BETA 200
BETA 250
BETA 300
BETA 400
BETA 500
BETA 600
BETA 800
BETA 1000

INSTRUCTION MANUAL

Elsist
UNINTERRUPTIBLE POWER SUPPLY

Contents

Publish statement

Thank you for purchasing this series UPS.
This series UPS is an intelligent, three phase in three phase out, designed by our R&D team who is with years of designing experiences on UPS. With excellent electrical performance, perfect intelligent monitoring and network functions, smart appearance, complying with EMC and safety standards, The UPS meets the world's advanced level.
Read this manual carefully before installation
This manual provides technical support to the operator of the equipment.

Made in P.R.C

1. SAFETY

Important safety instructions - Save these instructions
There exists dangerous voltage and high temperature inside the UPS. During the installation, operation and maintenance, please abide the local safety instructions and relative laws, otherwise it will result in personnel injury or equipment damage. Safety instructions in this manual act as a supplementary for the local safety instructions. Our company will not assume the liability that caused by disobeying safety instructions.
Contact the nearest hazardous waste disposal station when the products or components are discarded.

1.1 Safety notes

1. Even no connection with utility power, 220/230/240VAC voltage may still exist at UPS terminal !
2. For the sake of human being safety, please well earth the UPS before starting it.
3. Don't open or damage battery, for the liquid spilled from the battery is strongly poisonous and do harmful to body!
4. Please avoid short circuit between anode and cathode of battery, otherwise, it will cause spark or fire!
5. Don't disassemble the UPS cover, or there may be an electric shock!
6. Check if there exists high voltage before touching the battery
7. Working environment and storage way will affect the lifetime and reliability of the UPS. Avoid the UPS from working under following environment for long time
   - ◆ Area where the humidity and temperature is out of the specified range(temperature 0 to 40°C, relative humidity 5%-95%)
   - ◆ Direct sunlight or location nearby heat
   - ◆ Vibration Area with possibility to get the UPS crashed.
   - ◆ Area with erosive gas, flammable gas, excessive dust, etc
8. Keep ventilations in good conditions otherwise the components inside the UPS will be over-heated which may affect the life of the UPS.
9. There is no output switch in the Standard Version cabinet. During installation, an external output switch is required, and the auxiliary contact signal of the output switch is connected to the dry contact of the output switch of UPS, and the output dry contact signal of the switch is enabled on the display screen of ups
10. Do not connect the UPS output to regenerative load systems including photovoltaic system and speed drives. Failure to follow instruction can result in equipment damage!

1.2 Symbols used in this guide

WARNING! Risk of electric shock

CAUTION! Read this information to avoid equipment damage

2. MAIN FEATURES

2.1 Summarization

This series UPS is a kind of three-in-three-out high frequency online UPS.

The UPS can solve most of the power supply problems, such as blackout, over-voltage, under-voltage, voltage sudden drop, oscillating of decreasing extent, high voltage pulse, voltage fluctuation, surge, inrush current, harmonic distortion (THD), noise interference, frequency fluctuation, etc..

This UPS can be applied to different applications from computer device, automatic equipment, communication system to industry equipment.

2.2 Functions and Features

- Modularized design, the height of the single module is 3U.
- 3Phase In/3Phase Out UPS

  It is 3Phase In/3Phase Out high-density UPS system, of which input current is kept in balance. No unbalance problem might occur.
- Digital Control

  This series UPS is controlled by Digital Signal Processor (DSP); enhance, it increases reliability, performance, self-protection, and self-diagnostics and so on.
- Battery Configurable (common battery)

  from 30 blocks to 50 blocks, the battery voltage of this series UPS can be configured at 30 blocks, 32 blocks, 34 blocks, 36 blocks, 38 blocks, 40 blocks, 42 blocks, 44 blocks, 46 blocks, 48 blocks or 50 blocks according to your convenience.
- Charging Current is configurable

  the user may set the capacity of the batteries as well as reasonable charging current as well as maximum charging current. Constant voltage mode, constant current mode or floating mode can be switched automatically and smoothly.
- Intelligent Charging Method

  The series UPS adopts advanced three-stage charging method:

  1st stage: high current constant current charging to guarantee to charge back to 90%;

  2nd stage: Constant Voltage in order to vitalize battery and make sure batteries are fully charged

  3rd stage: floating mode.

  With this 3-stage charging method, it extends the life of the batteries and guarantees fast charging.
- LCD Display

  With LCD plus LED displays, the user may easily get UPS status and its operational parameters, such as input/output voltage, frequency & load%, battery % and ambient temperature, etc...
- Intelligent Monitoring Function

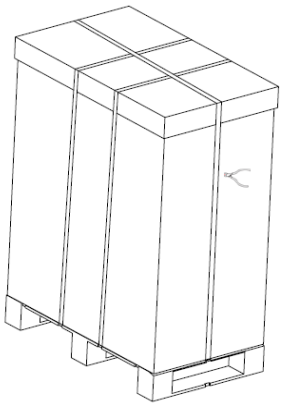
  Via optional SNMP Card, you may remotely control and monitor the UPS.
- EPO and REPO Function

  The series UPS may be completely shut off when the EPO is pressed. REPO function (Remote EPO) is also available in this series UPS.
- Equip with Maintenance Bypass Switch for easy maintenance purpose.
- Superior MTTR (Meantime to repair) & Short shutdown time in maintenance.
- Parallel redundant control system system.
- Centralized bypass.
- Optional Accessories available such as Isolation transformer, SNMP Card, Relay Contact Board, etc.

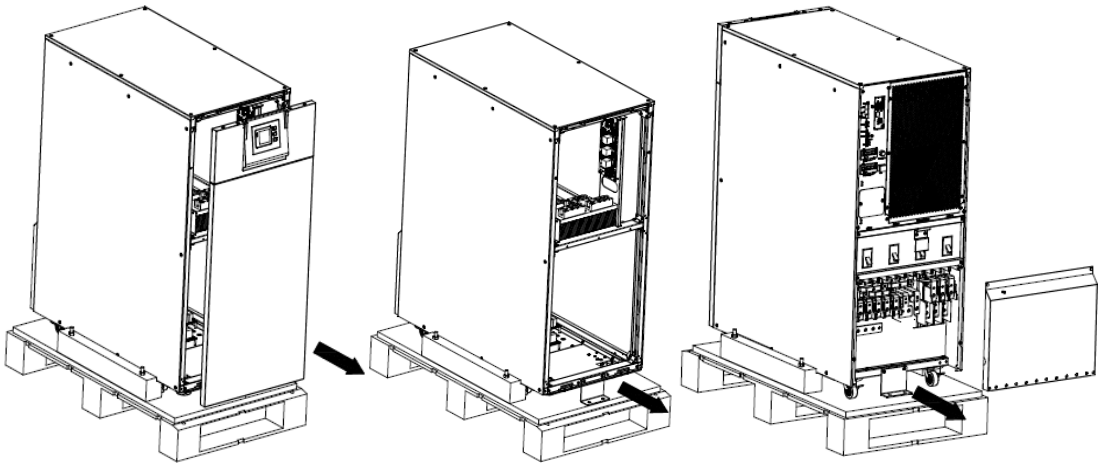
3. INSTALLATION

3.1 Unpacking and checking

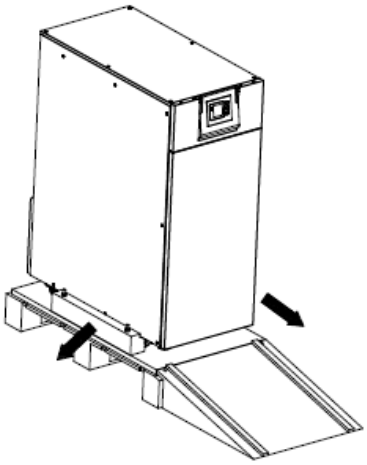
1. Don’t lean the UPS when moving it out from the packaging.
2. Check the UPS packing.
3. Use a pallet truck to transport the UPS to the installation position.
4. Cut and remove the plastic strap and remove the cardboard upward
5. Remove the plastic bag.
6. Check the appearance to see if the UPS is damaged or not during the transportation, Do not switch on the UPS if any damage found. Please contact the dealer right away.
7. Check the accessories according to the packing list and contact the dealer in case of missing parts.



8. Check and remove any existing retaining brackets used to hold the cabinet in place.



9. Use the wooden slide provided in the packaging to place the UPS on the ground.



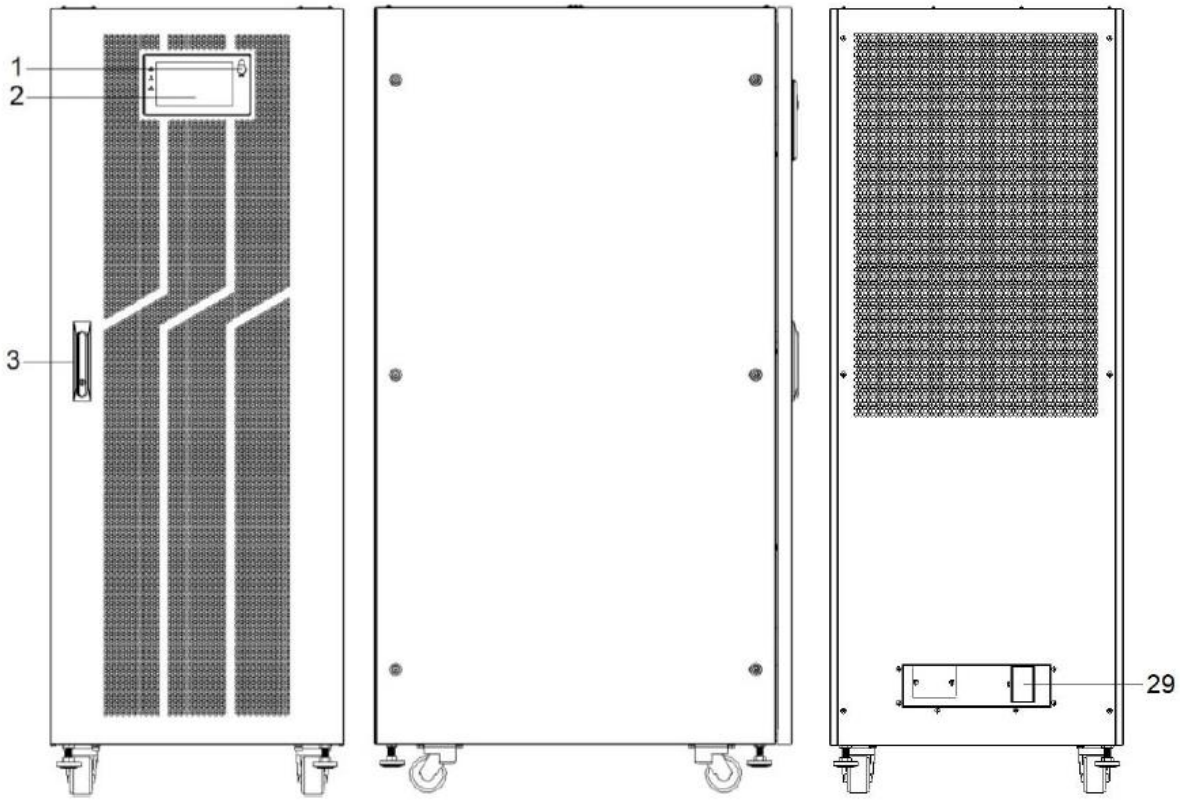
ITEM	
User Manual	●
Software MUSER5000 (CD)	●
USB Cable	●
EPO Connector	●
Parallel Cable	○

● present ○ optional

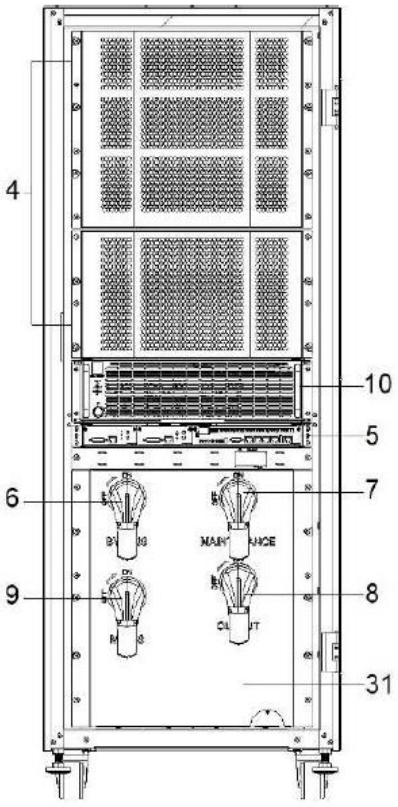
3.2 The appearance of the product

Standard configuration: cabinet with only maintenance bypass switch.
Full configuration: cabinet with mains, bypass, maintenance and output switch.

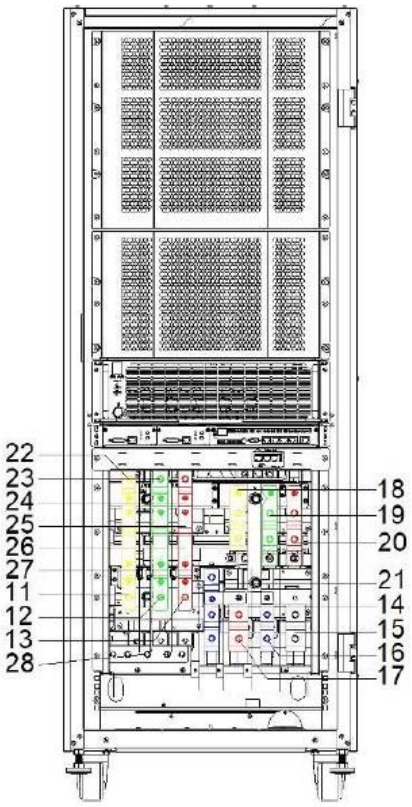
BETA 200-250-300 (Full configuration - Bottom entry)



Frontal view Side view Rear view

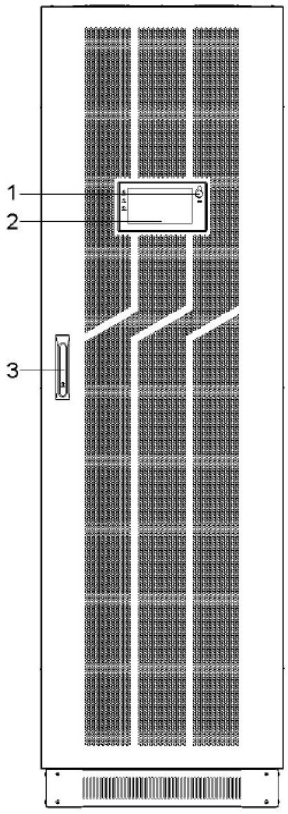


Frontal view (internal)

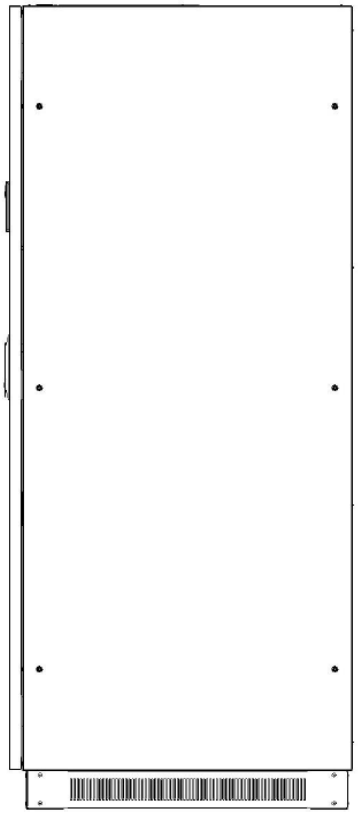


Rear view (Copper bar)

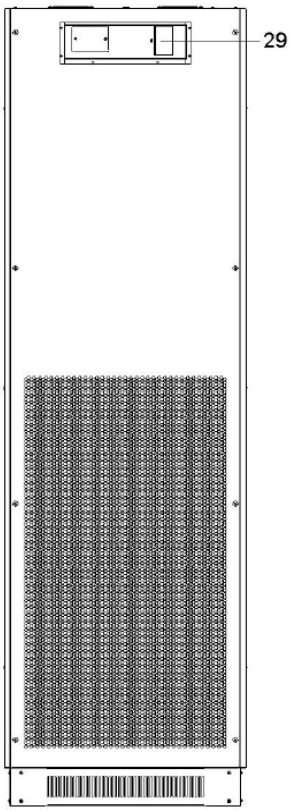
BETA 300 (Full configuration - Top entry)



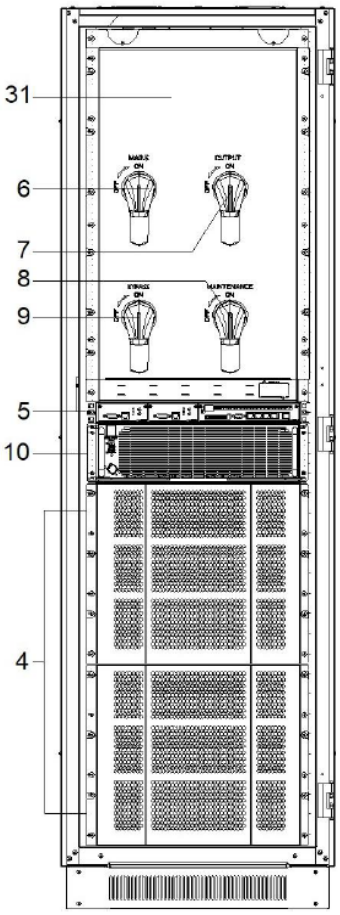
Frontal view



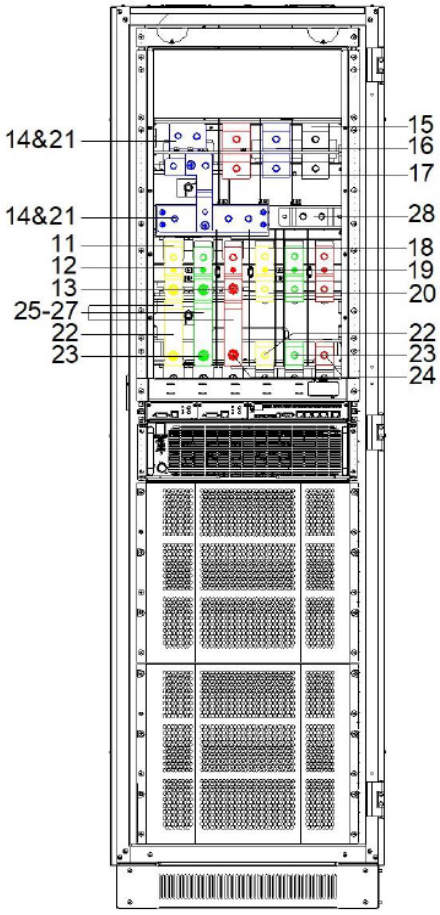
Side view



Rear view

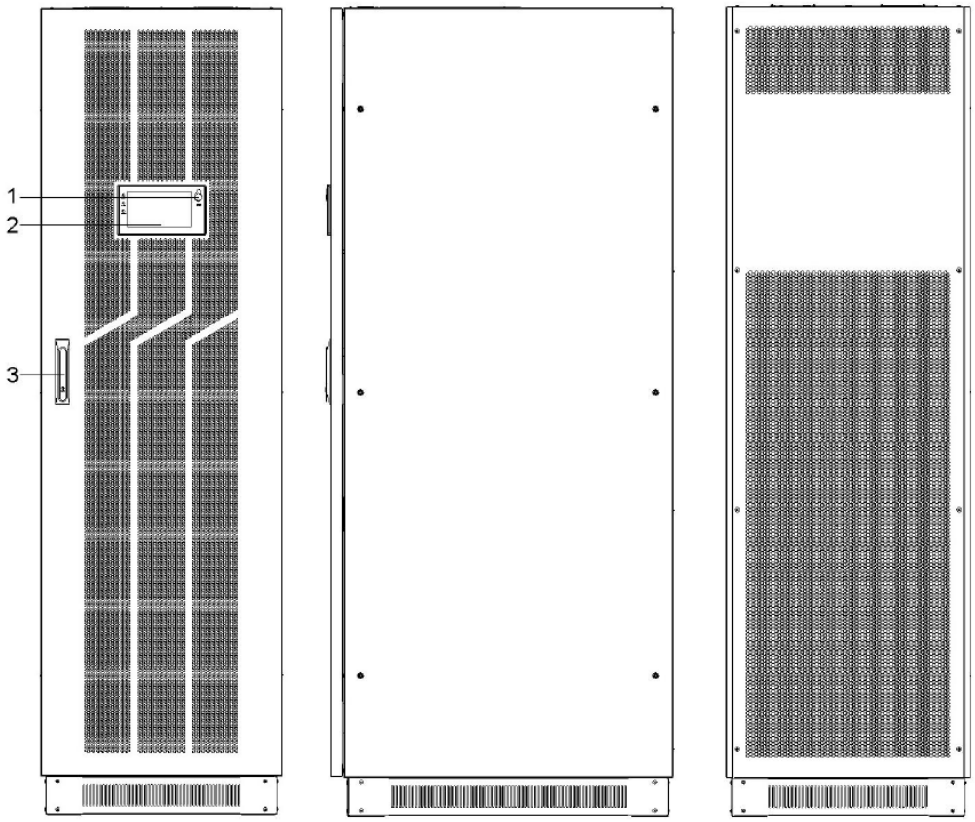


Frontal view (internal)

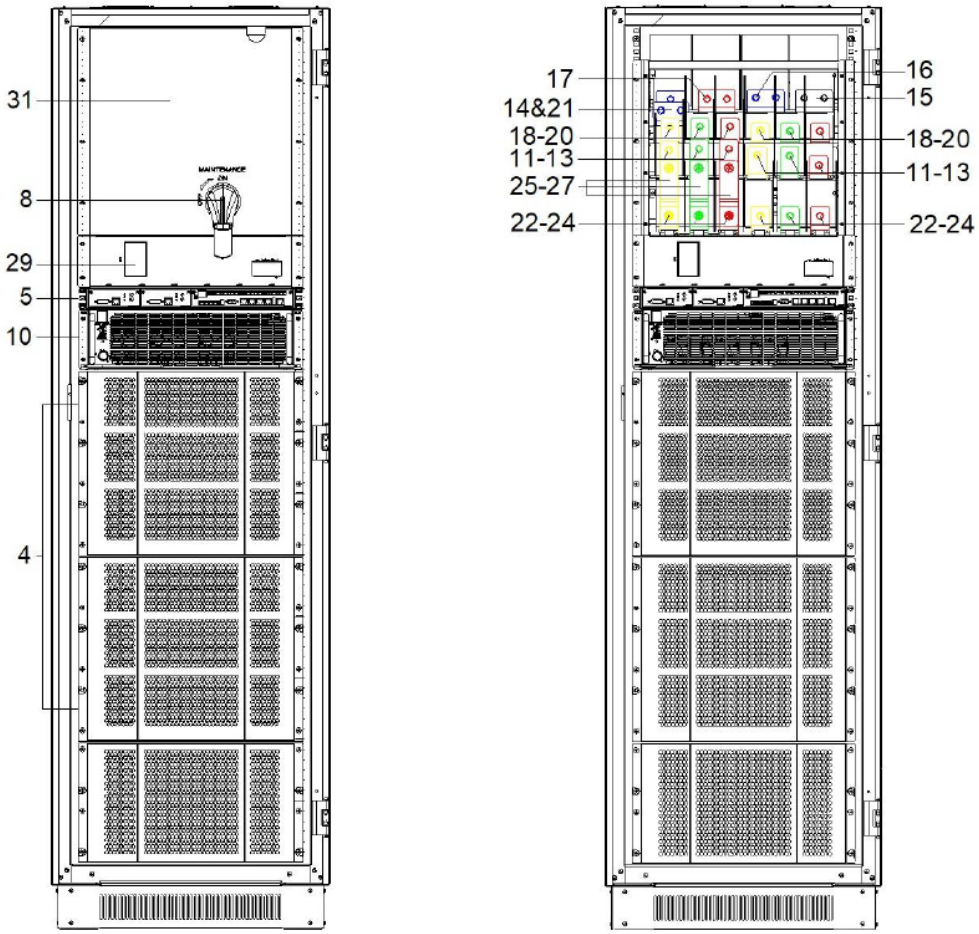


Rear view (Copper bar)

BETA 300 (Standard configuration - Top entry)

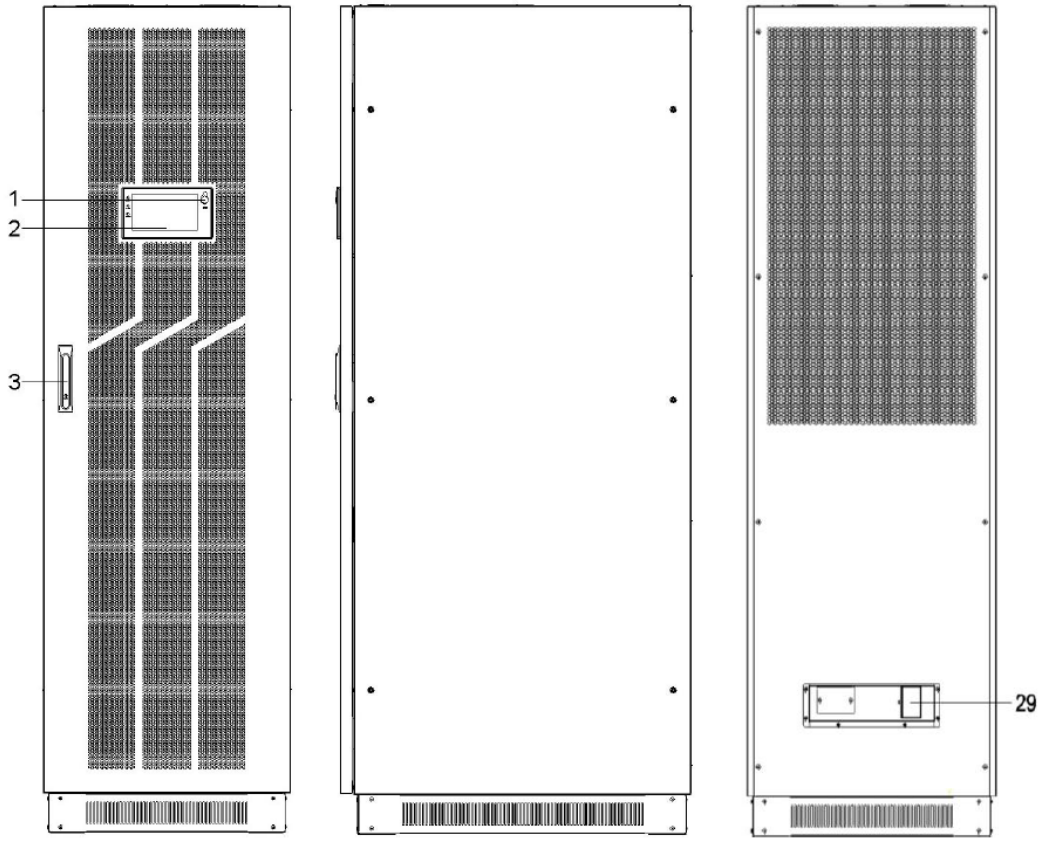


Frontal view | Side view | Rear view

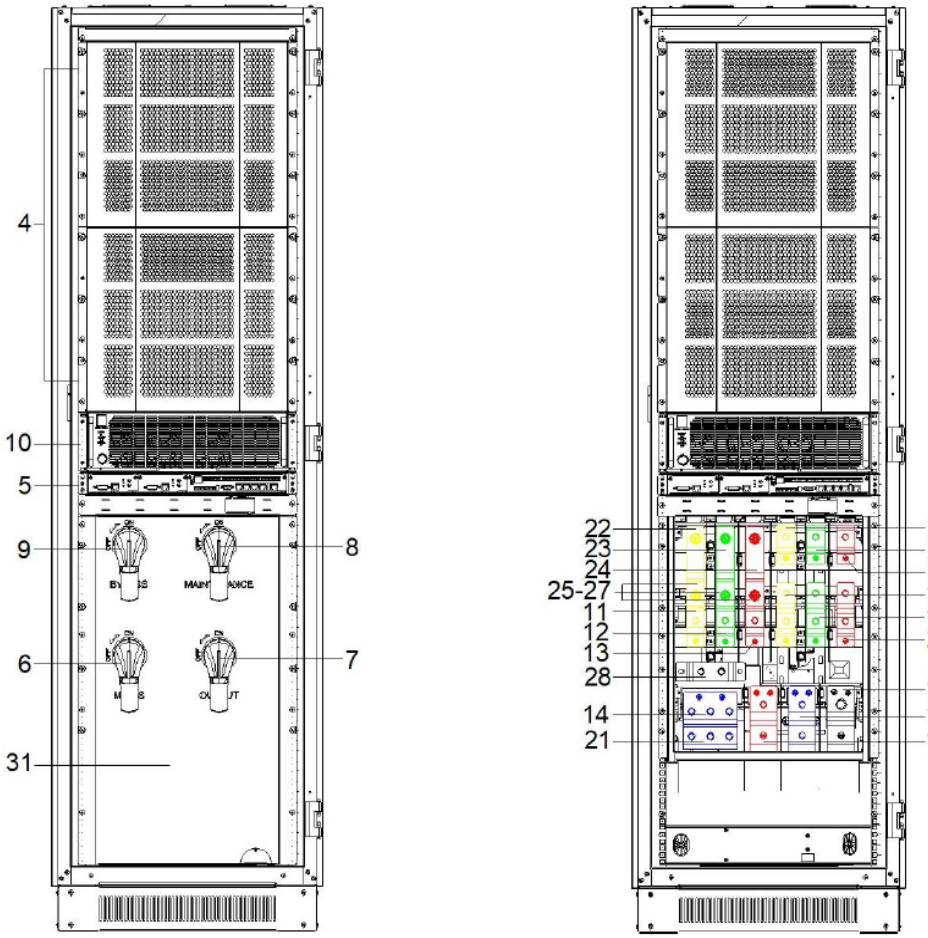


Frontal view (internal) | Rear view (Copper bar)

BETA 300 (Full configuration - Bottom entry)

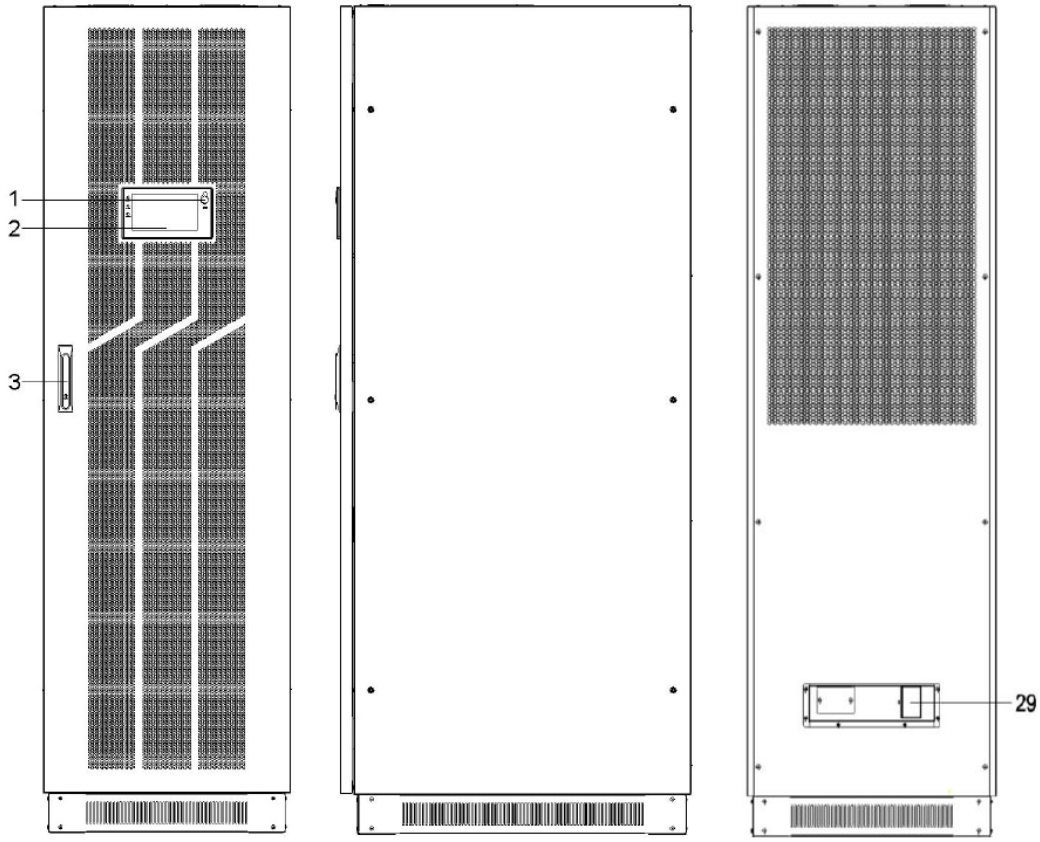


Frontal view | Side view | Rear view

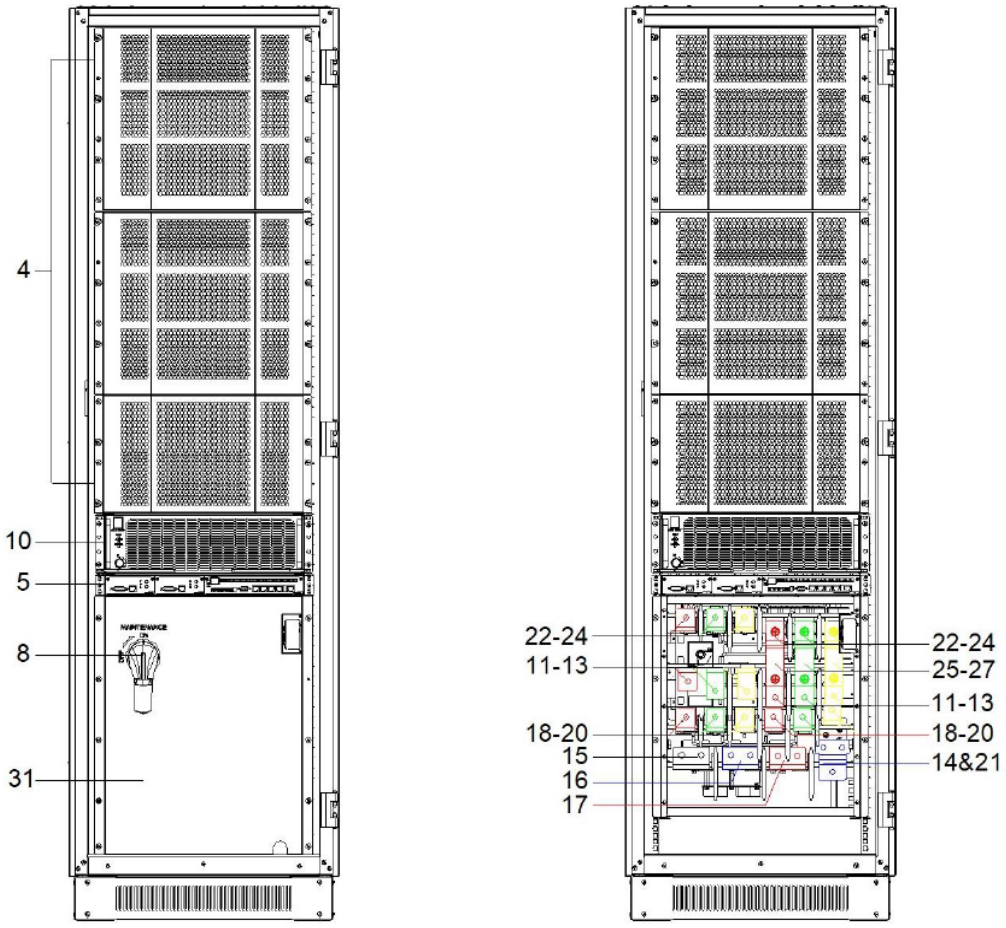


Frontal view (internal) | Rear view (Copper bar)

BETA 300 (Standard configuration - Bottom entry)

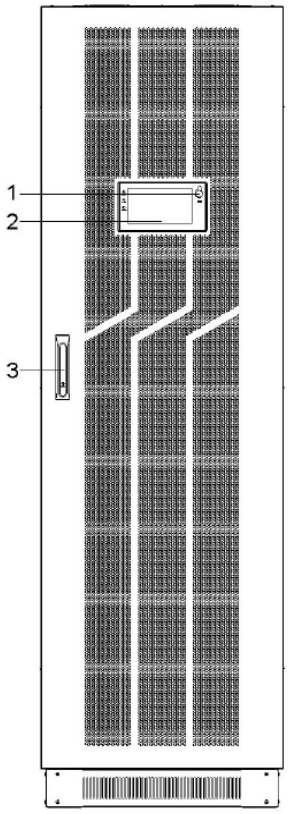


Frontal view | Side view | Rear view

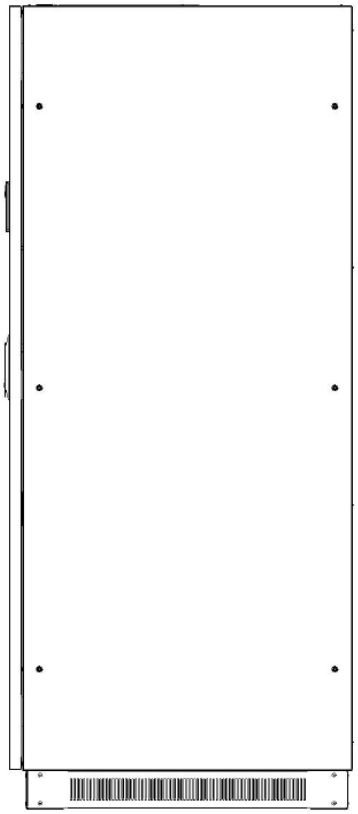


Frontal view (internal) | Rear view (Copper bar)

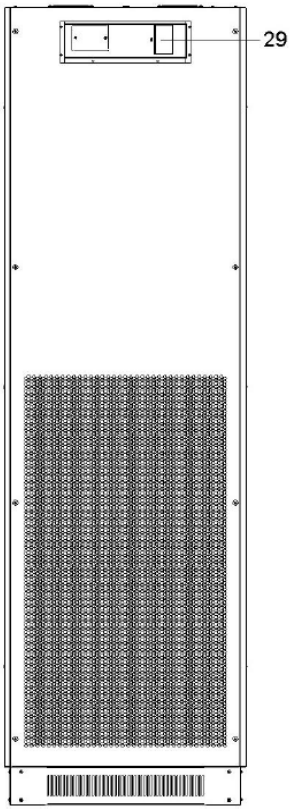
BETA 400 (Full configuration - Top entry)



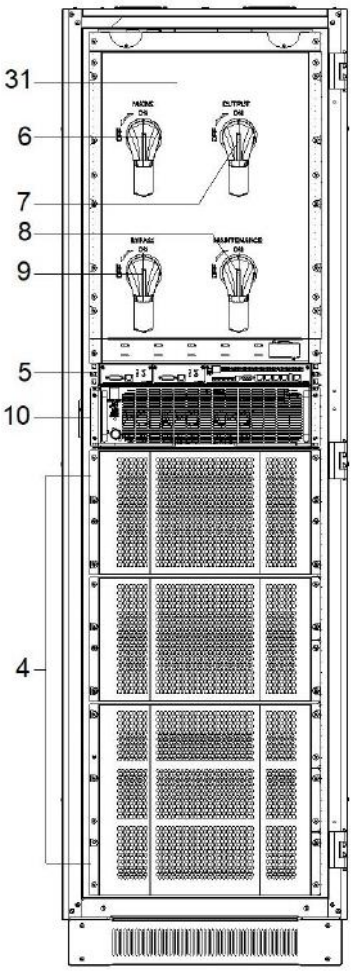
Frontal view



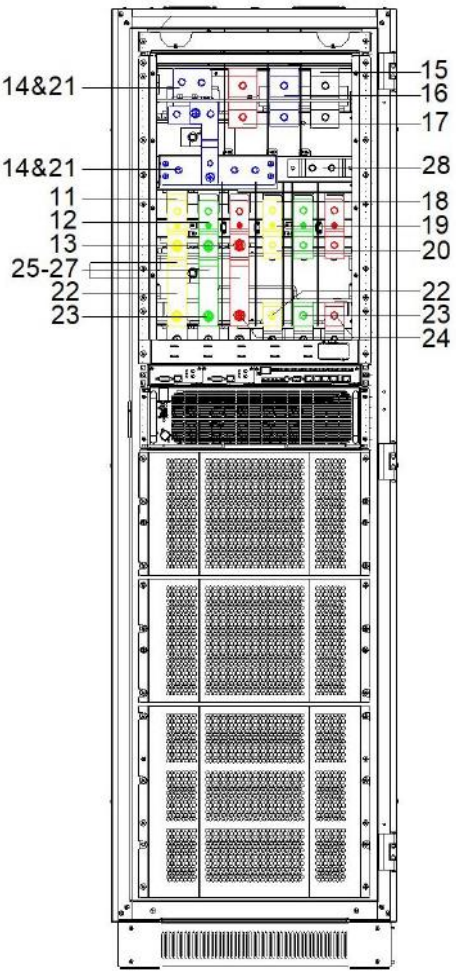
Side view



Rear view

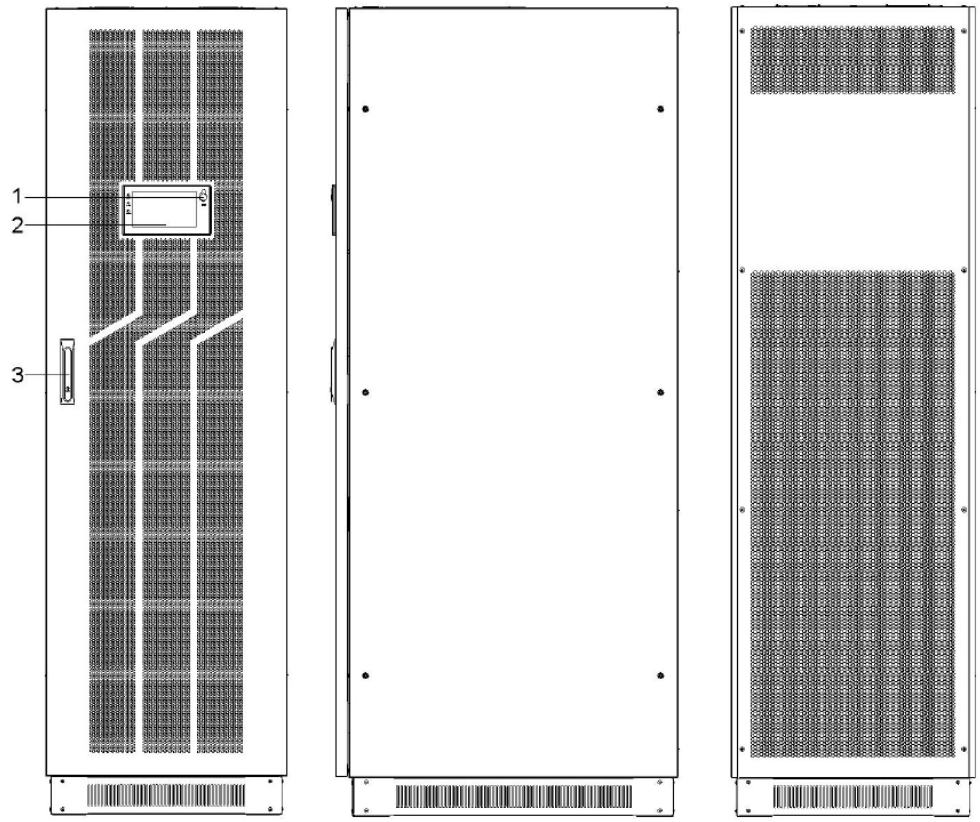


Frontal view (internal)

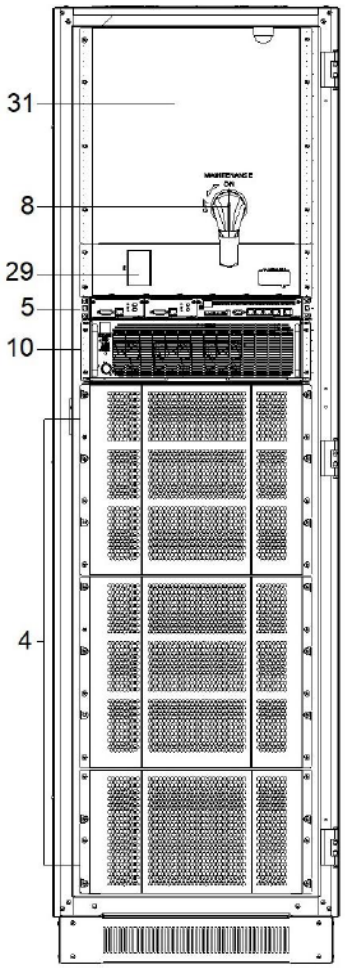


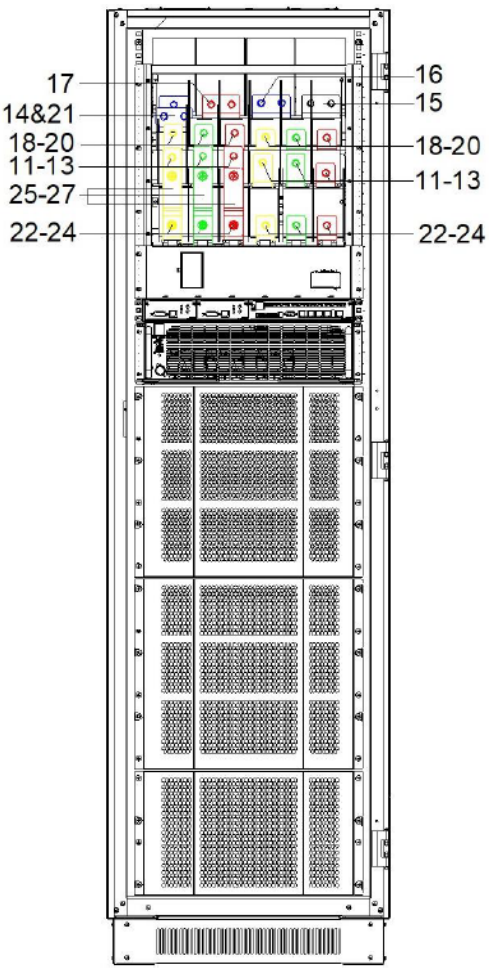
Frontal view (Copper bar)

BETA 400 (Standard configuration - Top entry)



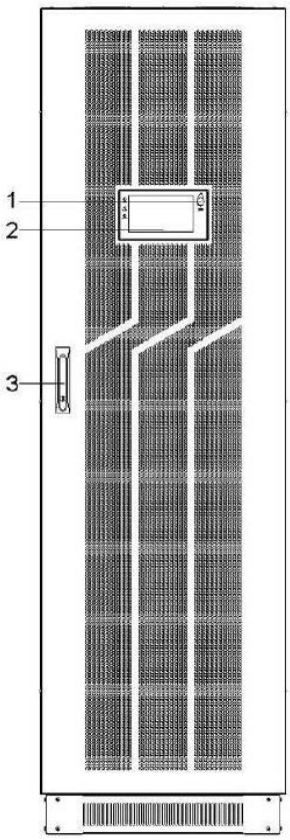
Frontal view | Side view | Rear view



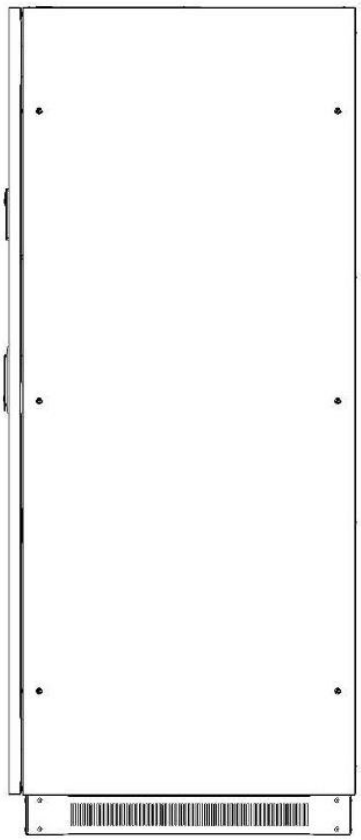


Frontal view (internal) | Frontal view (Copper bar)

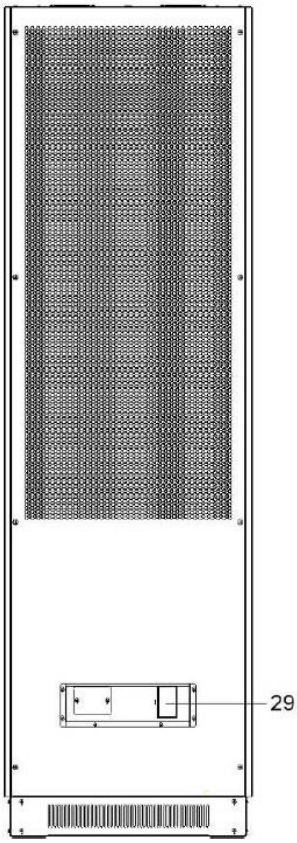
BETA 400 (Full configuration - Bottom entry)



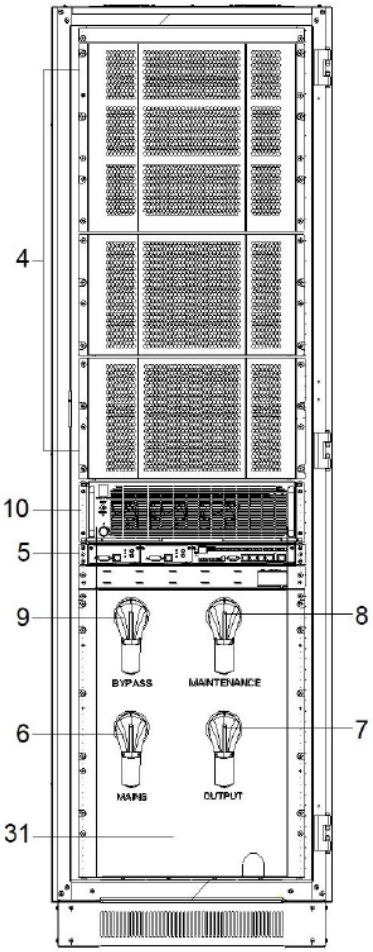
Frontal view



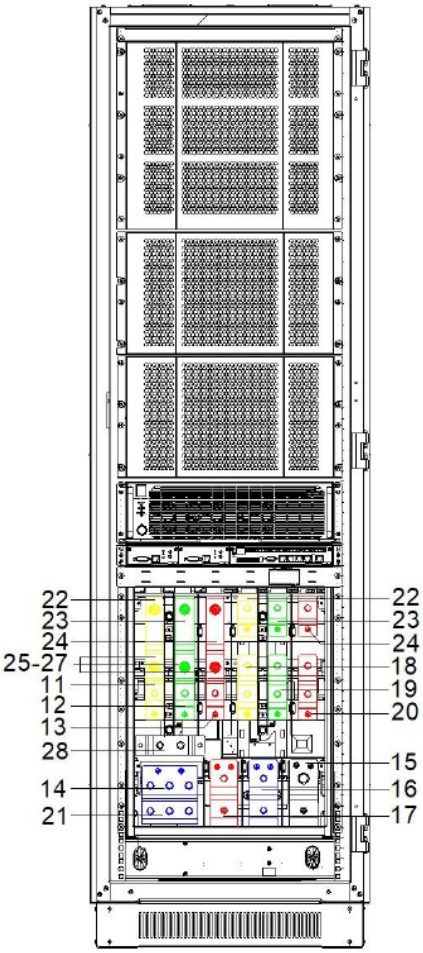
Side view



Rear view

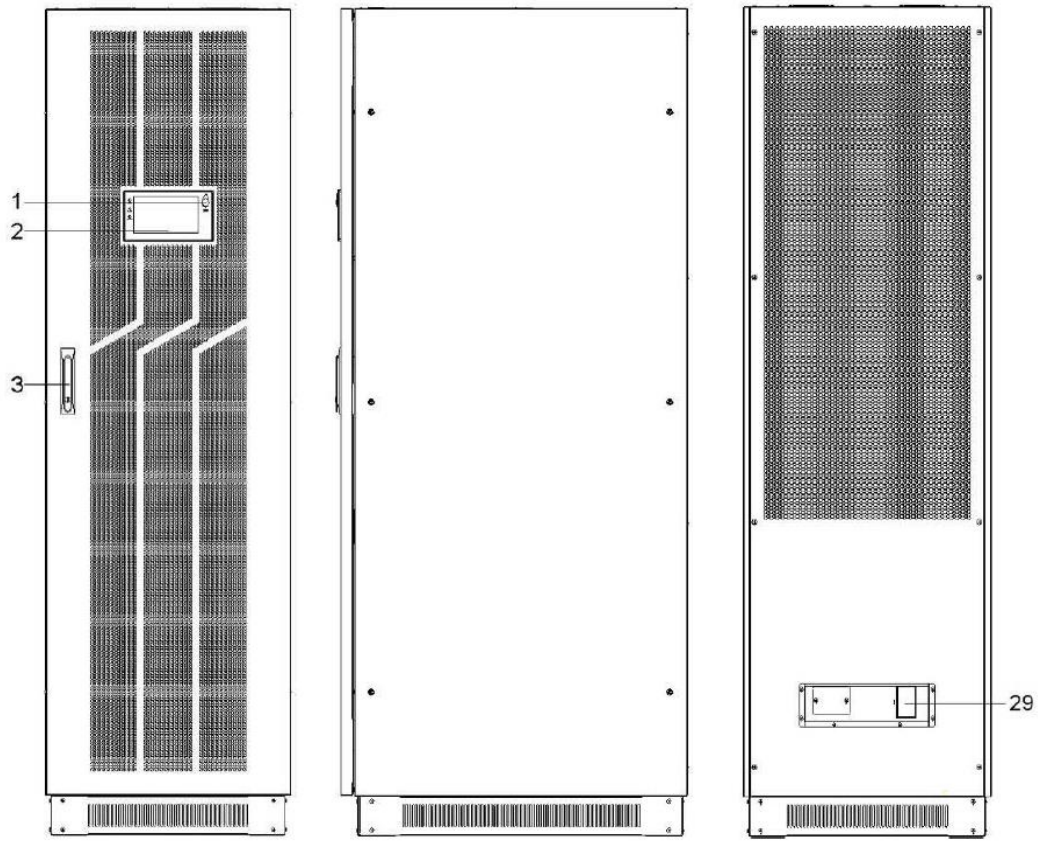


Frontal view (internal)

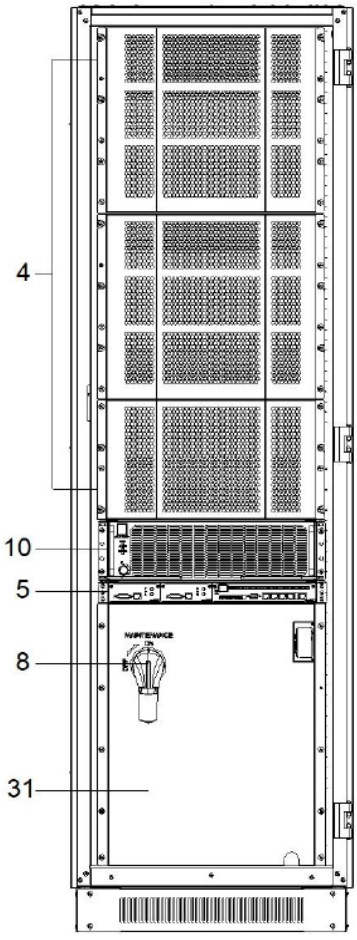


Frontal view (Copper bar)

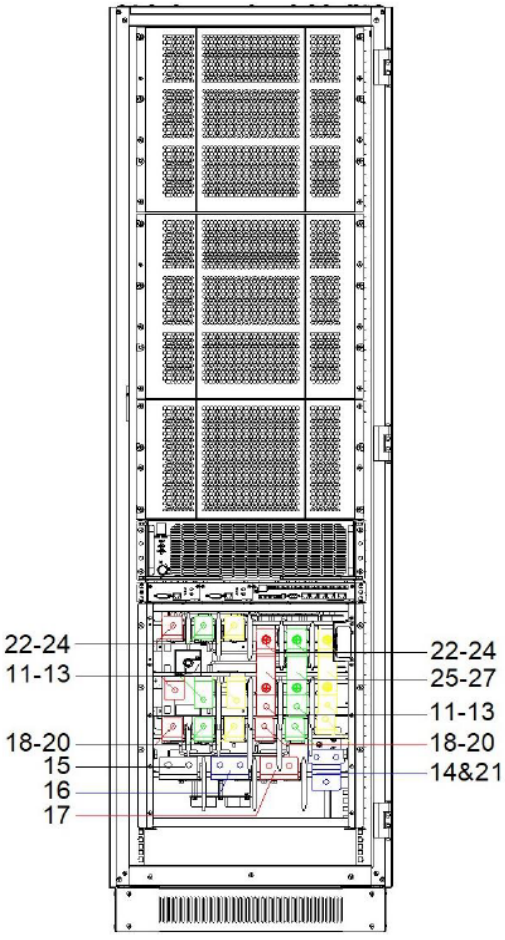
BETA 400 (Standard configuration - Bottom entry)



Frontal view | Side view | Rear view

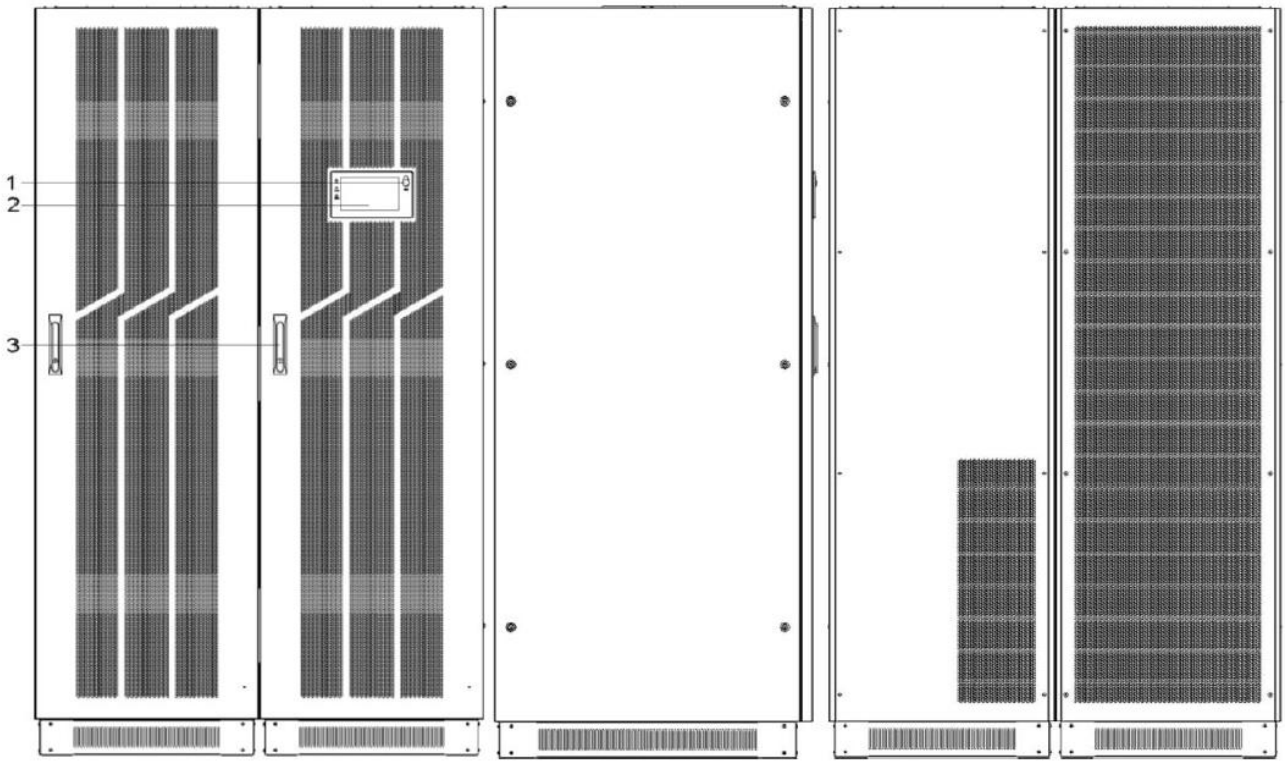


Frontal view (internal)



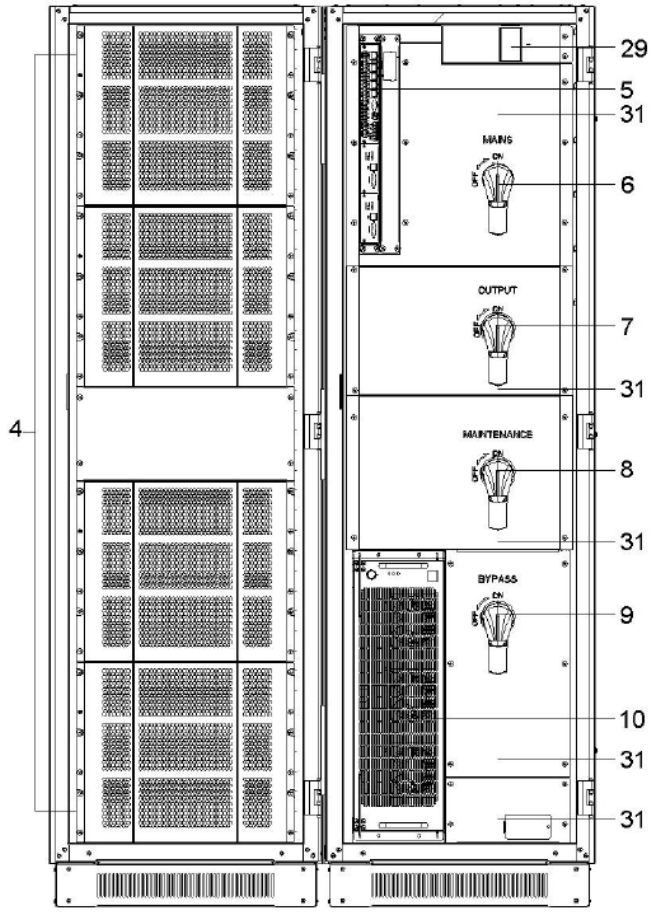
Frontal view (Copper bar)

BETA 400-500-600 (Full and Standard configuration – Top and Bottom entry)

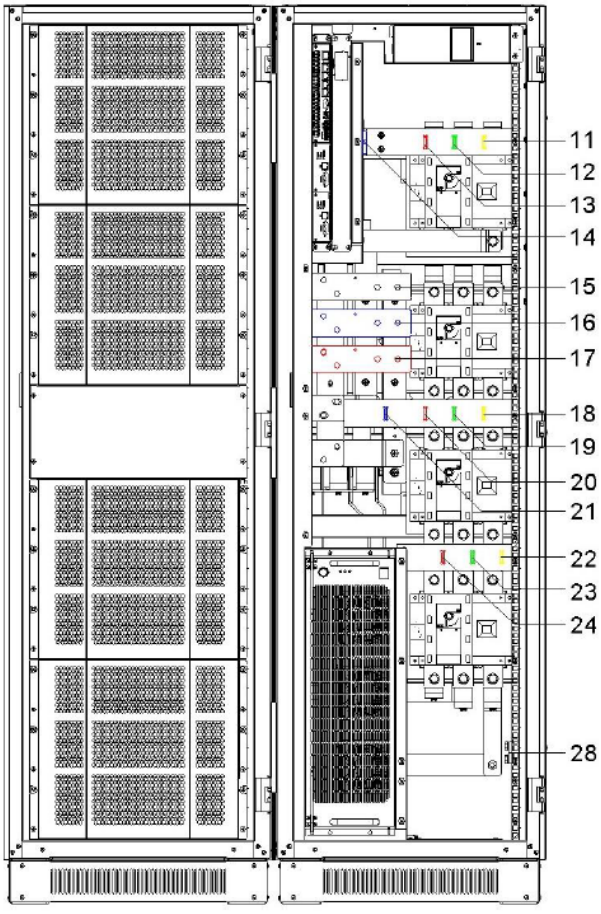


Frontal view Side view Rear view

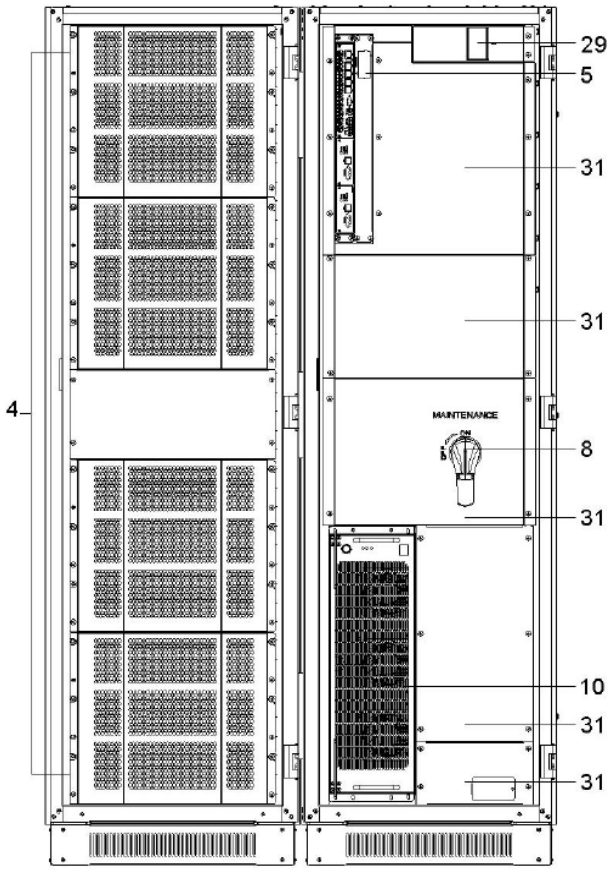
BETA 400 (Full and Standard configuration – Top and Bottom entry)



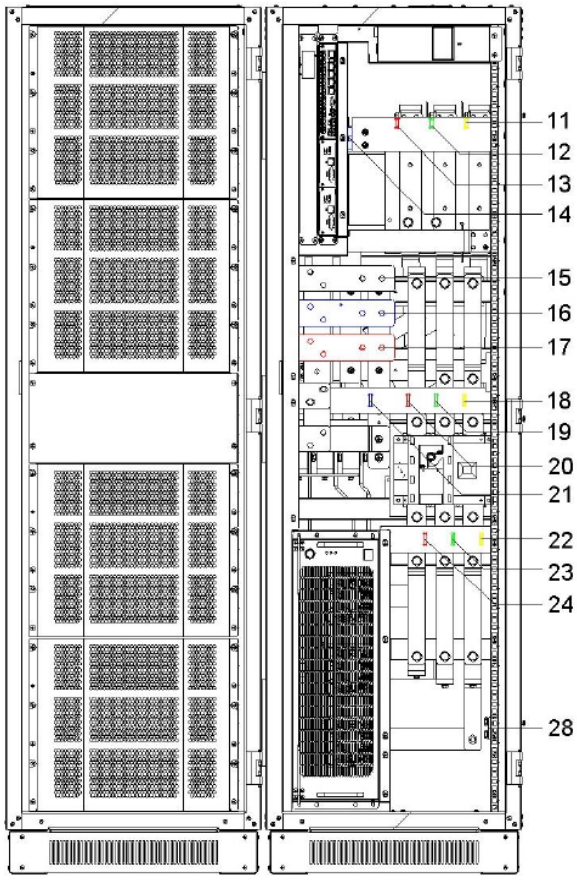
Full configuration Frontal view (internal)



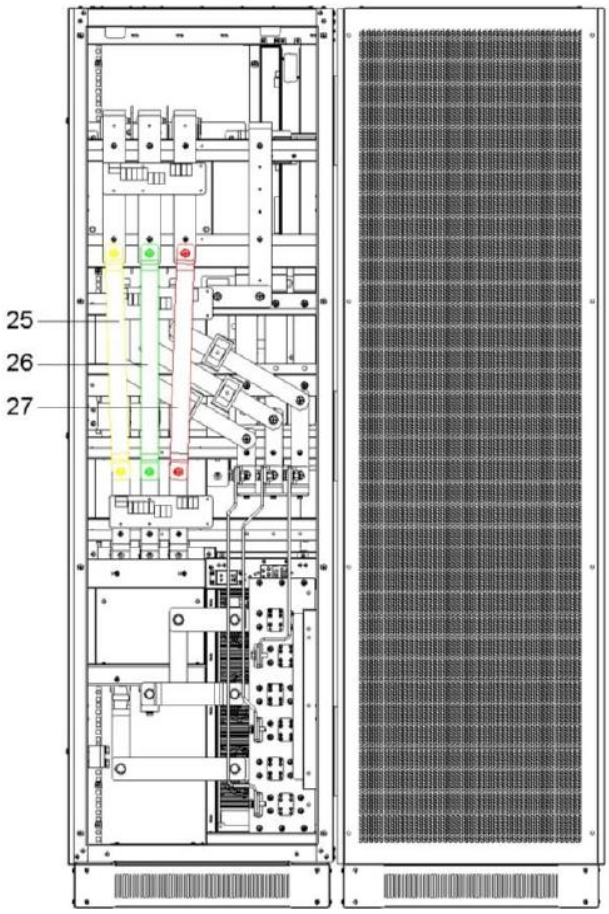
Full configuration Frontal view (Copper bar)



Standard configuration Frontal view (internal)

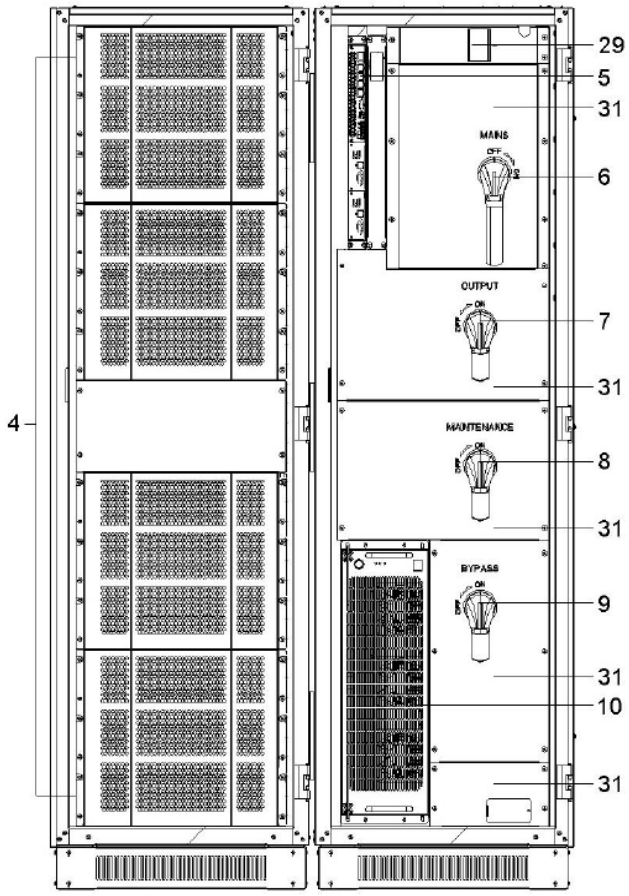


Standard configuration Frontal view (Copper bar)

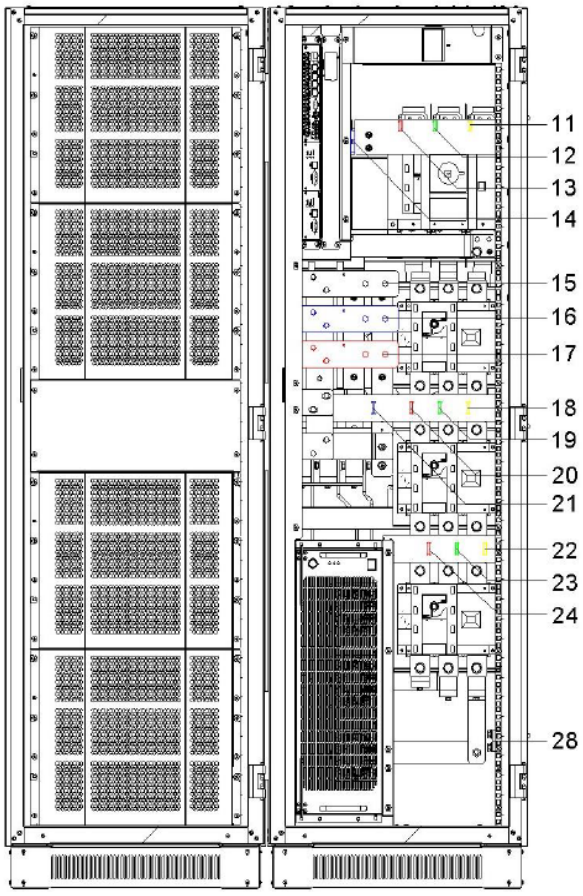


Mains-Bypass common copper bar Rear view

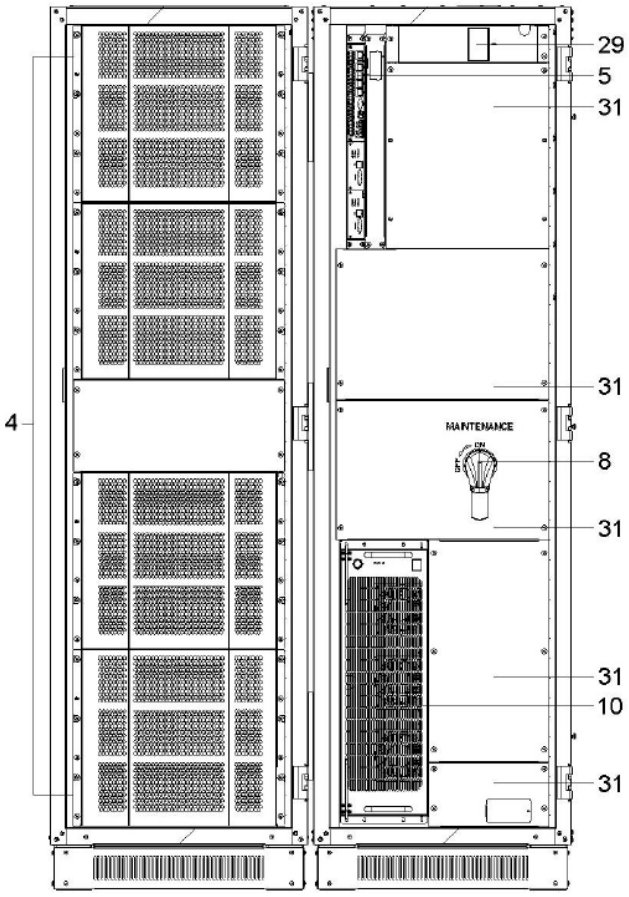
BETA 500 (Full and Standard configuration – Top and Bottom entry)

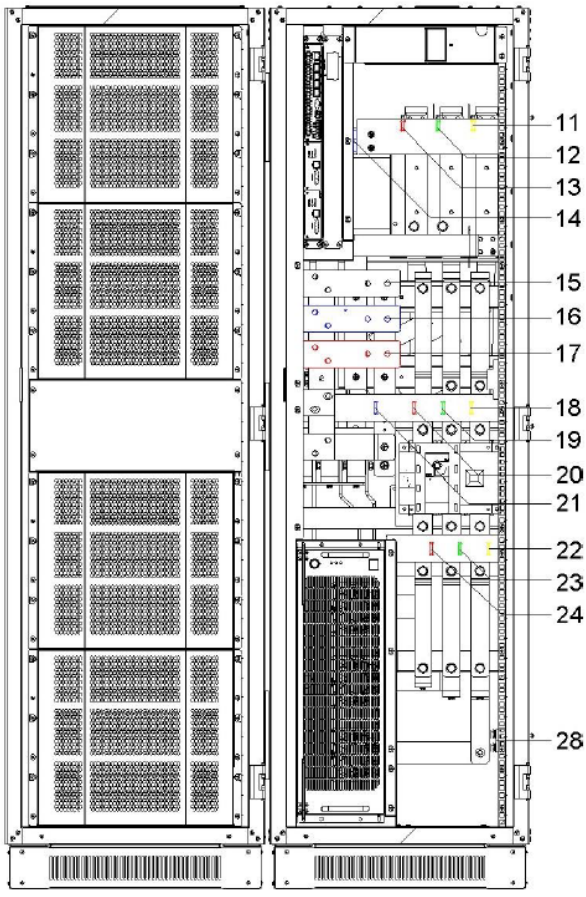


Full configuration Frontal view (internal)

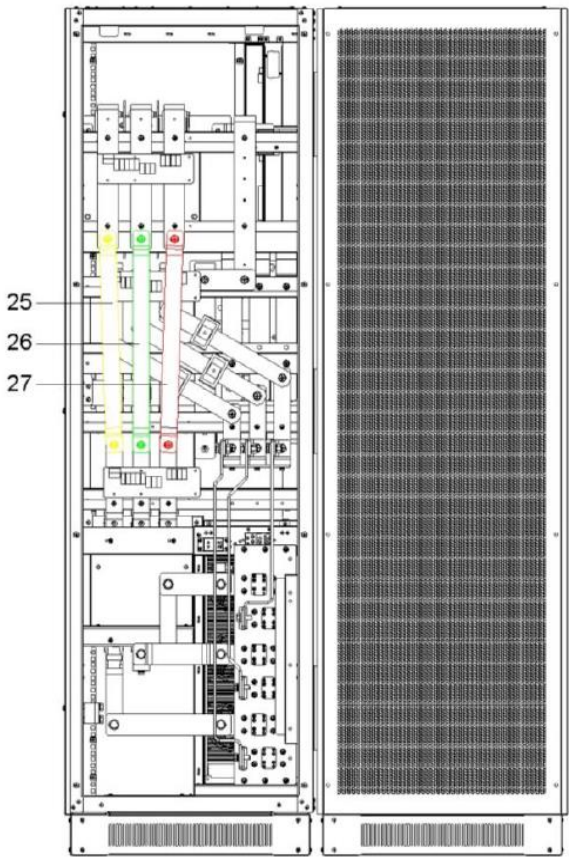


Full configuration Frontal view (Copper bar)





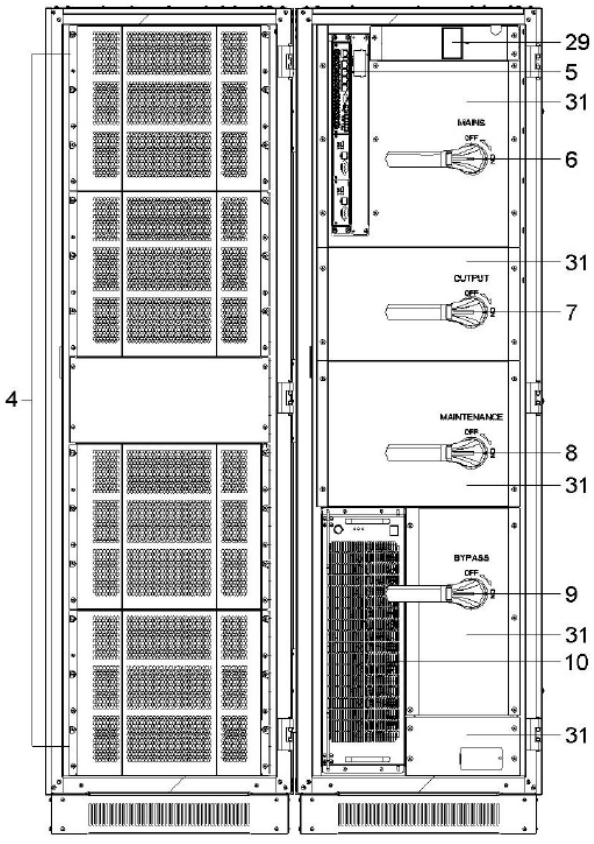
Standard configuration Frontal view (internal)



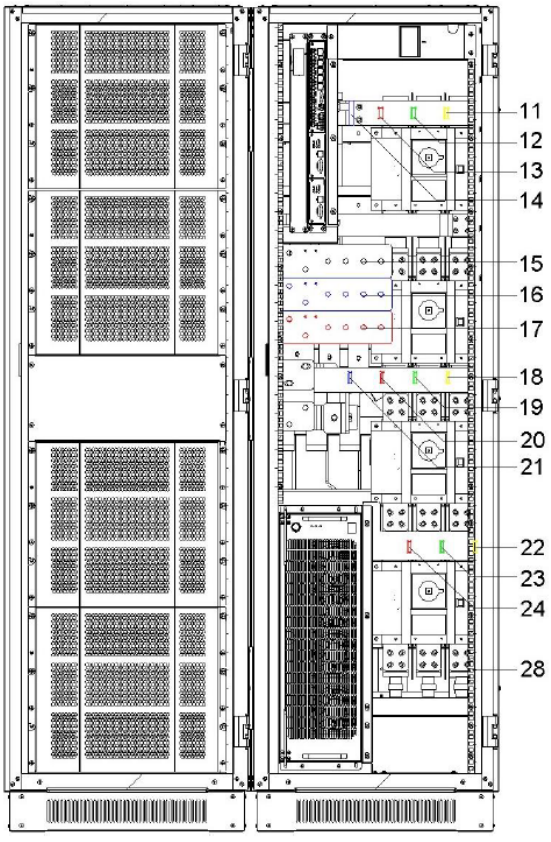
Standard configuration Frontal view (Copper bar)

Mains-Bypass common copper bar Rear view

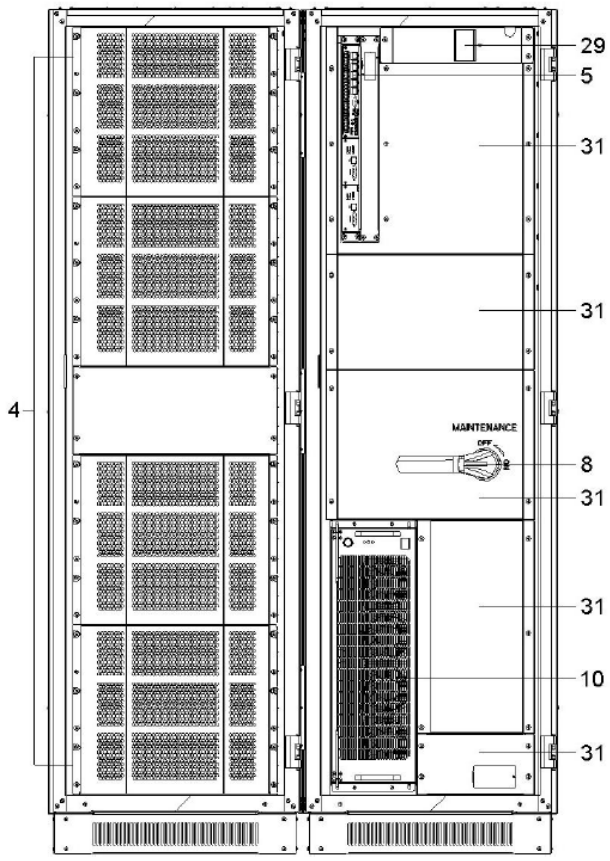
BETA 600 (Full and Standard configuration – Top and Bottom entry)



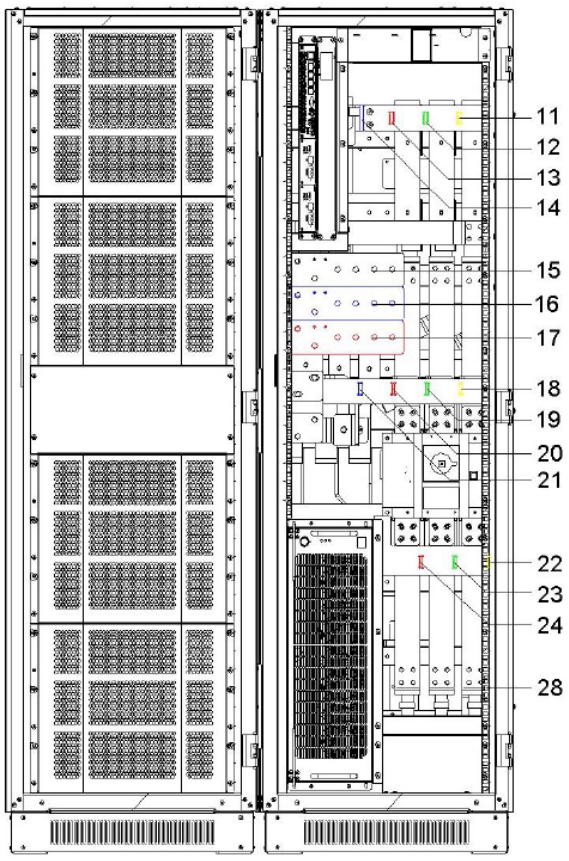
Full configuration Frontal view (internal)



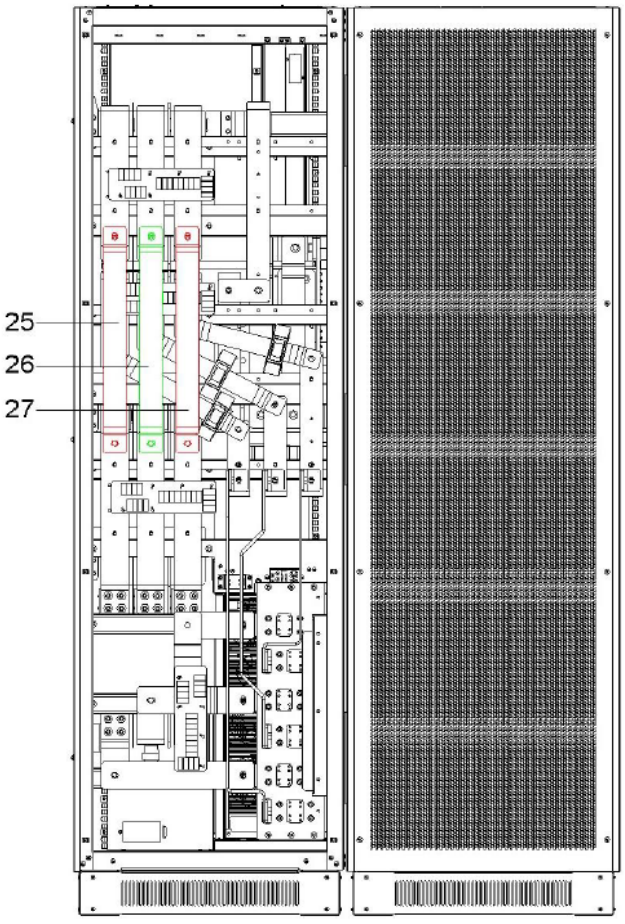
Full configuration Frontal view (Copper bar)



Standard configuration Frontal view (internal)

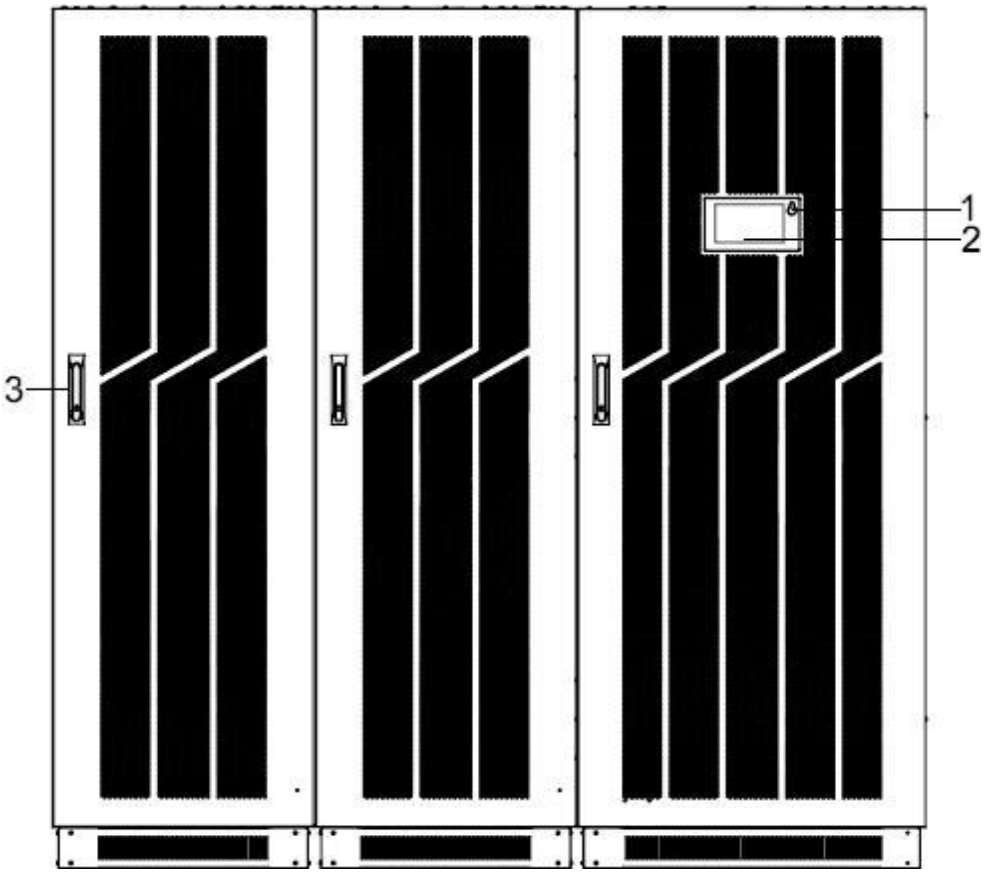


Standard configuration Frontal view (Copper bar)

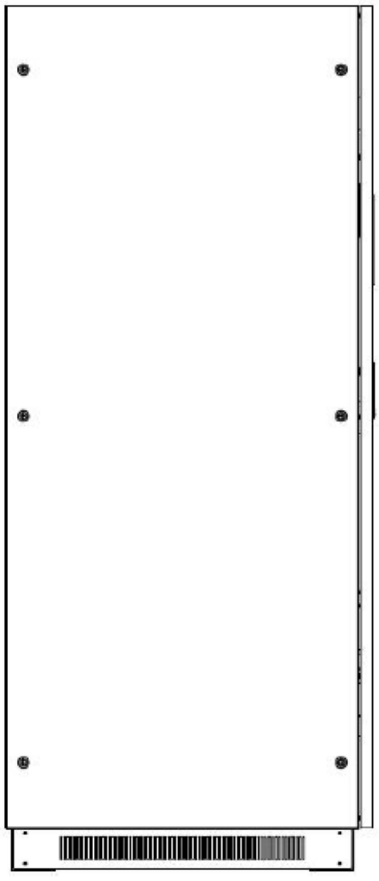


Mains-Bypass common copper bar Rear view

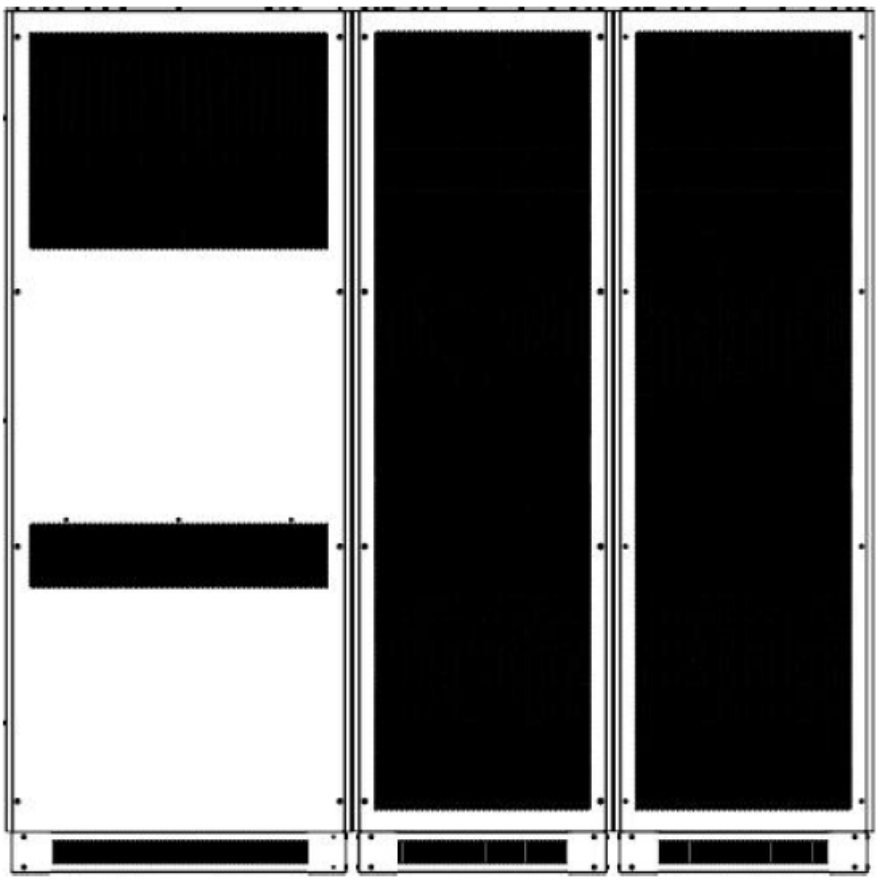
BETA 800-1000 (Full and Standard configuration – Top and Bottom entry)



Frontal view

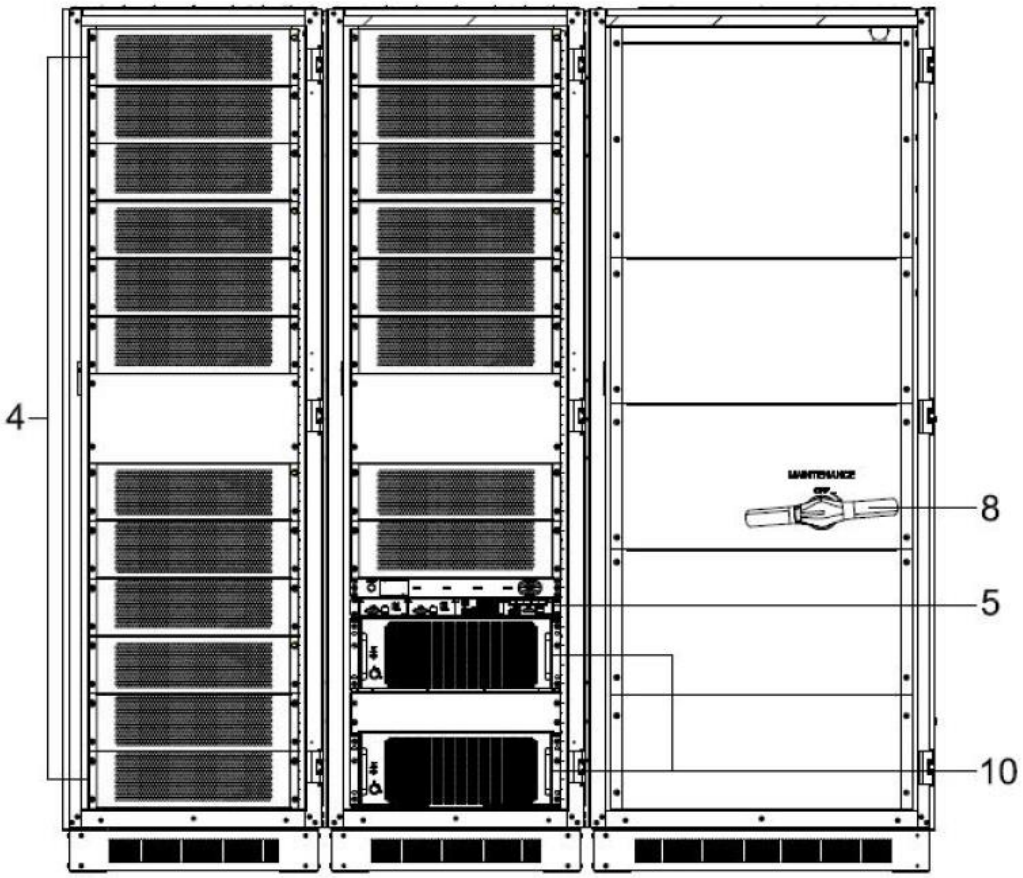


Side view

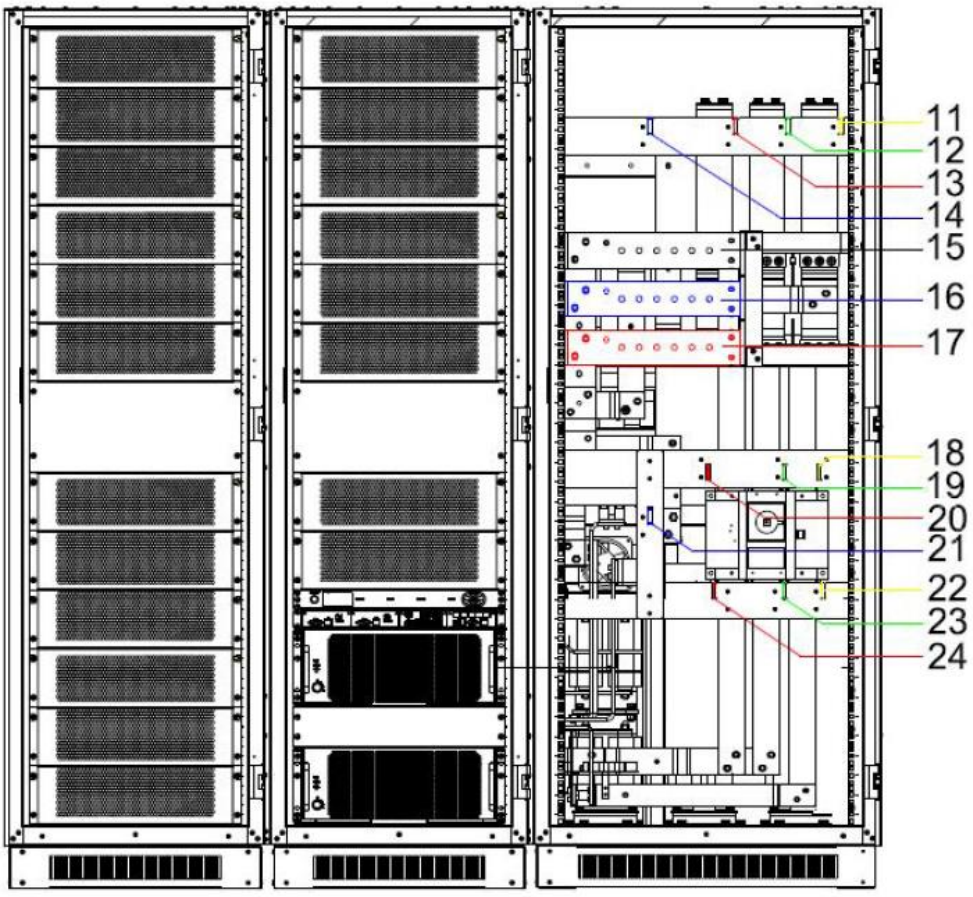


Rear view

BETA 800 (Standard configuration – Top and Bottom entry)

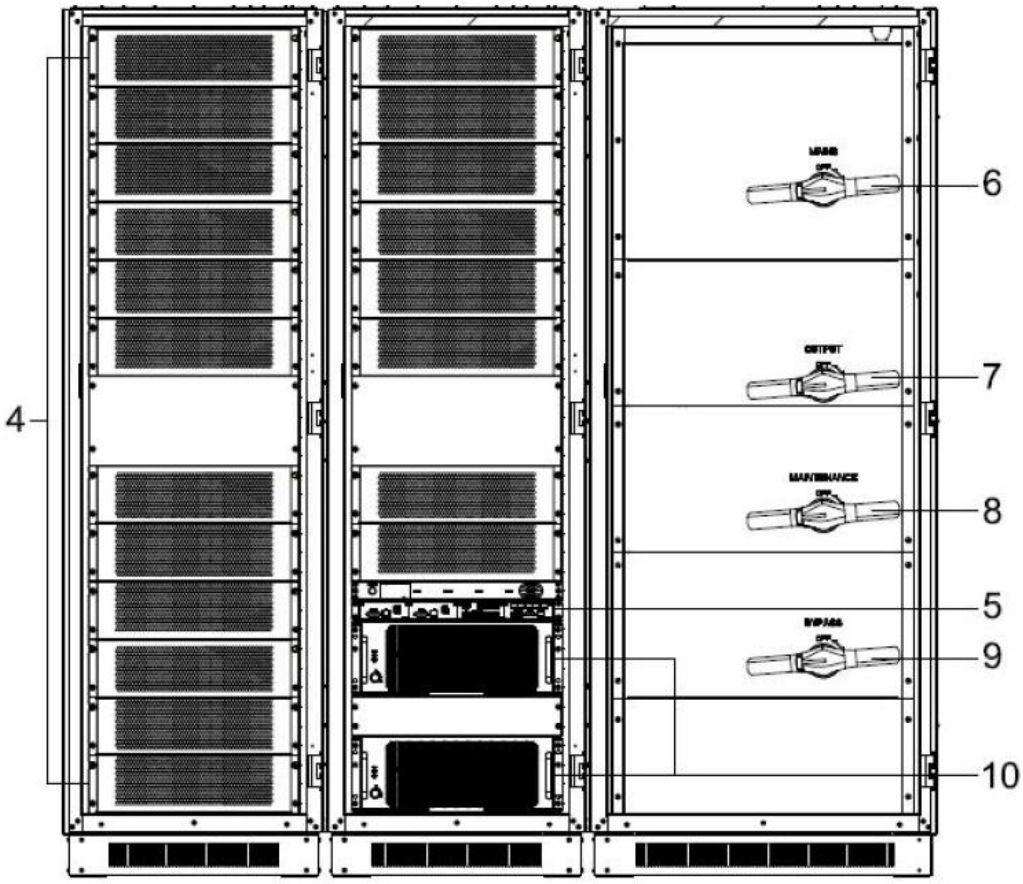


Frontal view (internal)

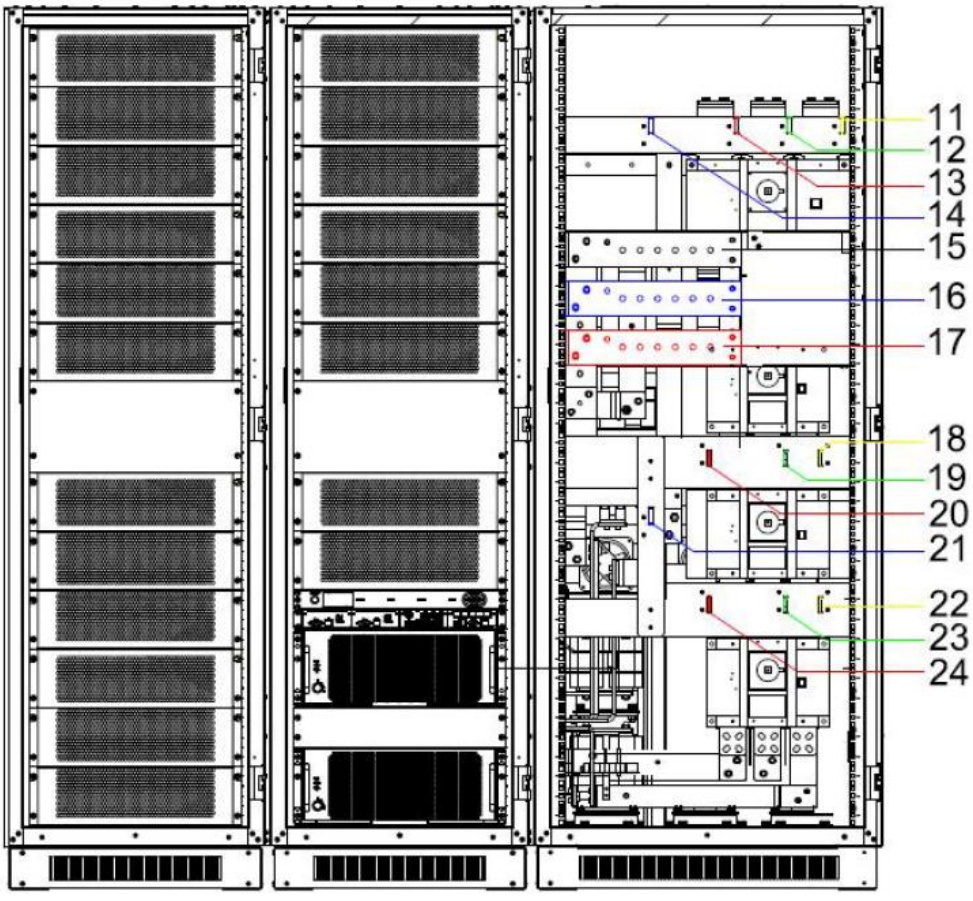


Frontal view (Copper bar)

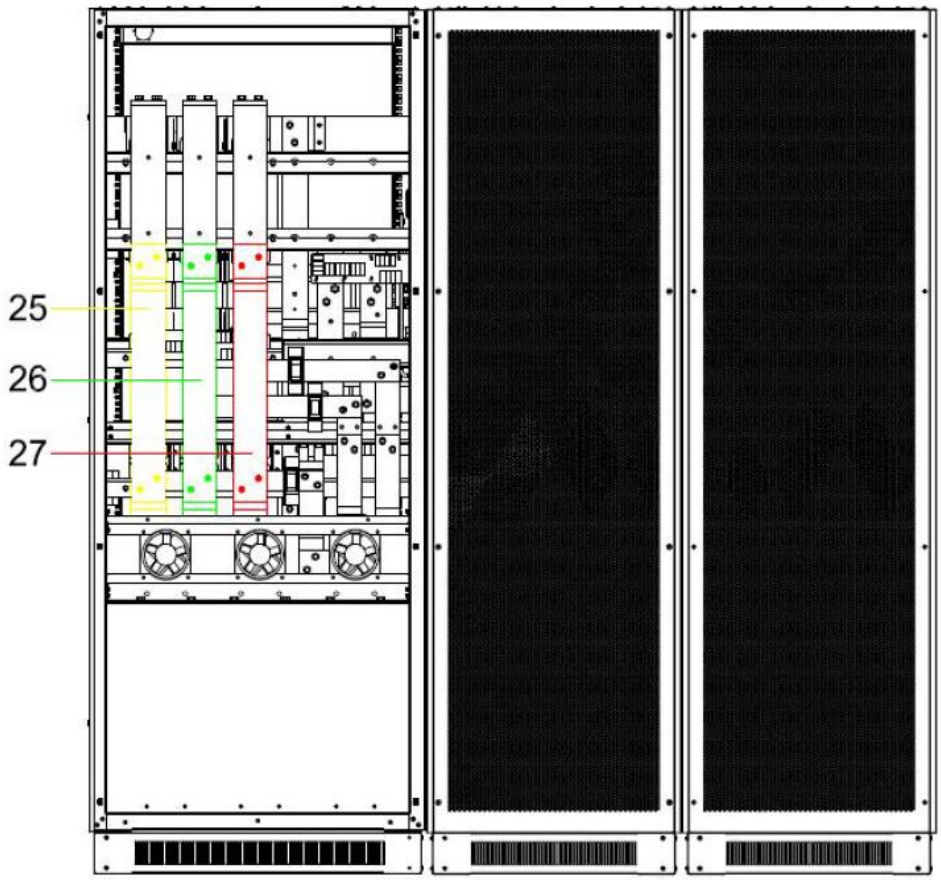
BETA 800 (Full configuration – Top and Bottom entry)



Frontal view (internal)

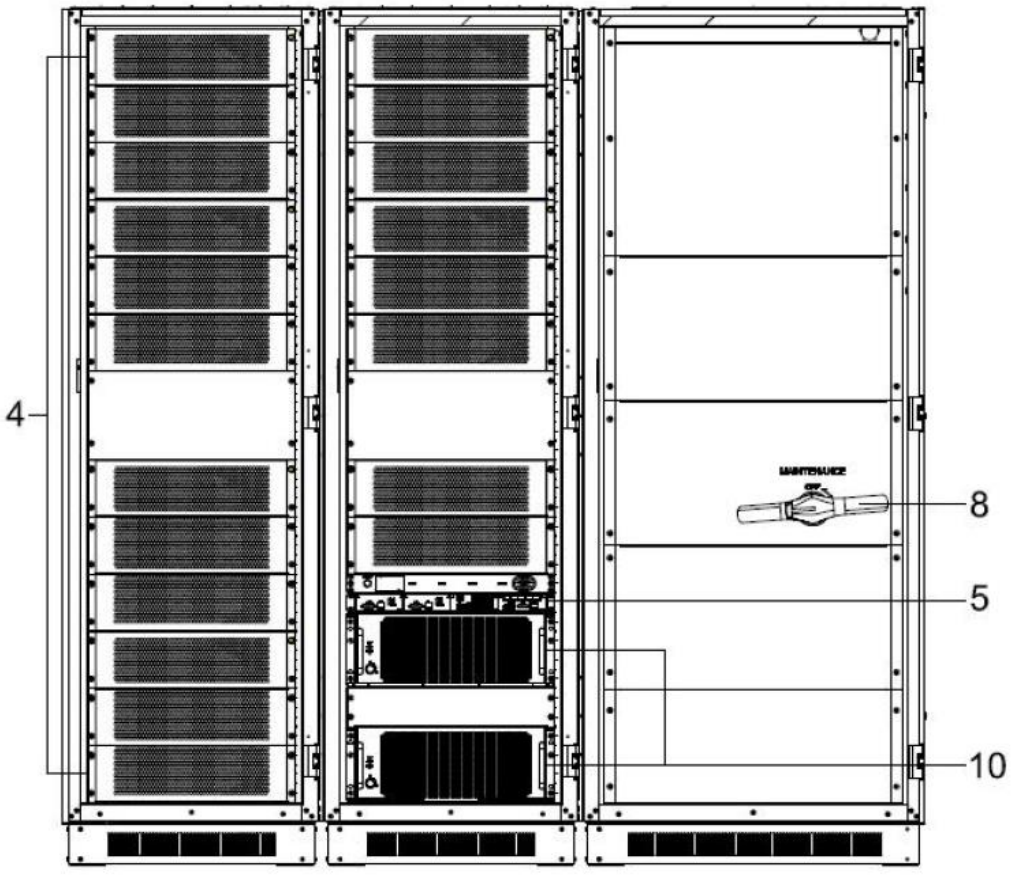


Frontal view (Copper bar)

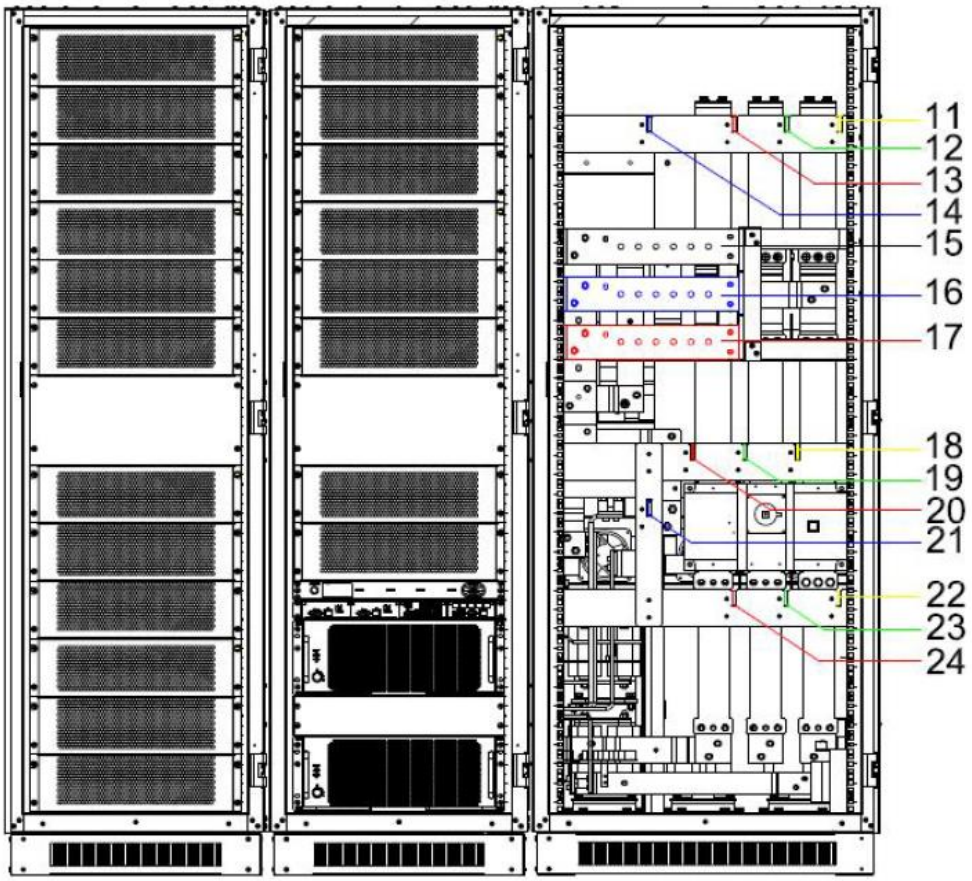


Mains-Bypass common copper bar Rear view

BETA 1000 (Standard configuration – Top and Bottom entry)

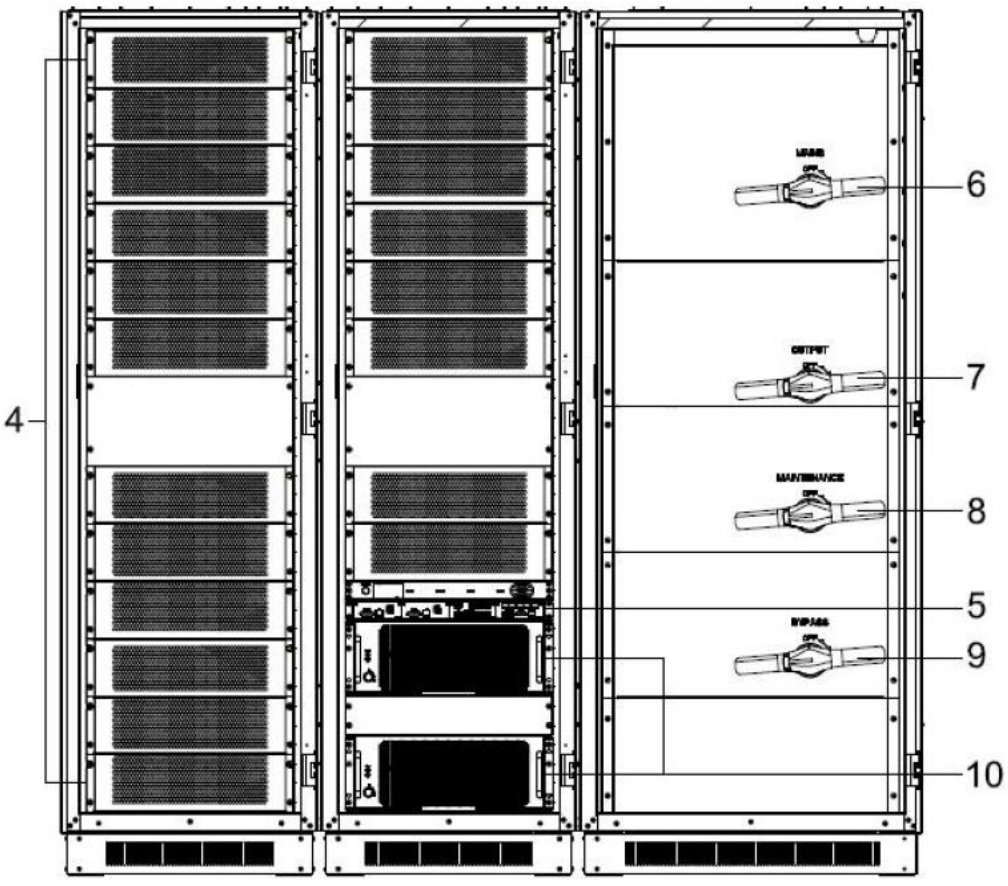


Frontal view (internal)

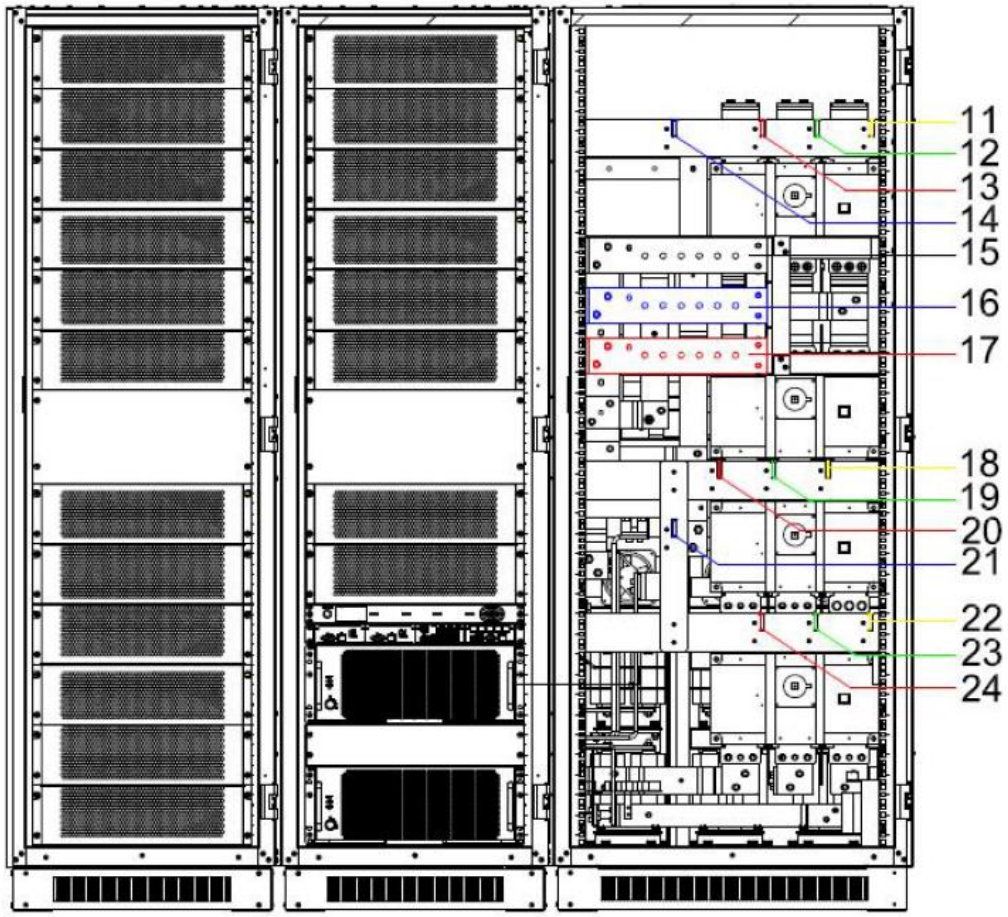


Frontal view (Copper bar)

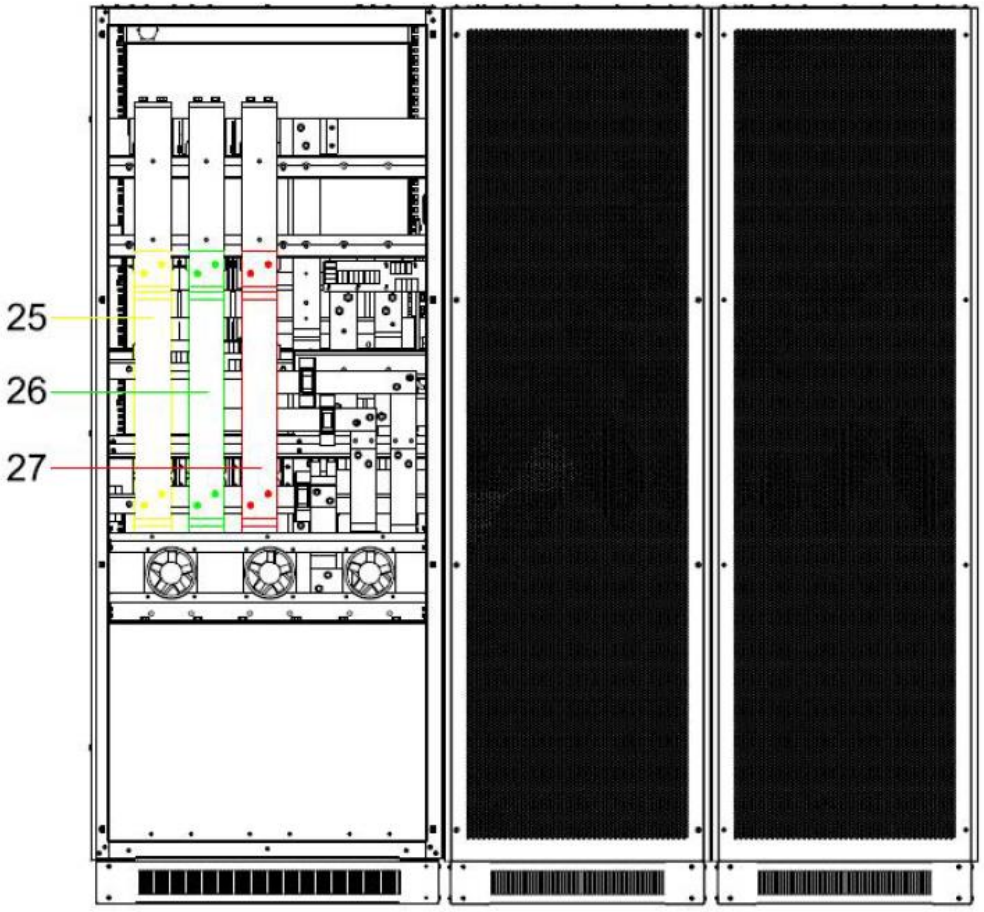
BETA 1000 (Full configuration – Top and Bottom entry)



Frontal view (internal)



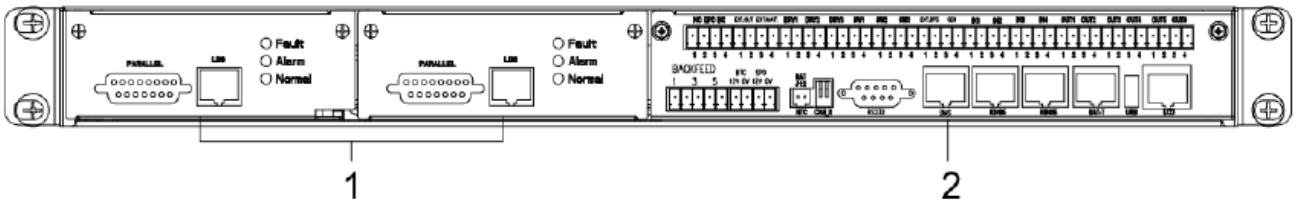
Frontal view (Copper bar)



Mains-Bypass common copper bar Rear view

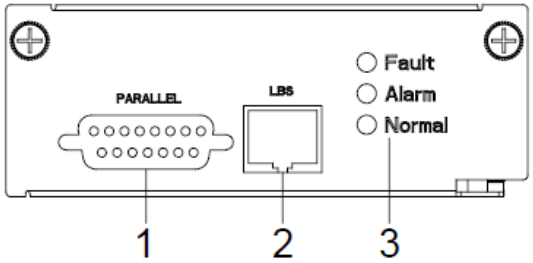
1) EPO key
2) LCD panel : Display UPS data and status
3) Front door lock
4) Power unit
5) Control unit
6) Mains switch
7) Output switch
8) Maintenance switch
9) Bypass switch
10) Bypass module
11) Mains-A input copper bar
12) Mains-B input copper bar
13) Mains-C input copper bar
14) Input neutral copper bar
15) Battery negative copper bar
16) Battery neutral copper bar
17) Battery positive copper bar
18) Output-A input copper bar
19) Output-B input copper bar
20) Output-C input copper bar
21) Output neutral copper bar
22) Bypass-A input copper bar : Wiring must be used when mains-bypass separation
23) Bypass-B input copper bar : Wiring must be used when mains-bypass separation
24) Bypass-C input copper bar : Wiring must be used when mains-bypass separation
25) Phase A mains-bypass common input connect copper bar
26) Phase B mains-bypass common input connect copper bar
27) Phase C mains-bypass common input connect copper bar
28) Grounding
29) SPD
31) Cabling cover

CONTROL UNIT



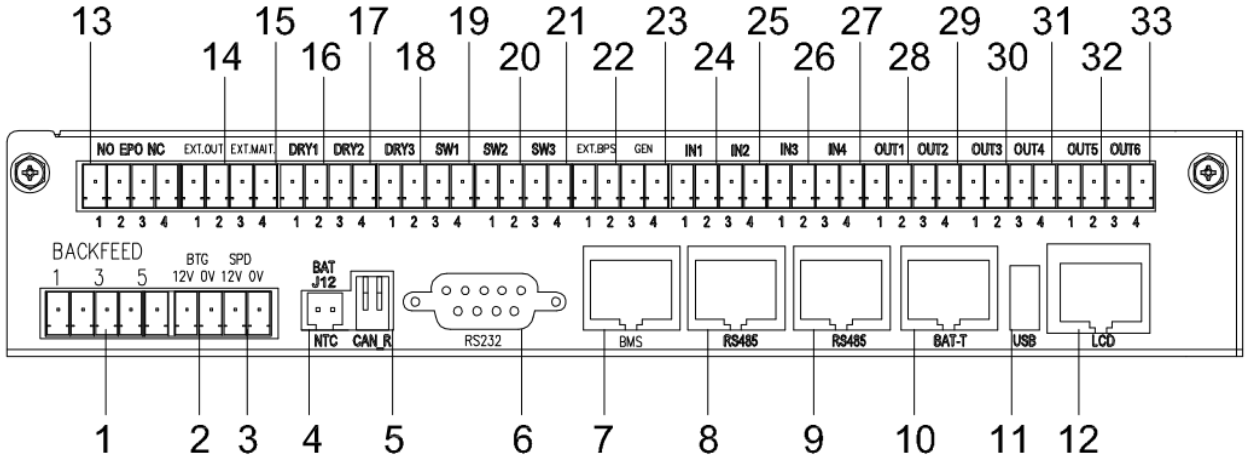
1) ECU1/2 : Centralized control unit
2) Monitor unit

ECU UNIT



1) PARALLEL port
2) LBS port
3) LED

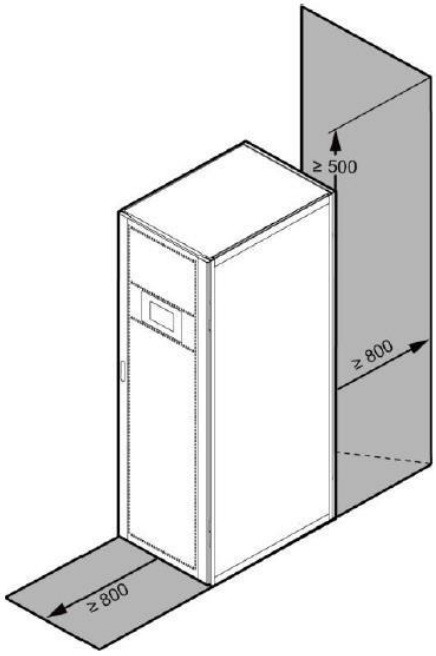
MONITOR UNIT



1) BACKFEED: Bypass backfeed singnal input port, PIN1_common, PIN3_NO, PIN5_NC
2) BTG: Battery grounding detect singnal input port, 12V_power supply, 0V_GND
3) SPD: SPD detect singnal input port, 12V_power supply, 0V_GND
4) BAT_T: NTC temperature sensor port
5) R-CAN: CAN communication resistor adjust
6) RS232: RS232 communication port
7) BMS: Commnunicate to Li battery BMS, include CAN and RS485 singnal
8) RS-485: RS485 communication port
9) RS-485: RS485 communication port
10) BAT_T: battery temperature sensor port (RS485)
11) USB: For software updata and history download
12) LCD: For LCD power supply and data commnunition
13) EPO: NO-12V: Normaly open port; NC-12V : normaly close port
14) EXT.OUT: External output breaker auxiliary contact singnal port, PIN1: 12Vdc, PIN2:GND
15) EXT.MAINT: External maintenance breaker auxiliary contact singnal port, PIN1: 12Vdc, PIN2: GND
16) DRY1: Battery group 1 breaker driver singnal output port PIN1: 24Vdc, PIN2:GND
17) DRY2: Battery group 2 breaker driver singnal output port PIN3: 24Vdc, PIN4:GND
18) DRY3: Battery group 3 breaker driver singnal output port PIN1: 24Vdc, PIN2:GND
19) SW1: Battery group 1 breaker auxiliary contact singnal port, PIN3: 12Vdc, PIN4:GND
20) SW2: Battery group 2 breaker auxiliary contact singnal port, PIN1: 12Vdc, PIN2:GND
21) SW3: Battery group 3 breaker auxiliary contact singnal port, PIN3: 12Vdc, PIN4:GND
22) EXT.BPS: External bypass breaker auxiliary contact singnal port, PIN1: 12Vdc, PIN2:GND
23) GEN: Generator detect singnal input port, PIN1: 12Vdc, PIN2:GND
24) IN1: Optional input dry contacts 1, PIN1: 12Vdc, PIN2:GND
25) IN2: Optional input dry contacts 2, PIN3: 12Vdc, PIN4:GND
26) IN3: Optional input dry contacts 3, PIN1: 12Vdc, PIN2:GND
27) IN4: Optional input dry contacts 4, PIN3: 12Vdc, PIN4:GND
28) OUT1: Optional output dry contacts 1, PIN1: common, PIN2:NO
29) OUT2: Optional output dry contacts 2, PIN3: common, PIN4:NO
30) OUT3: Optional output dry contacts 3, PIN1: common, PIN2:NO
31) OUT4: Optional output dry contacts 4, PIN3: common, PIN4:NO
32) OUT5: Optional output dry contacts 5, PIN1: common, PIN2:NO
33) OUT6: Optional output dry contacts 6, PIN3: common, PIN4:NO

3.3Installation notes

Note: Consider for the convenience of operation and maintenance, the space in front and back of the cabinet should be left at least 80cm and 80cm respectively when installing the cabinet.



- Please place the UPS in a clean, stable environment, avoid the vibration, dust, humidity, flammable gas and liquid, corrosive. To avoid from high room temperature, a system of room extractor fans is recommended to be installed. Optional air filters are available if the UPS operates in a dusty environment.
- The environment temperature around UPS should keep in a range of 0°C～40°C. If the environment temperature exceeds 40°C, the rated load capacity should be reduced by 12% per 5°C. The max temperature can't be higher than 50°C.
- If the UPS is dismantled under low temperature, it might be in a condensing condition. The UPS can't be installed unless the internal and external of the equipment is fully dry. Otherwise, there will be in danger of electric shock.
- Batteries should be mounted in an environment where the temperature is within the required specs. Temperature is a major factor in determining battery life and capacity. In a normal installation, the battery temperature is maintained between 15°C and 25°C. Keep batteries away from heat sources or main air ventilation area, etc.

WARNING!
Typical battery performance data are quoted for an operating temperature between 20°C and 25°C. Operating it above this range will reduce the battery life while operation below this range will reduce the battery capacity.

- Should the equipment not be installed immediately it must be stored in a room so as to protect it against excessive humidity and or heat sources.

CAUTION!
An unused battery must be recharged every 3 months Temporarily connecting the UPS to a suitable AC supply mains and activating it for the time required for recharging the batteries.

- The highest altitude that UPS may work normally with full load is 1000 meters. The load capacity should be reduced when this UPS is installed in place whose altitude is higher than 1000 meters, shown as the following table:

(Load coefficient equals max load in high altitude place divided by nominal power of the UPS)

Altitude (Mt)	1000	1200	1500	2000	2500	3000
Load coefficient	100%	99%	97.5%	95%	92.5%	90%

- The UPS cooling is depending on fan, so it should be kept in good air ventilation area. There are many ventilation holes on the front and rear, so they should not be blocked by any obstacles.

3.4 External Protective Devices

For safety reasons, it is necessary to install, external circuit breaker at the input A.C. supply and the battery. This chapter provides guidelines for qualified installers that must have the knowledge of local wiring practices for the equipment to be installed.

- **External Battery**
  The UPS and its associated batteries are protected against the effect of over-current through a DC compatible thermo-magnetic circuit-breaker (or a set of fuses) located close to the battery.
- **UPS Output**
  Any external distribution board used for load distribution shall be fitted with protective devices that may avoid the risk of UPS overloaded.
- **Over-current**
  Protection device shall be installed at the distribution panel of the incoming main supply. It may identify the power cables current capacity as well as the overload capacity of the system.

3.5 Power Cables

- The cable design shall comply with the voltages and currents provided in this section, Kindly follow local wiring practices and take into consideration the environmental conditions (temperature and physical support media).

WARNING!
Upon starting. Please ensure that you are aware of the location and operation of the external isolators which are connected to the UPS input/bypass supply of the mains distribution panel. Check to see if these supplies are electrically isolated. And post and necessary warning signs to prevent any inadvertent operation.

3.5.1. Recommended sectional for power cables

UPS	CABLE DIMENSION (mm^2)				
	AC Input	AC Output	BPS Input	DC Input	Ground
200kVA	95*2	95*2	95*2	120*2	70
250kVA	120*2	120*2	120*2	150*2	95
300kVA	120*2	120*2	120*2	150*2	120
400kVA	185*2	150*2	150*2	240*2	150
500kVA	150*3	240*2	240*2	185*3	240
600kVA	240*3	150*3	150*3	240*3	150*2
800kVA	185*4	150*4	150*4	240*4	150*2
1000kVA	240*4	240*4	240*4	185*6	185*3

CAUTION!
Protective earth cable: Connect each cabinet to the main ground system. For Grounding connection, follow the shortest route possible.

WARNING!
Failure to follow adequate earthing procedures may result in electromagnetic interference or in hazards involving electric shock and fire

- When selecting, connecting, and routing power cables, follow local safety regulations and rules.
- If external conditions such as cable layout or ambient temperatures change, perform verification in accordance with the IEC-60364-5-52 or local regulations.
- If the rated voltage is 400 V, multiply the currents by 0.95. If the rated voltage is 415 V, multiply the currents by 0.92.
- If primary loads are non-linear loads, increase the cross-sectional areas of neutral wires1.5–1.7 times.
- The nominal battery discharge current refers to the current of forty 12 V batteries at 480V in standard configuration.
- The maximum battery discharge current refers to the current when forty 12 V batteries in standard configuration, that is, two hundred and forty 2 V battery cells (1.67 V/cell), stop discharging.
- The battery cable specifications are selected based on 40 batteries by default and compatible with application scenarios with 30–50 batteries.
- When the mains input and bypass input share a power source, configure both types of input power cables as mains input power cables. The cables listed in Table are used only when the following requirements are met:
  - Routing mode: Routing the cables over the cable ladder or bracket in a single layer (IEC60364-5-52 middle E).
  - The ambient temperature is 30°C.
  - The AC voltage loss is less than 3%, and the DC voltage loss is less than 1%.
  - 90°C copper flexible cable.
  - The length of the AC power cables of a UPS is no longer than 30 m and DC power cables no longer than 50 m

3.5.2. Power cable connector requirements

Model	Connector	Connection Mode	Bolt Type	Bolt Hole Diameter	Torque
200-250 kVA	Mains input connector	Crimped OT terminals	M10	10.5mm	26N•m
	Bypass input connector	Crimped OT terminals	M10	10.5mm	26N•m
	Battery input connector	Crimped OT terminals	M10	10.5mm	26N•m
	Output connector	Crimped OT terminals	M10	10.5mm	26N•m
	Grounding connector	Crimped OT terminals	M10	10.5mm	26N•m
300-400 kVA	Mains input connector	Crimped OT terminals	M12	13.5mm	44N•m
	Bypass input connector	Crimped OT terminals	M12	13.5mm	44N•m
	Battery input connector	Crimped OT terminals	M12	13.5mm	44N•m
	Output connector	Crimped OT terminals	M12	13.5mm	44N•m
	Grounding connector	Crimped OT terminals	M10	10.5mm	26N•m

500-600 kVA	Mains input connector	Crimped OT terminals	M12	13.5mm	44N•m
	Bypass input connector	Crimped OT terminals	M12	13.5mm	44N•m
	Battery input connector	Crimped OT terminals	M12	13.5mm	44N•m
	Output connector	Crimped OT terminals	M12	13.5mm	44N•m
	Grounding connector	Crimped OT terminals	M10	10.5mm	26N•m
800-1000 kVA	Mains input connector	Crimped OT terminals	M16	17mm	44N•m
	Bypass input connector	Crimped OT terminals	M16	17mm	44N•m
	Battery input connector	Crimped OT terminals	M16	17mm	44N•m
	Output connector	Crimped OT terminals	M16	17mm	44N•m
	Grounding connector	Crimped OT terminals	M16	17mm	44N•m

3.5.3. Recommended input front-end and output back-end circuit breakers

UPS capacity	Component	Specifications
200kVA	Mains input circuit breaker	400A 3P
	Bypass input circuit breaker	400A 3P
	Output branch circuit breaker	400A 3P
	Battery input circuit breaker	630A 3P
250kVA	Mains input circuit breaker	500A 3P
	Bypass input circuit breaker	500A 3P
	Output branch circuit breaker	500A 3P
	Battery input circuit breaker	800A 3P
300kVA	Mains input circuit breaker	500A 3P
	Bypass input circuit breaker	500A 3P
	Output branch circuit breaker	500A 3P
	Battery input circuit breaker	1000A 3P
400kVA	Mains input circuit breaker	800A 3P
	Bypass input circuit breaker	630A 3P
	Output branch circuit breaker	630A 3P
	Battery input circuit breaker	1250A 3P
500kVA	Mains input circuit breaker	1000A 3P
	Bypass input circuit breaker	800A 3P
	Output branch circuit breaker	800A 3P
	Battery input circuit breaker	1600A 3P

600kVA	Mains input circuit breaker	1250A 3P
	Bypass input circuit breaker	1000A 3P
	Output branch circuit breaker	1000A 3P
	Battery input circuit breaker	2000A 3P
800kVA	Mains input circuit breaker	1600A 3P
	Bypass input circuit breaker	1250A 3P
	Output branch circuit breaker	1250A 3P
	Battery input circuit breaker	2500A 3P
1000kVA	Mains input circuit breaker	2000A 3P
	Bypass input circuit breaker	1600A 3P
	Output branch circuit breaker	1600A 3P
	Battery input circuit breaker	3200A 3P

3.6 Power cable connect

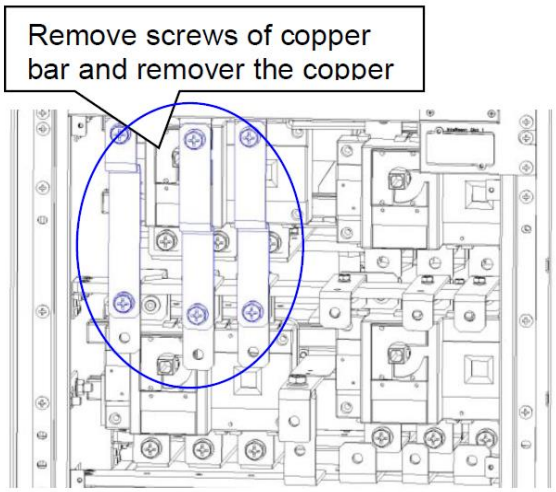
Once the equipment has been finally positioned and secured, connect the power cables as described in the following procedure.
Verify the UPS is totally isolated from its external power source and also all power isolators of the UPS are open. Check to see if they are electrically isolated, and post any necessary warning signs to prevent their inadvertent operation. Remove the cover of terminals for wiring easily.

Choose appropriate power cable. (Refer to the table above) and pay attention to the diameter of the connection terminal of the cable that should be greater than or equal to that of the connection poles;

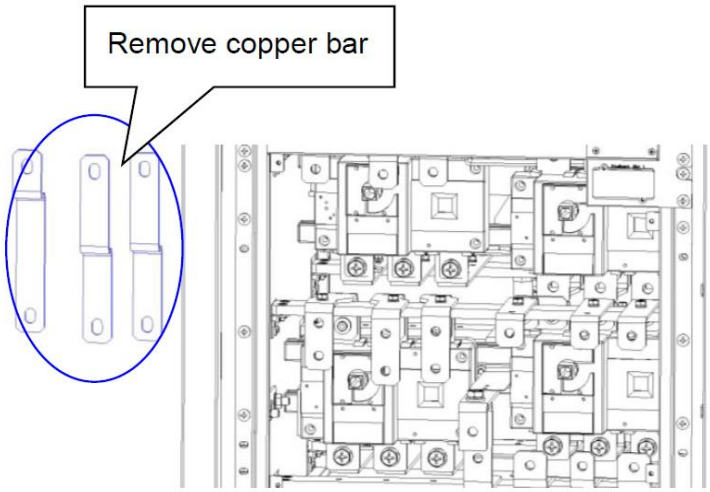
WARNING!
In the case of "Dual input" operation, make sure the copper wire between each input lines have been removed. The AC input and the AC bypass supplies must be referenced to the same neutral point.

Before equipment has been installed, must comfirm the input source type, Common input or Dual input, if the input source is Dual input, must remove the copper bar that connected bypass and mains as shown below:

BETA 200-250-300 (Bottom entry)

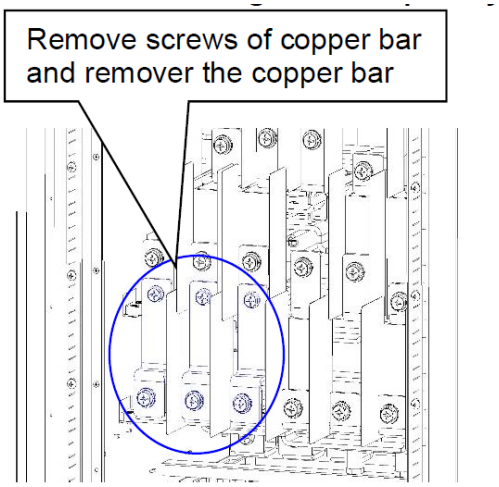


Remove copper bar

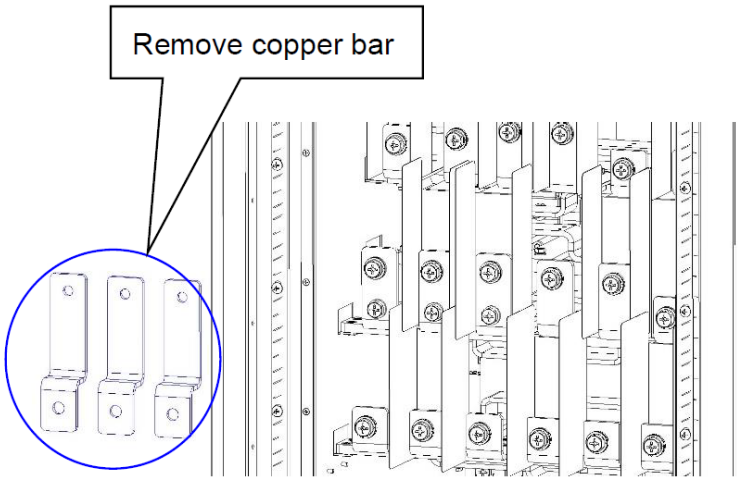


Separation of mains and By-pass

BETA 300 (Full configuration - Top entry)

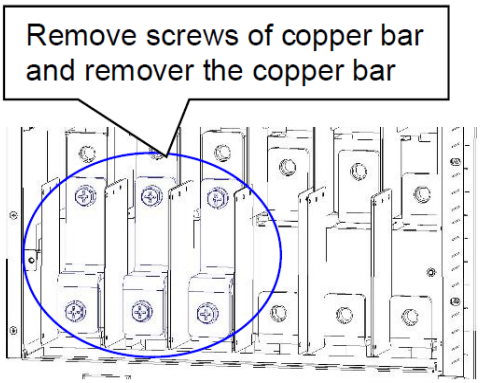


Remove copper bar

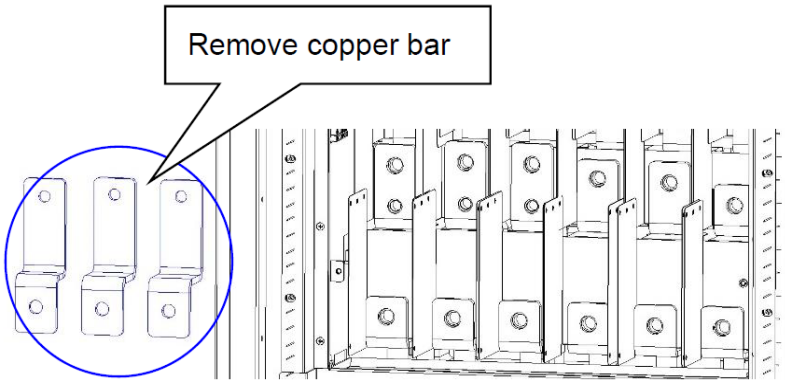


Separation of mains and By-pass

BETA 300 (Standard configuration - Top entry)

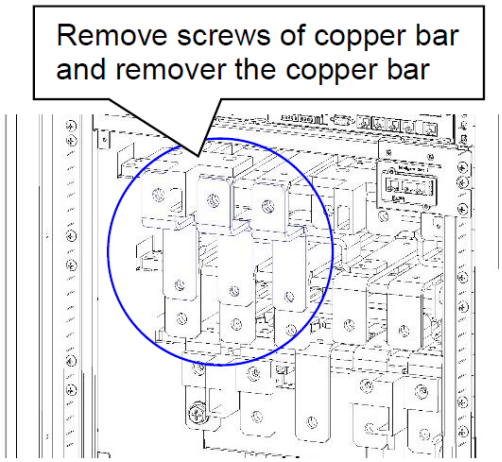


Remove copper bar

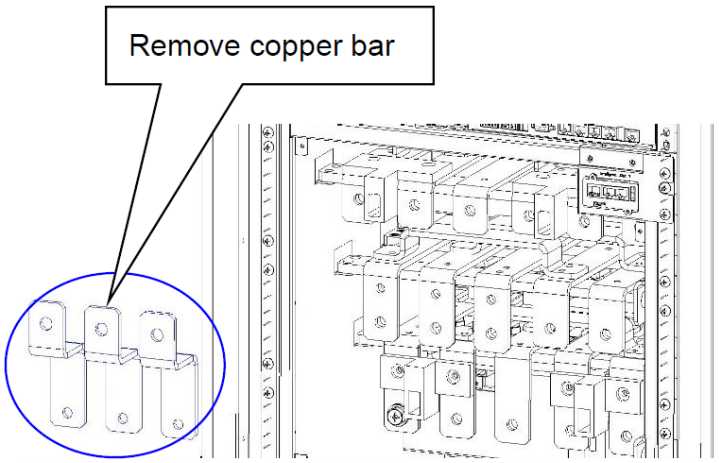


Separation of mains and By-pass

BETA 300 (Full configuration - Bottom entry)

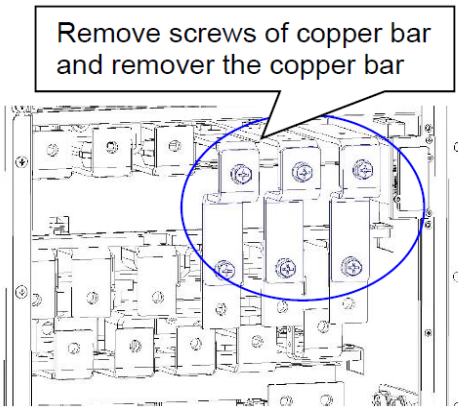


Remove copper bar

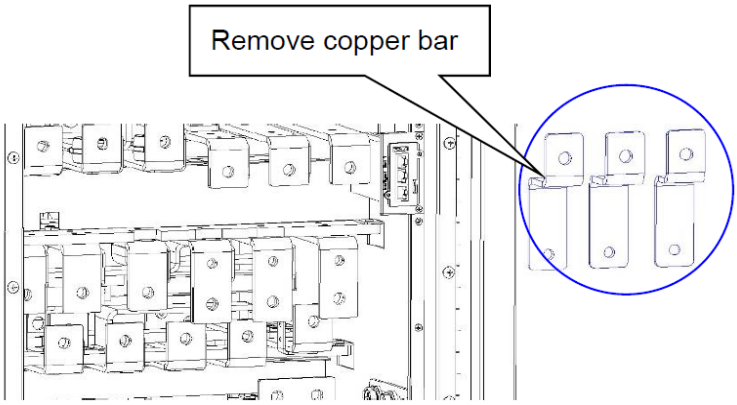


Separation of mains and By-pass

BETA 300 (Standard configuration - Bottom entry)

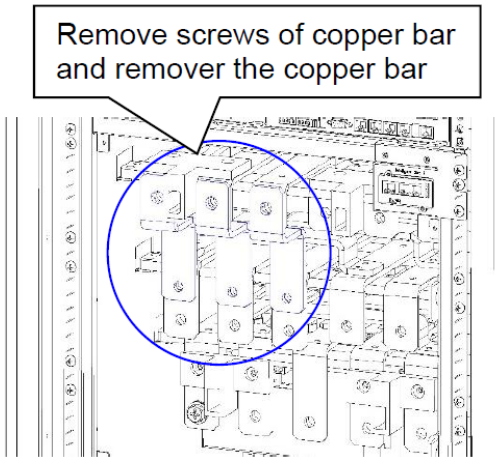


Remove copper bar

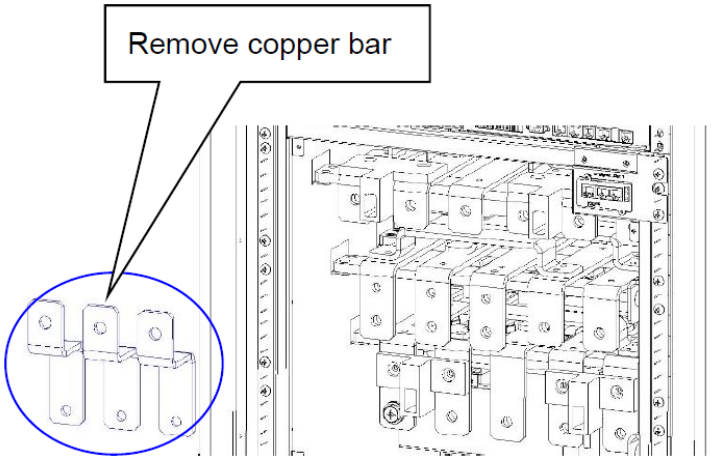


Separation of mains and By-pass

BETA 400 (Full configuration - Bottom entry)

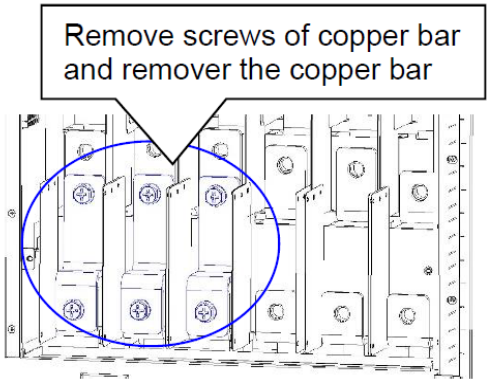


Remove copper bar

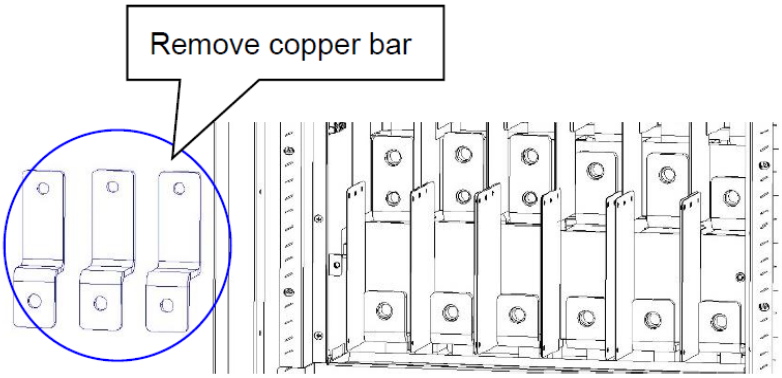


Separation of mains and By-pass

BETA 400 (Standard configuration - Top entry)

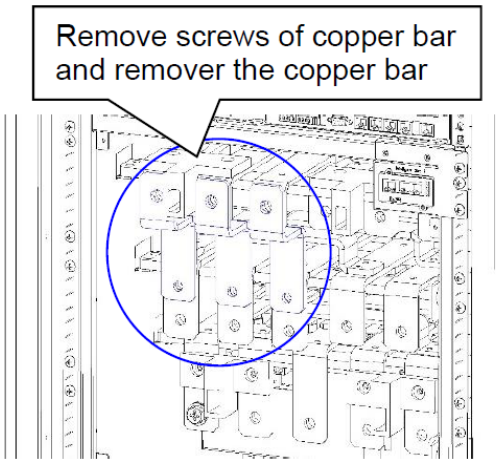


Remove copper bar

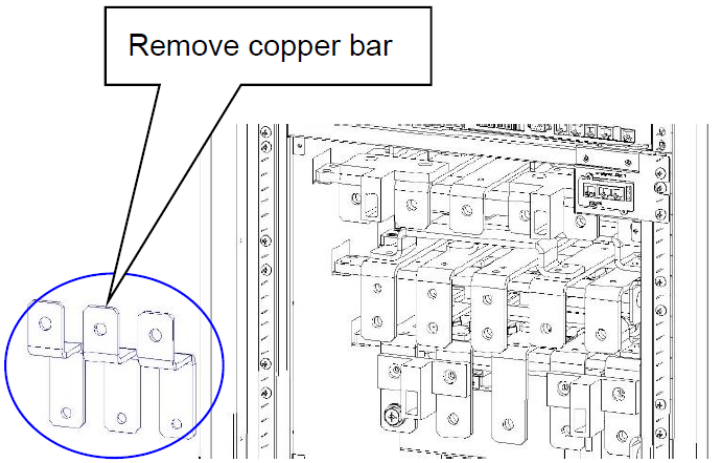


Separation of mains and By-pass

BETA 400 (Full configuration - Bottom entry)

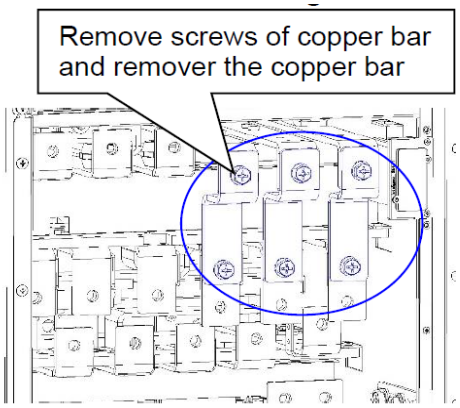


Remove copper bar

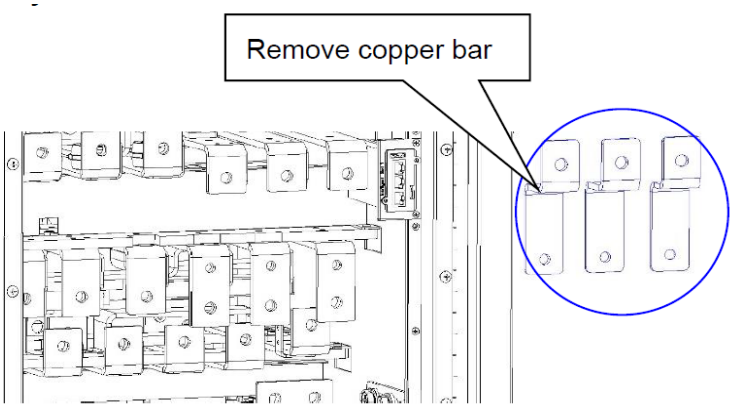


Separation of mains and By-pass

BETA 400 (Standard configuration - Bottom entry)

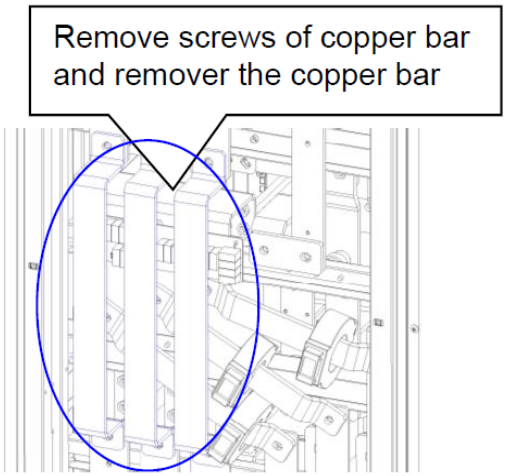


Remove copper bar

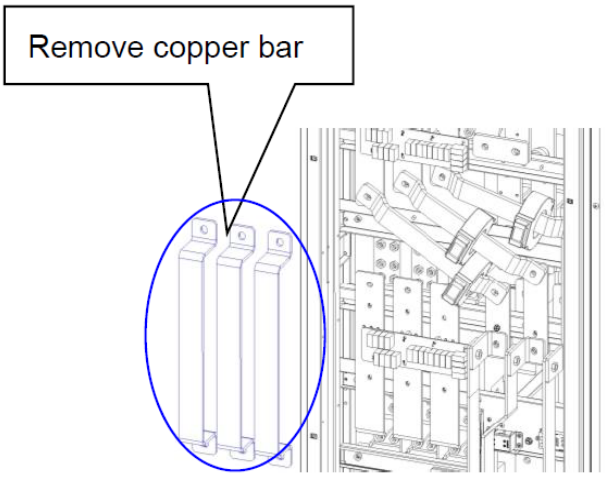


Separation of mains and By-pass

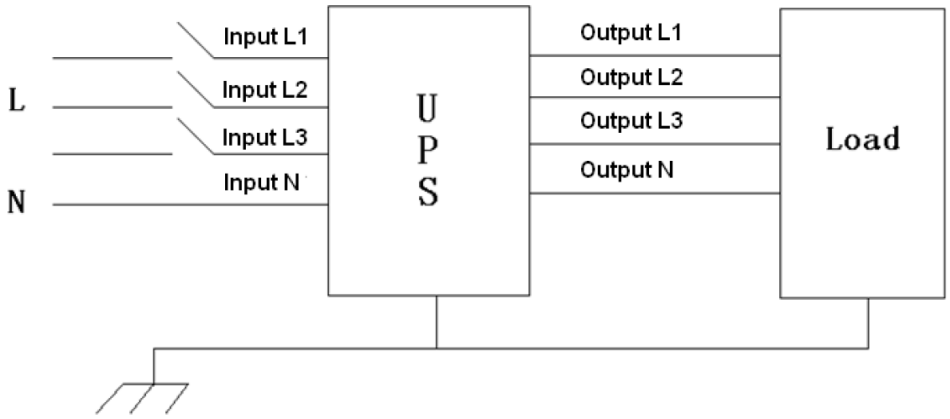
BETA 400-500-600 (Top and Bottom entry)



Remove copper bar



Separation of mains and By-pass



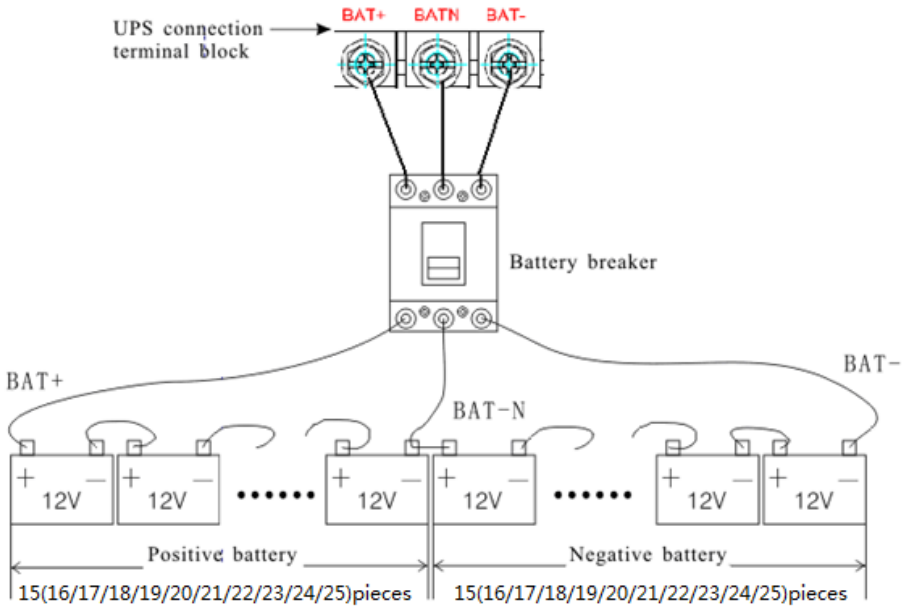
WARNING!

If the load equipment is not ready to accept power on the arrival of the commissioning engineer then ensure that the system output cables are safely isolated at their ends.
Connect the safety earth and any necessary bonding earth cables to the copper earth screw located on the floor of the equipment below the power connections. All cabinets in the UPS must be grounded properly.

CAUTION!
The earthing and neutral bonding arrangement must be in accordance with local and national codes of practice.

3.7 Battery connection

The UPS adopts positive and negative double battery framework, totally 30pcs (optional 32/34/36/38/40/42/44/46/48/50) in series. A neutral cable is retrieved from the joint between the cathode of the 15th (16th/17th/18th/19th/20th/21st/22nd/23rd/24th/25th) and the anode of the 16th (17th/18th/19th/20th/21st/22nd/23rd/24th/25th/26th) of the batteries.
Then the neutral cable, the battery Positive and the battery negative are connected with the UPS respectively. The battery sets between the Battery anode and the neutral are called positive batteries and that between neutral and cathode are called negative ones. The user can choose the capacity and the numbers of the batteries according to their desire.



Note**:**

The BAT+ of the UPS connect poles is connected to the anode of the positive battery, the BAT-N is connected to the cathode of the positive battery and the anode of the negative battery, the BAT- is connected to the cathode of the negative battery.

Charger current could be adjusted automatically according to battery capacity selected. All related settings can be done through LCD panel or monitoring software

CAUTION!
Don't mix batteries with different capacity or different brands or even mix up new and old batteries.

WARNING!
Ensure correct polarity of string end connections to the Battery Circuit Breaker and from the Battery Circuit Breaker to the UPS terminals i.e. (+) to (+) / (-) to (-) but disconnect one or more battery cell links in each tier. Do not reconnect these links and do not close the battery circuit breaker unless authorized by the commissioning engineer.

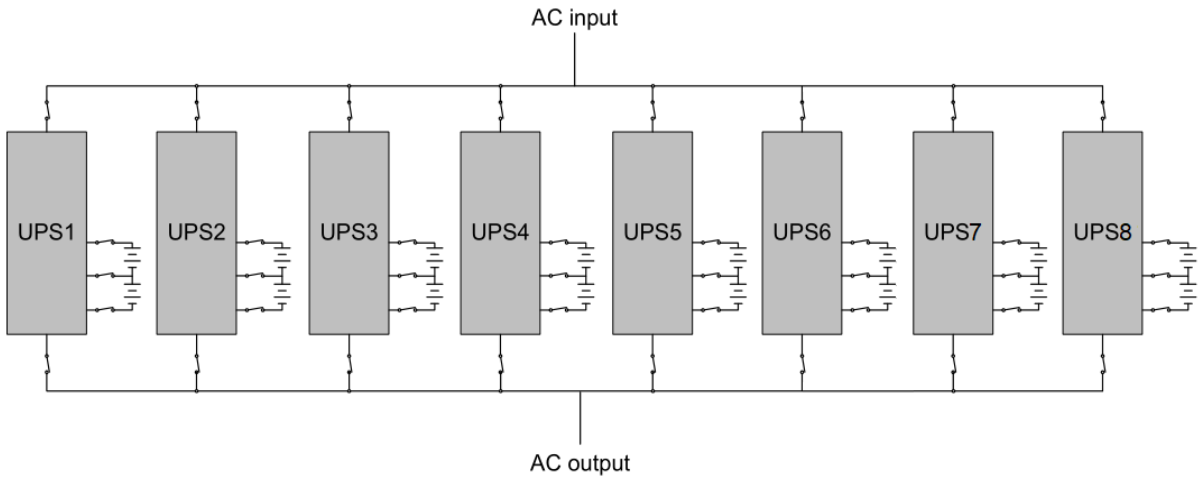
3.8 UPS parallel Installation

The basic installation procedure of a parallel system comprising of two or more UPS is the same as that of single system.
The following sections introduce the installation procedures specified to the parallel system.
Up to a maximum of 8 units can be connected in parallel.

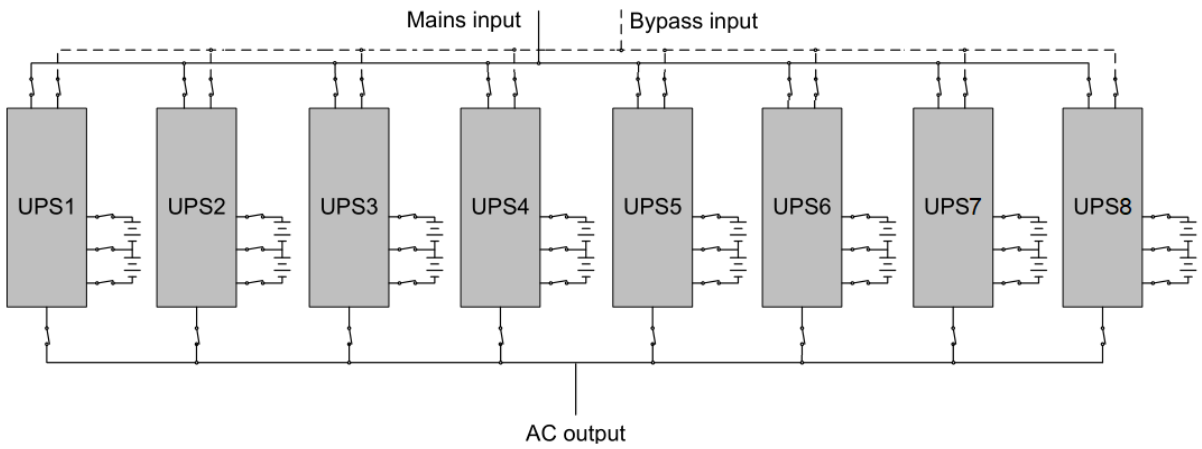
3.8.1 Cabinet installation

Connect all the UPS needed to be put into parallel system as below picture.

Common input:



Dual input:



Make sure each UPS input breaker is in “off” position and there is no any output from each UPS connected. Battery groups can be connected separately or in parallel, which means the system itself provides both separate battery and common battery.

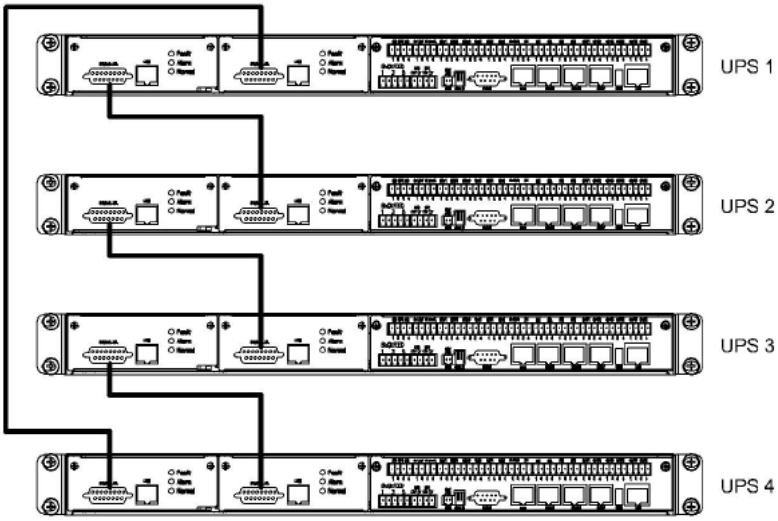
A group of paralleled UPS behaves as one large UPS system but with the advantage of presenting higher reliability. In order to assure that all UPS are equally utilized and comply with relevant wiring rules, please follow the requirements below:

1) All UPS must be of the same rating and be connected to the same bypass source.
2) Bypass and the mains input power must be received with the same neutral
3) The outputs of all the UPS must be connected to a common output bus
4) All bypass input cables and UPS output cables should be of the same length and specification. This facilitates load sharing when operating in bypass mode

WARNING!
Make sure the N, A (L1), B (L2), C (L3) lines are correct, and grounding is well connected.

3.8.2 Parallel cable installation

Shielded and double insulated control cables available must be interconnected in a ring configuration between UPS as shown below. The parallel control board is mounted on each UPS. The ring configuration ensures high reliability of the control.



Parallel system should be commissioning when the stand-alone are all intact.
Take 4 units in parallel for example.

1) Confirm the input/output wires connection and input phase sequence are correct; switch off the battery breaker, and measure the +/- bat voltage of all battery group are normal.
2) Switch on the input breaker of unit 1,and access LCD setting interface to setting the working mode (PAL), ID (1), parallel number (4), redundant number (0), number and capacity of battery. The output voltage level and Bypass protection range are default setting.
3) Turn off the input breaker of Unit 1, and make sure the UPS is off. Switch on the input breaker of Unit 2, access the LCD setting interface, setting the parallel working mode (PAL), ID (2) parallel number (4), redundant number (0), number and capacity of battery. The other setting are the same as UPS 1.
4) For Unit 3 and Unit 4 UPS, the operation setting are all the same as Unit 1 and 2.
5) Connect the parallel cable, it should be formed loop connection (refer point 3.9.2).
6) Turn on Bypass/input/output breaker of all the paralleled UPS, then confirm all the setting are correct. Each UPS has their owed different ID.
7) There are only one master in parallel system. You can turn on all the UPS after confirm all the setting are correct.
8) Turn on all the battery breaker and confirm the parameter (V/I) are normal.
9) Connected the Load, and check whether the output current are balance.

Switch on and off the utility breaker to test all the UPS converters system from Utility to battery and restored function are working find.

3.9 LBS installation (optional)

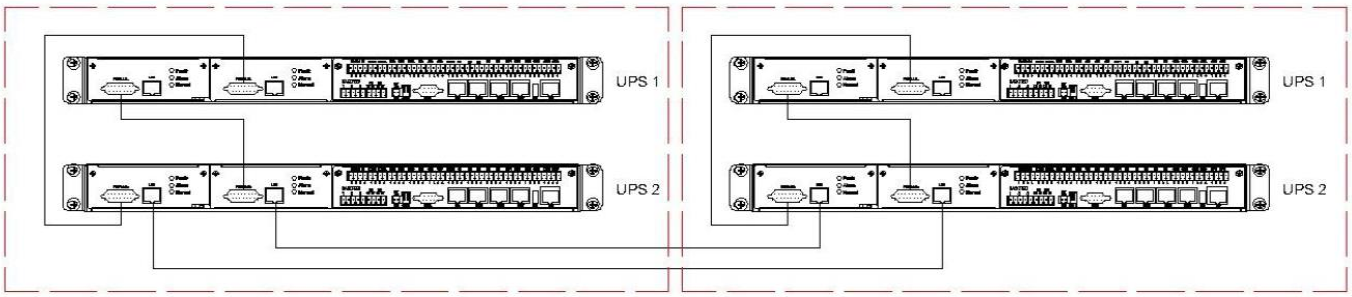
LBS system contains LCD set, commucation cable and STS device.

3.9.1 LCD setting

Set every UPS of the systems to be LBS Master or LBS Slave. For instance if the UPS belongs to LBS master system, its LBS setting must be set to Master.

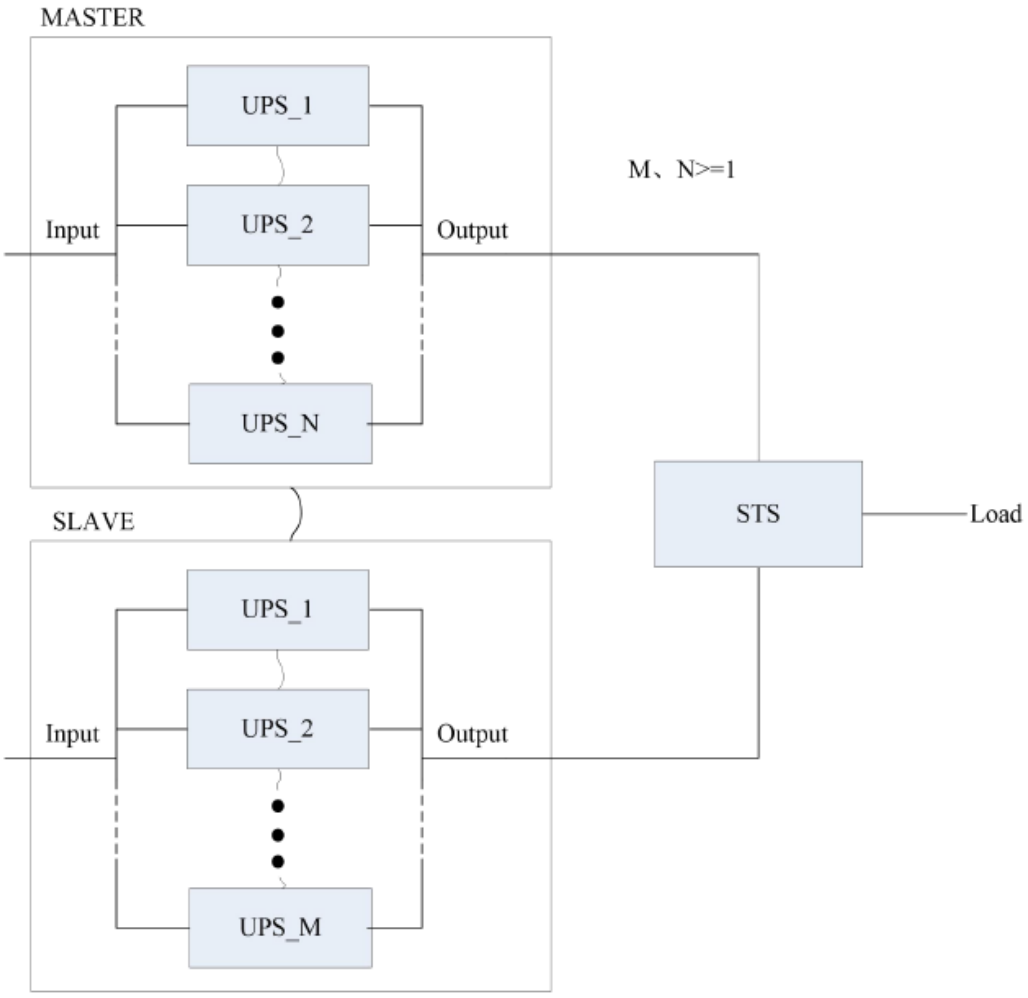
3.9.2 LBS cable installation

The two ports of one mesh wire should be plug into RJ45 interface of any one UPS of both master and slave system.



3.9.3 UPS installation

The whole systems is showed below.



4. OPERATION

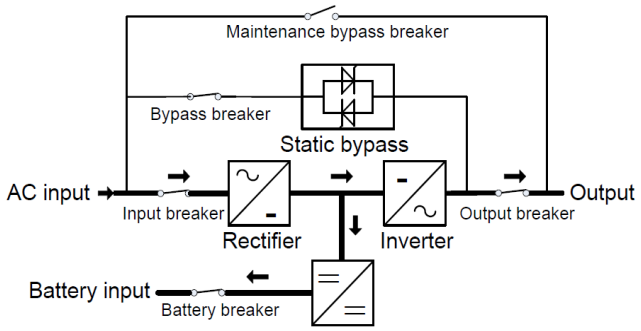
4.1 Operation Modes

The UPS is a double-conversion on-line UPS that may operate in the following alternative modes:

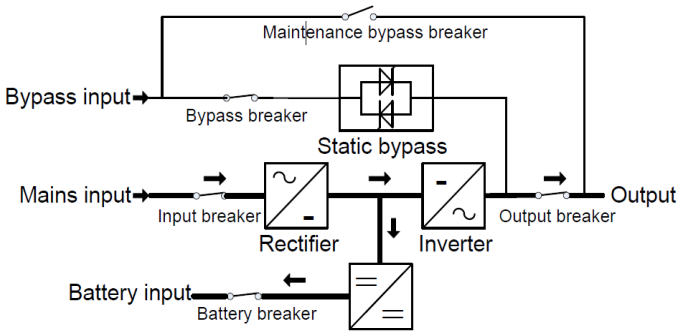
◆ **Normal mode**

The rectifier/charger derives power from the AC Mains and supplies DC power to the inverter while floating and boosting charge the battery simultaneously. Then, the inverter converts the DC power to AC and supplies to the load.

SINGLE INPUT: Mains Input



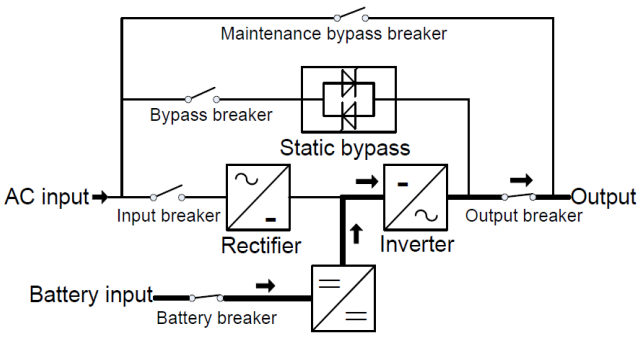
DUAL INPUT: Mains Input and Bypass Input



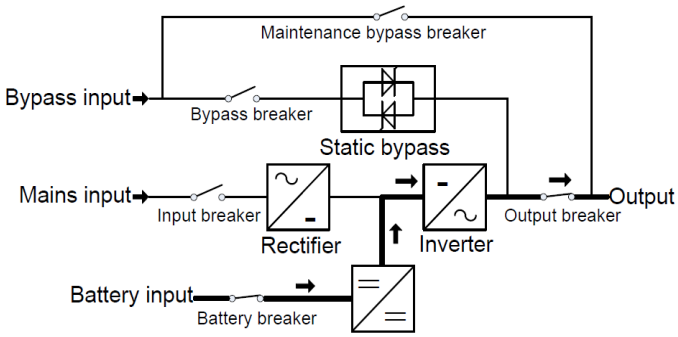
◆ **Battery mode (Stored Energy Mode)**

If the AC mains input power fails, the inverter, which obtains power from the battery, supplies the critical AC load. There is no power interruption to the critical load. The UPS will automatically return to Normal Mode when AC recovers.

SINGLE INPUT: Mains Input



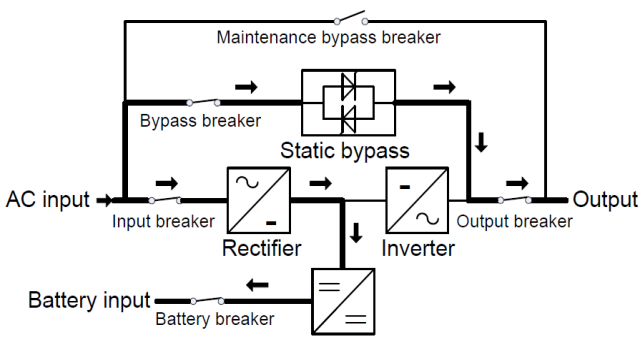
DUAL INPUT: Mains Input and Bypass Input



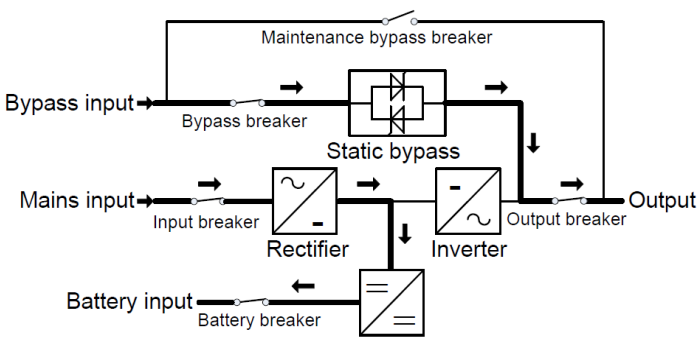
Bypass mode

If the inverter is out of order, or if overload occurs, the static transfer switch will be activated to transfer the load from the inverter supply to bypass supply without interruption to the critical load. In the event that the inverter output is not synchronized with the bypass AC source, the static switch will perform a transfer of the load from the inverter to the bypass with power interruption to the critical AC load. This is to avoid paralleling of unsynchronized AC sources. This interruption is programmable but typically set to be less than an electrical cycle e.g. less than 15ms (50Hz) or less than 13.33ms (60Hz).

SINGLE INPUT: Mains Input



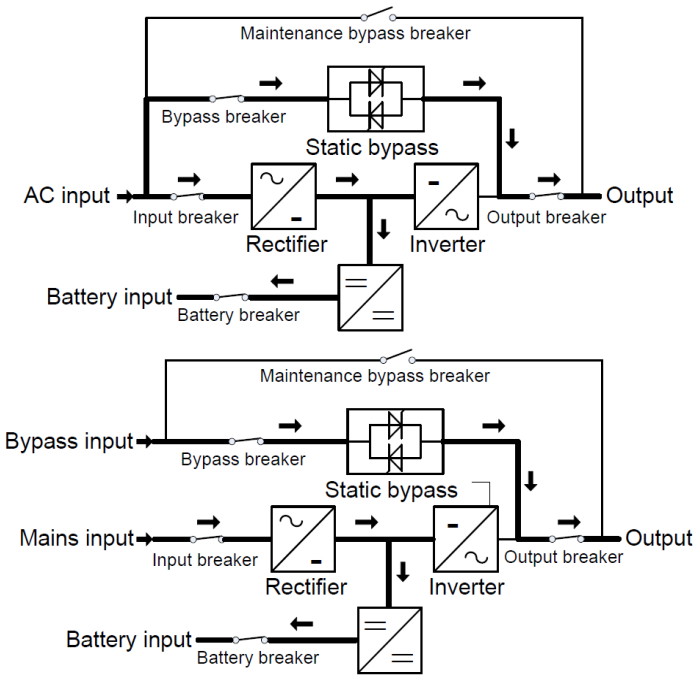
DUAL INPUT: Mains Input and Bypass Input



◆ **ECO Mode**

When the UPS is at AC Mode and the requirement to the load is not critical, the UPS can be set at ECO mode in order to increase the efficiency of the power supplied. At ECO mode, the UPS works at Line-interactive mode, so the UPS will transfer to bypass supply. When the AC is out of set window, the UPS will transfer from bypass to Inverter and supplies power from the battery, and then the LCD shows all related information on the screen.

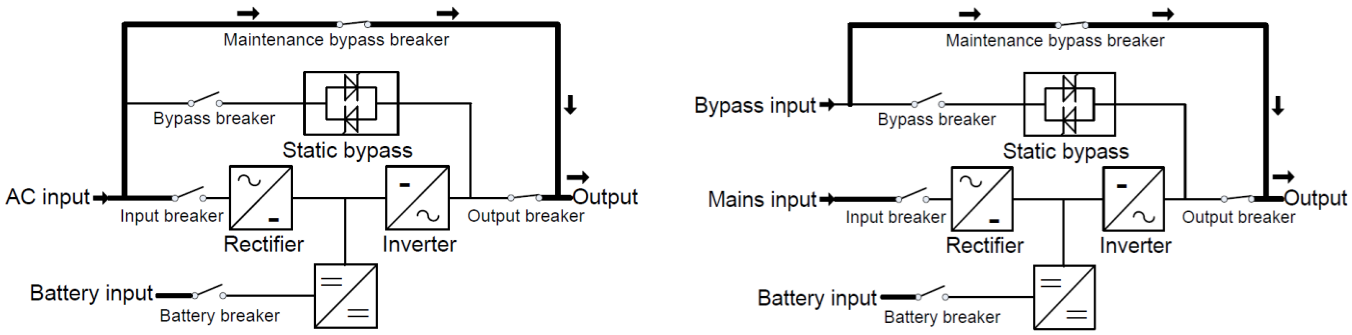
SINGLE INPUT: Mains Input **DUAL INPUT: Mains Input and Bypass Input**



◆ **Maintenance mode (Manual Bypass)**

A manual bypass switch is available to ensure continuity of supply to the critical load when the UPS is out of order or in repair and this manual bypass switch bears for equivalent rated load.

SINGLE INPUT: Mains Input **DUAL INPUT: Mains Input and Bypass Input**



4.2Turn on/off UPS

4.2.1 Start procedure with Main present

CAUTION!
Make sure grounding is properly done and the correct connection of the phases.
Set the Battery Switch to the "ON" position according to the user's manual.
Open the front and rear doors of the UPS to access to the main power switches.
During this procedure the output terminals will become alive.

CAUTION!
Check to see if the load is safely connected with the output of the UPS. If the load is not ready to receive power from the UPS, make sure that it is safely isolated from the UPS output terminals

- Close INPUT switch (MAINS)
- Close BYPASS switch
  When AC MAINS input voltage within the range, and the rectifiers of the UPS will be started up in 30 seconds, then the inverter is started completely. When the output switch is "ON", the inverter LED lights up.
- Close OUPUT switch
  If the rectifier of the UPS does not start-up, the green LED will flash, bypass module green LED will light on, the power module green LED will flash. when UPS turn to inverter mode power module and display panel green LED will light on.
  No matter the UPS is operated normally or not, the LCD display will indicate current status.

4.2.2 Test procedure

CAUTION!
The UPS is operating normally. It may take 60 seconds to boost up the system and perform self-test completely.

- Switch OFF the MAINS to simulate utility failure, the rectifier will turn off and the battery should feed the inverter without interruption.
- Switch ON the MAINS to simulate utility recovery, the rectifier will restart automatically after 20 seconds and the inverter will supply to the load. It is suggested to use dummy loads for testing. The UPS can be loaded up to its maximum capacity during load test.

4.2.3 Maintenance Bypass

To supply the load via Mains, you may simply active the maintenance switch.

CAUTION!
The load is not protected by the UPS when the manual bypass system is active.

Switch to mechanical bypass:

- Open the cover of maintenance switch, the UPS turns to bypass mode automatically.
- Turn on MAINTENANCE breaker;
- Turn OFF BATTERY breaker;
- Switch OFF the INPUT MAINS breaker,
- Switch OFF BYPASS breaker;
- Switch OFF OUTPUT breaker;

At this time the bypass source will supply to the load through the MAINTENANCE breaker.

Switch to normal operation (from mechanical bypass)

CAUTION!
Never attempt to switch the UPS back to normal operation until you have verified that there are no internal UPS faults.

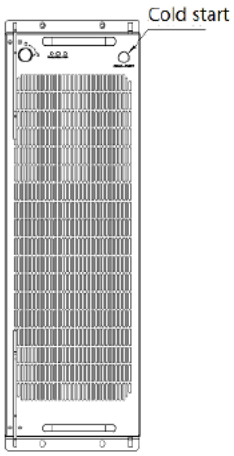
- Switch ON the OUTPUT breaker.
- Switch ON the MAINS breaker.
- Switch ON the BATTERY breaker.
- Switch OFF the MAINTENANCE breaker, then the output is supplied by the static bypass of the UPS.
- Put on the maintenance switch cover.

The rectifier will operate normally after 30 seconds. If the inverter works normally, the system will be transferred from bypass mode to normal mode.

4.2.4 Cold start procedure (start up from battery)

CAUTION!
Follow these procedures when the input AC Utility Failure, but battery is normal

- Switch ON the battery breaker. The battery will feed the Auxiliary power board.
- Switch ON the OUTPUT breaker.
- Trigger the cold start button of the bypass module.
  When battery normal, rectifier starts operation, 30s later, inverter starts and operates and the green LED will light on.



CAUTION!
Wait for approximately 30 seconds before you press the black start key.

4.2.5 Shutdown procedure

CAUTION!
This procedure should be followed to completely shutdown the UPS and the LOAD. After all power switches isolators and circuit breakers are opened, there will be no output.

- Press the INVERTER OFF key on the LCD display.
- Switch OFF the BATTERY breaker.
- Switch OFF the INPUT breaker.
- Switch OFF the OUTPUT breaker. Now the UPS will be completely OFF.

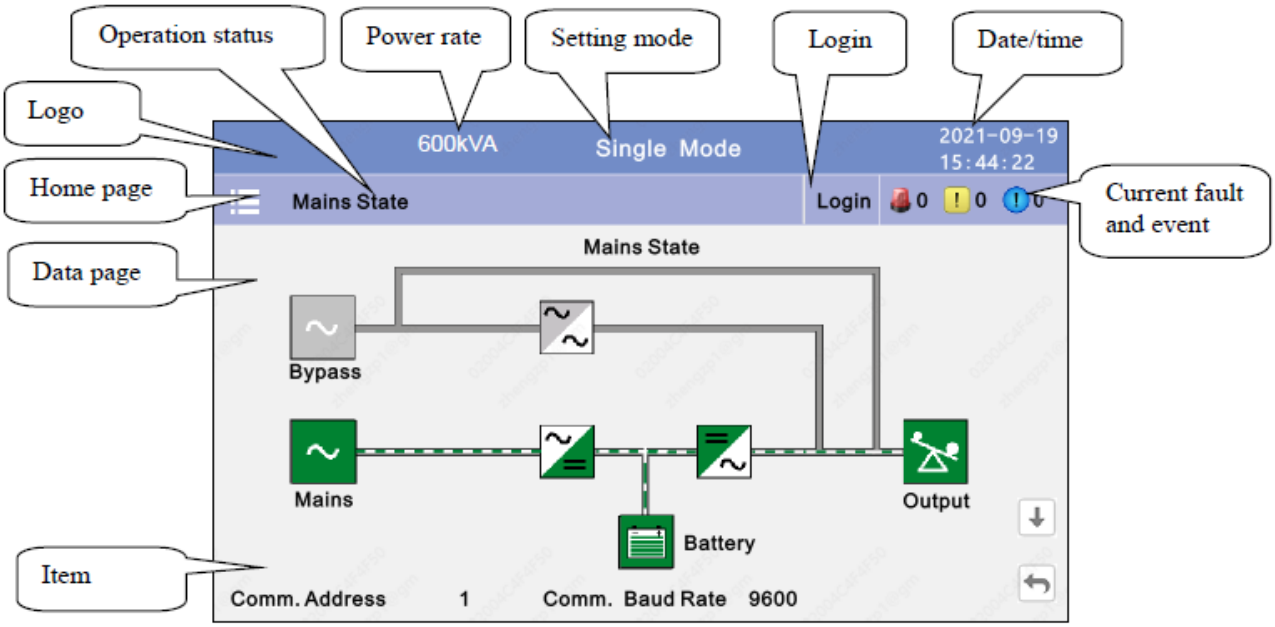
WARNING!
The internal capacitors are not completely discharged. Wait for about 5 minutes for the internal D.C. bus bar capacitors to be completely discharged

4.2.6 Startup procedure for parallel system

- Connect parallel cable, input/output cable, and battery cable well; modify the parallel board jumpers correctly.
- Switch ON the output switch at the front door.
- According to the startup procedure for single unit, set the operation mode of each UPS: single mode is changed to parallel mode; set the parallel number for each UPS; up to 8 units can be parallel; set the ID of each cabinet, the ID of each unit must be different.
- Switch ON the input switch. Close the external input switch and start from.
- After start from mains, check the LCD interface of each UPS to see if the ID, VA is the same with the actual values.
- Switch ON the external battery switch of each UPS. Check if the charging current displayed in LCD is normal.

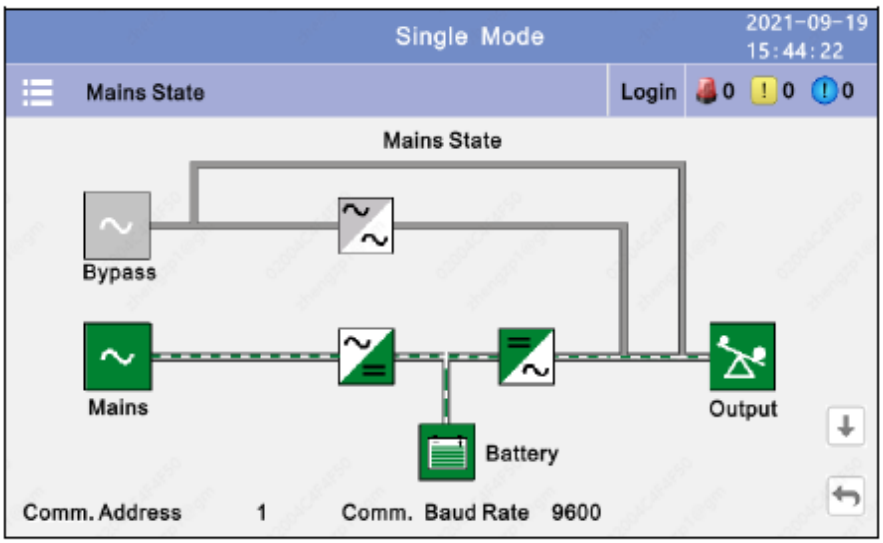
CAUTION!
The UPS cannot be parallel until each single unit is normal

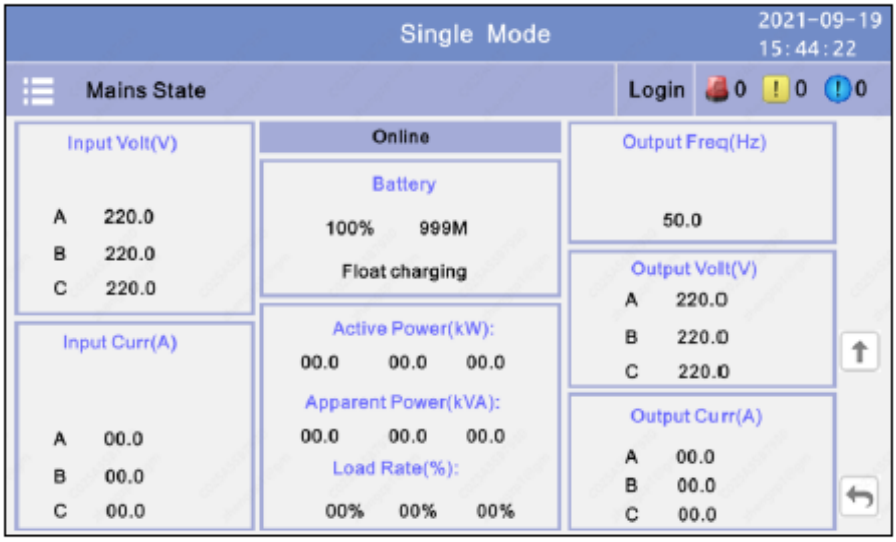
4.3 The Display



4.3.1 Datas

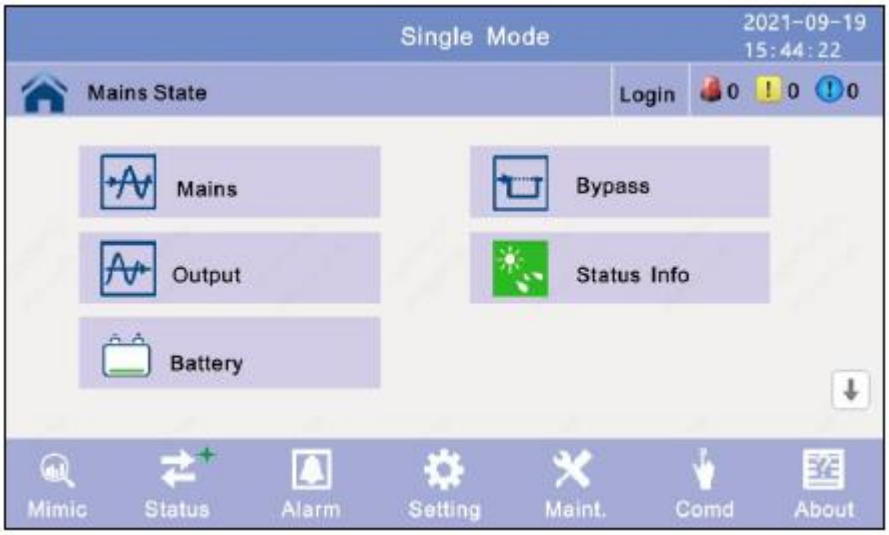
- Displays the flow state of UPS work, and quickly enters real-time data by clicking on the block





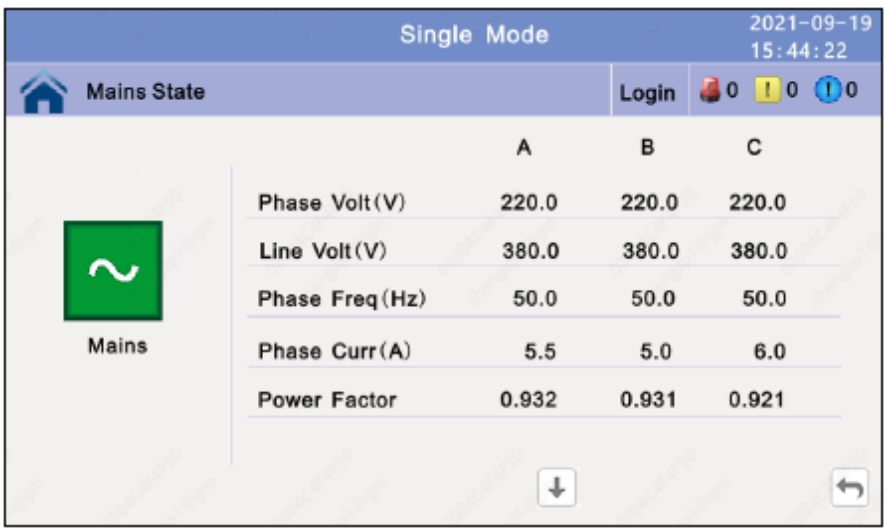
4.3.2 Status

- View the voltage and current of the main, bypass, output, battery (can also be entered through by real time data block), view the status of the switches, dry contacts, through clicking on the block, enter the corresponding data window.



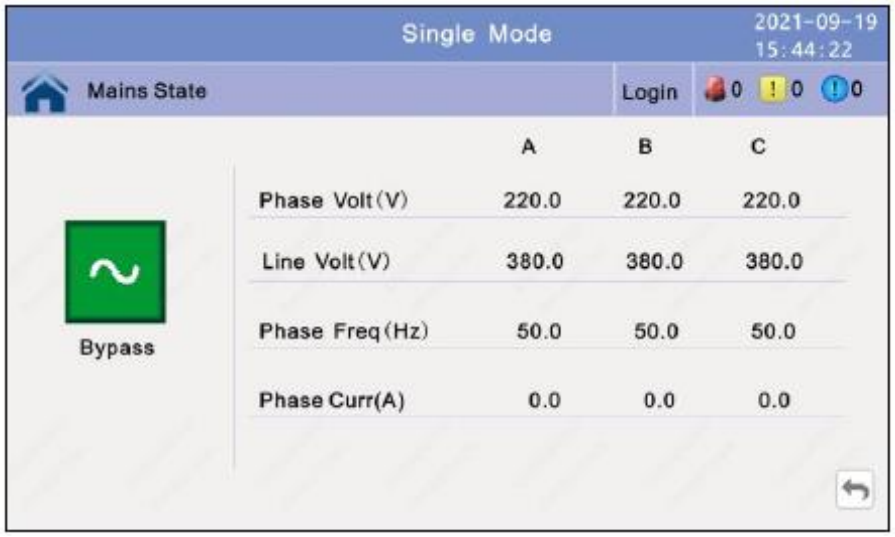
4.3.2.1 Main

- Click the main block to enter the main data display window, click return to return to the previous window, click home page to return to the main page.



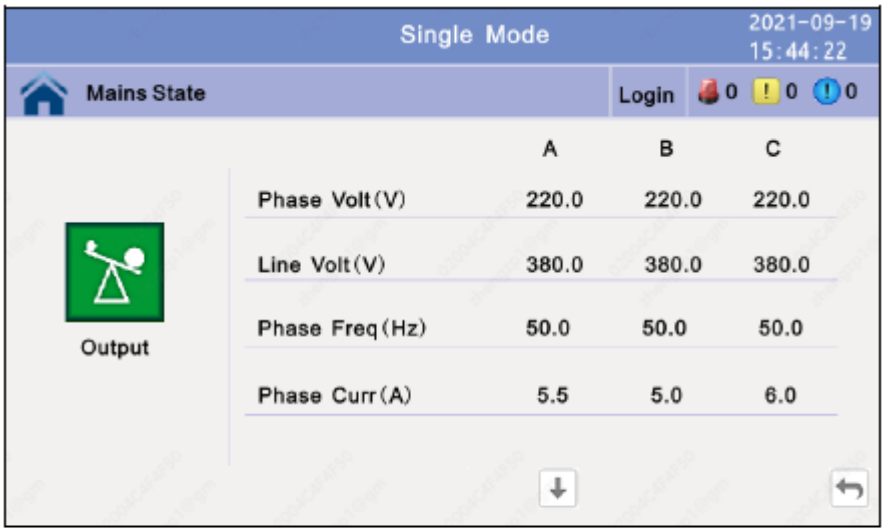
4.3.2.2 Bypass

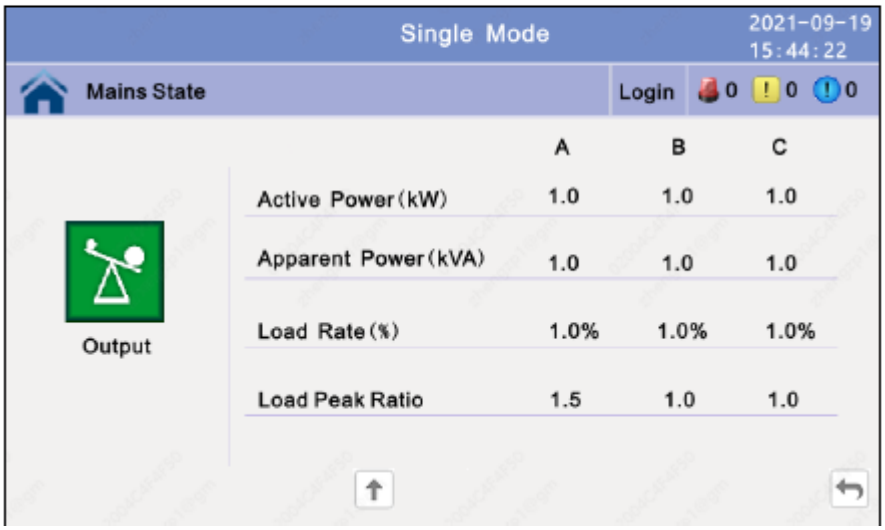
- Click the bypass block to enter the bypass data display window, click return to return to the previous window, click home page to return to the main page.



4.3.2.3 Output

- Click the output block to enter the output data display window, click return to return to the previous window, click home page to return to the main page.



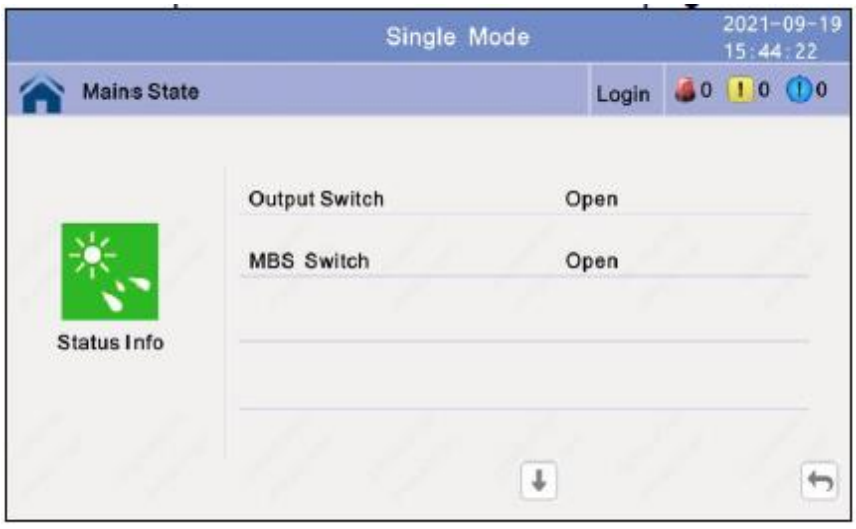


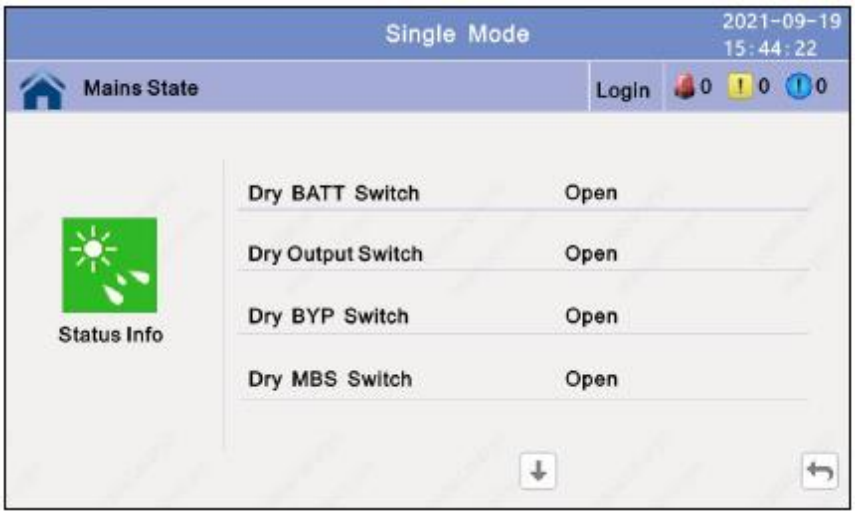
4.3.2.4 Battery

- Click the battery block to enter the battery data display window, click return to return to the previous window, click home page to return to the main page.

4.3.2.5 Status info

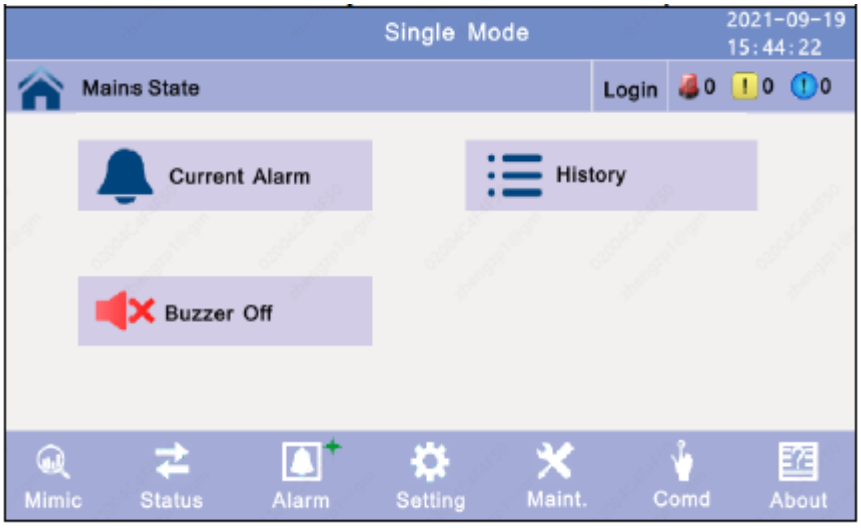
- Click the Status info block to enter the Status info data display window, click return to return to the previous window, click home page to return to the main page.





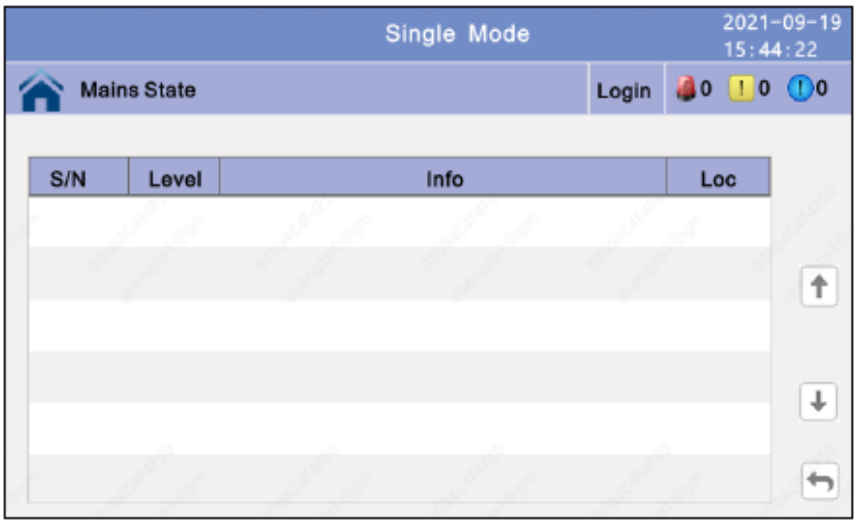
4.3.3 Alarm

- View the alarm and history of the UPS, and open or close the buzzer.



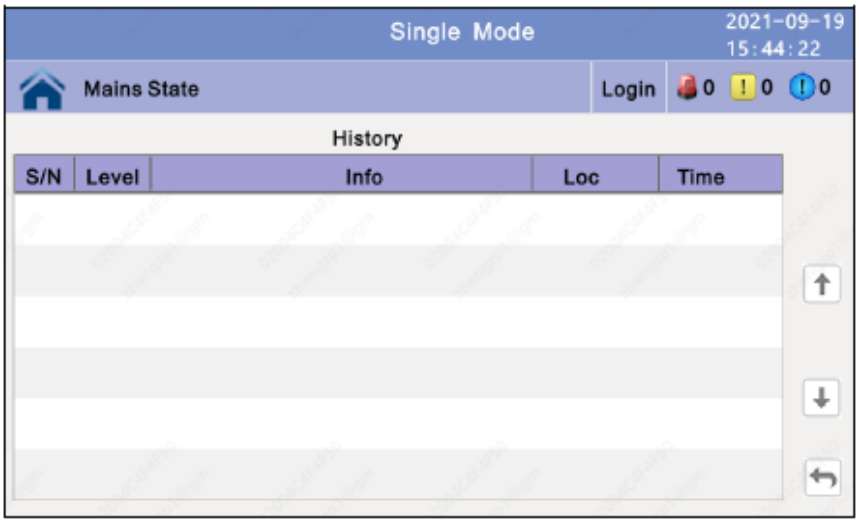
4.3.3.1 Current Alarm

- Click the Current alarm to enter the current alarm display window, click return to return to the previous window, click home page to return to the main page.



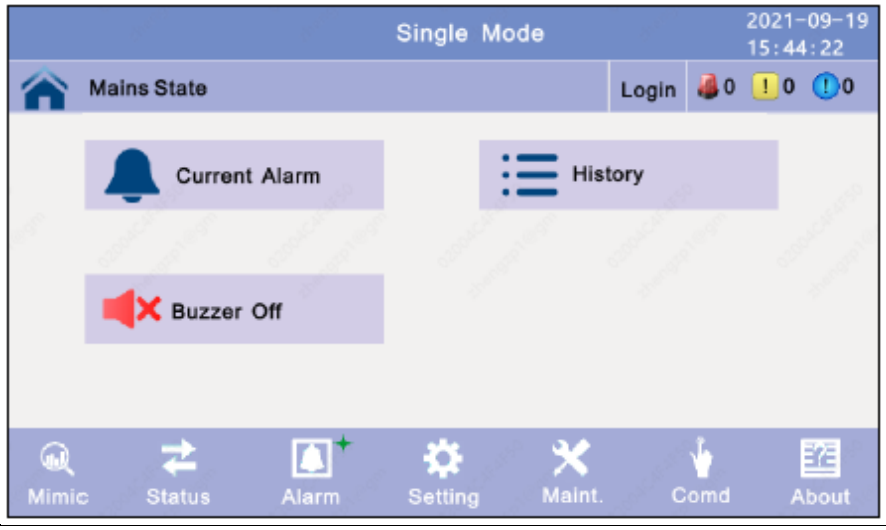
4.3.3.2 History

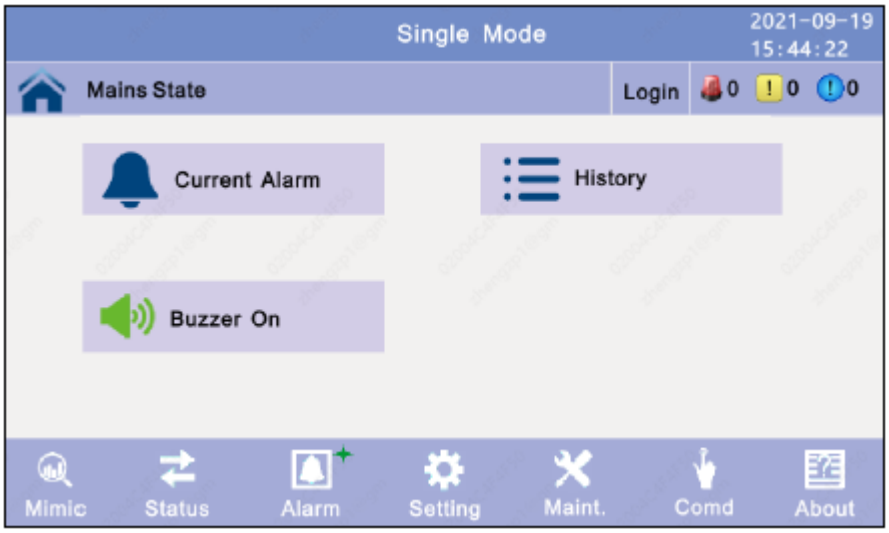
- Click the history to enter the history recode display window, click return to return to the previous window, click home page to return to the main page.



4.3.3.3 Buzzer

- Click the buzzer mute then the buzzer will mute and the red block will change to green, if the buzzer is on, then click the block buzzer will on and the block will change to red. click return to return to the previous window, click home page to return to the main page.



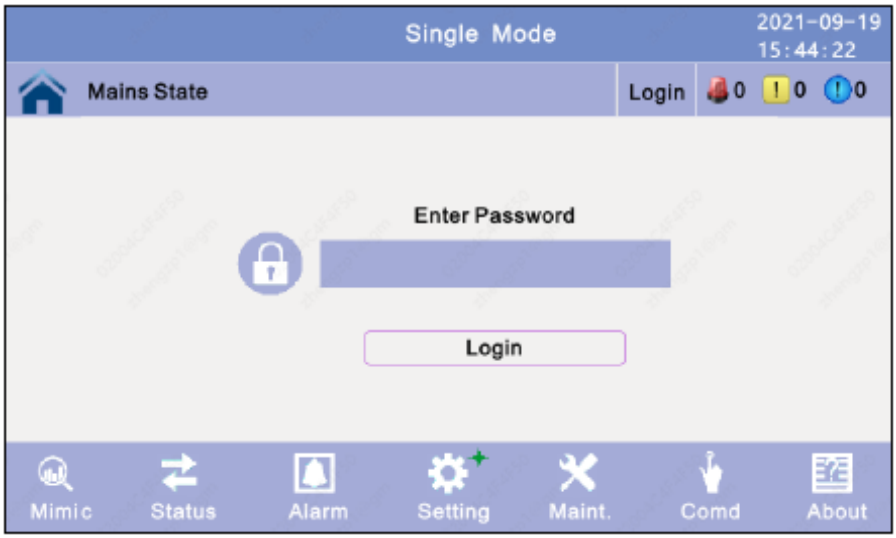


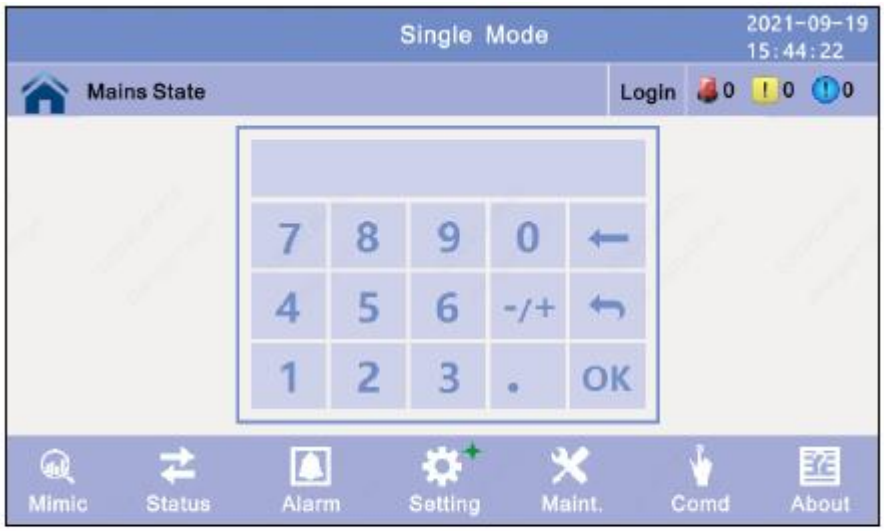
4.3.4 Setting

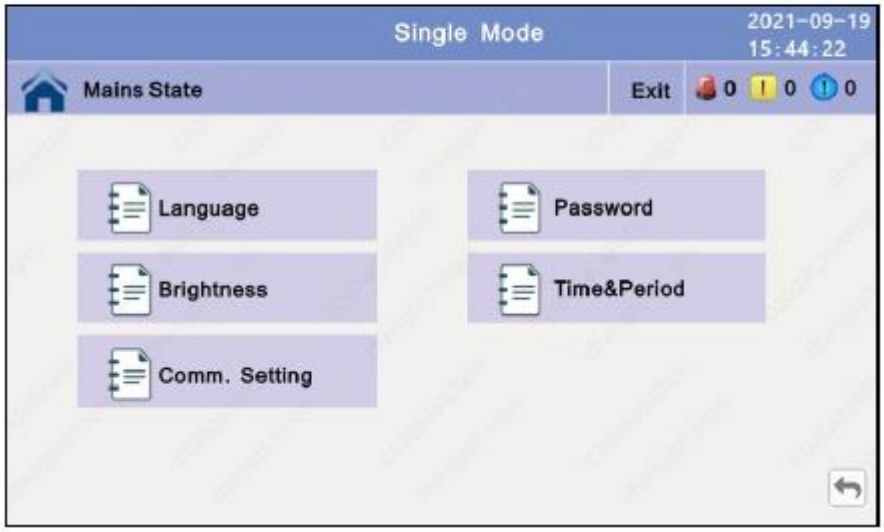
- There are two levels, the basic setting for user settings, advanced setting for technical personnel, please contact the relevant technical personnel to enter advanced settings.

4.3.4.1 Basic Setting

- Click basic setting, enter by input the correct password. The user password is “111111”.

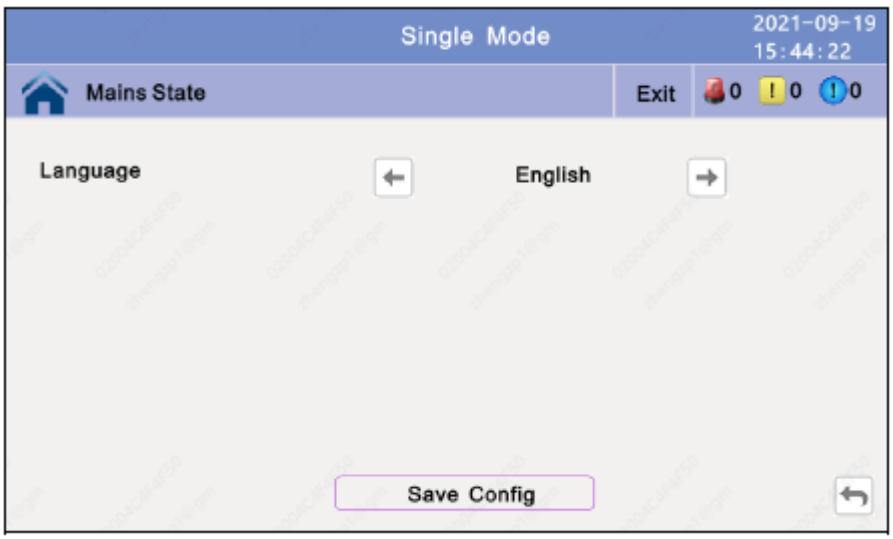






4.3.4.1.1 Language

- Click the language block witch you want and click the save config block to save. click return to return to the previous window, click home page to return to the main page.



4.3.4.1.2 Password

◆ Click password block enter user password setting page, input old password and new password, then click save config to save the change. Password format is six number. click return to return to the previous window, click home page to return to the main page.

Password lock time: When LCD is not touched, it needs to re login when the setting value is set, click left or right block to change the value.

4.3.4.1.3 Brightness and backlight time

◆ Click the block to change value click return to return to the previous window, click home page to return to the main page.

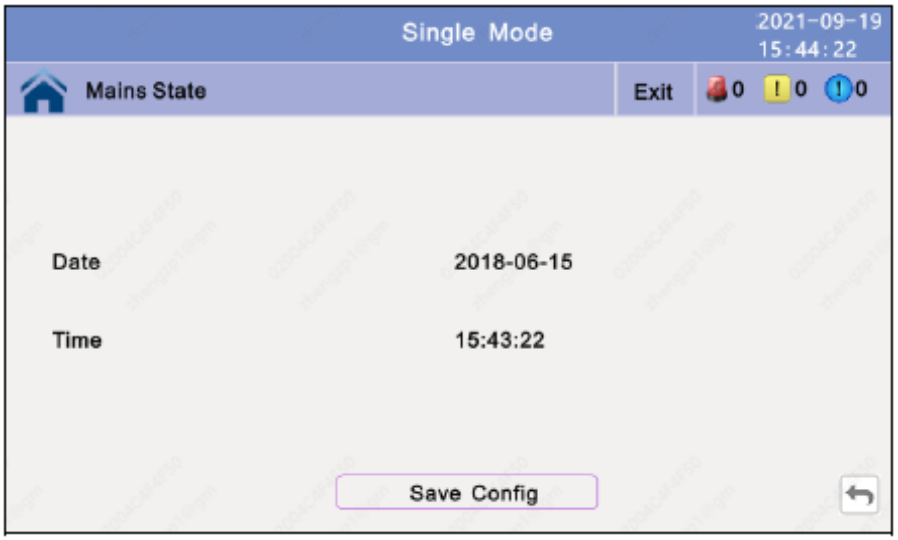
Brightness: Click the text to input new value and click the save config block to save Value range is 1~63, default value is 63. Click return to return to the previous window, click home page to return to the main page.

Backlight time: LCD backlight delay time, click the text to input new value and click save config block to save. Value range is 1~ 255, default value is 60 .Click return to return to the previous window, click home page to return to the main page.

4.3.4.1.4 Date and time setting

◆ Click the text to select other value or input new value and click save config block to save. Click return to return to the previous window, click home page to return to the main page.

Date: current date.
Time: current time.



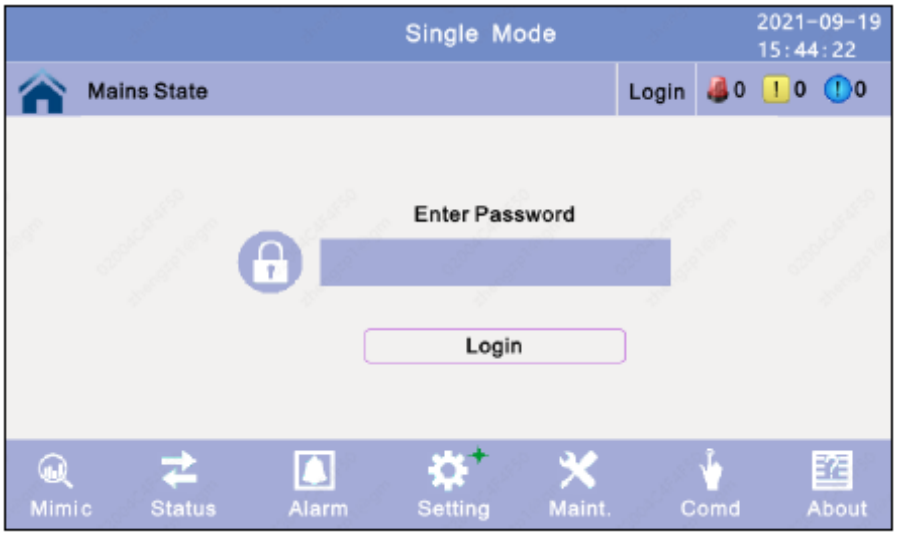
4.3.4.1.5 Communication setting

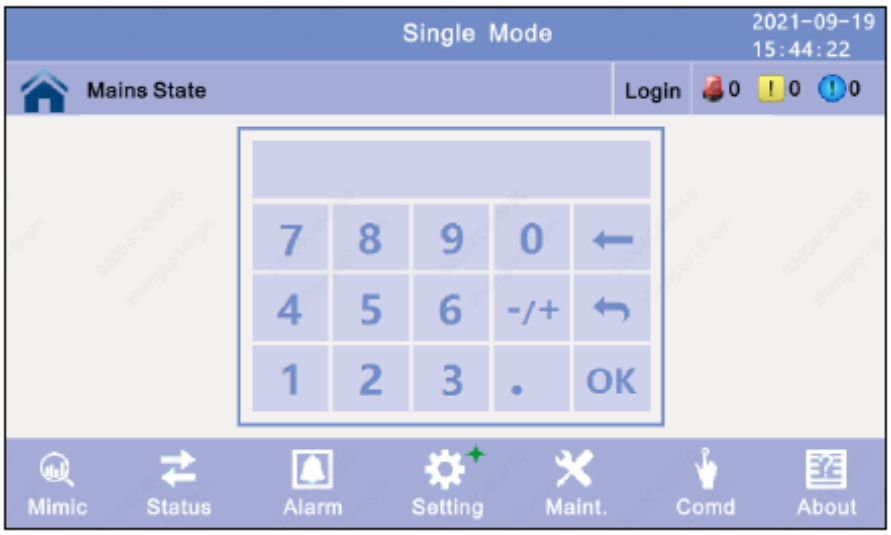
◆ Click the text to select other value or input new value and click save config block to save. Click return to return to the previous window, click home page to return to the main page.

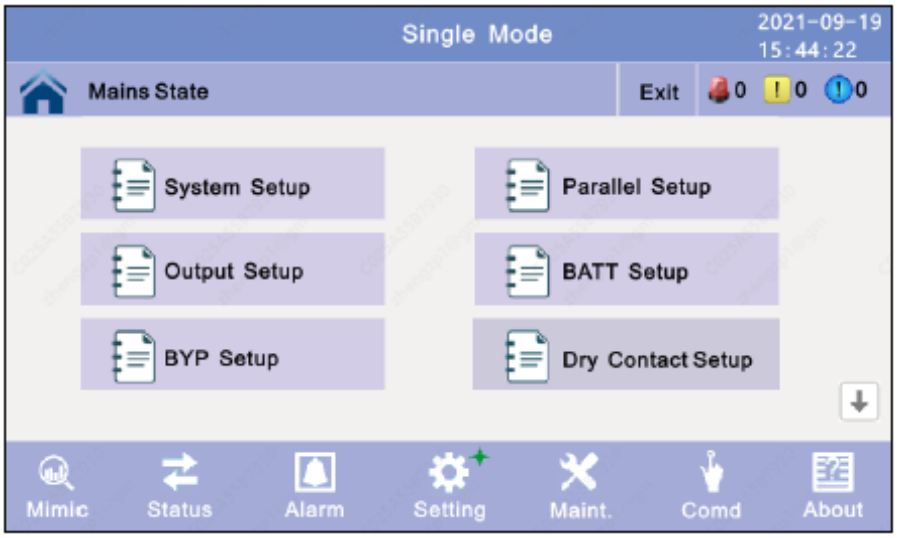
RS485 address: UPS communication ID, address range is 1~15, default is 1.
RS485 Baud Rate: 2400, 4800, 9600, 14400, 19200, default is 9600.

4.3.4.2 Advanced setting

- Click advanced setting, enter by input the correct password. For the password contact technical support.



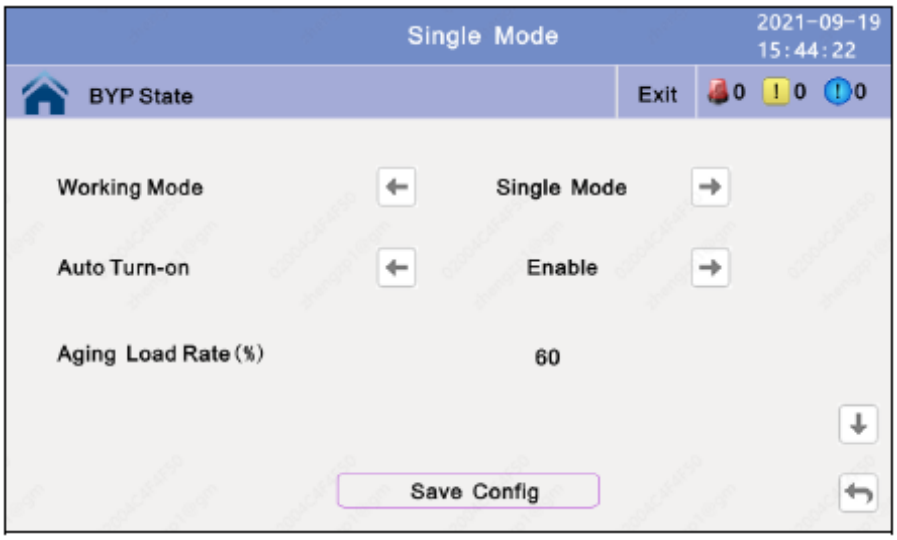




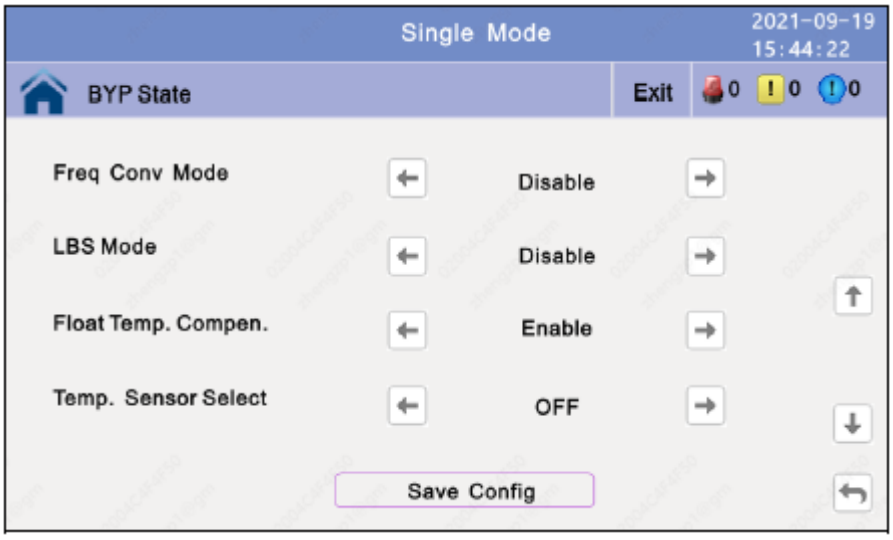
4.3.4.2.1 System setting

◆ Click the text to select other value or input new value and click save config block to save. Click return to return to the previous window, click home page to return to the main page.

Working Mode: Select the work mode of UPS: Single mode, Parallel mode, ECO mode.
Auto Turn-on: Select the UPS start logic, Enable: UPS start inverter output automatic, Disable: No output.
Aging load rate: The value can be 18~100%, default value: 60%.

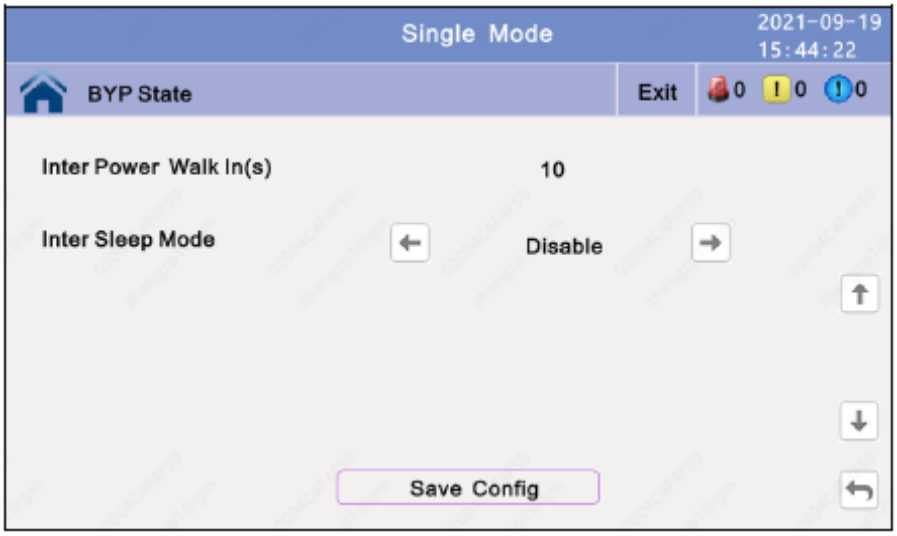


Freq Conv Mode: Frequency conversion mode, Enable: Output frequency set 50Hz or 60Hz, Input frequency is 60Hz or 50Hz, UPS no alarm not battery and bypass abnormal. Default is Disbale.
LBS Mode: setting value: LBS disable, LBS master, LBS slave. Default is LBS disable.
Temp sensor switch: temperature sensor compensation switch, when need to connect battery temperature sensor, please chage the value to enable.
Temp sensor select: temperature sensor type select. Has two types: NTC and RS485. NTC for single and short distance. RS485 for multiple and far distance.



Inter Power walk-in: this is enable the UPS to control the interval that each rack transfers from battery mode to normal mode, which reduces the impact on the generator or power grid. The value can be 0~200, default value is 10.

Inter sleep Mode: when load less than the software setting value, same parallel rack will turn to standby mode and if the load more than the setting value some rack will turn to inverter mode after setting the sleep mode enable. Default value is disable



Parallel operation ID: Parallel operation ID, must modify the ID after set work mode to parallel mode. The value can be 1~8, default value is 1.

Cabinet Paral Basic Units: Parallel cabinet number, must modify the total parallel cabinet number after set work mode to parallel mode. The value can be 2~8, default value is 2.

Cabinet Paral Redunt Units: Parallel redundancy cabinet number, can modify the redundancy cabinet number after set work mode to parallel mode. The value can be 0~5, default value is 0.

Output Freq: The value can be 50Hz or 60Hz.
Output Volt Level: The value can be 220V, 230V, 240V.
Output Ivn Volt Regu: Inverter voltage regulated, the value can be -5%~0~+5%, step is 0.5%, default value: 0.

Battery Type: Must modify the battery type to actual configuration.
No Battery Warning: Can be no warning when no battery after set disable, and is enable by default.
Cabinet shared battery: Tow parallel ups use common batter bank. The value can be set Disable and enable, disable by default.
Generator on Prohibit Charging: UPS disable charge the battery if set the value to enable when the generator signal is enable.

Battery Group 1: Must modify the group number to actual configuration. The value can be 1~8, default value is 1.

Battery Group 2: This option needs to be set when multiple sets of batteries are required and connected to the battery breaker auxiliary contact and trips. Must modify the group number to actual configuration. The value can be 1~8, default value is 1.

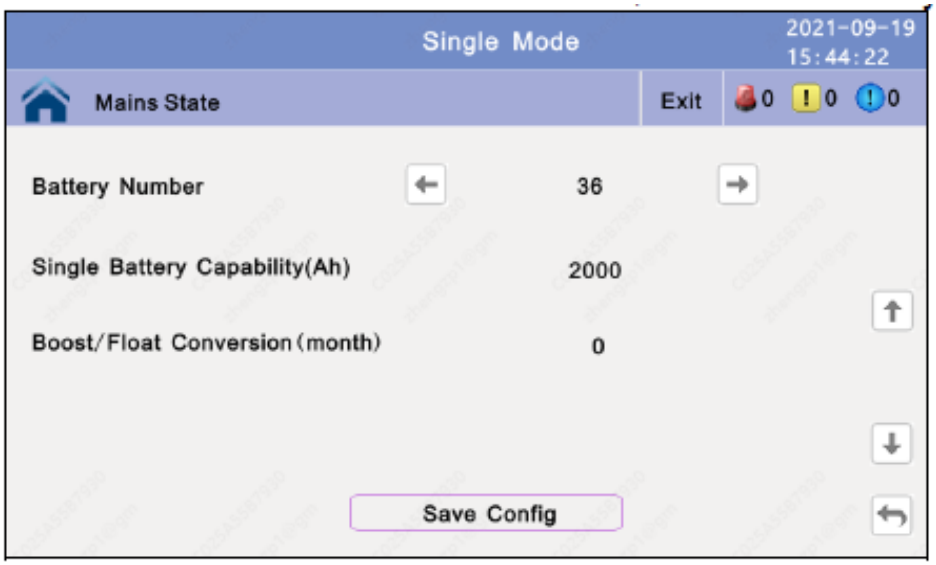
Battery Group 3: This option needs to be set when multiple sets of batteries are required and connected to the battery breaker auxiliary contact and trips. Must modify the group number to actual configuration. The value can be 1~8, default value is 1.

Single Battery Volt: Must modify the voltage to actual configuration. The value can be 2 or 12, default value is 12, for VRLA Battery.

Battery number: Must modify the battery number to actual configuration. The value can be 30~50, default value is 30 for VRLA Battery.

Single Battery Capability: Must modify the value to actual configuration, the value can be 7~2000 for VRLA Battery.

Boost/Float conversion: Boost charge and float charge alternate time, the value can be 0~20 for VRLA Battery.



Chg. cur. limiting coef.: The charging current limit is a multiple of the battery capacity. The value can be 0.05 - 0.25, and is 0.1 by default for VRLA Battery.

Cell float voltage: The float voltage value can be 2.23 - 2.30 V/cell, and is 2.25 V/cell by default for VRLA Battery.

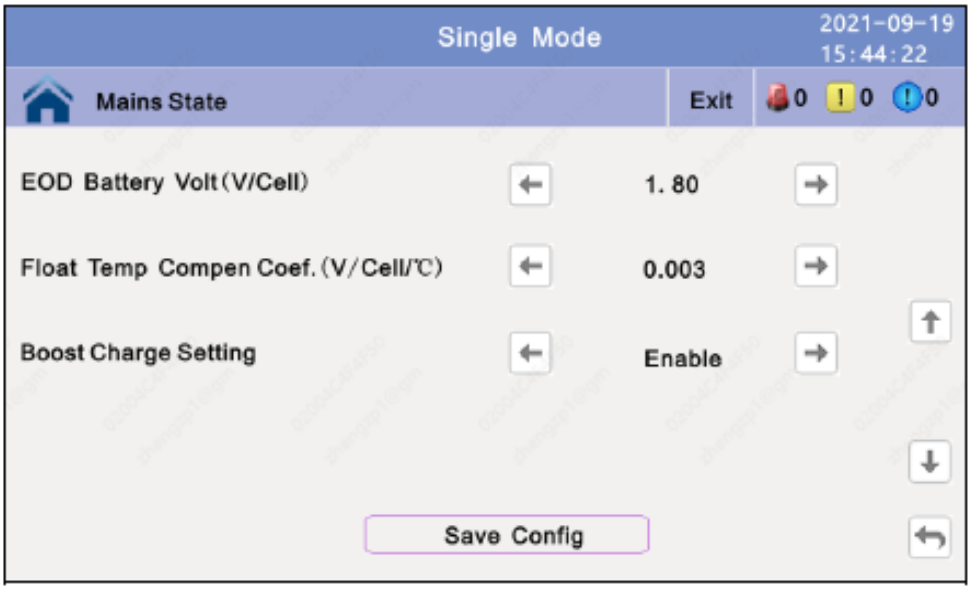
Cell boost voltage: The battery equalized voltage value can be 2.30 - 2.40 V/cell, and is 2.35 V/cell by default for VRLA Battery.

Aver charging Duration: boost charge time limit, the value can be 1 - 999min, and is 240 by default for VRLA Battery.

EOD Battery Volt: End of discharge voltage. The value can be 1.60~1.90, and is 1.80 by default for VRLA Battery.

Float Temp Compen Coeff: Modify the voltage of compensation after enable the switch. the value can be 0.001~0.007/ cell, and is 0.003 by default for VRLA Battery.

Boost Charge Setting: Boost charge disable or enable, and is enable by default for VRLA Battery.



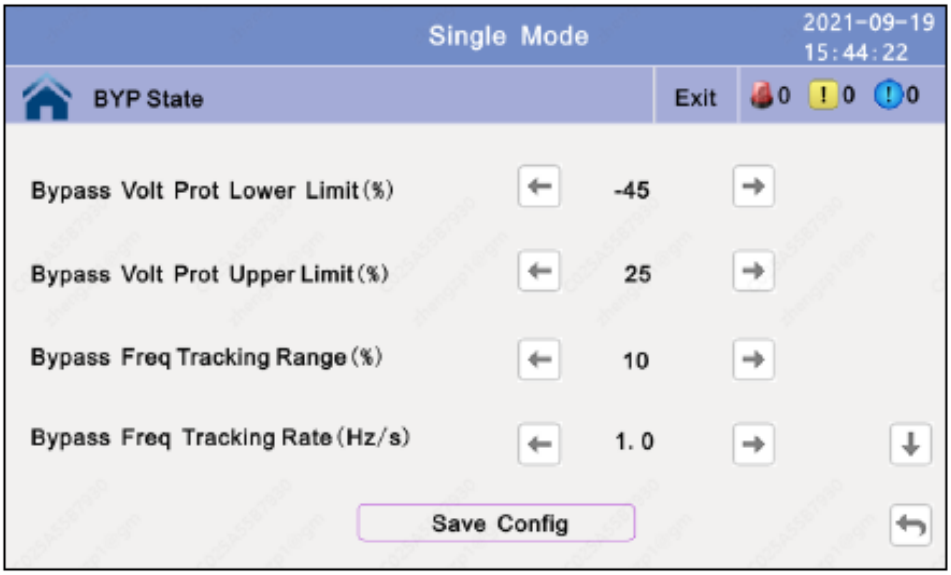
Neutral Cable Setting: set the battery cabling type, disable is battery not neutral, enable is battery has neutral.

Bypass Volt Prot Lower Limit: When the difference between the bypass voltage and the rated voltage exceeds the lower threshold for the bypass voltage, the system determines that the bypass voltage is abnormal and that the bypass is unavailable. The value can be -10%, -15%, -20%, -30%, -45%. The default value is 45%.

Bypass Volt Prot Upper Limit: When the difference between the bypass voltage and the rated voltage exceeds the upper threshold for the bypass voltage, the system determines that the bypass voltage is not normal and that the bypass is unavailable.
When the voltage level is 380V, the value range is 10%, 15%, 20%, and 25% (default).
When the voltage level is 400V, the value range is 10%, 15%, and 20% (default).
When the voltage level is 415V, the value range is 10% and 15% (default).

Bypass Freq Tracking Range: When the difference between the bypass input frequency and the rated frequency is greater than this value, the system determines that the bypass frequency is not normal, and that the bypass is unavailable. The value range is 1%, 2%, 4%, 5%, 10% (default).

Bypass Freq tracking rate: Inverter frequency tracking to bypass frequency rate. The value range is 0.5~2, and is 1 by default.



Power Supply upon bypass SCR Over Temp: Specifies whether to start bypass mode when overtemperature occurs. The default value is Enable.

Bypass Switches Limit: Cross currents occur during the transfer between bypass mode and normal mode, which impacts the system. This parameter specifies the number of transfers between bypass mode and normal mode within 1 hour, which ensures system security. The value can be 3 to 10 and is 10 by default.

EPO transfers to bypass: Specifies whether to start bypass mode when EPO occurs. The default value is Enable.

Battery abnormal BCB trip: Enable or disable BCB trip single output. The default value is Disable.

Bypass Feedback: Enable or disable bypass feedback output. The default value is Disable.

External Maint. breaker: Enable or disable external maintenance breaker connection detection. The default value is Disable.

Battery Switch: Enable or disable battery breaker connection detection. The default value is Disable.

Output Switch: Enable or disable output breaker connection detection. The default value is Disable.

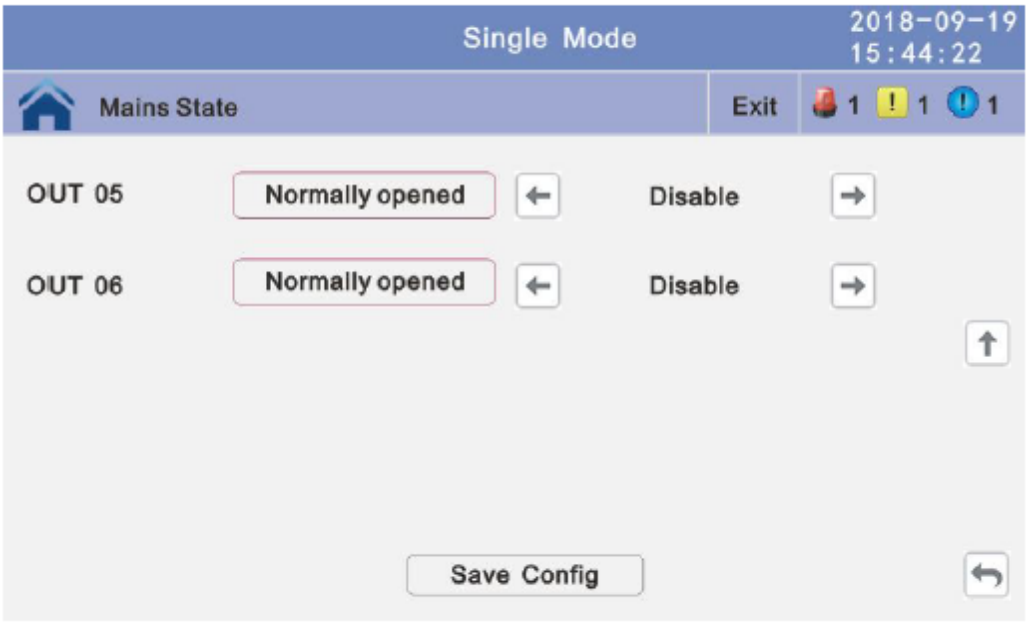
Bypass Switch: Enable or disable bypass breaker connection detection. The default value is Disable.

Battery ground Fault: Enable or disable battery grounding failure detection. The default value is Disable.

Lightning arrester (SPD): Enable or disable SPD detection. The default value is Disable.

Generator (GEN): Enable or disable GEN detection. The default value is Disable.

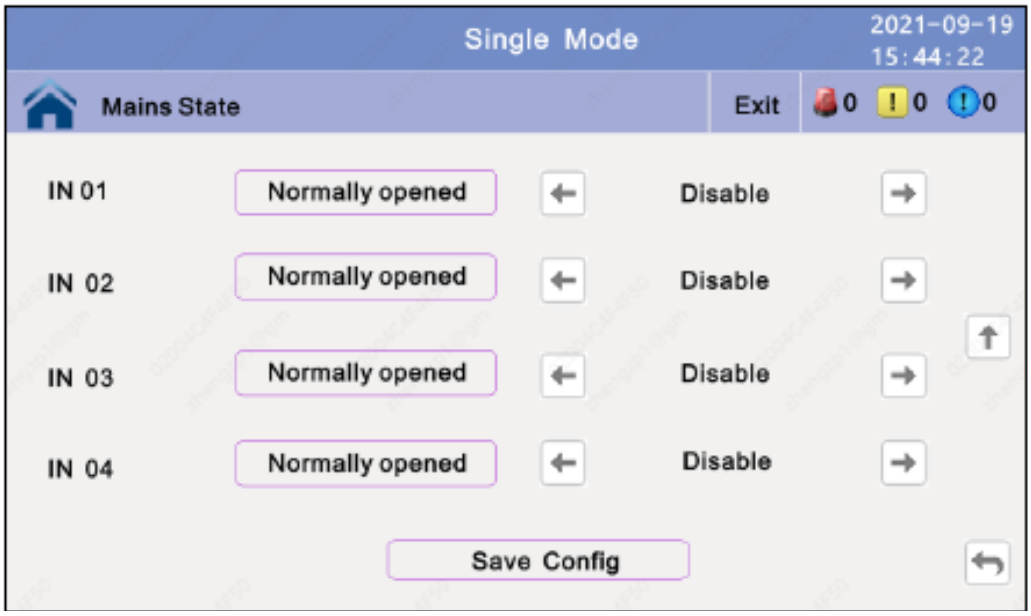
OUT01~OUT06: Output dry contact port, modify on the LCD the default value is Disable. The output port can set to normally closed or normally opened by jumpers on dry contact board, the default value is normally opened.



Setting value:

No.	Item	No.	Item
	Close	8	BATT Supply
1	Fault	9	No supply
2	Warning	10	ECO Mode
3	Mains Abnormal	11	MBS Close
4	BATT Low Volt	12	GEN. Connect
5	BATT Self-Test	13	SYS MBS SW
6	Mains Supply	14	SYS Output SW
7	BYP Supply	15	BATT cold start

IN01~IN04: Input dry con tact port, modify on the LCD. The default value is Disable. The input port can set to normally closed or normally opened, the default value is normally opened.



Setting value:

No.	Item	No.	Item
1	INV ON	9	Forced Charger OFF
2	INV OFF	10	Transformer Overtemp.
3	Battery inoperable	11	Firefighting Alarm
4	Rack Overtemp.	12	BMS internal Fault
5	Custom alarm 3	13	Charge Allowed
6	Custom alarm 4	14	Discharge forbidden
7	Disable ECO	15	Charging Derating
8	Forced INV OFF		

4.3.5 Maint

- Software update, Touch correction, history download and battery self test.

4.3.5.1 USB wizard

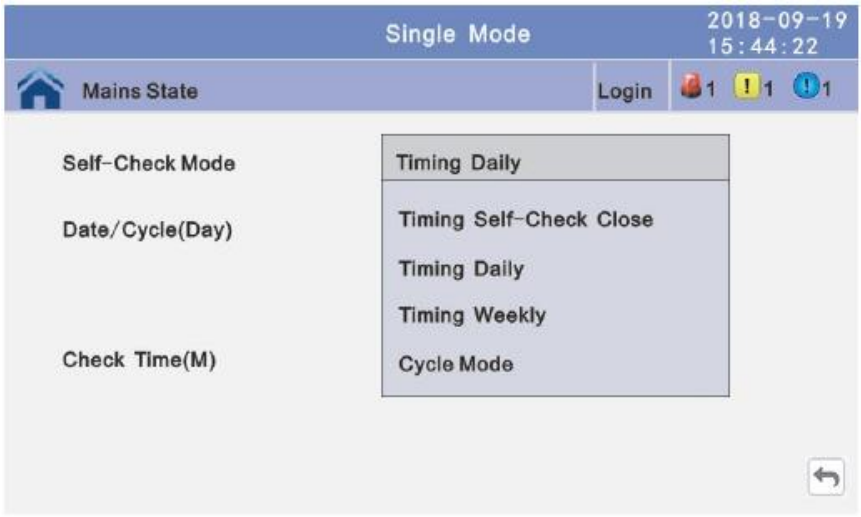
- History Output, download history and setting record by USB.

4.3.5.1.1 Alarm Log Output

4.3.5.1.2 Setting Log Output

4.3.5.2 Battery Self Check

- can select check by Timing Daily, Timing Weekly, Cycle mode. The default value is Timing Self-Check Close.



4.3.5.2.1 Timing daily

- modify the check date and check time. (10s default, 10min, EOD)

4.3.5.2.2 Timing weekly

- modify the check date and check time. (10s default, 10min, EOD)

4.3.5.2.3 Timing cycle mode

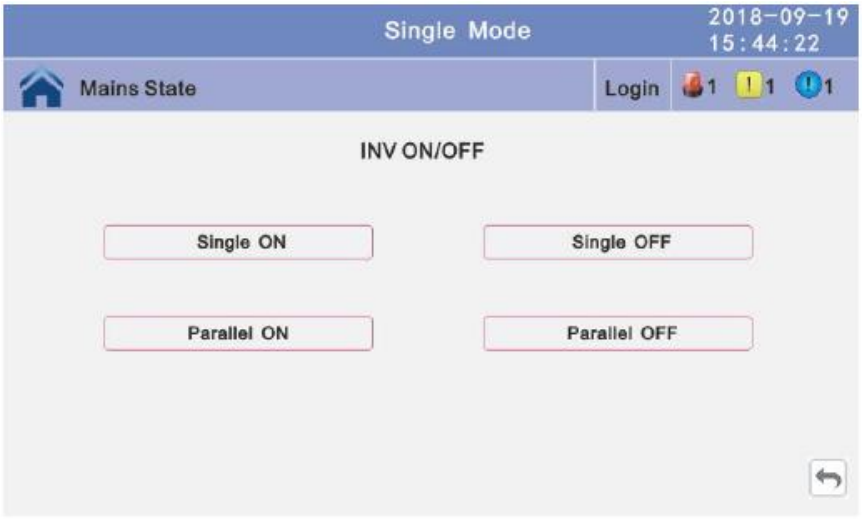
- modify the cycle date and check time. (10s default, 10min, EOD)

4.3.6 Common

- INV ON/OFF, Battery test and Fault clear.

4.3.6.1 INV ON/OFF

Single OFF: Inverter OFF location UPS.
Single ON: Inverter ON location UPS.
Parallel OFF: Inverter OFF all parallel UPSs.
Parallel ON: Inverter ON all parallel UPSs.


Single Mode
2018-09-19
15:44:22
Mains State
Login
1
1
1
INV ON/OFF
Single ON
Single OFF
Parallel ON
Parallel OFF

4.3.6.2 Battery test

10s: battery test for 10s.
10min: battery test for 10min.
EOD: battery test to EOD (End Of Discharge).
-10%: battery test down 10% capability.

4.3.6.3 Fault clear

- Clear the current fault (not for all faults).

4.3.7 About

- check the software version.

4.4 Display Messages/Troubleshooting

This section lists the event and alarm messages that the UPS might display. The messages are listed in alphabetical order. This section is listed with each alarm message to help you troubleshoot problems.

Fault and alarm Information (POLARIS 200-600)

No.	Code	Fault	Buzzer	Fault LED	Alarm LED
1	002	REC Over Temperature	Twice per second	Light	
2	003	REC Par. Cable Fault	Twice per second	Light	
3	004	REC Over Curr	Once per second	Light	
4	005	REC Power Fault	Beep continuously	Light	
5	007	Input Relay Fault	Beep continuously	Light	
6	00A	Discharge Relay Fault	Beep continuously	Light	
7	00C	Charge SCR Fault	Beep continuously	Light	
8	00E	Fan Fault	Beep continuously	Light	
9	011	Fan Power fault	Beep continuously	Light	
10	012	Charger Over Temp.	Beep continuously	Light	
11	013	Soft Start Failed	Beep continuously	Light	
12	014	BAT Charger Fault	Beep continuously	Light	
13	016	REC Comm. Fault	Once per 2 seconds	Light	
14	019	REC Initializes Fault	Twice per second	Light	
15	01D	Unit Connected fault	Once per 2 seconds	Light	
16	01E	Rectifier Fault	Beep continuously	Light	
21	03B	Rectifier current failure	Beep continuously	Light	
22	041	Inverter Fault	Beep continuously	Light	
23	044	INV IGBT Short	Beep continuously	Light	
24	047	Inverter Relay Short	Beep continuously	Light	
25	04A	Inverter Relay Broken	Beep continuously	Light	
26	04D	INV Par. cable Fault	Twice per second	Light	
27	051	Output Short Circuit	Once per second	Light	
28	054	INV Comm. Fault	Once per 2 seconds	Light	
29	057	INV Initializes Fault	Beep continuously	Light	
30	05A	INV Self-test Fault	Beep continuously	Light	
31	05E	DC Component Fault	Once per 2 seconds	Light	
32	061	DC Bus abnormal	Beep continuously	Light	
33	063	Unit Insert Fault	Once per 2 seconds	Light	
34	064	INV Power Fault	Beep continuously	Light	
35	067	INV Over Temperature	Twice per second	Light	
36	068	Load Sharing Fault	Twice per second	Light	
37	06A	Rack Mode Fault	Beep continuously	Light	
38	06B	Fuse Broken	Beep continuously	Light	
39	081	Par. Cable Fault	Twice per second	Light	
40	086	ECU Insert Fault	Once per 2 seconds	Light	
41	088	ECU Power Fault	Beep continuously	Light	
42	08B	ECU Comm. Fault	Once per 2 seconds	Light	

43	08D	ECU Initializes Fault	Beep continuously	Light	
44	091	BYP SCR Broken	Beep continuously	Light	
45	094	BYP SCR Short	Beep continuously	Light	
46	097	BYP Over Temperature	Beep continuously	Light	
47	09A	Output CT Reversed	Beep continuously	Light	
48	09B	Dry-Contact Power Fault	Beep continuously	Light	
49	09C	Dry-Contact Comm. Fault	Beep continuously	Light	
50	09D	BYP Backfeed Fault	Beep continuously	Light	
51	0C1	BYP Par. Cable Fault	Beep continuously	Light	
52	0C2	BYP SCR Broken	Beep continuously	Light	
53	0C5	BYP SCR Short	Beep continuously	Light	
54	0C8	BYP Comm. Fault	Beep continuously	Light	
55	0CA	BYP Initializes Fault	Beep continuously	Light	
56	0CD	BYP Connected Fault	Beep continuously	Light	
57	0CF	BYP Over Temperature	Beep continuously	Light	
58	0D2	BYP Fan Fault	Beep continuously	Light	
59	0D6	BYP Power Fault	Beep continuously	Light	
60	103	BATT Over Volt	Once per second		Light
61	104	BATT Low Pre-warning	Once per second		Light
62	105	BATT Reversed	Twice per second		Light
63	106	BATT EOD	Once per second		Light
64	107	BATT Low Volt	Once per second		Light
65	108	No BATT	Once per second		Light
66	109	Input Phase Reversed	Once per second		Light
67	10A	Input N-Line Lost	Twice per second		Light
68	10B	Mains Freq. Abnormal	Once per 2 seconds		Light
69	10C	Mains Volt. Abnormal	Once per 2 seconds		Light
70	10D	REC Comm. Error	Once per 2 seconds		Light
71	10E	No Mains	Once per 2 seconds		Light
72	10F	REC Set Data Error	Once per 2 seconds		Light
73	121	INV Par. Cable Abnormal	Once per 2 seconds		Light
74	125	INV Overload	Once per second		Light
75	126	INV Not Synchronized	Beep continuously		Light
76	129	INV Comm. Error	Once per 2 seconds		Light
77	12A	INV Set Data Error	Once per 2 seconds		Light
78	141	BYP Change to Num	Once per 2 seconds		Light
79	142	PM Quantity Mismatch	Once per 2 seconds		Light
80	143	Parallel Overload	Once per 2 seconds		Light
81	144	BYP Overload	Once per 2 seconds		Light
82	145	Maint. Switch Misuse	Once per 2 seconds		Light
83	146	ECU Comm. Error	Once per 2 seconds		Light
84	147	Rack Par. Cable Abnormal	Once per 2 seconds		Light
85	14B	ECU Par. Cable Abnormal	Once per 2 seconds		Light

86	14C	ECU Abnormal	Once per 2 seconds		Light
87	14E	BYP Phase Reverse	Once per second		Light
88	14F	BYP Unable To Trace	Once per 2 seconds		Light
89	150	BYP Not Available	Once per 2 seconds		Light
90	151	ECU Set Data Error	Once per 2 seconds		Light
91	152	LBS Signal Error	Once per 2 seconds		Light
92	153	Parallel Link Error	Once per 2 seconds		Light
93	161	BYP Par. Cable Abnormal	Once per 2 seconds		Light
94	162	BYP Phase Reverse	Once per 2 seconds		Light
95	163	BYP Unable To Trace	Once per 2 seconds		Light
96	164	BYP Not Available	Once per 2 seconds		Light
97	165	BYP Comm. Error	Once per 2 seconds		Light
98	166	BYP take over no O/P	Once per 2 seconds		Light
99	167	BYP Setting Data Error	Once per 2 seconds		Light
100	181	BATT Fault	Once per 2 seconds		Light
101	182	Dry Contact Comm. lost	Once per 2 seconds		Light
102	183	BATT Over Volt	Once per 2 seconds		Light
103	184	Rack Overtemp	Once per 2 seconds		Light
104	185	Batt temp. >45˚C or <-20˚C	Once per 2 seconds		Light
105	186	Room temp. >40˚C or <-20˚C	Once per 2 seconds		Light
106	187	Transformer Overtemp	Once per 2 seconds		Light
107	188	System Need maintenance!	Once per 2 seconds		Light
108	189	BATT Switch OFF	Once per 2 seconds		Light
109	18A	Eprom Error	Once per 2 seconds		Light
110	18B	RS485 Sensor Not Connected	Once per 2 seconds		Light
111	18C	Custom alert 03	Once per 2 seconds		Light
112	18D	Custom alert 04	Once per 2 seconds		Light
113	18E	Parallel CAN Comm. Failure	Once per 2 seconds		Light

Event Information (POLARIS 200-600)

No.	Code	Event	No.	Code	Event
1	001	Initializing	40	030	Dry. BYP SW Open
2	002	To Standby	41	031	Dry. Output SW Close
3	003	Non-Output	42	032	Dry. Output SW Open
4	004	On Bypass	43	033	INV.Invalid Due To Overload
5	005	On Line	44	034	ECU Work
6	006	Discharged BATT	45	035	LBS Activated
7	007	ECO Activated	46	036	Transfer Times-out
8	008	Automatic Self-Test	47	037	Generator Access
9	009	Inv In Soft Starting	48	038	Generator Disconnect
10	00A	System Fault Detected	49	039	Batt. Trip Activated
11	00B	Maint. BYP Mode	50	03A	Batt. Trip Stop
12	00C	EPO Activated	51	03B	BYP Takeover Mode

13	00D	Joint Power Supply	52	03C	Unit Online
14	00E	Enter Self-Aging Mode	53	03D	Unit Offline
15	015	REC EPO Mode	54	03E	Dry. BATT SW 2 Close
16	016	REC Curr Limit	55	03F	Dry. BATT SW 2 Open
17	017	REC Activated	56	040	Dry. BATT Trip Activated
18	018	REC Deactivated	57	041	Dry. BYP Feedback
19	019	P-Batt Boost Charging	58	042	REC EPO Clear
20	01A	P-Batt Float Charging	59	043	REC Curr Limit Clear
21	01D	BATT Testing	60	044	REC Mains Input
22	01E	Inverter Work	61	045	REC BATT Input
23	01F	Enter Sleep Mode	62	046	End of BATT Self-Test
24	020	Shutdown Due To Overload	63	047	Inverter Standby
25	021	On Bypass Due To Overload	64	048	Inverter Self-Aging
26	022	INV EPO Mode	65	049	Exit Sleep Mode
27	023	Maint. SW Close	66	04A	Inverter EPO Cancel
28	024	Maint. SW Open	67	04B	Startup capacity is normal
29	025	Input SW Close	68	04C	ECU Off
30	026	Input SW Open	69	04D	ECU Standby
31	027	BYP SW Close	70	04E	Dry. Thunder Protect Normal
32	028	BYP SW Open	71	04F	Dry. Thunder Protect Fault
33	029	Output SW Close	72	050	Dry. BATT Grounded Normal
34	02A	Output SW Open	73	051	Dry. BATT Ground Fault
35	02B	Dry. Maint. SW Close	74	052	ECU Takeover Mode
36	02C	Dry. Maint. SW Open	75	056	Enter cabinet sleep mode
37	02D	Dry. BATT SW Close	76	057	Exit cabinet sleep mode
38	02E	Dry. BATT SW Open	77	058	Dry. BATT SW 3 Close
39	02F	Dry. BYP SW Close	78	059	Dry. BATT SW 3 Open

Fault Information (POLARIS 800-1000)

No.	Code	Fault	Buzzer	LED
1	2	REC Over Temperature	Twice per second	Fault LED lit
2	3	REC Par. Cable Fault	Twice per second	Fault LED lit
3	4	REC Over Current	Beep continuously	Fault LED lit
4	5	REC Power Fault	Beep continuously	Fault LED lit
5	7	Input SCR Fault	Beep continuously	Fault LED lit
6	10	Battery SCR Fault	Beep continuously	Fault LED lit
7	12	Charge SCR Fault	Beep continuously	Fault LED lit
8	14	Fan Fault	Beep continuously	Fault LED lit
9	17	Fan Power fault	Beep continuously	Fault LED lit
10	18	Charger Over Temp.	Beep continuously	Fault LED lit
11	19	Soft Start Failed	Beep continuously	Fault LED lit
12	20	BAT Charger Fault	Beep continuously	Fault LED lit
13	22	REC Comm. Fault	Once per 2 seconds	Fault LED blinking

14	25	REC Initializes Fault	Beep continuously	Fault LED lit
15	29	Unit insert fault	Once per 2 seconds	Fault LED lit
16	99		Once per 2 seconds	Fault LED lit
17	30	Rectifier Fault	Beep continuously	Fault LED lit
18	65	Inverter Fault	Beep continuously	Fault LED lit
19	68	INV IGBT SHORT	Beep continuously	Fault LED lit
20	71	Inverter relay Short	Beep continuously	Fault LED lit
21	74	Inverter relay Broken	Beep continuously	Fault LED lit
22	77	INV par. cable Fault	Twice per second	Fault LED lit
23	81	Output Short Circuit	Once per second	Fault LED blinking
24	84	INV Comm. Fault	Once per 2 seconds	Fault LED blinking
25	87	INV Initializes Fault	Beep continuously	Fault LED lit
26	90	INV self-test Fault	Beep continuously	Fault LED lit
27	94	DC Component Fault	Once per 2 seconds	Fault LED lit
28	97	DC bus abnormal	Beep continuously	Fault LED lit
29	100	INV DSP Power Fault	Beep continuously	Fault LED lit
30	102	INV Over Temperature	Twice per second	Fault LED lit
31	104	Load Sharing Fault	Twice per second	Fault LED lit
32	106	Cabinet mode Fault	Beep continuously	Fault LED lit
33	107	Fuse Broken	Beep continuously	Fault LED lit
34	129	Par. cable Fault	Twice per second	Fault LED lit
35	134	ECU Insert Fault	Once per 2 seconds	Fault LED lit
36	136	ECU Power Fault	Beep continuously	Fault LED lit
37	139	ECU Comm. Fault	Beep continuously	Fault LED lit
38	141	ECU Initializes Fault	Once per 2 seconds	Fault LED blinking
39	145	Bypass SCR Broken	Beep continuously	Fault LED lit
40	194		Beep continuously	Fault LED lit
41	148	Bypass SCR short	Beep continuously	Fault LED lit
42	197		Beep continuously	Fault LED lit
43	151	BPS Over Temperature	Beep continuously	Fault LED lit
44	207		Beep continuously	Fault LED lit
45	154	Output CT Reverse	Beep continuously	Fault LED lit
46	155	Dry-contact Power Fault	Beep continuously	Fault LED lit
47	156	Dry-contact Comm. Fault	Beep continuously	Fault LED lit
48	157	Bypass Feedback Fault	Beep continuously	Fault LED lit
49	193	Bypass Par. cable Fault	Beep continuously	Fault LED lit
50	200	BPS Comm. Fault	Beep continuously	Fault LED lit
51	202	Bypass Initializes Fault	Beep continuously	Fault LED lit
52	205	Bypass connected fault	Beep continuously	Fault LED lit
53	210	Bypass Fan Fault	Beep continuously	Fault LED lit

Alarm Information (POLARIS 800-1000)

No.	Code	Fault	Buzzer	LED
1	259	Battery Over Voltage	Once per second	Alarm LED lit
2	260	BAT Low Pre-warning	Once per second	Alarm LED lit
3	261	Battery Reverse	Twice per second	Alarm LED lit
4	262	Battery EOD	Once per second	Alarm LED lit
5	263	Battery Voltage low	Once per second	Alarm LED lit
6	264	No Battery	Once per second	Alarm LED lit
7	265	Input Phase Reverse	Once per second	Alarm LED lit
8	266	Input N-Line lost	Twice per second	Alarm LED lit
9	267	Mains Freq. Abnormal	Once per 2 seconds	Alarm LED lit
10	268	Mains Volt. Abnormal	Once per 2 seconds	Alarm LED lit
11	269	REC Comm. Error	Once per 2 seconds	Alarm LED lit
12	270	Mains input lost	Once per 2 seconds	Alarm LED lit
13	271	Set Data Err.	Once per 2 seconds	Alarm LED lit
14	289	INV Par. cable abnormal	Once per 2 seconds	Alarm LED lit
15	293	INV Overload	Once per 2 seconds	Alarm LED lit
16	294	INV not synchronized	Beep continuously	Alarm LED lit
17	298	INV Set Data Err	Once per 2 seconds	Alarm LED lit
18	297	INV Comm. Error	Once per 2 seconds	Alarm LED lit
19	321	Bypass Switch to Num	Once per 2 seconds	Alarm LED lit
20	322	Unit quantity mismatch	Once per 2 seconds	Alarm LED lit
21	323	Parallel Overload	Once per 2 seconds	Alarm LED lit
22	324	Bypass Overload	Once per 2 seconds	Alarm LED lit
23	325	Maint. Switch Misuse	Once per 2 seconds	Alarm LED lit
24	326	ECU Comm. Error	Once per 2 seconds	Alarm LED lit
25	327	Par. cable abnormal	Once per 2 seconds	Alarm LED lit
26	331	ECU Par. cable abnormal	Once per 2 seconds	Alarm LED lit
27	332	ECU Abnormal	Once per 2 seconds	Alarm LED lit
28	334	BPS Phase Reversed	Once per second	Alarm LED lit
29	354		Once per second	Alarm LED lit
30	335	BPS Unable To Trace	Once per 2 seconds	Alarm LED lit
31	355		Once per 2 seconds	Alarm LED lit
32	336	BPS Not Available	Once per second	Alarm LED lit
33	356		Once per second	Alarm LED lit
34	337	Ecu Set Data Err	Once per 2 seconds	Alarm LED lit
35	353	BPS Par. cable abnormal	Once per 2 seconds	Alarm LED lit
36	357	Bypass Comm. Error	Once per 2 seconds	Alarm LED lit
37	358	Bypass module take over	Once per 2 seconds	Alarm LED lit

4.5 Optional cards

SNMP card: internal SNMP / external SNMP optional

- On the rear panel unscrew the 2 screws of the Intelligent slot cover. Carefully insert the SNMP card and fix it with the same screws.
- To uninstall the card proceed in the reverse order to the above description.

Functions

- Support multiple operating systems (Windows, Mac,Linux)
- UPS can be monitored remotely through the network
- Can realize web-based user interface
- Support e-mail alarm
- Multi-user permission management
- Support DHCP
- Support remote self-testing, shutdown and restart UPS functions (UPS support required)
- Support telnet, SSH, Web page configuration
- Support scheduled tasks (timed self-test, power on/off)
- Historical events and historical data storage functions
- Remote UPS monitoring and management can be performed through HTTP, SNMP, SSH, Telnet
- Complete equipment event handling (including event recording and notification)
- Can be extended to connect 2 channels of temperature and humidity monitoring modules

Features

- Networking methods: IP-based LAN, WAN, Internet, wireless Ethernet, etc.
- User permission management, safe, confidential and reliable
- Support multiple configuration management methods such as Telnet, SSH, Web
- Support scheduled task function, allow setting scheduled UPS on/off, scheduled battery discharge, etc
- Support storage of 50.000 historical data and 5.000 historical event records
- Built-in ultra-long-life system clock, support automatic timing to achieve time synchronization
- Support SNMP V1/V2/V3, HTTP, DHCP, SSH, SSL and other network protocols
- Support IPV6
- Support the expansion of 2-channel ambient temperature and humidity monitoring modules
- Support e-mail alarm function

RELAY card

- On the rear panel unscrew the 2 screws of the Intelligent slot cover. Carefully insert the SNMP card and fix it with the same screws.
- To uninstall the card proceed in the reverse order to the above description.
  Dry contact card provide dry contacts for UPS external monitoring, and tell the UPS operation status.
  Dry contact card provide 10 connectors for users, 7 outputs for indicating UPS status, 1 for common ground, 2 not used.

SNMP Card

RELAY Card

APPENDIX 1: SPECIFICATIONS

MODEL	BETA200	BETA250	BETA300	BETA400	BETA500	BETA600
Technology	On-line Double Conversion					
Power (kVA/kW)	200/200	250/250	300/300	400/400	500/500	600/600

INPUT

Phase	3 Phase + Neutral + Ground
Rated Voltage	380/400/415Vac
Voltage Range	138~485Vac
Frequency Range	40Hz - 70Hz
Power Factor	≥0.99
Current THDi	≤ 3% (100% linear load)
Bypass Voltage Range	Max Voltage.: 220Vac:+25% (optional +10%,+15%,+20%) 230Vac:+20% (optional +10%,+15%) 240Vac:+15% (optional +10%) Min. Voltage.: -45% (optional -10%, -15%, -20%, -30%) Frequency protection range: ±10%
Generator Input	Support

OUTPUT

Phase		3 Phase + Neutral + Ground
Rated Voltage		380/400/415Vac
Power Factor		1.0
Voltage Regulation		±1%
Frequency	Utility Mode	Synchronized with input (±1%, ±2%, ±4%, ±5%, optional)
	Battery Mode	(50/60 ±0.1) Hz
Crest Factor		3:1
THD		≤2% with linear load
		≤4% with not linear load
EFFICIENCY (in normal mode)		>96%

BATTERY

Voltage	±180V/±192V/±204V/±216V/±228V/±240/±252/±264/±276/±288/±300Vdc (30/32/34/36/38/40/42/44/46/48/50pcs optional) 360Vdc~600Vdc (30~50 pcs) 36~50pz Output PF 1; 32~34pz Output PF 0.9; 30pz Output PF0.8)				
Charge Current (A)	Charge current is automatically set in according to the capacity and the quantity of the batteries				
	Max 80A	Max 100A	Max 140A	Max 180A	Max 200A

PROTECTION

Overload	Inverter overload capability: ◆ 105%<load≤110%: transfer to bypass mode after 60 min ◆ 110%<load≤125%: transfer to bypass mode after 10 min ◆ 125%<load≤150%: transfer to bypass mode after 1 min ◆ ≥150% 1.2s shut down inverter, transfer to bypass immediately Bypass overload capability: ◆ Temperature ≤ 30°C, load ≤ 135%: run for a long time ◆ Temperature ≤ 40°C, load ≤ 125%: run for a long time ◆ 1000% load: run for 100 ms

Short Circuit	Hold Whole System
Overheat	Line Mode: Switch to Bypass; Backup Mode: Shut down UPS immediately
Battery Low	Alarm and Switch off
Self-diagnostics	Upon Power On and Software Control
EPO	Shut down UPS immediately
Battery	Advanced Battery Management

SYSTEM FEATURES

Transfer time	Utility to Battery: 0ms Utility to bypass: 0ms
Communication interface	RS232, RS485, Parallel, LBS, Dry contact port, Relay card (Optional), SNMP card (Optional), Battery temperature sensor (Optional)
Backfeed protection	Support

ENVIRONMENT

Operating Temperature	0°C ~ 40°C		
Storage Temperature	-25°C ~ 55°C		
Humidity	0 ~ 95% non condensing		
Altitude	<1000m		
Noise level	<65dB	<68dB	<70dB

DISPLAY

Audible & Visual	Line Failure, Battery Low, Overload, System Fault
Status LED	UPS Fault, Alarm and normal
Reading On the LCD	Input Voltage, Input Frequency, Output Voltage, Output Frequency, Load Percentage, Battery Voltage, parameter set, history record..

PHYSICAL

Dimension (WxDxH) mm	600x850x2000				1200x850x2000	
Weight (Kg)	360	400	480	530	800	890

STANDARDS

Safety	IEC/EN 62040-1, IEC/EN 62040-3, IEC/EN 62477-1
EMC	IEC/EN 62040-2 (IEC 61000-2-2, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11)

MODEL	BETA800	BETA1000
Technology	On-line Double Conversion	
Power (kVA/kW)	800/800	1000/1000

INPUT

Phase	3 Phase + Neutral + Ground
Rated Voltage	380/400/415Vac
Voltage Range	138~485Vac
Frequency Range	40Hz - 70Hz
Power Factor	≥0.99
Current THDi	≤ 3% (100% linear load)
Bypass Voltage Range	Max Voltage.: 220Vac:+25% (optional +10%,+15%,+20%) 230Vac:+20% (optional +10%,+15%) 240Vac:+15% (optional +10%) Min. Voltage.: -45% (optional -10%, -15%, -20%, -30%) Frequency protection range: ±10%
Generator Input	Support

OUTPUT

Phase		3 Phase + Neutral + Ground
Rated Voltage		380/400/415Vac
Power Factor		1.0
Voltage Regulation		±1%
Frequency	Utility Mode	Synchronized with input (±1%, ±2%, ±4%, ±5%, optional)
	Battery Mode	(50/60 ±0.1) Hz
Crest Factor		3:1
THD		≤2% with linear load
		≤4% with not linear load
EFFICIENCY (in normal mode)		>96%

BATTERY

Voltage	±180V/±192V/±204V/±216V/±228V/±240/±252/±264/±276/±288/±300Vdc (30/32/34/36/38/40/42/44/46/48/50pcs optional) 360Vdc~600Vdc (30~50 pcs) 36~50pz Output PF 1; 32~34pz Output PF 0.9; 30pz Output PF0.8)	
Charge Current (A)	Charge current is automatically set in according to the capacity and the quantity of the batteries	
	Max 280A	Max 340A

PROTECTION

Overload	Inverter overload capability: ◆ 105%<load≤110%: transfer to bypass mode after 60 min ◆ 110%<load≤125%: transfer to bypass mode after 10 min ◆ 125%<load≤150%: transfer to bypass mode after 1 min ◆ ≥150% 1.2s shut down inverter, transfer to bypass immediately Bypass overload capability: ◆ Temperature ≤ 30°C, load ≤ 135%: run for a long time ◆ Temperature ≤ 40°C, load ≤ 125%: run for a long time ◆ 1000% load: run for 100 ms

Short Circuit	Hold Whole System
Overheat	Line Mode: Switch to Bypass; Backup Mode: Shut down UPS immediately
Battery Low	Alarm and Switch off
Self-diagnostics	Upon Power On and Software Control
EPO	Shut down UPS immediately
Battery	Advanced Battery Management

SYSTEM FEATURES

Transfer time	Utility to Battery: 0ms Utility to bypass: 0ms
Communication interface	RS232, RS485, Parallel, LBS, Relay card (Optional), SNMP card (Optional)
Backfeed protection	Support

ENVIRONMENT

Operating Temperature	0°C ~ 40°C	
Storage Temperature	-25°C ~ 55°C	
Humidity	0 ~ 95% non condensing	
Altitude	<1500m	
Noise level	<73dB	<75dB

DISPLAY

Audible & Visual	Line Failure, Battery Low, Overload, System Fault
Status LED	UPS Fault, Alarm and normal
Reading On the LCD	Input Voltage, Input Frequency, Output Voltage, Output Frequency, Load Percentage, Battery Voltage, parameter set, history record ..

PHYSICAL

Dimension (WxDxH) mm	2000x850x2000	
Weight (Kg)	1450	1600

STANDARDS

Safety	IEC/EN 62040-1, IEC/EN 62040-3, IEC/EN 62477-1
EMC	IEC/EN 62040-2 (IEC 61000-2-2, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11)

APPENDIX 2: PROBLEMS AND SOLUTIONS

Messages are displayed in the top and bottom line of the color display.
In case the UPS cannot work normally, it might be wrong in installation, wiring or operation. Please check these aspects first. If all these aspects are checked without any problem, please consult with local agent right away and provide below information:

1) Product model name and serial number.
2) Try to describe the fault with more details, such as LCD display info, LED lights status, etc.

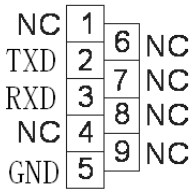
Read the user manual carefully, it can help a lot for using this UPS in the right way.
Some FAQ (frequently asked questions) may help you to troubleshoot your problem easily.

N°	PROBLEM	POSSIBLE REASON	SOLUTION
1	LCD not display	The network cable is not fixed properly or the cable of the front door is not fixed properly	Connect the network cable and cable properly of the front door
2	LCD Blue screen	LCD Interference	Take out the cable and insert back properly
3	Utility is connected but the UPS cannot be powered ON	Input power supply is not connected; Input voltage low	Measure if the UPS input voltage/frequency is within the correct range
4	Utility normal but Utility LED does not light on and the UPS operates at battery mode	Input cable is not well connected	Switch on the input switch; Make sure the input cable is well connected
5	The UPS does not indicate any failure, but output does not have voltage	Output cable does not well connected	Make sure the output cable is well connected
6	The UPS cannot transfer to bypass or inverter	Output switch do not switched on	Switch on the output switch
7	Utility LED is flashing	Utility voltage exceeds UPS input range	If the UPS operates at battery mode please pay attention to the remaining backup time needed for your system
8	Battery LED is flashing but no charge voltage and current	Battery switch is not switch on Batteries are damaged Battery are reversely connected Battery number and capacity are not set correctly	Switch on the battery switch. If batteries are damaged, need to replace whole group of batteries Connect the battery cables correctly Go to LCD setting of the battery number and capacity, set the correct datas
9	Buzzer beeps every 0.5 sec and LCD display “output overload”	Overload	Remove some load
10	Buzzer long beeps, LCD display “output short circuit”	The UPS output is in short circuit	Make sure the load is not in short circuit and then restart the UPS
11	The UPS only works on bypass mode	The UPS is set to ECO mode Transfer times to bypass mode are limited	Set the UPS working mode to Single type (non-parallel) Reset the times of transferring to bypass or re-start the UPS
12	Cannot Cold start	Battery switch is not properly closed; Battery fuse is open; Battery low	Close the battery switch; Change the fuse; Recharge the battery
13	Buzzer beeps continuously and LCD indicates Rectifier fault or output fault	UPS is out of order	Contact support for repair

APPENDIX 3: RS232 COMMUNICATION PORT DEFINITION

Definition of Male port - Connection between PC RS232 port and UPS RS232 port:

PC RS232 PORT	UPS RS232 PORT	SIGNAL DESCRIPTION
Pin 2	Pin 2	UPS send - PC receive
Pin 3	Pin 3	PC send - UPS receive
Pin 5	Pin 5	Signal Ground



Available function of RS232 port:

- .
- Monitor UPS alarm info.
- Monitor UPS running parameters.
- Timing off/on setting.

RS232 communication data format

Baud rate: 9600bps
Byte length: 8bit
End bit: 1bit
Parity check: none

CAUTION!
USB, RS232 and RS485 interface cannot be used at the same time, you can only use one of them at one time.

APPENDIX 4: RS485 COMMUNICATION PORT DEFINITION

Definition of port - Connection between the Device's RS485 port and UPS RS485 port:

DEVICE (RJ45)	UPS (RJ45)	SIGNAL DESCRIPTION
Pin 1/5	Pin 1/5	485 + "A"
Pin 2/4	Pin 2/4	485 - "B"

Available function of RS485 port:

- Monitor UPS power status.
- Monitor UPS alarm info.
- Monitor UPS running parameters.
- Timing off/on setting.

RS485 communication data format

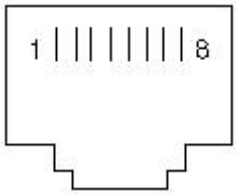
Baud rate: 9600bps
Byte length: 8bit
End bit: 1bit
Parity check: none

CAUTION!
USB, RS232 and RS485 interface cannot be used at the same time, you can only use one of them at one time.

APPENDIX 5: BAT_T COMMUNICATION PORT DEFINITION

Definition of port - Connection between the Device's RS485 port and UPS COM port:

DEVICE (RJ45)	UPS (RJ45)	SIGNAL DESCRIPTION
Pin 1/5	Pin 1/5	485 + "A"
Pin 2/4	Pin 2/4	485 - "B"



Available function of RS485 port:

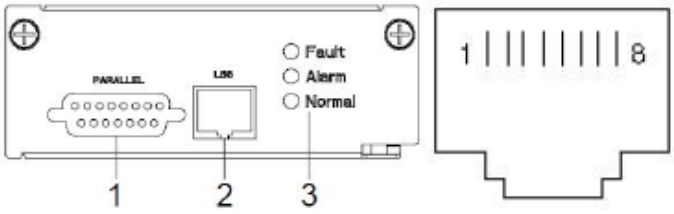
- Communicate to battery monitor

RS485 communication data format

Baud rate: 9600bps
Byte length: 8bit
End bit: 1bit
Parity check: none

APPENDIX 6: LBS PORT DEFINITION

Definition of port - Connection between the UPS LBS port:



UPS1 LBS1 (RJ45)	UPS2 LBS2 (RJ45)	DESCRIPTION
Pin 1/2/3	Pin 1/2/3	LBS
Pin 5/7/8	Pin 5/7/8	GND

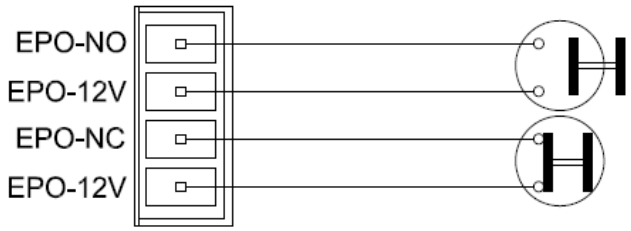
Available function of LBS port:

- The output POWER of two or more UPS in non-parallel system should be synchronized with each other.
- The output PHASE of two or more UPS in non-parallel system should be synchronized with each other.

CAUTION!
Two or more LBS cables must be used to form a ring when two or more LBS are in non-parallel system.

APPENDIX 7: REPO PORT DEFINITION

Definition of port - Connection diagram:



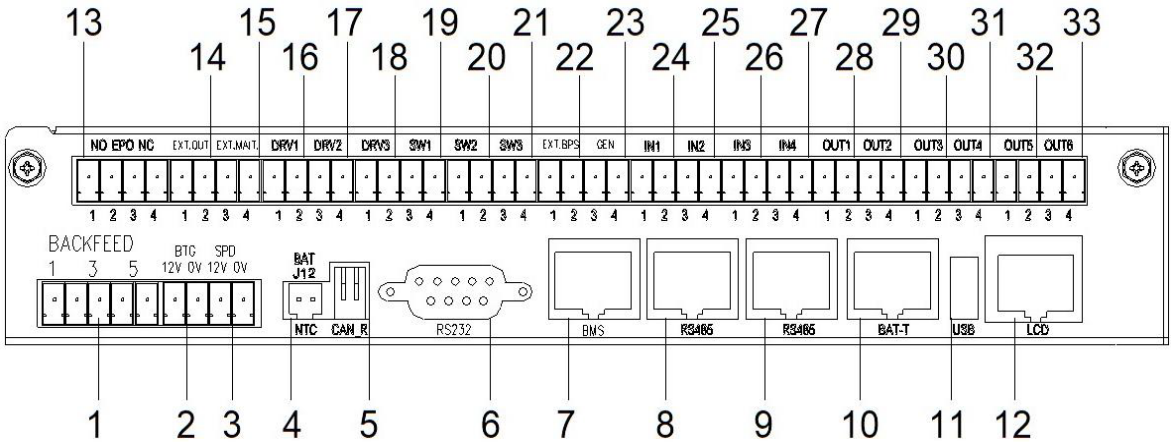
Connection between the button and UPS REPO port:

BUTTON	UPS REPO	DESCRIPTION
Pin 1	Pin 1	EPO-NO
Pin 2	Pin 2	EPO-12V
Pin 1	Pin 3	EPO-NC
Pin 2	Pin 4	EPO-12V

- A remote emergency stop switch can be installed in a remote location and connection through simple wires to the REPO connector.
- The remote switch can be connected to several UPS in a parallel architecture allowing the user to stops all units at once.

APPENDIX 8: DRY CONTACT PORT DEFINITION

Definition of input and output ports:



1. Function of Input dry contact ports

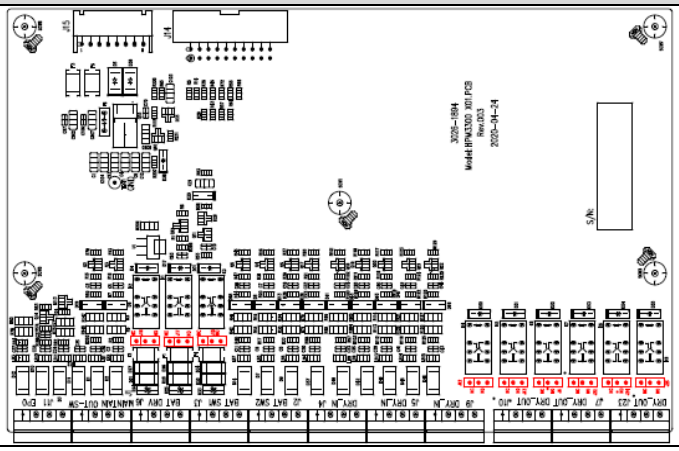
No.	Dry contact port	PIN	Function
13	EPO	NO	EPO normally opened port. EPO activation when NO port is shorted to 12V port. When EPO status active the UPS will turn to EPO mode
		12V	
		NC	EPO normally closed port. EPO activation when NC port is disconnected from 12V port. When EPO status active the UPS will turn to EPO mode
		12V	
14	Switch status	Ext. OUT	External output breaker status dry contact port. Normally opened port. Status activation when Ext. OUT port pin1 is shorted to pin2
15		Ext. MAINT.	External maintenance breaker status dry contact port. Normally opened port. Status activation when Ext. MAINT port pin3 is shorted to pin4. When Ext. MAINT status active the UPS will turn to maintenance bypass if the function is enable

22		Ext. BPS	External bypass breaker status dry contact port. Normally open port. Status activation when Ext. BPS port pin1 is shorted to pin2
19		SW1	External battery breaker status dry contact port. Normally open port. Status activation when SW1 port pin 3 is shorted to pin4, if the function is enable.
20		SW2	External battery breaker status dry contact port. Normally open port. Status activation when SW2 port pin 1 is shorted to pin2, if the function is enable.
21		SW3	External battery breaker status dry contact port. Normally open port. Status activation when SW3 port pin 3 is shorted to pin4, if the function is enable.
2	Battery Grounding Tester	12V 0V	Battery grounding tester status dry contact port. Normally opened. Status activation when BTG port 12V is shorted to 0V port.
3	Surge Protective Device	12V 0V	Surge protective device status dry contact port. Normally opened. Status activation when SPD port 12V is shorted to 0V port.
23	Generator Set	12V 0V	Generator Set status dry contact port. Normally opened. Status activation when GEN port 12V is shorted to 0V port. When gen status active the UPS will disable the DC charge if the function is enable.
24-27	IN 1 4	12V-GND	Normally opened. When IN port pin 1(3) is shorted to pin2(4), if the function is enable.

2. Function of Output dry contact ports

No.	Dry contact port	PIN	Function
16	Battery breaker driver	DRV1	Battery group 1 breaker driver port. Normally open port. DRV activation when battery discharge and voltage to EOD. Then DRV port will send + 24 V voltage to battery breaker coil to trip the breaker off, if the function is enable.
17		DRV2	Battery group 2 breaker driver port. Normally open port. DRV activation when battery discharge and voltage to EOD. Then DRV port will send + 24 V voltage to battery breaker coil to trip the breaker off, if the function is enable.
18		DRV3	Battery group 3 breaker driver port. Normally open port. DRV activation when battery discharge and voltage to EOD. Then DRV port will send + 24 V voltage to battery breaker coil to trip the breaker off, if the function is enable.
1	BP - BACKFEED	1 3 4	1 is connected to relay common pin, 3 is connected to relay NO pin, 5 is connected to relay NC pin. BP - BACKFEED activation when the UPS works in battery mode and then bypass SCR short. It will alarm BYP Backfeed Fault. Relay: 270Vac/5A, 125Vac/10A, 30Vdc/3A
28-33	Out 1-6	OUT-Common	It can choose normally open or normally close on the LCD. NO will short to com or disconnect from com when the port is enable. The function of the port as per the table in LCD description section. Relays: 125Vac/0.5A, 30Vdc/2A

3. Jumpers of dry contact board

Dry contactor		Jumper ID	Jumper location	Location (Dry contact board)
OUT_1		J12	PIN2-3 (NO) ON	
OUT_2		J13	PIN2-3 (NO) ON	
OUT_3		J8	PIN2-3 (NO) ON	
OUT_4		J22	PIN2-3 (NO) ON	
OUT_5		J24	PIN2-3 (NO) ON	
OUT_6		J25	PIN2-3 (NO) ON	
DRV1	UVR trip	J16	PIN1-2 (NC) ON	
	Shunt trip		PIN2-3 (NO) ON	
DRV2	UVR trip	J17	PIN1-2 (NC) ON	
	Shunt trip		PIN2-3 (NO) ON	
DRV3	UVR trip	J18	PIN1-2 (NC) ON	
	Shunt trip		PIN2-3 (NO) ON	

APPENDIX 9: BACKFEED PROTECTION

The presence of a backfeed protection is required by IEC 62040-1 UPS standard.

An additional external isolation device must be installed upstream the UPS system. A magnetic contactor or a circuit breaker with UVR (Under Voltage Release) functionality can be used for this purpose.

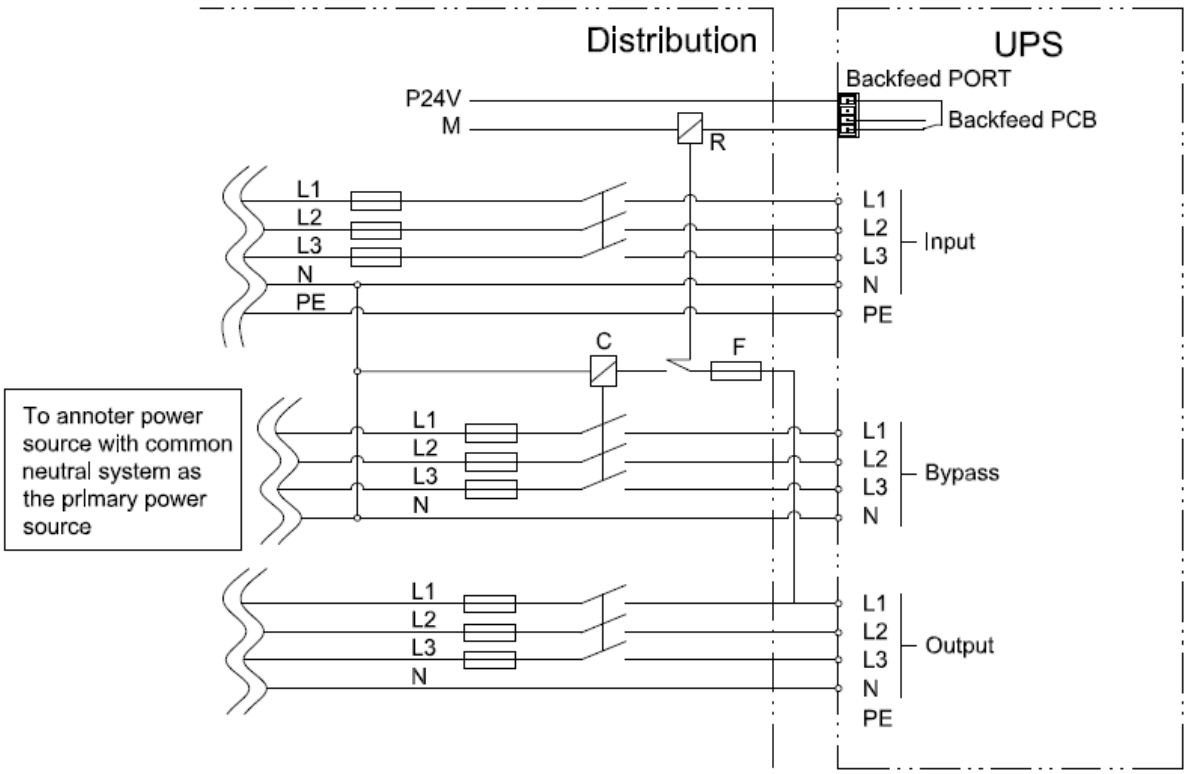
The isolation device must be able to carry the UPS input current (common input in case of single source, bypass input in case of dual source).

E.g. an isolation device can be a magnetic contactor. The coil of the contactor should be supplied by (eg. fused L1-N voltage) the input source in single mains configurations or by the bypass source in dual mains configurations, via the output port as per Appendix 6.

If the contactor coil exceeds the voltage/current limits of the UPS output port a 24 Vcc source should be generated from the same source the contactor coil is supplied from, in order to supply an additional external auxiliary relay coil. The relay contact, properly rated, should allow to supply the contactor coil.

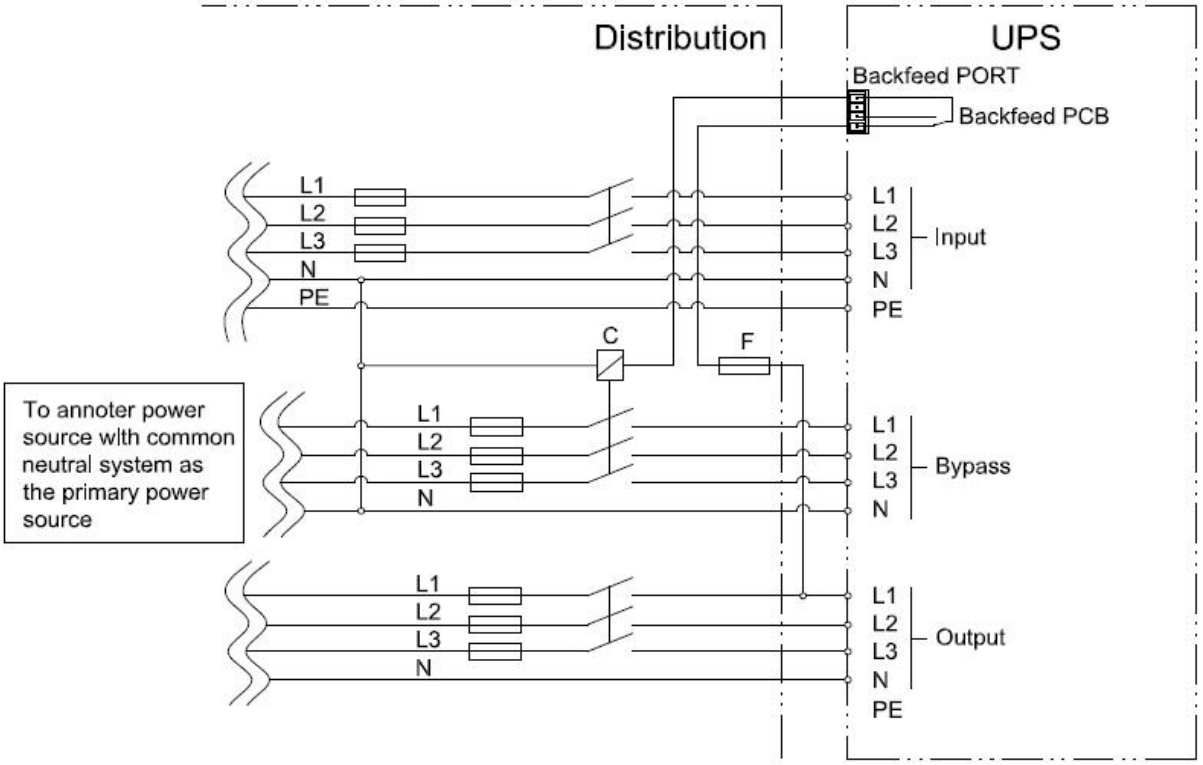
Backfeed installation with relay:

1. Connect the UPS backfeed dry contact port to an external +24 VDC supply pole “+”. Route the cable with the other signal cables.
2. Connect the UPS backfeed dry contact to a terminal of the relay R coil. Route the cable with the other signal cables.
3. Connect the terminal of the relay R coil to a +24 VDC supply pole “-”(M).
4. Connect the fuse F, the auxiliary contact of relay R, and the coil of C as shown in the illustration below.
5. Connect C (L1, L2, L3) with UPS bypass input (L1, L2, L3) as shown in the illustration below.
6. Connect bypass input (N) with mains feeding (N) in the distribution switchgear.



Backfeed installation without relay:

1. Connect the UPS backfeed dry contact port 1 to F. Route the cable with the other signal cables.
2. Connect the UPS backfeed dry contact port 4 to the contactor C coil. Route the cable with the other signal cables.
3. Connect the fuse F and the coil of C as shown in the illustration below.
4. Connect C (L1, L2, L3) with UPS bypass input (L1, L2, L3) as shown in the illustration below.
5. Connect bypass input (N) with mains feeding (N) in the distribution switchgear.



WARRANTY

Dear Customer,
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If the product fails in warranty period, please contact your dealer or call +39 02 950031 or go to www.naicon.com/elsist. Before contacting your dealer or authorized service network, we recommend that you read the operating and maintenance manual carefully.
With this warranty, NAICON warrants the product to be free from defective in materials or workmanship for 24 months, as of the original delivery date.
If there are material or manufacturing defects during the warranty period, ELSIST affiliates, Authorized Service Centers or authorized resellers located in the UE region will repair or (at ELSIST discretion) replace the defective product or components under the terms and conditions below, without any charge for labor or spare parts costs. ELSIST reserves the right (in its sole discretion) to replace the components of defective products or low cost products with assembled parts or new or refurbished products.
Conditions.
1. This warranty will be valid only if the defective product is returned together with the sales invoice.

ELSIST reserves the right to refuse warranty service in the absence of such documents or if the information contained therein is incomplete or illegible.
2. This warranty does not cover the costs and / or any damages and / or defects resulting from any modifications or adjustments made to the product, without prior written permission from ELSIST, in order to adapt the product to local technical or safety standards in countries other than those for which the product was originally designed and manufactured.
3. This warranty will be void if the model or serial number indicated on the product has been modified, deleted, removed or otherwise illegible.
4. Are excluded from the warranty:

- Periodic maintenance and repair or replacement of parts subject to normal wear and tear.
- Any modification or modification to the product, without prior written permission from ELSIST to enhance performance than those described in the User and Maintenance Manual
- All costs of technical staff support and any transport from the customer's address to Assistance Center and vice versa as well as all the risks involved.
- Damages due to:

  a. Improper use, including but not limited to: (a) the use of the product for any purpose other than the intended use or failure to observe the ELSIST instructions for correct use and maintenance of the product, (b) installation or use of the product not complying with the Technical or Safety standards in the country in which it is used.
  b. Repairs by unauthorized personnel or by the Customer himself.
  c. Accidental events, lightning, floods, fires, incorrect ventilation or other causes not attributable to ELSIST.
  d. Defects of the equipment or equipment to which the product was connected.

5. This warranty does not affect the buyer's rights established by applicable national laws nor the Customer's rights to the reseller arising out of the sales contract.

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