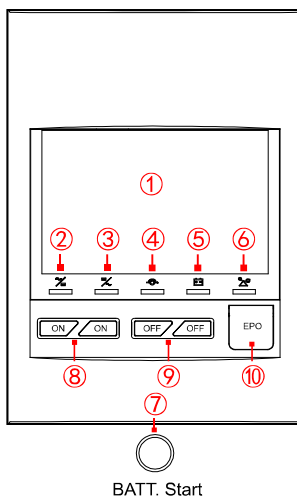
2.1.2 Appearance



Appearance of IST7 (touch screen)

Operation panel

- Touch screen

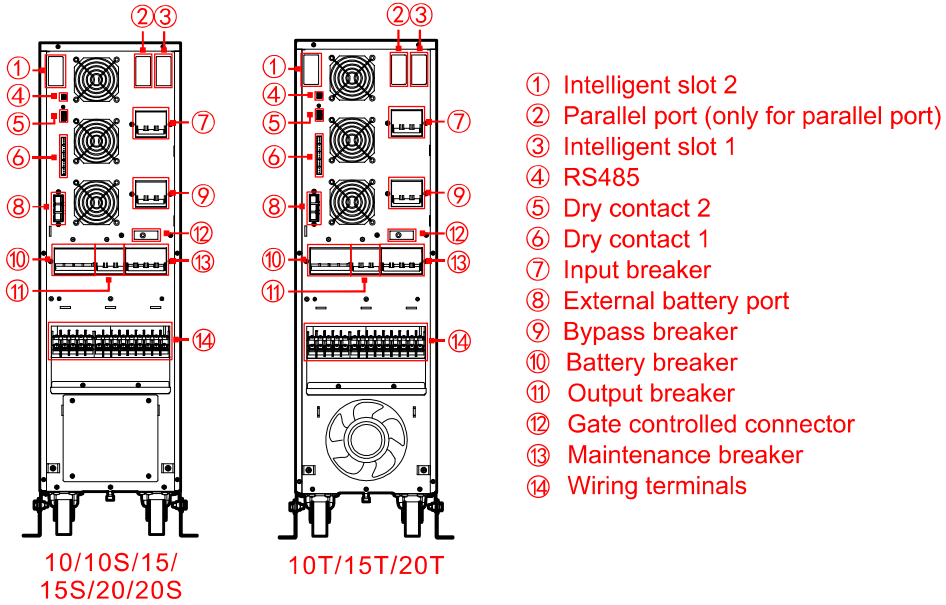


Operation panel

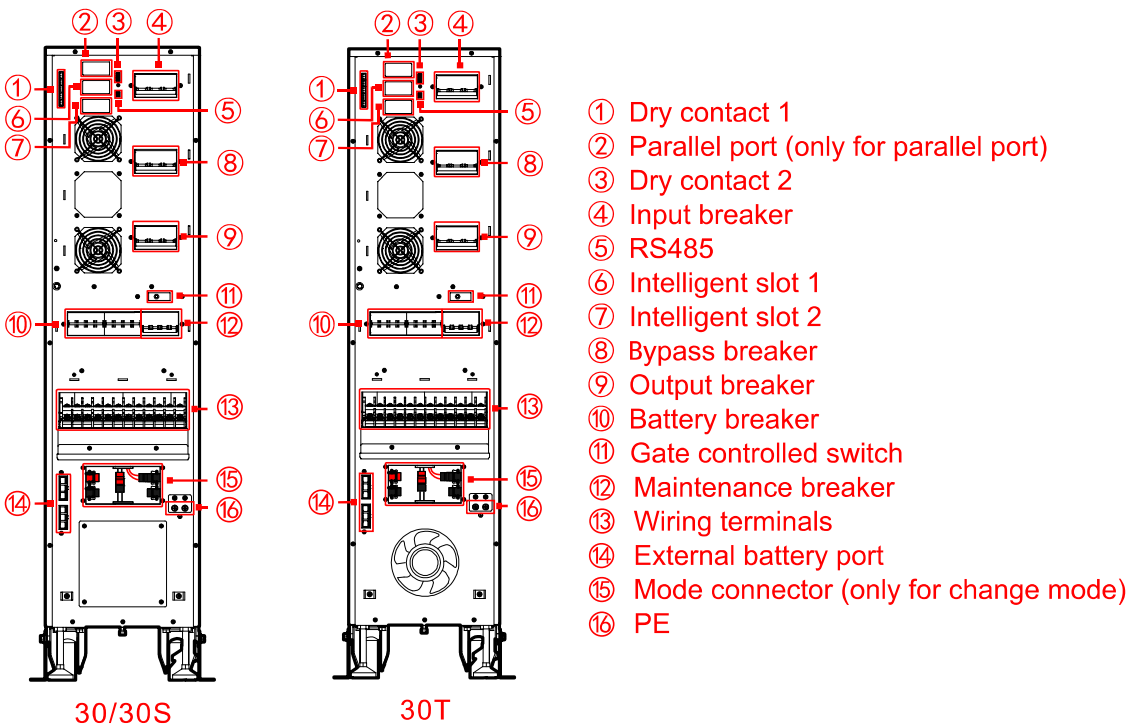
Illustration for touch screen operation panel

No.	Name	Illustration
Illustration for operation panel		
	Touch screen display	Shows the working status and system setting.
	AC/DC indicator	On (green): rectifier works normally; On (red): rectifier abnormal.
	DC/AC indicator	On (green): inverter works normally; On (red): inverter abnormal.
	BYP. indicator	On (green): bypass output; On (red): bypass abnormal.
	BATT. LOW indicator	On (red): battery is low-voltage.
	OVERLOAD indicator	On (red): output is overload or overload protection.
Buttons operation instructions		
	"BATT. Start" button	Press "BATT. Start" button for 7s, the system will build the aux power.
	"ON" combination button	Press a couple "ON" buttons for 1s at the same time, the system will power on.
	"OFF" combination button	Press a couple "OFF" buttons for 1s at the same time, the system will power off.
	EPO emergency power off button	Press the button, the system will power outage immediately.

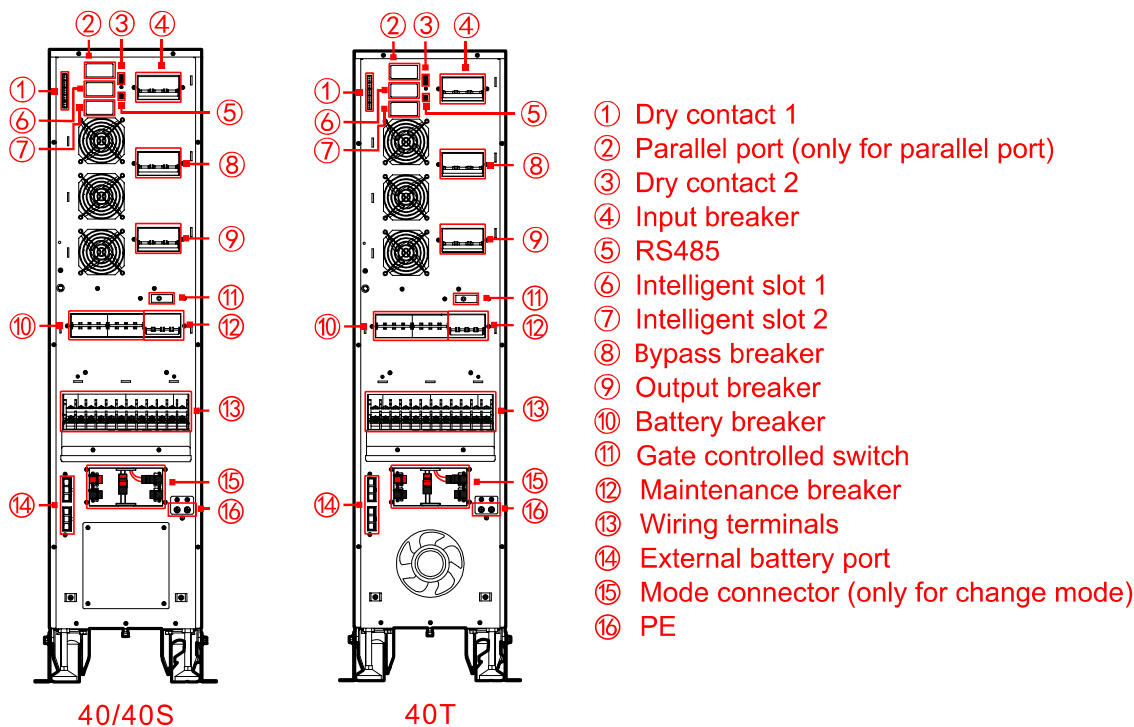
Rear panel



Structure of 10/15/20kVA rear panel



Structure of 30kVA rear panel



Structure of 40kVA rear panel

NOTE

The wiring terminal of 33 mode, 31 mode and 11 mode have a little different. For the detail of the wiring terminal of each mode please see 3.5.1UPS Wiring Operation.



CAUTION

The gate controlled switch release automatically when the maintenance breaker cover is removed and closes automatically when the cover is locked back.

2.1.3 Communication

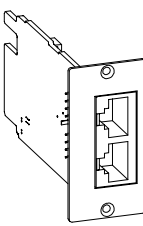
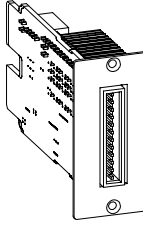
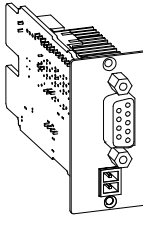
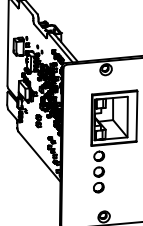
The supported communication method of this series UPS include RS485, parallel kit, communication dry contact, RS485+relay card, protocol transfer card and SNMP card.

Communication method correspondence with hardware port

Communication way	Communication port
RS485	RS485
Dry contact	Dry contact 1: output dry contact;

Communication way	Communication port
	Dry contact 2: input dry contact (EPO+IN. 1)

Communication method correspondence with hardware port (optional)

Communication way	Sketch map	Communication port
Parallel kit (optional)		Parallel port
RS485+relay card (optional)		Slot 2 (optional)
Protocol transfer kit (optional)		Slot 1/Slot 2 (optional)
SNMP card (optional)		

RS485

The UPS adopt RS485 series port to communicate with PC.

The corresponding pin relationship of RS485 port between of UPS and PC

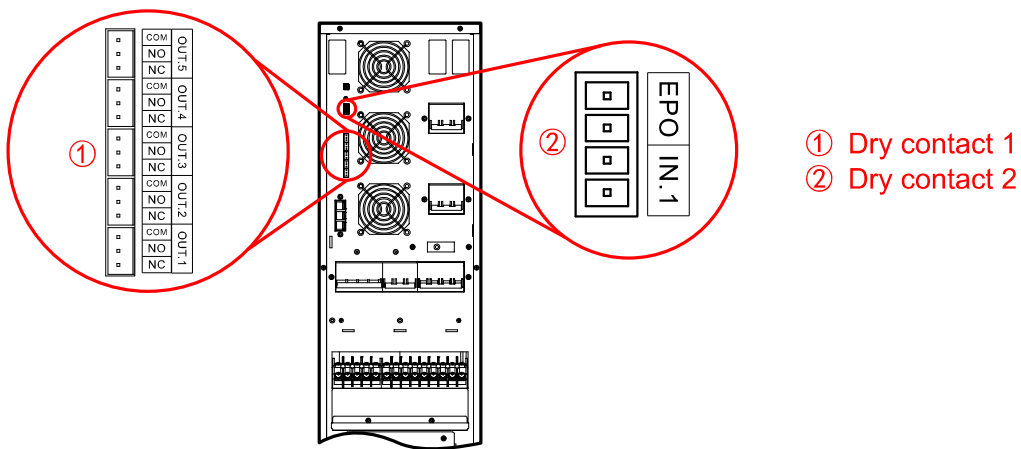
RS485 port of UPS	RS485 port of PC
A	A (+)

RS485 port of UPS	RS485 port of PC
B	B (-)

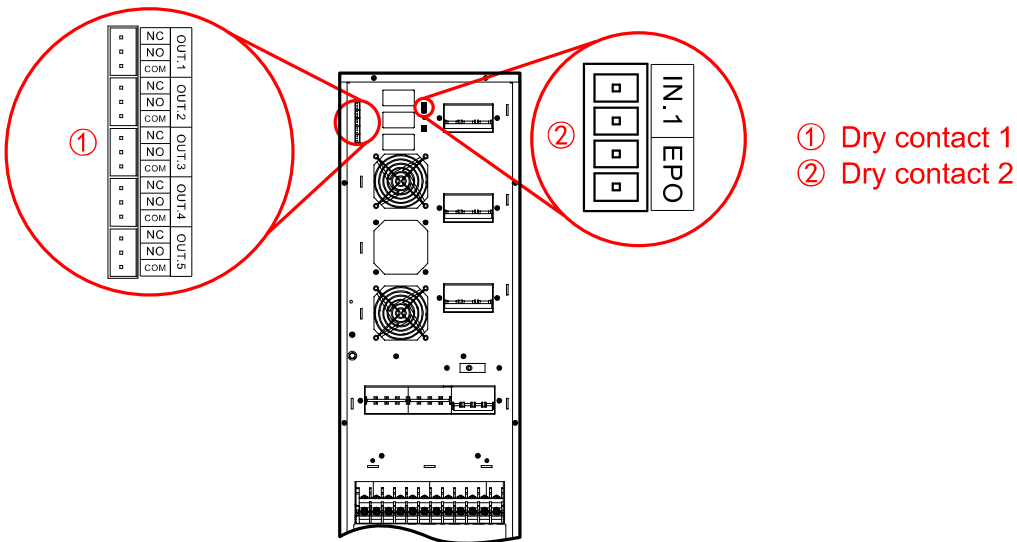
NOTE

The standard RS485 communication ports of rear panel cannot communicate normally when slot 2 is used.

Dry Contact



Dry contact position of 10-20KVA



Dry contact position of 30-40KVA

 **NOTE**

The dry contact position of IST7 series (30kVA-40kVA) is the same, above we take IST730 as an example to illustrate.

**CAUTION**

Relay dry contact capacity is 277Vac/30VDC/10A, relay coil voltage is 12V.

Dry contact functions illustration

No.	Silk-screen		Function illustration	Remarks
Dry contact 1	OUT.1	NC	Trigger action when signal is valid: NO and COM is connect, which disconnect with NC. The signal is settable and refers to the note for detail. Default is mains abnormal.	NC: close normally; NO: open normally; COM: common port.
		NO		
		COM		
	OUT.2	NC	Trigger action when signal is valid: NO and COM is connect, which disconnect with NC. The signal is settable and refers to the note for detail. Default is bypass abnormal.	
		NO		
		COM		
	OUT.3	NC	Trigger action when signal is valid: NO and COM is connect, which disconnect with NC. The signal is settable and refers to the note for detail. Default is battery abnormal.	
		NO		
		COM		
	OUT.4	NC	Trigger action when signal is valid: NO and COM is connect, which disconnect with NC. The signal is settable and refers to the note for detail. Default is output abnormal.	
		NO		
		COM		
	OUT.5	NC	Trigger action when signal is valid: NO and COM is connect, which disconnect with NC. The signal is settable and refers to the note for detail. Default is overload alarm.	
		NO		
		COM		

No.	Silk-screen		Function illustration	Remarks
Dry contact 2	EPO	-	The signal is valid when 2P terminal block disconnect. The signal is EPO and cannot settable.	-
	IN. 1	-	The trigger level of signal is settable (NC/NO) and short circuit is valid for default. The signal is settable and refers to the note for detail. Default is charge forbidden.	-

The settable item and illustrations of input dry contact

NO.	Item	Illustration
1	Charge forbidden	The charge forbidden signal of battery: The UPS will alarm and turn off the battery charge when receiving this signal. The trigger level of signal is settable.
2	External MBB on	The breaker on signal of external maintenance bypass: The UPS will alarm and turn off the inverter output and switch over bypass output when receiving this signal. The trigger level of signal is settable.
3	External BB status	The breaker disconnected signal of external battery: The UPS will alarm and prompts fault when receiving this signal. The trigger level of signal settable.
4	UPS remote on/off	The remote on/off signal of UPS: The UPS will on when receiving this signal. The trigger level of signal is settable.
5	Batt. ground fault	The fault signal of battery ground: The UPS will report an alarm and prompts fault when receiving this signal. The trigger level of signal is settable.
6	Discharge forbidden	The discharge forbidden signal of battery: The UPS will report an alarm and prohibits the battery discharge when receiving this signal. The trigger level of signal is settable.

The settable item and illustrations of output dry contact

NO.	Item	Illustration
1	Mains abnormal	When mains grid is abnormal, the signal is valid and triggers action of dry contact.
2	Bypass abnormal	When bypass is abnormal, the signal is valid and triggers action of dry contact.
3	Battery abnormal	When battery is abnormal, for example: battery low-voltage, battery over-voltage, battery over-temperature and battery disconnected, the signal is valid and triggers action of dry contact.
4	Output abnormal	When output is abnormal, the signal is valid and triggers action of dry contact.
5	Overload abnormal	When bypass or inverter of UPS is overloaded, the signal is valid triggers action of dry contact.
6	General abnormal	When the UPS is alarming for fault, the signal is valid and triggers action of dry contact.
7	Normal operation	When the UPS is in the normal operation, the signal is valid and triggers action of dry contact.
8	Battery operation	When the UPS is in the battery operation, the signal is valid and triggers action of dry contact.
9	Bypass operation	When the UPS is in the bypass operation, the signal is valid and triggers action of dry contact.
10	UPS on/off status	When the UPS is in on status, the signal is valid and triggers action of dry contact.
11	Battery low	When battery is low voltage, the signal is valid and triggers action of dry contact.
12	ECO mode	When the UPS output mode is ECO, the signal is valid and triggers action of dry contact.
13	Fan fault	When fan is abnormal, the signal is valid and triggers action of dry contact.

Optional Communication

- Parallel port

Parallel kit (optional): Built-in card is suitable for CAN communication between parallel equipments when the UPS is upgraded from single device to parallel device. The parallel function requires parallel kit for the standard UPS model is single equipment. Install the parallel kit in the parallel port after the UPS was power off. After the installation is completed, power up the UPS and set the UPS to parallel mode through the screen display.

- Intelligent slot 1/Intelligent slot 2

RS485+relay card (optional): Built-in card. Three output dry contacts: mains input abnormal, battery abnormal and inverter status (configurable as bypass output state). Two input dry contacts: battery temperature detection (for charging temperature compensation), battery breaker status detection (configurable as UPS remote on/off detection).

Protocol transfer card (optional): Built-in card. One route for RS485 communication, reserved for lithium battery communication (2P green terminal block); the other routes for RS485+RS232. Only one can be selected for communicate (DB9 terminal block).

SNMP card (optional): Built-in card and configuration protocol through webpage. Through the web configuration protocol to meet the use of different models or different communication protocols.

 **NOTE**

Please see the installation guide of corresponding optional communication card for more details.

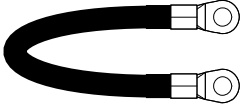
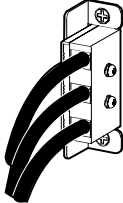
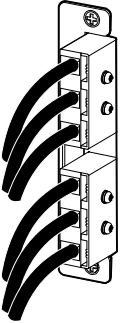
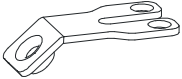

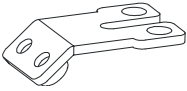
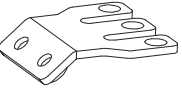
5.1.1 Fittings Illustration

Each device standard with three short circuit wire which the length is 200mm and users can short-circuit the mains input and bypass by it. The installation position is shown in 3.5.1UPS Wiring Operation.

When the UPS needs an external battery, the optional extension battery wiring assembly can be used to connect the external battery to the equipment. The installation position is shown in 3.5.2Wiring Between UPS and External Battery.

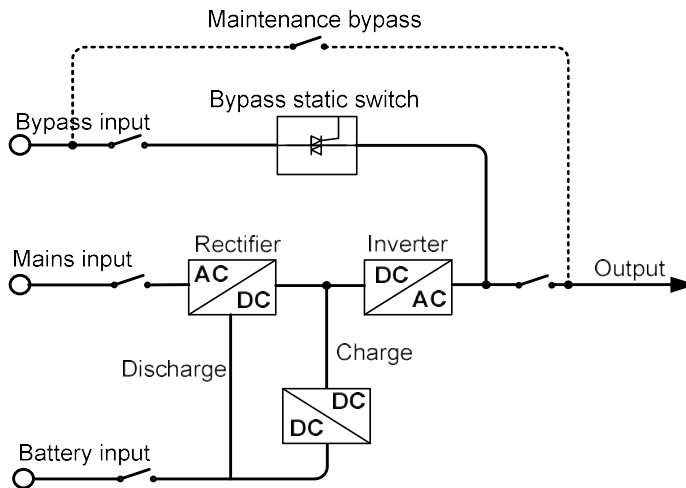
UPS 10-20KVA has 2 kinds of optional connector jumper (1# and 2# connector jumper), UPS 30-40KVA has 2 kinds of optional connector jumper (3# and 4# connector jumper). User can connect the connector jumper to the wiring terminal according need.

Fittings illustration

Name	Illustration	Sketch map
Short circuit wire of mains-and-bypass	The length is 200mm	
10~20K extension battery wiring assembly (optional)	1m or 3m of the wiring length for selection (optional)	
30~40K extension battery wiring assembly (optional)	1m or 3m of the wiring length for selection (optional)	
1# connector jumper	2PIN connector jumper (optional)	
2# connector jumper	3PIN connector jumper (optional)	
3# connector jumper	2PIN connector jumper (optional)	
4# connector jumper	3PIN connector jumper (optional)	

5.2 Work Principle

5.2.1 Work Principle Diagram



Work principle diagram

The IST7 series UPS includes rectifier/PFC, inverter, charger, bypass static switch etc function module, the input power includes mains input, bypass input, battery input, the output mode includes inverter output, bypass output and maintenance bypass output (if equipped).

When mains is normal, the rectifier starts and the charger charges the battery at the same time. When UPS off, if bypass is normal, the system turns to bypass output; when UPS on, the mains boosts by rectifier/PFC and output DC bus voltage, and then go through inverter and output pure sine-wave AC power, the output turns to inverter output to load from bypass output (if equipped).

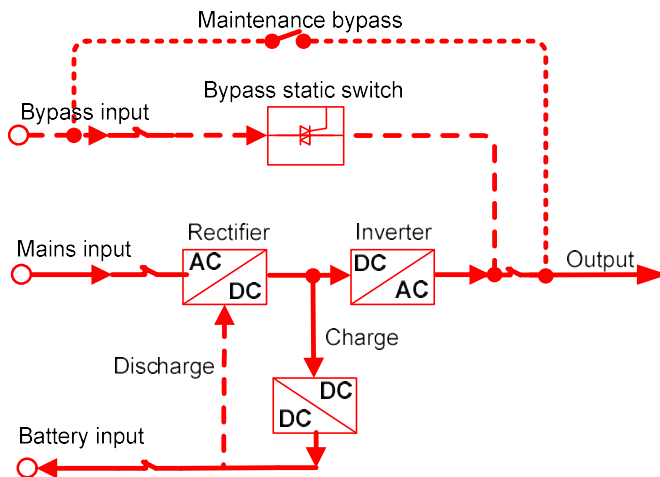
When mains is abnormal, the battery voltage boosts by rectifier/PFC and output DC bus voltage, and then go through inverter and output pure sine-wave AC power to load. When mains recover normal, the UPS turns to mains mode from battery mode automatically.

5.2.2 Work Mode

There are 5 work modes of the UPS: normal mains power supply mode, battery inverter mode, bypass power supply mode, ECO power supply mode and maintenance bypass power supply mode.

Normal mains power supply mode

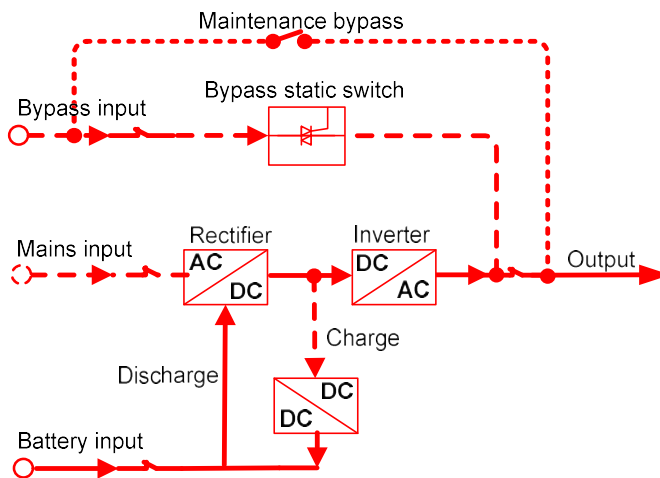
When mains power is normal, the UPS works in mains inverter status and charge the battery at the same time.



Normal mains power supply mode (the thick solid line stands for the energy flow direction)

Battery inverter mode

When mains is abnormal, the rectifier will transfer to battery input immediately, boost the battery voltage and then maintain the voltage of DC bus voltage to guarantee the inverter output continuous.



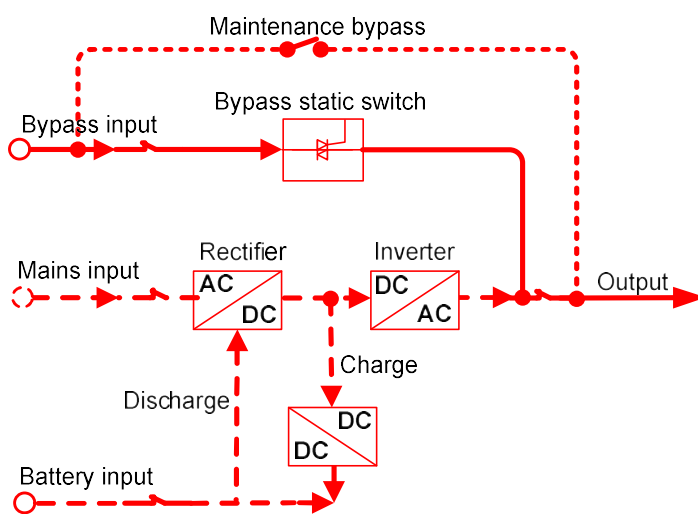
Battery inverter mode (the thick solid line stands for the energy flow direction)

Before the battery stop discharging, if the mains recover normal, the rectifier will transfer to mains input automatically and charge the battery at the same time. That is to say, the UPS recover normal mains power supply mode. If the mains always abnormal and the battery is running up, the UPS will send sound and light alarm and stop working till battery low-voltage point. At that time, the buzzer long beeps to alarm, the power for load powers down. Under the circumstance of mains power outage completely, the UPS will shut down about 1min later automatically and close the power of the UPS to avoid the battery discharge slimly, thus to

protect the service life of battery. Once the mains recover, the UPS will start automatically and turn to normal mains power supply mode.

Bypass power supply mode

Under the circumstance of bypass voltage is normal, when UPS off or fault (such as inverter output overload, over-current surge or IGBT over-temperature etc.) while UPS on, the UPS will output by bypass. When UPS on and the fault removed, it will turn to inverter output again. If the same fault occurs more than 5 times in a short time, the UPS protects and output by bypass until power off manually or power down and remove the fault, restart the UPS and then it will recover normal work.



Bypass power supply mode (the thick solid line stands for the energy flow direction)

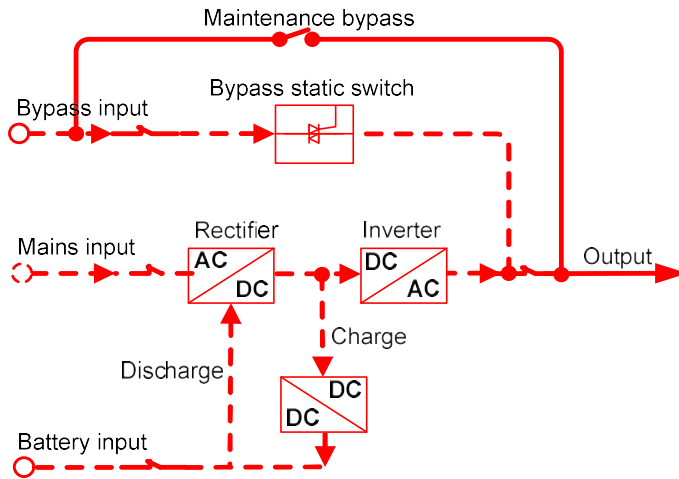
ECO power supply mode

At the ECO mode, when bypass voltage is normal, the power for load is prior supplied by bypass, when bypass voltage is abnormal, the power for load turns to inverter. ECO mode is an economic operation mode. For the load which does not require high quality, user can select ECO mode to reduce the energy consumption. At the ECO mode, the UPS efficiency can up to 99%.

Maintenance bypass power supply mode

When the UPS needs to be maintained and the power supply for load cannot be interrupted, user can shut down the inverter and make the UPS works in bypass status, the gate controlled switch release automatically when open the maintenance bypass cover, then switch on the maintenance bypass breaker and switch off the mains input breaker and bypass input breaker,

output breaker. During the transforming of manual maintenance bypass, AC power is supplied for load by maintenance bypass breaker. At this time, the inner UPS has no electricity, maintainer can perform the maintenance safely.



Maintenance bypass power supply mode (the thick solid line stands for the energy flow direction)

3 Installation

3.1 Announcements

- The installation tools should be with isolated operation, which is to avoid electric shock.
- There exist high-voltage in wiring end, please ensure that the wiring terminal with no electricity, and then the wire connection can be done.
- Place the UPS flat on the ground, avoid tilt and uneven ground.
- Do NOT place goods or sit on the UPS.

3.2 Installation Preparation

3.2.1 Install Environment

The installation environment of the UPS should be with good ventilation, and far away from water source, heat source and inflammable and explosive objects. Avoid installing the UPS in the place where has direct sunshine, dust, volatile gas, corrosive objects or high salt.

3.2.2 Install Space

The installation site should be with enough space to place the device. Maintain a clearance of at least 300mm from rear panel of the UPS to the wall or other device.

3.2.3 Select Breaker & Wires

The selecting for AC input and output wire, DC input wire and corresponding breakers needs to be judged by the UPS's max. steady state phase current.

UPS max. steady state phase current

Type	10KVA			15KVA			20KVA		
	33 mode	31 mode	11 mode	33 mode	31 mode	11 mode	33 mode	31 mode	11 mode
AC input (A)	19.5	19.5	58.6	27.5	27.5	82.5	35.5	35.5	106.4

Type	10KVA			15KVA			20KVA		
	33 mode	31 mode	11 mode	33 mode	31 mode	11 mode	33 mode	31 mode	11 mode
Bypass input (A)	19.5	58.6	58.6	27.5	82.5	82.5	35.5	106.4	106.4
DC input (A)	54.8	54.8	54.8	41.1	41.1	41.1	54.8	54.8	54.8
AC output (A)	15.2	45.6	45.6	22.7	68.2	68.2	30.3	90.9	90.9

UPS max. steady state phase current

Type	30KVA		40KVA	
	33 mode	31 mode	33 mode	31 mode
AC input (A)	65.7	65.7	81.7	81.7
Bypass input (A)	65.7	197.1	81.7	245.0
DC input (A)	82.2	82.2	109.6	109.6
AC output (A)	45.5	136.4	60.6	181.8

3.2.4 Select Input Breaker

We suggest to add a breaker (we suggest to select the breaker with feedback double pole disconnection equipment) that matches the UPS power at the front of the UPS input to insulate the mains. Considering the UPS charge power and the impact current while power on, the selected breaker must be 1.5 to 2 times of UPS input max. current, and cannot with leakage protection, which is to avoid wrong action of breaker. The breaker of DC input should be select more than the 250V DC.

Recommended input breaker list

Type	10KVA			15KVA			20KVA		
	33 mode	31 mode	11 mode	33 mode	31 mode	11 mode	33 mode	31 mode	11 mode
AC input (A)	32*3P	32*3P	80*1P	63*3P	63*3P	100*3P	63*3P	63*3P	150*3P

Type	10KVA			15KVA			20KVA		
	33 mode	31 mode	11 mode	33 mode	31 mode	11 mode	33 mode	31 mode	11 mode
Bypass input (A)	32*3P	80*1P	80*1P	63*3P	100*3P	100*3P	63*3P	100*3P	150*3P
DC input (A)	100*3P	100*3P	100*3P	63*3P	63*3P	63*3P	100*3P	100*3P	100*3P
AC output (A)	32*3P	80*1P	80*1P	63*3P	100*3P	100*3P	63*3P	100*3P	100*3P

Recommended input breaker list

Type	30KVA		40KVA	
	33 mode	31 mode	33 mode	31 mode
AC input (A)	100*3P	100*3P	100*3P	100*3P
Bypass input (A)	100*3P	250*1P	100*3P	300*1P
DC input (A)	125*3P	125*3P	175*3P	175*3P
AC output (A)	100*3P	200*1P	100*3P	250*1P

3.2.5 Select Wires

The cross-sectional area of the following cable is only for reference when the user is connected wire for a length of about 5 meters. If the length of the lead wire exceeds 20 meters, the cross-sectional area of the conductor wire shall be increased.

Recommended cross-sectional area of wire (unit: mm², environment temperature: 25°C)

	33 mode				
	10KVA	15KVA	20KVA	30KVA	40KVA
Mains input live wire (U/V/W)	4	6	6	16	16

	33 mode				
	10KVA	15KVA	20KVA	30KVA	40KVA
Mains input neutral wire (N)	4	6	6	16	16
Bypass input neutral wire (N)	4	6	6	16	16
Bypass input live wire (U/V/W)	4	6	6	16	16
Mains output live wire (U/V/W)	4	6	6	16	16
Mains output neutral wire (N)	4	6	6	16	16
DC input (+/BATN/-)	10	10	10	2*10	2*10
Grounding wire (PE)	4	6	6	16	16

Recommended cross-sectional area of wire (unit: mm², environment temperature: 25°C)

	31 mode				
	10kVA	15KVA	20KVA	30KVA	40KVA
Mains input live wire (U/V/W)	4	6	6	16	16
Input neutral wire (N)	16	25	25	2*25	2*25
Bypass input live wire (L)	16	25	25	2*25	2*25
Mains output live wire (L)	16	25	25	2*25	2*25
Mains output neutral wire (N)	16	25	25	2*25	2*25
DC input (+/BATN/-)	10	10	10	2*10	2*10

	31 mode				
	10kVA	15KVA	20KVA	30KVA	40KVA
Grounding wire (PE)	2*10	2*10	2*10	25	25

Recommended cross-sectional area of wire (unit: mm², environment temperature: 25°C)

	11 mode		
	10KVA	15KVA	20-40KVA
Mains input live wire (L)	16	25	25
Input neutral wire (N)	16	25	25
Bypass input live wire (L)	16	25	25
Mains output live wire (L)	16	25	25
Mains output neutral wire (N)	16	25	25
DC input (+/BATN/-)	10	10	10
Grounding wire (PE)	2*10	2*10	2*10

3.3 Transport and Unpacking

3.3.1 Transport

The UPS can be transported by forklift and manual forklift. When lifting the device, the device's center of gravity should be at the centre of the forklift arm. Keep the devices moving slowly and stably.

3.3.2 Unpacking

NOTE

Determine the unpacking site in advance. In principle, the unpacking site should be as close as possible to the installation site.

Check if the package appearance is in good condition and if there is any damage caused by transportation. If damaged, please inform the carrier immediately.

Transport the UPS to assigned site.

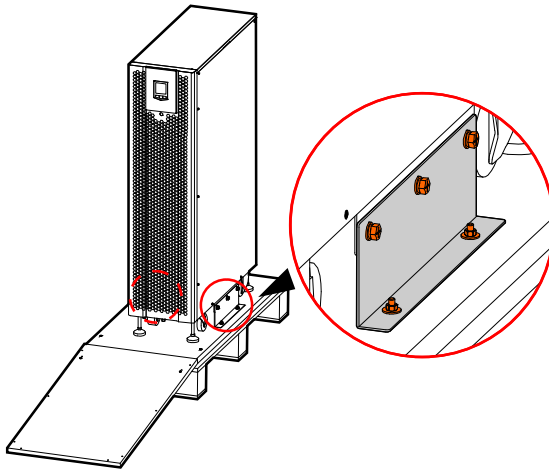
Unpack the external package, and take out the fittings.

Check the UPS.

- Inspect the appearance and check if there has any damage caused by transportation. If damaged, please inform the carrier immediately.
- Compare with the packing list and check if the fittings are complete and proper. If the fittings lack or model wrong, please take note and contact the local agency of our company.

Put the front plate down to become an oblique board.

After checking, unscrew the bolts that connected with the UPS and wooden bracket and the supporting plate by socket wrench, remove the supporting plate.



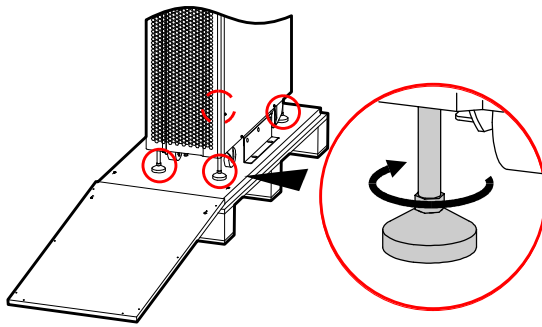
Bolts position



NOTE

The bolts position of IST7 series (10kVA-40kVA) is the same, above we take IST740 as an example to illustrate.

Heighten the supporting feet.

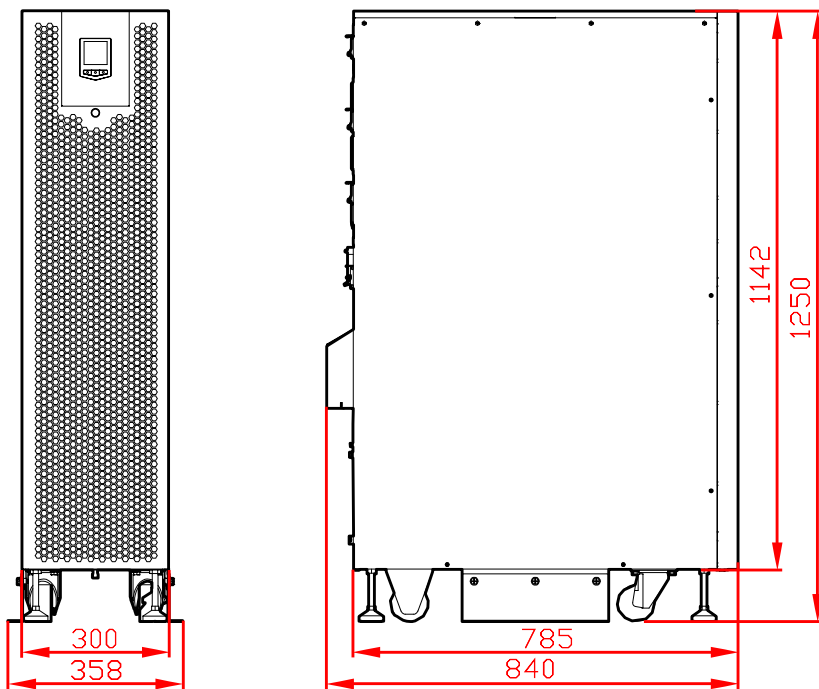


Screw up the supporting feet brackets

Then slip the UPS along the oblique board to ground slowly.

3.4 Mechanical Installation

Determine and plan the installation position according to the device and install space requirement.



Outer dimensions of UPS IST7 30-40 KVA (unit: mm)

3.5 Electrical Connection



WARNING

Before connecting, ensure that the external connected rear breakers of mains, battery are all off. DO NOT connect wires with electricity.

While wiring, avoid making the power wire at the place where is easy to be trod or tripped.

DO NOT move the UPS after connect wires.

3.5.1 UPS Wiring Operation

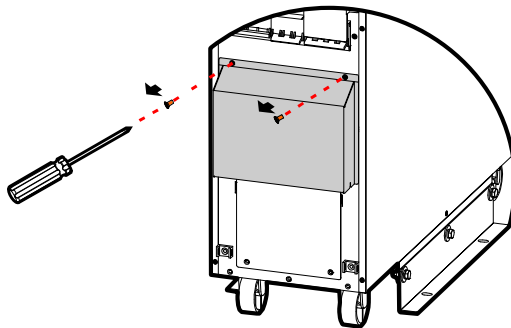
UPS 10-20-30-40 kVA



NOTE

The wiring operation of IST7 series (10kVA-20kVA) is the same, below we take IST710 as an example to illustrate.

Unscrew the bolt on the wiring cover, dismantle the wiring cover plate.

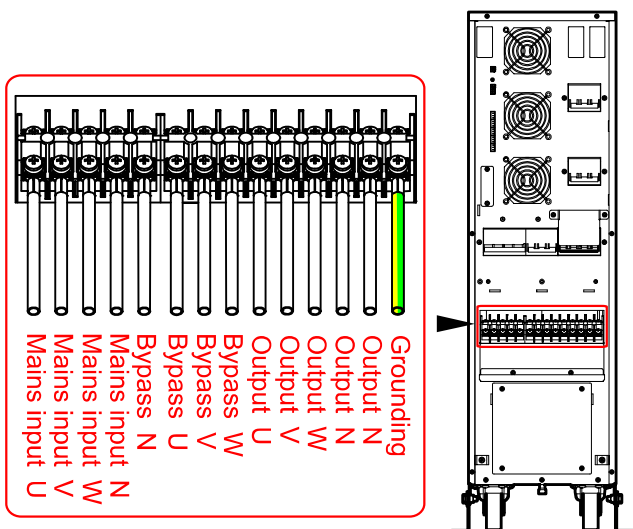


Unscrew the bolt on the wiring cover plate

- 33 mode

Wiring method 1: Different input sources for mains and bypass

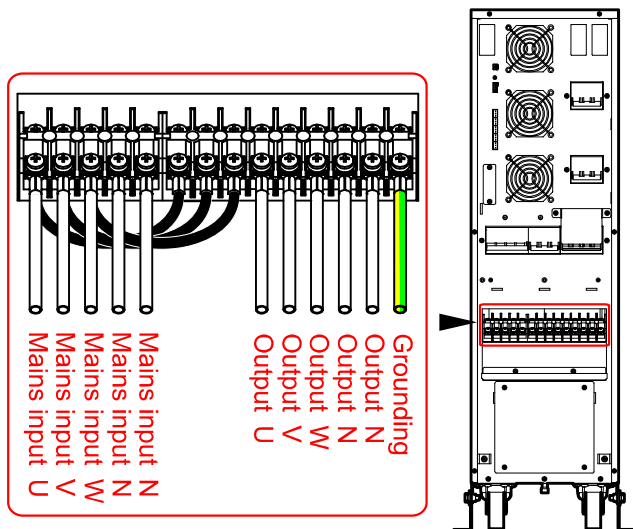
The mains input and bypass input are connected separately when the mains input and bypass input have different input sources.



Wiring diagram of 33 mode

Wiring method 2: One input sources for mains and bypass

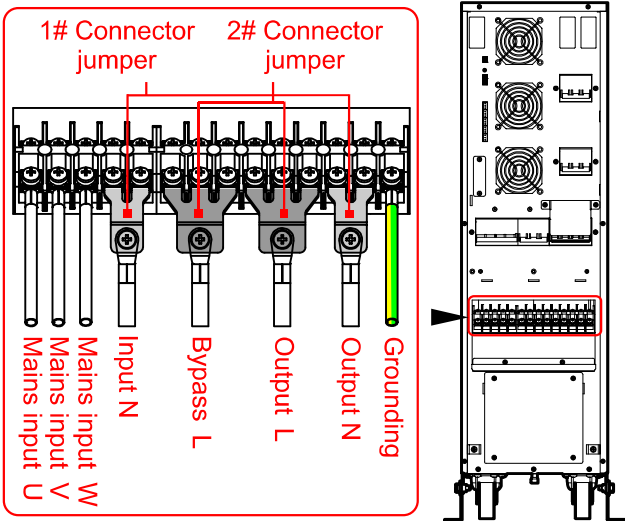
The bypass input is connected to the mains input by short circuit wire when the mains input and bypass input are same sources.



Wiring diagram of 33 mode

- 31 mode

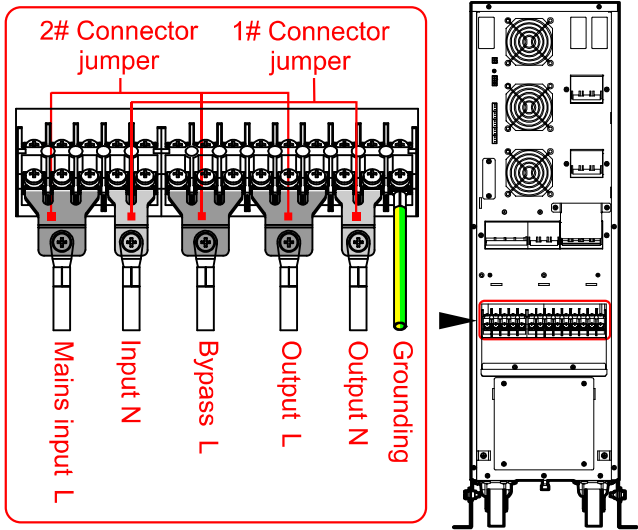
Take out a couple of 1# and 2# connector jumper (1# and 2# connector jumper is optional), connect them to the wiring terminal of UPS. Then connect the wires to corresponding port according to the wiring diagram.



Connector jumper and wiring diagram of 31 mode

- 11 mode

Take out a couple of 1# connector jumper and three 2# connector jumper (1# and 2# connector jumper is optional), connect them to the wiring terminal of UPS. Then connect the wires to corresponding port according to the wiring diagram.



Connector jumper and wiring diagram of 11 mode



CAUTION

When changing the mode of IST7 series (10kVA-40kVA), power down the UPS, the connection must be strictly according to the above step wiring. After completion, UPS is only connected to the mains and the bypass breaker must be disconnected. Set work configuration (for touch screen) on the screen display of the UPS is consistent with the actual wiring. After above operation is completed, please ensure that the wiring be consistent with work configuration (for touch screen) of screen display, and then startup the UPS, close the bypass breaker after inverter output was normal.

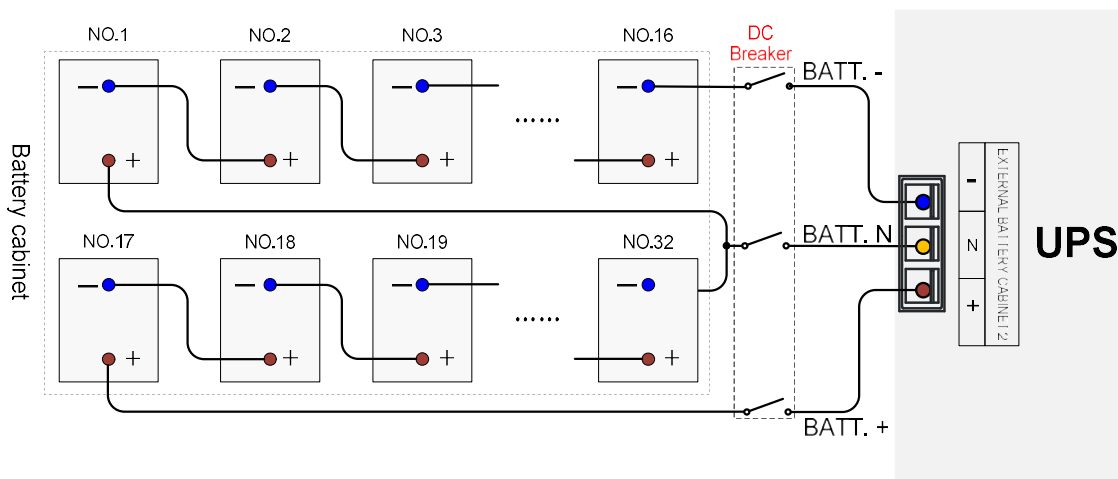
3.5.2 Wiring Between UPS and External Battery



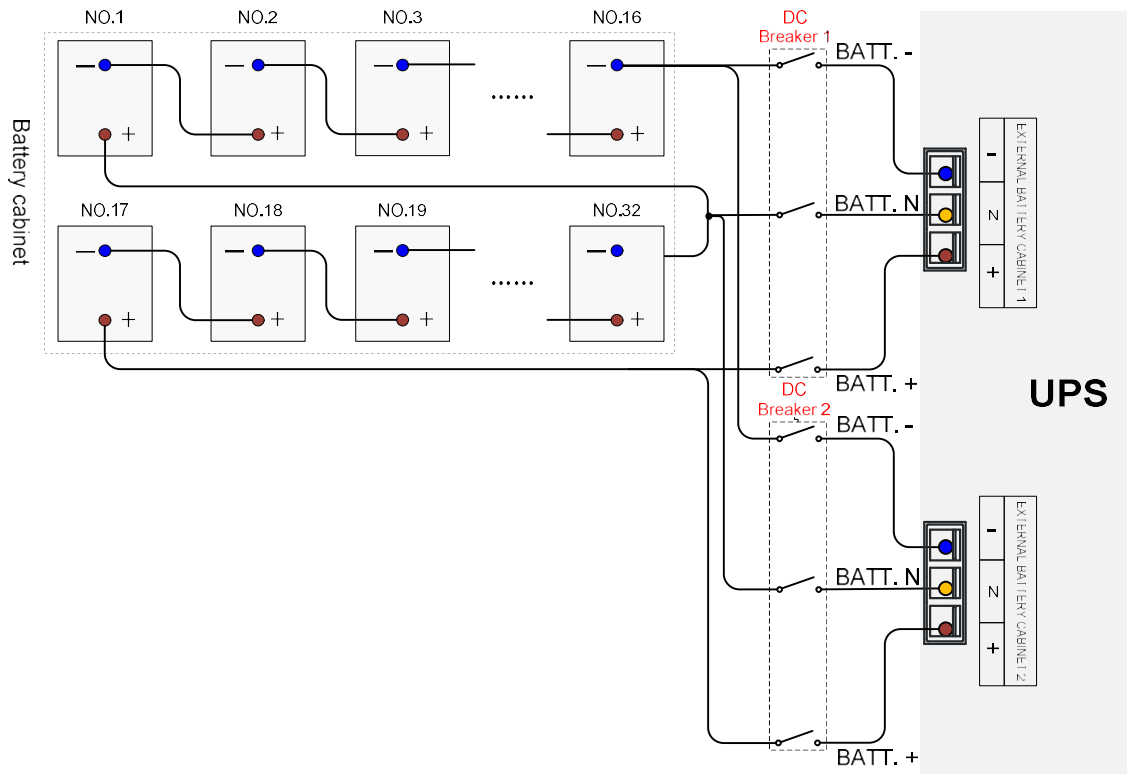
NOTE

You can connect with external battery when you purchase internal battery of the UPS to prolong back-up time.

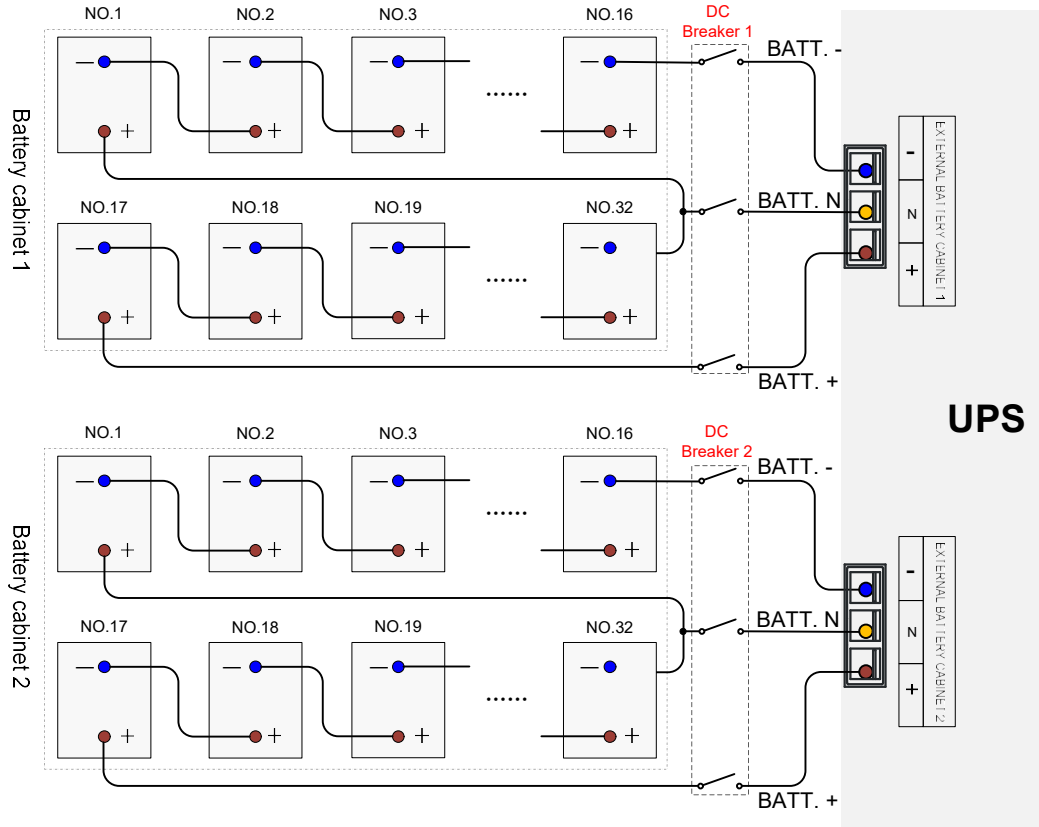
You must connect with external battery when you purchase without internal battery of the UPS.



Wiring diagram 1 of external batteries



Wiring diagram 2 of external batteries



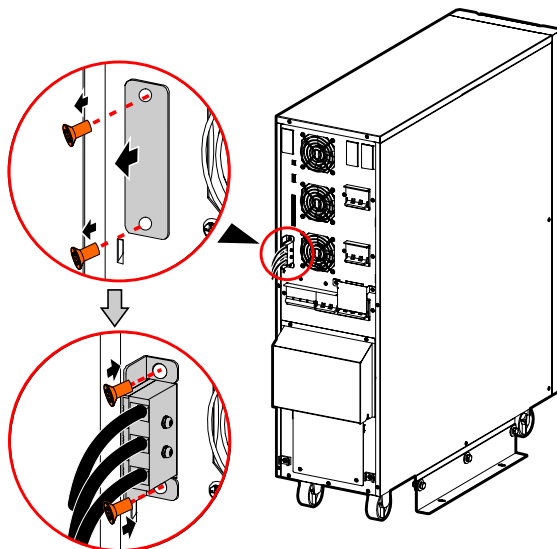
Wiring diagram 3 of external batteries

 **NOTE**

When the two battery cabinet is shared by two external battery cabinets of UPS, please make sure that all battery parameters of each UPS are consistent, such as battery branding, battery capacity, battery number and battery voltage.

Extension battery wiring assembly (optional)

Extension battery wiring assembly is optional when the UPS need to connect with external battery.



Extension battery wiring assembly of IST710

 **NOTE**

The extension battery wiring assembly can optional one-meter or three-meter wiring according to actual need.

Above we take IST710 as an example to illustrate. IST7 series (30kVA-40kVA) have two external battery ports and the position is different with IST710, which the installation method is the same as IST710.

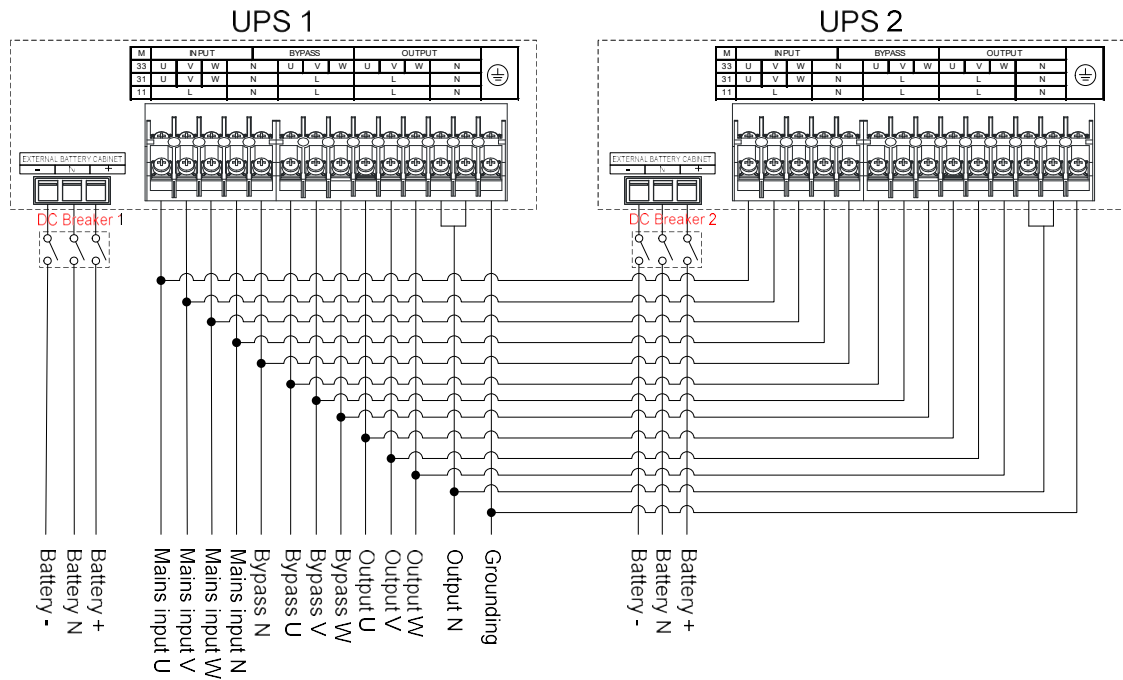
3.5.3 Wiring of Parallel System

 **NOTE**

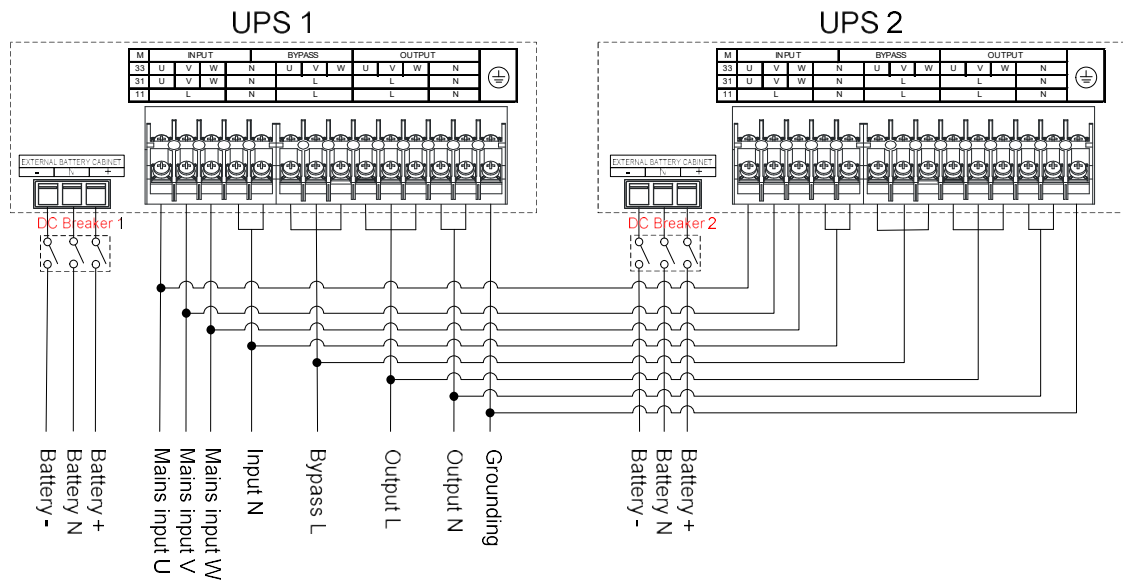
The parallel function requires parallel kit (optional) for the standard UPS model is single equipment.

Install the battery and UPS of parallel system separately according to 3.4Mechanical Installation.

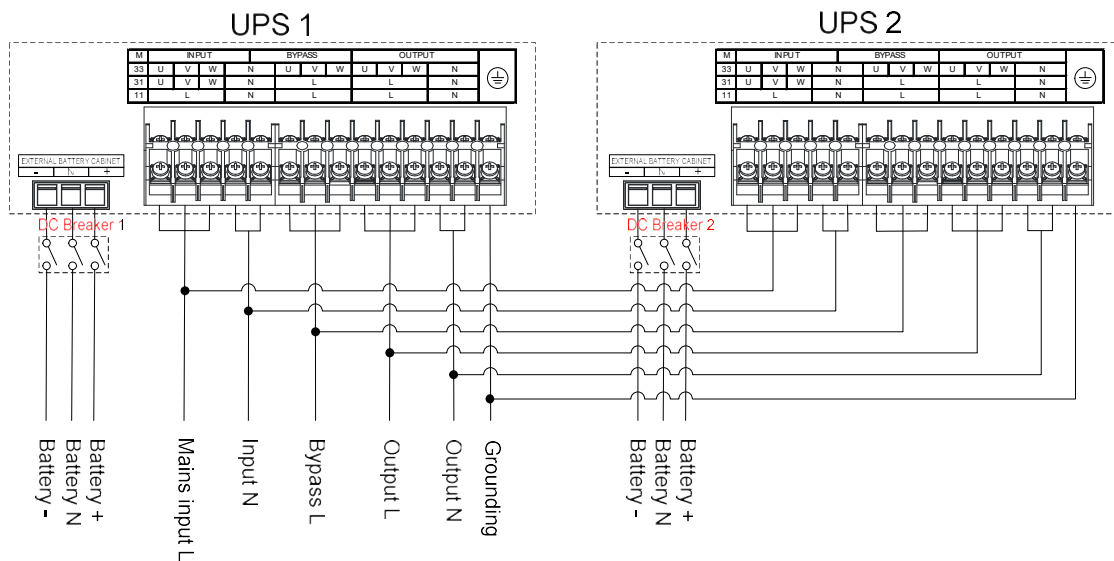
Connect the wires of input, bypass, output and battery in parallel system.



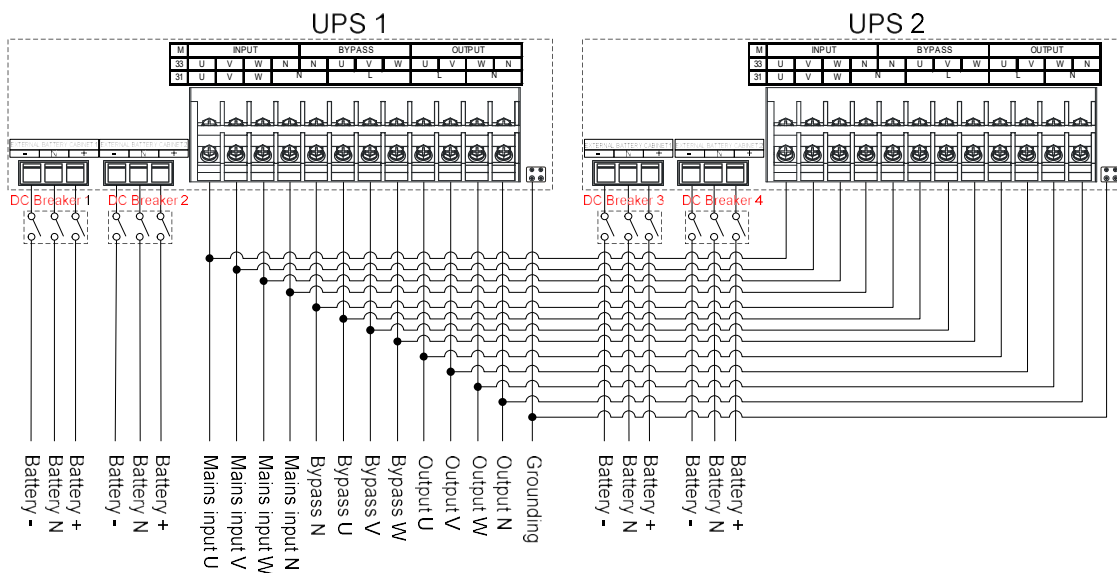
33 mode parallel system wiring diagram of IST7 10-20KVA



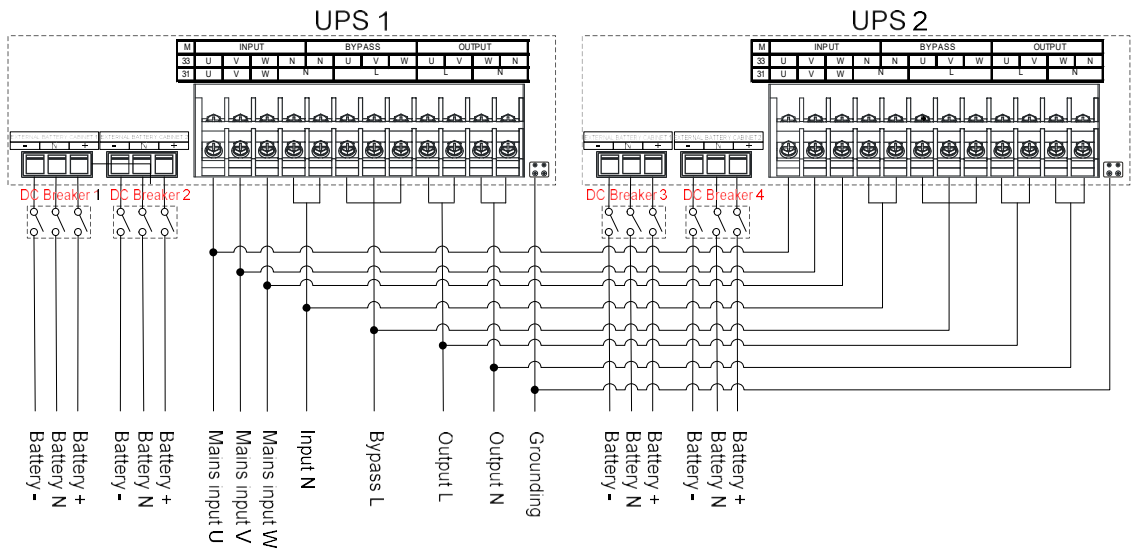
31 mode parallel system wiring diagram of IST7 10-20KVA



11 mode parallel system wiring diagram of IST7 10-20KVA

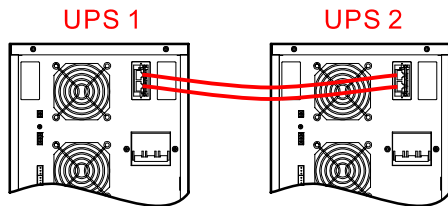


33 mode parallel system wiring diagram of IST7 30-40KVA

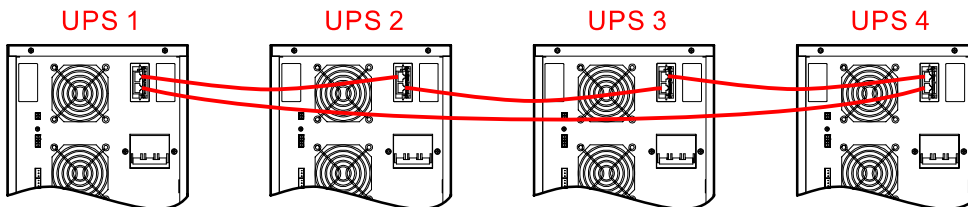


31 mode parallel system wiring diagram of IST7 30-40KVA

Connect the parallel port of each UPS in parallel by parallel wires.



Double parallel wiring diagram of IST7 10kVA



Four parallel wiring diagram of IST7 10kVA

NOTE

The parallel wiring operation of IST7 series (10kVA-40kVA) is the same but the parallel port position of IST7 series (30kVA-40kVA) is different with IST710, above we take IST710 as an example to illustrate.

When the battery pack is shared by UPS in the parallel system, please make sure that all battery parameters of each UPS are consistent, such as battery capacity, battery number, charging voltage and charging current.

4 Touch Screen Operation

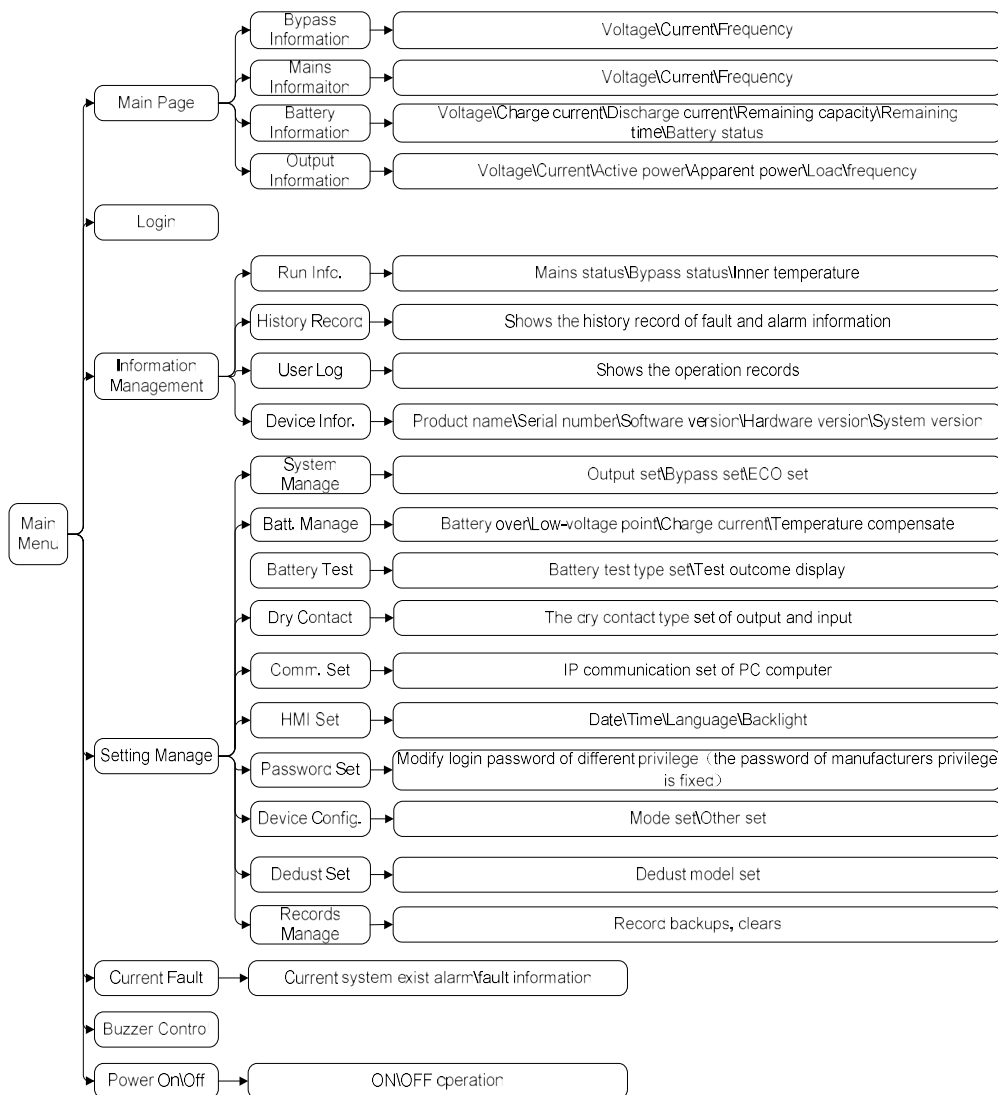
In the touch screen, user can scan input parameter, output parameter, load parameter, battery parameter, get UPS status and warning information and perform relative setting. Besides, it also can query event log for fault diagnosis.



NOTE

The parameters values and other details in the pictures in this chapter are for illustration only. Detailed information should be based on the touch screen of the product.

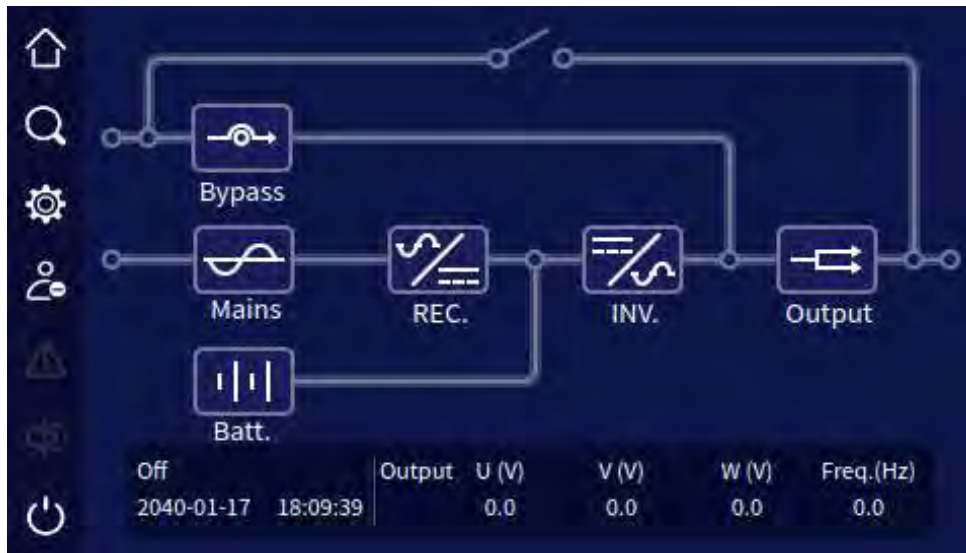
4.1 Menu Hierarchy



Menu structure of the touch screen












4.2 Main Page

After powering on, the touch screen will enter initialize. Then will enter system monitoring main page after powering on.



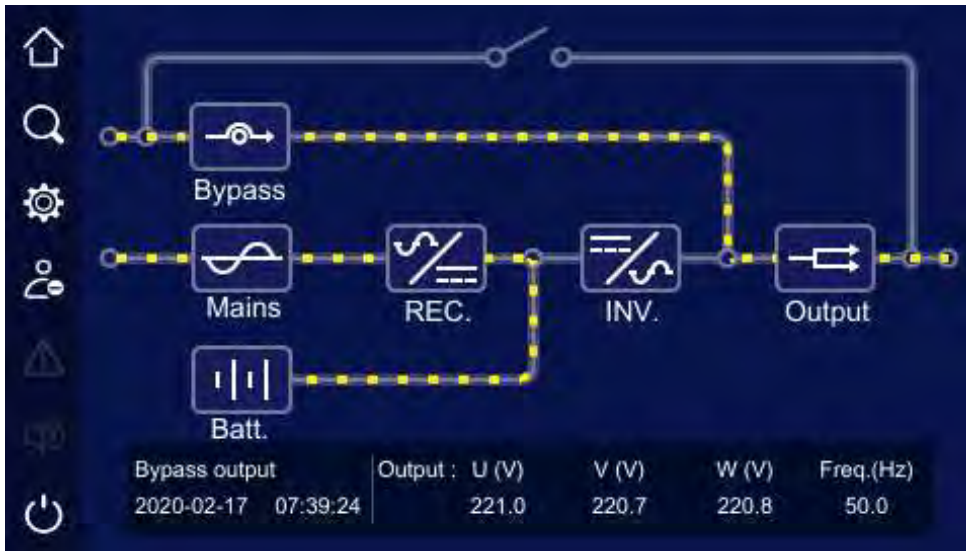
4.2.1 Icon Meaning

In the main page, it shows the topological structure of UPS. The icon meaning is as follows:

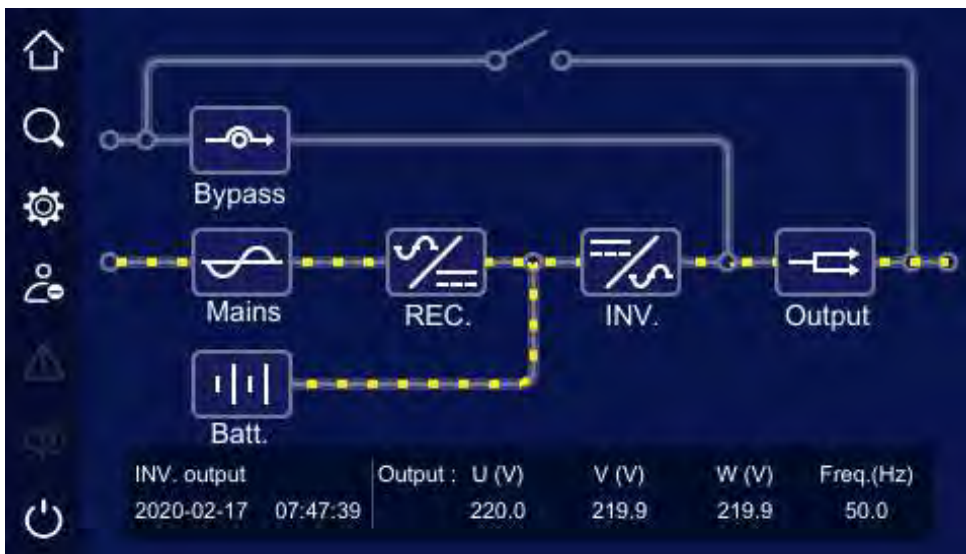
- : Homepage. Click the icon in any page, it will return to the main page.
- : Information management. Click the icon it will enter the information management page.
- : Setting management. Click the icon, it will enter the setting management page.
- : Current fault information. If there is any fault, click the icon, you can check the corresponding fault information.
- : Buzzer. Click the icon to control the buzzer.
- : Login.
- : ON/OFF.
- : Bypass information. When bypass is abnormal, the icon will be on and show in red.
- : Mains information. When mains is abnormal, the icon will be on and show in red.
- : Battery information. When battery is abnormal, the icon will be turn on and show in red.
- : Output information. When output is abnormal, the icon will be on and show in red.

4.2.1 Working Status

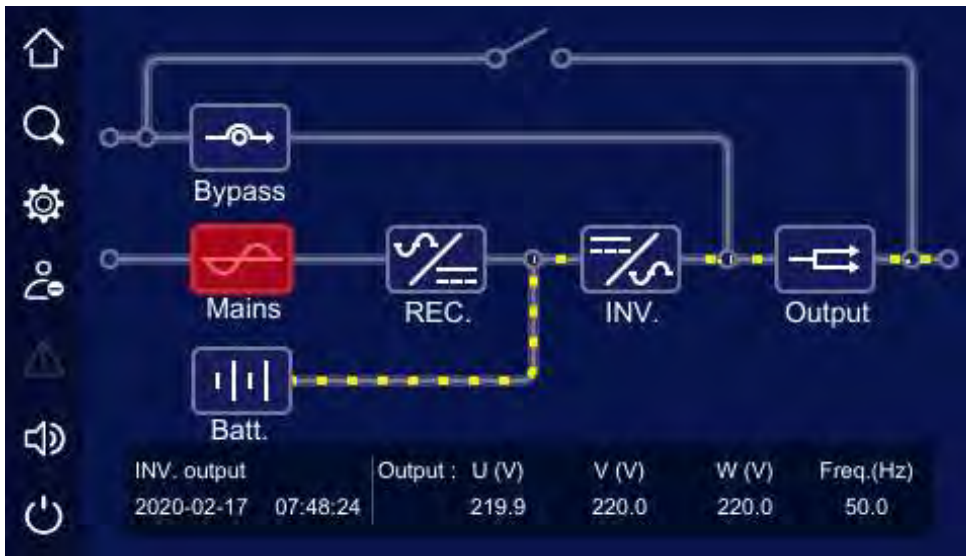
There are six main working statuses: without energy transmission status, mains inverting status, battery inverting status, bypass output status, ECO output and maintenance bypass output status.



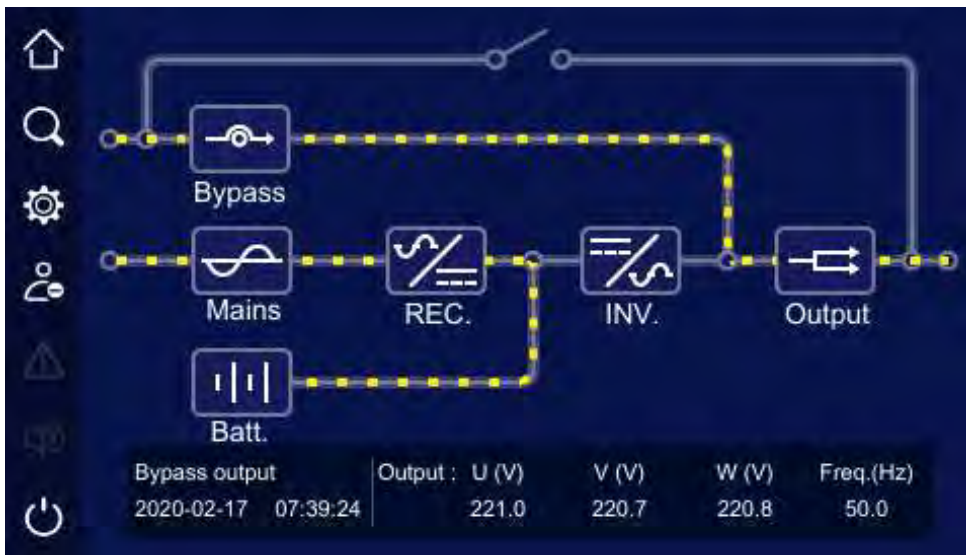
Without energy transmission status



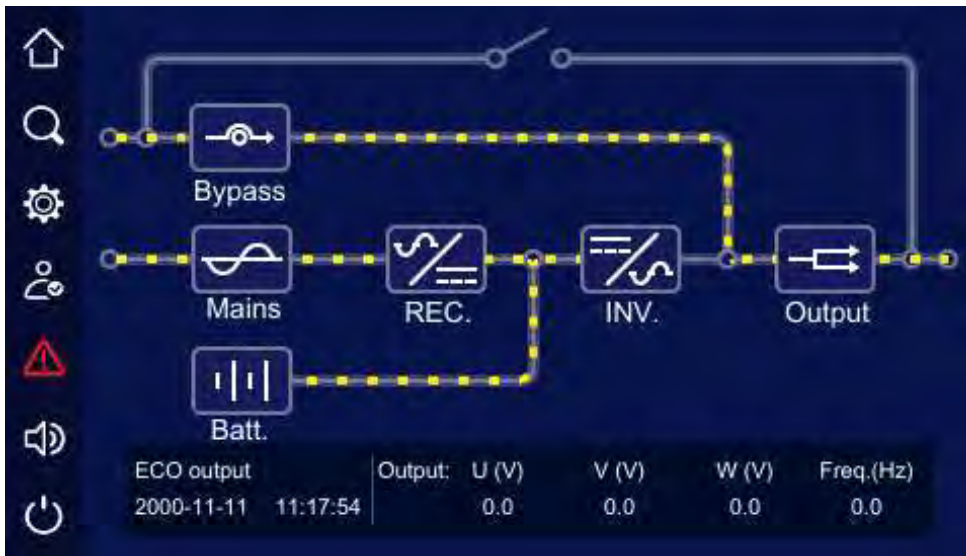
Mains normal, mains inverting status



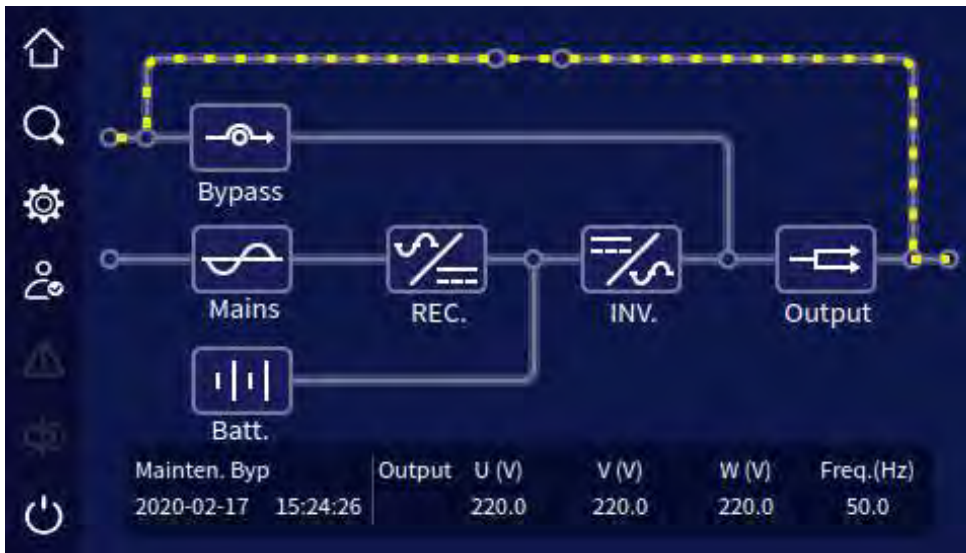
Mains abnormal, battery inverting status



Bypass output status




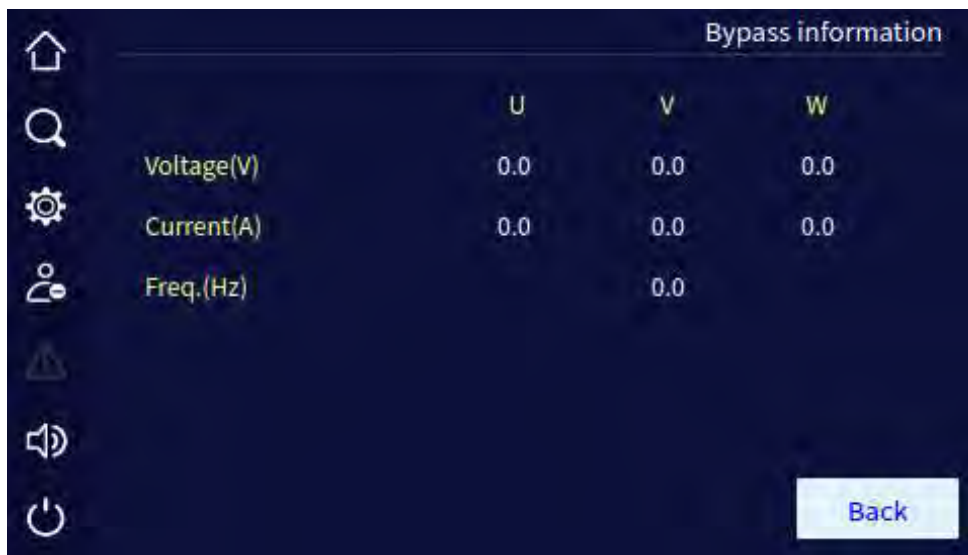
ECO status



Maintenance bypass output status


4.2.2 Bypass Information Page

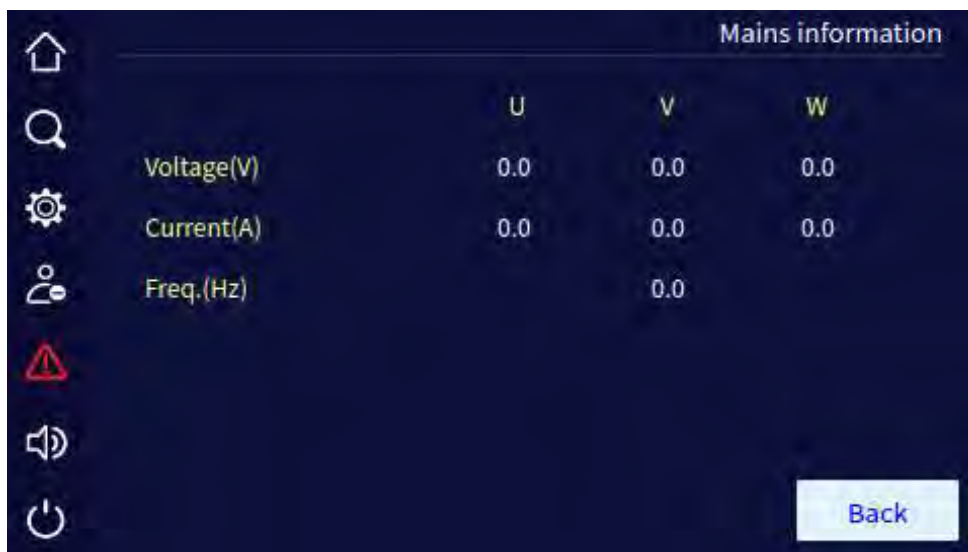
On main page, click "" icon, it will enter the bypass information page.



Bypass information page


4.2.3 Mains Information Page

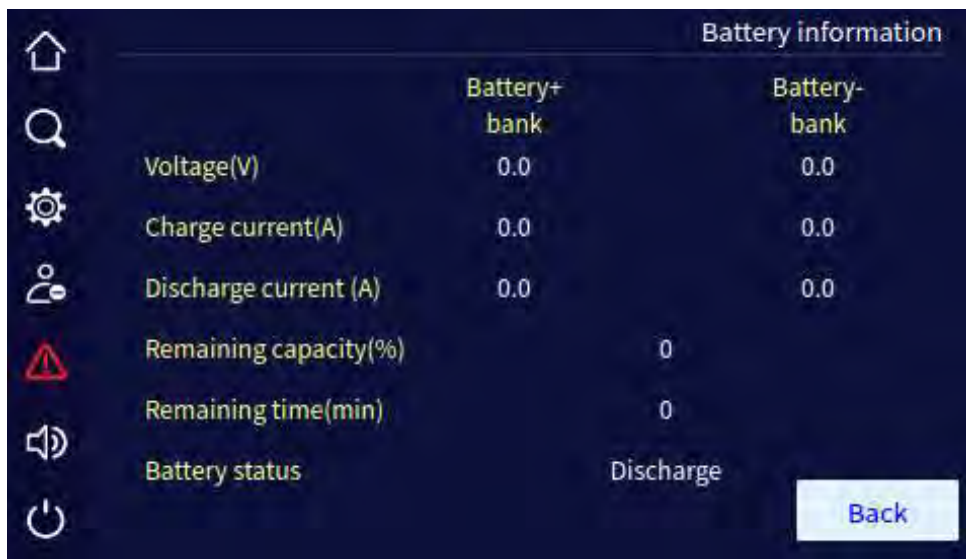
In the main page, click "" icon, it will enter the mains information page.



Mains information page


4.2.4 Battery Information Page

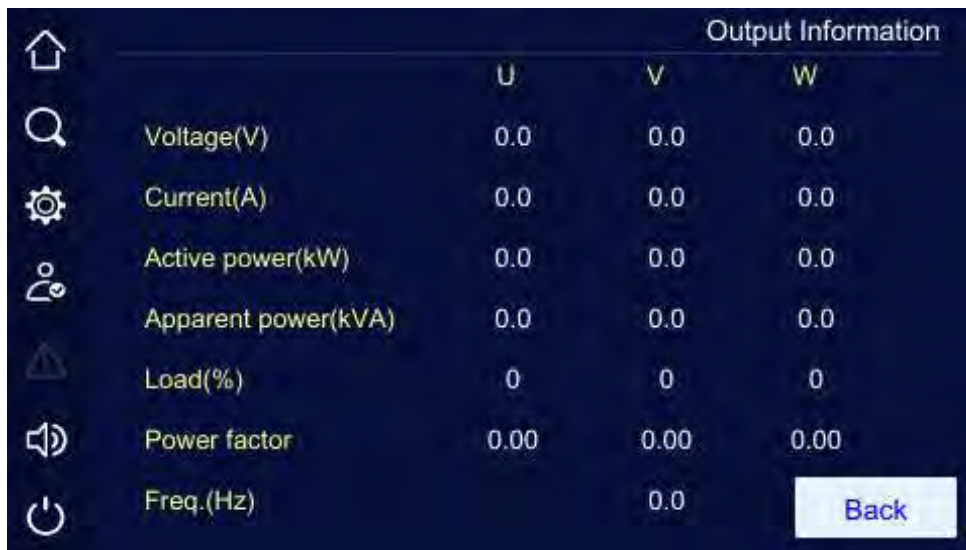
In the main page, click "" icon, it will enter the battery information page. When battery is discharging, it shows discharge current. When battery is equalizing charging or float charging, it will show charge current. The battery status shows the current battery status: discharge, equalized charge, floating charge. Besides, the page also includes the battery remaining time capacity and remaining time, etc.



Battery information page


4.2.5 Output Information Page

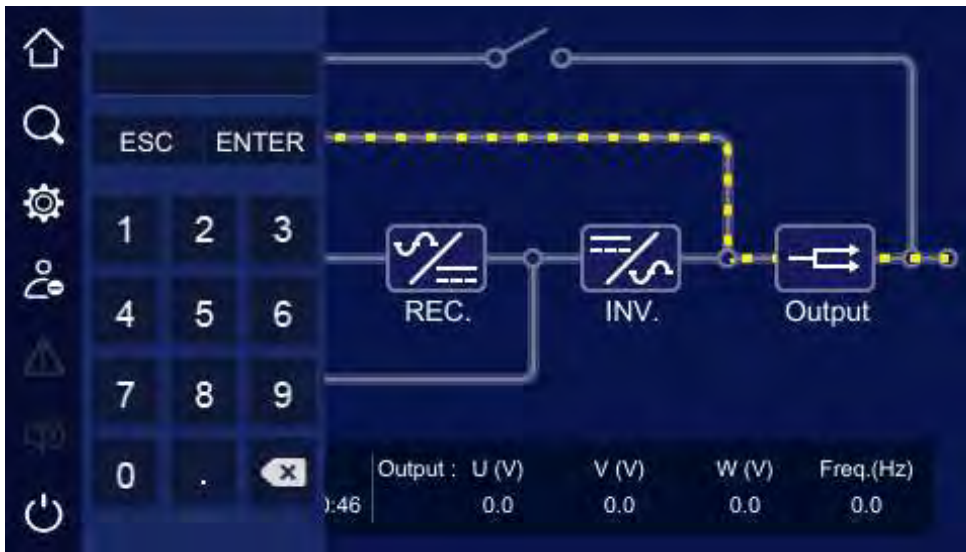
In the main page, click "  " icon, it will enter the output information page. The page shows the output voltage, current, load, active power, apparent power, power factor, output frequency, etc.



Output information page

4.3 Login Page

In the main page, click "  " icon, it will enter the login page. Only login, the setting management can be done.




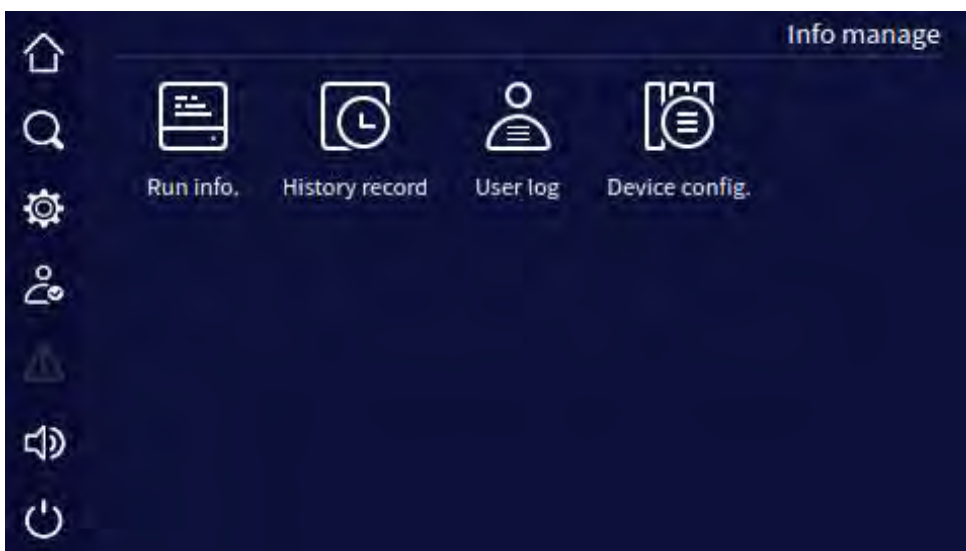
Login page

NOTE

The password for common user is 111, the password for administrator is 222. Common user can check the parameters only, administrator can check and set the UPS parameters.

4.4 Information Management Page

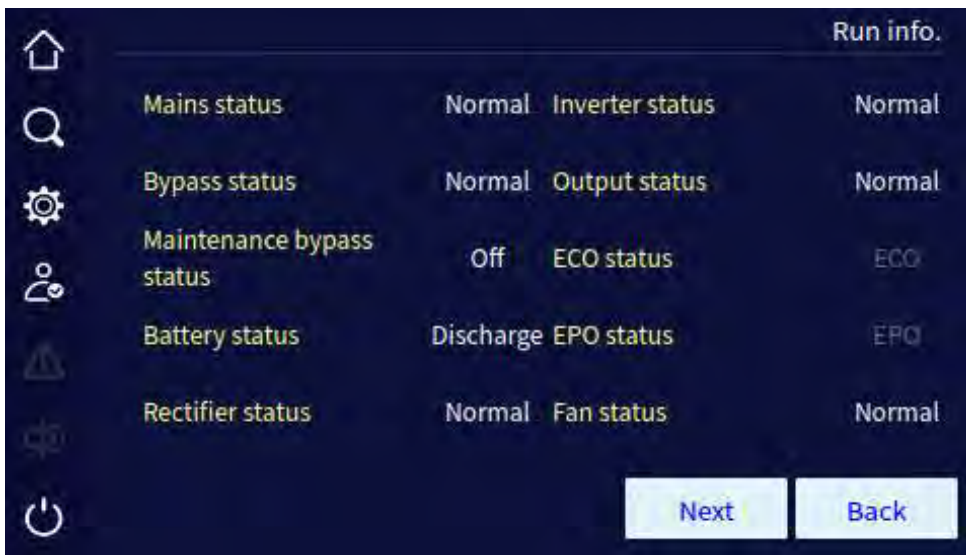
In the main page, click "" icon, it will enter the information management page. The page includes run info, history record, user log and device config.



Information management page

5.2.3 Run Information Page

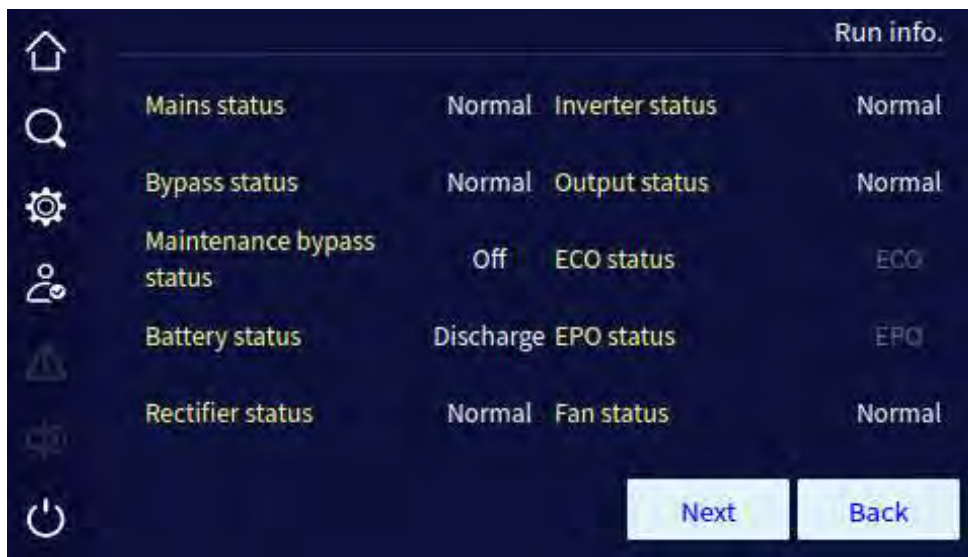
In the information management page, click the run info icon, it will enter the run information page. The page shows the UPS current status, including mains status, bypass status, battery status, output status, load status, rectifier status, inverter status, work mode, input loop, bypass loop, battery loop, fan status, inner temperature.



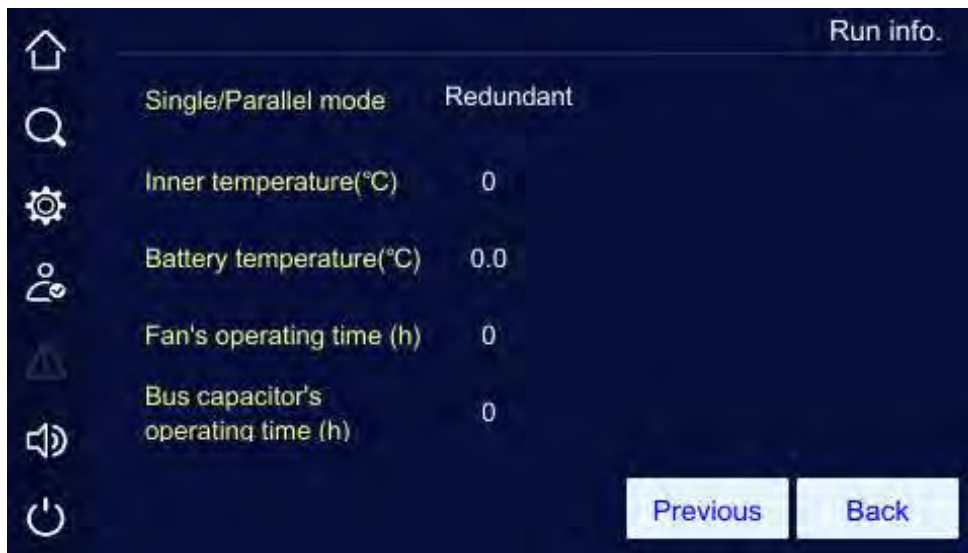
Run info page 1 (single UPS)



Working status page 2 (single UPS)



Working status page 1 (parallel UPS)



Working status page 2 (parallel UPS)

4.4.1 History Record Page

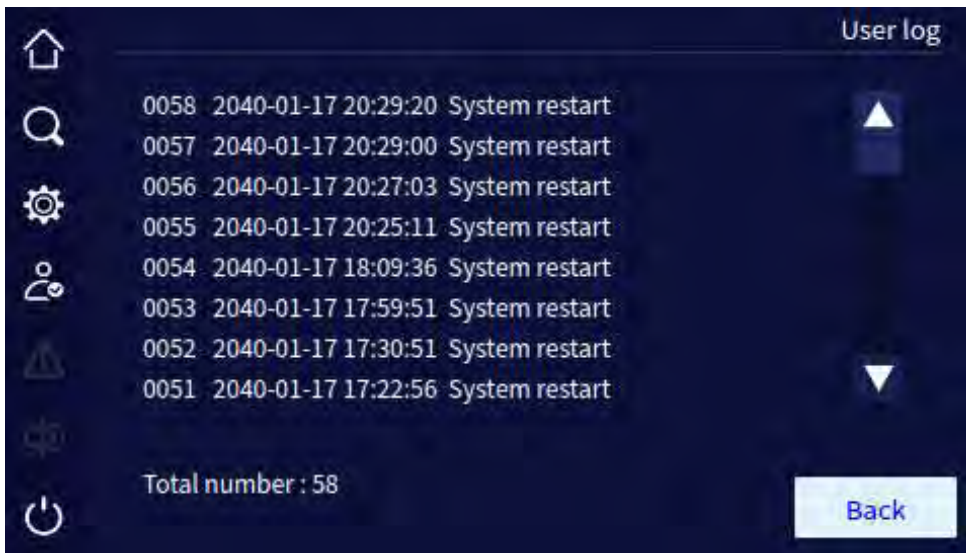
In the information management page, click event log icon, it will enter the history record page. The page shows the fault and alarm information, and they are listed on the basis of time. The first record is the latest fault.



Event log page

4.4.2 User Log Page

In the information management page, click the user log icon, it will enter the user log page. The page shows the operation records, such as ON/OFF operation, mains voltage range setting, bypass voltage setting, etc. The user log is listed on the basis of time. The first record is the latest operation record.

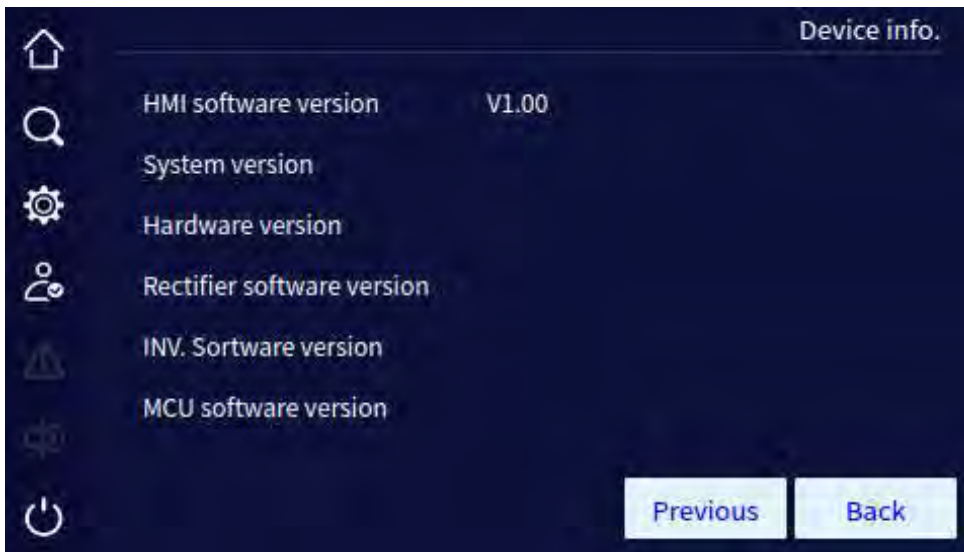


User log page

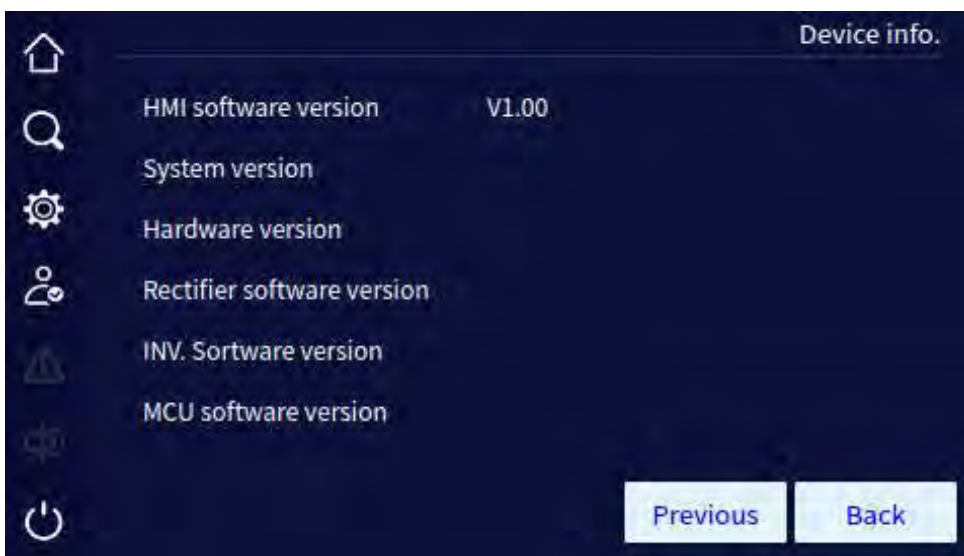
4.4.3 Device Information Page

In the information management page, click the device information icon, it will enter the device information page. Device information page includes product name and model, version

information includes serial number, rectifier version, inverter version, system version, protocol version and HMI software version, etc.




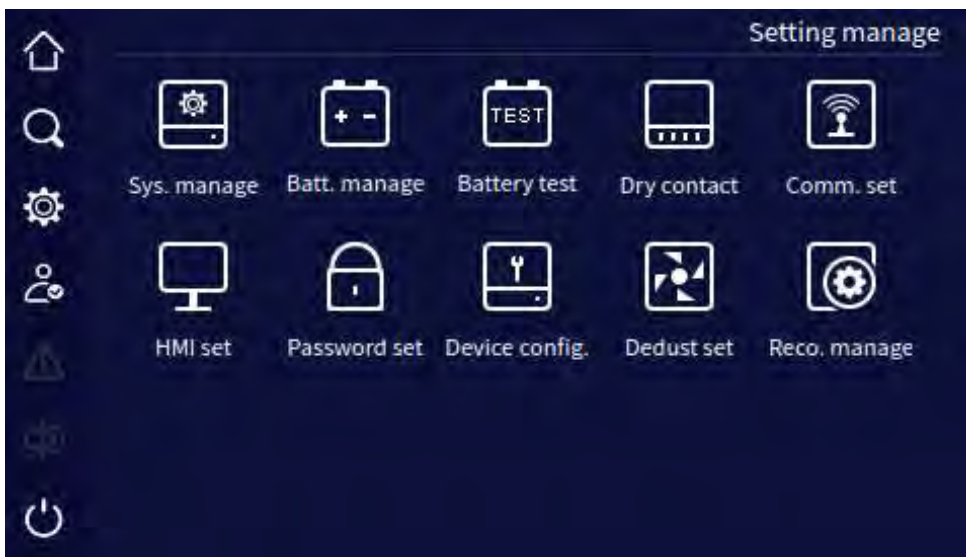
Device information page 1



Device information page 2

4.5 Setting Management Page

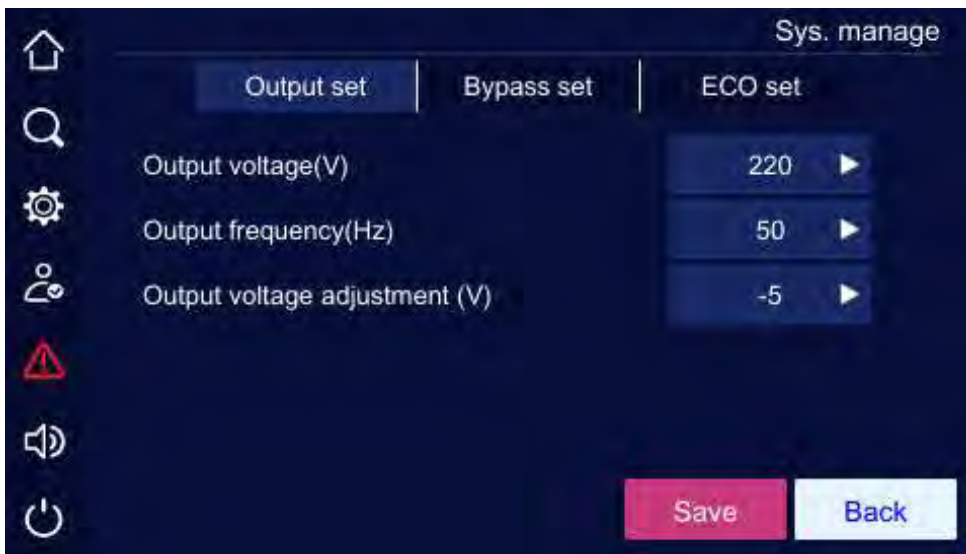
In the main page, after login, click "" icon, it will enter the setting management page. The page includes: system manage, battery manage, battery test, log manage, communication setting, screen setting, dedust setting and password setting.



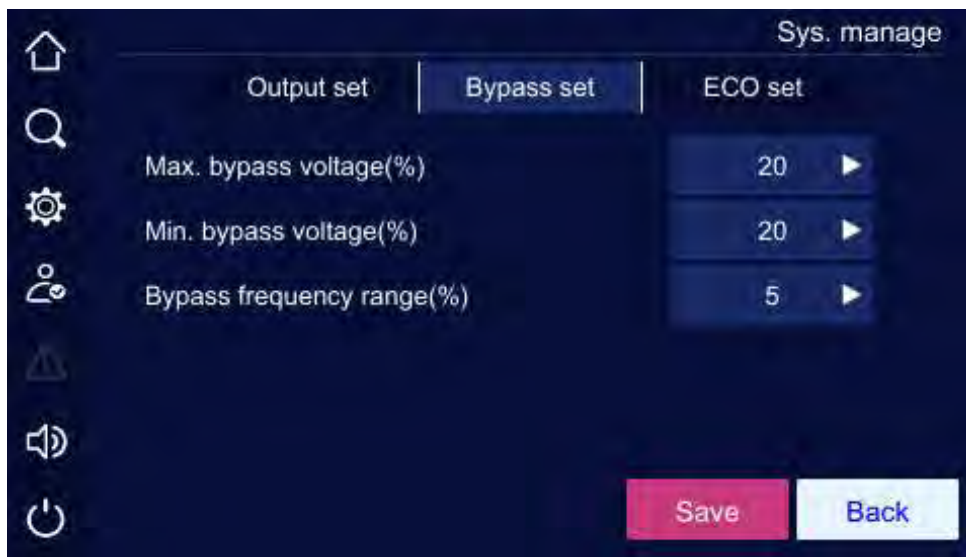
Setting management page

5.2.4 System Manage Page

In the system manage page, user can set the mains voltage range, bypass voltage range, bypass frequency range, ECO mode and ECO voltage range.



System manage page 1 of output set



System manage page 2 of bypass set






System management page 3 of ECO set

Setting description for system manage

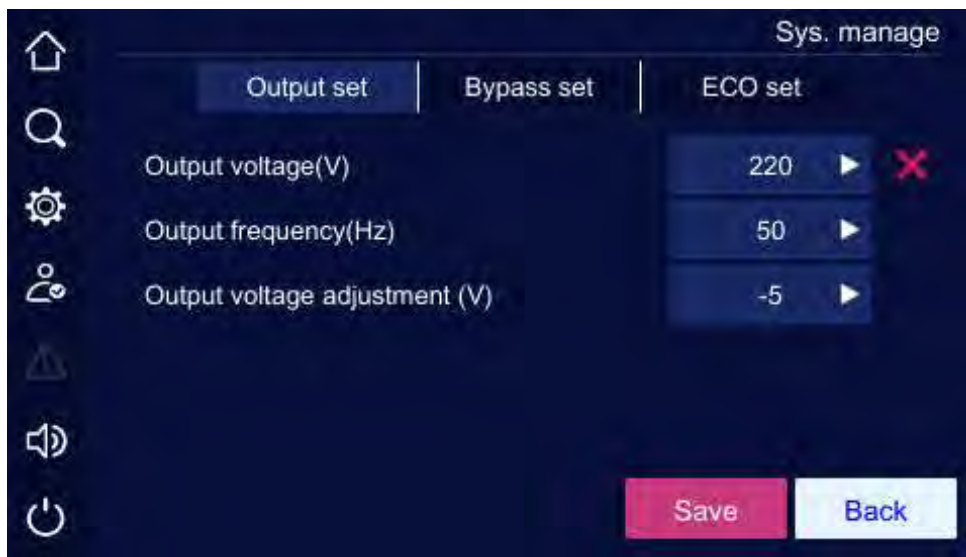
Item	Settable value
Output voltage (V)	220V, 230V, 240V
Output frequency (Hz)	50Hz, 60Hz
Output voltage adjustment (V)	-5~ +5
Max. bypass voltage (%)	10%, 15%, 20%

Item	Settable value
Min. bypass voltage (%)	10%, 15%, 20%
Bypass frequency range (%)	5%, 10%
ECO mode	On, Off
ECO voltage range (%)	10%, 15%
ECO frequency range (%)	5%, 10%

After changing the parameter, it is necessary to click "  " button to save the setting. If the setting is successful, there will be a "  " icon at the right side of the parameter, if the setting is unsuccessful, there will be a "  " icon at the right side of the parameter.



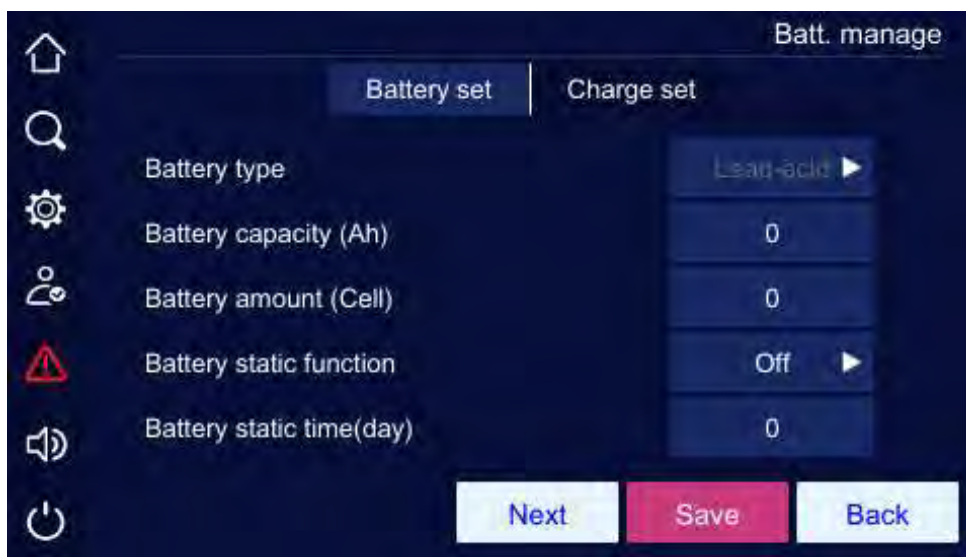
Successful setting



Unsuccessful setting

4.5.1 Battery Management Page

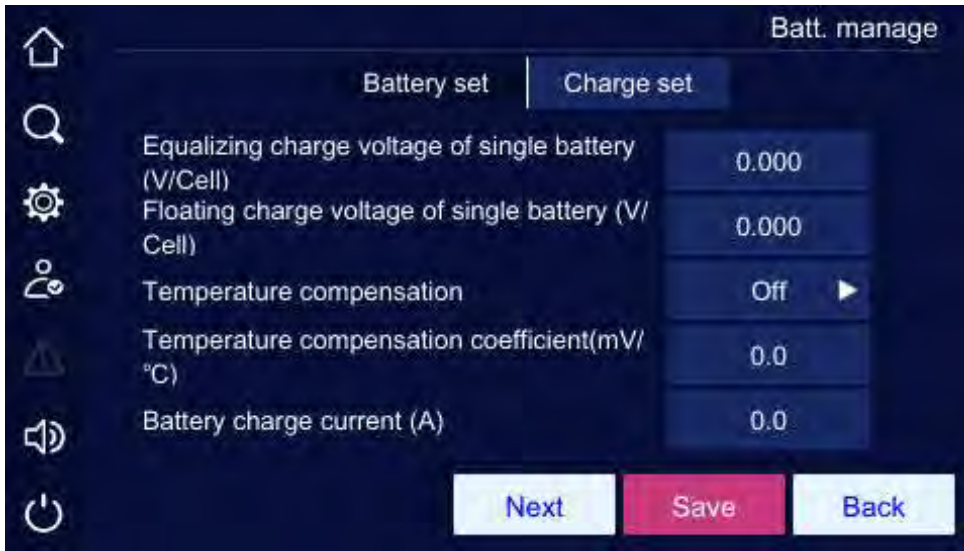
Battery manage page includes equalizing charge voltage, floating charge voltage, charge current, battery test ending voltage, low-voltage warning, low-voltage protection, temperature compensation coefficient, force equalizing charge.



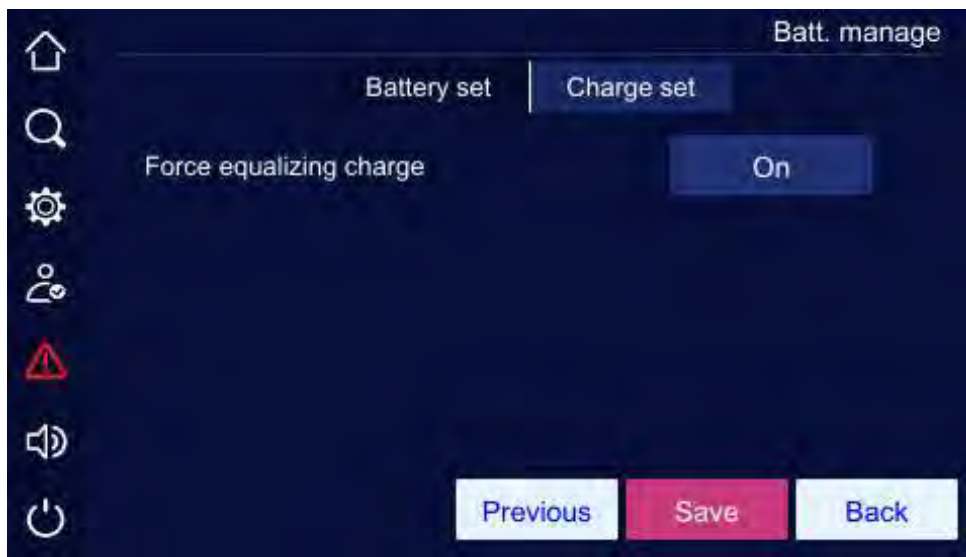
Battery set page 1 of battery management



Battery set page 2 of battery management



Charge set page 1 of battery management



Charge set page 2 of battery management

Setting description for battery manage page

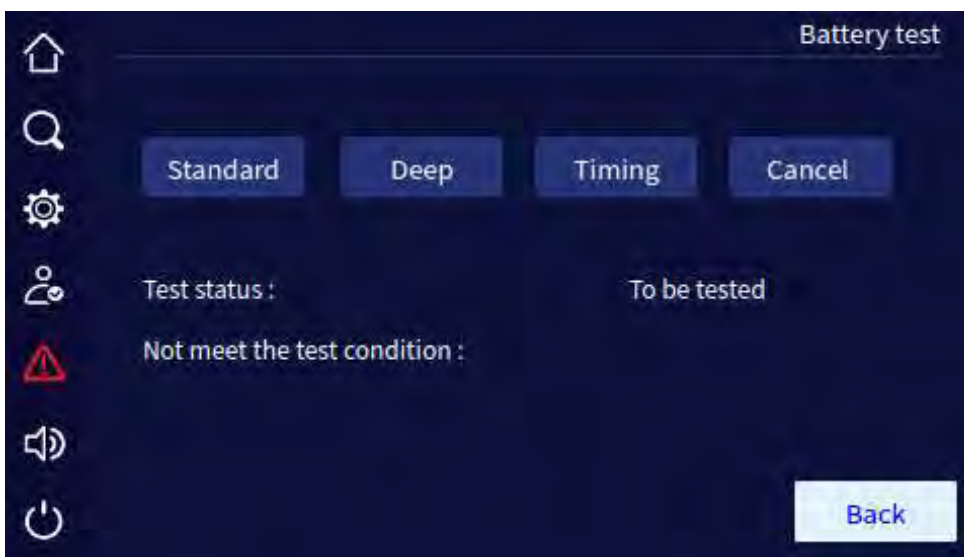
Item	Settable value
Battery type	Lead-acid
Battery capacity (Ah)	1~2000
Battery amount (Cell)	48-120
Battery static function	On, Off
Battery static time (day)	1~30
Battery static delay time (h)	1~48
Battery backup function	On, Off
Single battery low-voltage protection (V/Cell)	1.667~1.867
Single battery test ending voltage (V/Cell)	1.667~1.867
Equalizing charge voltage of single battery (V/Cell)	2.083~2.417
Floating charge voltage of single battery (V/Cell)	2.083~2.333
Temperature compensation	On, Off

Item	Settable value
Temperature compensation coefficient (mV/°C)	0~5.0
Battery charge current (A)	10kVA-20kVA: 1.0~10.0; 30kVA-40kVA: 1.0~20.0
Force equalizing charge	On

Click number input box, it will display the input range of setting value at the top of the input keyboard. When the setting exceeds the range, the setting will be invalid. After setting, click " Save " button to save the setting. Successful setting/unsuccessful setting mark is the same as that of system management.

4.5.2 Battery Test Page

Battery test includes standard test and depth test and the battery test also can be canceled. The page shows the test status, battery current, consumed capacity and test time.



Battery test page

4.5.3 Dry Contact Page

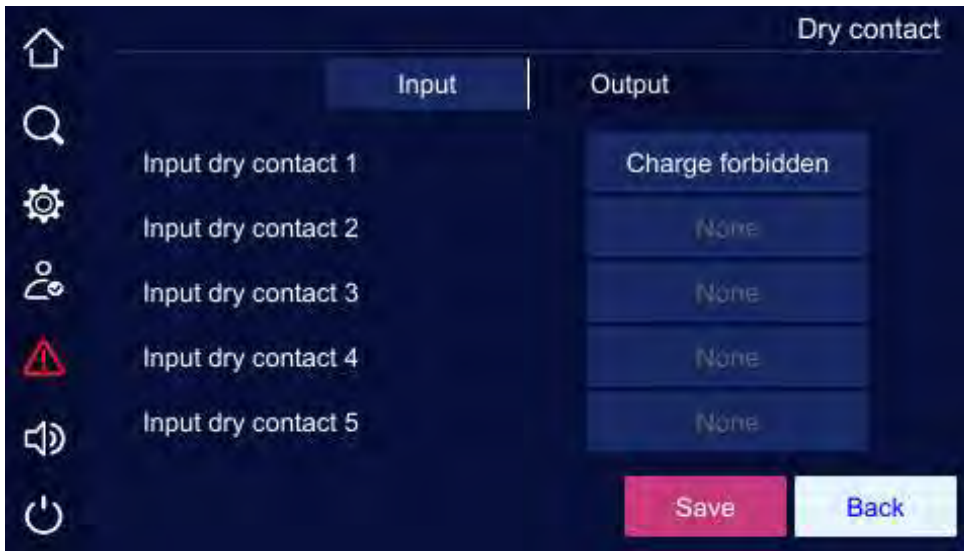
In setting manage page, click Dry Contact icon, it will enter dry contact setting page.

 **NOTE**

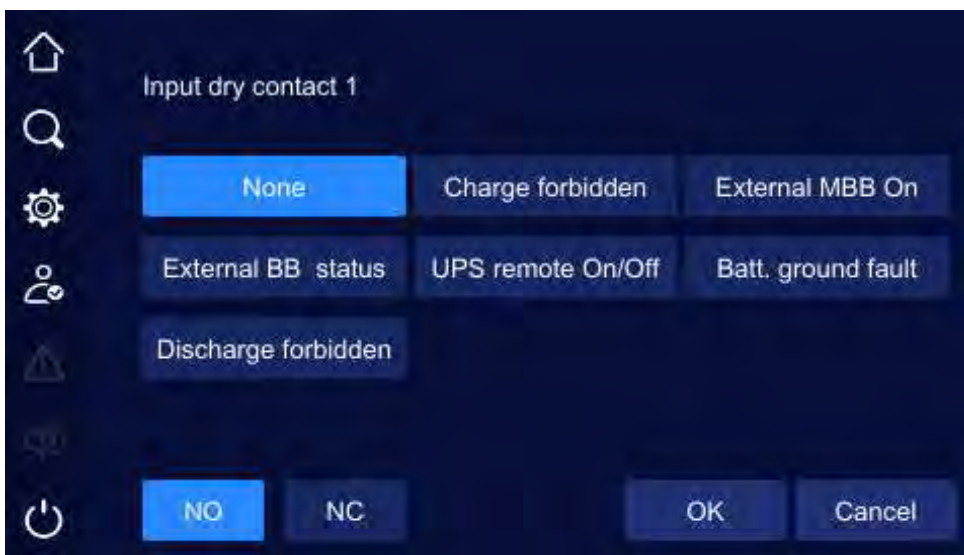
The dry contact setting is the same, below we take dry contact 1 as an example to illustrate.

Input dry contact

On Dry contact page, click "Charge forbidden" icon, it will enter corresponding dry contact setting page. Click "OK" button to save the dry contact setting and return Dry contact setting page. After setting, click "Save" button on Dry contact page to save the setting. Successful setting/unsuccessful setting mark is the same as that of system management.



Input dry contact setting page 1

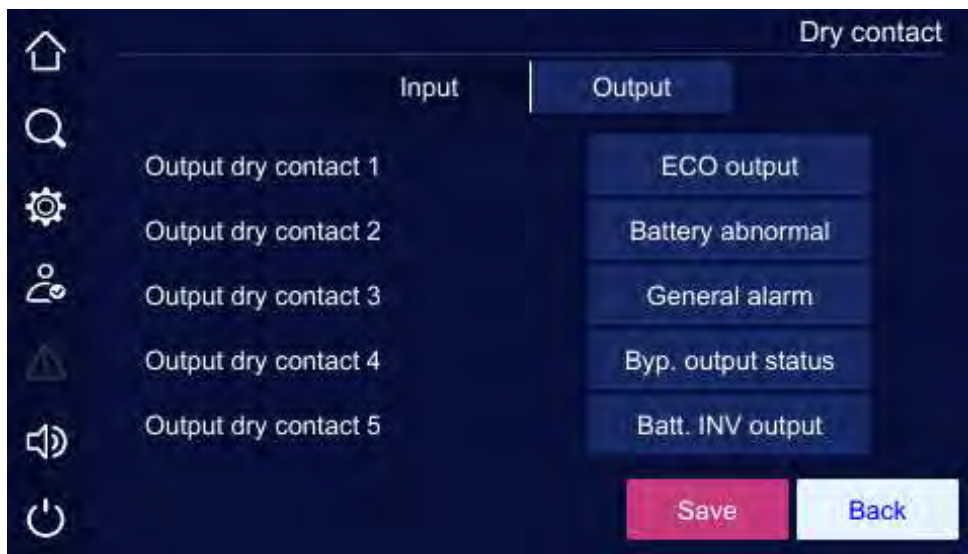


Input dry contact setting page 2

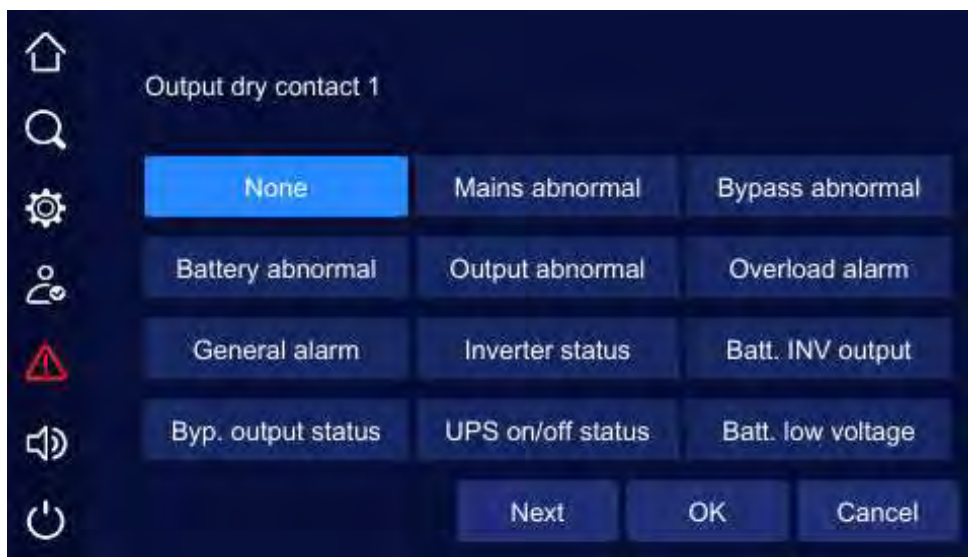
Output dry contact

On Dry contact page, click "ECO output" icon, it will enter corresponding dry contact setting page. Click "OK" button to save the dry contact setting and return Dry contact

setting page. After setting, click " Save " button on Dry contact page to save the setting. Successful setting/unsuccessful setting mark is the same as that of system management.



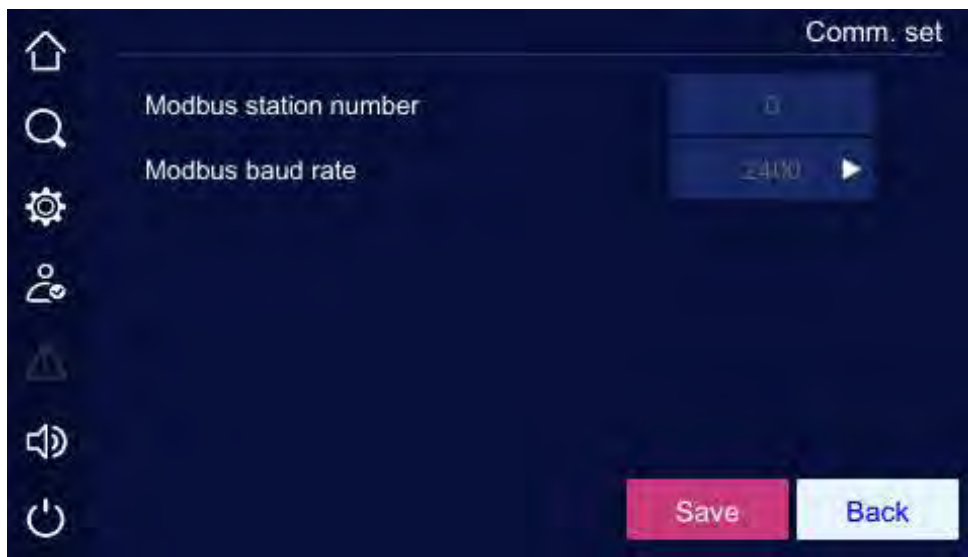
Output dry contact setting page 1



Output dry contact setting page 2

4.5.4 Communication Setting Page

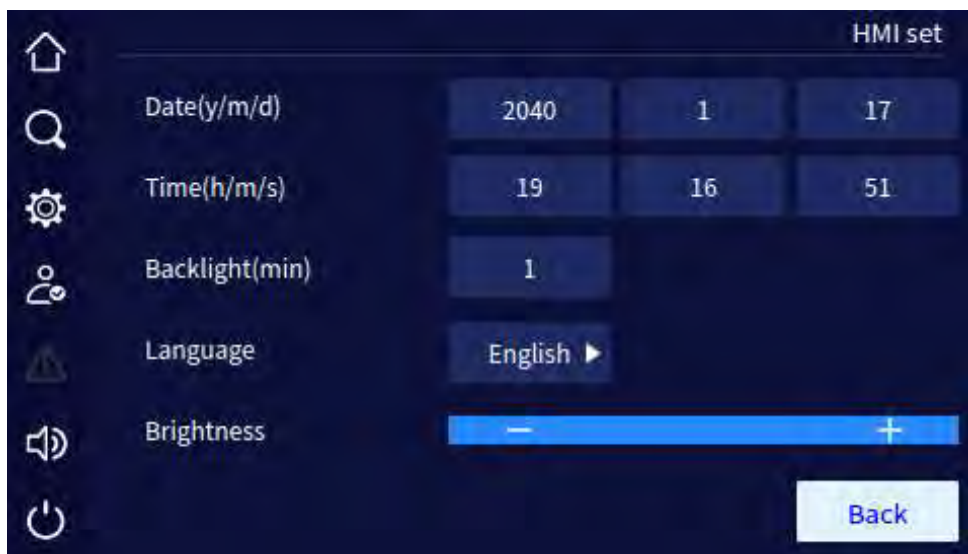
User can select the communication way of upper-computer in communication setting page, Modbus and SNMP can be set. For Modbus communication, user can set the Modbus address and baud rate.



Communication setting page

4.5.5 HMI Setting Page

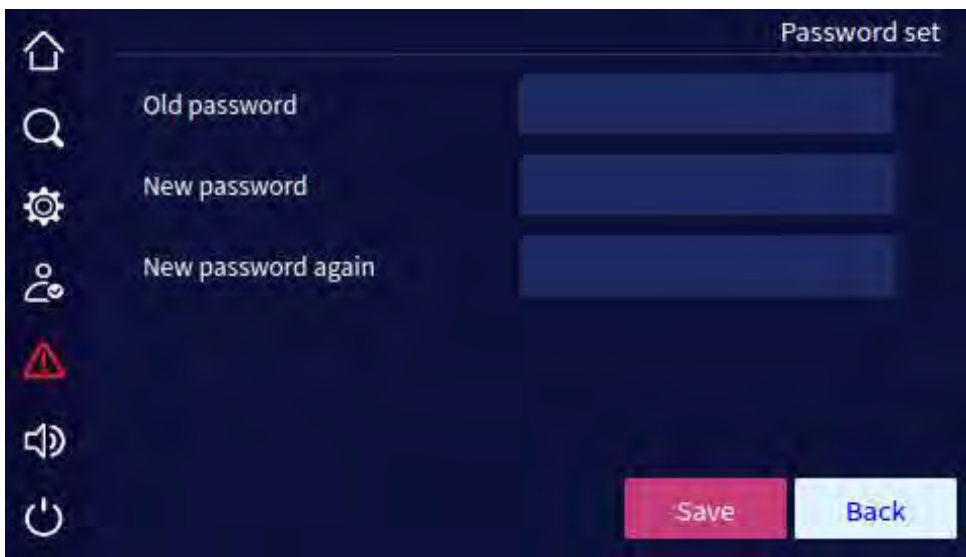
In screen setting page, user can set the date, time, language, backlight and screen saver.



Screen setting page

4.5.6 Password Setting Page

In setting management page, click password setting icon, it will enter the password setting page.



Password setting page

4.5.7 Device Configuration Page

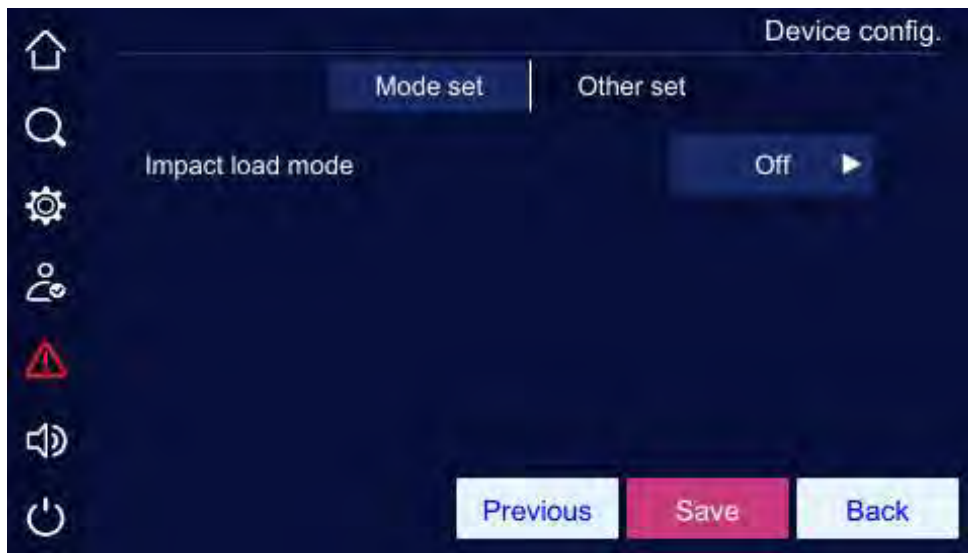
In setting manage page, click Device config icon, it will enter Device configuration page.



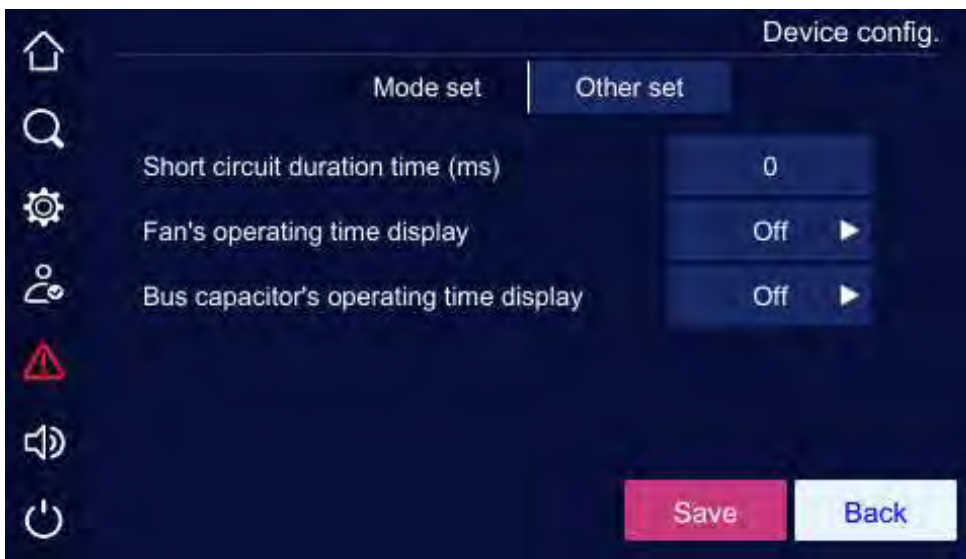
Mode set page 1 of device configuration



Mode set page 2 of device configuration



Mode set page 3 of device configuration




Other set page of device configuration

Setting description for battery mange page

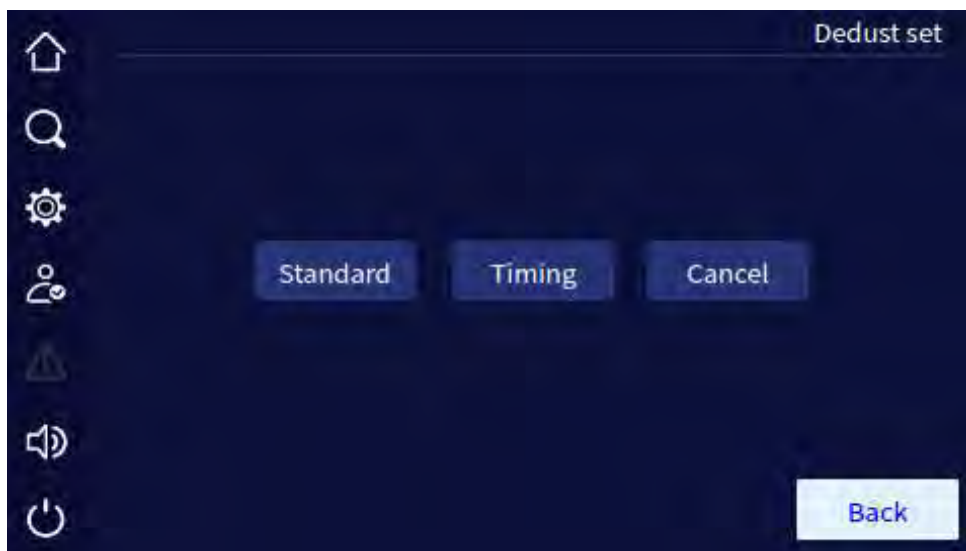
Item	Settable value
Short circuit duration time (ms)	10-200
Fan's operating time display	On, Off
Bus capacitor's operating time display	On, Off
Work configuration	10kVA-20kVA: 3/3, 3/1, 1/1; 30kVA-40kVA: 3/3, 3/1
Parallel mode	Redundant, Single, Expand, BSC
Parallel UPS ID	1-4
Frequency converter function	On, Off
Frequency converter frequency	50, 60
Self-start when power on	UPS will not turn off, On, Off
Bypass disable	On, Off
Bypass disable when short circuit	On, Off
Test load function	On, Off

Item	Settable value
Test load rate (%)	10-100
Impact load mode	On, Off

Click number input box, it will display the input range of setting value at the top of the input keyboard. When the setting exceeds the range, the setting will be invalid. After setting, click "  " button to save the setting. Successful setting/unsuccessful setting mark is the same as that of system management.



4.5.8 Dedust Setting Page

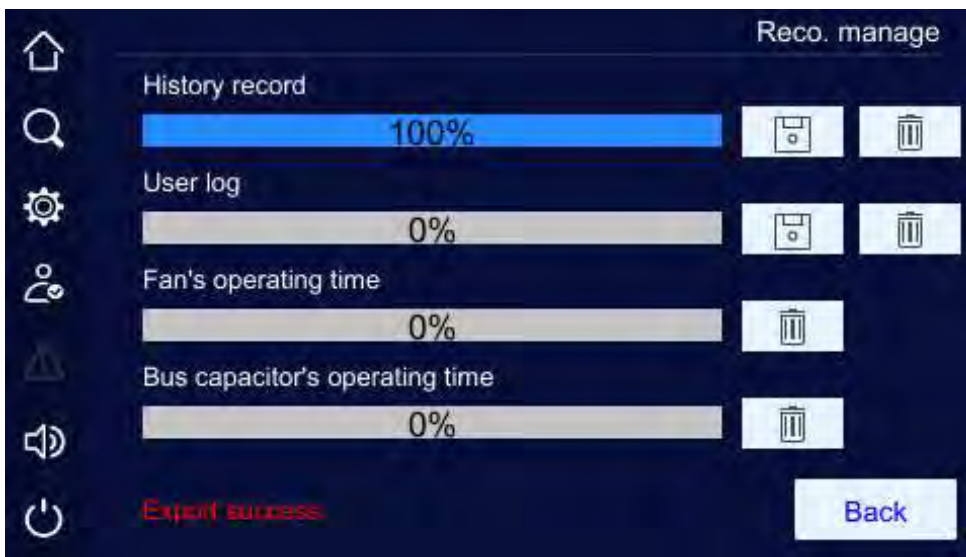
In setting manage page, click Batt. Manage icon, it will enter battery manage page.



Dedust set page

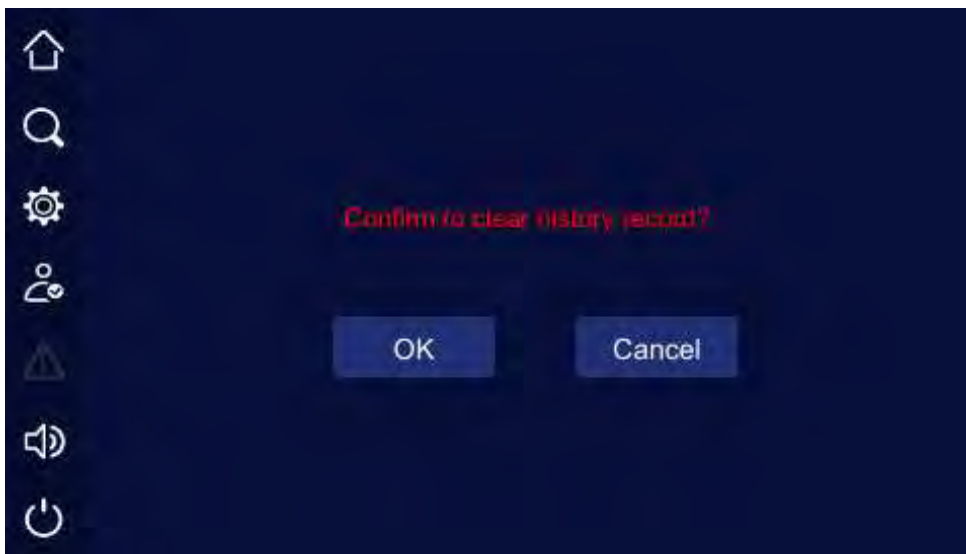
4.5.9 Record Manage Page

Reco. mange page can export and clear the history log, user log, and wave capture. Click "  " button, you can export the selected items by USB flash drive, click the "  " button, you can clear the selected items. Before clearing, it will show the prompting window to confirm.



Export success of record manage page

Insert U dish, you can backup the records.



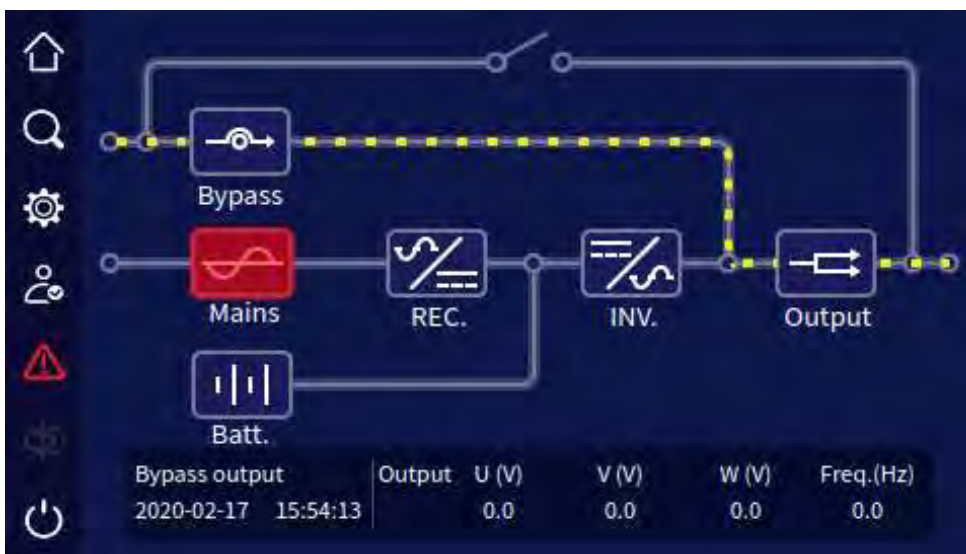
Prompting for clearing log



The U dish is not inserted

4.6 Current Fault Page

When the UPS is fault, the "⚠" icon at the left will light on. Click it, the page will show the current fault information.



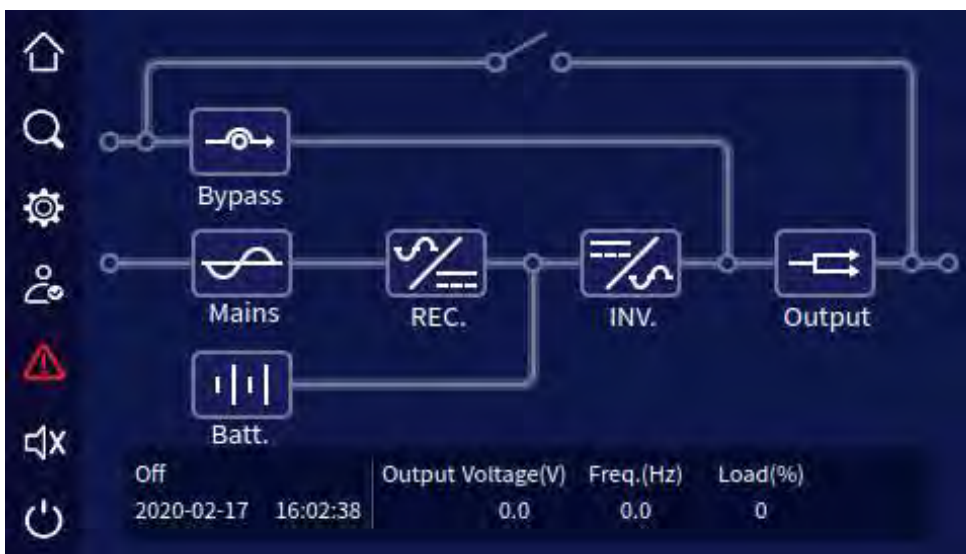
Fault alarm status



Current fault information

4.7 Buzzer Control

When the UPS fault, the buzzer icon will light on. Click the "🔊" icon, the buzzer can be muted or opened.

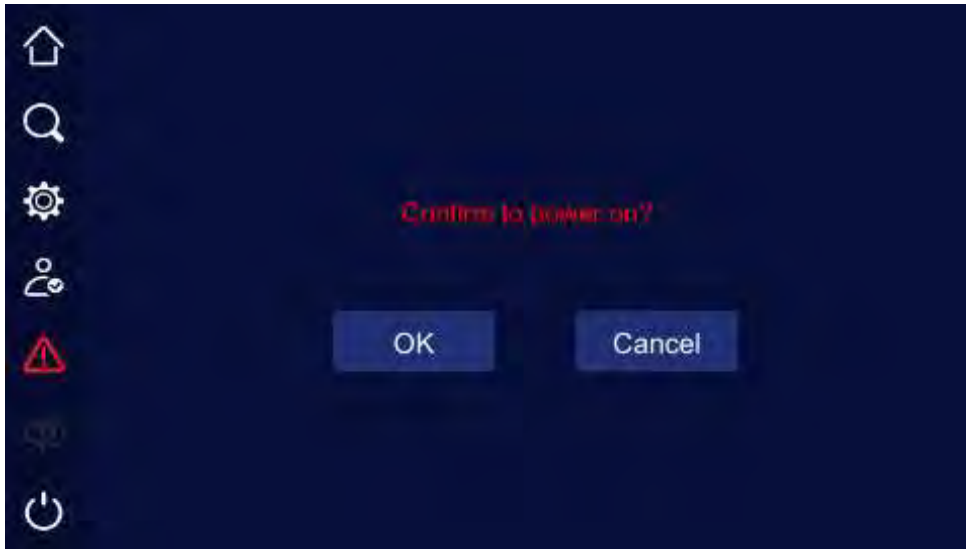


Buzzer mute status

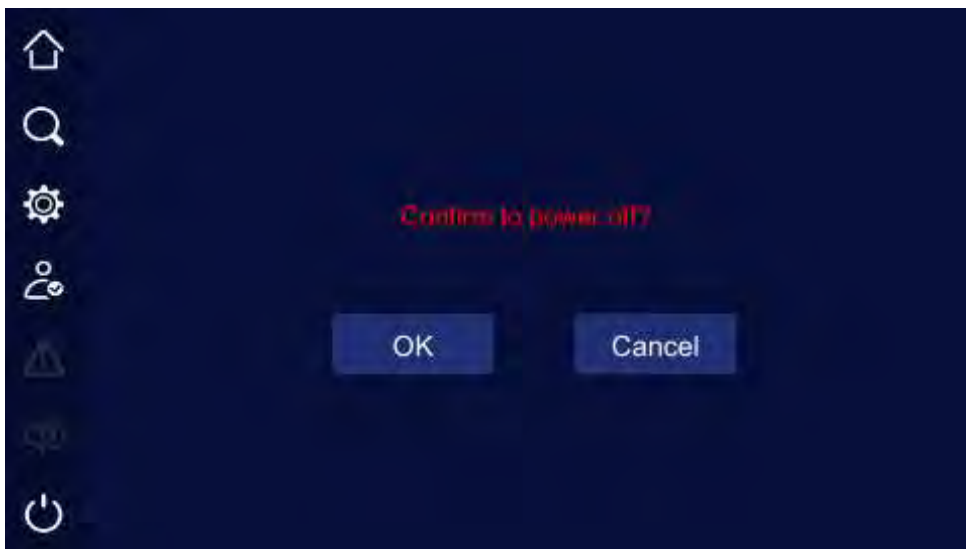
NOTE
The buzzer cannot be muted when it long beep.

4.8 ON\OFF Operation

In main page, click "🔌" icon, the UPS can be started or shutdown. When the UPS is shutdown, click the icon, it will show "confirm to power on?", when the UPS is started, it will show "confirm to power off?".



Confirm to turn on page



Confirm to turn off page

5 Use and Operation

5.1 Check Before Startup

- Check if the wire connection is firm and the color of AC wires is in accordance with the specification.
- Check if UPS is grounded reliably.
- Check if the voltage between the neutral wire and grounding wire is less than 5Vac.
- If the UPS equipped with remote monitoring device, check if the wiring of the RS485 port is correct.
- If it is long backup model, check if the wiring between UPS and battery box is correct and reliable.
- Check if the wiring is neat and the wire binding is in accordance with the specification.
- Check if the installation and wiring are good for transformation, expansion and maintenance in future.
- Check that there is no short-circuit in the output of the UPS and the load capacity isn't beyond the rated capacity of the UPS.

5.2 Startup Operation

Switch on the external mains, bypass and battery switch.

After touch screen light on, press the "ON" combination button on the touch screen for 1s at the same time on the front panel to start the UPS.

About 10s later, if the UPS works steadily, start loads, such as PC, etc.

**CAUTION**

Start load according to "high power device→small power device", which is to avoid overload protection when starting high power device.

5.3 Shutdown Operation

Close load and keep the UPS running without load for about 10min to exhaust heat.

Press "OFF" combination button (touch screen) for 1s at the same time on the front panel to shut down the UPS.

Switch off the external battery, bypass and mains switch.

5.4 Parallel System Operation

5.4.1 Start Parallel System

**CAUTION**

Ensure that each UPS in the parallel system is equipped with the parallel kit (optional) for parallel and has been set to the same parallel mode through the screen display.

Before completely starting the parallel system, please do not start load, and ensure that all switches of UPS are off.

The following steps for start the parallel system:

Ensure that each UPS of parallel system is installed properly, start each UPS of parallel system according to the 5.2Startup Operation one by one.

After each UPS in parallel system outputs by inverter, measure the inverter voltage of each paralleled UPS. The voltage difference between max. and min. voltage should be within 8V. Close the output breaker of paralleled UPS, measure the circulating current of parallel UPS, and the current should be less than 3A.

When the voltage different larger than 8V, measure the output voltage of the UPS and check if the output are all 220V, if the voltage different larger than 15V, please report it to our company to maintain it. In addition, once the circulating current of parallel UPS too large, it

will lead to the inverter fault. If the circulating current is larger than 3A, please report it to our company to maintain it.

Switch on the total output breaker of UPS, each output branch breaker, and then start the load one by one.

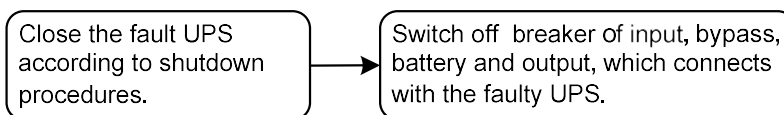
5.4.2 Shut Down Parallel System

Generally, it isn't recommended to start or close parallel system frequently.

Shut down parallel UPS one by one.

5.4.3 Exit Parallel System

When one UPS in parallel system fault, it will exit from parallel system automatically with sound & light alarm. At that time, the fault UPS will be exited from parallel system completely to achieve online hot maintenance or replacement.



5.5 Periodic Preventative Maintenance

To improve the efficiency and reliability of the UPS, perform the following maintenance regularly:

- Clean the UPS by dry cloth regularly. Don't use liquid or spray cleaner. Before cleaning, shut down the UPS.
- Check if the wiring of input and output is firmly and well connected.
- Check the working status of cooling fans regularly. Prevent sundries from blocking the air outlet. If damaged, please replace it in time.
- Check the battery voltage and the working status of UPS regularly to discover fault timely.

5.6 Battery Maintenance

The working life of battery is based on the environment temperature and discharge times. Using battery in the high temperature for a long time or discharging battery deeply will reduce the working life of battery.

When selecting battery box, please pay attention to following items:

- Charge the battery for 10 hours before using. During charging, the UPS still can be used, but if power outage at the same time, the discharging time may be less than the standard backup time.
- Generally, charge and discharge the battery once every 4 to 6 months. Discharge the battery till under-voltage and power off and then charge it. In high temperature area, charge and discharge the battery once every 2 months. The charging time for the standard battery should be more than 10 hours every time.
- If the UPS hasn't been used for a long time, it is recommended to charge the battery more than 10 hours every three months.
- Generally, the working life of battery is 3 to 5 years. If battery is not so good, replace it in time. The battery replacement should be performed by authorized professional.

5.7 Troubleshooting

5.7.1 Common Fault

Troubleshooting

Fault phenomenon	Possible reason
The mains normal, after starting the UPS, it outputs normally, but it works in the battery mode and the buzzer beeps intermittently.	<p>Check if the contactors and wiring terminals in the input circuit are in good condition;</p> <p>Check if the displayed input voltage amplitude or frequency of mains on the touch screen is beyond the allowable range of UPS;</p> <p>Check if the mains input breaker is disconnected, if yes, please close the breaker again.</p>
After installing UPS, connecting with power will fuse the fuse or cause tripping operation.	The wiring of UPS input or output is short circuit.
After starting, the touch screen display and output are normal. But once connecting with load, it will stop	UPS is overload seriously or the output circuit is short-circuit. Please reduce load to proper capacity or find the short-circuit reason. The common reason is that the output changeover socket short-circuit or the input short-

Fault phenomenon	Possible reason
outputting immediately.	circuit after UPS damage; The load is not started according to "high power device → small power device". Restart the UPS, and after the UPS works steadily, start high power load first, and then start small power ones successively.
Buzzer long beeps, fault indicator lights on, UPS works in bypass mode and inverter failure.	The output is overload. The load is too heavy and beyond the rated power of the UPS. Please reduce load or select a UPS with larger power capacity. If it is temporary bypass caused by impact of load start and recovers automatically, it still is normal; UPS over-temperature protection. Check if the air inlet and air outlet of UPS is blocked or the working temperature of UPS is beyond the allowable range.
Usually, UPS works normally. When power failure, it doesn't transfer to battery mode or it transfers to battery mode and battery under-voltage protection soon.	Battery aging, the battery capacity loss. Please replace battery; Battery charger fault. At ordinary time, the battery cannot be charged; Battery wire doesn't connect well or the terminals contact is bad.
When the load is PC, everything works normally. When power failure, UPS works normally, but the computer system halted.	The grounding connection is not so good. The floating voltage between the neutral wire and the grounding wire is too high.

Meaning of fault symbol and buzzer status

NO.	Fault symbol	Buzzer status	Meaning
1	EPO	Long beep	UPS has emergency protection (if equipped with EPO function), Bypass output and inverting output are all closed.
2	Mode fault	Long beep	UPS system mode system settings and the

NO.	Fault symbol	Buzzer status	Meaning
			actual wiring do not match the fault, please check the main power or bypass wiring, and make the actual system is consistent with the set mode system.
3	Maintain bypass fault	Long beep	UPS maintenance bypass protection, inverted output closed, please checks back board maintenance bypass detection port is shorted.
4	Output fault	Long beep	The UPS output is faulty, detect the UPS output is short or over load.
5	Mode mismatch	Long beep	The UPS of the input and output mode in the parallel does not match the actual system.
6	Voltage mismatch	Long beep	The UPS of the output voltage in the parallel does not match the actual system.
7	Frequency mismatch	Long beep	The UPS of the frequency in the parallel does not match the actual system.
8	Bypass mismatch	Long beep	The UPS of the bypass voltage or frequency in the parallel does not match the actual system.
9	Pattern mismatch	Long beep	The UPS parallel mode setting in the parallel system does not match the actual system.
10	Power mismatch	Long beep	The UPS of the output power setting in the parallel does not match the actual system.
11	Battery number mismatch	Long beep	The UPS of the battery number setting in the parallel does not match the actual system.
12	Parallel mismatch	Long beep	The UPS of parameters setting in the parallel does not match the actual system.
13	Short mismatch	Long beep	The UPS of short turn to bypass setting in the parallel does not match the actual system.
14	Two-ended	Long beep	Fall-off fault at both ends of the parallel wire.

NO.	Fault symbol	Buzzer status	Meaning
	fault		
15	Single-ended fault	Slow beep	Fall-off fault at one ends of the parallel wire.
16	Auxiliary power supply failure	Long beep	UPS internal working power failure, if it cannot be automatically recovered, please report repair promptly.
17	Fan failure	Urgent beep (alarm once about every 0.2s)	Fan fault warning prompt, please check the fan for damage or blocking.
18	CAN fault	Slow beep (alarm once about every 2.0s)	The CAN communication of parallel system abnormal, please check if the parallel wire is damaged or there is only one UPS in parallel system works.
19	SCI fault	Long beep	UPS internal communication abnormal, if the continuous alarm cannot be restored, please report repair promptly.
20	There is no redundancy in the parallel UPS	Slow beep (alarm once about every 2.0s)	The total output load of the UPS parallel system exceeds the full load of the single machine, check that the output load exceeds the requirements for redundant backups.
21	Main power abnormal	Long beep	The mains power input phase sequence is abnormal, please check the main power input wiring.
		3 continuous alarms at 10s intervals	The main power input occur lack N fault, power down failure, overvoltage protection, under voltage protection, over-frequency fault, under-frequency fault, please check whether the main power input status is normal.
22	Bypass	Slow beep	At mains status, the bypass voltage abnormal,

NO.	Fault symbol	Buzzer status	Meaning
	abnormal	(alarm once about every 2.0s)	frequency abnormal, phase sequence abnormal, or mode setting mismatches the wiring. Please check if the bypass breaker is closed, if the bypass phase sequence is normal, if the wiring way of bypass matches the system mode setting.
23	Battery abnormal	Slow beep (alarm once about every 2.0s)	Battery has been pressure protection, charging fuse failure, over-pressure alarm fault, please check the battery status is normal.
		Urgent beep (alarm once about every 0.2s)	Battery wiring fault, charging short, under-voltage protection, under-voltage warning problem, please check the battery wiring and the current state is normal.
		No buzzer warning	The battery charging temperature is too high.
24	Rectifier abnormal	Urgent beep (alarm once about every 0.2s)	UPS rectifier fault.
25	Inverter abnormal	Long beep	UPS inverter fault.

6 Package, Transportation and Storage

6.1 Package

During packing, please pay attention to the place direction requirements. At the side of the package, there is afraid of wet, handle with care, upward, stack layer limit, etc. alarm marks. And also, the device model is printed on the package. At front of the package, the device name is printed.

6.2 Transportation

During transporting, pay attention to the warning marks and avoid severe impact on the package. Place the device according to the marked direction, which is to avoid damage the component. Any inflammable, explosive, corrosive object is not allowed to shipping with the device. While midway transportation, do not put the device in the open air. The device cannot suffer any rain, snow or liquid material or mechanical damage.

6.3 Storage

During storing, place the UPS according to the marked direction. The package box should be far away from ground for 200mm, and keep at least 500mm from wall, eat source, cold source, window or air inlet.

Storage temperature: -20~50°C, relative humidity is 20%~80%. In the warehouse, any inflammable, explosive, corrosive object or harmful gas is not allowed, and also, strong mechanical shake, impact or magnetic field is forbidden. The storage period of these requirements, generally, is 6 months. If the UPS is stored more than 6 months, it is necessary to check again. If the UPS is stored for a long time, please charge the battery every 3 months.

7 Technical Specifications

Index		Model	10KVA	15KVA	20KVA	30KVA	40KVA	
Input	Input mode	1W+N+PE (can be set to 3W+N+PE)				3W+N+PE		
	Voltage range (Vac)	When the input voltage in the range of 176~280, the UPS can bear load of 100% rated power; When the input voltage in the range of 80-176, the output of the UPS needs to decrease rated power linearly to use						
	Frequency range (Hz)	39.5~70.5						
	Bypass synchronism track range (Hz)	50/60±10% (50/60 self-adaption)						
	Bypass input voltage range (Vac)	220/230/240±20% (phase voltage) (default is 220)						
	Input power factor	≥0.99						
	Input THDI	Resistive full load: ≤3%; non-linear full load: ≤5%						
	Battery voltage (Vdc)	IST7015~40: ±144~±240 (can be selected from ±72 cells~±120 cells, default is ±96 cells, when the battery voltage is set from ±72 cells~±90 cells, the output of the UPS decreases to 75% rated) (single battery voltage is 2Vdc); IST7100: ±96~±240 (can be selected from ±48 cells~±120						

Index		Model	10KVA	15KVA	20KVA	30KVA	40KVA
		cells, default is ±48 cells					
	Charge current (A)	1~10 settable (default is 1)				1~20 settable (default is 2)	
Output	Output mode	3W +N+PE (can be set to 1W+N+PE)					
	Capacity (kVA/kW)	10/10	15/15	20/20	30/30	40/40	
	Voltage (Vac)	L-N: 220/230/240 (default is 220); L-L: 380/400/415 (default is 380)					
	Frequency (Hz)	When mains is normal, it tracks the bypass input frequency; When mains is abnormal, it tracks the frequency of 50±0.1 or 60±0.1 (default is 50)					
	Wave form	Sine-wave					
	Voltage distortion	Resistive full load: ≤2%; non-linear full load: ≤4%				Resistive full load: ≤1%; non-linear full load: ≤4%	
	Power factor	0.9/1 settable (default is 1)					
	Transfer time of bypass and inverter (ms)	Synchronization: <1ms; asynchronization: <10ms					
	System efficiency	Up to 96%					
	Overload capacity	PF=0.9 Inverter: <105%: continue; 115%~130%: 15min; 130%~155%: 1min; 155%~200%: 200ms; >200%: protection immediately.					

Model		10KVA	15KVA	20KVA	30KVA	40KVA
Index		<p>Bypass:</p> <p><130%: continue; 130%~155%: 1min; >155%: 200ms</p> <p>PF=1.0</p> <p>Inverter:</p> <p><105%: continue; 105%~110%: 60min; 110%~130%: 10min; 130%~155%: 1min; 155%~200%: 200ms; >200%: protection immediately.</p> <p>Bypass:</p> <p><130%: continue; 130%~155%: 1min; >155%: 200ms</p>				
Other	DC startup function	Equipped				
	Panel display	Touch screen show the running status of the UPS				
	Communication port	RS485/RS232/SNMP				
	Alarm function	Alarm for battery low-voltage, mains abnormal, UPS fault, output overload, etc.				
	Protection function	Protection for battery under-voltage, overload, short-circuit, over-temperature, input over-voltage, communication abnormal, etc.				
	Noise (dB)	<55 (25°C)				
	Work temperature (°C)	-5~40				

Model		10KVA	15KVA	20KVA	30KVA	40KVA
Index	Relative humidity	0~95%, non-condensation				
	Size (W×D×H) (mm ³)	308×803×882			358×840×1250	
	Weight (kg)	IST710: 50;	IST715: 50;	IST720: 50;	IST730: 88.5;	IST740: 88.5;

- Specifications are subject to change without prior notice.

