



WRL 3KVA Racked Type UPS

User Manual

Version 1.0; Release Date: February 2020



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(BS-EE, MS-EEE)



Introduction:

The UPS system operates with mains, battery or bypass power. It contains components that carry high currents and voltages. When installed correctly, the UPS system is grounded to earth and IP 20 rated against electrical shock and foreign objects.

This user manual contains guidelines to check delivery, install and commission the UPS and is intended for people who plan the installation, commission and use or service the UPS. The reader is expected to be familiar with the fundamentals of electricity, wiring, electrical components and electrical schematic symbols.

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Symbols Convention:

Safety instructions and general information that appears in this manual are described.



WARNING

Warning indicates the presence of a hazard which could result in severe injury and/or Serious damage to the system.



CAUTION

Caution indicates the presence of a hazard which could result in minor injury and/or damage to the product.



NOTE

Note indicates the presence of a hazard which could lead to property damage.



SAFETY WARNING

The symbol is used to alert the user to warnings, cautions and notes.



DANGER

The symbol is used to alert the user to the occurrence of electrical live parts with hazardous voltages.

1. Safety instructions:


1.1 Operator precautions:

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

Only the following user operations are permitted:


- Use of the LCD control panel (LCD Display) and Maintenance Bypass (if present).
- Start up and shut down of the UPS (excluding the commissioning start up).
- Operation of additional connectivity devices.

WRL does not take any responsibility for damages caused through incorrect manipulations of the UPS system.




DANGER

Do not remove any screws from the UPS system or from the battery cabinet: danger of electrical shock.




WARNING



DANGER

High fault currents (leakage currents).



WARNING

Before connecting the mains ensure that the UPS is grounded.

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 amount 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.
- Under no circumstances install the UPS 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% (non-condensing).

1.3 Operation:



CAUTION

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.



CAUTION

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



CAUTION

Press the off button to fully disconnect the UPS. Wait until the UPS is on bypass or on stand-by mode before disconnecting it from the mains.



CAUTION

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

2. Installation:

2.1 Delivery, transportation, positioning and storage:

2.1.1 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 your Resellers immediately.

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

2.1.2 Unpacking list:

After examining the package, open the carton box and remove the accessories:

- 4 x UPS support (feet)
- 1 x IEC C13-C14 cable
- 1 x AC cable (Schuko plug)
- 1 x USB cable
- 1 x 2 pin EPO connector
- 1 x 4 pin EPO connector
- 1 x monitoring software CD

Rack mounting accessories (full rack mounting kit to purchase separately):

- 2 x 90° rack mounting brackets
- 4 x M6 clip nuts
- 4 x M6 screws
- 8 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 Resellers immediately in case of any damage.

2.1.3 Storage of the UPS:

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

2.2 Site planning and positioning:


2.2.1 Planning before the installation:

Install the unit to a position where any danger to the UPS is minimized to ensure a long service life:

- Install the UPS indoors.
- Leave 25 cm of space on each side of the cabinet to enable cooling airflow and ensure that the circulation of air to the ventilation slits is not obstructed.
- Avoid excessively high temperature and excessive moisture.
- Make sure that the surface is solid and flat.

2.2.2 Positioning:

WRL RT UPS can be mounted in a rack or installed as a standalone configuration.

| | |
|-----------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  WARNING | Water condensing may occur if the UPS is unpacked in a very low temperature. In this case it is necessary to wait until the UPS is fully dried inside out before proceeding installation and use to avoid hazards and electric shock. |
|-----------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

2.2.3 Rack Mount Installation:

WRL RT UPS can be installed in a 19-inch rack.

Note that you need a rack mounting kit (purchased separately) for this operation.

1. Installing the UPS:

To install the UPS:

1. Align the rack mounting ears on the side of the UPS and tighten the screws.
2. Assemble the rack rails with the rack-mounting kit.
3. Slide the UPS into the rack rail and lock it into the structure.
4. Tighten the screws and then proceed with wiring of the UPS.

If installing additional UPS units, repeat the steps above for each cabinet.

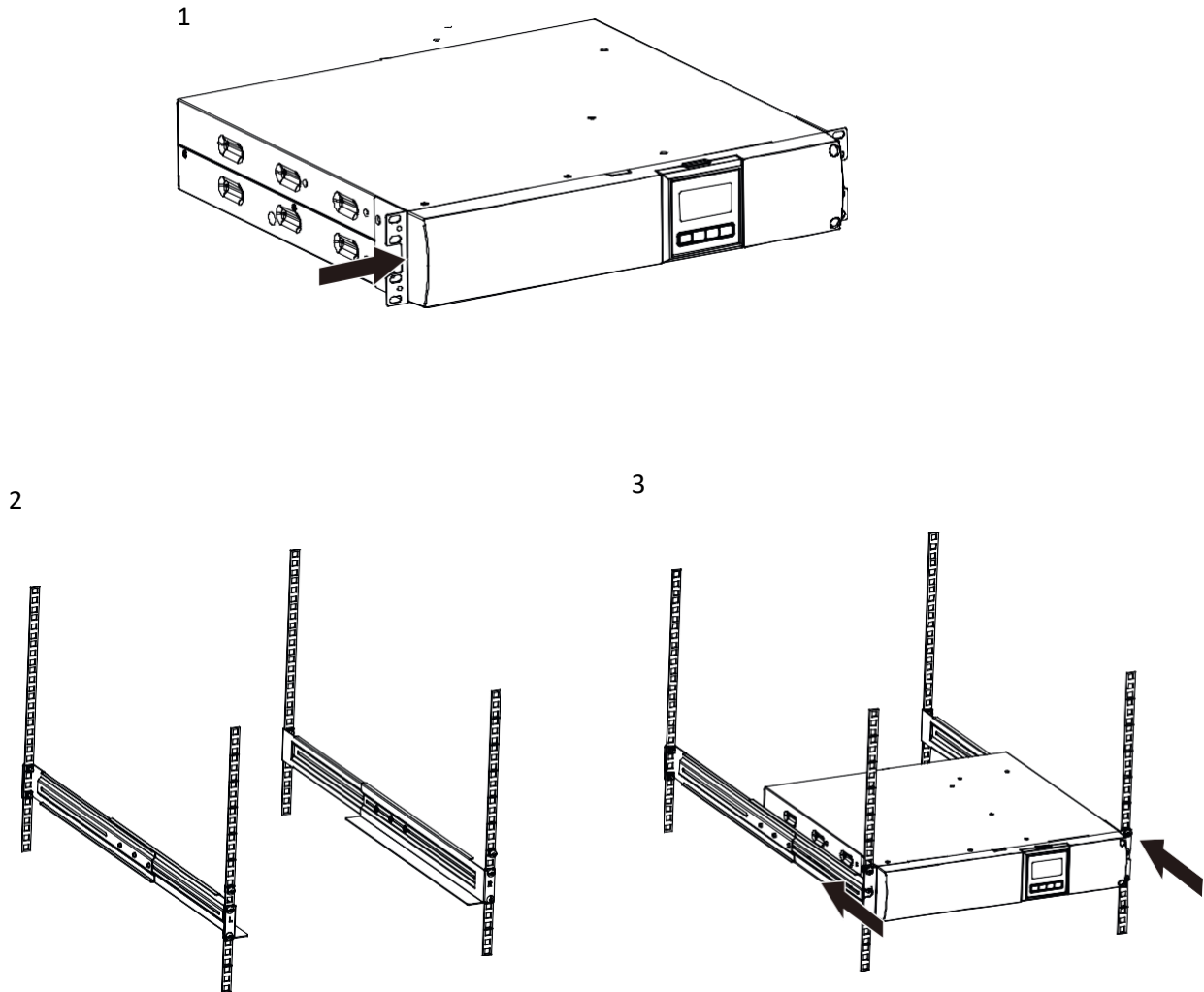


Figure 1: Installing the UPS

2.2.4 Standalone / Tower Installation:

2. Installing the UPS:

To install the UPS in a vertical (tower) position on the UPS stands (feet):

1. Place the UPS in a vertical position with the front panel screws orientated upwards.

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2. Place the two stands on a horizontal surface (see figure 2).
3. Place the UPS carefully on the UPS stands.
4. Pull out the LCD box. Rotate it 90° clockwise and then push it back into the front panel.

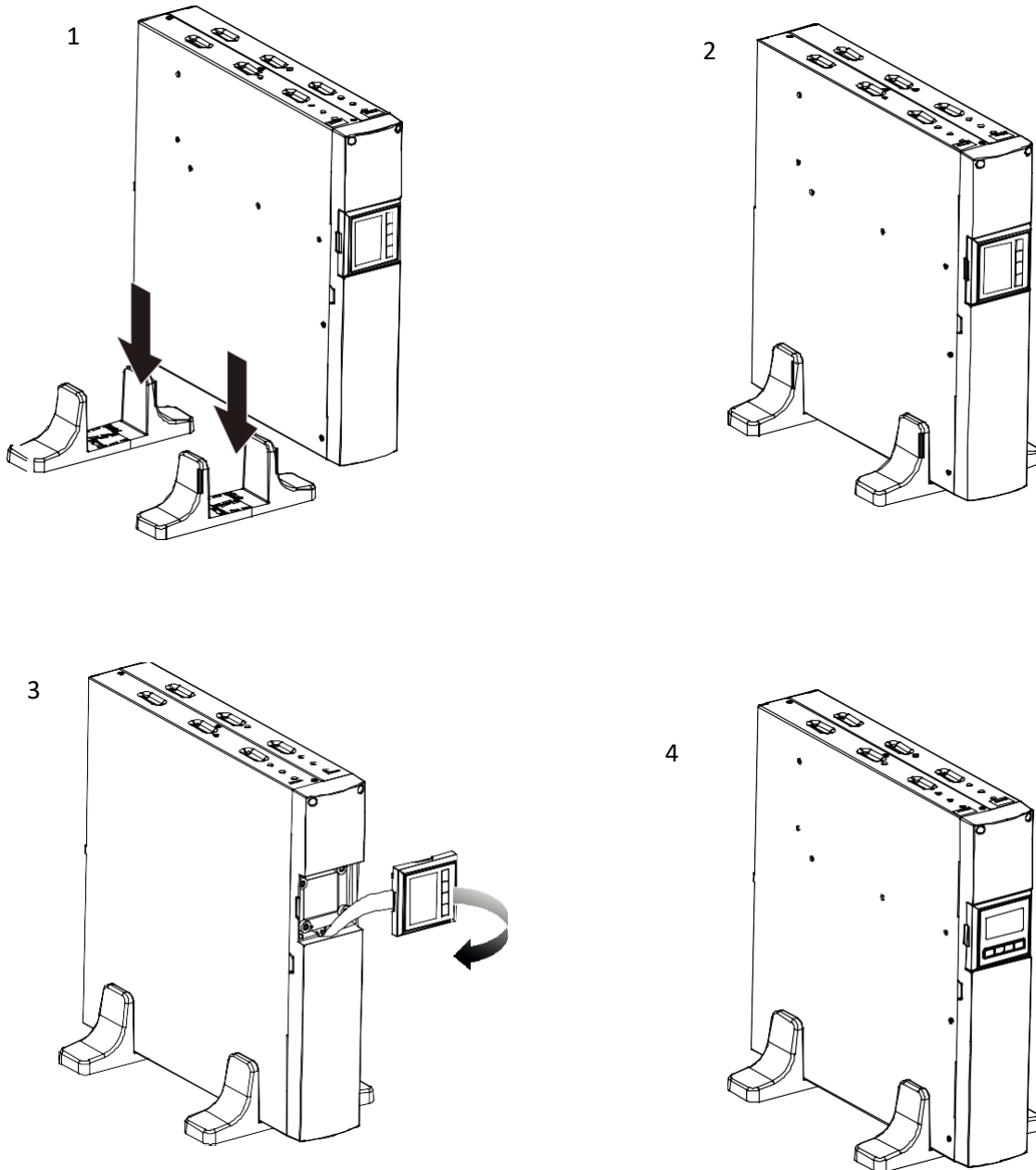


Figure 2: Installing the UPS in a vertical position

2.3 General characteristics:

1. Front panel:

Figure 3 shows the front panel of the UPS.

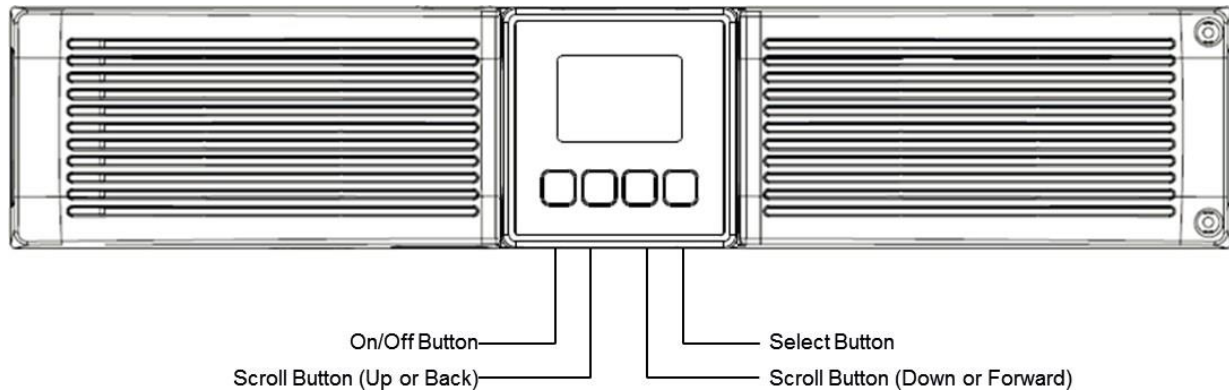


Figure 3: Front panel of UPS

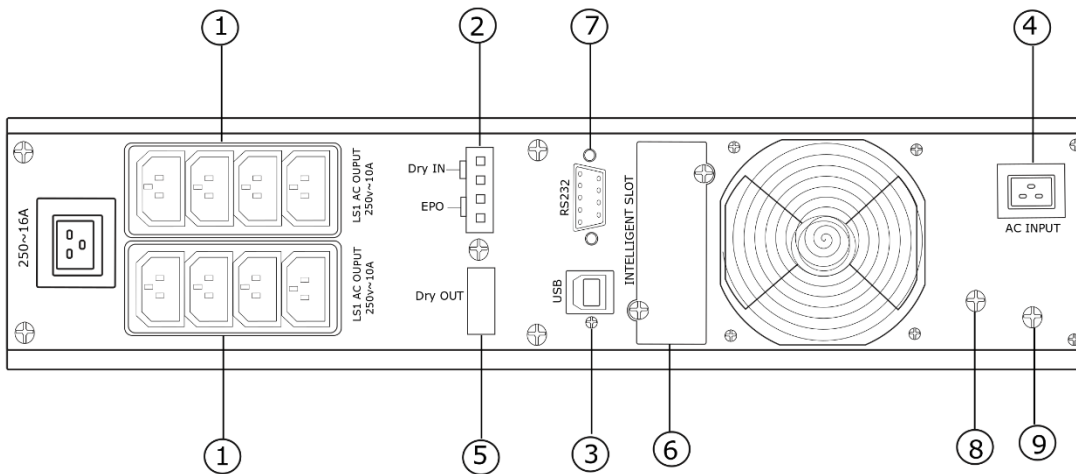


Figure 4: Rear view of UPS

| | |
|---|----------------------------|
| 1 | AC Output |
| 2 | EPO/Dry Contact input port |
| 3 | USB Port |
| 4 | AC Input |

| | |
|---|-------------------------|
| 5 | Dry Contact Output Port |
| 6 | SNMP/AS400 slot |
| 7 | RS232 |
| 8 | HI-POT screw |
| 9 | GND Contact |

Table 1: Description of rear View of UPS

2.4 Electrical Installation:

2.4.1 Commissioning:

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



CAUTION

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



DANGER



WARNING

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

2.4.2 Connections:

Before installing the electrical wiring, check the nominal amperage of your incoming feeder.

1. Input:



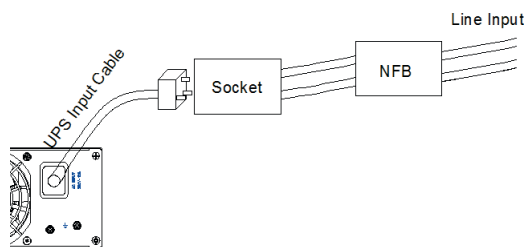
WARNING

If the UPS is connected through the power cords supplied with the unit, use the appropriate input connectors with protection against electric current.



NOTE

The UPS system does not have an input breaker in the standard cabinet. When installing the UPS, connect the external breakers and protective components in the input terminals. It is recommended to select NFB (non-fused breakers) instead of the traditional combination kit including breaker and fuse.



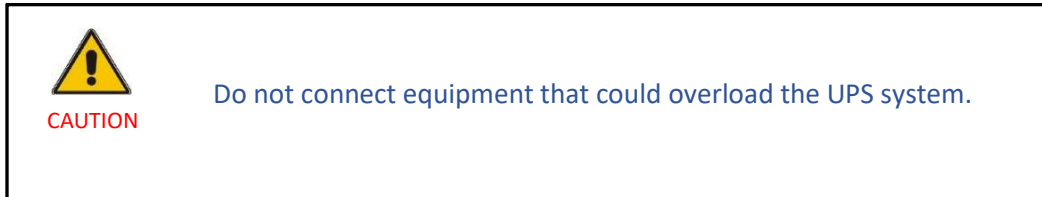
NOTE

Use appropriate tools and terminal splices to guarantee a reliable contact between the AC input wires and the terminal blocks.



2. Output:

The output connections of the UPS are made through the IEC sockets in the back of the units. Plug the load power cord to the output sockets to complete the connection.



2.5 Emergency power off (EPO):

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 opened (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 energy to the load until the EPO status is changed.



Figure 5: EPO connector

To return to normal status, the EPO connector must be closed. Enter the LCD menu to clear the EPO status.

The UPS alarm is cleared and bypass mode is recovered. Set the UPS to inverter mode manually.

Contact your Resellers for further information before modifying the settings.

2.6 Installation checklist:

Before installing the UPS check that:

- All packing materials and restraints have been removed from the UPS.
- Each Module in the UPS system is placed in the installed location.
- All conduits and cables are properly routed to the UPS and auxiliary enclosures.

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- All power cables are correctly sized and terminated.
- A ground conductor is correctly installed.
- Air conditioning equipment is installed and operating correctly.
- The area around the installed UPS system is clean and dust-free.
- Adequate workspace exists around the UPS and other cabinets.
- Adequate lighting is provided around all UPS equipment.
- Any optional accessories are mounted in their installed location and correctly wired.
- Summary alarms and/or building alarms are wired appropriately.
- Authorized service personnel have performed start-up and operational checks.
- All network connections are completed.

3. Operation:

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

The user can:

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

3.1 Control Panel:

The user-friendly control panel has two parts:

- Selection keys
- Power management LCD display (PMD)



Figure 6: Control panel

3.1.1 Selection Keys:

Table 2 shows the selection keys of the UPS.





| Button | Function | Illustration |
|-----------------------------------------------------------------------------------|---------------|----------------------------------------------------|
|  | Power ON/OFF | Turn the UPS ON and OFF or change operating mode. |
|  | Scroll up | Enter/exit the menu and scroll across the screens. |
|  | Scroll down | Scroll down the menu. |
|  | Select / Edit | Select and confirm settings. |

Table 2: UPS selection keys

3.1.2 LCD display:

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

- Input
- Output
- Battery
- Load parameters
- Working mode
- Settings on voltage
- Frequency
- Bypass presence.

The display has two main backlight colors. During normal operation the display has a blue background with white text. In case of a critical alarm, the backlight color changes to orange with dark text.

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

| 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 2 minutes |
| Overload | Beep twice every second |

Table 3: Definition of alarms

When powering ON, the LCD display 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).
- Module and charger status (including Module voltage, charge level and charger status).
- Current runtime information.

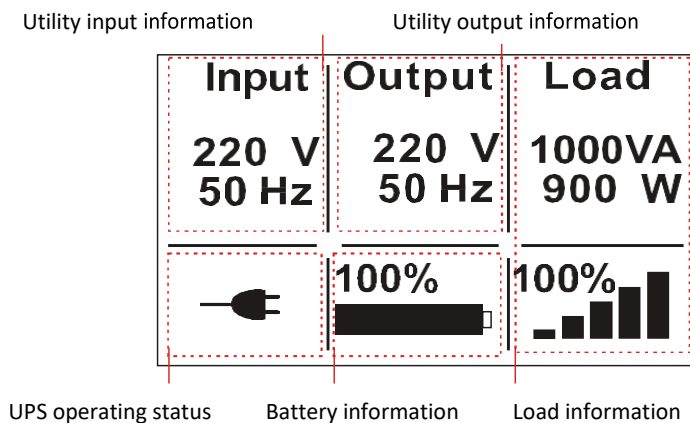
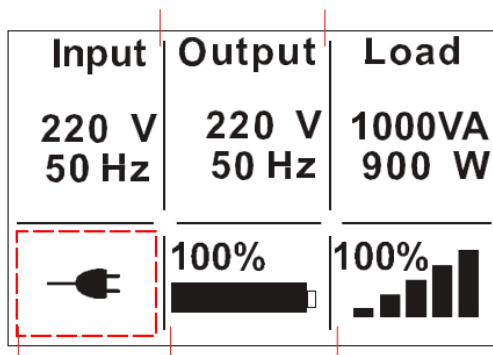


Figure 7: The default LCD display






3.2 Operating Mode:

Symbols indicate the status and the operating mode of the UPS. Symbols appear in the position shown in Figure 8.



Operating Mode

Figure 8: Operating mode

| Status | Symbol | Description |
|---------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Online-mode |  | UPS is running through the inverter (online-mode). |
| Battery-mode |  | UPS is running on battery. The alarm buzzer sounds every 4 seconds. |
| Bypass-mode |  | The power used by the load is supplied from the mains power via an internal filter. Note that if there is a power failure and the UPS is on bypass, it will not transfer back to mains or to battery-mode. In bypass-mode the alarm buzzer will sound every 2 minutes. |
| Stand-by-mode |  | UPS is running in bypass but there is no power in the output. |
| ECO-mode |  | <p>After the UPS is turned ON, the power used by the load is supplied from the mains via an internal filter if its power is in an acceptable range. This guarantees higher efficiency of the UPS. In case of a mains failure, the UPS transfers to Online-mode or Battery-mode and the load is supplied continuously.</p> <p>Note: ECO-mode can be enabled through the LCD settings or through the monitoring software.</p> <p>Warning: The transfer time of UPS output from ECO-mode to</p> |







| | | |
|----------------------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | battery-mode is 10ms and not recommended for sensitive loads. |
| Converter-mode |  | In converter-mode, the UPS runs with fixed output frequency (50Hz or 60Hz). In case of a mains failure, the UPS transfers to battery-mode and the load is supplied continuously. Note: - Converter-mode function can be enabled through the LCD settings or the monitoring software. - The load is de-rated to 70% in converter-mode. |
| Warning |  | Warnings indicate abnormal situations that do not stop the UPS from working. The UPS continues running but the user should perform corrective actions. |
| Fault |  | In case of failure, the UPS may disconnect the load or transfer to bypass depending on the cause of the failure. The UPS alarm sounds a continuous signal and the backlight of the UPS will turn red. |
| Overload |  | When the UPS is on overload, an alarm sounds twice every second. Disconnect unnecessary loads one by one to decrease the load. The load should be lower than 90% of its nominal power capacity in order to stop alarming. |
| Battery test |  | UPS is performing a battery test. |
| Battery disconnected |  | The battery is disconnected or defective. The UPS alarm sounds. |

Table 4: Symbols in operating mode

3.3 UPS start-up and shutdown:



NOTE

The first time the UPS is started-up, the utility must be connected. This is to prevent turning ON the UPS by mistake during transportation.



CAUTION

Switch OFF the connected loads before turning on the UPS. Then 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.

3.3.1 UPS Start-Up:

To start up the UPS with mains supply:

1. Check that all cables are connected correctly and well- fixed mechanically.
2. Connect the UPS to the power supply.
3. Keep the power-ON button pressed for longer than 1 second. The alarm buzzer will sound for 1 second and the UPS will start up.
4. After a few seconds, the UPS goes to online-mode. If the mains power is abnormal, the UPS will transfer to battery- mode without interruption in the output of the UPS.

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

1. Check that all cables are connected correctly and well- fixed mechanically.
2. Press the power-ON button. The UPS will perform a self- test and display the status screen.
3. Keep the power-ON button pressed for longer than 1 second. The alarm buzzer sounds and the UPS will start up.
4. 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 interruption in the output of the UPS.

3.3.2 UPS shutdown

To shut down the UPS with mains supply:

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



NOTE

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. In case bypass has been disabled through the Settings menu, keep the power-ON button pressed for more than 3 seconds to shut down the UPS. The unit will transfer from online to stand-by 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.

3.4 UPS operation:

The LCD display shows information on the status of the UPS, measurements, events and general information on the UPS. This section describes how to navigate through the display and how to adjust the user's settings.

3.4.1 Changing the operating-mode:

To change the operating-mode, the power-ON button is used as follows:



- From online-mode to bypass-mode: Press the power-ON button for 3 seconds.
- From bypass-mode to online-mode: Press the power-ON button for 3 seconds.
- From bypass-mode to battery: Disconnect the power supply cable.
- From battery-mode to online-mode: Connect the power supply to the UPS and it will transfer automatically to online-mode.




NOTE

If bypass is disabled in the settings menu after pressing the power-ON button for 3 seconds, the UPS goes from online mode to stand-by mode.

3.4.2 Navigation:

Use the scroll buttons to navigate through the UPS screens. From the main screen (UPS status screen), press  or  for information on alarm and battery.

From the main screen, keep  pressed for longer than 1 second to enter the main menu.


The main menu has the following submenus:

- UPS status
- event log
- measurements
- control
- identification
- settings



3.4.2.1 UPS Status:

The UPS status menu contains general information on the status of the UPS.

3.4.2.2 Event log:

To enter the event log menu, press . The last 50 events, alarms and faults occurred in the UPS are displayed. The alarms are indicated by the corresponding event code and operating time of UPS. To





navigate through the events and alarms, press  or .

3.4.2.3 Measurements:

To enter the measurements menu, press . The following measurements are displayed:

- Output power [W]
- Output power [VA]
- Output current [A]
- Load percentage [%]
- Output voltage [V]
- Output frequency [Hz]
- Input voltage [V]
- Input frequency [Hz]
- Battery voltage [V]
- Battery capacity [%]
- DC bus voltage [V]
- Temperature [°C]

To navigate through the measurements, press  or .



3.4.2.4 Control:

Using the Control menu, you can control the operations shown in table 5.

| Control | Description | Possible values | Default values |
|--------------------|--------------------------------------------|------------------------------|----------------|
| Buzzer mute | Mute the UPS sound | No/Yes | No |
| Start battery test | | Schedule No/Yes | No |
| Load segments | | Seg1 and seg 2: ON/OFF | ON/ON |
| Clear EPO status | Remove UPS from emergency power off status | No/Yes | No |
| Reset fault state | Reset warning, alarming status and buzzer | No/Yes | No |


| | | | |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------|--------|----|
| Clear event log | Reset all the events from the log file | No/Yes | No |
| Restore factory settings | Recover all settings in the LCD menu and the EPO polarity and locks the DC start-up (can be executed only when UPS is in bypass mode) | No/Yes | No |

Table 5: Description of Control menu operations

To modify the parameters, press . Then scroll up or down to modify the parameters. To confirm the selection, keep  pressed for longer than 1 second.

Examples:

- Clear EPO status: Once the EPO status is enabled, the UPS output is cut-off. To return to normal status, the EPO connector must first be closed. Enter this menu to clear the status of EPO. The UPS alarm will stop and it will recover to bypass-mode. Note that the UPS needs be turned ON manually.





Make sure the EPO signal is inactive or the LCD will show that the EPO active status could not be cleared.

NOTE


- Reset fault status: When a failure occurs, the UPS goes to fault-mode and the buzzer alarm sounds. After checking the reason of the failure and taking the appropriate corrective actions, enter this menu to reset the error status and recover the normal status. The UPS alarm will stop and it will recover to bypass-mode.
- Restore factory settings: All factory settings are recovered. Note that this operation can only be executed when the UPS is in bypass-mode.

3.4.2.5 Identification

Press  on the Identification menu to navigate through its data. The identification information includes UPS serial number, firmware serial number and model type. Keep  pressed for longer than 1 second to return to the last main menu.







3.4.2.6 Settings

Some settings in the Settings menu impact the performance of the UPS and others enable and disable functions within the UPS. Failures and reduced protection can occur if the equipment is not set in an adequate way.



Most settings should be done only when the UPS in bypass-mode.

NOTE

- Press  in the Settings menu to enter the sub-menus.
- To modify a parameter, press  and scroll up or down. To confirm the selection, keep  pressed for longer than 1 second.
- If the user password is enabled, enter the password 4314 by pressing the buttons ,  and . The password is used mainly to protect against unwanted modifications in the Settings menu.

The available operations are listed in Table 6.

| Submenu item | Description | Optional Values | Default value |
|---------------|-----------------------------------------|-------------------|---------------|
| Language | Select menu language | English / Chinese | English |
| User password | Protects against settings modifications | enabled/disabled | disabled |

| | | | |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|-------------|
| Audio alarm | Enable/disable alarm sounds | enabled/disabled | enabled |
| Rated output voltage | Define local rated output voltage | 208/220/230/240V | 230V |
| Output frequency | Define local rated output frequency | autosensing/50/60 Hz | autosensing |
| Power strategy** | Define the UPS running mode as normal, ECO-mode (or HE high efficiency) and converter mode | normal/high efficiency (ECO-mode)/converter | normal |
| DC start (Cold start) | Start the UPS from the batteries (without mains power) | enabled/disabled | enabled |
| Site wiring fault alarm | Phase and neutral cables are connected in reversed positions. | enabled/disabled | disabled |
| Ambient temperature warning | Temperature is over the limit supported by the UPS | enabled/disabled | enabled |
| Automatic battery tests period | Define the frequency of the battery tests | 0-31 days | 7 days |
| Auto restart | After UPS shuts down (low battery capacity), the UPS restarts automatically when mains power is recovered. | enabled/disabled | enabled |
| Automatic overload restart | The UPS is automatically restarted if it shut downs due to overload | enabled/disabled | enabled |
| Auto bypass | Automatic bypass can be disabled for countries where the power supply is very unstable. UPS runs only online or on battery. | enabled/disabled | enabled |

| | | | |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|----------|
| Short circuit clearance | When enabled, short circuit will last for 4s before cutting off the output. If short circuit is removed during this time, the UPS will continue to run normally. When disabled, short circuit will only last for 100ms before UPS output is cut off. | enabled/disabled | disabled |
| Bypass voltage low limit | When the voltage in the bypass is below this limit, the UPS changes running mode. | 120~215V | 184V |
| Bypass voltage high limit | When the voltage in the bypass is above this limit, the UPS changes running mode. | 245~276V | 264V |
| Bypass frequency low limit | When the frequency in the bypass is below this limit, the UPS changes running mode. | 40~49.5 Hz | 45 Hz |
| Bypass frequency high limit | When the frequency in the bypass is above this limit, the UPS changes running mode. | 50.5~70 Hz | 55 Hz |
| Eco-mode voltage low limit | When the voltage in the bypass is below this limit, the UPS changes running mode. | 5%~10% | 5% |
| Eco-mode voltage high limit | When the voltage in the bypass is above this limit, the UPS changes running mode. | 5%~10% | 5% |
| Eco-mode frequency low limit | When the frequency in the bypass is below this limit, the UPS changes running mode. | 5%~10% | 5% |
| Eco-mode frequency high limit | When the frequency in the bypass is above this limit, the UPS changes running mode. | 5%~10% | 5% |
| External battery modules*** | Define the number of battery modules. If number is higher than 4, it should be configured through the monitoring software. | 0 - 9 | 0 |



| | | | |
|------------------|---------------------------------------------------------|----------------------------------------------------------------|-----------------|
| Set running time | Set the UPS running time mainly used for test purposes. | Day: hour: minute: second 0000:0000:00~9999 :23:59:59 | Running time |
| LCD contrast | Changes the light contrast in the LCD panel. | -5~+5 | 0 |

Table 6: Description of Submenu items

Example: Setting the rated output voltage value and setting running time.

1. Scroll through the settings menu.
2. Select output voltage submenu.
3. Change the value.
4. Confirm the setting.
5. The setting stops flashing after confirmed.



4. Inbuilt Sirius Module:

The UPS has an inbuilt 1000Wh-12V Sirius Module.

4.1 Shelf Life:

Shelf life is the life of the Module in years from the date it is manufactured to the time it is first operated.

The shelf life of supercapacitor cell is 10 years.

4.2 Maintenance:

The Sirius Module does not require periodic maintenance.

4.3 Disposal:

Dispose according to local regulation.

5. Communication:

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

In case of a power failure and a predicted shutdown of the UPS due to low battery autonomies, the monitoring system is capable of saving the data in the load and of initiating the shutdown of the equipment connected to the UPS.

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 9 and in table 7.

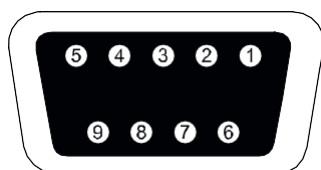


Figure 9: RS-232 Communication Port (DB-9 Connector)

| Pin Number | Signal Name | Function | Direction from the UPS |
|------------|-------------|---------------------------------|------------------------|
| 1 | | Unused | Not applicable |
| 2 | Tx | Transmit to external device | Out |
| 3 | Rx | Receive from external device | In |
| 4 | | Unused | Not applicable |
| 5 | GND | Signal common (tied to chassis) | Not applicable |
| 6 | | Unused | Not applicable |
| 7 | | Unused | Not applicable |

WRL 3KVA RT UPS – User Manual

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| | | | |
|---|--|--------|----------------|
| 8 | | Unused | Not applicable |
| 9 | | Unused | Not applicable |

Table 7: Cable Pins Functions

5.2 USB port:

The UPS can communicate with USB-compliant computers. 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 Dry contact ports:

Remote alarm indication can be set up using the potential free (dry contact) ports positioned in the rear of the UPS. The 4-pole connector corresponds to the input contacts. Configure the signal input to control UPS On/Off/Maintain bypass statuses through the LCD setting menu or protocol command. The default input contact is “Disabled”.

| Dry contact input signal | Description |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Disable | Disable the function. |
| UPS ON | One second pulse activate. If active, the UPS turns ON if the UPS is not on inverter. |
| UPS OFF | One second pulse activate. If active, the UPS turns OFF if the UPS is ON inverter. |
| Maintain bypass | One second pulse activate. If active, the UPS will transfer to bypass-mode. To recover to normal status, inactivate the signal and turn ON the UPS manually. |

Table 8: Dry contact input signal

The 2-pole connector corresponds to the output contacts. Configure the relay output through the LCD settings menu or protocol command, the default output contact corresponds to “Summary Alarm”. The possible alarms are shown in table 9.

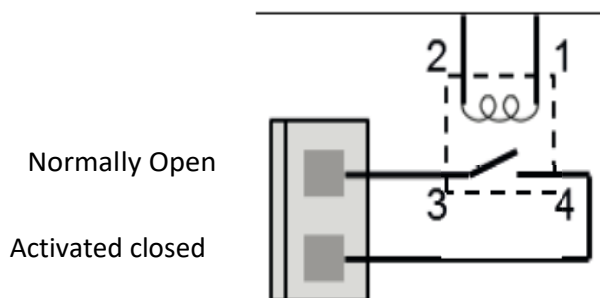


Figure 10: Output Dry Contact schematic

| Dry contact output signal | Description |
|---------------------------|----------------------------------------------------|
| Summary alarm | Activated when any warning happens. |
| On battery | Activated when the UPS operates on battery. |
| Battery low | Activated if battery autonomy is low. |
| UPS ok | Activated when the UPS has no alarms and no fault. |
| On bypass | Activated when the UPS has bypass output. |

Table 9: Dry contact output signal

Note: The relay output contact must not be connected to any utility connected circuits. Reinforced insulation to the utility is required. The relay output contact has a maximum rating of 30Vac/1A and 60Vdc/2A normal values.


5.4 Network management card (optional):

WRL RT UPS is equipped with an intelligent slot for optional cards for remote management of the UPS through internet/intranet. Either of the following accessories can be installed in the intelligent slot:

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

5.5 Installing a serial network management card (optional):

Each UPS has a communication slot for an optional Serial Network Management (SNMP) Card. After installing an SNMP card, an environmental monitoring probe can be connected to the UPS.



The UPS do not have to be shut down before installing a communication card.

NOTE

To install the network management card:

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

Compatible SNMP cards: CS141 Basic, CS141 ModBus, CS141 Advanced, WinPower.

5.6 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 in the output of the UPS. Instructions on how to install the software are provided with the network management cards.

6. Troubleshooting

Alarm and events indicate warnings and notify of errors or potential failures in the system. The output of the UPS is not necessarily affected in case of an alarm but taking the correct actions may prevent loss of power to the load. If the UPS system does not operate correctly, attempt to solve the problem using the table below.

Always have the following information available when calling your Resellers:

1. Model number and serial number
2. Date on which the problem occurred
3. LCD/LED display information and buzzer alarm status
4. Mains power condition, load type and capacity, environment temperature and ventilation condition
5. Information on external battery pack (battery capacity, quantity)

| Problem | Possible cause | Remedy |
|--------------------------------------------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| No indication, no warning tone even though system is connected to mains power supply | No input voltage | Check building wiring socket outlet and input cable. |
| Emergency supply period shorter than nominal value | Batteries not fully charged / batteries with defect | Charge the batteries for at least 5 - 8 hours and then check capacity. If the problem persists, consult your supplier. |
| Fan fails Alarm Code: 84 | Fan abnormal | Check if the fan is running |
| Battery over voltage Alarm Code:16 | Battery is overcharged | Stop charging to battery automatically, and after the battery voltage is normal and the mains is normal, charge automatically again. |
| Battery low Alarm Code:12 | Battery voltage is low | If audible alarm sounds every second, the battery is almost empty. |
| Charge fail Alarm Code:15 | The charge is broken | Notify dealer. |
| Inverter temperature high Alarm Code:86 | Inside temperature of the UPS is too high | Check the ventilation of the UPS, check the ambient temperature. |

| | | |
|------------------------------------------------------------------------|-----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Ambient temperature high Alarm Code:82 | The ambient temperature is too high | Check the environment ventilation. |
| Battery open Alarm Code:11 | Battery pack is not connected correctly | Check if the battery bank is connected to the UPS. Check if the battery breaker is turned on. |
| Service Battery Alarm Code:13 | Battery may need to be replaced | Consult dealer |
| Overload Alarm Code: 41/42/43 | Overload | Check the loads and remove some non-critical loads. Check whether some loads have failures. |
| Site fail Alarm Code:04 | Phase and neutral conductor at input of UPS system are reversed | Rotate mains power socket by 180° or connect UPS system. |
| EPO active Alarm Code:71 | EPO function is enabled | Turn off the EPO switch. |
| Bus fault (Low / high / Unbalance / Soft start) Alarm Code:22/21/23/25 | UPS internal fault | Consult your supplier |
| Inverter fault (Low/high/soft start) Alarm Code:33/32/34 | UPS internal fault | Consult your supplier |
| Over temperature fault Alarm Code:81 | Over temperature | Check the ventilation of the UPS, check the ambient temperature and ventilation. |
| NTC open Alarm Code:87 | UPS internal fault | Consult your supplier |
| Inverter short Alarm Code:31 | Output short circuit | Remove all the loads. Turn off the UPS. Check whether the output of UPS and loads is short circuited. Make sure the short circuit is removed, and the UPS has no internal faults before turning on again. |
| Bus short Alarm Code:24 | UPS internal fault | Consult your supplier |