



Liebert®

GXT5™ UPS

Installer/User Guide

120 V, 500 VA to 3,000 VA

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Technical Support Site

If you encounter any installation or operational issues with your product, check the pertinent section of this manual to see if the issue can be resolved by following outlined procedures. Visit <https://www.Vertiv.com/en-us/support/> for additional assistance.

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IMPORTANT SAFETY INFORMATION

IMPORTANT! This manual contains important safety instructions that must be followed during the installation and maintenance of the UPS and batteries. Read this manual thoroughly and the safety and regulatory information, available at <https://www.vertivco.com/ComplianceRegulatoryInfo>, before attempting to install, connect to supply, or operate this UPS.

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1 GXT5 DESCRIPTION

The Liebert® GXT5 is a compact, online uninterruptible power system (UPS) that continuously conditions and regulates its output voltage. The Liebert® GXT5 supplies microcomputers and other sensitive equipment with clean sine-wave input power.

Upon generation, AC power is clean and stable. However, during transmission and distribution it is subject to voltage sags, spikes, and complete failure that may interrupt computer operations, cause data loss, and damage equipment.

The Liebert® GXT5 protects equipment from these disturbances. The Liebert® GXT5 continuously charges its batteries from the utility power, enabling it to supply power to connected loads, even when the mains fail.

1.1 UPS Features and Available Models

The GXT5 includes the following features. **Table 1.1** below, lists the available models and power ratings.

- Enhanced load capacity with an output power factor of 1.
- Input power factor greater than 0.99
- Optional tower or rack installation to meet varying installation requirements.
- Adapts to areas with unstable power-mains supply via high-frequency double-conversion topology structure, with high input-power factor, wide input-voltage range, and output immune to grid interference.
- Full digital-control platform and hardware-design platform adapts to unstable mains supply and load impact
- Programmable terminals with cascade protection protect key devices when load is heavy.
- Operation and display panel with model-specific color LCD offers simple configuration and control of the UPS.
- ECO power-supply mode and smart-sleep mode help you save the maximum amount of energy.

Table 1.1 UPS Models and Power Ratings

MODEL NUMBER	NOMINAL POWER RATING
GXT5-500LVRT2UXL	500 VA/500 W
GXT5-750LVRT2UXL	750 VA/750 W
GXT5-1000LVRT2UXL	1000 VA/1000 W
GXT5-1500LVRT2UXL	1500 VA/1350 W
GXT5-2000LVRT2UXL	2000 VA/1800 W
GXT5-3000LVRT2UXL	3000 VA/2700 W

1.2 Front Panels

The various GXT5 models have the same general appearance, with the main difference being the receptacle types on the rear panel.

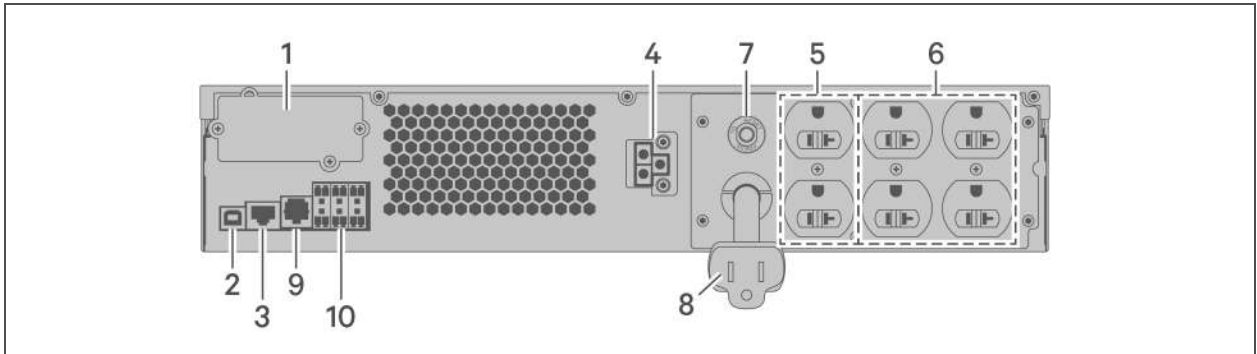
Figure 1.1 Front View



1.3 Rear Panels

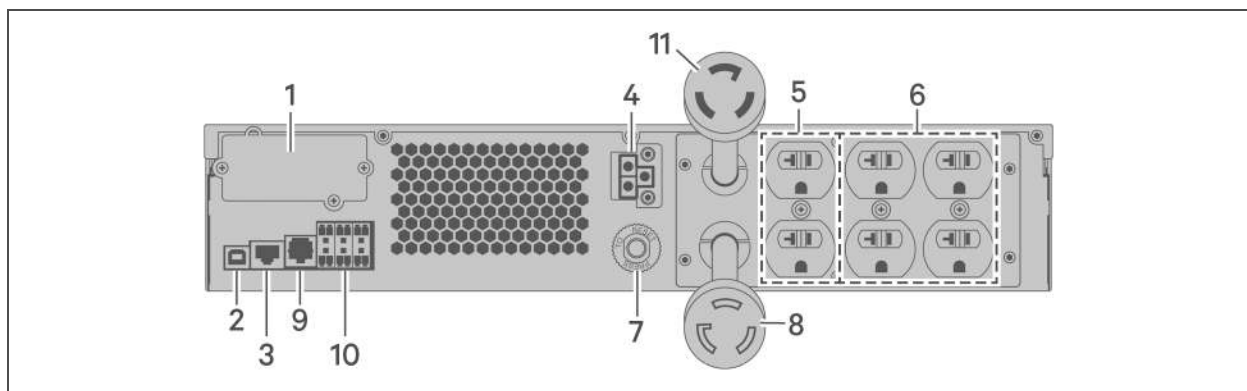
The following figures detail the rear-panel features for each GXT5 model.

Figure 1.2 GXT5-500/750/1000/1500LVRT2UXL Rear Panel



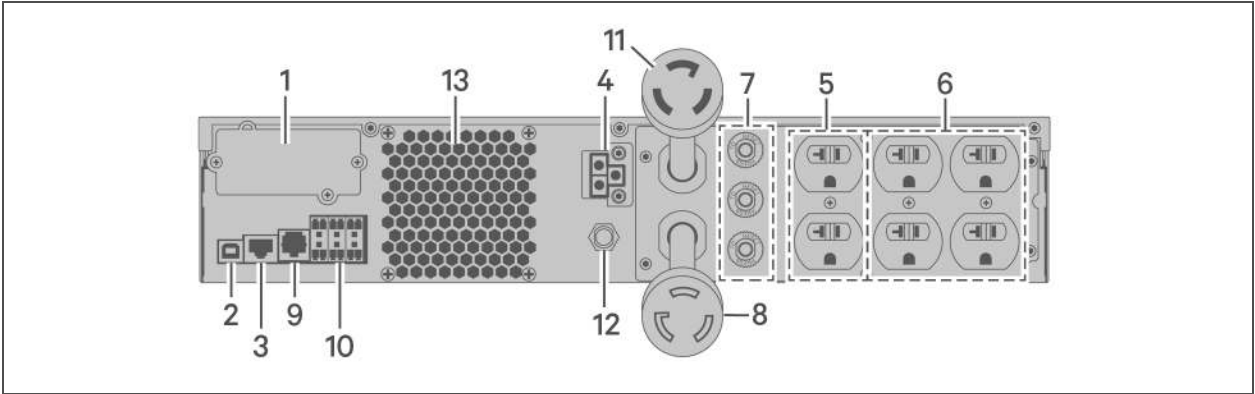
ITEM	DESCRIPTION
1	Liebert® IntelliSlot™ port
2	USB port
3	RS-485 port
4	External-battery connector
5	Non-programmable output receptacles, IEC-60906-115-A
6	Programmable output receptacles, IEC-60906-115-A
7	Input circuit breaker
8	Input-power plug and cable, IEC-60906-115-A
9	RS-232 port
10	Terminal-block communication connectors

Figure 1.3 GXT5-2000LVRT2UXL Rear Panel



ITEM	DESCRIPTION
1	Liebert® IntelliSlot™ port
2	USB port
3	RS-485 port
4	External-battery connector
5	Non-programmable output receptacles, IEC-60906-120-A
6	Programmable output receptacles
7	Input circuit breaker
8	Input-power plug and cable, L5-20P
9	RS-232 port
10	Terminal-block communication connectors
11	Output-power plug and cable, L5-20R

Figure 1.4 GXT5-3000LVRT2UXL Rear Panel

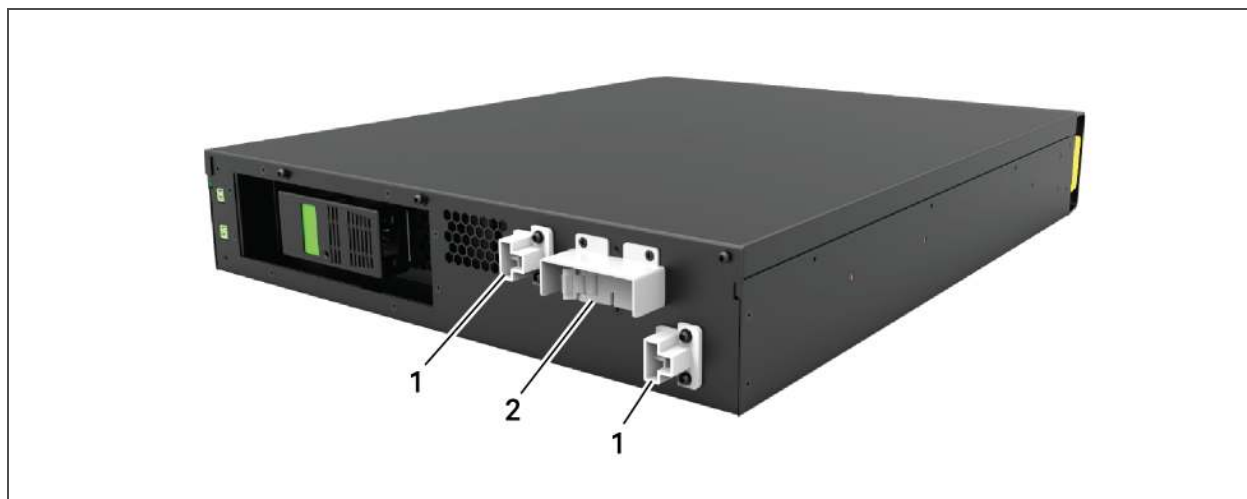


ITEM	DESCRIPTION
1	Liebert® IntelliSlot™ port
2	USB port
3	RS-485 port
4	External-battery connector
5	Non-programmable output receptacles, IEC-60906-120-A
6	Programmable output receptacles
7	Output circuit breakers
8	Input-power plug and cable, L5-30P
9	RS-232 port
10	Terminal-block communication connectors
11	Output-power plug and cable, L5-30R
12	Input circuit breaker
13	Cooling fan

1.4 Battery Cabinet

Optional battery cabinets are available for the UPS, and include a single battery-connector cable. Up to 10 battery cabinets may be connected in parallel to the UPS, and up to 6 can be detected using EBC-detection. See [External Battery Cabinet Specifications](#) on page 53, for the cabinet specifications. For approximate battery run times with additional EBCs, see [Battery Run Times](#) on page 54. See [Installing External Battery Cabinets](#) on page 12, to connect the cabinets.

Figure 1.5 Battery Cabinet



ITEM.	DESCRIPTION
1	Battery connectors
2	Isolation breaker

1.5 Major Internal Components and Operating Principle

Figure 1.6 on the next page, shows the UPS operating principle. **Table 1.2** on page 9, describes the function of the major components in the UPS.

NOTE: **Figure 1.6** on the next page, is one example of basic operation.

Figure 1.6 Basic Operating Principle Diagram

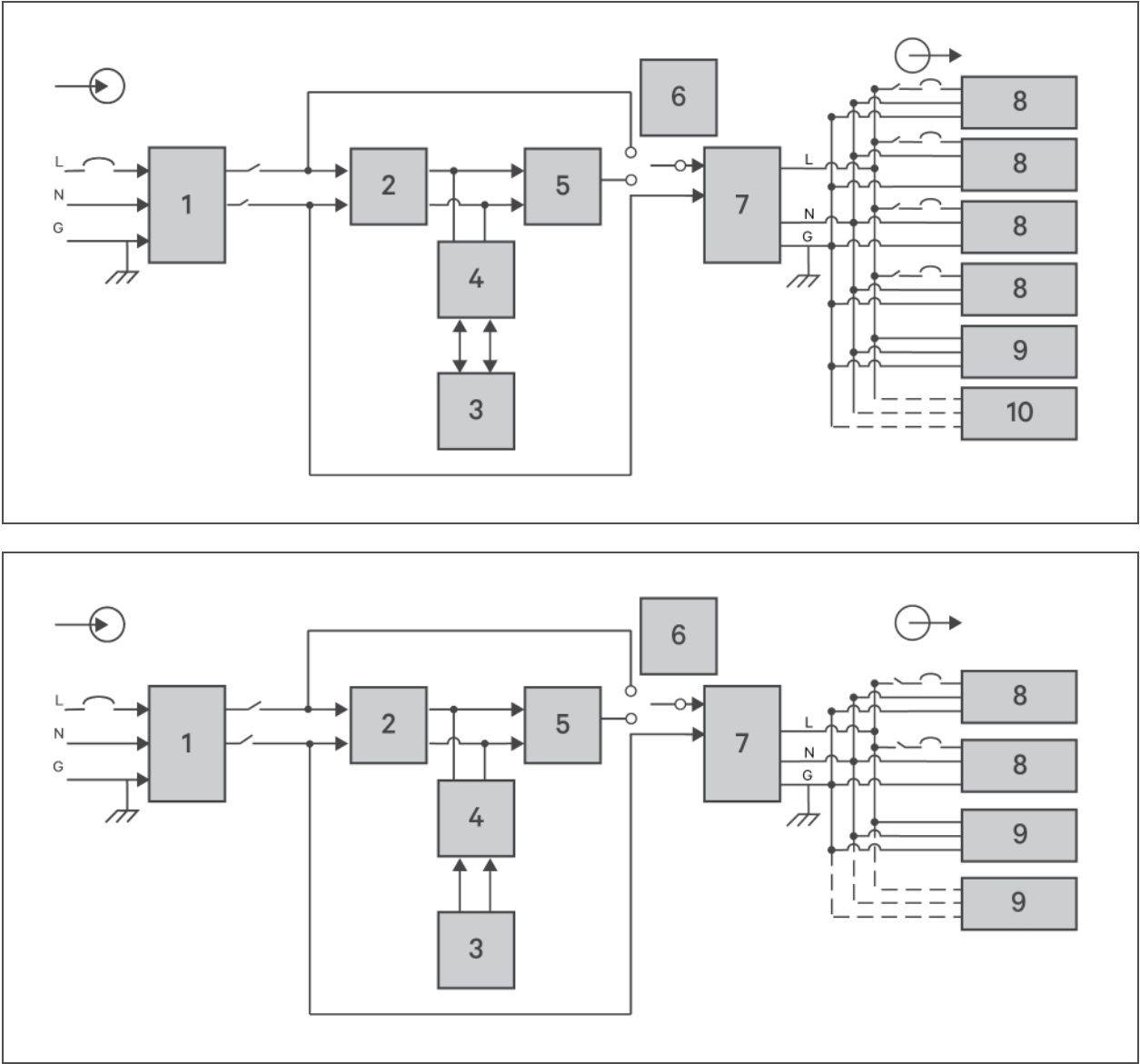


Table 1.2 Major Components

ITEM	COMPONENT	OPERATION/FUNCTION
1	Transient Voltage Surge Suppression (TVSS) and EMI/RFI Filters	Provide surge protection. Filter electromagnetic interference (EMI) and radio frequency interference (RFI). Minimize surges or interference present in the utility power and protect devices connected on the same branch as the UPS.
2	Rectifier/Power Factor Correction (PFC) Circuit	In normal operation, converts utility AC power to regulated DC power for use by the inverter while ensuring that the wave shape of the input current used by the UPS is near ideal. Extracting this sine-wave input current ensures efficient use of utility power and reduces reflected harmonic distortion making cleaner power available to devices that are not protected by the UPS.
3	Batteries	Valve-regulated, non-spillable, lead-acid batteries. NOTE: To maintain battery design life, operate the UPS in an ambient temperature of 59°F to 77°F (15°C to 25°C).
4	DC-to-DC Converter	Raises the DC voltage from the battery to the optimum operating voltage for the inverter. This allows the inverter to operate continuously at its optimum efficiency and voltage, thus increasing reliability.
5	Inverter	In normal operation, inverts the DC output of the PFC circuit into precise, regulated sine-wave AC power. When utility power fails, the inverter receives DC power from the DC-to-DC converter. In either operating mode, the UPS inverter remains on-line, generating clean, precise, regulated AC-output power.
6	Dynamic Internal Bypass	In the unlikely event of UPS failure such as overload or over-temperature, automatically transfers the connected load to bypass. To manually transfer the connected load from inverter to bypass, see Transferring from Normal to Bypass Mode on page 22.
7	EMI/RFI Filters	Filter electromagnetic interference (EMI) and radio frequency interference (RFI). Minimize interference present in the utility power and protect devices connected on the same branch as the UPS.
8	Outlet group	Programmable output receptacles.
9	Outlet group	General output receptacles.
10	Outlet group	General output receptacles on 2,000- and 3,000-VA models only.

1.6 UPS States and Operating Modes

NOTE: See [LED Indicators](#) on page 25, for description of the run-indicator and alarm-indicator LEDs mentioned in this section.

1.6.1 Normal Mode

When utility power is normal, Normal mode employs the rectifier and inverter to provide voltage- and frequency-stabilized power to the load. The charger charges the battery in normal mode. On the front-panel display, the run-indicator (green) is On, the alarm indicator is OFF, and the buzzer is silent.

1.6.2 Bypass Mode

Bypass mode supplies power to the load from the bypass source (utility power) if an overload or fault occurs during normal operation. On the front-panel display, the run indicator (green) is On, the alarm indicator (yellow) is On, and the buzzer beeps once each seconds. The LCD "Current" screen displays "On Bypass."

NOTE: If utility power fails or if the utility voltage goes outside of the permissible range during bypass-mode operation, the UPS shuts down and no output is supplied to the load.

1.6.3 Battery Mode

Battery mode supplies battery power to the load if utility power fails or if the utility voltage goes outside of the permissible range. On the front-panel display, the run indicator (green) is On, the alarm indicator (yellow) is On, and the buzzer beeps once each second. The LCD "Current" screen displays "On Battery."

NOTE: The batteries are fully-charged before shipment. However, transportation and storage inevitably cause some loss of capacity. To ensure adequate back-up time, charge the batteries for at-least 8 hours before first start-up.

NOTE: If utility power fails and the batteries are charged, you may cold-start the UPS in battery mode and use battery power to extend system availability for a time.

NOTE: Powering-off the UPS when it is in battery mode results in loss of output power to the connected load.

1.6.4 Frequency Converter Mode

All models of the GXT5 are capable of frequency conversion. Frequency Conversion Mode can be selected using the configuration program. Allowable frequency operating modes include:

- Auto Sensing - 50 Hz or 60Hz – Bypass Enabled
- Auto Sensing - 50 Hz or 60Hz – Bypass Disabled
- Frequency Converter - 50 Hz – Bypass Disabled
- Frequency Converter - 60Hz – Bypass Disabled

NOTE: The default for all models of the Liebert® GXT5 is "Auto Sensing - 50 Hz or 60Hz – Bypass Enabled."

1.6.5 ECO Mode

The energy-saving ECO mode reduces power consumption by powering the load via bypass if the bypass voltage is normal or by powering the load via the inverter when the bypass voltage is abnormal. You can use ECO mode to power equipment that is not sensitive to power-grid quality to via bypass and reduce power consumption.

NOTE: During Eco mode, if a bypass-failure or abnormal-bypass-voltage notification appears when the output is not overloaded, the UPS will transfer to Normal Mode. However, if a notification showing bypass failure or abnormal bypass voltage appears when the output is overloaded, the UPS will shut down the bypass.

2 INSTALLATION

Do not start the UPS until after the installation is finished.



WARNING! Risk of electrical shock. Can cause equipment damage, injury and death. Before beginning installation, verify that all external overcurrent protection devices are open (Off), and that they are locked-out and tagged appropriately to prevent activation during the installation, verify with a voltmeter that power is Off and wear appropriate, OSHA-approved personal protective equipment (PPE) per NFPA 70E. Failure to comply can cause serious injury or death. Before proceeding with installation, read all instructions. Follow all local codes.

2.1 Unpacking and Inspection

Unpack the UPS and conduct the following checks:

- Inspect the UPS for shipping damage. If any shipping damage is found, report it to the carrier and your local Vertiv representative immediately.
- Check the accessories included against the packing list. If there is any discrepancy, contact your local Vertiv representative immediately.



CAUTION: The UPS is heavy (see [Specifications](#) on page 49, for the weight). Take proper precautions when lifting or moving the unit.

2.2 Pre-installation Preparation

- Install the UPS indoors in a controlled environment, where it cannot be accidentally turned Off. The installation environment should meet the specifications listed in [Specifications](#) on page 49.
- Place the UPS in an area of unrestricted air-flow around the unit, away from water, flammable liquids, gases, corrosives, and conductive contaminants. Avoid direct sunlight

NOTE: Operating the UPS in temperatures above 77°F (25°C) reduces battery life.

2.2.1 Installation Clearances

Maintain at least 4 in. (100 mm) clearance in the front and rear of the UPS. Do not obstruct the air inlets on the front panel and rear panel of the UPS. Blocking the air inlets reduces ventilation and heat dissipation, shortening the service life of the unit.

2.3 Installing the UPS

The UPS may be installed as a tower or in a rack, depending on available space and use considerations. Determine the type of installation and follow the appropriate instructions. See [Tower Installation](#) on the next page or [Rack Installation](#) on the next page.

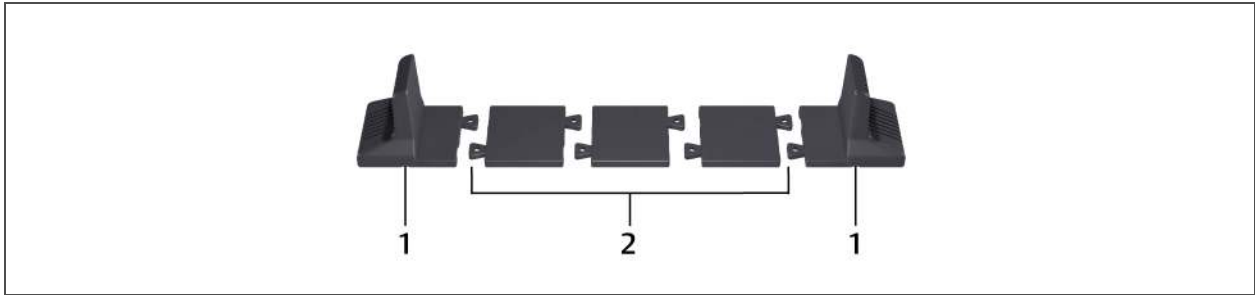
NOTE: When installing the UPS or making input and output connections, comply with all relevant safety codes and standards

2.3.1 Tower Installation

To install the UPS as a tower:

1. Take the support bases out of the accessories box.

Figure 2.1 Support bases



NO.	DESCRIPTION
1	Support bases
2	Spacers with connectors NOTE: Three spacers are shown here. However, the number of spacers varies depending on your UPS model and the number of battery cabinets in your system.

2. If optional, Liebert® external battery cabinets will be connected, take out the spacers shipped with the battery cabinet.
3. Connect the spacers and the support bases as shown in **Figure 2.1** above. Each GXT5 requires 2 support bases, one in the front and one in the rear.
4. Place the GXT5 and any battery cabinets on the 2 support bases.

2.3.2 Rack Installation

When installed in a rack enclosure, the GXT5 UPS and external battery cabinets (EBC) must be supported by a shelf or rack-mount rails. Because different rack-mount options install differently, refer to the installation instructions provided with the rack-mount kit.



CAUTION: The GXT5 is heavy. The UPS must be installed as near the bottom of a rack as possible. If placed too high, it can make the rack top-heavy and prone to tipping over. For unit weights, see [Specifications](#) on page 49.

2.4 Installing External Battery Cabinets

Optional, external battery cabinets (EBC) may be connected in parallel to the UPS to provide additional battery run time. For approximate battery run times with additional EBCs, see [Battery Run Times](#) on page 54.

External battery cabinets are placed on one side of the UPS in a tower configuration or stacked beneath the UPS in a rack configuration. Up to 10 EBCs may be connected to the UPS, and up to 6 may be detected using EBC-detection.



WARNING! Risk of electric shock. Can cause injury or death. Disconnect all local and remote electric power supplies before working with the UPS. Ensure that the unit is shut down and power has been disconnected before beginning any maintenance.



CAUTION: The external battery cabinet(s) are heavy, see **Table 7.3** on page 53. Take proper precautions when lifting them.

To install the EBC(s):

1. Inspect the EBC for freight damage. Report damage to the carrier and your local dealer or Vertiv representative.
2. For tower installation:
 - An additional set of support-base extensions ships with each EBC.
 - See the steps in [Tower Installation](#) on the previous page, to connect the support extenders and install the bases.

– or –

For rack installation:

- Rack-mount hardware ships with the EBC.
- Refer to the instructions included with the rack-mount kit to install.

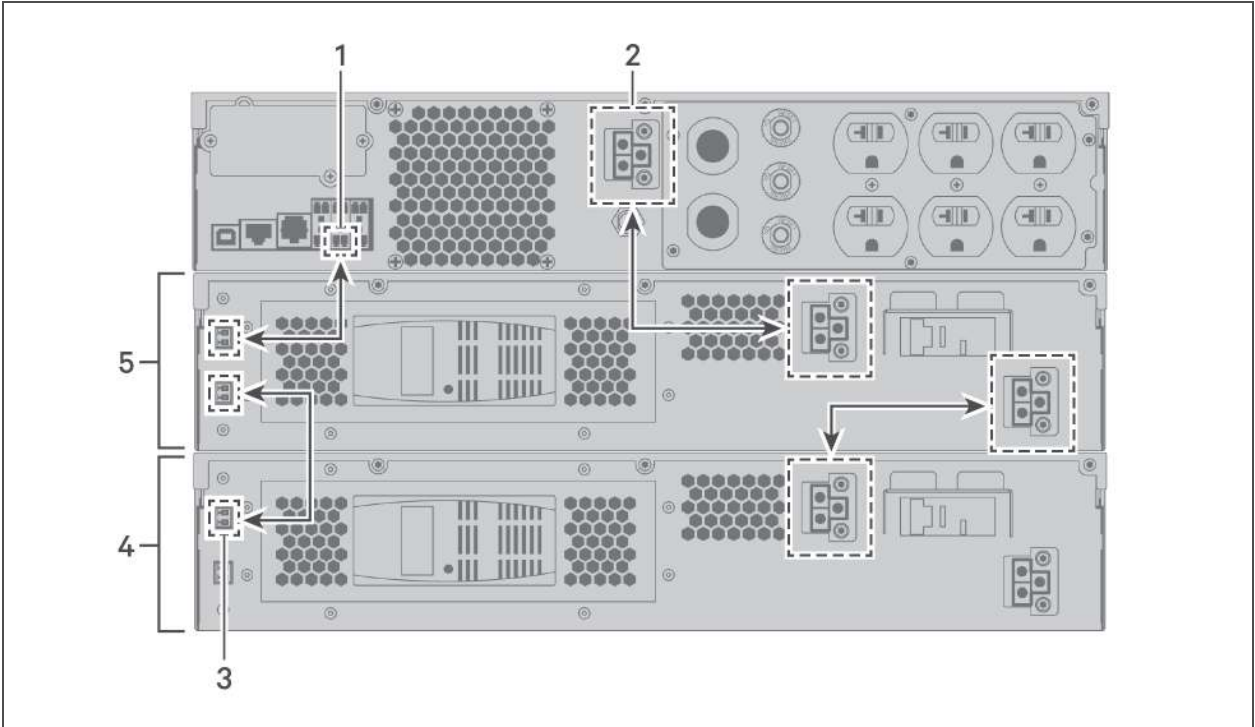
NOTE: Optional slide rails and securing hardware are sold separately. Please contact your Vertiv representative for options and Vertiv Technical Support for assistance.

3. Verify that the EBC breaker is in the "Off" position.
4. Connect the supplied EBC cable(s) to the rear of the cabinet, then to the rear of the UPS, see **Figure 2.2** on the next page.
5. Turn the EBC breaker to the "On" position.
6. Verify the circuit breaker on the EBC is in the "On" position.
The additional back-up run time is enabled.

NOTE: When removing an EBC, turn off the circuit breaker on the rear of the cabinet before disconnecting the cable.

NOTE: If shipping or storing the UPS for an extended time, disconnect the EBC(s) minimize stand-by current drain on the batteries and help maintain design life.

Figure 2.2 EBCs connected to the UPS



ITEM	DESCRIPTION
1	EBC-detection dry-contact port (See Table 2.2 on page 17, for details.)
2	EBC connector
3	EBC-detection port
4	External battery cabinet
5	External battery cabinet

2.5 Connecting AC Input Power

Ensure that all the loads are turned Off. Prepare an input power supply that is properly protected by a circuit breaker in accordance with national and local electrical codes. The wall receptacle must be grounded. We recommend installing an upstream circuit breaker of the same series as the input circuit breaker of the GXT5.

Table 2.1 below, lists the specifications of the input circuit breaker on the rear panel by UPS model

Table 2.1 Input circuit breaker specifications

MODEL	RATED CIRCUIT BREAKER
GXT5-500LVRT2UXL	12 A
GXT5-750LVRT2UXL	12 A
GXT5-1000LVRT2UXL	12 A
GXT5-1500LVRT2UXL	15 A
GXT5-2000LVRT2UXL	20 A
GXT5-3000LVRT2UXL	30 A

To connect AC-input power, plug the input plug of the UPS into the input-power connection.

NOTE: If the input plug will serve as the disconnecting device, the wall socket/outlet must be near the UPS and must be easily accessible, per the National Electric Code/NFPA 70 requirements.

2.6 Connecting Loads

500-VA to 1500-VA models have five groups of outlets:

- One group is not programmable (always On).
- Four groups are controlled with programmed responses or an SNMP network.

2000-VA and 3000-VA models have six groups of outlets:

- Two groups are not programmable (always On).
- Four groups are controlled with programmed responses or an SNMP network.

NOTE: When connecting load, verify that the equipment is plugged into the appropriate outlets if any of the outlets will be controlled.

NOTE: Do not overload any output receptacle. Output cable length should not exceed 10 m (32.8 ft).

To connect equipment, plug equipment into the appropriate output receptacles on the rear of the UPS, see the appropriate figure for your model in [Rear Panels](#) on page 4.

2.7 Communication Connections

The UPS offers several communication interfaces and ports.

NOTE: We recommend that signal-cable lengths be less than 10 ft (3 m), and are kept away from power cabling.

2.7.1 Connecting IntelliSlot Communication

The IntelliSlot ports accepts two optional cards:

The Liebert® IntelliSlot™ Relay card (IS-RELAY) card provides dry-contact relay output for custom-wired applications.

The Liebert® IntelliSlot™ Unity card (RDU101) provides SNMP monitoring of the UPS across the network and/or building management system and lets you monitor external temperature, humidity and contact-closure inputs using external sensors.

See the appropriate figure for your model in [Rear Panels](#) on page 4, for the location of the card port.

To install an IntelliSlot Card:

1. Remove the screws from the slot cover plate and remove the plate.
2. Insert the card into the slot, and secure with the screws that held the cover plate.

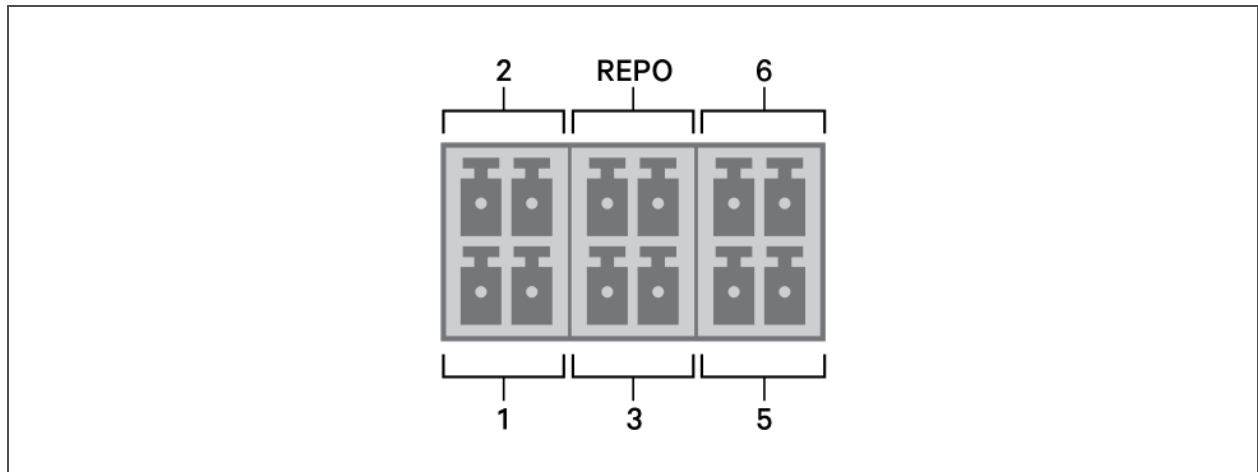
To make connections to the card, refer to the Installer/User Guide for the appropriate IntelliSlot card available at www.Vertiv.com.

2.7.2 Connecting to the Dry-contact Port

The UPS includes a dry-contact port. See the appropriate figure for your model in [Rear Panels](#) on page 4, for the location of the port. **Figure 2.3** below, shows the ports and **Table 2.2** on the facing page, describes each port.

The I/O dry contact port capacity is 125 Vdc, 0.5 A; 30 Vdc, 1 A

Figure 2.3 Dry-contact Port and Pin Layout



NOTE: Pins 7 and 8 are shorted before delivery.

NOTE: The emergency power-off (EPO) action of the UPS closes the rectifier, inverter and static bypass, but it cannot disconnect the UPS mains input inside. To completely disconnect the UPS, disconnect the upstream input circuit breaker when generating the EPO. For details on REPO connection and operation, see [Connecting a Remote Emergency Power-off \(REPO\) Switch](#) on the facing page.

Table 2.2 Dry-contact Connection and Pin-out Descriptions

PORT NO.	PORT NAME	PIN NO.	PIN NAME	DESCRIPTION
1	Input 1	1	Disable/Battery mode shutdown/Any mode shutdown (Remote Comms Shutdown)	Default: Disable, can be set via the LCD settings page. User can choose dry contact as NO/NC. when NO, Pin 1 and Pin 2 are shorted, the function is active. when NC, Pin 1 and Pin 2 are open, the function is active.
		2	Signal Ground	Signal Ground
2	Input 2	3	Disable/Battery mode shutdown/Any mode shutdown (Remote Comms Shutdown)	Default: Disable, can be set via the LCD settings page. User can choose dry contact as NO/NC. when NO, Pin 1 and Pin 2 are shorted, the function is active. when NC, Pin 1 and Pin 2 are open, the function is active.
		4	Signal Ground	Signal Ground
3	Battery Detection	5	EBC Detection	Default: Normally-Open (NO), automatically detects number of external-battery cabinets when pins 5 and 6 are connected to the detection port, see Installing External Battery Cabinets on page 12.
		6	EBC Detection	Default: Normally-Open (NO), automatically detects number of external-battery cabinets when pins 5 and 6 are connected to the detection port, see Installing External Battery Cabinets on page 12.
REPO	REPO Input	7	+5V	REPO power supply, 5-Vdc 100-mA
		8	REPO Coil-NC	NC, activated when Pin 7 and Pin 8 is open NOTE: For details on REPO connection and operation, see Connecting a Remote Emergency Power-off (REPO) Switch below.
5	Output 5	9	Low Battery/On battery/On bypass/UPS fault	Default: Low battery, can be set via the LCD settings page. When the system has a fault, short Pin 9 and Pin 10
		10	Signal Ground	Signal Ground
6	Output 6	11	Low Battery/On battery/On bypass/UPS fault	Default: UPS fault, can be set via the LCD settings page. When the system has a fault, short Pin 11 and Pin 12
		12	Signal Ground	Signal Ground

2.7.3 Connecting a Remote Emergency Power-off (REPO) Switch

The UPS includes an EPO connection in the dry-contact port. See the appropriate figure for your model in [Rear Panels](#) on page 4, for the location of the port.

UPS ships with a REPO jumper installed, allowing the UPS to operate as a normally-closed switch system (fail-safe). Opening the circuit disables the UPS. To connect a REPO switch that opens the circuit to shut down the rectifier and inverter and power-off the UPS, use a cable from the remote switch to plug into the REPO-port on the UPS.

In normal conditions, the REPO switch cannot cut off the UPS input power. When the REPO switch trips, the UPS generates an alarm and immediately cuts-off output power. When the emergency condition is resolved, the UPS will not return to normal operation until you reset the REPO switch and manually power-on the UPS.

To make the cable for the REPO connection:

Figure 2.4 below, shows the cable required to make the connection. We recommend using 18 AWG to 22 AWG (0.82 mm² to 0.33 mm²) copper-core cable.

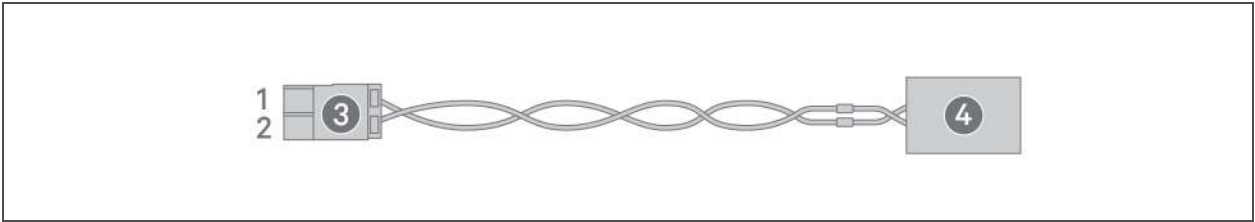
- 1. Remove the insulation from the end of two cables.
- 2. Insert the stripped end into the plug terminals 1 and 2 respectively, then press down the terminals. Make sure that the cables are secure in the plug to prevent failure because of loose contact.

To connect a UPS to the REPO switch

! CAUTION: To maintain safety (SELV) barriers and electromagnetic compatibility, signal cables should be shielded and run separately from power cables.

- 1. Connect one end of the cable to the remote switch, see **Figure 2.4** below.
- 2. Remove the factory-installed jumper from pins 7 and 8 of the dry-contact port on the UPS
- 3. Connect the plug to pins 7 and 8.

Figure 2.4 Cable/Plug for Connecting REPO switch to UPS REPO port



ITEM	DESCRIPTION
1	Terminal 1
2	Terminal 2
3	Plug (connects to REPO port on UPS)
4	REPO switch

2.7.4 Connecting a USB Cable

The UPS includes a USB connector. See the appropriate figure for your model in [Rear Panels](#) on page 4, for the location of the port.

The standard, B-type USB port connects the UPS to a network server or other computer system.

The USB port supports HID/CDC protocol. The CDC protocol is reserved for service software.

2.7.5 Connecting CLI Communication Cables

The UPS supports the Vertiv command-line interface for operation with ACS and other third-party monitoring protocols. The RJ-45 port is used for CLI connection. See the appropriate figure for your model in [Rear Panels](#) on page 4, for the location of the port. The pin-out, described in **Table 2.3** on the facing page, is consistent with the ACS pin-out.

Table 2.3 RJ-45 Port Pin-out

PIN	SIGNAL	DIRECTION
1	NC	—
2	NC	—
3	TXD	O
4	GND	—
5	NC	—
6	RXD	I
7	NC	—
8	NC	—

2.7.6 Connecting Sensors to the Control Port

The UPS supports the Vertiv temperature and temperature/humidity sensors. The RJ-45 port is used for sensor connection. See the appropriate figure for your model in [Rear Panels](#) on page 4, for the location of the port.

When connected, the sensor address must be 1 to 20.

The GXT5 supports two sensors:

- Liebert® IRM-S01T
- Liebert® IRM-S02TH

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3 OPERATING THE UPS



WARNING! Risk of electric shock. Can cause injury or death. Hazardous mains and/or battery voltage exists behind the protective cover. No user accessible parts are located behind the protective covers that require a tool for removal. Only qualified service personnel are authorized to remove such covers. If maintenance for rack is needed, notice that the neutral line is live.

3.1 Silencing the Audible Alarm

The audible alarm may sound during UPS operation. To silence the alarm, press and hold the **ESC** button for 2 seconds. The button is located on the front-panel display, see [Operation and Display Panel](#) on page 23.

3.2 Starting-up the UPS

IMPORTANT! Do not start the UPS until after the installation is finished, the system is commissioned by an authorized engineer, and the external input circuit breakers are closed.



CAUTION: Starting the UPS applies mains/utility power to the output terminals. Make sure that the load power is safe and ready to accept power. If the load is not ready, isolate the load with the output terminal.

The UPS starts in Normal Mode.

To start the UPS:

1. If included on your UPS model, make sure the maintenance-bypass switch is in the open “OFF” position and that the guard is secured in place.
2. Ensure that the REPO connector on the rear of the unit has a jumper between pins 7-8 or that it is properly wired to an Emergency Power- Off circuit (normally closed).
3. Make sure the breaker supplying power to the UPS is closed, and close the input breaker on the rear of the UPS.
4. If included on your UPS model, close the bypass breaker on the rear of the UPS.
5. Close all output breakers on the rear of the UPS (or in an external panel board, if used).
6. Power-on the UPS by pressing and holding the power button on the operation and display panel until the confirmation dialog appears. Use the Up/ Down arrows to select **YES**, then press **Enter**.
7. If this is the first-time start-up of the UPS, the Start-up Guidance wizard opens to set the basic parameters of the UPS. Follow the prompts.
For detailed description of UPS display functions and settings, see [Operation and Display Panel](#) on page 23.

3.3 Transferring to Battery Mode

The UPS operates in Normal mode unless the mains/utility power fails or it is performing a battery self test, then it automatically transfers to Battery mode for the back-up time available or the mains/utility power is restored. Once input power is restored, the UPS returns to Normal mode.

NOTE: Battery back-up run times are listed in [Battery Run Times](#) on page 54.

3.4 Transferring from Normal to Bypass Mode

Press and hold the power button for 2 seconds.

- If the bypass power is within normal operating range, the option to continue to Bypass mode or turn-off the UPS displays:
 - a. Use the arrow buttons to select *To the Bypass*, and press **Enter**.
 - b. Use the arrow buttons to select *No* or *Yes*, then press **Enter** to confirm.
- If the bypass power is outside normal operating range, do not transfer to Bypass mode.

3.5 Transferring from Bypass to Normal Mode

Press and hold the power button for 2 seconds.

- If the UPS is operating normally, without faults, the option to continue to turn-on or turn-off the UPS displays:
 - a. Use the arrow buttons to select *Turn on UPS*, and press **Enter**.
 - b. Use the arrow buttons to select *No* or *Yes*, then press **Enter** to confirm.

NOTE: The UPS automatically switches back to normal mode after an "overheated" or "overloaded" fault is cleared and normal power is restored.

3.6 Shutting-down the UPS Completely



WARNING! Risk of electric shock. Can cause injury or death. Disconnect all local and remote electric power supplies before working with the UPS. Ensure that the unit is shut down and power has been disconnected before beginning any maintenance.

Transfer to Bypass mode, see [Transferring from Normal to Bypass Mode](#) above. Then, if power to the load is not needed, open the main-input circuit breaker.

3.7 Remote Emergency Power-off (REPO)

REPO turns off the UPS in emergency conditions such as fire or flood. When an emergency occurs, the REPO switch turns off the rectifier and inverter and stops powering the load immediately. The battery stops charging and discharging.

To manually power-off in an emergency, disconnect the terminal connecting the REPO port on the rear of the UPS.

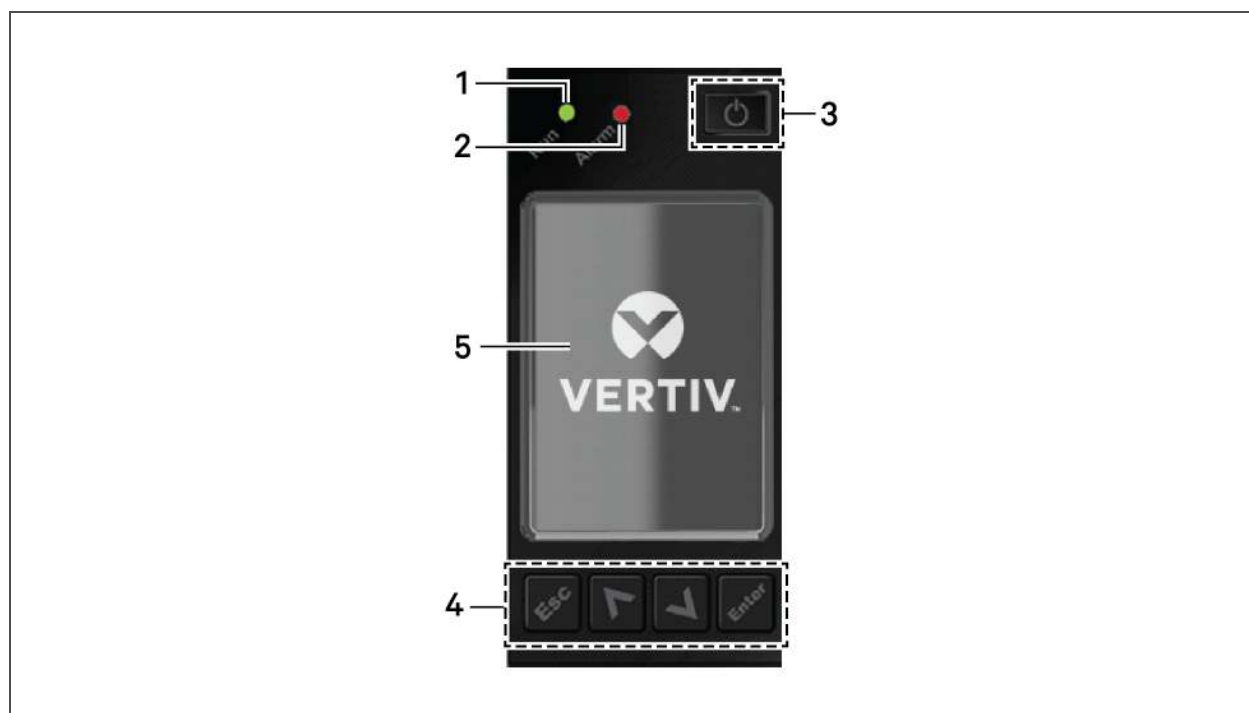
If mains/utility power is present, the UPS control circuit remains active even though output power is disabled. To remove all mains/utility power, disconnect the external main-input MCB.

4 OPERATION AND DISPLAY PANEL

NOTE: The UPS has a gravity-sensor function that automatically rotates the LCD display depending on tower or rack installation. See [Display orientation](#) on page 32.

The operation/display panel includes LED indicators, function keys, and an LCD interface to configure and control UPS operation.

Figure 4.1 UPS Front-panel Display



ITEM	DESCRIPTION
1	Run indicator LED, see LED Indicators on page 25.
2	Alarm indicator LED, see LED Indicators on page 25.
3	Power button, see Table 4.1 on the next page.
4	Menu keys, see Table 4.1 on the next page.
5	LCD panel.

Table 4.1 Display-panel Button Functions and Descriptions

BUTTON	FUNCTION	DESCRIPTION
	Enter	Confirm or enter selection.
	Up	Move to previous page, increase value, move left.
	Down	Move to next page, decrease value, move right.
	Escape	Go back.
	Power	Power-on the UPS, power-off the UPS, transfer to Bypass Mode.

NOTE: While the UPS is operating, the LCD will dim and display a screen saver if there is no active alarm or user interaction for two minutes, see **Figure 4.2** below. If an alarm or fault occurs or if any button is pressed, the UPS-flow screen displays.

Figure 4.2 LCD Screen Saver



4.1 LED Indicators

The LEDs on the front-panel display indicate operation and alarm statuses of the UPS.

NOTE: When an alarm is indicated, an alarm message is logged. on page 36, describes the alarm messages you may see. When a fault is indicated, front-panel display list the fault, which are described in Table 6.2 on page 47.

Table 4.2 LED Functions

INDICATOR	LED COLOR	LED STATE	INDICATES:
Run indicator	Green	On	UPS has output
		Blinking	Inverter is starting
		Off	UPS has no output
Alarm indicator	Yellow	On	Alarm occurs
	Red	On	Fault occurs
	None	Off	No alarm, no fault

4.2 LCD Menu and Screens

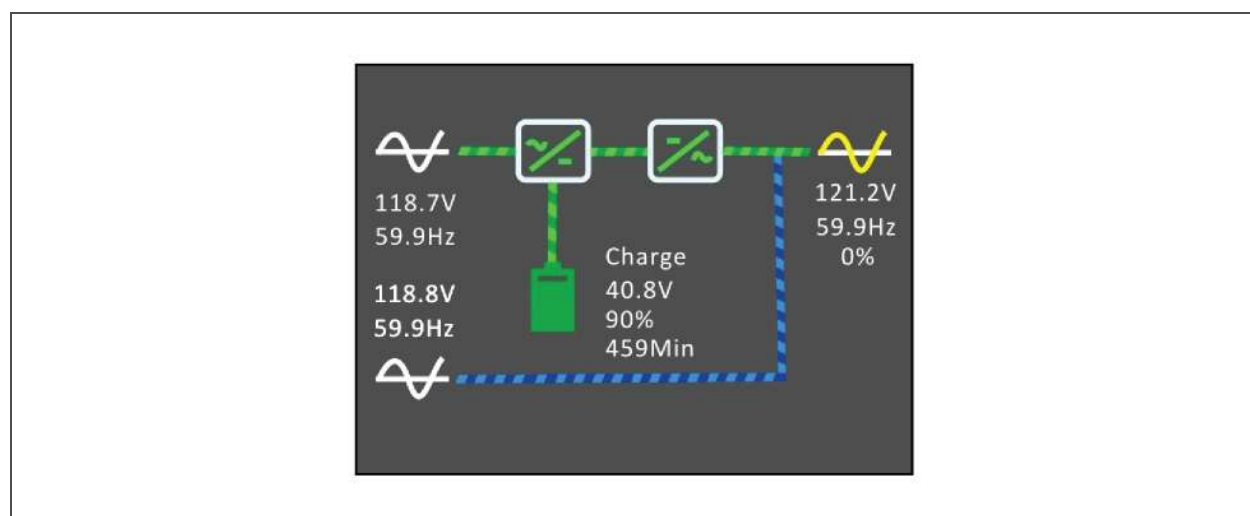
The menu-driven LCD user interface lets you browse the UPS status, view operating parameters, customize settings, control operation, and view alarm/event history. Use the function keys to navigate through the menu, and view statuses or select settings in the screens.

4.2.1 Start-up and Flow Screens

At start-up, the UPS executes a system test and displays the Vertiv logo screen for about 10 seconds, shown in Figure 4.1 on page 23. After the test completes, an overview screen shows status information, the active (green) power path, and the non-working power path (gray).

NOTE: Figure 4.3 below, is an example flow screen and does not reflect the actual values that you may see on your unit.

Figure 4.3 UPS Flow Screen



4.2.2 Main Menu

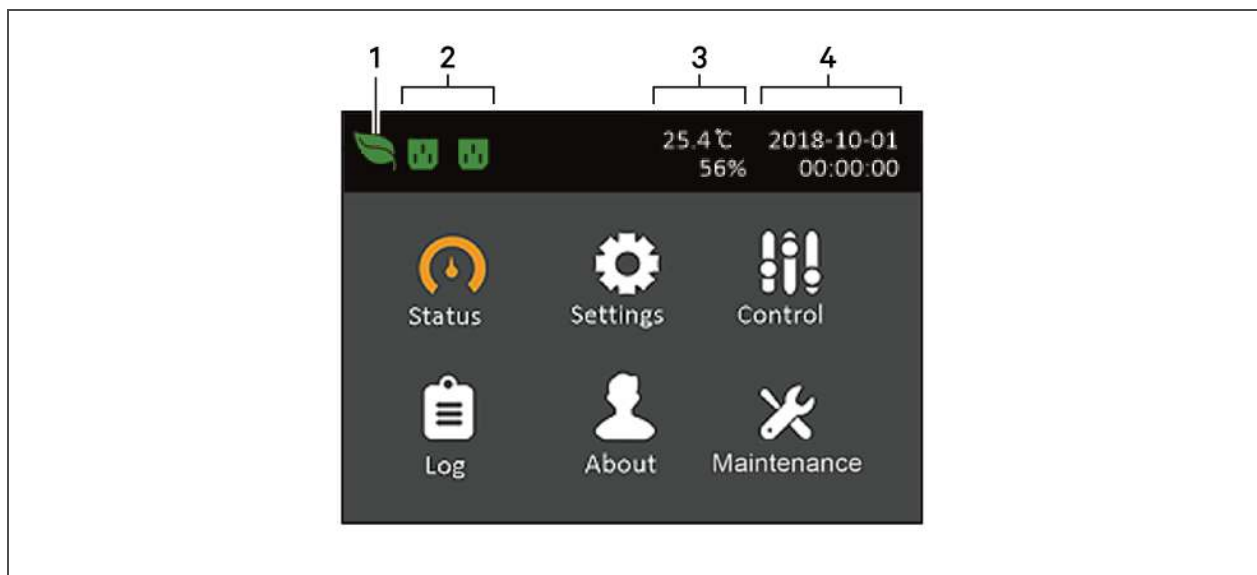
To access the main menu, press **Enter** while at the flow screen. **Table 4.3** below, describes the menu options, and **Figure 4.4** below, describes the display.

Use the arrow buttons to select the sub-menu options, and press **Enter** to open the sub menu. Press **ESC** to return to the flow.

Table 4.3 Menu Options

SUB MENU	DESCRIPTION
Status	Voltage, current, frequency, and parameters for UPS components, see Status Screen on the facing page.
Settings	Display and system parameter settings, see Settings Submenu on page 30.
Control	UPS controls, see Control Screen on page 35.
Log	Current alarms and event history, see Log Screen on page 36.
About	Product and network information, see About Screen on page 40.
Maintenance	Service-only, service-password protected page for use only by Vertiv service representatives.

Figure 4.4 Main Menu



ITEM	DESCRIPTION
1	ECO-mode indicator
2	Programmable-outlet indicator
3	Ambient temperature and humidity. Only displays when sensors are connected.
4	Date and time

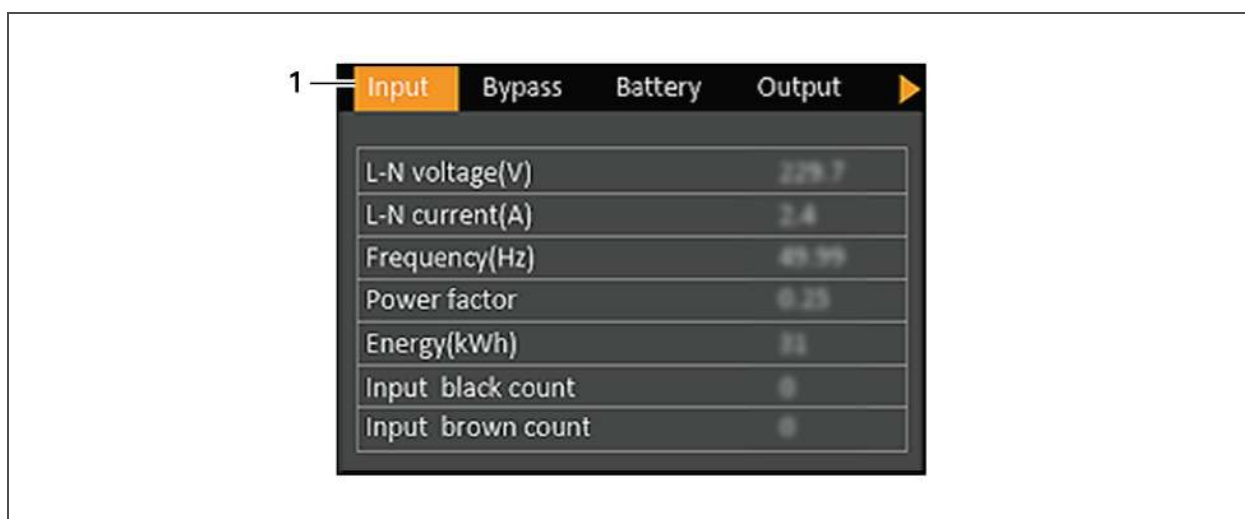
Status Screen

The status screen displays voltages, currents, frequencies, and parameters on individual tabs for input, bypass, battery, output, and load status.

To view the UPS status information:

1. At the main menu, select the Status icon, and press **Enter**.
2. Use the arrow buttons to move the cursor left/right and select a tab, then press **Enter** to display the status information for the selected tab.

Figure 4.5 Status-screen tabs



ITEM	DESCRIPTION
1	Screen tabs with Input tab selected.

NOTE: Multiple phases are shown in multiple columns. For example, a unit with 3-phase input will display 3 columns of status data.

Input statuses

L-N voltage(V)

Line-neutral voltage of input power.

L-N current(A)

Line-neutral current of input power.

Frequency (Hz)

Frequency of input of input power.

Power factor

Power factor of the input power.

Energy (kWh)

Input power.

Input black count

Count of input voltage lost.

Input brown count

Count of PFC overload to battery.

Bypass status options

L-N voltage(V)

Line-neutral voltage of bypass power.

Frequency (Hz)

Frequency of bypass power.

Battery status options

Battery status

Current battery state: charging, discharging, or fully-charged.

Battery voltage (V)

Voltage of battery power.

Battery current (A)

Current of battery power.

Backup time(Min)

Amount of back-up time remaining for battery.

Remaining capacity(%)

Percent of capacity remaining for battery.

Discharge count

Number of discharges for the battery module.

Total discharge time(Min)

Number of minutes until battery is fully discharged.

Batt running time(Day)

Number of days the batteries have been in operation.

Battery replacement time

Date of last time battery was replaced.

External battery cabinet group No.

Number of external battery cabinets connected.

Battery average temp(°C)

Average temperature of the battery.

Battery highest temp(°C)

Highest temperature battery has reached.

Battery lowest temp(°C)

Lowest temperature battery has reached.

Output status options

L-N voltage(V)

Line-neutral voltage of output power.

L-N current(A)

Line-neutral current of output power.

Frequency (Hz)

Frequency of output power.

Energy (kWh)

Output power

Load status options

Sout(kVA)

Apparent output power.

Pout(kVA)

Active output power.

Power factor

Power factor of output power.

Load percent(%)

Percentage of recent power rated to output power.

Settings Submenu

The settings screen consists of tabs that list UPS settings for configuration and adjusting parameters with tabs for:

- Output
- Battery
- Monitor
- System

NOTE: Do not change parameter settings or reset to factory defaults when powering-off the UPS.

To modify UPS settings:

1. At the main menu, select the Settings icon, and press **Enter**.

NOTE: To adjust the settings, you must enter a password. See [Editing Display and Operation Settings](#) on page 41, for details on entering the password and editing the setting parameters.

2. Use the arrow buttons to move the cursor left/right and select a tab, then press **Enter** to display the parameter list for the selected tab.

Output parameter options

Voltage selection

Selects the default output voltage.

Startup on bypass

When enabled, the UPS starts in Bypass mode then transfers to Normal mode. When disabled, the UPS starts in Normal mode.

Frequency selection

Selects the frequency of the output. Options are:

- Auto, Bypass enabled = Automatically detects frequency of utility/mains power and sets the nominal frequency to match and bypass mode is enabled. Typical operating mode.
- Auto, Bypass disabled = Automatically detects frequency of utility/mains power and sets the nominal frequency to match and bypass mode is disabled.
- Frequency converter 50 Hz = Bypass mode is disabled and the UPS provides 50-Hz output from any qualified utility/mains power.
- Frequency converter 60 Hz = Bypass mode is disabled and the UPS provides 60-Hz output from any qualified utility/mains power.

Bypass voltage upper limit

Percentage that the input voltage may be above the selected output voltage setting and remain in Bypass mode.

Bypass voltage lower limit

Percentage that the input voltage may be below the selected output voltage setting and remain in Bypass mode.

Run mode

Selects Normal or ECO operation for the UPS. Options are:

- Normal = Connected load is always powered through the UPS inverter. ECO mode is disabled.
- ECO mode = ECO mode is enabled. The UPS inverter is bypassed, and the connected load is powered by utility/mains power within the selected ECO voltage and frequency tolerances.

ECO voltage range

Percentage that the input voltage may be above or below the selected output voltage setting and remain in ECO mode.

ECO frequency range

Amount that the input frequency (Hz) may be above or below the selected frequency setting and remain in ECO mode.

ECO requalification time

To ensure the stability of the utility/mains power, this is the length of time that the UPS requires after the input-power voltage and frequency tolerances are met before switching to ECO-mode operation.

Battery parameter options

External battery AH

Sets the Amp-hour.

External battery cabinet group No.

Sets the number of external battery cabinets.

Low battery time

Sounds an alarm when the selected amount of time remaining for the UPS to operate in Battery mode is met.

Battery periodic test enable

Enables/Disables automatic battery self test.

Batt. note duration (months)

Sets the duration of the notice to replace the batteries.

Dischg protect time

Sets the discharge protection time.

Equal charge enable

Enable/Disables equal-charge mode.

Max chg curr

Sets the maximum charge current.

Temp compensation

Enables/Disables temperature compensation.

Replace battery

Activates newly-installed battery packs after replacement.

Monitor settings options

Language

Selects the language of the display, see [Selecting the Display Language](#) on page 42. Options are:

- English
- French
- Portuguese
- Spanish
- Chinese
- German
- Japanese
- Russian

Date

Selects the current date for the UPS display, YYYY-MM-DD.

Time

Select the current time for the UPS display, HH:MM:SS.

Display orientation

Selects the orientation of the display for use in rack or tower configuration. Options are:

- Auto-rotate = Automatically rotates based on the detected orientation of the UPS.
- Horizontal
- Vertical

Audible alarm

Enables/Disables the audible alarm of the UPS.

Change settings password

Opens the dialog to change the password used to access and update the UPS parameter settings, see [Changing the Password](#) on page 41.

System parameter options

Auto restart

Enables/Disables automatic restart of the UPS when input power is restored after a complete shut-down of the UPS system.

Auto restart delay

Length of time to elapse before an automatic restart after input power is restored.

Guaranteed shutdown

Enables/Disables continued shutdown of the UPS system after the Low Battery alarm threshold is reached, even if input power is restored during this time.

Start with no battery

Enables/Disables UPS start-up when batteries are fully depleted.

Remote control

Enables/Disables remote control of the UPS.

Any mode shutdown auto restart enable

Enables/Disables any-mode shut-down auto-restart function.

Output contact NO/NC

Selects the state of the dry-contact output, normally-open or normally-closed.

Input contact NO/NC

Selects the state of the dry-contact input, normally-open or normally-closed.

Dry contact 5 (Output)

Selects the output of dry-contact 5. Options are:

- Low battery
- On bypass
- On battery
- UPS fault

Dry contact 6 (Output)

Selects the output of dry-contact 6. Options are:

- Low battery
- On bypass
- On battery
- UPS fault

Dry contact 1 (Input)

Selects the input of dry-contact 1. Options are:

- Disable
- Battery mode shutdown
- Any mode shutdown

Dry contact 2 (Input)

Selects the input of dry-contact 2. Options are:

- Disable
- Battery mode shutdown
- Any mode shutdown

Sleep mode

Enables/Disables sleep mode.

IT system compatibility

Enables/Disables the neutral back-feed relay on battery mode.

Outlet parameter options

Apply the same settings as Outlet1

Applies the settings for another outlet to this outlet. This lets you set the parameters for a single outlet and apply identical settings to multiple outlets at once.

Turn on outlet

Turns-on the outlet.

Turn on delay

Length of time to elapse before outlet turns on after UPS start-up.

Turn off when UPS overload on battery

Enables/Disables turning-off the outlet if the UPS is overloaded.

Outlet settings based on discharging time

Threshold of turning off the outlet

Length of time that the batteries discharge before turning off the outlet.

Turn on when power returns for

Length of time to elapse after input power returns before turning on the outlet.

Outlet settings based on backup time

Threshold of turning off the outlet

Amount of back-up time remaining to turn off the outlet.

Turn on when power returns for

Length of time to elapse after input power returns before turning on the outlet.

Outlet settings based on capacity

Threshold of turning off the outlet

Percent capacity remaining to turn off the outlet.

Turn on when power returns for

Length of time to elapse after input power returns before turning on the outlet.

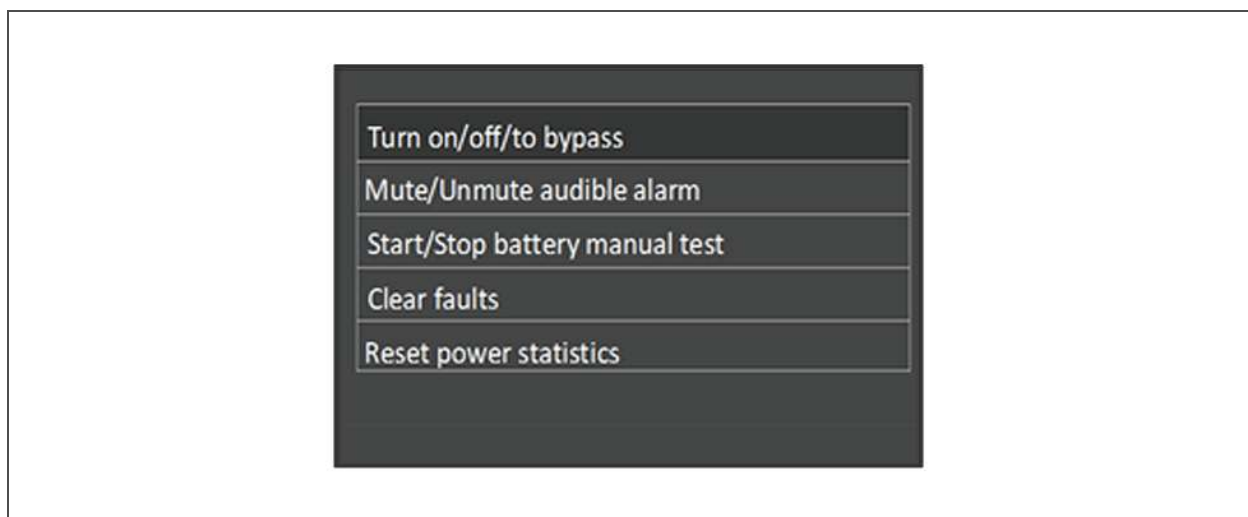
Control Screen

The Control screen offers UPS-control options.

To adjust the UPS controls:

1. At the main menu, select the Control icon, and press **Enter**.
2. Use the arrow buttons to move the cursor to the option, then press **Enter** to selected the control.

Figure 4.6 Control Screen



Control options

Turn on/off/to bypass

Opens the dialog to change operating modes, see [Operating the UPS](#) on page 21.

Mute/Unmute audible alarm

Silences or un-silences the audible alarm, see [Silencing the Audible Alarm](#) on page 21.

Start/Stop battery manual test

Runs the battery self test.

Clear faults

Clears displayed faults after the issue causing the fault is resolved, see [Table 6.2](#) on page 47, for a description of the faults.

Reset power statistics

Resets to zero the values tracked to calculate the Efficiency graph, see [About Screen](#) on page 40.

Log Screen

The Log Screen offers tabs that list the current alarms and the alarm/event history. [Table 4.4](#) below, describes the alarm messages you may see in the logs.

To view the logs:

1. At the main menu, select the Log icon, and press **Enter**.
2. Use the arrow buttons to move the cursor left/right and select a tab, then press **Enter** to display the log for the selected tab.

Figure 4.7 Current and History Log Tabs

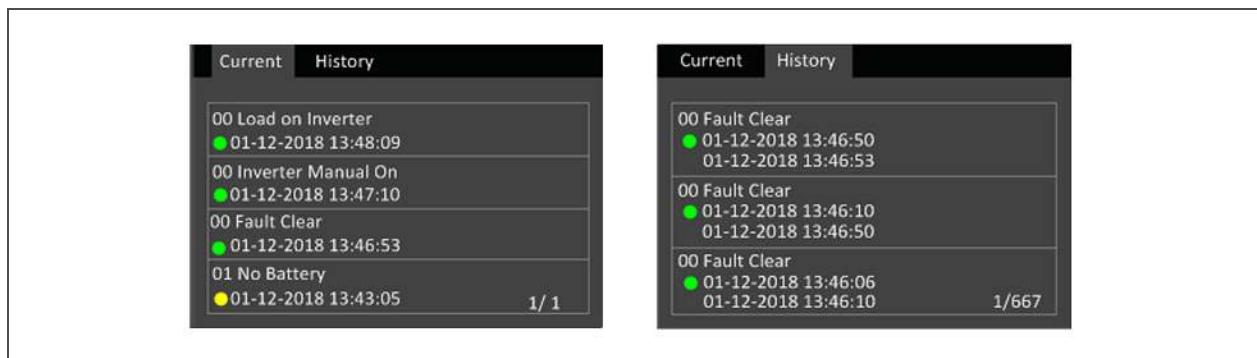


Table 4.4 Alarm Messages

MESSAGE	DESCRIPTION
Aux. power fault	The auxiliary power output voltage exceeds the normal range
Battery cabinet connect abnormal	An incorrect number of external battery cabinets are connected to the UPS.
Battery EOD	Battery end of discharge.
Battery low pre-warning	This alarm occurs when the battery reaches the EOD. After the pre-warning, the battery capacity allows two minutes discharge at full load. The user can set the time ranging from 2 min~ 30 min, (2 min by default). Please shut down the load timely

Table 4.4 Alarm Messages (continued)

MESSAGE	DESCRIPTION
Battery mode	The UPS is on battery, and the inverter starts
Battery overtemp	Battery ambient temperature too high. Check that the battery ambient temperature is higher than setting value 40 ~ 60°C (default: 50°C)
Battery replacement timeout	The alarm will appear when the time (Battery replaced time adds the noted time of battery replacement) later than the current system time. When the users set the noted time of battery replacement as disabled, the alarm will not appear.
Battery test fail	The battery low voltage is detected when the battery has manual or periodical self-test. Battery replacement is recommended
Battery test started	The battery periodic self-test and manual self-test started
Battery test stopped	The battery periodic self-test or manual self-test finished
Battery to utility transition	The UPS is powered by the mains instead of the battery
Battery voltage abnormal	When battery is connected, the system checks that the battery voltage exceeds the normal setting range. Check that the battery terminal voltage exceeds the normal range
Bypass abnormal	Maybe caused by bypass voltage and frequency outside of range, bypass power-off and incorrect bypass cables connection. 1. Check that the bypass voltage and frequency are within the setting range. 2. Check the bypass cables connection
Bypass abnormal in ECO mode	Maybe caused by ECO bypass voltage and frequency outside of range, ECO bypass power-off, and incorrect ECO bypass cables connection. Check that the ECO bypass voltage and frequency are within the setting range.
Bypass mode	The UPS is on bypass
Bypass overcurrent	The bypass current exceeds the rated value.
Charger fault	The charger output voltage is abnormal, and the charger will be off.
Communication fail	Internal communication is abnormal, please check the communication cables are connected correctly or not.
DC bus abnormal	The inverter is off when DC bus voltage is faulty. The load will transfer to bypass if the bypass is available because the bus voltage exceeds the range.
DC/DC fault	The discharger is faulty, because the bus voltage exceeds the range when discharger starts or soft starts.
EOD turn off	The inverter is off due to EOD. Check the mains power-off state and recover the mains in time
Fan fault	At least one fan is faulty. Check that the fan is blocked or the cables connection is loosened
Faults cleared	The faults have been cleared using the Settings > Controls > Clear faults option.
Guaranteed shutdown	Under forced EOD mode, the battery discharging finished, then system shuts down
Input abnormal	The rectifier and charger are off due to the mains voltage and frequency exceeding normal range. Check that the rectifier input phase voltage and frequency exceed the normal range or that the mains has power-off
Input ground	Check that the PE line is well connected and that the alarm can be cleared at the display.

Table 4.4 Alarm Messages (continued)

MESSAGE	DESCRIPTION
lost	
Input phase reversed	the input live line and N line are connected incorrect
Insufficient capacity to start	The UPS is on bypass, UPS get the command of start, the system load capacity is larger than 105% rated . the prompt will appear
Inverter fault	The inverter is off when the inverter output voltage and current exceed the setting range. If bypass is available, the UPS will transfer to bypass mode, otherwise the system will power off
Inverter overload	Inverter load capacity is larger than the rated value, overload delay time is up, inverter shuts down. If bypass is available, the system will transfer to the bypass mode, otherwise the output is failure. Check that the actual inverter load capacity, if overloaded, just reduce the load capacity, and the system will transfer to the inverter mode after five seconds with alarm cleared
Load off due to output short	The inverter short circuit or the bypass short circuit. Please check it
Load off due to shutdown on battery	Shutdown in battery mode
Manual power-on	Set power-on via LCD panel
Manual shutdown	Set shutdown via LCD panel
Manual shut off	Displayed when the user shuts-down UPS output.
No battery	Check the battery and battery cables connection
Operating on inverter	The UPS output state is on inverter
Output disabled	The system is in standby state, and the dry contact shutdown is enabled. Check whether the shutdown dry contact is enabled or not
Output off due to bypass abnormal	The bypass is abnormal, and the bypass is in stand-by mode. Check that the bypass input is normal
Output off due to overload & bypass abnormal	The output is off due to output overload and bypass abnormal. Please check it
Output off, voltage is not zero	When there is no output, the system detects that the output has a voltage
Output pending	Remote shutdown is enabled, and the system will be off
Output short	Check that the output cables are not shorted
Output voltage abnormal	The output voltage exceeds the normal voltage range.

Table 4.4 Alarm Messages (continued)

MESSAGE	DESCRIPTION
Rectifier fault	The rectifier is faulty and off because the bus voltage exceeds the range when the rectifier starts or soft starts.
Rectifier overload	The output power is larger than the rectifier overload point. Check that the input voltage meets the output load, mains input 176 V ~ 100 V, the load 100% ~ 50% linear derating
Remote power-on	Remotely power on
Remote shut-off	Remotely power off
Remote shutdown	Dry contact activated at any mode shutdown
REPO	Shutdown caused by the REPO terminal Normally Closed contact open
Restore factory defaults	Under UPS stand-by state, set 'Restore Factory Defaults' function via the Maintain page
Shutdown due to overtemp	During the UPS operation, the system checks that the heat sink temperature exceeds the setting range. If overtemperature, please check: 1. Ambient temperature too high or not 2. Dust is blocked or not 3. Fan fault or not
System fault	Alarm when model configuration is incorrect. Contact Vertiv Technical support.
System overtemp	Internal heat sink temperature too high, and the inverter is off. The alarm can only be silenced if the heat-sink temperature is lower than the alarm setting. The system can automatically start after overtemperature fault is solved. If overtemperature, please check: 1. Ambient temperature too high or not 2. Dust is blocked or not 3. Fan fault or not
Turn off programmable outlet	The programmable-outlet status changed from "Turn On" to "Turn Off"
Turn on fail	The UPS does not start because there is no mains/utility power or it is greater than the voltage required to supply the full load. Check the AC input power.
Turn on programmable outlet.	The programmable-outlet status changed from "Turn Off" to "Turn On."
UPS has no output	Both Inverter and Bypass provide no power supply.
UPS is out of service	The UPS is out of service.

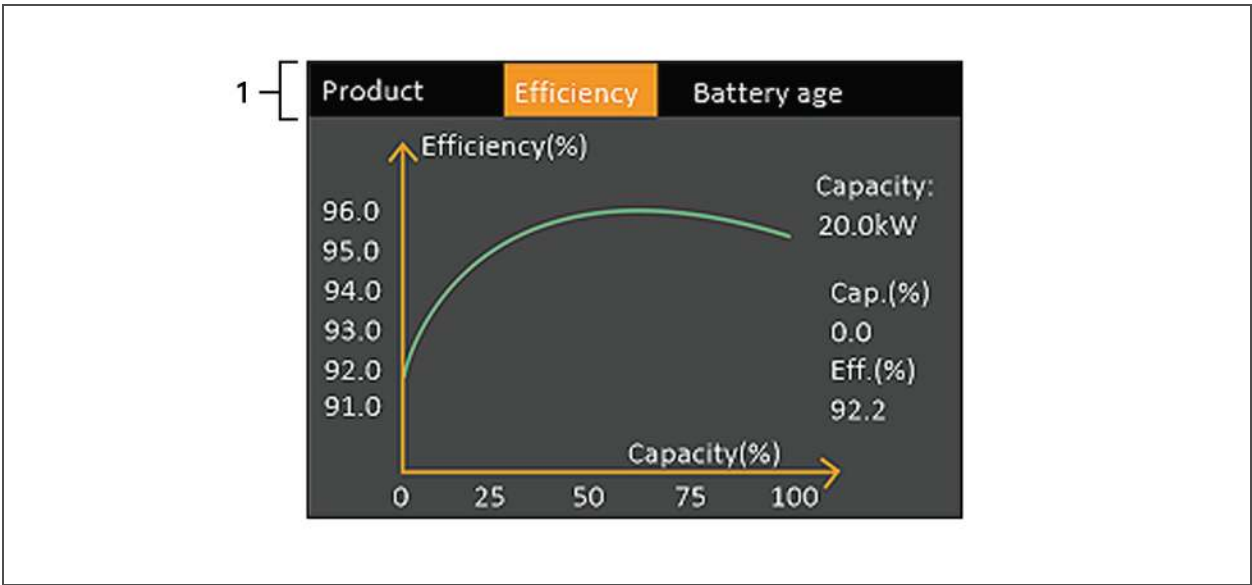
About Screen

The About screen offers tabs that list information about the product and the network. The Efficiency tab shows a chart of battery efficiency versus capacity. The Battery age tab show a chart of SOH percentage versus battery age in years.

To view the product and network information:

- 1. At the main menu, select the About icon, and press **Enter**.
- 2. Use the arrow buttons to move the cursor left/right and select a tab, then press **Enter** to display the information for the selected tab.

Figure 4.8 About Screen Tabs



ITEM	DESCRIPTION
1	Screen tabs with Efficiency tab selected. NOTE: The tab shown in the figure is an example of the graph and does not represent the actual capacity values for your UPS model.

Product information

Product Type

UPS model number.

Serial number

UPS serial number.

Time since startup

Elapsed time since start-up of the UPS.

Boot FW version

Version of MCU boot firmware on the monitor board.

Monitor FW version

Version of MCU application firmware on the monitor board.

DSP FW version

Version of DSP firmware on the UPS power-module control board.

4.3 Editing Display and Operation Settings

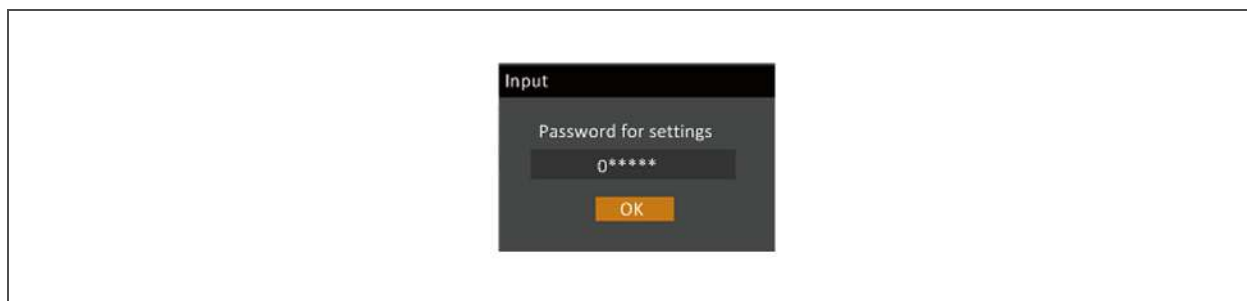
You may adjust the display settings and UPS configuration via the LCD. The display and operation settings are password protected. The default password is 111111 (six ones).

NOTE: We recommend that you change the password to protect your system and equipment and record the new password and store it in an accessible location for later retrieval. See [Changing the Password](#) below.

To enter the password:

1. Press the up-arrow button to change the digit, then press the down-arrow button to move to the next digit.
2. Repeat to select each digit, and press **Enter** to submit the password.

Figure 4.9 Password Prompt



4.3.1 Changing the Password

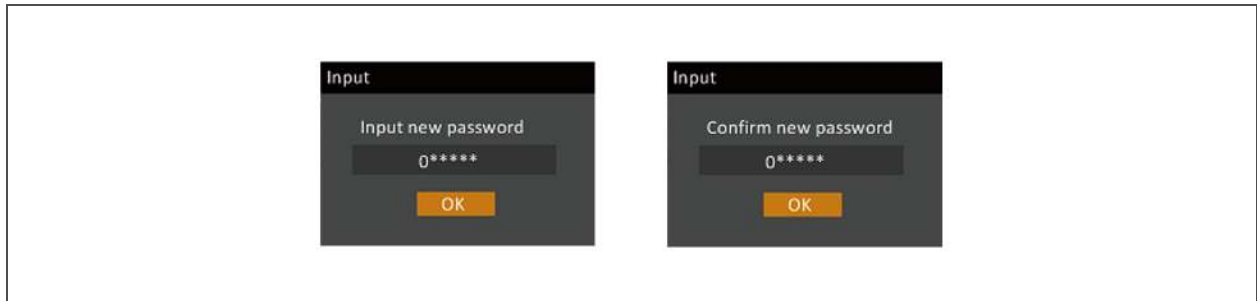
The default password is 111111 (six ones). You must use the current password to change the password.

NOTE: We recommend that you change the password from the default to protect your system and equipment. Record the new password and store it in an accessible location for later retrieval.

1. At the main menu, select the Settings icon, and press **Enter**.
2. At the password prompt, use the up-arrow to select the first digit, press the down-arrow to move to the next digit, repeat for each digit, then press **Enter** to access the settings.
3. Use the arrow buttons to select the Monitor tab, then press **Enter**.

4. Use the down arrow to highlight *Change Settings Password*, press **Enter**, and re-enter the current password.
The Input new password dialog opens, see Figure 4.10 below.
5. Enter the new password, then confirm the new password.
A confirmation dialog opens to indicate a successful password change.
6. Press **ESC** to return to the settings or main menu.

Figure 4.10 New and Confirm Password dialogs



4.3.2 Selecting the Display Language

The LCD is multilingual. The available languages are English, French, Portuguese, Spanish, Chinese, German, Japanese, and Russian.

To change the language:

1. At the main menu, select the Settings icon, and press **Enter**.
2. At the password prompt, use the up-arrow to select the first digit, press the down-arrow to move to the next digit, repeat for each digit, then press **Enter** to access the settings.
3. Use the arrow buttons to select the Monitor tab, then press **Enter**.
4. Use the down arrow to highlight *Language*, then press **Enter**.
5. Use the up/down arrows to select the language, then press **Enter**.
All the LCD elements display in the selected language.

4.3.3 Setting the Date and Time

To adjust the date and time:

1. At the main menu, select the Settings icon, and press **Enter**.
2. At the password prompt, use the up-arrow to select the first digit, press the down-arrow to move to the next digit, repeat for each digit, then press **Enter** to access the settings.
3. Use the arrow buttons to select the Monitor tab, then press **Enter**.
4. Use the down arrow to highlight *Date* or *Time*, then press **Enter**.
5. Use the up/down arrows to select the date/time, then press **Enter** to confirm.

5 MAINTENANCE



WARNING! Risk of electric shock. Can cause equipment damage, injury and death. A battery can present a risk of electrical shock and high short-circuit current.



WARNING! Risk of electric shock. Can cause injury or death. Hazardous mains and/or battery voltage exists behind the protective cover. No user accessible parts are located behind the protective covers that require a tool for removal. Only qualified service personnel are authorized to remove such covers. If maintenance for rack is needed, notice that the neutral line is live.

Observe the following precautions when working on batteries:

- Remove watches, rings and other metal objects.
- Use tools with insulated handles.
- Wear rubber gloves and boots.
- Do not lay tools or metal parts on top of batteries.
- Disconnect charging source prior to connecting or disconnecting battery terminals.
- If the battery kit is damaged in any way or shows signs of leakage, contact your Vertiv representative immediately.
- Handle, transport, and recycle batteries in accordance with local regulations.
- Determine if the battery is inadvertently grounded. If it is inadvertently grounded, remove the source of the ground. Contact with any part of a grounded battery can result in electrical shock. The likelihood of such shock will be reduced if grounds are removed during installation and maintenance (applicable to a UPS and a remote battery supply not having a grounded supply circuit).

5.1 Replacing Batteries



WARNING! Risk of electric shock. Can cause injury or death. Disconnect all local and remote electric power supplies before working with the UPS. Ensure that the unit is shut down and power has been disconnected before beginning any maintenance.



WARNING! Risk of electric shock and explosion. Can cause equipment damage, injury and death. Do not dispose of the battery in a fire. The battery may explode. Do not open or damage the battery. Released electrolyte is toxic and is harmful to skin and eyes. If electrolyte comes into contact with the skin, wash the affected area immediately with plenty of clean water and get medical attention.



WARNING! Risk of electric shock. Can cause equipment damage, injury and death. A battery can present a risk of electrical shock and high short-circuit current.



WARNING! Risk of explosion. Can cause equipment damage, injury and death. A battery can explode if the battery is replaced by an incorrect type. Dispose of used batteries according to the instructions included with the battery-pack.

Read all safety cautions before proceeding. A trained user can replace the internal battery pack when the UPS is in a restricted access location (such as a rack or server closet). To obtain the appropriate replacement battery pack(s), refer to **Table 5.1** below, and contact your local dealer or Vertiv representative.

Table 5.1 Replacement Battery-pack Model Numbers

UPS MODEL NUMBER	BATTERY PACK MODEL NUMBER	QUANTITY REQUIRED
GXT5-500LVRT2UXL	GXT5-36BATKIT	1
GXT5-750LVRT2UXL		
GXT5-1000LVRT2UXL		
GXT5-1500LVRT2UXL	GXT5-48BATKIT	1
GXT5-2000LVRT2UXL		
GXT5-3000LVRT2UXL	GXT5-72BATKIT	1

To replace a battery pack:

NOTE: The internal battery pack is hot-swappable. However, you must exercise caution because; during this procedure, the load is unprotected from disturbances and power outages. Do not replace the battery while the UPS is operating in Battery Mode. This will result in a loss of output power and will drop the connected load.

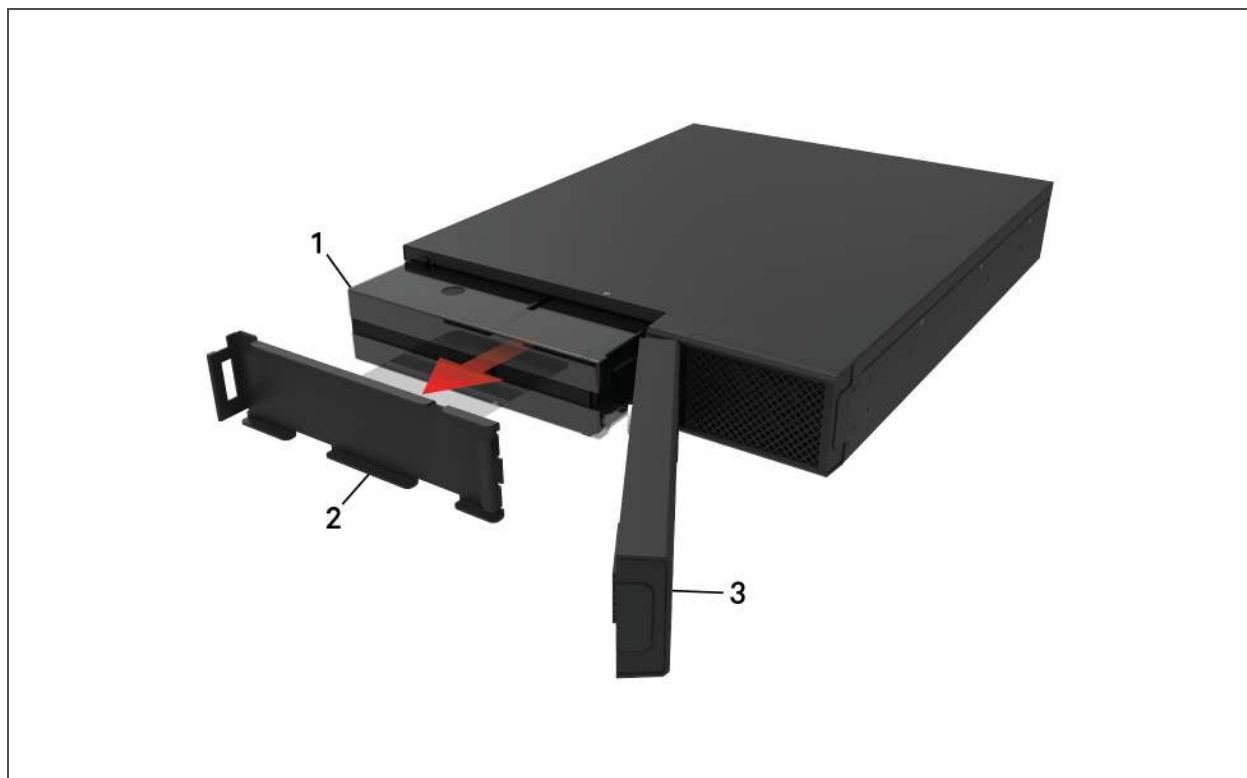
1. Press the button on the left-front of the UPS front panel, and pull the panel open, then, loosen and remove the screw from the battery door, see **Figure 5.1** on the facing page.
2. Lay the battery door and screw aside for reassembly.
3. Grasp the battery handle, and pull out the battery pack, see **Figure 5.1** on the facing page.
4. Unpack the replacement battery pack, taking care not to damage the packaging to re-use when disposing of the old battery.
5. Compare the new and old battery pack to make sure they are the same type and model. If so, proceed with step 6. If they are different, stop and contact your Vertiv representative, or Technical Support, <http://www.Vertiv.com/en-us/support/>.
6. Line-up and slowly push-in each replacement battery pack. The battery is fully-inserted if the battery door fits flush against the UPS.
7. Re-attach the battery door with the screw, and replace the front cover.
8. Activate the new battery pack(s) using the operating/display panel:

NOTE: The display menus and functions are described in [Operation and Display Panel](#) on page 23.

- From the main menu, select *Settings*, then the Monitoring tab and verify that the date and time are correct. If the date or time need correction, see [Setting the Date and Time](#) on page 42.

- Select the *Battery* tab, use the arrows to select *Replace Battery*, and press **Enter**.
The replaced battery packs are activated.
- Use **ESC** to return to the main display.

Figure 5.1 Replacing the Battery Pack



ITEM	DESCRIPTION
1	Battery pack
2	Battery door
3	Front panel

5.2 Charging Batteries

The batteries are valve-regulated, non-spillable, lead acid and should be kept charged to attain their design life. The UPS charges the batteries continuously when it is connected to the utility input power.

If the UPS will be stored for a long time, We recommend connecting the UPS to input power for at least 24 hours every 4 to 6 months to ensure full recharge of the batteries.

5.3 Checking UPS Operation

NOTE: Operation-check procedures may interrupt power supply to the connected load.

We recommend checking the UPS operation once every 6 months.

Back-up the load data before conducting the check.

1. Press the power button to check the indicators and display function.
2. Check for alarm or fault indicators on the operation/display panel.
3. Make sure that there are no audible or silenced alarms.
4. Select the Setting menu, and look at the log for alarm and fault history.
5. Check the operating mode for Normal mode. If the UPS is operating in Bypass mode, contact Vertiv Technical Support.
6. Check to see if batteries are discharging (operating in Battery mode) and utility power is normal. If so, contact Vertiv Technical Support.

5.4 Cleaning the UPS



WARNING! Risk of electric shock. Can cause injury or death. Disconnect all local and remote electric power supplies before working with the UPS. Ensure that the unit is shut down and power has been disconnected before beginning any maintenance.



WARNING! Risk of electric shock. Can cause injury or death. Hazardous mains and/or battery voltage exists behind the protective cover. No user accessible parts are located behind the protective covers that require a tool for removal. Only qualified service personnel are authorized to remove such covers. If maintenance for rack is needed, notice that the neutral line is live.

The UPS requires no internal cleaning. If the outside of the UPS becomes dusty, wipe with a dry cloth. Do not use liquid or aerosol cleaners. Do not insert any objects into the ventilation holes or other openings in the UPS.

6 TROUBLESHOOTING

This section indicates various UPS symptoms you may encounter and provides a troubleshooting guide in the event the UPS develops a problem. Use the following information to determine whether external factors caused the problem and how to remedy the situation.

6.1 Symptoms that Require Troubleshooting

The following symptoms indicate the UPS is malfunctioning:

- The relative indicators illuminate, indicating the UPS has detected a problem.
- An alarm buzzer sounds, alerting the user that the UPS requires attention.

6.2 Audible Alarm (Buzzer)

An audible alarm accompanies various events during UPS operations. **Table 6.1** below, describes the sounds and their meaning. To silence an alarm, see [Silencing the Audible Alarm](#) on page 21.

Table 6.1 Audible-alarm Descriptions

SOUND	INDICATES:
Continuous beep	Generated when a UPS fault appears, such as a fuse or hardware failure.
One beep every 0.5 seconds	Generated when a UPS critical alarm appears, such as on inverter overload.
One beep every 1 second	Generated when a UPS critical alarm appears, such as on battery low voltage.
One beep every 3.3 seconds	Generated when a UPS general alarm appears.

NOTE: When an alarm is indicated, an alarm message is logged. **Table 4.4** on page 36, describes the alarm messages you may see. When a fault is indicated, front-panel display list the fault, which are described in **Table 6.2** below.

6.2.1 Faults

When the fault indicator is illuminated, the LCD displays the fault. The faults are described in **Table 6.2** below.

Table 6.2 Description of displayed faults

DISPLAYED FAULT	CAUSE	CORRECTIVE STEPS
Battery test fail	The battery is bad or weak.	Contact technical support.
Rectifier fault	A rectifier failure occurred.	Contact technical support.
Inverter overload, Bypass overcurrent	The UPS is overloaded, Bypass is over current.	Reduce the load and contact technical support.
Inverter fault	The inverter is faulty.	Contact technical support.
Battery aged	The battery is bad or weak.	Replace the battery.
Output short	The output connection is short-circuited.	Shut-down the equipment and contact technical support.
DC bus fail	The DC bus is faulty.	Contact technical support.

Table 6.2 Description of displayed faults (continued)

DISPLAYED FAULT	CAUSE	CORRECTIVE STEPS
System overtemp	Over-temperature condition in the UPS. The UPS will transfer to bypass mode.	Reduce the load and contact technical support.
Charger fault	The charger is faulty.	Contact technical support.
Fan fault	At least one fan is faulty.	Contact technical support.
DC/DC fault	A DC-DC charger failure occurred.	Contact technical support.

6.3 Troubleshooting UPS Issues

In the event of an issue with the UPS, refer to **Table 6.3** below, to determine the cause and solution. If the fault persists, contact Vertiv Technical Support. Visit the GXT5 product page at www.Vertiv.com for contact information.

When reporting a UPS issue to Vertiv, include the UPS model and serial number. These are located in several places for your ease of location:

- on the top panel (rack mount orientation)
- the left side (tower orientation)
- the rear panel
- on the front of the unit behind the front plastic bezel
- on the LCD select *Main Menu > About*.

Table 6.3 Troubleshooting

PROBLEM	CAUSE	SOLUTION
UPS fails to start	UPS is short-circuited or overloaded	Ensure UPS is Off. Disconnect all loads and ensure nothing is lodged in output receptacles. Ensure loads are not defective or shorted internally.
	Batteries are not charged enough or not connected	Check to ensure the internal battery is connected. If it is not, make the connection and try to start the unit. If the battery is connected, leave the UPS connected to input power for 24 hours to recharge batteries, then try to start the unit.
UPS has reduced battery backup time	Batteries are not fully charged	Keep UPS plugged in continuously at least 24 hours to recharge batteries.
	UPS is overloaded	Check load level indicator and reduce the load on the UPS.
	Batteries may not be able to hold a full charge due to age	Replace batteries. Contact your Vertiv representative or Vertiv Technical Support for replacement battery kit.

7 SPECIFICATIONS

Table 7.1 UPS Specifications, 500 VA to 1000 VA models

MODEL: GXT5-	500LVRT2UXL	750LVRT2UXL	1000LVRT2UXL
RATING	500 VA/500 W	750 VA/750 W	1000 VA/1000 W
Dimensions, in. (mm)			
Unit, D x W x H	15.7 x 16.9 x 3.4 (400 x 430 x 85)		
Shipping, D x W x H	24.3 x 22.4 x 10.3 (617 x 570 x 262)		
Weight, lb (kg)			
Unit	37 (16.8)		
Shipping	49.9 (22.68)		
Input AC Parameters			
Voltage Range (typical).	120 VAC nominal, variable based on output load		
90% ~ 100% loading	94 ~ 102 VAC/149.5 VAC		
70% ~ 90% loading	77 ~ 94 VAC/149.5 VAC		
50% ~ 70% loading	60 ~ 77 VAC/149.5 VAC		
0% ~ 50% loading	60 VAC/149.5 VAC		
Frequency	40 Hz ~ 70 Hz; auto-sensing		
Input Power Cord	10-ft. (3 m) attached with NEMA 5-15P plug		
Output AC Parameters			
Output Receptacles	5-15R x 6		
Voltage	100/110/115/120/125 VAC (user-configurable); ±3%		
Waveform	Sine wave		
Utility (AC) Mode Overload	> 200% for 250 mS, 150 – 200% for 2 seconds; 125 – 150% for for 60 seconds;		

Table 7.1 UPS Specifications, 500 VA to 1000 VA models (continued)

MODEL: GXT5-	500LVRT2UXL	750LVRT2UXL	1000LVRT2UXL
RATING	500 VA/500 W	750 VA/750 W	1000 VA/1000 W
Battery Parameters			
Type	Valve-regulated, non-spillable, lead acid		
Quantity x Voltage x Rating	3 x 12V x 9.0AH		
Battery Mfr./Part #	LEOCH/DJW12-9.0		
Back-up time	See Battery Run Times on page 54.		
Recharge time	3 hours to 90% capacity after full discharge with 100% load til UPS auto-shutdown (internal batteries only)		
Environmental Requirements			
Operating Temperature, °F (°C)	32 to 122 (0 to 50)		
Storage Temperature, °F (°C)	-4 to 140 (-20 to 60) [batteries are from 5 to 104 (-15 to 40)]		
Relative Humidity	0% – 95% non-condensing		
Operating Elevation	Up to 10,000 ft (3,000 m) at 77°F (25°C) without derating		
Audible Noise	<46 dBA max. at 3 ft (1 m) front and sides, <43 dBA max. at 3 ft (1 m) rear		
Agency			
Surge Immunity	ANSI C62.41 Category B		
Transportation	ISTA Procedure 1A		

Table 7.2 UPS Specifications, 1500 VA to 3000 VA models

MODEL: GXT5-	1500LVRT2UXL	2000LVRT2UXL	3000LVRT2UXL
RATING	1500 VA/ 1350 W	2000 VA/ 1800 W	3000 VA/ 2700 W
Dimensions, in. (mm)			
Unit, D x W x H	18.5 x 16.9 x 3.4 (470 x 430 x 85)		21.3 x 16.9 x 3.4 (540 x 430 x 85)
Shipping, D x W x H	24.3 x 22.4 x 10.3 (617 x 570 x 262)		28.2 x 22.4 x 10.3 (717 x 570 x 262)
Weight, lb (kg)			
Unit	46.2 (21)	47.5 (21.6)	66 (30)
Shipping	57.4 (26.1)	58.7 (26.7)	77.2 (35.1)
Input AC Parameters			
Voltage Range (typical).	120 VAC nominal, variable based on output load		
90% ~ 100% loading	94 ~ 102 VAC/149.5 VAC		
70% ~ 90% loading	77 ~ 94 VAC/149.5 VAC		
50% ~ 70% loading	60 ~ 77 VAC/149.5 VAC		
0% ~ 50% loading	60 VAC/149.5 VAC		
Frequency	40 Hz ~ 70 Hz; auto-sensing		
Input Power Cord	10-ft. (3 m) attached with NEMA 5-15P plug	10-ft. (3 m) attached with NEMA 5-20P plug	10-ft. (3 m) attached with NEMA 5-30P plug
Output AC Parameters			
Output Receptacles	5-15R x 6	L5-20R + 5-15/20R x 6	L5-30R + 5-15/20R x 6
Voltage	100/110/115/120/125 VAC (user-configurable); ±3%		
Waveform	Sine wave		
Utility (AC) Mode Overload	> 200% for 250 mS; 150 – 200% for 2 seconds; 125 – 150% for for 50 seconds; 105 – 125% for 60 seconds		> 200% for 250 mS; 150 – 200% for 2 seconds; 125 – 150% for for 10 seconds; 105 – 125% for 15 seconds

Table 7.2 UPS Specifications, 1500 VA to 3000 VA models (continued)

MODEL: GXT5-	1500LVRT2UXL	2000LVRT2UXL	3000LVRT2UXL
RATING	1500 VA/ 1350 W	2000 VA/ 1800 W	3000 VA/ 2700 W
Battery Parameters			
Type	Valve-regulated, non-spillable, lead acid		
Quantity x Voltage x Rating	4 x 12V x 9.0AH		6 x 12V x 9.0AH
Battery Mfr./Part #	LEOCH/DJW12-9.0		
Back-up time	See Battery Run Times on page 54.		
Recharge time	4 hours to 90% capacity after full discharge with 100% load til UPS auto-shutdown (internal batteries only)	3 hours to 90% capacity after full discharge with 100% load til UPS auto-shutdown (internal batteries only)	
Environmental Requirements			
Operating Temperature, °F (°C)	32 to 122 (0 to 50)		
Storage Temperature, °F (°C)	-4 to 140 (-20 to 60) [batteries are from 5 to 104 (-15 to 40)]		
Relative Humidity	0% – 95% non-condensing		
Operating Elevation	Up to 10,000 ft (3,000 m) at 77°F (25°C) without derating		
Audible Noise	<46 dBA max. at 3 ft (1 m) front and sides, <45 dBA max. at 3 ft (1 m) rear	<48 dBA max. at 3 ft (1 m) front and sides, <48 dBA max. at 3 ft (1 m) rear	
Agency			
Surge Immunity	ANSI C62.41 Category B		
Transportation	ISTA Procedure 1A		

Table 7.3 External Battery Cabinet Specifications

MODEL NUMBER:	GXT5-EBC36VRT2U	GXT5-EBC48VRT2U	GXT5-EBC72VRT2U
USED WITH UPS MODEL:	500 – 1000 VA MODELS	1500 – 2000 VA MODELS	3000 VA MODELS
Dimensions, D x W x H, in. (mm)			
Unit	14.6 x 16.9 x 3.3 (370 x 430 x 85)	19.7 x 16.9 x 3.3 (497 x 430 x 85)	23.7 x 16.9 x 3.3 (602 x 430 x 85)
Shipping	24.3 x 22.4 x 10.3 (617 x 570 x 262)		28.2 x 22.4 x 10.3 (717 x 570 x 262)
Weight, lb (kg)			
Unit	49.72 (22.6)	63.36 (28.8)	90.64 (41.2)
Shipping	63.14 (28.7)	77 (35)	104.72 (47.6)
Battery Parameters			
Type	Valve-regulated, non-spillable, lead acid		
Quantity x Voltage	2 x 3 x 12V x 9.0Ah	2 x 4 x 12V x 9.0Ah	2 x 6 x 12V x 9.0Ah
Battery Mfr./Part#	LEOCH/DJW12-9.0		
Back-up Time	See Battery Run Times on the next page.		
Environmental			
Operating Temperature, °F (°C)	32 to 104 (0 to 40)		
Storage Temperature, °F (°C)	5 to 122 (–15 to 50)		
Relative Humidity	0% – 95% non-condensing		
Operating Elevation	Up to 10,000 ft (3,000 m) at 104°F (40°C)		
Storage Elevation	50,000 ft (15,000 m) maximum		
Agency			
Safety	UL1778 4th Edition and CSA 22.2 No. 107.1		
RFI/EMI	FCC Part 15 Class A		
Surge Immunity	ANSI C62.41 Category B		
Transportation	ISTA Procedure 1A		

7.1 Battery Run Times

Table 7.4 Battery Run Time in Minutes

NO. OF EBCS	LOAD PERCENTAGE OF CAPACITY	120 VAC					
		500 VA	750 VA	1000 VA	1500 VA	2000 VA	3000 VA
0 (UPS only)	10%	165.5	118	92.5	88	66.5	70
	20%	92.5	63.5	47	42.5	30	31.5
	30%	63.5	41	29	25.5	17.5	18.5
	40%	47	29	20	17.5	12	12.5
	50%	36.5	21.5	15	13	9	9
	60%	29	17	11.5	10.5	7	7
	70%	24	14	9.5	8.5	5.5	6
	80%	20	11.5	8	7	4.5	4.5
	90%	17	10	7	6	3.5	4
	100%	15	8.5	6	5	3	3
+1 EBC	10%	572	421	330	314	237	249.5
	20%	330	226	168.5	154	113.5	117.5
	30%	226	148	110.5	100.5	74.5	77.5
	40%	168.5	110.5	82.5	74.5	55	56.5
	50%	132	88	65	59	42	43.5
	60%	110.5	73	53.5	48	33.5	34.5
	70%	94.5	62	44.5	39.5	27.5	28
	80%	82.5	53.5	38	33.5	23	23.5
	90%	73	46.5	33	28.5	19.5	20
	100%	65	41	28.5	25	17	17
+2 EBC	10%	978.5	727	575.5	549	420	441
	20%	575.5	402	305.5	281.5	208	216.5
	30%	402	272	201.5	183	132	137
	40%	305.5	201.5	146.5	132	98.5	101.5
	50%	244.5	158	116	105.5	78	80
	60%	201.5	128.5	96	87.5	64	65.5
	70%	170.5	110	82	74	54	55.5
	80%	146.5	96	71	64	46	47
	90%	128.5	85	63	56	40	40.5
	100%	116	76	56	49.5	35	35.5

Table 7.4 Battery Run Time in Minutes (continued)

NO. OF EBCS	LOAD PERCENTAGE OF CAPACITY	120 VAC					
		500 VA	750 VA	1000 VA	1500 VA	2000 VA	3000 VA
+3 EBC	10%	1385	1032.5	820.5	783.5	603.5	632.5
	20%	820.5	578	443	409	306.5	318
	30%	578	396	297.5	271	199.5	207
	40%	443	297.5	220.5	199.5	144	148.5
	50%	357	236	172.5	155.5	113.5	116.5
	60%	297.5	194	140	127	94	96
	70%	254	163.5	119	108	79.5	81.5
	80%	220.5	140	104	94	69	70.5
	90%	194	123.5	92.5	82.5	60.5	61.5
	100%	172.5	111	82.5	74	54	54.5
+4 EBC	10%	1791	1338.5	1066	1018	879+ 6	935
	20%	1066	754	580.5	537	404.5	419.5
	30%	754	519.5	393.5	359.5	267	277
	40%	580.5	393.5	294	267	196	202
	50%	470	314.5	232.5	210.5	152	156
	60%	393.5	260	191	172	124	127
	70%	337	221	160.5	143.5	105.5	108
	80%	294	191	137.5	124	91.5	94
	90%	260	167.5	122	109.5	81	82.5
	100%	232.5	148.5	109	98	72	73
+5 EBC	10%	2197.5	1644	1311	1252.5	969.5	1015.5
	20%	1311	930	718	664.5	503	521
	30%	930	643.5	489	447.5	335	347
	40%	718	489	368	335	248	255
	50%	582.5	392.5	292.5	265.5	194.5	199.5
	60%	489	326.5	241.5	219	157.5	162
	70%	420.5	278	204.5	184	131.5	135
	80%	368	241.5	176.5	157.5	114.5	117
	90%	326.5	213	154.5	137	101	103
	100%	292.5	190	136.5	122.5	90.5	92

Table 7.4 Battery Run Time in Minutes (continued)

NO. OF EBCS	LOAD PERCENTAGE OF CAPACITY	120 VAC					
		500 VA	750 VA	1000 VA	1500 VA	2000 VA	3000 VA
+6 EBC	10%	2604	1950	1556.5	1487	1152.5	1207.5
	20%	1556.5	1106	855	792.5	601.5	622.5
	30%	1106	767.5	585	536	402.5	417
	40%	855	585	441.5	402.5	300	308.5
	50%	695.5	470.5	353	320.5	236.5	242.5
	60%	585	392.5	292.5	265.5	198.3	198
	70%	503.5	335.5	249	224	161.5	166.5
	80%	441.5	292.5	215.5	193	138	142
	90%	392.5	258.5	189.5	168.5	121.5	124
	100%	353	231	168	149	109	110.5

APPENDICES

Appendix A: Technical Support

Our Technical Support staff is ready to assist you with any installation or operating issues you may encounter with your Liebert® product. Please call or e-mail us:

In Europe, Middle East, and Asia:

EMEA Multi-Language Technical support:

e: eoc@vertivco.com

p: Toll free 0080011554499

p: Toll +39 02 98250222

In the United States:

Technical support:

e: liebert.upstech@vertivco.com

p: 1-800-222-5877 menu option 1

Monitoring support:

e: liebert.monitoring@vertivco.com

p: 1-800-222-5877 menu option 2

Warranty support:

e: microups.warranty@vertivco.com

p: 1-800-222-5877 menu option 3

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