PHASAK®

MANUAL

Serie Gate Pro

PH 9270 · 10000 VA

www.phasak.com

READ AT LEAST THIS

Strictly follow all warnings and instructions in this manual.

Before installing this unit, please read all instructions carefully.

Do not use this UPS before carefully reading all safety information and instructions for use.

1. Precauciones

1.1. Transport

Please transport the Phasak UPS in its original box to protect it from shocks and bumps.

1.2. Preparation

· When the UPS goes from being in a warm environment to a cold one, condensation may form. The equipment must be completely dry before being installed. Please, leave the UPS turned off and unplugged for at least two hours to warm up the equipment.

· Do not install the UPS near water or in humid environments, nor in direct sunlight or near heat sources.

· Do not block the ventilation holes of the UPS.

1.3. Facility

· Do not connect the output socket of the UPS to devices that may overload it (for example: laser printers).

· Route connecting cables so that they cannot be stepped on or tripped over.

· Do not connect appliances such as hair dryers to the UPS outlet.

· The UPS must be installed and handled by qualified personnel. Children no, but otherwise....

· Connect the UPS, with ground, so that it is easily accessible.

· Please use only VDE and CE approved power and charging cables to connect the UPS to the mains (grounded) outlet.

· When installing the UPS, you must ensure that the sum of the leakage current of the UPS and the connected equipment does not exceed 3.5mA.

1.4. Functioning

• Do not disconnect the power cord of the UPS, otherwise the protection that the earth ground provides to the UPS and all its loads will be nullified.

• The UPS has its own internal power supply (batteries). There may be voltages at the UPS output socket or output voltage terminals, even if the UPS is not connected to the mains.

• To completely turn off the UPS, press the OFF/Enter switch.

• Prevent the entry of liquids or foreign objects inside the UPS.

1.5. Maintenance and repair

• The UPS operates with dangerous voltages. Any repair must be carried out exclusively by qualified personnel. Do not open or disassemble the UPS in any other case.

• Caution - Risk of electric shock. Even after disconnecting from the grid, the internal wiring is still connected to the battery and the voltage is dangerous.

• Before carrying out any type of service and/or maintenance, disconnect the batteries, verifying that there is no current or risk of voltage, including those created by high capacity capacitors.

• Only people authorized to deal with batteries and who do so with the necessary measures and precautions can replace batteries and control operations.

• Caution - Risk of electric shock. The battery is not isolated from the input voltage circuit. There may be dangerous voltages between the battery terminals and the ground. Before touching anything, please check that there is no voltage!

• Batteries can cause electrical shock and short circuits. Please take the precautions detailed below and any other necessary measures when working with batteries, such as removing watches, rings and other metal objects, as well as using only tools with insulated handles.

• When changing batteries, install the same number and the same type of batteries.

• Do not attempt to throw away or burn batteries, as they may explode.

• Do not open or destroy batteries. Released electrolyte can damage skin and eyes. The battery is toxic.

• Please replace the fuse only with another of the same type and amperage to avoid risk of fire.

Before installation, please check the drive.

Make sure nothing inside the packaging is damaged.

Keep the original packaging in a safe place for future use.

1. Safety and EMC Instructions

Please read carefully the following user manual and the safety instructions before installing the unit or using the unit!

1-1. Transportation and Storage

Please transport the UPS system only in the original package to protect against shock and impact.

The UPS must be stored in the room where it is ventilated and dry.

1-2. Preparation

Condensation may occur if the UPS system is moved directly from a cold to a warm environment. The UPS system must be absolutely dry before being installed. Please allow at least two hours for the UPS system to acclimate to the environment.

Do not install the UPS system near water or in moist environments.

Do not install the UPS system where it would be exposed to direct sunlight or a nearby heater.

Do not block ventilation holes in the UPS housing.

1-3. Installation

Do not connect appliances or devices which would overload the UPS (e.g., big motor-type equipment) to the UPS output sockets or terminal.

Place cables in such a way that no one can step on or trip over them.

Do not block air vents in the housing of the UPS. The UPS must be installed in a location with good ventilation. Ensure enough space on each side for ventilation.

UPS has provided an earthed terminal. In the final installed system configuration, equipotential earth bonding to the external UPS battery cabinets is required.

The UPS can be installed only by qualified maintenance personnel.

An appropriate disconnect device as short-circuit backup protection should be provided in the building wiring installation.

An integral single emergency switching device that prevents further supply to the load by the UPS in any mode of operation should be provided in the building wiring installation.

Connect the earth before connecting to the building wiring terminal.

Installation and wiring must be performed in accordance with local electrical laws and regulations.

1-4. Operation

Do not disconnect the earth conductor cable on the UPS or the building wiring terminals at any time, as this would cancel the protective earth of the UPS system and all connected loads.

The UPS system features its own internal current source (batteries). The UPS output sockets or output terminal blocks may be electrically live even if the UPS system is not connected to the building wiring outlet.

To fully disconnect the UPS system, first press the "OFF" button and then disconnect the mains.

Ensure that no liquid or other foreign objects can enter the UPS system.

The UPS can be operated by any individuals with no previous experience.

1-5. Standards

Safety

- IEC/EN 62040-1

EMI

- Conducted Emission: IEC/EN 62040-2 Category C3
- Radiated Emission: IEC/EN 62040-2 Category C3

EMS

- ESD: IEC/EN 61000-4-2 Level 4
- RS: IEC/EN 61000-4-3 Level 3
- EFT: IEC/EN 61000-4-4 Level 4
- Surge: IEC/EN 61000-4-5 Level 4
- CS: IEC/EN 61000-4-6 Level 3
- Power-frequency Magnetic Field: IEC/EN 61000-4-8 Level 3
- Low Frequency Signals: IEC/EN 61000-2-2

Warning:

This is a product for commercial and industrial application in the second environment. Installation restrictions or additional measures may be needed to prevent disturbances.

2. Installation and Operation

2-1. Unpacking and Inspection

Unpack the package and check the package contents. The shipping package contains:

1. One UPS
2. One user manual
3. One monitoring software CD
4. One RS-232 cable (optional)
5. One USB cable
6. One parallel cable (only available for the parallel model)
7. One share current cable (only available for the parallel model)
8. One battery cable (optional)

NOTE:

Before installation, please inspect the unit. Ensure that nothing inside the package is damaged during transportation. Do not turn on the unit and notify the carrier and dealer immediately if there is any damage or missing parts. Please keep the original package in a safe place for future use.

2-2. Rear Panel View

Refer to the diagrams provided in the following pages for the rear panel view and descriptions of the components.

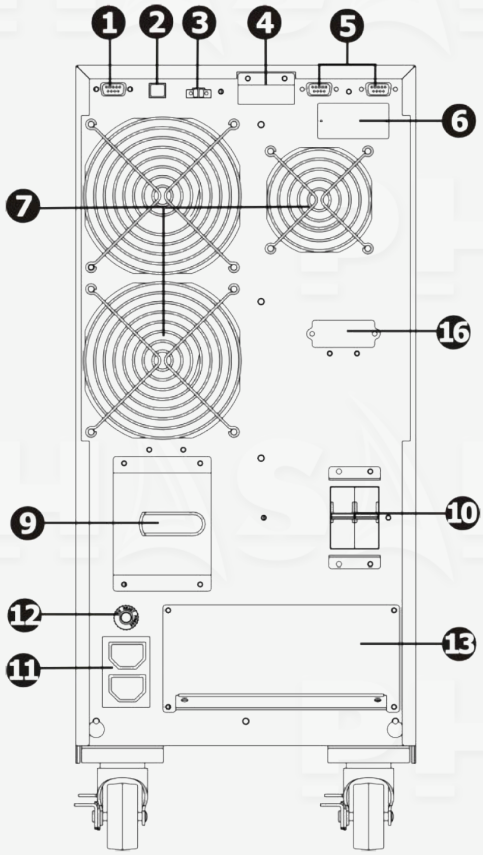


Diagram 1:Rear Panel

1. RS-232 communication port
2. USB communication port
3. Emergency power off function connector (EPO connector)
4. Share current port (only available for parallel model)
5. Parallel port (only available for parallel model)
6. Intelligent slot
7. Cooling fan
8. External maintenance bypass switch port
9. Maintenance bypass switch
10. Input circuit breaker
11. Output receptacles: connect to mission-critical loads
12. Output circuit breaker for receptacles
13. Input/Output terminal (Refer to Diagram 2, 4, 6 for the details)
14. Output terminal: connect to mission-critical loads
15. Programmable output terminal: connect to non-critical loads
16. External battery connector
17. Utility input terminal

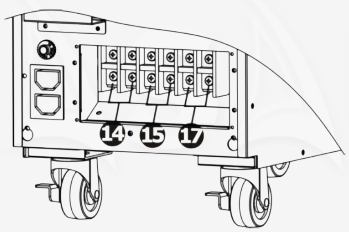


Diagram 2: Input/Output Terminal

2-3. Single UPS Installation

Installation and wiring must be performed in accordance with local electrical laws/regulations and executed by professional personnel. Follow these instructions:

1. Ensure appropriate mains wiring and breakers:

- Verify that the building's wiring and breakers are sufficient for the UPS's rated capacity to avoid hazards like electric shock or fire.

NOTE: Do not use a wall receptacle as the input power source for the UPS if its rated current is less than the UPS's maximum input current. Otherwise, the receptacle may burn and be destroyed.

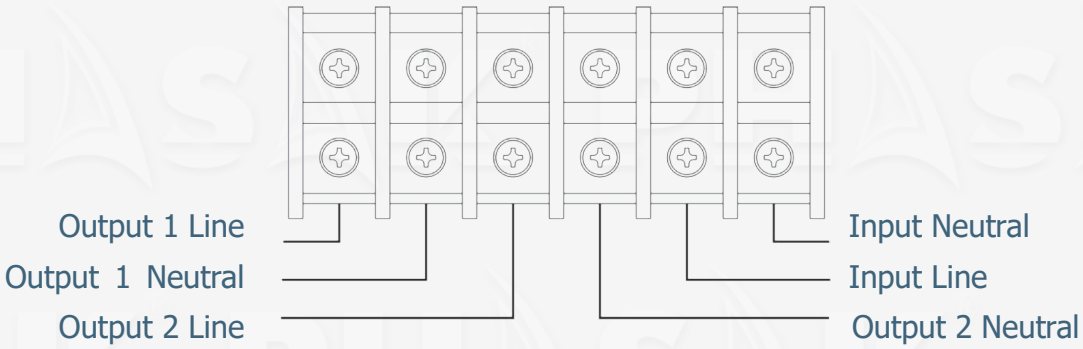
2. Switch off the building's mains switch before installation.

3. Turn off all connected devices before connecting them to the UPS.

4. Remove the terminal block cover on the rear panel of the UPS. Connect the wires as shown in the terminal block diagrams.

IMPORTANT: *Connect the earth wire first when making wire connections, and disconnect it last during wire disconnection.*

5. Replace the terminal block cover after completing connections.



Terminal Block wiring diagram for tower model

WARNING
Carefully verify the battery voltage and polarity when connecting external battery packs to avoid damage to the UPS.

Notes:

Ensure that the wires are connected tightly to the terminals.

Two types of outputs are provided:

Output Terminal/Outlets: For critical devices.

1. Programmable Terminal: For non-critical devices.
2. During a power failure, you can extend the backup time for critical devices by setting a shorter backup time for non-critical devices.
3. Install an output breaker between the output terminal and the load. If necessary, use a breaker with leakage current protection.

WARNINGS

Ensure the UPS is not turned on during installation.

Do not modify the standard model to a long-run model. Particularly, do not connect the standard internal battery to an external battery, as mismatched battery types and voltages could cause hazards.

Additional Notes:

Set the battery pack breaker to the "OFF" position before installation.

Carefully verify the battery voltage, polarity, and wiring connections. Incorrect connections can cause irreversible damage.

Ensure proper protective grounding, including wire specifications, positioning, and reliable connections.

Confirm that the utility input and output wiring are correct, avoiding reversed polarity or short circuits.

2.4 UPS Installation for Parallel System

If the UPS is only available for single operation, you may skip this section.

1. Install and wire the UPS units: Follow the instructions in Section 2-3 for each UPS unit.

2. Connect the output wires of each UPS to an output breaker.

3. Connect all output breakers to a major output breaker: This major output breaker will directly connect to the loads.

4. Each UPS is connected to an independent battery pack.

5. Connect the parallel cables:

- Remove the cover of the parallel share current cable port on each UPS.
- Connect each UPS one by one using the parallel cable and share current cable.
- Screw the cover back after the connections.

NOTE:

The parallel system cannot use a single battery pack. Otherwise, this will cause permanent system failure.

6. Refer to the following wiring diagram for a parallel system:

- **Diagram 1:** Power cable connection for the tower model
- **Diagram 2:** Parallel communication port and share current cable connection

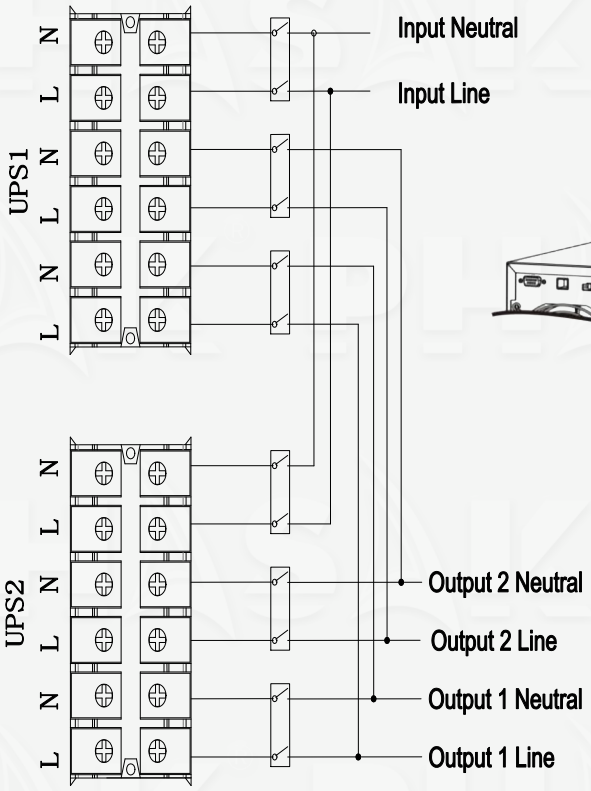


Diagram 1

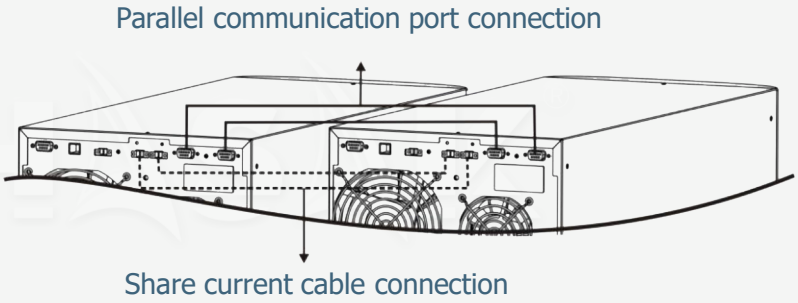


Diagram 2

WARNINGS

Before turning on the parallel system, ensure that all UPS units' maintenance switches are in the same position.

Do not operate the maintenance switch of any unit when the parallel system is powered on and working

2-5. Software Installation

To optimize computer system protection, install UPS monitoring software to fully configure UPS shutdown. Refer to the software installation manual for details.

3. Operations

Button Functions:

ON/Enter Button:

- **Turn on the UPS:** Press and hold the button for more than 0.5 seconds to turn on the UPS.
- **Enter Key:** Press this button to confirm the selection in the setting menu.

OFF/ESC Button:

- **Turn off the UPS:** Press and hold the button for more than 0.5 seconds to turn off the UPS.
- **Esc Key:** Press this button to return to the previous menu in the setting menu.

Test/Up Button:

- **Battery Test:** Press and hold the button for more than 0.5 seconds to test the battery while in AC mode or CVCF mode.
- **Up Key:** Press this button to display the next selection in the setting menu.

Mute/Down Button:

- **Mute the Alarm:** Press and hold the button for more than 0.5 seconds to mute the buzzer. Refer to Section 3-4-9 for details.
- **Down Key:** Press this button to display the previous selection in the setting menu.

Test/Up + Mute/Down Buttons:

- Press and hold the two buttons simultaneously for more than 1 second to enter or exit the setting menu.

Note:
CVCF mode refers to converter mode.

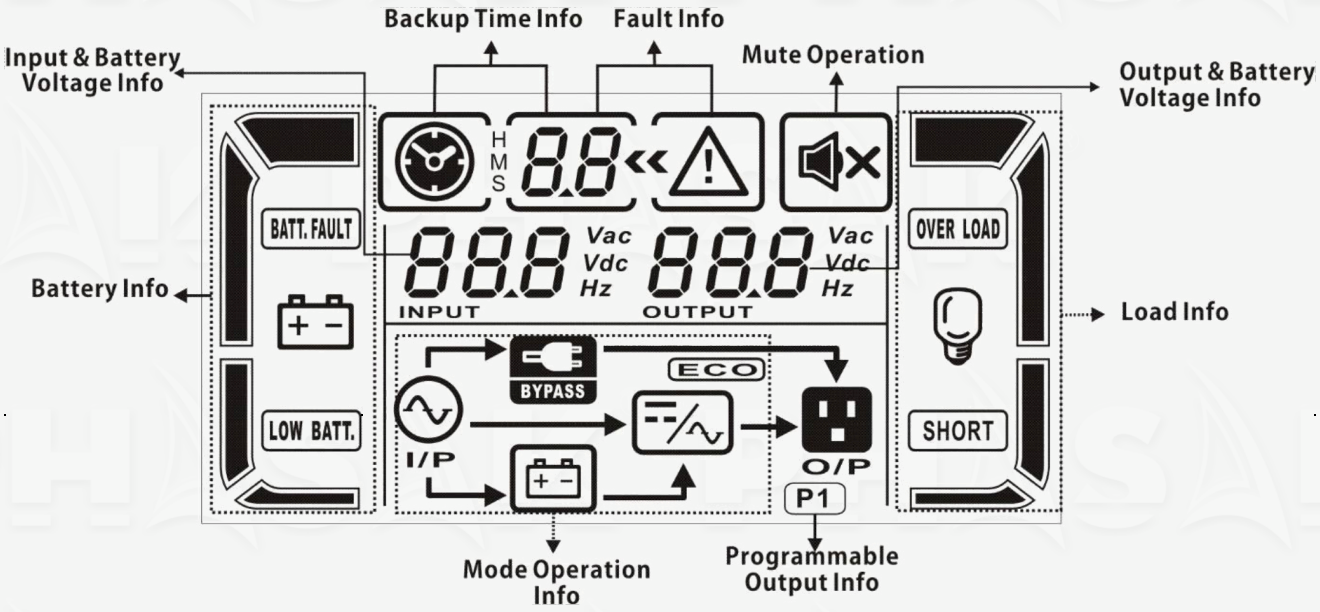
3.2 LED Indicators and LCD Panel

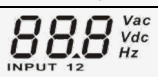
There are 4 LEDs on the front panel to show the UPS working status:

Mode	Bypass	Line	Battery	Fault
UPS Startup	●	●	●	●
Bypass Mode	●	○	○	○
AC Mode	○	●	○	○
Battery Mode	○	○	●	○
CVCF Mode	○	●	○	○
Battery Test	●	●	●	○
ECO Mode	●	●	○	○
Fault	○	○	○	●

● means the LED is lit. | ○ means the LED is off.

LCD Panel:



Display	Function
Backup time information	
	Indicates battery discharge time in numbers. H: hours, M: minutes, S: seconds
Fault information	
	Indicates that the warning and fault occurs.
	Indicates the fault codes, and the codes are listed in details in section 3-9.
Mute operation	
	Indicates that the UPS alarm is disabled.
Output & Battery voltage information	
	Indicates the output voltage, frequency or battery voltage. Vac: output voltage, Vdc: battery voltage, Hz: frequency
Load information	
	Indicates the load level by 0-25%, 26-50%, 51-75%, and 76-100%.
	Indicates overload.
	Indicates the load or the output is short.
Programmable output information	
	Indicates that the programmable outputs are working.
Mode operation information	
	Indicates the UPS connects to the mains.
	Indicates the battery is working.
	Indicates the bypass circuit is working.
	Indicates the ECO mode is enabled.
	Indicates the Inverter circuit is working.
	Indicates the output is working.
Battery information	
	Indicates the Battery capacity by 0-25%, 26-50%, 51-75%, and 76-100%.
	Indicates the battery is not connected.
	Indicates low battery level and low battery voltage.
Input & Battery voltage information	
	Indicates the input voltage or frequency or battery voltage. Vac: Input voltage, Vdc: battery voltage, Hz: input frequency

3.3 Audible Alarm

Description	Buzzer Status	Muted
UPS Status		
Bypass mode	Beeping once every 2 minutes	Yes
Battery mode	Beeping once every 4 seconds	Yes
Fault mode	Beeping continuously	Yes
Warning		
Overload	Beeping twice every second	No
Low battery	Beeping once every second	No
Battery unconnected	Beeping once every second	No
Overcharge	Beeping once every second	No
EPO enable	Beeping once every second	No
Fan failure/Overtemperature	Beeping once every second	No
Charger failure	Beeping once every second	No
I/P fuse broken	Beeping once every second	No
Overload (3 times in 30 min)	Beeping once every second	No
EPO Status		
Cover of maintenance switch	Beeping continuously	Yes
Parallel protection	Beeping continuously	Yes
Fault		
Bus start failure	Beeping continuously	Yes
Bus over	Beeping continuously	Yes
Bus under	Beeping continuously	Yes
Bus unbalance	Beeping continuously	Yes
Inverter soft start failure	Beeping continuously	Yes
High inverter voltage	Beeping continuously	Yes
Low inverter voltage	Beeping continuously	Yes
Inverter output short-circuited	Beeping continuously	Yes
Negative power fault	Beeping continuously	Yes
Battery SCR short-circuited	Beeping continuously	Yes
Inverter relay short-circuited	Beeping continuously	Yes
Parallel communication failure	Beeping continuously	Yes
Parallel output current unbalance	Beeping continuously	Yes
Over temperature	Beeping continuously	Yes
CPU communication failure	Beeping continuously	Yes
Overload	Beeping continuously	Yes

3.4 Single UPS Operation

Turn on the UPS with utility power supply (AC mode):

- After correctly connecting the power supply, set the breaker of the battery pack to the "ON" position (only for long-run models). Then, set the input breaker to the "ON" position. At this point, the fan will start running, and the UPS will supply power to the loads via bypass mode.

  Note: *In bypass mode, the load is not protected by the UPS. To protect connected devices, you must turn on the UPS.*

- Press and hold the “ON” button for 0.5 seconds. The buzzer will beep once.
- A few seconds later, the UPS will enter AC mode. If utility power is abnormal, the UPS will operate in Battery mode without interruption.

  Note: *If the UPS runs out of battery, it will shut down automatically in Battery mode. When utility power is restored, the UPS will restart in AC mode.*

Turn on the UPS without utility power supply (Battery mode):

- Ensure that the breaker of the battery pack is in the "ON" position (only for long-run models).
- Press and hold the “ON” button for 0.5 seconds. The buzzer will beep once.
- A few seconds later, the UPS will enter Battery mode.

Connect devices to the UPS:

- Turn on the UPS first, then switch on connected devices one by one. The LCD panel will display the total load level.
- If connecting inductive loads (e.g., printers), ensure that the inrush current does not exceed the UPS's capacity.

  In the case of overload:

  - Remove some loads immediately.
  - Keep total connected loads below 80% of the UPS's nominal power capacity to avoid overload.

Charge the batteries:

- After connecting the UPS to utility power, the batteries will charge automatically except during Battery mode or a battery self-test.
- Charge the batteries for at least 10 hours before first use.

Battery mode operation:

- If the battery voltage drops to the alarm level, the buzzer will beep once per second. Disconnect non-critical loads to extend backup time.
- Press the "Mute" button to silence the alarm if necessary.

Test the batteries:

- To check battery status, press the "Test" button while in AC mode. The UPS will perform a self-test automatically.

Turn off the UPS:

- **With utility power:** Press and hold the “OFF” button for 0.5 seconds. The UPS will switch to Bypass mode. To fully disconnect, switch off the input breaker.
- **Without utility power:** Press and hold the “OFF” button for 0.5 seconds. The UPS will cut off power completely.

3.5 Paralel UPS Operation

Parallel System Connection:

- Ensure all UPS units are parallel-compatible models.
- Follow the installation and wiring instructions in Section 2-3 for each UPS unit.

Voltage check:

After connecting the input breakers, measure the voltage difference between the output lines of each UPS.

If the voltage difference is less than 1V, the connections are correct. If it exceeds 1V, check the wiring.

- Turn on the input breakers of all UPS units. Each UPS should display its parallel ID (e.g., PAR001, PAR002). If not, verify the parallel cables.
- Turn on the UPS units sequentially. Ensure the output voltage difference between units is less than 2V.
- Once all units are synchronized, turn on the major output breaker.

Add a New Unit to the Parallel System:

- Shut down the entire system before adding a new unit.
- Ensure the new UPS is a parallel-compatible model and follow the wiring instructions in Section 2-3.

Remove a Unit from the Parallel System:

- Press the "OFF" button on the unit to be removed. Turn off its input and output breakers.
- Disconnect the parallel and share current cables.

Warnings

Ensure all maintenance switches are in the same position before activating the parallel system.

Do not operate the maintenance switch on any unit while the system is running.

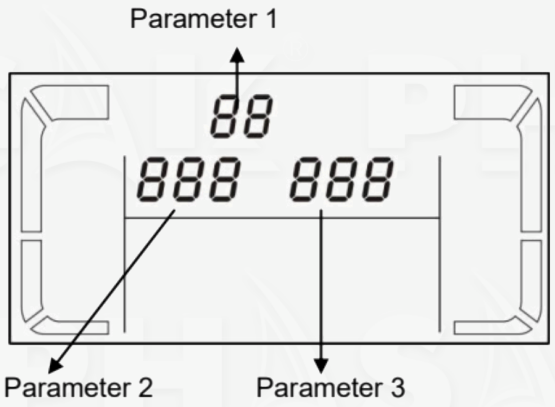
3.6 Abbreviation Meaning in LCD Display

Abbreviation	Display Content	Meaning
ENA	Enable	Function is enabled
DIS	Disable	Function is disabled
ATO	Auto	Automatic setting
BAT	Battery	Battery-related function
NCF	Normal mode	Not CVCF mode
CF	CVCF mode	Constant output frequency
SUB	Subtract	Reduction of value
ADD	Add	Increase of value
ON	On	Function is active
OFF	Off	Function is inactive
FBD	Not allowed	Operation not permitted
OPN	Allow	Operation allowed
RES	Reserved	Reserved setting
PAR	Parallel	Related to parallel mode

3.7 LCD Setting

There are three parameters for setting up the UPS. Refer to the diagram below:

- **Parameter 1:** Program alternatives (15 programs available).
- **Parameter 2:** Setting options or values for each program.
- **Parameter 3:** Corresponding value to Parameter 2.



Parameter 1

Code	Description	Modes Supported
01	Output voltage	Bypass, AC, ECO, CVCF
02	Output frequency	AC, CVCF
03	Voltage range for bypass	Bypass
04	Frequency range for bypass	Bypass
05	ECO mode enable/disable	ECO
06	Voltage range for ECO mode	ECO
07	Frequency range for ECO mode	ECO
08	Bypass mode setting	Bypass
09	Battery backup time setting	All modes
10	Programmable output setting (N/A Rack)	All modes
11	Shutdown point for programmable output	All modes
12	Hot standby function enable/disable	All modes
13	Battery voltage adjustment	All modes
14	Charger voltage adjustment	All modes
15	Output voltage adjustment	AC, ECO, CVCF

01: Output voltage

Setting

Parameter 3: Output voltage

You may choose the following output voltage in parameter 3:

208: Presents output voltage is 208Vac

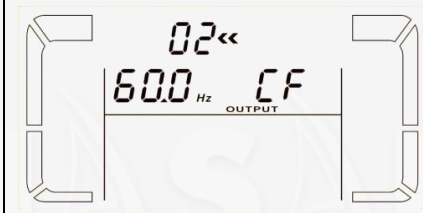
220: Presents output voltage is 220Vac

230: Presents output voltage is 230Vac

240: Presents output voltage is 240Vac

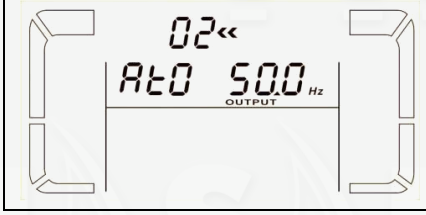
02: Output frequency

60 Hz, CVCF mode



50 Hz, Normal mode

ATO



Setting

Parameter 2: Output Frequency

Setting the output frequency. You may choose following three options in parameter 2:

50.0Hz: The output frequency is setting for 50.0Hz.

60.0Hz: The output frequency is setting for 60.0Hz.

ATO: If selected, output frequency will be decided according to the latest normal utility frequency. If it is from 46Hz to 54Hz, the output frequency will be 50.0Hz. If it is from 56Hz to 64Hz, the output frequency will be 60.0Hz. ATO is default setting.

Parameter 3: Frequency mode

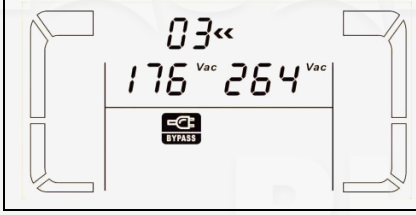
Setting output frequency at CVCF mode or not CVCF mode. You may choose following two options in parameter 3:

CF: Setting UPS to CVCF mode. If selected, the output frequency will be fixed at 50Hz or 60Hz according to setting in parameter 2. The input frequency could be from 46Hz to 64Hz.

NCF: Setting UPS to normal mode (not CVCF mode). If selected, the output frequency will synchronize with the input frequency within 46~54 Hz at 50Hz or within 56~64 Hz at 60Hz according to setting in parameter 2. If 50 Hz selected in parameter 2, UPS will transfer to battery mode when input frequency is not within 46~54 Hz. If 60Hz selected in parameter 2, UPS will transfer to battery mode when input frequency is not within 56~64 Hz.

*If Parameter 2 is ATO, the Parameter 3 will show the current frequency.

03: Voltage range for bypass

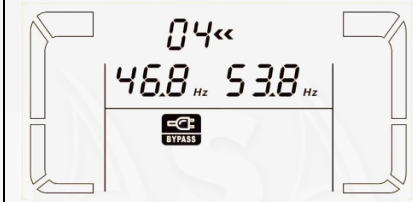


Setting

Parameter 2: Set the acceptable low voltage for bypass. Setting range is from 110V to 209V and the default value is 110V.

Parameter 3: Set the acceptable high voltage for bypass. Setting range is from 231V to 276V and the default value is 264V.

04: Frequency range for bypass

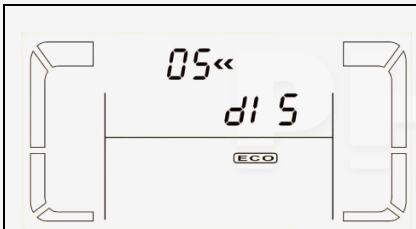


Setting

Parameter 2: Set the acceptable low frequency for bypass.
50 Hz system: Setting range is from 46.0Hz to 49.0Hz.
60 Hz system: Setting range is from 56.0Hz to 59.0Hz.
The default value is 46.0Hz/56.0Hz.

Parameter 3: Set the acceptable high frequency for bypass.
50 Hz: Setting range is from 51.0Hz to 54.0 Hz.
60 Hz: Setting range is from 61.0Hz to 64.0Hz.
The default value is 54.0Hz/64.0Hz.

05: ECO mode enable/disable



Setting

Parameter 3: Enable or disable ECO function. You may choose following two options:

DIS: disable ECO function

ENA: enable ECO function

If ECO function is disabled, voltage range and frequency range for ECO mode still can be set, but it is meaningless unless the ECO function is enabled.

06: Voltage range for ECO mode

Setting

Parameter 2: Low voltage point in ECO mode. The setting range is from 5% to 10% of the nominal voltage.
Parameter 3: High voltage point in ECO mode. The setting range is from 5% to 10% of the nominal voltage.

07: Frequency range for ECO mode

Setting

Parameter 2: Set low frequency point for ECO mode.
50 Hz system: Setting range is from 46.0Hz to 48.0Hz.
60 Hz system: Setting range is from 56.0Hz to 58.0Hz.
The default value is 48.0Hz/58.0Hz.
Parameter 3: Set high frequency point for ECO mode.
50 Hz: Setting range is from 52.0Hz to 54.0 Hz.
60 Hz: Setting range is from 62.0Hz to 64.0Hz.
The default value is 52.0Hz/62.0Hz.

08: Bypass mode setting

Setting

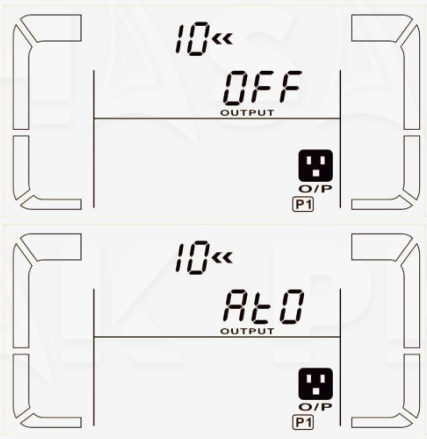
Parameter 2:
OPN: Bypass allowed. When selected, UPS will run at Bypass mode depending on bypass enabled/disabled setting.
FBD: Bypass not allowed. When selected, it's not allowed for running in Bypass mode under any situations.
Parameter 3:
ENA: Bypass enabled. When selected, Bypass mode is activated.
DIS: Bypass disabled. When selected, automatic bypass is acceptable, but manual bypass is not allowed. Manual bypass means users manually operate UPS for Bypass mode. For example, pressing OFF button in AC mode to turn into Bypass mode.

09: Battery backup time setting

Setting

Parameter 3:
000~999: Set the maximum backup time from 0min to 999min. UPS will shut down to protect battery after backup time arrives. The default value is 990min.
DIS: Disable battery discharge protection and backup time will depend on battery capacity.

10: Programmable output setting

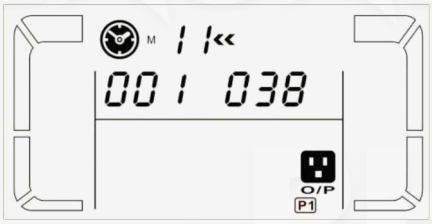


Setting

Parameter 3: Set programmable output. You may choose the following three options:
ON: Programmable output is manually switched on timelessly.
OFF: Programmable output is manually switched off. However, if UPS restarts, this setting will automatically go to "ATO" status.
ATO: Programmable output is automatically turned on or cut off according to battery or load status. When the battery voltage is lower than the setting point, or shutdown time arrives, the programmable output will be cut off automatically. After the utility is recovering, the output will turn on automatically. If overload happens, the programmable output also will be cut off automatically. If it happens 3 times, the programmable output will be cut off until it is manually switched on.

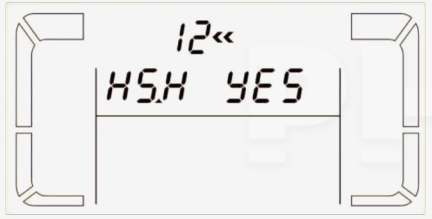
11: Shutdown point for programmable output

Note：This function is not supported by the Rack model.

	Setting
	**Parameter 2: 001.** Set shutdown time for programmable output. **Parameter 3: Shutdown time in minutes.** Setting range is from 0 to 300. When shutdown time arrives, the programmable output terminal will be cut off. The default value is 30 minutes.

	**Parameter 2: 002** Set shutdown voltage for programmable output. **Parameter 3: Shutdown voltage in V.** Setting range is from 11.2 to 13.6. If the battery voltage is less than the setting point, the programmable output will be cut off. The default value is 11.2V.

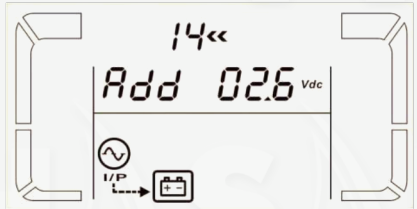
12: Hot standby function enable/disable

	Setting
	**Parameter 2: HS.H** Enable or disable Hot standby function. You may choose following two options in **Parameter 3:** **YES:** Hot standby function is enabled. It means that the current UPS is set to host of the hot standby function, and it will restart after AC recovery even without battery connected. **NO:** Hot standby function is disabled. The UPS is running at normal mode and can't restart without battery

13: Battery voltage adjustment

Interface	Setting
	**Parameter 2:** Select "**Add**" or "**Sub**" function to adjust battery voltage to real figure. **Parameter 3:** the voltage range is from 0V to 5.7V, the default value is 0V.

14: Charger voltage adjustment

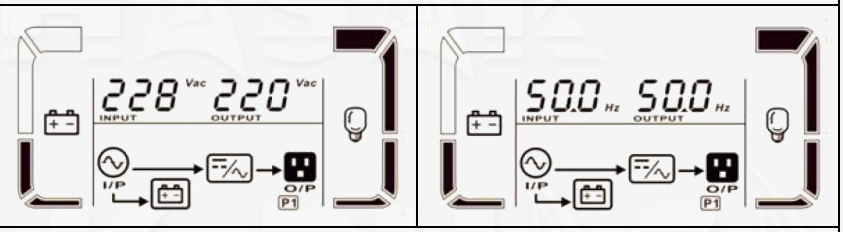
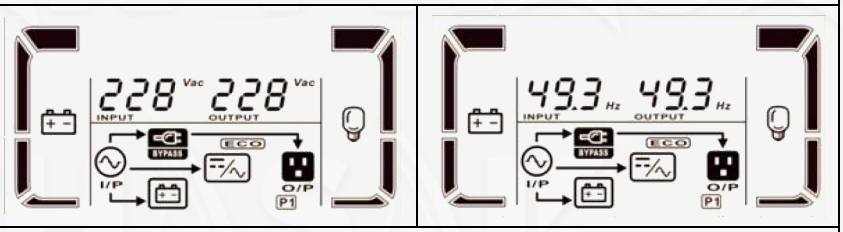
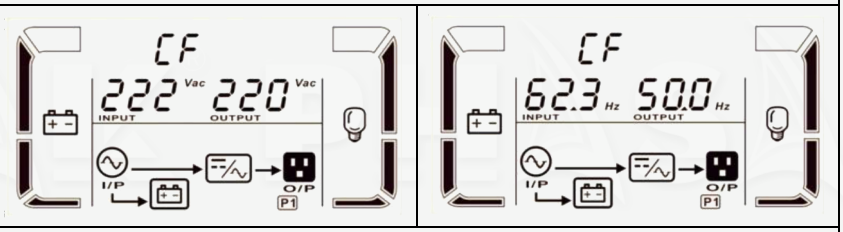
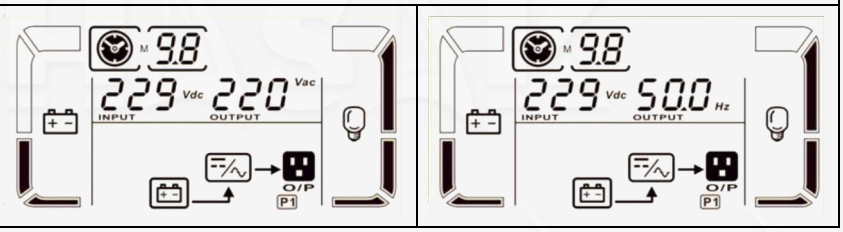
	Setting
	**Parameter 2:** you may choose **Add** or **Sub** to adjust charger voltage **Parameter 3:** the voltage range is from 0V to 9.9V, the default value is 0V. **NOTE:** *Before making voltage adjustment, be sure to disconnect all batteries first to get the accurate charger voltage. *We strongly suggest to use the default value (0). Any modification should be suitable to battery specifications.

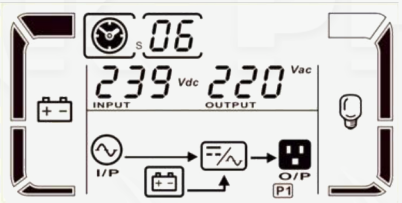
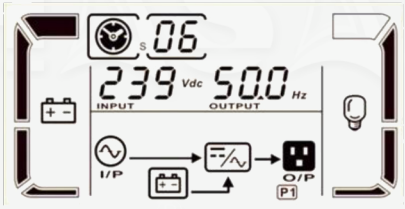
15: Output voltage adjustment

	Setting
	**Parameter 2:** you may choose **Add** or **Sub** to adjust inverter voltage **Parameter 3:** the voltage range is from 0V to 6.4V, the default value is 0V.

3.8 Operating Mode/Status Description

If parallel UPS systems are successfully set up, it will show one more screen with “PAR” in parameter 2 and be assigned number in parameter 3 as below parallel screen diagram. The master UPS will be default assigned as “001” and slave UPSs will be assigned as either “002” or “003”. The assigned numbers may be changed dynamically in the operation;

Operating mode/status		
AC mode	Description	When the input voltage is within acceptable range, UPS will provide pure and stable AC power to output. The UPS will also charge the battery at AC mode.
	LCD display	
ECO mode	Description	When the input voltage is within voltage regulation range and ECO mode is enabled, UPS will bypass voltage to output for energy saving.
	LCD display	
CVCF mode	Description	When input frequency is within 46 to 64Hz, the UPS can be set at a constant output frequency, 50 Hz or 60 Hz. The UPS will still charge battery under this mode.
	LCD display	
Battery mode	Description	When the input voltage is beyond the acceptable range or power failure, UPS will backup power from battery and alarm will beep every 4 seconds.
	LCD display	

<table>
<tr><td rowspan="2">Bypass mode</td><td>Description</td><td colspan="2">When input voltage is within acceptable range and bypass is enabled, turn off the UPS and it will enter Bypass mode. Alarm beeps every two minutes.</td></tr>
<tr><td>LCD display</td><td> 
</td><td> 
</td></tr>
<tr><td rowspan="2">Battery Test</td><td>Description</td><td colspan="2">When UPS is in AC mode or CVCF mode, press “Test” key for more than 0.5s. Then the UPS will beep once and start “Battery Test”. The line between I/P and inverter icons will blink to remind users. This operation is used to check the battery status.</td></tr>
<tr><td>LCD display</td><td> 
</td><td> 
</td></tr>
<tr><td rowspan="2">Fault status</td><td>Description</td><td colspan="2">When UPS has fault happened, it will display fault messages in LCD panel.</td></tr>
<tr><td>LCD display</td><td> 
</td><td> 
</td></tr>
</table>

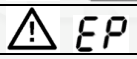
3.9 Operating Mode/Status Description

The UPS system uses fault codes and icons to indicate errors. Below is a table of fault events and their corresponding codes and icons:

Fault Event	Fault Code	Icon
Bus start failure	01	None
Bus over	02	None
Bus under	03	None
Bus unbalance	04	None
Inverter soft start failure	11	None
High inverter voltage	12	None
Low inverter voltage	13	None
Inverter output short-circuited	14	

Negative power fault	1A	None
Battery SCR short-circuited	21	None
Inverter relay short-circuited	24	None
Parallel communication failure	35	None
Parallel output current unbalance	36	None
Over temperature	41	None
CPU communication failure	42	None
Overload	43	

3.10 Warning Indicator

Warning	I con (flashing)	Alarm
Battery low		Beeping every second
Overload		Beeping twice every second
Battery unconnected		Beeping every second
Over charge		Beeping every second
EPO enable		Beeping every second
Fan failure/Over temperature		Beeping every second
Charger failure		Beeping every second
I/P fuse broken		Beeping every second
Overload 3 times in 30min		Beeping every second
Parallel Protection		Beeping every second

Reference	PH 9260	PH 9270
Power	6000 VA / 5400 W	10000 VA / 10000 W
Power Factor	0.9	1
Input		
Low Line Transfer	160Vac / 140Vac / 120Vac / 110 Vac ± 5 %	110 VAC ± 3 % @ 50% de carga; 176 VAC ± 3 % @ 1 00% de carga
Low Line Comeback	175 VAC ± 5 % ou 85 VAC ± 5 %	Low voltage line+ 10V
High Line Transfer	300 VAC ± 5 % ou 150 VAC ± 5 %	300 VAC ± 3 %
High Line Comeback	290 VAC ± 5 % ou 145 VAC ± 5 %	High voltage line - 1 av
Frequency Range	46Hz - 54 Hz	46Hz - 54 Hz @ 50Hz 56Hz - 64 Hz @ 60Hz
Phase	Single phase + neutral	
Power Factor	≥ 0.99@ 220-230 VAC o 110-120 VAC	
Output		
Rated Voltage	208/220/230/240VAC	
AC voltage regulation (Batt.)	± 1%	
Frequency range (Sync.)	47 - 53 Hz o 57 - 63 Hz	46Hz - 54 Hz @ 50Hz system 56Hz - 64 Hz @ 60Hz system
Frequency range (Batt.)	50 Hz± 0.25 Hz o 60Hz ± 0.3 Hz	50 Hz± 0.1 Hz o 60Hz ± 0.1 Hz
Overload	Online Mode: 105%~110% Alert, bypass mode in 10m 110%~130% Alert, Bypass mode in 1m <130% Alert, Bypass mode in 3s Battery Mode: 105%~110% Alert, shutdown in 10m 110%~130% Alert, shutdown in 1m <130% Alert, shutdown in 3s Bypass Mode: 110%~120% Alert, shutdown in 30m 120%~130% Alert, shutdown in 10m <130% Alert, shutdown in 1m	
Current Crest Ratio	3:1 (Max)	
Harmonic distortion	≦ 3 % THD (linear load); ≦ 6 % THD (no line load)	
Transfer time (AC / BYPASS)	Cero / 0 ms (Typical)	Cero / 10 ms (Typical)
Waveform (Bat.)	Pure Sine	
Efficiency AC / Battery Mode	90 % / 85 %	90 % / 85 %
Battery		
Quantity / Type / No.	16x 12V / 9Ah	20x 12V / 9Ah
Charging time (90%)	4 h	4 h
Charging Current / Voltage	1A / 218.4 VDC ±1%	4A / 136.5 VDC ±1%
Indicators		
Display / Alarmas	LCD / Battery mode, low battery, overload, internal fault	
Characteristics		
Dimensions (WxHxD)	190 x 369 x 688	250 x 571 x 560
Weight (Kg)	61.0	83.0
Operating humidity	20 – 90% no condensation	> 95% no condensation
Noise level	0 - 40°C	
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