USER MANUAL

PowerValue 11 RT G2 IN

6-10 kVA

Safety symbols and warning

The following symbols are used in this manual, the list below explains each symbol.

	This symbol in conjunction with the signal word “DANGER” indicates an imminent electrical hazard. Failure to observe the related safety note may cause injury, death or equipment damage.
	This symbol in conjunction with the signal word “WARNING” indicates a potentially dangerous situation. Failure to observe may cause injury, death or equipment damage.
	This symbol in conjunction with the signal word “NOTE” indicates operator tips or particularly useful or important information for the use of the product. This symbol and wording do not indicate a dangerous situation.
	This symbol indicates that reading the instruction manual/booklet before starting work or before operating equipment or machinery is compulsory.
	Recycle
	Do not dispose of with ordinary trash.

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1. Important safety instructions

Read this important safety instruction chapter before reading the operating manual

1.1 Operator precautions

Always follow the precautions and instructions described in this manual. Any deviations from the instructions may result in electric shock or cause accidental load loss.

ABB does not take any responsibility for damages caused through incorrect use of the UPS system.

DANGER!	
	Do not remove any screws from the UPS system or from the battery cabinet: danger of electrical shock.
	High fault currents (leakage currents). Before connecting the mains, ensure that the UPS is earthed!
	Display a warning label on all primary power isolators installed away from the UPS area to warn electrical maintenance personnel that the circuit feeds a UPS. Make sure that warning label contains the following text or equivalent: "Isolate the UPS (uninterruptible power supply) before working on this circuit."

1.2 Environmental considerations

To operate the UPS with optimal efficiency, your installation site should meet the environmental parameters outlined in this user manual. Excessive amounts of dust or moisture in the operating environment may cause damage or lead to malfunction. The UPS should always be protected from the weather and sunshine. The operating environment must meet the weight, airflow, size and clearance requirements specified in the technical datasheet.

Under no circumstances should the UPS be installed in an airtight room, in the presence of flammable gases, or in an environment exceeding the environmental requirements specified below. An ambient temperature of +20°C to +25°C is recommended to achieve a long life of the UPS and batteries. The cooling air entering the UPS must not exceed +40 °C and the humidity should be below 95 percent (non-condensing).

1.3 Declaration of safety conformity and CE marking

The **PowerValue 11 RT G2 IN 6-10 kVA** is designed, manufactured and commercialized in accordance with the **EN ISO 9001** standard relating to quality management systems.

These products conform with the following directives:

- 2014/35/EU Low voltage directive
- 2014/30/EU Electromagnetic Compatibility directive (EMC)
- 2011/65/EU Restriction of the use of certain hazardous substances (RoHS) directive

These products also meet the following product standards:

Table 1: Standards

	Product standards
Safety	IEC/EN 62040-1:2008+A1:2013
EMC	IEC/EN 62040-2:2006
Performance	IEC/EN 62040-3
ESD	IEC 61000-4-2: Level 3
Radiated field	IEC 61000-4-3: Level 3
EFT	IEC 61000-4-4: Level 4
Fast transients	IEC 61000-4-5: Level 4
Electromagnetic field	IEC 61000-4-6: Level 3
Conducted magnetic field	IEC 61000-4-8: Level 4
RoHS	IEC/EN50581:2012

1.4 Inquiries

Inquiries regarding the UPS should be addressed to the local ABB office or agent authorized by ABB. Note the type code and the serial number of the equipment before contacting ABB or authorized agent. The serial number is shown on the nameplate of the product. For further information on troubleshooting, see Chapter 6.

1.5 Operation

WARNING!

Do not disconnect the mains cable from the UPS or the building wiring socket during operation as this removes the ground from the UPS and all connected loads.

NOTE!

Press the off button to fully disconnect the UPS. Ensure the UPS is on bypass or on standby mode before disconnecting it from the mains.

NOTE!

To reduce the risk of fire, connect the UPS to a circuit provided with branch circuit protection with an ampere rating in accordance with the IEC/EN 60934 standard or your local electrical code.

See technical specifications for recommendations.

WARNING!

Indiscriminate operation of switches may cause output loss or damage to equipment.

WARNING!

Never dispose of batteries in a fire as they may explode.

WARNING!

Do not open or damage the batteries.

WARNING!

Released electrolyte is harmful to the skin and eyes.

2. Maintenance

PowerValue 11 RT G2 IN 6-10 kVA UPS requires only
minimal maintenance.

Charge the UPS regularly to maximize the expected life of the battery. When connected to mains power, the UPS charges the batteries and prevents the batteries from overcharging and over-discharging.

- Replace the batteries when the battery service life has been exceeded (around three to five years at 25 °C ambient temperature). Contact your local ABB or an agent authorized by ABB for replacements.
- Charge the UPS once every four to six months if it is not used regularly.
- In high-temperature regions, charge and discharge the battery every two months. The standard charging time should be at least 12 hours.
- Replace the battery when the discharge time is less than 50 percent of specified after fully charging. Check the battery connection or contact your local dealer to order a new battery.

DANGER!

Components inside the UPS are connected to the battery even when the UPS is disconnected from the mains power supply.

DANGER!

Disconnect the batteries before carrying out any kind of service and/or maintenance. Verify that no current is present, and no hazardous voltage exists in the capacitor or bus capacitor terminals.

DANGER!

The battery circuit is not isolated from the input voltage. Hazardous voltages may occur between the battery terminals and the ground. Verify that no voltage is present before servicing.

DANGER!

A battery can present a risk of electrical shock and high short-circuit current. The following precautions should be observed when working on batteries:

- Remove watches, rings or other metal objects
- Make use of proper ppe (personal protection equipment) as per local policies and rules
  - Wear flame/arc resistant whole body clothing
  - Wear suitable voltage rated gloves
  - Use safety dielectric footwear
  - Wear arc flash face shield
  - Use voltage rated tools
- Do not lay tools or metal parts on top of batteries
- Disconnect the charging source prior to connecting or disconnecting battery terminals.

WARNING!

Replace batteries with the same number and same type of batteries.

WARNING!

Replace fuses only with fuses of the same type and of the same amperage to avoid fire hazards.

2.1 UPS disposal and recycling

2 .1 .1 For professional users in the European Union

The crossed - out wheeled bin symbol on the product(s) and / or accompanying documents means that used electrical and electronic equipment (WEEE) should not be mixed with general household waste.

If you wish to discard electrical and electronic equipment (EEE), please contact your dealer or supplier for further information.

Disposing of this product correctly will help save valuable resources and prevent any potential negative effects on human health and the environment, which could otherwise arise from inappropriate waste handling.

2 .1 .2 For disposal in countries outside of the European Union

The crossed - out wheeled bin symbol is only valid in the European Union (EU) and means that used electrical and electronic equipment (WEEE) should not be mixed with general household waste.
If you wish to discard this product, please contact your local authorities or dealer and ask for the correct method of disposal.

Disposing of this product correctly will help save valuable resources and prevent any potential negative effects on human health and the environment, which could otherwise arise from inappropriate waste handling.

3. Installation

3 .1 Delivery, transportation, positioning and storage

3 .1 .1 Receipt of the UPS and visual inspection
When receiving the UPS, carefully examine the packing container and the UPS for any signs of physical damage. In case of damage, notify the carrier immediately.

The packing container of the UPS protects it from mechanical and environmental damage.
To increase protection, the UPS is wrapped in a plastic sheet. Keep the packaging for later re-use.

3 .1 .2 Unpacking list
After examining the package, open the box and check the following items are included:

- 1 x PowerValue 11 RT G2 IN UPS
- 1 x user manual
- 2 x UPS stands (support)
- 4 x M4 round screw (UPS stands)
- EPO contactor
- Dry contactor
- 1 x OVCD Box
- 1 x USB flash driver
- 1 x 15-pin communication cable (for parallel systems)
- RS232 cable
- 1 x USB cable

Rack-mounting accessories (full rack-mounting kit can be purchased separately):
- 2 x 90° rack mounting brackets
- 4 x M6 clip nuts
- 12 x M6 screws
- 4 x M4 screws

Examine the UPS for any signs of damage and ensure that the received UPS corresponds to the material indicated in the delivery note. Notify your carrier or supplier immediately in case of any damage.

3.1.3 Storage of UPS
If you plan to store the UPS prior to use, keep it in a dry, clean and cool storage room with an ambient temperature between -15°C to +60°C and humidity of less than 95 percent (non-condensing). If the packing container has been removed, protect the UPS from dust. Always keep the UPS in an upright position and do not drop.

3.2 Site planning and positioning

3.2.1 Planning before the installation
To ensure a long service life, install the unit in a position where any danger to the UPS is minimized:

- Install the UPS indoors.
- Leave 50 cm of space on each side of the cabinet to allow cooling airflow and ensure that the circulation of air to the ventilation slits is not obstructed.
- Avoid excessively high temperatures and excessive moisture.
- Make sure that the surface is solid and flat.

3.2.2 Positioning
PowerValue 11 RT G2 IN can be mounted in a rack or installed in a standalone configuration.

WARNING!

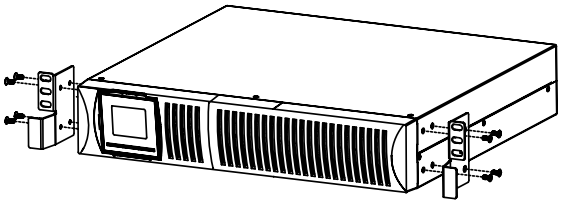
Water condensation may occur if the UPS is unpacked in a very low temperature. To avoid hazards and risk of electric shock, wait until the UPS is fully dry both inside and outside before installing / using the UPS.

3.2.3 Rack mount installation

3.2.3.1 UPS

Note that you need a rack-mounting kit (purchased separately) for this operation. This procedure is suitable for 19-inch rack cabinet installation with a minimum depth of 800 mm. Identify the final position and keep 2U spacing for this installation.

1. Install the ear bracket onto the unit using the M4 flathead screws (figure 1).
2. Slide the unit into the rail kit and make sure to tighten the rack-mounting screw (figure 3).
   If installing additional UPS units, repeat the steps above for each cabinet.



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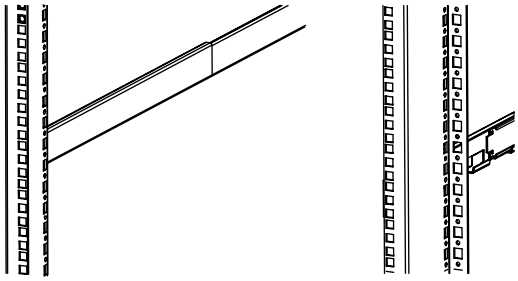
01
Ear bracket



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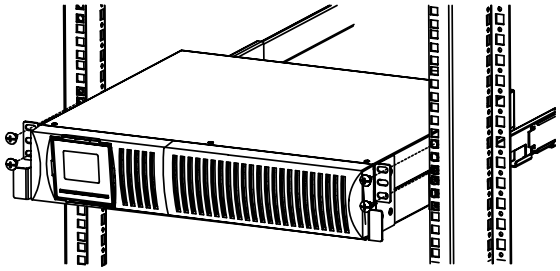
02
Rack rails



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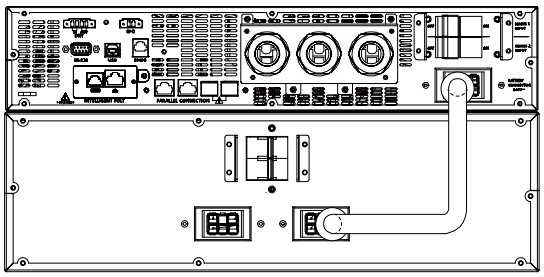
03
Rack mount installation

3.2.3.2 External battery modules

Identify the final position and keep 3U spacing for this installation; it is recommended that this spacing is provided below the UPS.

1. Install the ear bracket onto the unit with the flathead M4 screw. (figure 1).
2. Slide the unit into the rail kit and make sure to tighten the rack-mounting screw (figure 3).
3. Connect the EBM to the UPS with the battery power cable (figure 4).



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04
Battery module connection

NOTE!

Up to four external battery enclosures can be connected to the UPS in the same way as shown above.

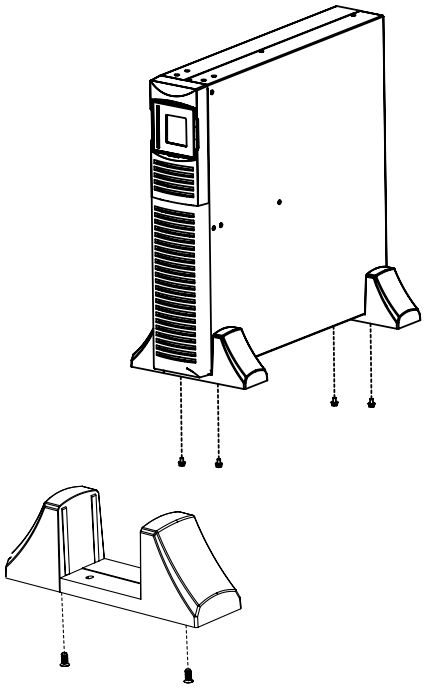
NOTE!

After connecting the battery enclosures, configure the number of battery modules in the control panel (for more information see chapter 4.6.7). See appendix C for further details.

3.2.4 Standalone / tower installation

3.2.4.1 UPS

1. Set up the stabilizer bracket then put the unit into the stabilizer bracket.(figure 5).



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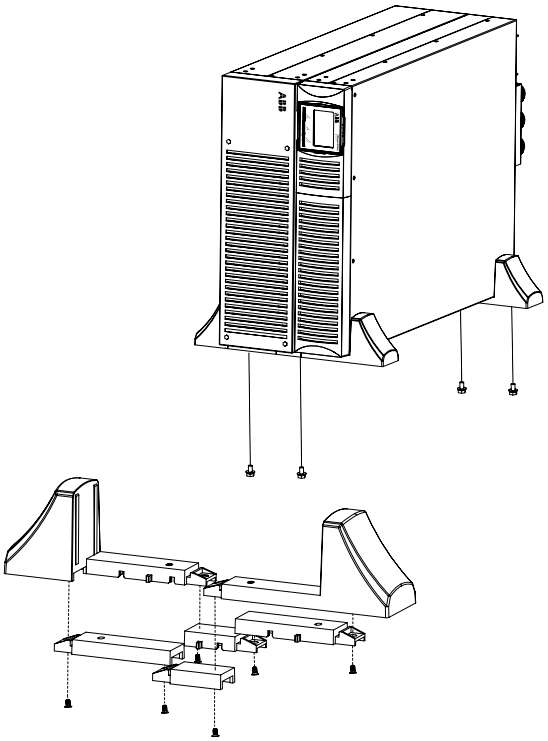
05
Display rotation

3.2.4.2 External battery modules

1. Set up the extension plate as below and install it on the UPS stabilizer bracket.
2. Install the UPS and EBM individually into the stabilizer bracket.
3. Connect to the UPS with the battery power cable (refer to rack position installation).



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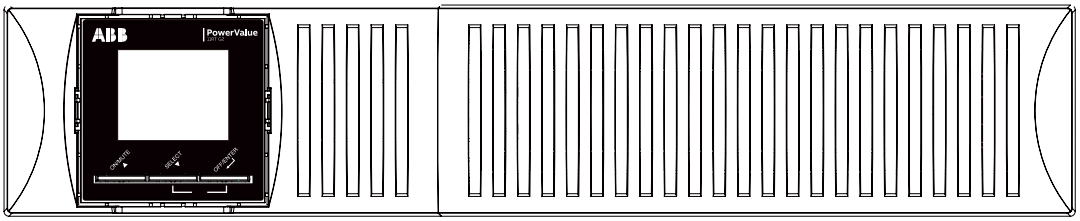
06
Stabilizer bracket for external battery module

Note:
It is recommended that this unit be installed to UPS's righthand side.
If installing an additional unit, place it next to the previous unit.

3.3 General characteristics

3.3.1 UPS front panel

Figure 8 shows the front panel of the UPS.



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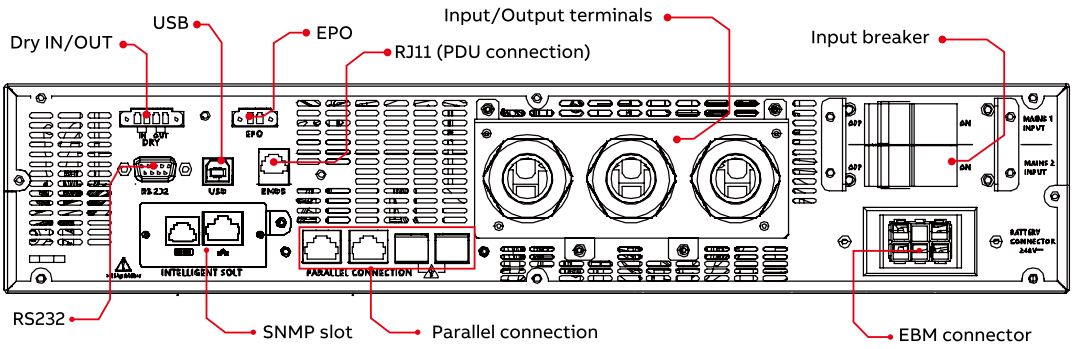
08
UPS front panel

3.3.2 UPS rear panel

The figures below show the connectors and ports in the UPS and external battery module rear panel.



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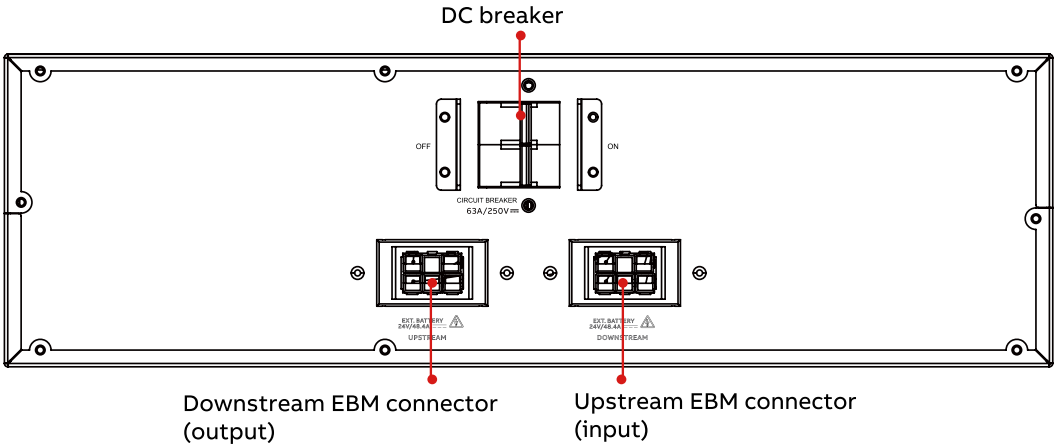
09
UPS rear view



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External battery module rear view

3.4 Electrical installation

33.4.1 Commissioning

The commissioning of the UPS includes the connection of the UPS and batteries, the verification of the electrical installation and operating environment of the UPS, the controlled start-up and testing of the UPS, and customer training.

WARNING!

Do not operate in case of presence of water or moisture.

DANGER!

When opening or removing the UPS covers you are exposed to dangerous voltages.

3.4.2 Recommended cable sections and fuse ratings

When selecting the cable cross-sections and the protective devices, follow the recommendations in the technical specifications document or follow local standards.

DANGER!

To reduce the risk of fire, the unit should only connect to a circuit provided with branch circuit overcurrent protection for:

- D curve 63 A rating (upstream circuit), for 6kva models,
- D curve 80 A rating (upstream circuit), for 10kva models

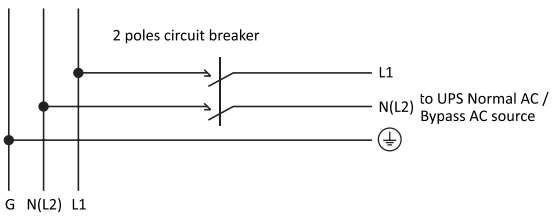


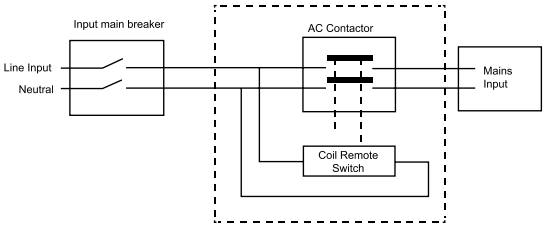
Table 4: Recommended cable cross-sections

Model	6K	10K
Protective earthing conductor (min. cross-section)	10 mm^2 (8 AWG)	16 mm^2 (6 AWG)
Input L, N, G (min. conductor cross-section)	10 mm^2 (8 AWG)	16 mm^2 (6 AWG)
Input fuse	63 A	80 A
Output L,N, (min. conductor cross-section)	10 mm^2 (8 AWG)	16 mm^2 (6 AWG)

DANGER!

Risk of backfeed voltage. Isolate the UPS by installing an external isolating device between the mains input and the UPS.
Before working on this circuit, check for hazardous voltage.

ABB recommends that an external isolating device is installed between the mains input and UPS as shown in Figure 12 to protect against backfeed currents.



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12
External backfeed isolation

AC Contactor: 208-240 V, 63 A (PowerValue 11 RT G2 IN 6 kVA)
208-240 V, 80 A (PowerValue 11 RT G2 IN 10 kVA)

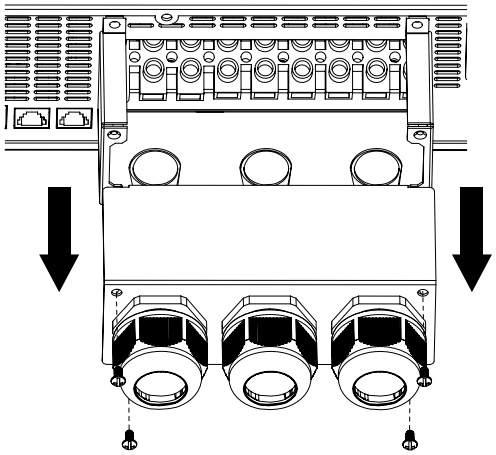
3.4.3 Connections

DANGER!

High leakage current:
Make sure that the earth wire is connected.
Common input/output sources connection

WARNING!

Before carrying out any connection, check that the upstream protection devices (Normal AC source and bypass AC sources) are open “0” (off).



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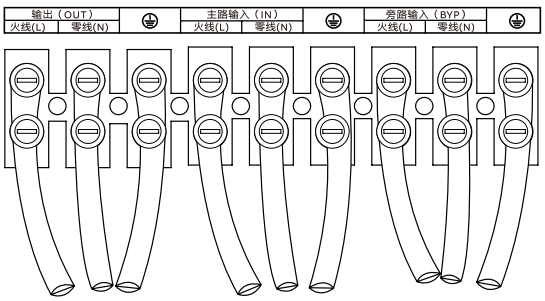
13
Terminal block cover

Connect the AC cable to the terminal blocks; refer to the indication on the rear panel.



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14
Terminal connections

Tie up the AC cable to the rear panel and re-install the cover of the terminal block.

3.4.4 External OVDC box connections

WARNING!

This Product design for IT system, can’t be used for life support applications where failure of this equipment can reasonably be expected to cause the failure of the life support equipment or to significantly affect its safety or effectiveness is not recommended.
Do not use this equipment in the presence of a flammable anesthetic mixture with air, oxygen or nitrous oxide.

WARNING!

Do not connect appliances or devices which would overload the OVCD box.

WARNING!

Do not install the OVCD near water or in moist environments.

WARNING!

If OVCD box has failed, please disconnect the input power, and contact with device supplier.

WARNING!

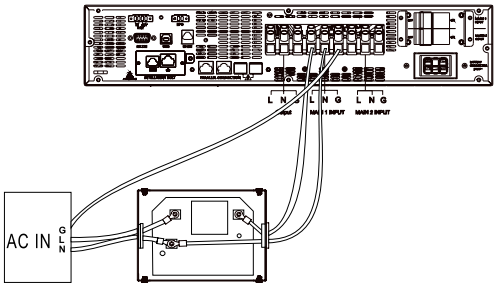
Please doesn’t use or store OVCD box in below conditions:

- Where near water, flammable anesthetic, corrosive material or in moist, environments.
- Where abnormal high or low temperature (over 40°C or under 0°C), or high humidity over 90%
- Where it would be exposed to direct sunlight or nearby heater.
- Where there's strong shock or vibration

WARNING!

In case of fire around the machine, please use the dry powder extinguisher. The use of a liquid fire extinguisher has the risk of causing an electric shock.

Connect UPS and OVDC box as shown in Figure 15.



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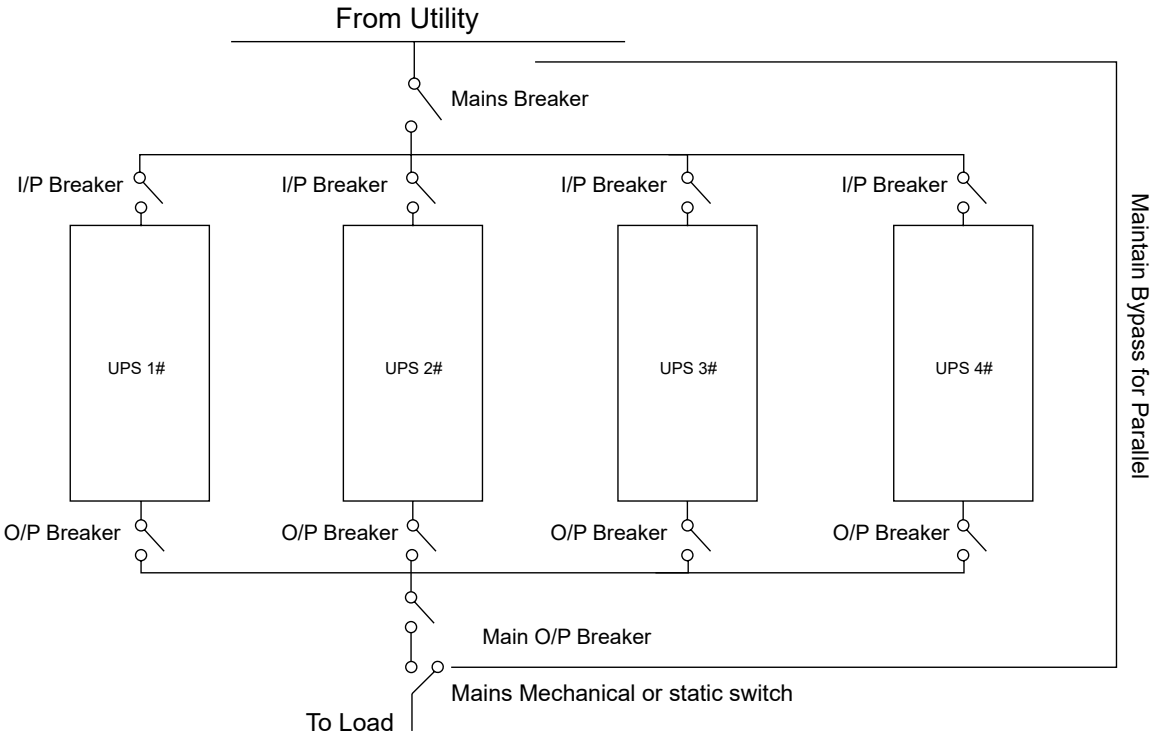
15
PDU terminal block access

3.4.5 Parallel installation operation

Up to four UPSs can be connected in parallel to configure a sharing and redundant output power.



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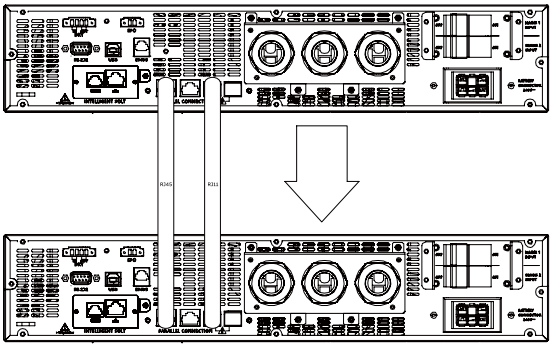
Parallel system installation diagram

How to install a new parallel UPS system:

1. Before installing a new parallel UPS system, prepare the input/output wires, breakers and a main maintenance mechanical switch or static switch.
2. Independent battery packs for each UPS.
3. Remove the cover plate from the parallel connection port on the UPS, connect each UPS one by one with a parallel connection cable and make sure the cable is screwed in tightly.



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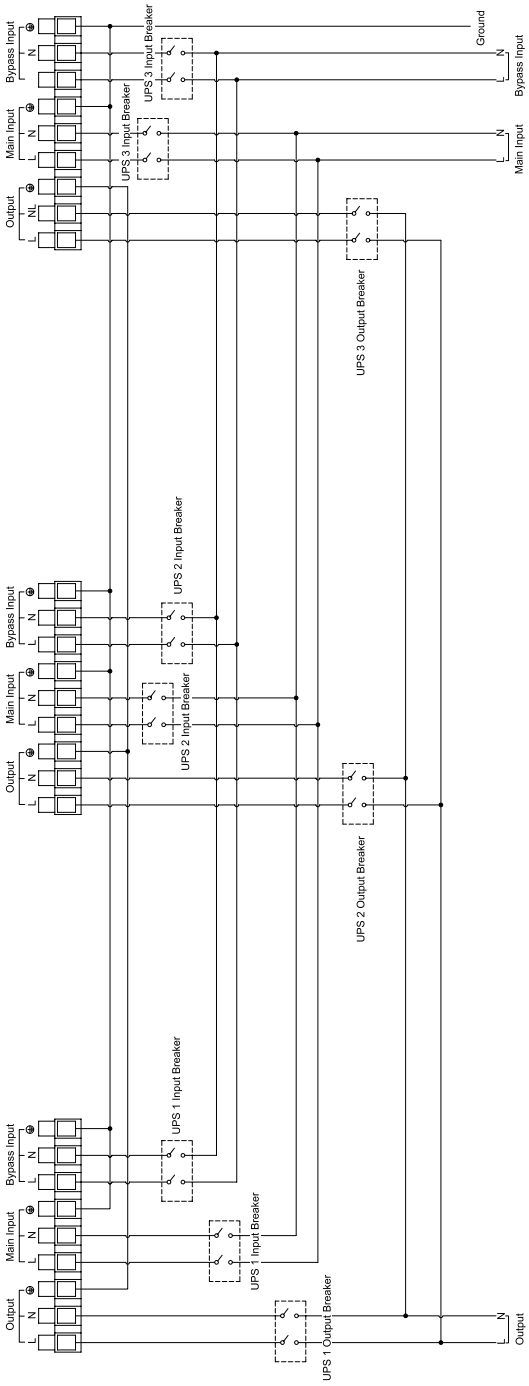
17
Parallel cable connection



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Parallel system wiring diagram

4. Connect the input and output wires and make sure all the breakers are turned off.
5. Turn on the input breakers for the parallel UPS.
6. Hold button for more than 1 s on one UPS in the system; the system will then switch to line mode.
7. Check the output voltage of each UPS separately and check if the difference in output voltage is less than 0.5 V among the units in the parallel system. If the difference is more than 0.5 V, the UPS need to be regulated.
8. If the difference in output voltage is less than 0.5 V, turn off the input breakers to let the UPS shut down. Then switch on the output breakers for all UPSs.
9. Switch on the input breakers for the parallel UPS. Hold button for more than 1 s on one UPS in the system; the system will then switch to line mode. After these operations, the system will work normally in parallel mode.

NOTE!

Wiring requirement:
1. If the distance between the UPS and breaker panel is less than 20 meters in a parallel system, the length difference between input and output cable of the UPS is required to be less than 20%.
2. If the distance between the UPS and breaker panel is more than 20 meters in a parallel system, the length difference between input and output cable of the UPS is required to be less than 5%.

How to add a new UPS to a parallel system:

1. Firstly, a main maintenance mechanical switch or static switch should be installed in the parallel system.
2. Regulate the output voltage of the new UPS: check if the output voltage difference between the new UPS and the parallel system is less than 0.5 V.
3. Ensure the bypass of the parallel system is normal and the auto bypass setting is at “enable,” then press the button to turn off the UPS, the UPS will switch to bypass mode.
4. Set the main maintenance switch or static switch from “UPS” to “BPS,” then switch off the main output breaker, input breaker and mains breaker. The UPS will then shut down.
5. Connect the cable and wire for the new UPS.
6. Switch on the input breakers and mains breaker and make sure that every UPS is in bypass mode.
7. Switch on the output breakers and main output breaker, transfer the main maintenance switch or static switch from “BPS” to “UPS”.
8. Press the button on one UPS - all the UPSs will turn on. The system will work in line mode.

How to remove a single UPS from a parallel system:

1. Firstly, a main maintenance mechanical switch or static switch should be installed on the parallel system.
2. Ensure the bypass is normal and the auto bypass setting is at “enable,” then press the button to turn off the UPS system and the UPS system will switch to bypass mode.
3. Transfer the main maintenance switch or static switch from “UPS” to “BPS,” then switch off the output breakers, input breakers and mains breaker in the parallel system. The UPS will then shut down.
4. Switch off the main output breaker and output breaker in the parallel system.
5. Remove the UPS of interest and disconnect cables/wires.
6. Switch on the mains breaker and input breaker of the reserve UPS, make sure the UPS is in bypass mode.
7. Switch on the output breaker and main output breaker.
8. Transfer the main maintenance switch or static switch from “BPS” to “UPS” and press the button to turn on the UPS, and the UPS will turn on in line mode.

How to remove all the UPSs from a parallel system:

1. Firstly, a main maintenance mechanical switch or static switch should be installed on the parallel system.
2. Ensure the bypass is normal and the auto bypass setting is set to “enable”. Press the button to turn off the UPS system, and the UPS system will switch to bypass mode.
3. Transfer the main maintenance switch or static switch from “UPS” to “BPS”, then switch off the output breakers, input breakers and mains breaker in the parallel system, and the UPS will shut down. The line will power the load via the maintenance mechanical switch or static switch.

4. Operation

This chapter describes how the UPS is operated through the LCD.

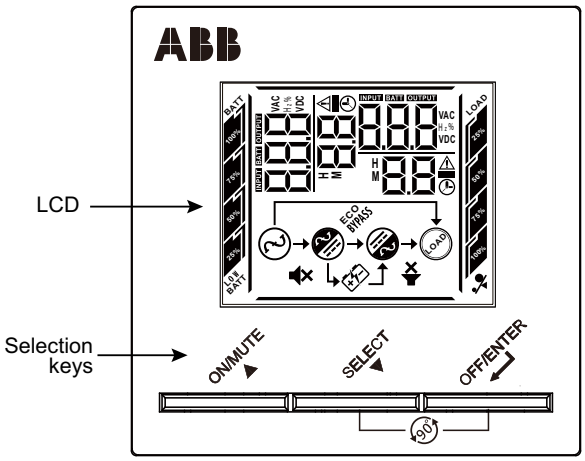
The user can:

- Operate the LCD
- Start up and shut down the UPS (excluding the commissioning start up)
- Operate additional SNMP adapters and their software

4 .1 Control panel

The user-friendly control panel has two parts:

- Selection keys
- Power management LCD (PMD)



4.1-1
Control panel

4.1.1 Selection keys

Table 2: UPS selection keys

Button	Function	Illustration
ON/MUTE ▲	ON/ Mute button	• Turn on the UPS: Press and hold ON/Mute button for at least 2 seconds to turn on the UPS. • Mute the alarm: When the UPS is on battery mode, press and hold this button for at least 5 seconds to disable or enable the alarm system. Not applicable to situations when warnings or errors occur. • Up key: Press this button to display previous selection in UPS settings mode. • Switch to UPS self-test mode: Press and hold ON/Mute button for 5 seconds to enter UPS self-testing while in AC mode, ECO mode, or converter mode.
OFF/ENTER ↵	OFF/ Enter button	• Turn off the UPS: Press and hold this button at least 2 seconds to turn off the UPS. UPS will be in standby mode under power normal or will transfer to bypass mode, if the bypass enable is set when this button is pressed. • Confirm selection key: Press this button to confirm selection in UPS settings mode.
SELECT ▼	Select button	• Switch LCD message: Press this button to change the LCD message for input voltage, input frequency, battery voltage, output voltage and output frequency. It will revert to default display after 10 seconds of no input. • Settings mode: Press and hold this button for 5 seconds to enter UPS settings mode when UPS is in standby mode or bypass mode. • Down key: Press this button to display next selection in UPS settings mode.
ON/MUTE ▲ SELECT ▼	ON/Mute + Select button	• Switch to bypass mode: When the main power is normal, press ON/Mute and select buttons simultaneously for 5 seconds. Then UPS will enter bypass mode. This action will be ineffective when the input voltage is out of acceptable range.
OFF/ENTER ↵ SELECT ▼	OFF/Enter + Select button	• Switch LCD screen 90°: Press Off/Enter and select buttons simultaneously 5 second. The UPS LCD screen will rotate 90°.

4.1 .2 LCD

The LCD shows an overview of the status of the UPS:

- Input
- Output
- Battery
- Load parameters
- Working mode
- Frequency
- Bypass presence

The LCD backlight automatically dims after two minutes of inactivity (except in cases of a UPS fault). Press any button to wake up the screen.

A buzzer indicates UPS status. Table 3 lists the buzzer status meanings.

Table 3: Definition of alarms

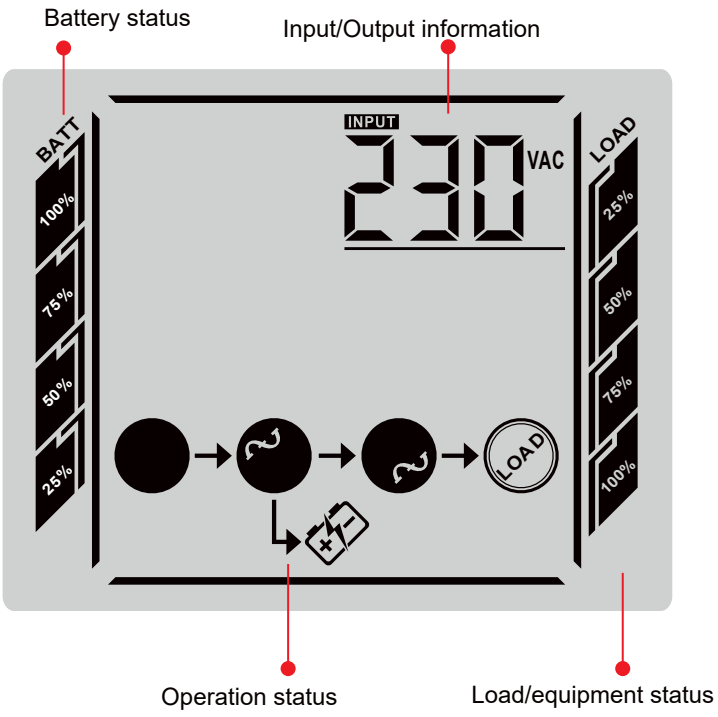
UPS condition	Buzzer status
Active fault	Continuous
Active warning	Beep every second
Battery	UPS on battery: Beep every 4 seconds Low battery: Buzzer beeps every second
Bypass	Beep every 10 minutes
Overload	Beep twice every second

When powering on, the LCD shows the UPS status. The UPS will also return to this default screen when no buttons have been pressed for 15 minutes.

The status screen shows the following information:

- Status summary, including operating mode and load information
- Alarm status, if present (including fault and warning information)
- Battery and charger status (including battery voltage, charge level and charger status)
- Current runtime information

For more information on how to use the LCD, see Chapter 4.4 and 4.6.

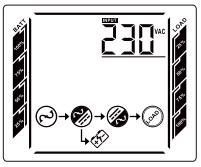
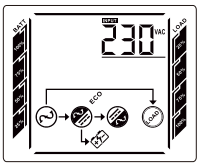
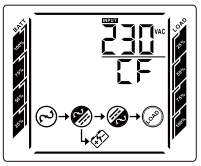
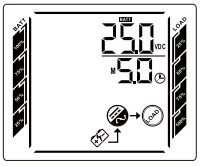
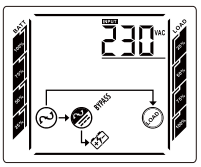
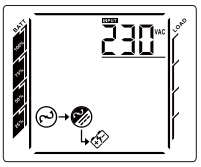
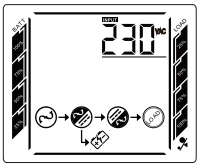
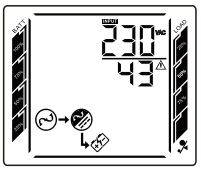
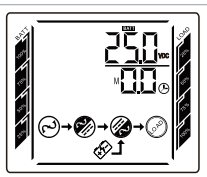


—
21
The default LCD

4 .2 Operating mode

The following table describes the UPS status information:

Table 4: Symbols in operating mode

Status	LCD Screen	Description
Online mode		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 in online mode.
ECO mode		Energy saving mode: When the input voltage is within voltage regulation range, UPS will bypass voltage to output for energy saving.
Frequency converter mode		When input frequency is within 40 Hz to 70 Hz, the UPS can be set at a constant output frequency, 50 Hz or 60 Hz. The UPS will still charge battery under this mode.
Battery mode		When the input voltage is beyond the acceptable range or power failure and alarm are sounding every 4 second, UPS will backup power from battery.
Bypass mode		When input voltage is within acceptable range but UPS is overloaded, UPS will enter bypass mode or bypass mode can be set from front panel. Alarm sounds every 10 seconds.
Standby mode		UPS is powered off and no output supply power, but still can charge batteries.
Overload warning		When the UPS is in overload, an alarm sounds twice every second. will flash. Disconnect unnecessary loads one by one to decrease the load. The load should be lower than 90 percent of its nominal power capacity in order to stop alarming.
Overload fault		When the UPS is in overload fault, an alarm sounds continuously. Overload icon will be on. At this time, UPS will stop operation and there is no output power on receptacles. Please check chapter 6.Troubleshooting to solve this problem.
Battery test		UPS is performing a battery test. → → will flash.

4.3 UPS start-up and shutdown

WARNING!

Switch off the connected loads before turning on the UPS. Switch on the loads one by one after the UPS is turned on. Switch off all of the connected loads before turning off the UPS.

NOTE!

The first time the UPS is started up, it must be connected to the utility.

4.3.1 UPS start-up

To start up the UPS with mains supply:

1. Check that all cables are securely and correctly connected.
2. Keep the power button pressed for longer than 1 second. The fans will activate and the UPS will load for a few seconds.
3. The UPS will perform a self-test and the LCD will show the default UPS status screen.

NOTE!

Bypass mode is enabled by default and can be configured through the user's settings (for more information, see table 10).

To start up the UPS without mains supply (cold start):

4. Check that all cables are securely and correctly connected.
5. Keep the power button pressed for longer than 1 second. The UPS will power on, the fans will activate and the LCD will turn on. The UPS will perform a self-test and show the default UPS status screen.
6. Keep the power button pressed for longer than 1 second. The alarm buzzer will sound for 1 second and the UPS will start up.
7. After a few seconds, the UPS transfers to battery mode. When the UPS is supplied with power from the mains, the UPS transfers to online mode without interrupting the UPS power output.

4.3.2 UPS shutdown

To shut down the UPS with mains supply:

1. If the UPS is working in bypass mode, go to step 3.
2. If the UPS is in online mode, keep the power button pressed for more than 3 seconds. The alarm buzzer will sound and the UPS will transfer to bypass mode.

DANGER!

The output is still energized.

3. Disconnect the mains power supply. The display will shut down and the output voltage will be removed from the UPS output terminal.
4. If the bypass has been disabled via the Settings menu, keep the power button pressed for longer than 3 seconds to shut down the UPS. The unit will transfer from online to standby mode. Disconnect the input power cable and the display will shut down.

To shut down the UPS without mains supply:

1. To power off the UPS, keep the power on/off button pressed for more than 3 seconds. The alarm buzzer will sound for 3 seconds and the output power will be immediately cut off.
2. The display will shut down and the output voltage will be removed from the UPS output terminal.

4.4 LCD wordings index

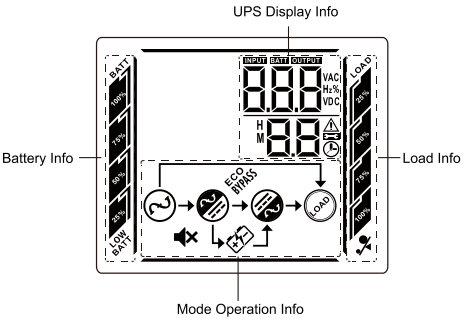
The following table describes the UPS status information:

Table 5: Symbols in operating mode

Abbreviation	Display content	Meaning
ENA	ENA	Enable
DIS	dIS	Disable
ESC	ESC	Escape
HLS	HLS	High loss
LLS	LLS	Low loss
CF	CF	Converter
TP	EP	Temperature
CH	CH	Charger fail
FU	FU	Bypass frequency unstable
EE	EE	EEPROM error
TON	tON	Input dry contact: UPS turn on
TOF	tOF	Input dry contact: UPS turn off
MBS	3bS	Input dry contact: Maintain bypass
SAL	SAL	Output dry contact: Summary alarm
BTA	btA	Output dry contact: Battery active
LBA	LbA	Output dry contact: Low battery active
UPN	UPn	Output dry contact: UPS normal
BSA	bSA	Output dry contact: Bypass active
CLR	CLr	Clear
RAC	rAC	Display type: Rack
TOE	tOE	Display type: Rower
ON	On	Output receptacle on
OFF	OFF	Output receptacle off

4.5 LCD panel

Rack display



Tower display

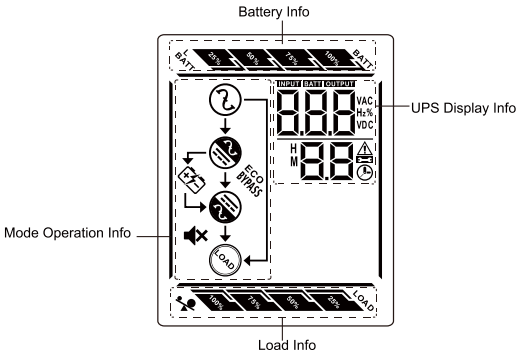


Table 6: Symbols in operating mode

Display	Function
	Indicates the remaining backup time in pie chart.
	Indicates the remaining backup time in numbers. H: hours, M: minutes, S: seconds
	Indicates warning and fault.
	Indicates the warning and fault code. Code details are listed in section 3.5.
	Indicates that the UPS alarm is disabled.
	Indicates the input voltage, frequency, output voltage, battery voltage, output current, battery capacity, load percent, output power, positive bus voltage, negative bus voltage, temperature, output receptacle 1, output receptacle 2.
	Indicates the load level: 0-25%, 26-50%, 51-75%, and 76-100%.
	Indicates overload.
	Indicates the UPS is connected to the mains.
	Indicates the battery is working.
BYPASS	Indicates the bypass circuit is working.
ECO	Indicates the ECO mode is enabled.
	Indicates the inverter circuit is working.
	Indicates the output is working.
	Indicates the battery level: 0-25%, 26-50%, 51-75%, and 76-100%.
LOW BATT	Indicates low battery level and low battery voltage.
	Indicates UPS is in settings mode.

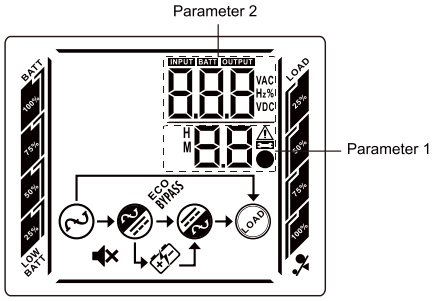
4.6 LCD settings

WARNING!

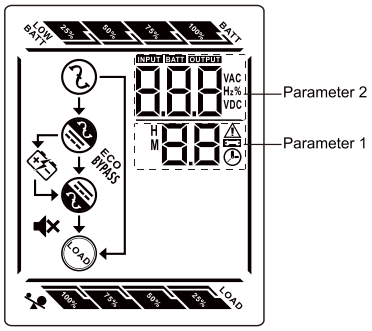
Changing UPS settings might adversely impact the load supply or load functionality.
It is recommended to disconnect the load before proceeding.

Press and hold select button for 5 seconds to enter UPS settings mode when UPS is in standby mode or bypass mode. Press and hold "Off/Enter" and "select" buttons for 5 seconds to switch LCD screen in rack or tower display.

Rack display

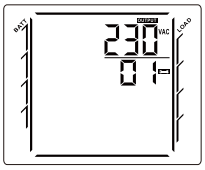


Tower display

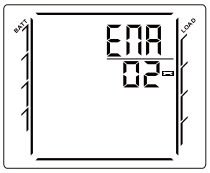


There are two parameters to set up the UPS.
Parameter 1: It's for program alternatives. Refer to below table.
Parameter 2: The setting options or values for each program.

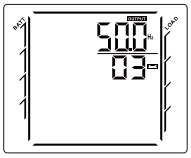
01: Output voltage setting

Interface	Settings
	**Parameter 1:** Output voltage Set up output voltage. You may choose the following output voltage: **208:** output voltage is 208 Vac **220:** output voltage is 220 Vac **230:** output voltage is 230 Vac (default) **240:** output voltage is 240 Vac

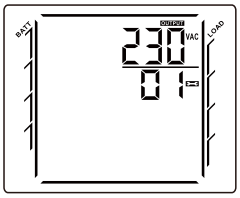
02: Frequency converter enable/disable

Interface	Settings
	**Parameter 1:** Enable or disable converter mode. You may choose from the following two options: **CF ENA:** converter mode enable **CF DIS:** converter mode disable (default)

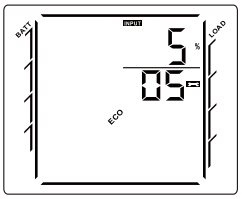
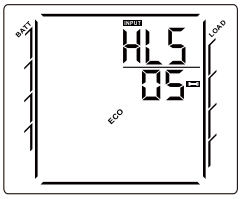
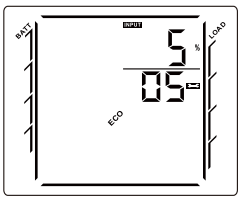
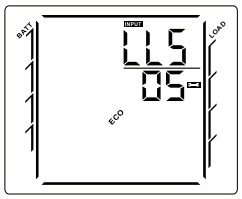
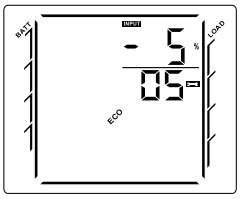
03: Output frequency settings

Interface	Settings
	**Parameter 1:** Output frequency setting. You may set the initial frequency on battery mode: **50:** output frequency is 50 Hz **60:** output frequency is 60 Hz If converter mode is enabled, you may choose from the following output frequency: **50:** output frequency is 50 Hz **60:** output frequency is 60 Hz

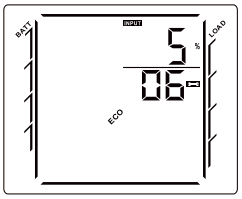
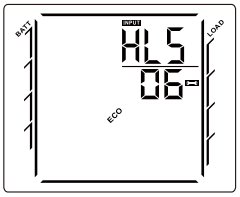
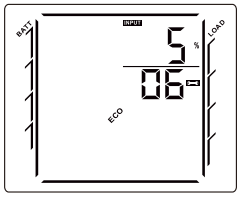
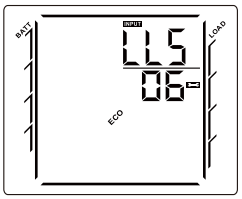
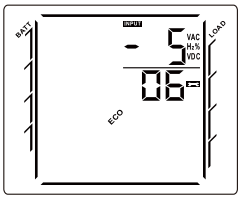
04: ECO enable/disable

Interface	Settings
	**Parameter 1:** Output voltage You may choose the following output voltage: **208:** presents output voltage is 208Vac **220:** presents output voltage is 220Vac **230:** presents output voltage is 230Vac (Default) **240:** presents output voltage is 240Vac

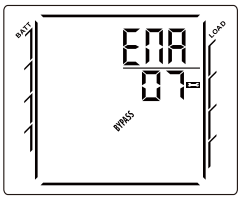
05: ECO voltage range settings

Interface	Settings
	**Parameter 1:** Set the acceptable high voltage point and low voltage point for ECO mode by pressing Down key or Up key.
 	**HLS:** High loss voltage in ECO mode in parameter 1. The setting range in parameter 2 is from 5% to 10% of the nominal voltage. (Default: 5%)
 	**LLS:** Low loss voltage in ECO mode The setting range in parameter 2 is from -5% to -10% of the nominal voltage. (Default: -5%)

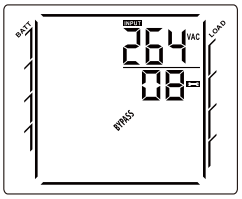
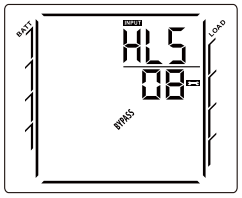
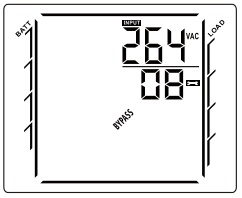
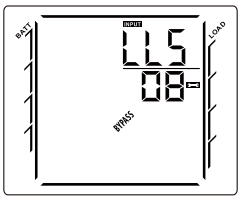
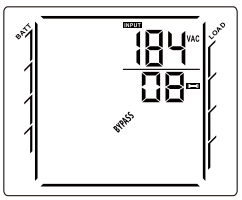
06: ECO frequency range settings

Interface	Settings
	**Parameter 1:** Set the acceptable high frequency point and low frequency point for ECO mode by pressing Down key or Up key
 	**HLS:** High loss frequency in ECO mode in parameter 1. The setting range in parameter 2 is from 5% to 10% of the nominal voltage. (Default: 5%)
 	**LLS:** Low loss frequency in ECO mode in parameter 1. The setting range in parameter 2 is from -5% to -10% of the nominal voltage. (Default: -5%)

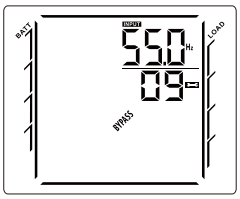
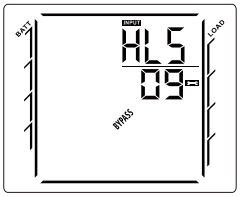
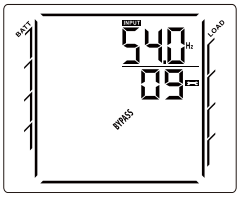
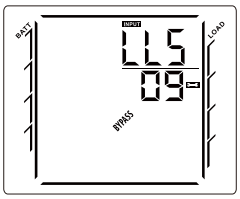
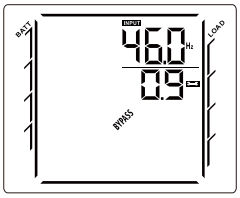
07: Bypass enable/disable when UPS is off

Interface	Settings
	**Parameter 1:** Enable or disable Bypass function. You may choose the following two options: **ENA:** Bypass enable **DIS:** Bypass disable (Default)

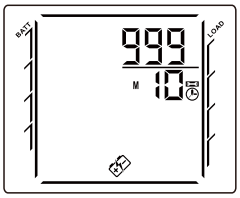
08: Bypass voltage range setting

Interface	Settings
	**Parameter 1:** Set the acceptable high voltage point and low voltage point for Bypass mode by pressing the Down key or Up key
 	**HLS:** Bypass high voltage point **245-276:** Sets the high voltage point in parameter 2 from 245 Vac to 276 Vac (Default: 264 Vac)
 	**LLS:** Bypass low voltage point **120-215:** Sets the low voltage point in parameter 2 from 120 Vac to 215 Vac (Default: 184 Vac)

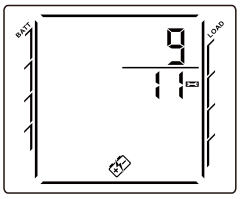
09: Bypass frequency range settings

Interface	Settings
	**Parameter 1:** Set the acceptable high frequency point and low voltage point for Bypass mode by pressing the Down key or Up key
 	**HLS:** Bypass high frequency point **51.0-54.0:** Setting the high frequency point in parameter 2 from 51.0 Hz to 54.0 Hz for 50 Hz system. (Default: 54.0 Hz) **61.0-64.0:** Setting the high frequency point in parameter 2 from 61.0 Hz to 64.0 Hz for 60 Hz system. (Default: 64.0 Hz)
 	**LLS:** Bypass low frequency point **46.0-49.0:** Setting the low frequency point in parameter 2 from 46.0 Hz to 49.0 Hz for 50 Hz system. (Default: 46.0 Hz) **56.0-59.0:** Setting the low frequency point in parameter 2 from 56.0 Hz to 59.0 Hz for 60 Hz system. (Default: 56.0 Hz)

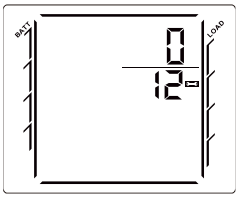
10: Autonomy limitation setting

Interface	Settings
	**Parameter 1:** Set up backup time on battery mode for output receptacles. **0-999:** setting the backup time in minutes from 0-999 for output receptacles on battery mode. **0:** When setting as “0”, the backup time will be only 10 seconds. **999:** When setting as “999”, the backup time setting will be disabled. (Default)

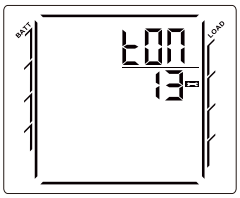
11: External battery AH

Interface	Settings
	**Parameter 1:** Set up external battery AH value of the UPS. (unit: AH) **7-999:** setting the external battery capacity from 7 to 999. Please set up this figure if external battery modules are connected. (Default: 20Ah)

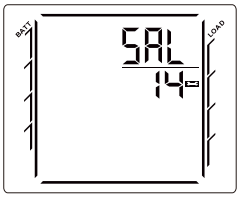
12: External battery module numbers

Interface	Settings
	**Parameter 1:** Set connected external battery module numbers. The setting range is from 0 to 9. (Default: 0)

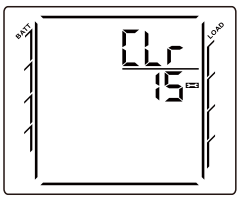
13: Input dry contact

Interface	Settings
	**Parameter 1:** Set input dry contact. **DIS:** Disable the function (Default) **TON:** UPS Turn On. **TOF:** UPS Turn Off. **MBS:** Maintain Bypass.

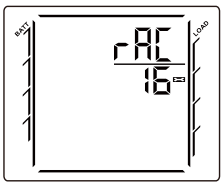
14: Output dry contact

Interface	Settings
	**Parameter 1:** Set output dry contact. **SAL:** Summary alarm (Default) **BTA:** Battery active **LBA:** Low battery **UPN:** UPS normal **BSA:** Bypass active

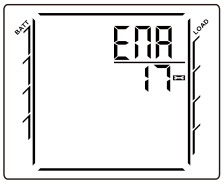
15: EPO

Interface	Settings
	**Parameter 1:** Clear EPO warning. EPO active, the UPS output is cut-off. To recover the normal status, EPO connector must first be closed. Enter this menu to clear the status of EPO. The UPS will stop alarming and will recover in Bypass-mode. Note that the UPS needs be turned on by manual operation.

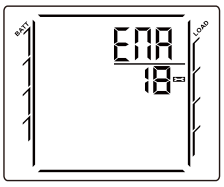
16: LCD display type

Interface	Settings
	**Parameter 1:** Set LCD display type. **RAC:** The LCD display type is Rack (Default) **TOE:** The LCD display type is Tower

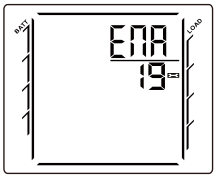
17: Audio alarm enable/disable

Interface	Settings
	**Parameter 1:** Set audio alarm **ENA:** Audio alarm enable (Default) **DIS:** Audio alarm disable

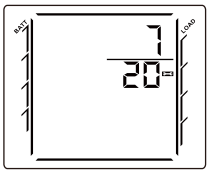
18: DC start enable/disable

Interface	Settings
	**Parameter 1:** Set DC start **ENA:** DC start enable (Default) **DIS:** DC start disable

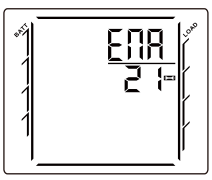
19: Ambient temperature warning

Interface	Settings
	**Parameter 1:** Set ambient temperature warning **ENA:** Ambient temperature warning enable (Default) **DIS:** Ambient temperature warning disable

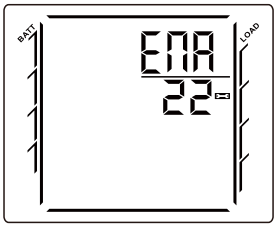
20: Automatic battery test

Interface	Settings
	**Parameter 1:** Set automatic battery test 0~31 days (Default: 7 days)

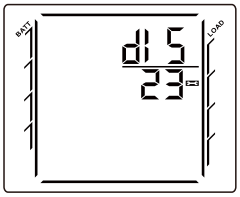
21: Auto restart

Interface	Settings
	**Parameter 1:** Set auto restart **ENA:** Auto restart enable (Default) **DIS:** Auto restart disable

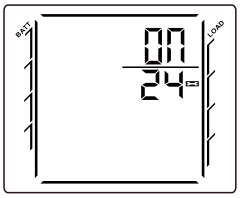
22: Automatic overload restart

Interface	Settings
	**Parameter 1:** Set automatic overload restart **ENA:** Automatic overload restart enable (Default) **DIS:** Automatic overload restart disable

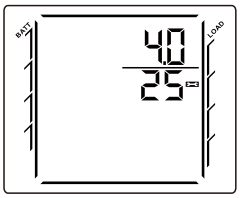
23: Short-circuit clearance

Interface	Settings
	**Parameter 1:** Set short-circuit clearance **ENA:** Short-circuit clearance enable **DIS:** Short-circuit clearance disable (Default)

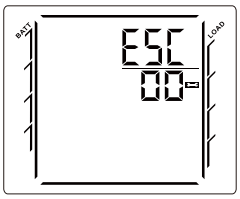
24: Outlet 1

Interface	Settings
	**Parameter 1:** Set Outlet 1 **ON:** Outlet 1 On (Default) **OFF:** Outlet 1 Off

25: Charging current setting

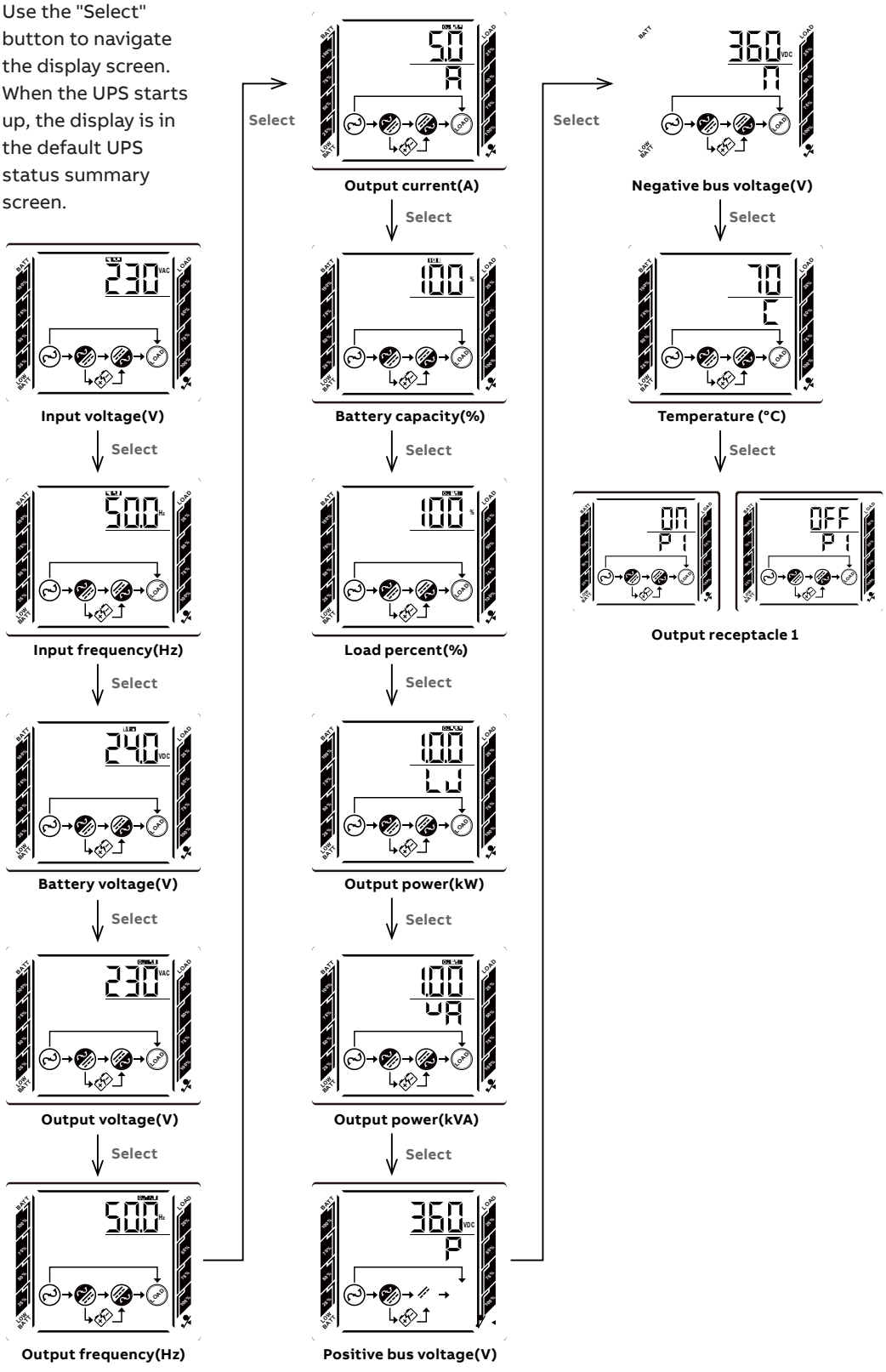
Interface	Settings
	**Parameter 1:** Set charging current for S model. You may choose the following charging current (1-12A, Step=1A): **1.0:** presents charging current is 1.0A **2.0:** presents charging current is 2.0A **4.0:** presents charging current is 4.0A (Default) **6.0:** presents charging current is 6.0A **8.0:** presents charging current is 8.0A **12.0:** presents charging current is 12.0A

00: Exit settings

Interface	Settings
	Exit settings.

4.7 LCD measurement functions

Use the "Select" button to navigate the display screen. When the UPS starts up, the display is in the default UPS status summary screen.



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4.7-1
Display measurement functions

5. Communication

A USB and an RS-232 port are available to enable communication between the UPS and a remote computer/ station. Only one communication port can be active at a time and priority is given to the USB port.

Once the communication cable is installed, the power management software can exchange information with the UPS. The software collects information from the UPS and indicates the status of the device, the power quality of the mains and the battery autonomy of the units.

If there is a power failure and a predicted shutdown of the UPS due to low battery autonomies, the monitoring system can save the load data and initiate shutdown of the equipment connected to the UPS.

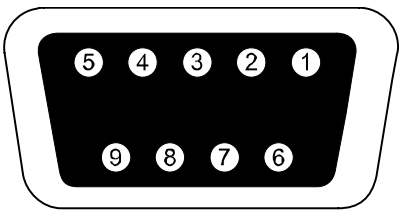
NOTE!

Lengths of cables shall not exceed 10 m
Keep routing of communication cables separated from mains supply AC and DC cables

5.1 RS-232 port

The UPS has an RS-232 port for UPS monitoring, control and firmware updates. To establish communication between the UPS and a computer, connect one end of the serial communication cable to the RS-232 port on the UPS and the other end to the RS-232 port of a computer.

The cable pins for the RS-232 communication port are described in Figure 5.1-1 and Table 7.



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5.1-1
RS-232 Communication Port (DB-9 Connector)

Table 7: Communication port pin assignment

PIN	Signal name	Function	Direction from UPS
2	TxD	Transmit to external device	Out
3	RxD	Receive from external device	in
5	GND	Signal common	-

5.2 USB port

The UPS can communicate with USB-compliant computers that run power management software. To establish communication between the UPS and a computer, connect the USB cable to the USB port on the UPS. Connect the other end of the cable to the USB port on a computer.

5.3 Emergency power off

The EPO connector can be used to block the output of the UPS in case of an emergency.
The EPO connector can be configured as Normally Closed (NC) or Normally Open (NO) through the USB or RS232 port.

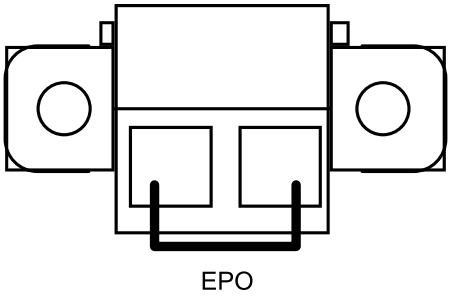
By default, the EPO connector is Normally Closed (NC) by a jumper in the rear panel. If the jumper is removed, the UPS output will not supply power to the load until the EPO status is changed. It’s necessary for UPS normal operation to change EPO connector to Normally closed status. Then, the EPO warning will clear and UPS will be back to Bypass mode. It’s necessary to turn on UPS manually.

5.3.1 Dry IN

Dry in allows a remote action to switch on/ switch off/ maintenance bypass the UPS. This is done by switching the contact from Opened to close.

5.3.2 Dry OUT

The dry out port is normally open. If the dry out port is closed, it indicates that the UPS is running in summary alarm / on battery / battery low / UPS ok / on bypass.



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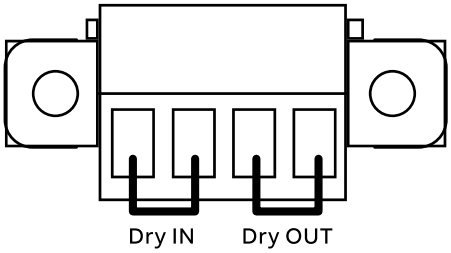
5.3-1
EPO (Emergency power off)



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5.3.2-1
Dry IN & OUT connector

5.4 Network management card (optional)

The PowerValue 11 RT G2 IN 1–3 kVA is equipped with an intelligent slot for optional cards for remote management of the UPS through the Internet/Intranet. Either of the following accessories can be installed in the intelligent slot:

- **SNMP/Modbus Card -** SNMP/Modbus, HTTP and monitoring capabilities through a Web browser interface.
- **AS400 Card -** AS400 card for AS400 communication protocol.

5.4.1 Installing a serial network management card (optional)

Each UPS has a communication slot for an optional serial network management protocol (SNMP/Modbus) card. After installing an SNMP/ Modbus card, an environmental monitoring probe can be connected.

NOTE!

The UPS does not have to be shuts down before installing a Communication card.

To install a network management card:

1. Remove the two screws that protect the communication slot of the UPS.
2. Insert the SNMP/Modbus card into the communication slot.
3. Screw the SNMP/Modbus card onto the slot using the screws removed in Step 1

For more information on the SNMP/Modbus Cards, see the SNMP/Modbus user's manual.

5.4.2 Monitoring software

The UPS can be monitored using software. The software provides a remote and safe shutdown for multi-client systems in case of absence of power at the UPS output. Instructions on how to install the software are provided with the network management cards.

For more information, contact your local supplier

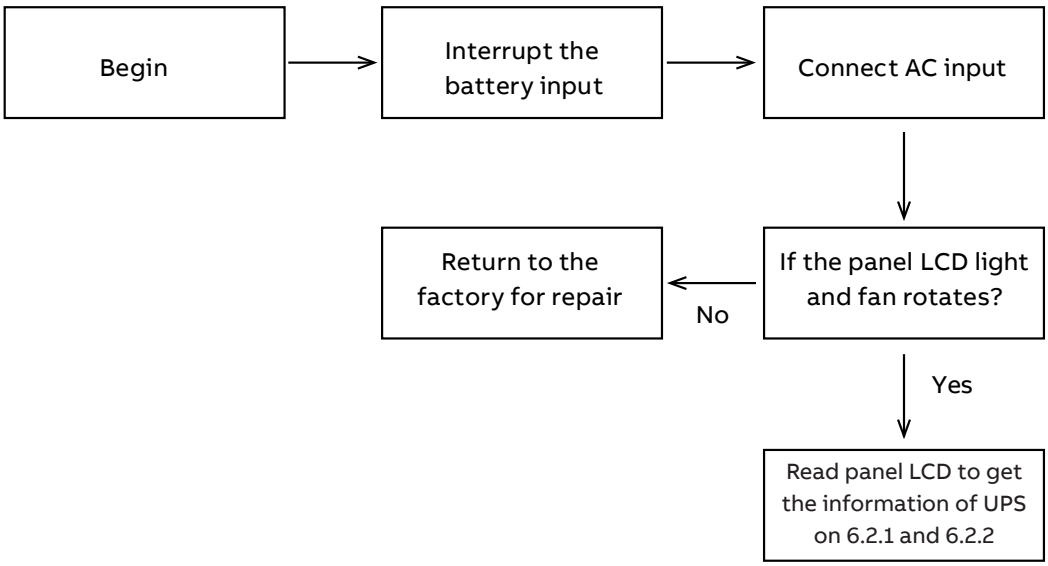
6. Troubleshooting

6.1 Fault identification and rectification

Alarms and events indicate warnings and notify of errors or potential failures in the system. The output of the UPS is not necessarily affected when an alarm arises but taking the correct actions may prevent loss of power to the load

6.2 Accessing alarms

Due to careful design and strict tests of our products, fail of UPS seldom occurs. However, once they do fail in some situations, please check them according to Troubleshooting Chart, which will help you solve the most problems on UPS.



6.2.1 Faults reference code

Fault event	Fault code	Icon
Bus start fail	01	X
Bus over	02	X
Bus under	03	X
Bus unbalance	04	X
Inverter soft start failure	11	X
Inverter voltage high	12	X
Inverter voltage low	13	X

Fault event	Fault code	Icon
Inverter output short	14	X
Battery voltage too high	27	X
Battery voltage too low	28	X
Over temperature	41	X
Overload	43	
Charger failure	45	X

6.2.2 Warning indicator

Warning	Icon (flashing)	Alarm
Low battery		Sounding every second
Overload		Sounding twice every second
Battery is not connected		Sounding every second
Over charge		Sounding every second
Over temperature		Sounding every second
Charger failure		Sounding every second
Battery fault		Sounding every second
Out of bypass voltage range		Sounding every second
Bypass frequency unstable		Sounding every second
EEPROM error		Sounding every second

Symptom	Possible cause	Remedy
No indication and alarm even though the mains is normal.	The AC input power is not connected well.	Check if input power cord is firmly connected to the mains.
	The AC input is connected to the UPS output.	Plug AC input power cord to AC input correctly.
The icon ⚠ and  flashing on LCD display and alarm is sounding every 2 seconds.	The external or internal battery is incorrectly connected.	Check if all batteries are connected well.
Fault code is shown as 27 and alarm is continuously sounding.	Battery voltage is too high or the charger is faulty.	Contact your dealer.
Fault code is shown as 28 and alarm is continuously sounding.	Battery voltage is too low or the charger is faulty.	Contact your dealer.
The icon ⚠ and  flashing on LCD and alarm is sounding twice every second.	UPS is overloaded.	Remove excess loads from UPS output.
	UPS is overloaded. Devices connected to the UPS are fed directly by the electrical network via the bypass.	Remove excess loads from UPS output first. Then shut down the UPS and restart it.
Fault code is shown as 43 and the icon  is lighting on LCD and alarm is continuously sounding.	The UPS shuts down automatically because of overload at the UPS output.	Remove excess loads from UPS output and restart it.
Fault code is shown as 14 and alarm is continuously sounding.	The UPS shuts down automatically because short-circuit has occurred on the UPS output.	Check output wiring and if connected devices are in short-circuit status.
Fault code is shown as 01, 02, 03, 04, 11, 12, 13, 41 and 45 on LCD and alarm is continuously sounding.	A UPS internal fault has occurred. There are two possible results: 1. The load is still supplied, but directly from AC power via bypass. 2. The load is no longer supplied by power.	Contact your dealer
Battery backup time is shorter than nominal value	Batteries are not fully charged	Charge the batteries for at least 5 hours and then check capacity. If the problem still persists, consult your dealer.
	Batteries defective.	Contact your dealer to replace the battery.

ABB India Helpline
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customers and channel partners.
Toll free: (BSNL) +91 1800 420 07 07

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