



Liebert® GXT5 Lithium-Ion UPS

Installer/User Guide

208 V Input (L1, L2, N, G), 120/208 V Output, 5 kVA to 10 kVA

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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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1 Important Safety Instructions

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.vertiv.com/ComplianceRegulatoryInfo>, before attempting to install, connect to supply, or operate this UPS.

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2 Product Description

The Vertiv™ Liebert® GXT5 Lithium-Ion is a compact, online uninterruptible power system (UPS) that continuously conditions and regulates its output voltage. The Liebert® GXT5 Lithium-Ion 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 Lithium-Ion protects equipment from these disturbances. The Liebert® GXT5 Lithium-Ion continuously charges its batteries from the mains, enabling it to supply power to connected loads, even when the mains fail.

2.1 UPS Features and Available Models

The Liebert® GXT5 Lithium-Ion includes the following features. **Table 2.1** 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.
- 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 2.1 UPS Models and Power Ratings

Model Number	Nominal Power Rating @ 120/208 V Input
GXT5LI-5000MVRT3UXLN	5000 VA/5000 W, 120/208 VAC
GXT5LI-6000MVRT4UXLN	6000 VA/6000 W, 120/208 VAC
GXT5LI-8000MVRT4UXLN	8000 VA/8000 W, 120/208 VAC
GXT5LI-10KMVRT4UXLN	10000 VA/10000 W, 120/208 VAC

2.2 Front Panels

The various Liebert® GXT5 Lithium-Ion models have the same general appearance. The difference between the varying models is the type of receptacle that is located on the rear panel.

Figure 2.1 GXT5 Lithium-Ion UPS Front View



Figure 2.2 GXT5 Lithium-Ion External Battery Cabinet Front View



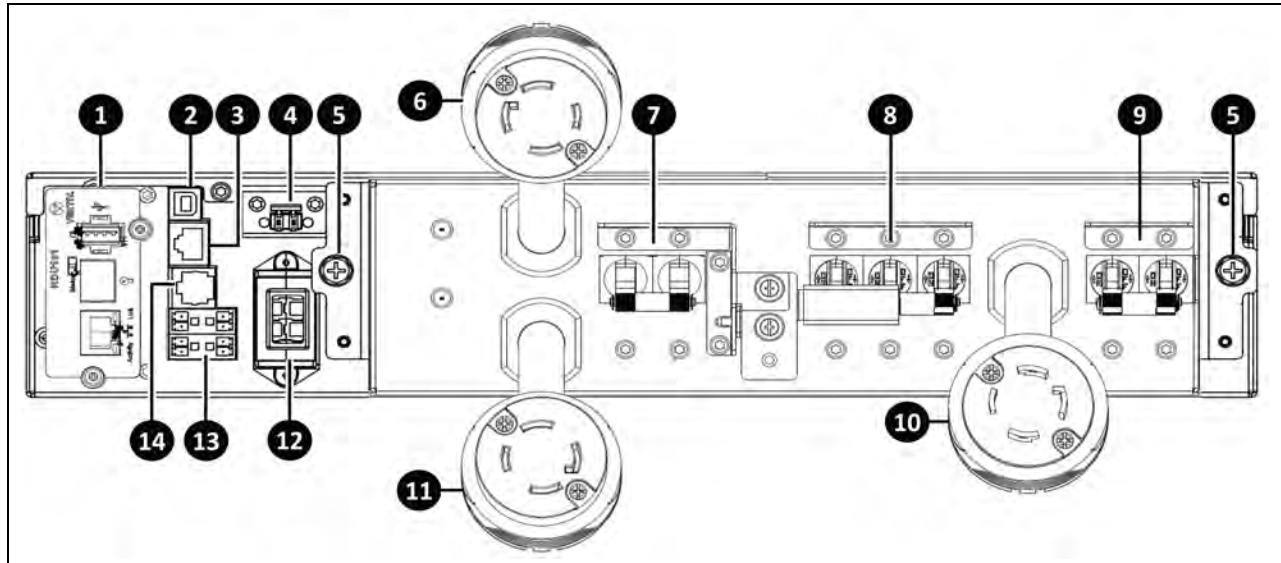
Figure 2.3 UPS with EBC



2.3 Rear Panels

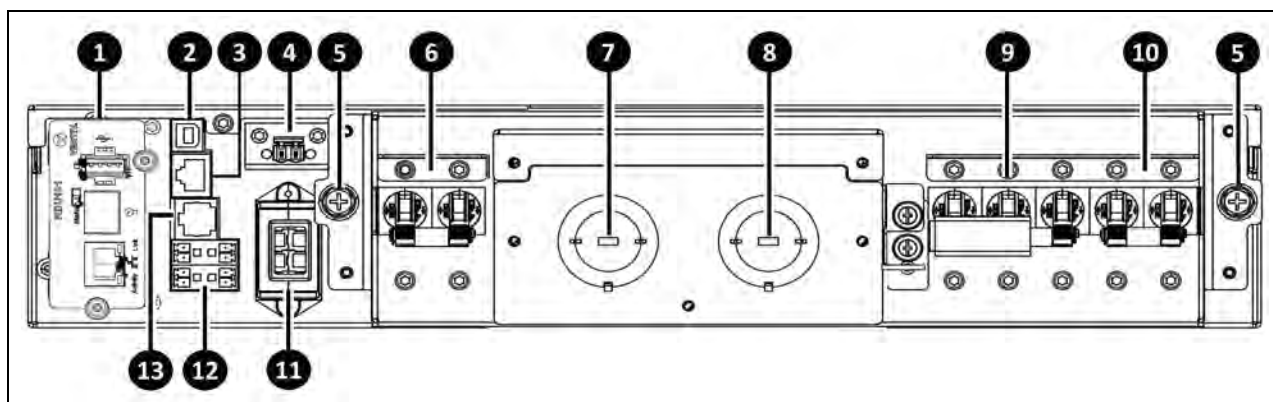
The following figures detail the rear panel features for each Vertiv™ Liebert® GXT5 Lithium-Ion UPS and external battery cabinet (EBC).

Figure 2.4 GXT5LI-5000MVRT3UXLN UPS Rear Panel



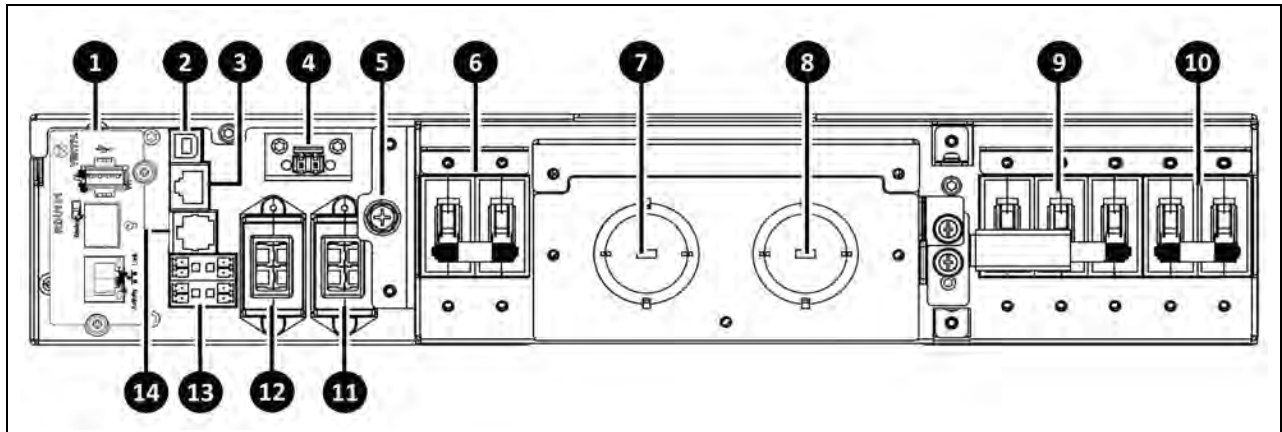
Item	Description
1	Preinstalled network card
2	USB port
3	EBC communication port (RS-485)
4	REPO connector
5	Ground screw
6	L14-30R output
7	Output circuit breaker (30A)
8	Maintenance bypass circuit breaker (30A)
9	Input circuit breaker (30A)
10	L14-30P input
11	L14-30R output
12	EBC connector
13	Dry contact communication terminal block
14	RS-232 port (used for CLI)

Figure 2.5 GXT5LI-6000MVRT3UXLN UPS Rear Panel

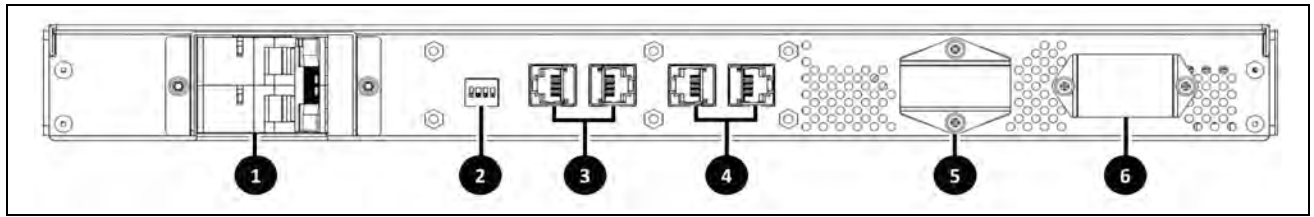


Item	Description
1	Preinstalled network card
2	USB port
3	EBC communication port (RS-485)
4	REPO connector
5	Ground screw
6	Output circuit breaker (40A)
7	Output hardwire connection
8	Input hardwire connection
9	Maintenance bypass circuit breaker (40A)
10	Input circuit breaker (40A)
11	EBC connector
12	Dry contact communication terminal block
13	RS-232 port (used for CLI)

Figure 2.6 GXT5LI-8000MVRT4UXLN and GXT5LI-10KMVRT4UXLN UPS Rear Panel



Item	Description
1	Preinstalled network card
2	USB port
3	EBC communication port (RS-485)
4	REPO connector
5	Ground screw
6	Output circuit breaker (60A)
7	Output hardwire connection
8	Input hardwire connection
9	Maintenance bypass circuit breaker (60A)
10	Input circuit breaker (60A)
11	EBC BAT+ connector
12	EBC BAT- connector
13	Dry contact communication terminal block
14	RS-232 port (used for CLI)

Figure 2.7 VEBCLI-192VRT1U EBC Rear Panel

Item	Description
1	Battery Breaker (63A)
2	Address dip switches
3	COM ports (RS-485)
4	CAN ports
5	Battery port A
6	Battery port B

2.4 Maintenance Bypass Cabinet

The 5-10 kVA GXT5 Lithium-Ion models ship with a maintenance bypass cabinet (MBC). This MBC includes input and output wiring terminal block (6 kVA, 8 kVA, 10 kVA models), input plugs and output receptacles (5 kVA model), and input, output, and maintenance bypass circuit breakers (See [Rear Panels](#) on page 5).

The MBC needs to be installed on the UPS. Refer to [Installing the UPS and External Battery Cabinets](#) on page 13 for details.

2.5 External Battery Cabinets

EBCs are required with these Vertiv™ Liebert® GXT5 Lithium-Ion UPS models as they do not have internal batteries. The table below illustrates the minimum number of EBCs required and maximum number of EBCs allowed per model. The UPS ships with the minimum number of EBCs required for the model. Additional EBCs 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 . By default, battery cabinets will be automatically detected by the UPS once connected. Auto detection can be changed in the settings menu. For more information, see [Settings Submenu](#) on page 28 .

See [Rear Panels](#) on page 5 for details on the rear panel of the EBC.

UPS Model	Minimum Number of EBCs Required	Maximum Number of EBCs	EBC model
GXT5LI-5000MVRT3UXLN	1	8	VEBCLI-192VRT1U
GXT5LI-6000MVRT3UXLN			
GXT5LI-8000MVRT4UXLN	2 (1 set)	16 (8 sets)	VEBCLI-192VRT1UX2 (Ships with 2 x VEBCLI192VRT1U)
GXT5LI-10KMVRT4UXLN			

NOTE: The UPS model ships with minimum number of required EBCs.

2.6 Major Internal Components and Operating Principle

Figure 2.8 below, shows the UPS operating principle. Figure 2.8 below, describes the function of the major components in the UPS.

NOTE: Figure 2.8 below, is one example of basic operating principle.

Figure 2.8 Basic Operating Principle Diagram

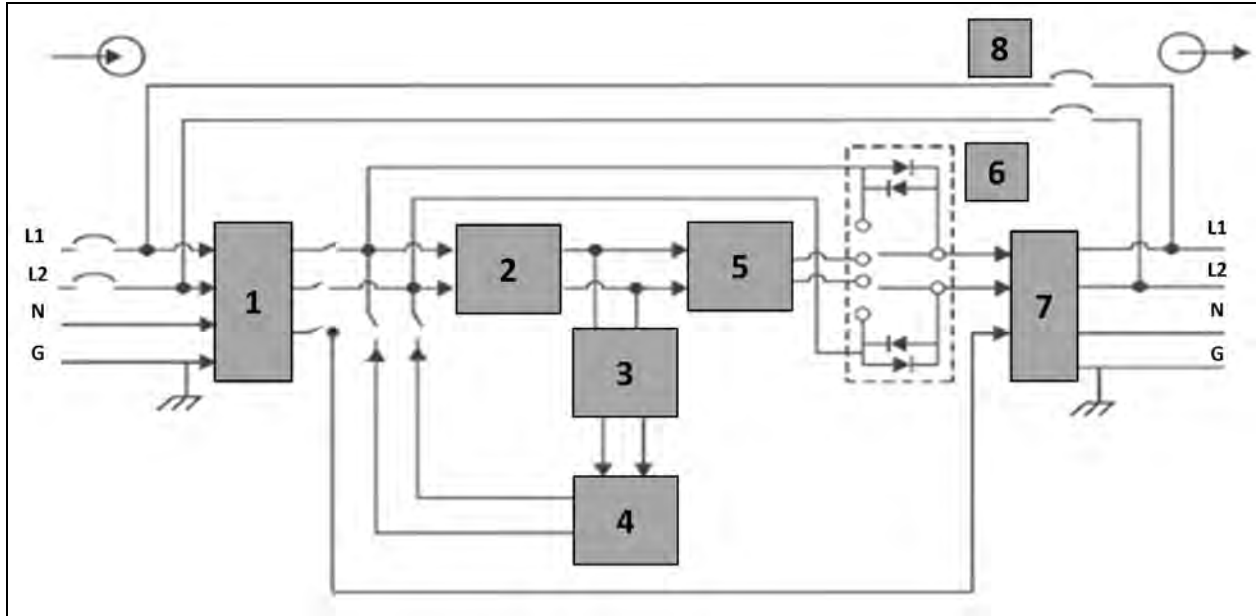


Table 2.2 Major Components

Item	Component	Operation/Function
1	Transient Voltage Surge Suppression (TVSS) and EMI/RFI Filters	Provides surge protections, and filters electromagnetic interference (EMI) and Radio Frequency Interference (RFI). Minimizes surges or interference present in the utility power and protects devices connected to 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. The 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.
3	Battery Charger	Regulates input AC power to continuously float-charge the batteries. Batteries are charged when the UPS is plugged in, even when not powered-on.
4	Batteries	Lithium-ion NOTE: To maintain battery design life, operate the UPS in an ambient temperature of 59 °F to 86 °F (15 °C to 30 °C).

Table 2.2 Major Components (continued)

Item	Component	Operation/Function
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 EMI and RFI. Minimize interference present in the utility power and protect devices connected on the same branch as the UPS.
8	Maintenance Bypass	In the unlikely event of UPS failure, allows replacing the UPS while keeping the connected equipment powered with utility power. NOTE: The bypass power path does not protect connected equipment from disturbances in the utility supply.

2.7 UPS States and Operating Modes

NOTE: LED Indicators , for description of the run indicator and alarm indicator LEDs mentioned in this section.

2.7.1 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. The LCD Flow screen displays energy flow from the input power source to the battery and then to the UPS inverter.

2.7.2 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 Flow screen displays energy flow from the input power source through the bypass path instead of the UPS inverter.

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.

2.7.3 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 Flow screen displays energy flow from the battery through the UPS inverter. The battery status displays "Discharge."

NOTE: The batteries are fully charged before shipment. However, transportation and storage inevitably cause some loss of capacity. To ensure adequate backup time, it is recommended to charge the batteries for at least 2 hours before first startup.

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.

2.7.4 Frequency Converter Mode

All models of the Vertiv™ Liebert® GXT5 Lithium-Ion 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 60 Hz – Bypass Enabled
- Auto Sensing - 50 Hz or 60 Hz – Bypass Disabled
- Frequency Converter - 50 Hz – Bypass Disabled
- Frequency Converter - 60Hz – Bypass Disabled

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

2.7.5 ECO Mode

The energy saving ECO mode reduces power consumption by powering the load via bypass when 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 via bypass and reduce power consumption.

NOTE: If a bypass failure or abnormal bypass voltage notification appears when the output is not overloaded during ECO mode, the UPS will transfer to Normal mode. If a notification showing bypass failure or abnormal bypass voltage appears when the output is overloaded, the UPS will shut down the bypass and therefore the load will shut down.

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3 Installation

Do not start the UPS until the installation is finished.



WARNING! Risk of electric 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.

3.1 Unpacking and Inspection



CAUTION: The UPS is heavy, see Specifications . Take proper precautions when lifting or moving the unit.

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.

3.2 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 .

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 86°F (30°C) reduces battery life.

3.2.1 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.

3.3 Installing the UPS and External Battery Cabinets



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 is heavy, see **Table 8.2** on page 53. Take proper precautions when lifting them.

The UPS may be installed as a tower or in a rack, depending on available space and use considerations. Installation instructions vary based on model. Please refer to the **Quick Installation Guides** (Vertiv's SL-70928, SL-70910, and SL-70929) included in the package or available online at www.vertiv.com.

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

3.4 Hardwired Input/Output Connections



WARNING! Risk of electric shock. Can cause equipment damage, injury and death. Before beginning installation, verify that all external over current 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.

Observe the following guidelines and specifications when making the hard wire input and output connections:

- We recommend installing a UL489 approved breaker upstream of unit.
- Provide circuit breaker protection according to local codes. The mains disconnect should be within sight of the UPS or have an appropriate lock out.
- Maintain service space around the UPS or use flexible conduit.
- Provide output distributions panels, circuit breaker protection, or emergency disconnects according to local codes.
- Do not install input and output wiring in the same conduit.
- The GXT5LI-5000MVRT3UXLN uses a cord connected input plug that is used as the power disconnect device. This model UPS must be installed near a wall socket or outlet that is easily accessible per the National Electric Code/NFPA 70 requirements.

3.4.1 Branch Circuit Breaker

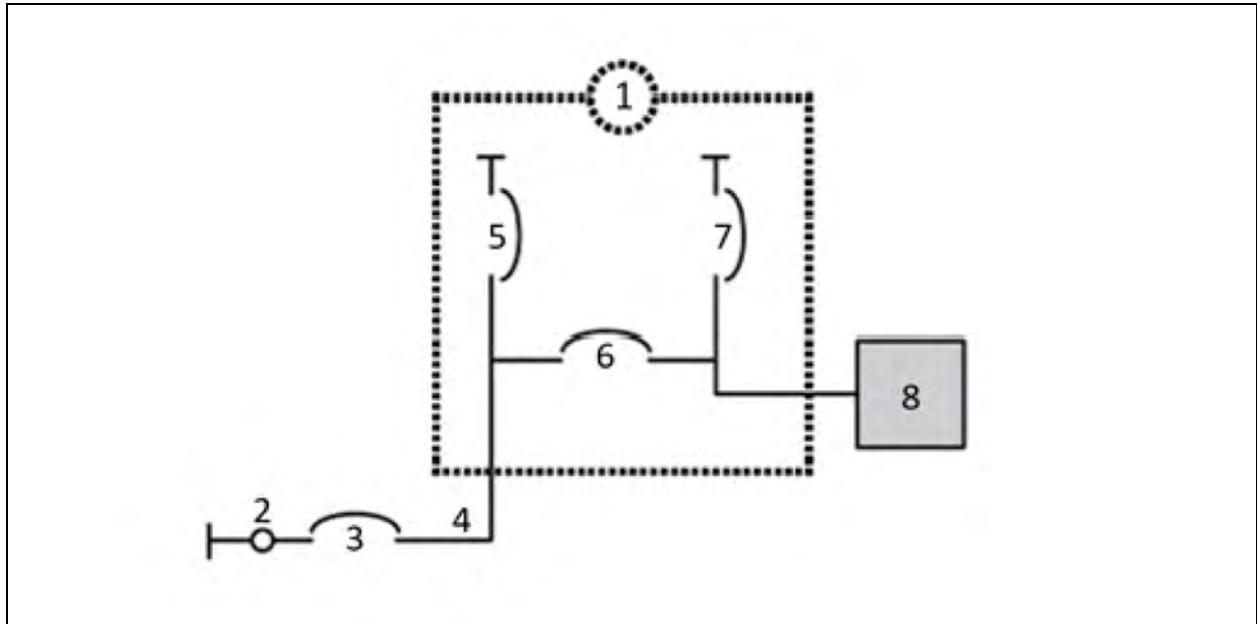
The installer must provide an upstream branch circuit breaker, see **Table 3.1** on the facing page, for the ratings. The MBC includes input, output and maintenance bypass circuit breakers. The input circuit breaker disconnects input power to the UPS. The output circuit breaker disconnects output power from the UPS. The maintenance bypass breaker bypasses power directly from the input terminal block to the output terminal block. The input circuit breaker does not disconnect power from the maintenance bypass breaker. [Circuit Breakers Diagram](#) on the facing page, illustrates the circuit breaker diagram.

Observe the following guidelines and specifications when making the hard wire input and output connections:

- Provide circuit breaker protection according to local codes. The mains disconnect should be within sight of the UPS or have an appropriate lock out.
- Maintain service space around the UPS or use flexible conduit.
- Provide output distributions panels, circuit breaker protection, or emergency disconnects according to local codes.
- Do not install input and output wiring in the same conduit.

Table 3.1 MV Panel Feeder Breaker

UPS Model	Recommended Panel Feeder Breaker
GXT5LI-5000MVRT3UXLN	30 A
GXT5LI-6000MVRT3UXLN	40 A
GXT5LI-8000MVRT4UXLN	70 A
GXT5LI-10KMVRT4UXLN	

Figure 3.1 Circuit Breakers Diagram

Item	Description
1	UPS
2	Mains/utility
3	Panel feeder breaker
4	Input
5	Input circuit breaker
6	Maintenance bypass circuit breaker
7	Output circuit breaker
8	Output distribution

3.4.2 Terminal Block Connections

On the GXT5LI-6000MVRT3UXLN, GXT5LI-8000MVRT4UXLN, and GXT5LI-10KMVRT4UXLN models, hardwire connections to the terminal blocks are made through knockouts on MBC. Refer to section [Rear Panels](#) on page 5 for the location of the input/output knockouts on your model.

For details on electrical-connection specifications see, **Table 3.2** on the next page.

Table 3.2 Terminal Block Electrical Specifications

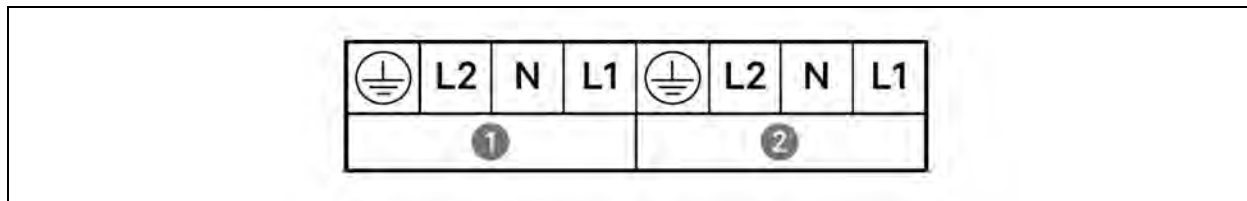
UPS Model	Recommended Wire Size (Including Ground Wire) (90°C Copper Wire)	Maximum Wire Size Accepted by Terminal Block	Terminal Tightening Torque	
			Phillips Screw Type Terminal Block	Flathead Screw Type Terminal Block
GXT5LI-5000MVRT3UXLN	Not Applicable	Not Applicable	Not applicable	Not applicable
GXT5LI-6000MVRT3UXLN	8 AWG (10 mm²)	4 AWG (21.2 mm²)	25 lb-in (2.82 Nm) (8 AWG) 35 lb-in (3.95 Nm) (4-6 AWG)	26 lb-in (2.93 Nm)
GXT5LI-8000MVRT4UXLN	4 AWG (21.2 mm²)	4 AWG (21.2 mm²)	35 lb-in (3.95 Nm)	26 lb-in (2.93 Nm)
GXT5LI-10KMVRT4UXLN				

To make the terminal block connections:

1. Loosen the screws from the cable entry/conduit box cover, and pull the cables through the cable entry hole/knockout leaving some slack for connection

NOTE: We recommend using the knockouts to install input and output wiring in separate conduit. You must use a suitable cable gland to prevent risk of electric shock.

2. Referring to the appropriate terminal block connection instructions, connect the cables to the corresponding input/output terminals and use a torque wrench to turn the screw clockwise until tightened as specified in **Table 3.2** above.
3. Re-install the cable entry/conduit box cover, and tighten the screws.

Figure 3.2 Terminal Block**Figure 3.3 Terminal Block**

Item	Description
1	Output
2	Input

3.4.3 Connecting to Terminal Blocks on GXT5 LI 5 kVA, 6 kVA, 8 kVA, and 10 kVA Models

These models offer a single type of I/O connection, 1-in 1-out common source. Refer to the details in [Terminal Block Connections](#) on the previous page, when making the connections.

3.5 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.

3.5.1 Connecting IntelliSlot Communication

The Vertiv™ Liebert® GXT5 Lithium-Ion 5-10kVA models ship with a Vertiv™ Liebert® IntelliSlot™ RDU101 communications card installed. The Liebert® IntelliSlot™ RDU101 communications card provides advanced monitoring and control of the Liebert® GXT5 Lithium-Ion. Visit www.vertiv.com/rdu101 for additional information and operation instructions.

See the appropriate figure for your model in [Rear Panels](#) on page 5, for the location of the card port.

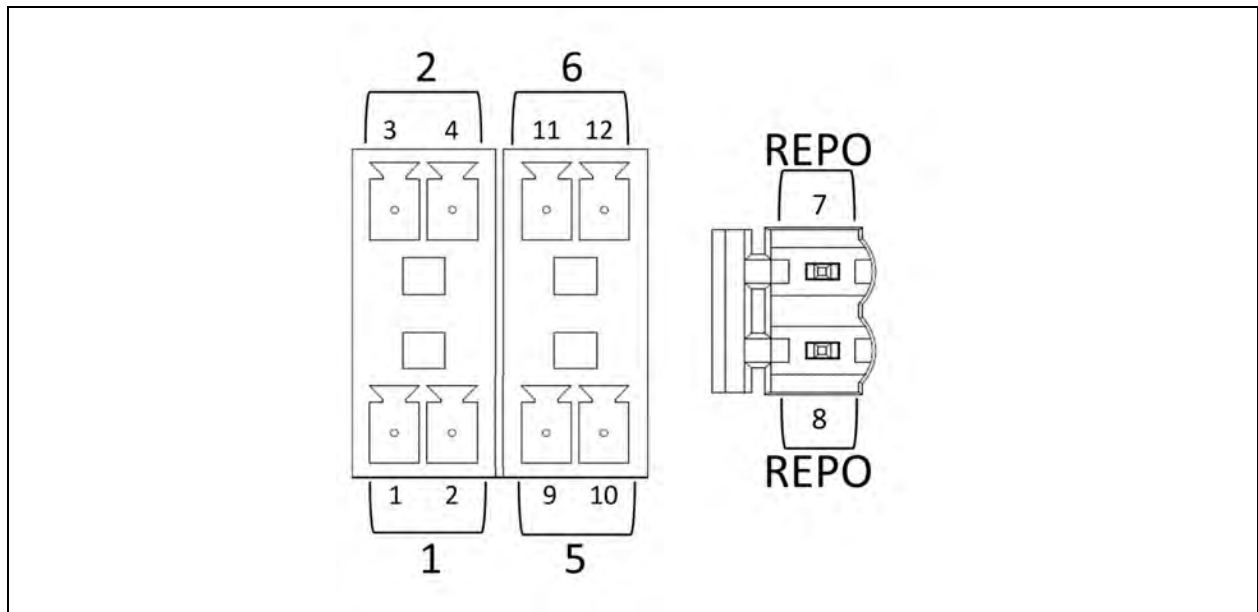
Vertiv™ Power Insight can be used with a network communication card to help improve efficiency, protect valuable critical equipment and increases visibility of the UPS. See [UPS Management Software](#) on page 20 for more information.

3.5.2 Connecting to the Dry Contact and Remote Emergency Power Off (REPO) Port

The UPS includes a dry contact port. See the appropriate figure for your model in [Rear Panels](#) on page 5, for the location of the port. **Figure 3.4** below, shows the ports and **Table 3.3** on the next page describes each port.

The I/O dry contact port ratings are 125 VAC, 0.5 A; 30 VDC, 1 A.

Figure 3.4 Dry Contact Port and Pin Layout



NOTE: Pins 7 and 8 are shorted before delivery.

NOTE: Remote Emergency Power Off (REPO) disables the UPS closes the rectifier, inverter and static bypass, but it cannot disconnect the UPS mains input. To completely disconnect the UPS, disconnect the upstream input circuit breaker when activating the REPO. For details on REPO connection and operation, see [Connecting a REPO Switch](#) on the next page .

Table 3.3 Dry contact Connection and Pin Out Descriptions

Port No.	Port Name	Pin No.	Pin Name	Description
1	Input 1	1	Remote Comms Shutdown 1	User configurable dry contact input that can be set to trigger the events below. The user can also select the dry contact as either NO or NC. (See on page 32) When NO, Pins 1 and 2 are shorted to trigger the event. When NC, Pins 1 and 2 are opened to trigger the event. Options are: <ul style="list-style-type: none"> • Disable (default) • Battery mode shutdown - If the UPS is running on batteries and this input is triggered, the UPS shuts down • Any mode shutdown - If this input is triggered, the UPS shuts down regardless of current operating mode
		2	Signal Ground	Signal Ground
2	Input 2	3	Remote Comms Shutdown 2	User configurable dry contact input that can be set to trigger the events below. The user can also select the dry contact as either NO or NC. (See on page 32) When NO, Pins 3 and 4 are shorted to trigger the event. When NC, Pins 3 and 4 are opened to trigger the event. Options are: <ul style="list-style-type: none"> • Disable (default) • Battery mode shutdown - If the UPS is running on batteries and this input is triggered, the UPS shuts down • Any mode shutdown - If this input is triggered, the UPS shuts down regardless of current operating mode
		4	Signal Ground	Signal Ground
5	Output 5	9, 10	Remote Fault Alert 5	User configurable dry contact output that can be set to alert the user to the faults below. The user can also select the dry contact as either NO or NC. (See on page 32) When NO, Pins 9 and 10 are shorted when the fault occurs. When NC, Pins 9 and 10 are opened when the fault occurs. Options are: <ul style="list-style-type: none"> • Low battery (default) • On battery • On bypass • UPS fault
6	Output 6	11, 12	Remote Fault Alert 6	User configurable dry contact output that can be set to alert the user to the faults below. The user can also select the dry contact as either NO or NC. (See on page 32) When NO, Pins 11 and 12 are shorted when the fault occurs. When NC, Pins 11 and 12 are opened when the fault occurs. Options are: <ul style="list-style-type: none"> • Low battery • On battery • On bypass • UPS fault (default)
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 REPO Switch below .

3.5.3 Connecting a REPO Switch

The UPS includes a REPO connection in the dry contact port. See the appropriate figure for your model in [Rear Panels](#) on page 5 , 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 disconnect 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 3.5 below, shows the cable required to make the connection. We recommend using 18 to 22 AWG (0.82 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 tighten the terminals. Make sure that the cables are secure in the plug to prevent failure because of loose contact.

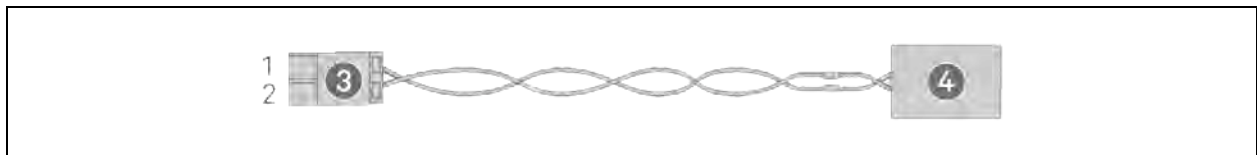
To make the cable for the REPO connection:



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 3.5** 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 3.5 Cable/Plug for Connecting REPO Switch to UPS REPO Port



Item	Description
1	Terminal 1
2	Terminal 2
4	Plug (connects to REPO port on UPS)
4	REPO switch

3.5.4 Connecting a USB Cable

The UPS includes a USB connector. See the appropriate figure for your model in [Rear Panels](#) on page 5, 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. To use the HID protocol for monitoring, get Power Assist from www.vertiv.com.

3.5.5 Connecting CLI Communication Cables

The UPS supports the Vertiv command-line interface for operation with Vertiv ACS and other third-party monitoring protocols. The RJ-45 port (labeled *R232*) is used for CLI connection. See the appropriate figure for your model in [Rear Panels](#) on page 5, for the location of the port. The pin out, described in below table is consistent with the ACS pin out.

Pin	Signal
1	NC
2	NC
3	TXD (out)
4	GND
5	NC
6	RXD (in)
7	NC
8	NC

3.5.6 UPS Management Software

Vertiv offers two UPS management software packages:

Vertiv™ Power Insight software provides UPS management and graceful unattended system shutdown in the event of an extended power outage. Power Insight requires a network card. Visit www.vertiv.com/powerinsight for a free download of the software and additional information.

Vertiv™ Power Assist is an easy to use management and shutdown software package. Power Assist connects locally to the UPS via a USB port. Visit www.vertiv.com/powerassist for a free download of the software and additional information.

4 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.

4.1 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.

4.2 Starting Up the UPS



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.

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

The UPS starts in Normal Mode.

To start the UPS:

1. Confirm 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. Confirm the panel feeder breaker supplying power to the UPS is closed.
4. Close the input circuit breaker on the rear of the MBC.
5. Close the output breaker on the rear of the MBC.
6. Close the breakers on the rear of the connected EBCs.
7. When the UPS is first connected startup guidance screens will appear. Use the Up, Down, and Enter buttons to confirm settings. Then, press and hold the Power button until a confirmation dialog appears. Use the Up/Down arrows to select Yes, the press **Enter**.

NOTE: The UPS will sound an alarm when the output is not powered. Press and hold the Esc button for two seconds to mute the alarm.

For detailed description of UPS display functions and settings, see [Operation and Display Panel](#).

4.3 Transferring to Battery Mode

The UPS operates in Normal Mode unless the input power fails or a battery self test is running. When the input power fails the UPS automatically transfers to Battery Mode. The UPS will run in Battery Mode for the backup time available or until the input power is restored. Once input power is restored the UPS automatically returns to Normal Mode.

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

4.4 Transferring from Normal to Bypass Mode

Press and hold the **Power** button for 2 seconds.

If the UPS is operating normally, without faults, the option to *Turn to bypass*, *Turn off output*, or *Turn off UPS* displays:

- Use the arrow buttons to select *Turn to bypass*, and press **Enter**.
- Use the arrow buttons to select *No* or *Yes*, then press **Enter** to confirm.

NOTE: If the bypass power is outside normal operating range, the option *turn-off the UPS* displays. Use the *arrow buttons* to select *No* or *Yes*, then press **Enter** to confirm.

4.5 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 UPS*, *Turn off output*, or *Turn off UPS* displays:

- Use the arrow buttons to select *Turn on UPS*, then press **Enter**.
- Use the arrow buttons to select *No* or *Yes*, then press **Enter** to confirm.

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

4.6 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.

Confirm power to load is not needed. Press and hold the **Power** button. Select "Turn off UPS" then press the **Enter** button. Open the input circuit breaker on the rear of the maintenance bypass cabinet.

4.7 Remote Emergency Power Off (REPO)

REPO turns off the UPS in case of any emergency conditions. 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.

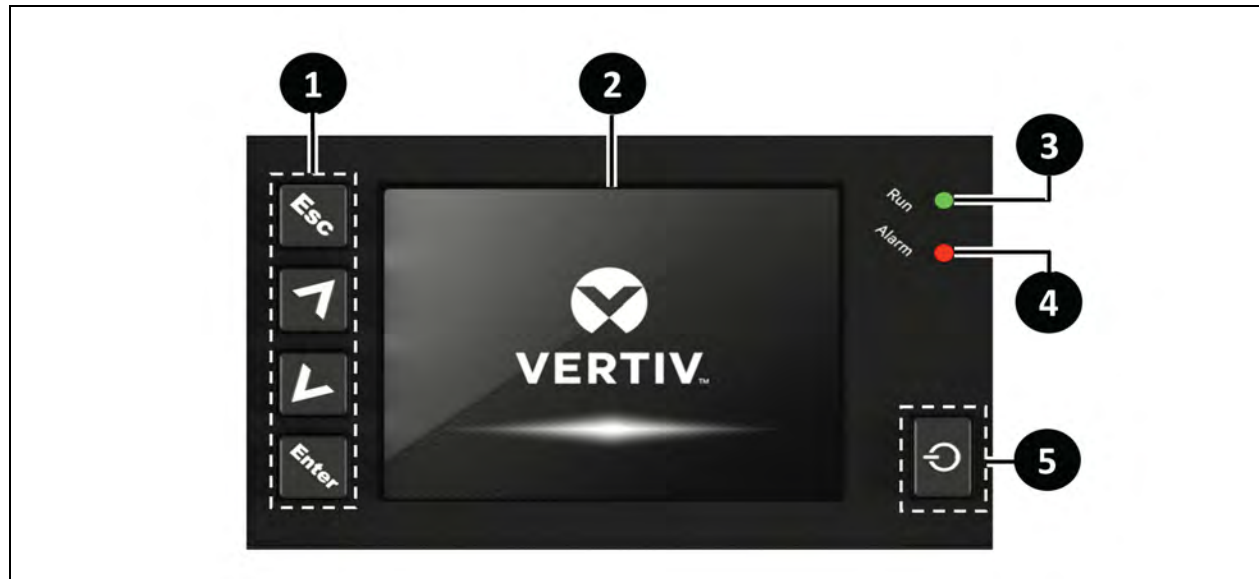
To manually power off in an emergency, disconnect the terminal connecting the REPO port on the rear of the UPS.

If mains/utility power is connected to the UPS input, the UPS control circuit remains active even though output power is disabled. To remove all mains/utility power, disconnect the external input circuit breaker.

5 Operation and Display Panel

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

Figure 5.1 UPS Front Panel Display



Item	Description
1	Menu keys, see Table 5.1 below.
2	LCD panel.
3	Run indicator LED, see LED Indicators on the next page .
4	Alarm indicator LED, see LED Indicators on the next page .
5	Power button, see Table 5.1 below.

Table 5.1 Display-Panel Button Functions and Descriptions

Button	Function	Description
	Enter	Confirm or enter selection.
	Up/Left	Move to previous page, increase value, move left.
	Down/Right	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 5.2** below. After 4 minutes of inactivity, the display will blank to conserve power. If an alarm or fault occurs or if any button is pressed, the UPS flow screen displays.

Figure 5.2 LCD Screen Saver



5.1 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 in **Table 5.4** on page 37, describes the alarm messages you may see. When a fault is indicated, front panel display list the fault, which are described in **Table 7.2** on page 49.

Table 5.2 LED Functions

Indicator	LED Color	LED State	Indicates
Run indicator	Green	On	UPS output on
		Blinking	Inverter is starting
	None	Off	UPS has no output
Alarm indicator	Yellow	On	Alarm occurs
	Red	On	Fault occurs
	None	Off	No alarm, no fault

5.2 LCD Menu and Screens

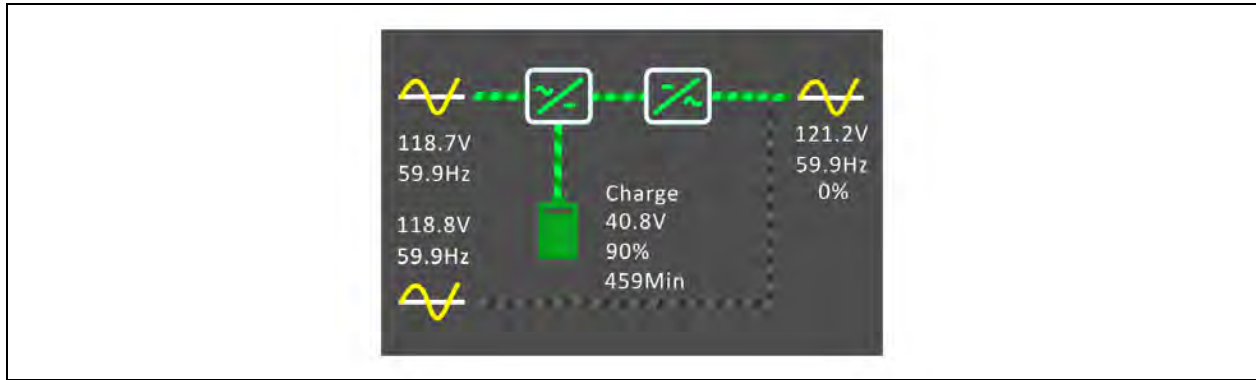
The menu driven LCD user interface lets you browse the UPS status, view operating parameters, customize settings, control operation, and view alarm/event history. Use the function keys to navigate through the menu, and view statuses or select settings in the screens.

5.2.1 Startup and Flow Screens

At startup, the UPS executes a system test and displays the Vertiv logo screen for about 10 seconds, shown in **Figure 5.1** on the previous page. After the test completes, an overview screen shows status information, the active (green) power path, and the non-working path (gray).

NOTE: Figure 5.3 below is an example flow screen and does not reflect the actual values that you may see on your unit.

Figure 5.3 UPS Flow Screen



5.2.2 Main Menu

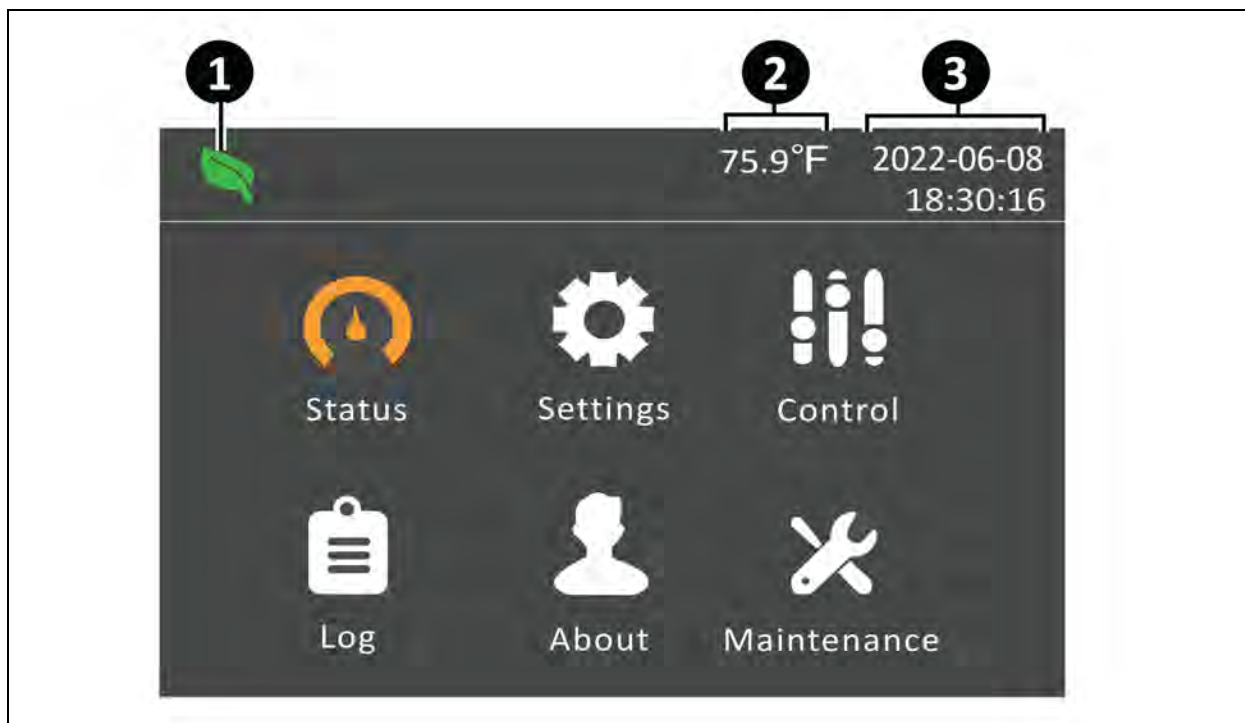
To access the main menu, press **Enter** while at the flow screen. **Table 5.3** below, describes the menu options, and **5.2.2** above, describes the display.

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

Table 5.3 Menu Options

Submenu	Description
Status	Input, Bypass, Battery, BMS, Output, and Load status information, see Status Screen on the next page .
Settings	Output, Battery, Monitor, and System parameter settings, see Settings Submenu on page 28 .
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 5.4 Main Menu



Item	Description
1	ECO mode indicator
2	Ambient Temperature
3	Date and Time

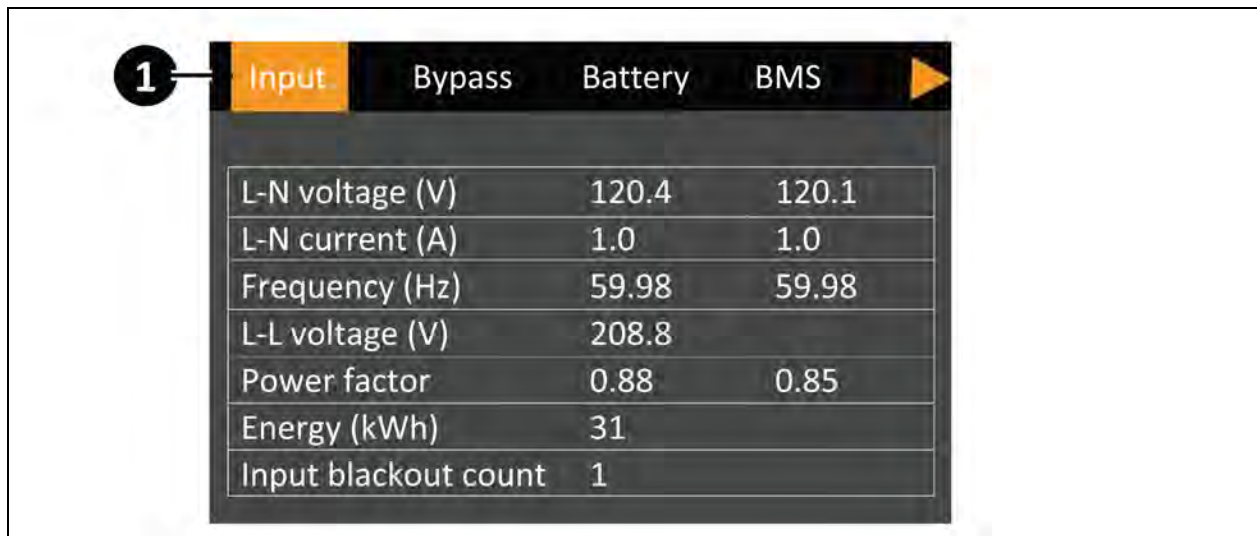
5.2.3 Status Screen

The status screen displays voltages, currents, frequencies, and other parameters for input, bypass, battery, battery management system (BMS), and output.

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 5.5 Status Screen Tabs



Item	Description
1	Screen tabs with Input tab selected

NOTE: 5.2.3 on the previous page is an example status screen and does not reflect the actual values that you may see on your unit.

Input Status Options

- **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.
- **L-L voltage (V):** Line-line voltage of input power.
- **Power Factor:** Power factor of the input power.
- **Energy (kWh):** Input power.
- **Input black count:** The number times that the input voltage was lost or dropped below 60 VAC (black out). Resets to 0 when UPS is powered down.
- **Input brown count:** The number of times that the input voltage was too low to support the load and the UPS was forced to switch to battery power (brown out). Resets to 0 when the UPS is powered down.

Bypass Status Options

- **L-N voltage (V):** Line-neutral voltage of bypass power.
- **Frequency (Hz):** Frequency of bypass power.
- **L-L voltage(V):** Line-line voltage of bypass power.

Battery Status Options

- **Battery status:** Current battery state: no battery, test, charging, discharging, idle, or full.
- **Battery voltage (V):** Voltage of battery power.
- **Battery current (A):** Current of battery power.
- **Backup time (Min):** Amount of backup time remaining for battery.
- **Remaining capacity (%):** Percent of capacity remaining for battery.

- **External battery cabinets:** Number of connected external battery cabinets.
- **Battery average temp (°F):** Average temperature of the battery.
- **Battery highest temp (°F):** Highest temperature battery has reached.
- **Battery lowest temp (°F):** Lowest temperature battery has reached.
- **Max cell volt (mV):** Maximum voltage the battery cell has reached
- **Min cell volt (mV):** Minimum voltage the battery cell has reached.

Battery Management System (BMS)

- **Lithium Battery# Status:** The status of the internal battery.
- **Lithium Battery# SOC (%):** The state of charge of the internal battery.
- **Lithium Battery# SOH (%):** The state of health of the internal battery.

NOTE: Additional status, SOC(%), and SOH(%) lines will populate for each external battery cabinet connected.

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.
- **L-L voltage (V):** Line-line voltage of output power.
- **Energy (kWh):** Output power.

Load Status Options

- **Sout (kVA):** Apparent output power.
- **Pout (kW):** Active output power.
- **Power Factor:** Power factor of output power.
- **Load percent (%):** Percentage of recent power rated to output power.

5.2.4 Settings Submenu

The settings sub-menu consists of Output, Battery, Monitor, and System tabs with configurable settings.

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

NOTE: Some settings may only be changed when the UPS output is off. For these settings a prompt will appear to shut down the output.

To modify UPS settings:

1. At the main menu, select the Settings icon, and press **Enter**.
2. Use the arrow buttons to enter the settings password and press **Enter**. The default password is 111111 (six ones). See [Editing Display and Operation Settings](#) on page 42 for more details on entering the password and editing the setting parameters.
3. 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.
4. Use the arrow buttons to scroll through the parameter list, and press **Enter** to select a parameter.
5. Use the arrow buttons to select the parameter value, press **Enter** to save the selection or press **Esc** to discard the change.

Output Parameter Options

Voltage selection

Nominal voltage setting. Set the nominal system voltage to match the input voltage of the UPS.

- 100/173V
- 100/173RVS (L1/L2 reversed)
- 100/200V
- 110/190.5V
- 110/190.5RVS (L1/L2 reversed)
- 110/220V
- 115/199V
- 115/199RVS (L1/L2 reversed)
- 115/230V
- 120/208V (default)
- 120/208RVS (L1/L2 reversed)
- 120/240V
- 125/216.5V
- 125/216.5RVS (L1/L2 reversed)
- 125/250V
- Autodetect (default)

NOTE: Autodetect is set as the default. When the UPS starts for the first time, the input voltage is automatically detected and confirmed during startup guidance. After that, the confirmed value appears in the settings menu.

Startup on bypass

Allows the UPS to startup in bypass mode.

- Enable = Start the UPS in bypass mode
- Disable (default) = Start the UPS in normal mode

Frequency selection

Selects the frequency of the output.

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

Bypass voltage upper limit

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

- +10% (default)

- +15%
- +20%

Bypass voltage lower limit

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

- +10%
- +15% (default)
- +20%

Run mode

Selects Normal or ECO operation for the UPS.

- Normal (default) = Connected load is always powered through the UPS inverter. ECO mode is disabled (default)
- 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

Sets the percentage that the input voltage may be above or below the selected output voltage setting to remain in ECO mode. This option is only shown when Run mode is set to ECO.

- $\pm 5\%$
- $\pm 10\%$ (default)
- $\pm 15\%$

ECO frequency range

Sets the amount that the input frequency (Hz) may be above or below the selected frequency setting to remain in ECO mode. This option is only shown when Run mode is set to ECO.

- $\pm 1\text{Hz}$
- $\pm 2\text{Hz}$
- $\pm 3\text{Hz}$ (default)

ECO requalification time

To ensure the stability of the utility/mains power, this is the length of time that the UPS requires the input voltage and frequency tolerances to be maintained before switching to ECO mode. This option is only shown when Run mode is set to ECO.

- 1 min (default)
- 5 min
- 15 min
- 30 min

Battery Parameter Options

External battery cabinets

Allows connected EBCs to be detected automatically with Autodetect. The number of attached EBCs (5 kVA and 6 kVA models), or sets of EBCs (8 kVA and 10 kVA models) may also be set manually. The 5 kVA and 6 kVA models supports up to 8 EBCs. The 8 kVA and 10 kVA models support up to 8 sets of EBCs (16 total EBCs, must be connected in sets of 2). Third party EBCs cannot be connected. See the [External Battery Cabinets](#) on page 8 for more information on EBCs.

- 0 - 8
- Autodetect (default)

Low battery time

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

- 2 - 30 minutes (default of 2 minutes)

Battery periodic test

The UPS can periodically self-test the battery.

- Enable (default)
- Disable

Battery periodic test interval

Sets the length of time between periodic test.

- 8, 12, 16, 20, or 26 weeks (default is 8 weeks)

Battery periodic test weekday

Sets the day of the week that the battery periodic test is performed.

- Sunday - Saturday (Wednesday is default)

Battery periodic test time

Sets the time that the battery periodic test is performed.

- 00:00 - 23:59 (default is 00:00)

Dischg protect time

Sets the maximum discharge time for the UPS. The default setting is the maximum allowing the battery to fully discharge. This can be set lower to limit the amount of time the UPS will provide battery protection after which it will shut down. If the discharge time remaining on the battery is lower than the setting value, it will have no effect.

- 1 - 4320 minutes (default is 4320 minutes)

Max chg curr

Sets the maximum charge current for the battery. A higher charge current will charge the battery more quickly but can shorten battery life. A lower value will lengthen the battery charge time and can increase battery life. The load is always prioritized and the charge current will be decreased internally if necessary to support the load.

- 0.6 - 5 A (See [Specifications](#) on page 51)

NOTE: The maximum setting with 1 external battery cabinet (EBC) or 1 set of EBCs connected is 3A. If additional EBCs are connected the maximum charging current can be increased to 5A. The actual charging current depends on the operating conditions, but will not exceed the set value.

Monitor Settings Options

Language

Selects the language of the display, see [Selecting the Display Language](#) on page 43 [Selecting the Display Language](#)

- English (default)
- Français (French)
- Português (Portuguese)
- Español (Spanish)
- 中文 (Chinese)
- Deutsch (German)
- 日本語 (Japanese)
- Русский (Russian)
- čeština (Czech)
- Italiano (Italian)

Date

Selects the current date for the UPS display, YYYY-MM-DD. See [Setting the Date and Time](#) on page 44 .

Time

Select the current time for the UPS display, HH:MM:SS. See [Setting the Date and Time](#) on page 44 .

Display orientation

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

- Auto-rotate (default) = Automatically rotates based on the detected orientation of the UPS.
- Horizontal = Screen rotated for rack use.
- Vertical = Screen rotated for tower use.

Audible alarm

If enabled, the UPS will beep when an alarm is generated. If disabled, it will be silent. See [Audible Alarm \(Buzzer\)](#) on page 49 .

- Enable (default)
- Disable

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 43 .

System Parameter Options

Auto restart

Allows the automatic restart of the UPS when input power is restored after a shutdown of the UPS due to battery EOD (end of discharge).

- Enable (default) = The UPS will restart automatically when the input power is restored after a complete shut down.
- Disable = The UPS will not restart automatically

Auto restart delay

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

- 0 - 999 seconds (default 0 seconds)

Guaranteed shutdown

Forces a continued shutdown of the UPS after the Low Battery alarm threshold is reached, even if input power is restored during this time. This can be used to ensure connected equipment shuts down completely after receiving a signal to shutdown from an external monitoring device before power is reapplied. This ensures that once the equipment begins to shut down, it is brought down completely before power is applied again.

- Enable
- Disable (default)

Start with no battery

Allows the UPS to start when the battery is not installed or is not functional due to damage. This can be used to turn on the UPS and power the attached load without battery protection when utility power is available but battery backup is not.

- Enable (with Auto restart enabled) — The UPS will power the load with no user intervention when main power returns after the battery has been fully depleted.
- Enable (with Auto restart disabled) — The UPS will startup and allow the user to turn on the output when power returns after the battery has been fully depleted.
- Disable (default) — The UPS cannot start with a fully depleted battery.

Remote control

Allows the UPS to be controlled remotely via the CLI or RDU101 card.

- Enable (default)
- Disable

Any mode shutdown auto restart enable

Automatically restart the UPS after an *Any mode shutdown* signal is received. When the UPS is shut down via dry contact inputs 1 or 2, it will restart automatically if this option is enabled.

- Enable
- Disable (default)

Output contact NO/NC

Selects the states of the dry contact outputs 5 and 6.

- Normally open (default)

- Normally closed

Input contact NO/NC

Selects the states of the dry contact inputs 1 and 2.

- Normally open (default)
- Normally closed.

Dry contact 5 (Output)

Selects the output of dry contact 5.

- Low battery (default) = The contacts switch when the UPS reaches the amount of time left on battery configurable from *Low battery time*
- On bypass = The contacts switch when the UPS is running in bypass mode
- On battery = The contacts switch when the UPS is running on battery
- UPS fault = The contacts switch when a UPS fault has occurred

Dry contact 6 (Output)

Selects the output of dry contact 6.

- Low battery = The contacts switch when the UPS reaches the amount of time left on battery configurable from *Low battery time*
- On bypass = The contacts switch when the UPS is running in bypass mode
- On battery = The contacts switch when the UPS is running on battery
- UPS fault (default) = The contacts switch when a UPS fault has occurred

Dry contact 1 (Input)

Selects the action taken by the UPS when the input of dry contact 1 is triggered.

- Disable (default)
- Battery mode shutdown = If the UPS is running on batteries and this input is triggered, the UPS shuts down
- Any mode shutdown = If this input is triggered, the UPS shuts down regardless of current operating mode

Dry contact 2 (Input)

Selects the action taken by the UPS when the input of dry contact 2 is triggered.

- Disable (default)
- Battery mode shutdown = If the UPS is running on batteries and this input is triggered, the UPS shuts down
- Any mode shutdown = If this input is triggered, the UPS shuts down regardless of current operating mode

Sleep mode

Allows the UPS to turn off the output on a weekly schedule. For instance, turn on every Monday at 1:00 and off every Friday at 23:00.

- Enable
- Disable (default)

Power on day of week

Sets the day of week to turn on the UPS. This option is only shown when sleep mode is enabled.

- Sunday-Saturday (default is Monday)

Power on time

Sets the time of day to power on the UPS on the selected day. This option is only shown when sleep mode is enabled.

- 00:00 - 23:59 (default is 00:00)

Power off day of week

Sets the day of week to turn off the UPS. This option is only shown when sleep mode is enabled.

- Sunday-Saturday (default is Saturday)

Power off time

Sets the time of day to power off the UPS on the selected day. This option is only shown when sleep mode is enabled.

- 00:00 - 23:59 (default is 00:00)

IT system compatibility

When this option is enabled, the *Input phase reversed* and *Input ground lost* alarms are disabled.

- Enable
- Disable (default)

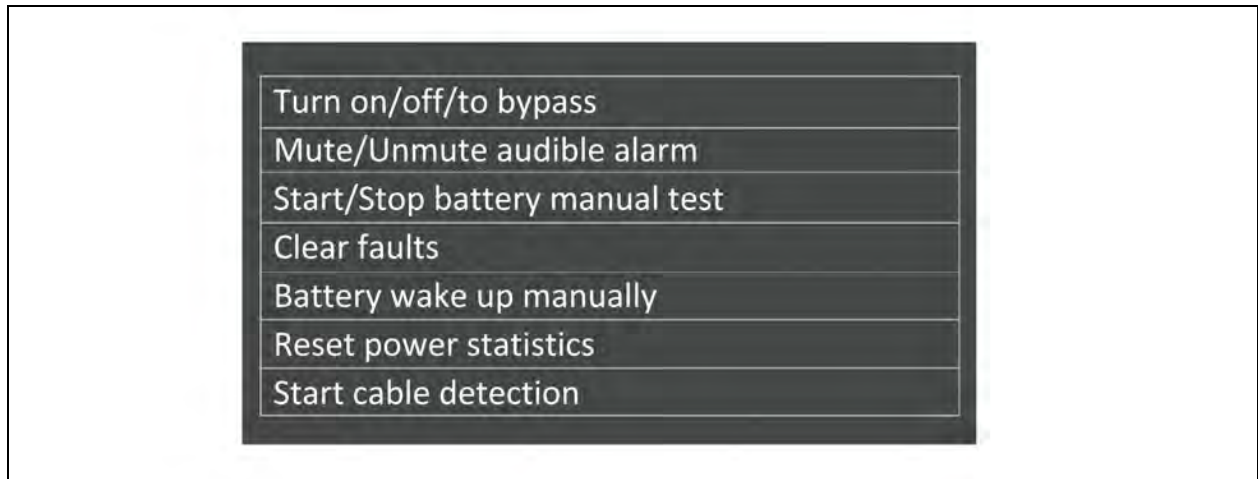
5.2.5 Control Screen

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 select the control.

Figure 5.6 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 unsilences the audible alarm, see [Silencing the Audible Alarm](#) on page 21.
- **Start/Stop battery manual test:** Starts the battery self test manually. If the manual self test is already running, stop the self test.
- **Clear faults:** Clears displayed faults after the issue causing the fault is resolved, see **Table 7.2** on page 49, for a description of the faults.
- **Battery wake up manually:** The battery may enter a dormant state. Use this feature to wake the battery from the dormant state
- **Reset power statistics:** Resets the values tracked to calculate the Efficiency graph, see [About Screen](#) on page 40.
- **Start cable detection:** Checks whether the power cable connection between EBC and UPS is correct.

NOTE: If input power is lost output power will also be lost while using the start cable detection feature. It is recommended to use this feature while the UPS output is off.

5.2.6 Log Screen

The Log Screen offers tabs that list the current alarms and the alarm/event history. **Table 5.4** on the facing page, 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 5.7 Current and History Log Tabs

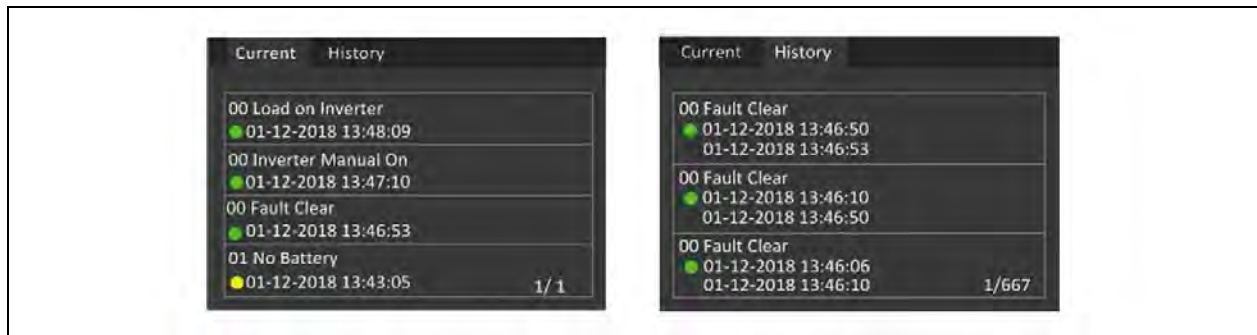


Table 5.4 Alarm Messages

Message	Description
Aux. power fault	UPS internal auxiliary power voltage fault. Contact Vertiv Technical Support.
Battery cabinet connect abnormal	More than 10 external battery cabinets are connected to the UPS. Disconnect excess battery cabinets.
Battery EOD	The battery has reached the end of discharge and mains/utility power is unavailable. Restore the mains power. The UPS will power off if it is not restored.
Battery low prewarning	This alarm occurs when the battery approaches the EOD. After the pre-warning, the battery capacity allows two minutes discharge at full load. The user can set the time with the Low Battery Time setting in Battery settings from 2 min - 30 min, (2 min by default). This allows for any loads to be shut down before the system powers off if utility power cannot be restored.
Battery mode	The UPS operating in battery mode. The alarm will clear when utility power is restored.
Battery overtemp	Battery ambient temperature too high. Ensure that the battery ambient temperature is not higher than setting value 40 ~ 60 °C (default: 50 °C)
Battery replacement timeout	The system time is past the time set for the batteries to be replaced. If you have disabled the "Batt. note duration" or have no batteries installed, the alarm will not occur.
Battery reversed	The battery positive and negative are reversed. Reconnect the battery and check the battery cable connections.
Battery test fail	The voltage of the battery was low when the periodic or manual self-test was run. Battery replacement is Recommended.
Battery test started	The battery periodic self-test or manual self-test was started. This will display in the log whenever the event occurs.
Battery test stopped	The battery periodic self-test or manual self-test has finished. This will display in the log whenever the event occurs.
Battery address error	Applicable for the GXT5LI-5000/6000MVRT3UXLN. The address is set as 9-16, but must be set as 1-8. Open the battery breaker and check the address setting.
Battery cabinet fault	There is a fault with the EBC.
Battery cabinet parallel fault	Conditions for connecting EBCs in parallel are not met.
Battery cable fault	The CAN communication cable between EBCs is connected incorrectly. Confirm the CAN communication cable are connected to each EBC CAN port. Confirm the CAN communication cable is not damaged.
Battery cable test	The battery cable detection was started. This will clear automatically once detection is complete.
Battery checking	Appears when the EBC is first connected or the manual battery wake up feature is used.
Battery comm fault	The communication between the UPS and battery is lost. Check whether the communication cable is connected between the UPS RS485 port and the battery COM port. Confirm the cable is not damaged.

Table 5.4 Alarm Messages (continued)

Message	Description
Battery current abnormal	The EBC current is abnormal. Open the EBC breaker.
Battery model incompatible	The connected EBC manufacturer is incorrect. Confirm a compatible battery is connected.
Battery No. exceed the limit	More than 8 EBCs or sets of EBCs are connected. Confirm 8 or less EBCs or sets of EBCs are connected.
Battery SN code abnormal	The EBC serial number is inconsistent with the product or multiple EBCs share the same serial number. Confirm a compatible EBC is connected.
Battery temperature abnormal	The EBC temperature is abnormal. Check surroundings for heat sources. Open the EBC breaker.
Battery to utility transistion	The UPS has transferred the load to the mains power from the battery. This will display in the log whenever the event occurs.
Battery unmatched with the unit	The connected EBC is not suitable for the UPS. Confirm a compatible EBC is connected.
Battery voltage abnormal	The battery voltage exceeds the normal range. Confirm the battery terminal voltage is correct.
Battery wait for charging	The EBC does not meet charging conditions and is in an abnormal state. Check the UPS Log for alarms.
Battery wiring abnormal	An EBC power cable is not connected properly after using the battery cable detection feature.
Bypass abnormal	May be caused by bypass voltage and frequency outside of range, bypass power off and incorrect bypass cables connection. Check that the bypass voltage and frequency are within the setting range. Check the bypass cables connection
Bypass abnormal in ECO mode	May be 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. Check the bypass cable connection
Bypass mode	The UPS is on bypass. This will clear when the UPS returns to Normal mode.
Bypass over-current	The load is drawing more current than the UPS is rated to supply in bypass mode. Reduce the load.
Charger fault	The charger output voltage is abnormal, and the charger is off. Contact Vertiv Technical Support.
Communication fail	Internal communication is abnormal. Check that the communication cables are connected correctly.
DC bus abnormal	The inverter is off due to DC bus voltage out of acceptable range. The load will transfer to bypass if the bypass is available because the bus voltage is outside of the acceptable range.
DC/DC fault	The discharger is faulty, because the bus voltage exceeds the range when the discharger starts. Contact Vertiv Technical Support.
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 if the fan is blocked or the cable connection is loose.
Faults cleared	The faults have been cleared using Settings > Controls > Clear faults. This will display in the log whenever the event occurs.
Guaranteed shutdown	The battery has finished discharging, then system shuts down because Guaranteed Shutdown is enabled (see Guaranteed shutdown on page 37). This alarm will clear when the UPS is turned on again.
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.

Table 5.4 Alarm Messages (continued)

Message	Description
Input ground lost	Check that the PE line is well connected and that the alarm can be cleared at the display.
Input neutral lost	The mains input neutral is not detected. The alarm will clear when the neutral connection has been restored.
Input phase reversed	The mains input line and neutral are reversed. Shut off external input breaker and connect the lines correctly.
Insufficient capacity to start	The UPS is on bypass and is started with a load greater than 105% of the rated capacity. Reduce the load to the rated capacity or below to start the unit.
Inverter fault	The inverter is turned off when the inverter output voltage or current exceed the ranges set. If bypass is available, the UPS will transfer to bypass mode, otherwise the system will power off. Contact Vertiv Technical Support.
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 system will power off. Check the output load. If overloaded, reduce the load, and the system will transfer to the inverter mode after five seconds with no alarm.
Inverter relay welded	The inverter relay is shorted. Contact Vertiv Technical Support.
Load off due to output short	A short has occurred on the output. Check the output cables and for any equipment that may have shorted.
Load off due to shutdown on battery	The system was shut down in battery mode. This will clear when the system is turned back on.
Manual power- on	The system was turned on via the display panel. This will display in the log whenever the event occurs.
Manual shutdown	The system was shut down via the display panel. This will display in the log whenever the event occurs.
No battery	No battery detected. Check the battery and battery cable connections.
On maintenance bypass	The UPS is operating in maintenance bypass mode. This will display in the log whenever the event occurs.
Operating on inverter	The UPS output is being powered by the inverter. This will display in the log whenever the event occurs.
Output disabled	The system is in standby state, and the dry contact shutdown is enabled. Check if the shutdown dry contact is enabled.
Output off due to bypass abnormal	The bypass voltage or frequency is outside the acceptable range, and the bypass is in stand-by mode. Check that the input is normal.
Output off due to overload & bypass abnormal	The output is off due to an overload of the UPS output, and the bypass voltage or frequency is outside the acceptable range. Check that the input is normal.
Output off, voltage is not zero	This occurs when the output is off and the system detects that there is still voltage on the output. Check output equipment for backfeeds or contact Vertiv Technical Support.
Output pending	Remote shutdown has been initiated, and the system will turn off shortly.
Output short	A short has occurred on the output. Check the output cables and for any equipment that may have shorted.
Rectifier fault	The rectifier is off because the bus voltage is out of the acceptable range when the rectifier starts. Contact Vertiv Technical Support.
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	The UPS was powered on remotely. This will display in the log whenever the event occurs
Remote shut- off	The UPS was powered off remotely. This will display in the log whenever the event occurs.
Remote shutdown	Any mode shutdown was initiated by the dry contact input. This will display in the log whenever the event occurs.

Table 5.4 Alarm Messages (continued)

Message	Description
REPO	Shutdown caused by the REPO terminal Normally Closed contact input opening. This will display in the log whenever the event occurs.
Restore factory defaults	On the Maintenance page, Restore Factory Defaults has been set while the UPS is in the standby state. This will return settings to their factory settings.
Shutdown due to over temp	<p>During the UPS operation, the system checks if the heat sink temperature exceeds the setting range.</p> <p>If an overtemperature occurs, check if:</p> <ul style="list-style-type: none"> • The ambient temperature is too high. • Dust is blocking any of the UPS vents. • A fan fault has occurred.
System over temp	<p>The internal heat-sink temperature is 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 corrected.</p> <p>If an overtemperature occurs, check if:</p> <ul style="list-style-type: none"> • The ambient temperature is too high. • Dust is blocking any of the UPS vents. • A fan fault has occurred.
Turn on fail	The UPS does not start because there is no mains/utility power or it is outside of the range of the voltage required to supply the full load. Check the AC input power.
UPS has no output	Both Inverter and Bypass are not supplying power due to the UPS output being turned off remotely or via the LCD, or are unavailable due to no input power or input power out of range. Check that UPS is on and input power is available.

5.2.7 About Screen

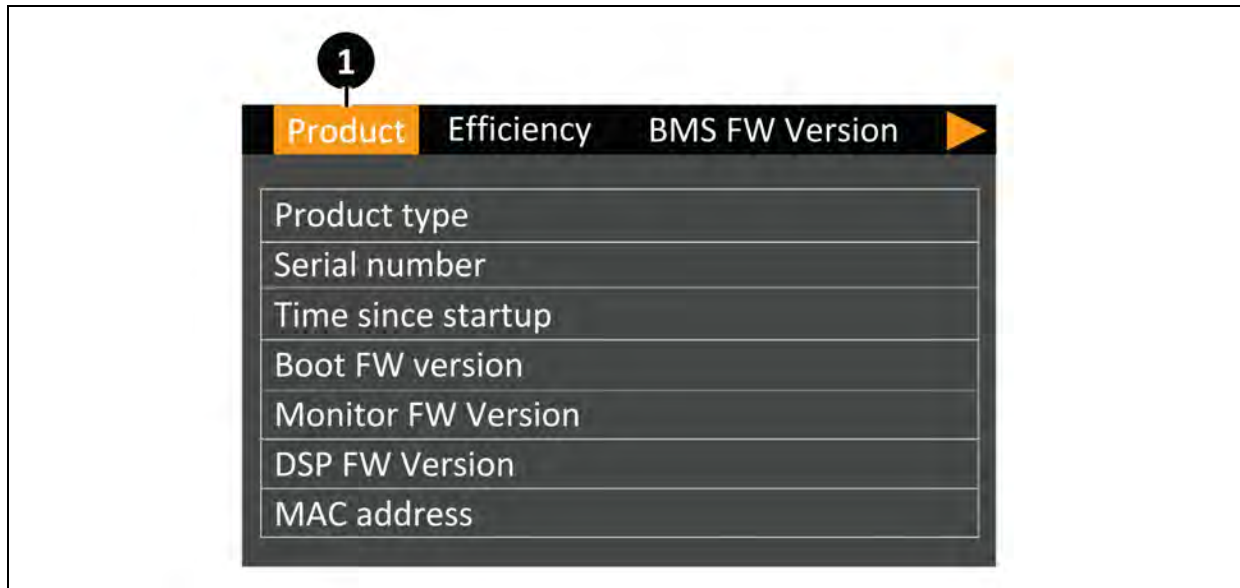
The About screen offers tabs that list information about the product.

- Product tab — Displays UPS identification information, firmware versions, and information about the communication card.
- Efficiency tab — Displays the efficiency curve of the UPS vs the load, output load percentage, and efficiency at that load percentage.
- BMS FW Version—Displays the firmware version for the connected external battery cabinets.
- BMS SN — Displays the serial number for the connected external battery cabinets.

To view the product, efficiency, and battery Age 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 5.8 About Screen Tabs



Item	Description
1	About screen tabs with Product tab selected. NOTE: The tab shown in the figure is an example and may not represent the actual information for your UPS model.

Product

- **Product Type:** UPS model number.
- **Serial number:** UPS serial number.
- **Time since startup:** Elapsed time since startup 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.
- **MAC address:** Shows the MAC address of the RDU101 card. This is only shown when the RDU101 card is installed.
- **IPv4 address:** Shows the IPv4 address of the RDU101 card. This is only shown when the RDU101 card is installed.
- **Subnet mask:** Shows the subnet mask of the RDU101 card. This is only shown when the RDU101 card is installed.
- **Gateway address:** Shows the gateway address of the RDU101 card. This is only shown when the RDU101 card is installed.

Efficiency

- **Capacity:** This shows the maximum capacity of the UPS model.
- **Load (%):** This shows the percentage of the maximum capacity the UPS is currently using.
- **Eff. (%):** This shows the efficiency the UPS is currently operating at based on the Load (%) value.

BMS FW Version

- **Lithium Battery#:** Displays the battery firmware version for each connected external battery cabinet.

BMS SN

- **Lithium Battery#:** Displays the serial number for each connected external battery cabinet.

5.3 Editing Display and Operation Settings

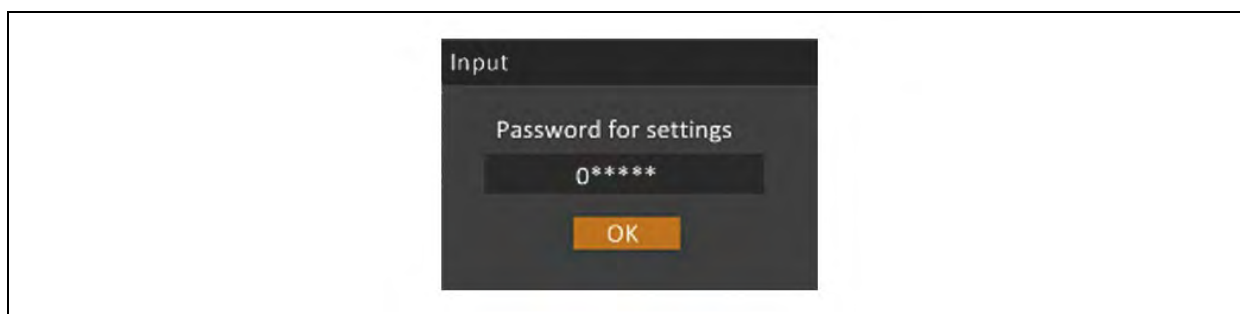
You may adjust the display settings and UPS configuration via the LCD. The display and operation settings are password protected. The default password is 111111 (six ones).

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](#).

To enter the password:

1. Press the **Up** arrow button to change the digit shown, 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 5.9 Password Prompt



5.3.1 Settings Prompts

While using the operation and display panel, prompts display to alert you to specific conditions or require confirmation of commands or settings. **Table 5.5** below lists the prompts and their meaning.

Table 5.5 Display Prompts and Meanings

Prompt	Meaning
Cannot set this online, please shut down output	Appears when changing important output settings (output voltage, output frequency, output phase No.).
Incorrect password, please input again	Appears when the Settings password is input incorrectly.
Operation failed, condition is not met	Appears when attempting to execute a operation for which the required conditions are not met.
Password changed OK	Appears upon successful change of the Settings password.
Fail to change password, please try again	Appears when attempting to change the Settings password but the new and confirmation passwords do not match.
The time cannot be earlier than system time	Appears when attempting to set the time of Turn on delay or Turn off delay earlier than the current system time.
Turn on failed, condition is not met	Appears when proper conditions are not met for UPS power-on. Applies when using the power button or when execute the command of Turn on/Turn off/to Bypass on the LCD panel Control page).
Cannot set this on line, please unplug REPO	Appears when attempting to change the output phase number while the output is connected.

5.3.2 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.

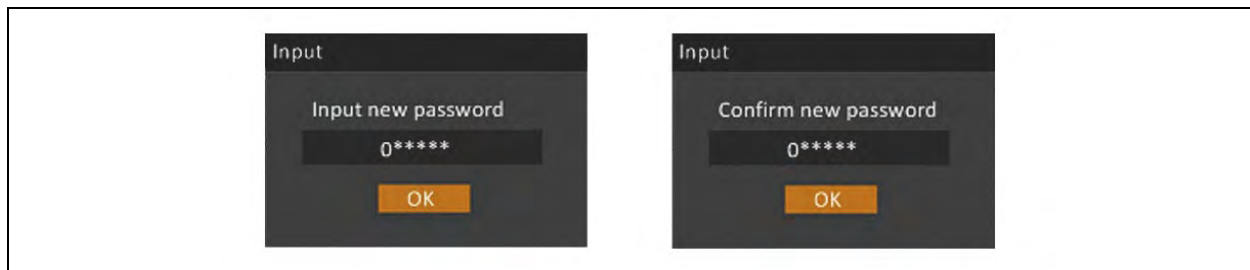
The Input new password dialog opens, see **Figure 5.10** below.

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 5.10 New and Confirm Password dialogs



5.3.3 Selecting the Display Language

The LCD is multilingual. The available languages are listed below:

- English
- Français (French)
- Português (Portuguese)
- Español (Spanish)
- 中文 (Chinese)
- Deutsch (German)
- 日本語 (Japanese)
- Русский (Russian)
- čeština (Czech)
- Italiano (Italian)

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 will now display in the selected language.

5.3.4 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.
6. Use the **Down** arrow to select the digit to change and the **Up** arrow to select the correct digit. Repeat as needed to set each digit.

6 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. These covers require a tool for removal. Only qualified service personnel are authorized to remove such covers. If maintenance for a 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 input power 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, 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.

6.1 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 electrolytes toxic and harmful to skin and eyes. If electrolytes come 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 EBC when the UPS is in a restricted access location (such as a rack or server closet). To obtain the appropriate replacement battery packs, see [Replacing Batteries](#) on the previous page, and contact your local dealer or Vertiv representative.

Table 6.1 Replacement EBC Model Numbers

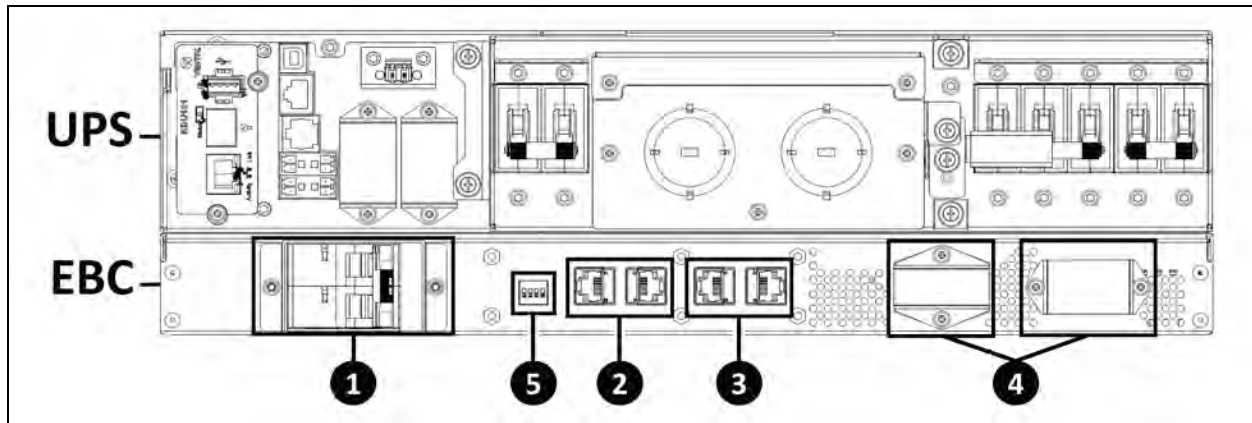
UPS Model	Minimum Number of EBCs Required	Maximum Number of EBCs	EBC model
GXT5LI-5000MVRT3UXLN	1	8	VEBCLI-192VRT1U
GXT5LI-6000MVRT3UXLN			
GXT5LI-8000MVRT4UXLN	2 (1 set)	16 (8 sets)	VEBCLI-192VRT1UX2 (Ships with 2 x VEBCLI192VRT1U)
GXT5LI-10KMVRT4UXLN			

To replace an EBC refer to the steps below and Figure 6.1 on the facing page

NOTE: The EBC 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. Open the EBC circuit breaker by switching it to the OFF position.
2. Disconnect any communication cables from the EBC COM ports.
3. Disconnect any CAN communication cables from the EBC CAN ports.
4. Disconnect the battery power cable from Battery Port A and Battery Port B (if applicable) on the EBC.
5. Note the address of the EBC. The same address will need to be set on the replacement EBC.
6. Remove the EBC from the mounting location.
7. Unpack the replacement EBC, taking care not to damage the packaging to reuse when disposing of the old battery.
8. Confirm the new EBC part number matches **Figure 6.1** on the facing page. If so, proceed to step 9. If not, stop and contact your Vertiv representative, or Technical Support at <http://www.Vertiv.com/en-us/support/>.
9. Install the replacement EBC in the mounting location.
10. Reconnect the cables removed in steps 2, 3, and 4 and set the address noted in step 5, then close the battery circuit breaker by switching it to the ON position.

Figure 6.1 Replacing the External Battery Cabinet



Item	Description
1	External battery cabinet circuit breaker
2	COM ports
3	CAN ports
4	Battery Port A (left) and Port B (right)
5	Address dip switches

6.2 Charging Batteries

The batteries are LiFePO4 type Lithium-Ion batteries. They should be kept charged to maintain their design life. The Vertiv™ Liebert® GXT5 Lithium-Ion charges the batteries continuously when it is connected to input power. If the UPS will be stored for a long time, Vertiv recommends connecting the UPS to input power every 4 to 6 months for at least 3 hours to ensure recharge of the batteries.

The Lithium-ion batteries used in the Liebert® GXT5 Lithium-Ion series, as well as all Vertiv™ Lithium-Ion UPSs, contain a Battery Management System (BMS) that self monitors the safety of the Lithium-Ion batteries in real time. This is an agency tested and certified requirement now eliminating the industry wide safety risk known with previous Lithium-Ion batteries.

6.3 Checking UPS Operation

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

We recommend checking the UPS operation once every 6 months. Ensure that output power loss to the connected load will not cause data loss or other errors before conducting the check.

1. Press the **Enter** button to check the indicators and display function, see Operation and Display Panel .
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 Log, and check the Current and History tabs for current and previous alarms and faults, see [Log Screen](#) on page 36 .
5. Check the flow screen to ensure the UPS is operating in Normal mode. If the UPS is unexpectedly operating in Bypass mode contact Vertiv Technical Support.

6.4 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.

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.

6.5 Firmware Updates

The UPS has three firmware components:

- DSP is the firmware for the power module.
- MCU is the firmware for the display panel.
- BMS is the firmware for the lithium ion battery management system. This will appear for the internal battery and any connected external battery cabinets.

All firmware components may be updated using either CLI and the RS232 port, or the RJ-45 port on the RDU101 card, if installed.

The latest firmware files and update instructions are available for download under UPS Product Downloads on Vertiv's Software Downloads page at

<https://www.vertiv.com/en-us/support/software-downloads/>.

7 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.

7.1 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.

7.2 Audible Alarm (Buzzer)

An audible alarm accompanies various events during UPS operations. **Table 7.1** below, describes the sounds and their meaning. To silence an alarm, see [Silencing the Audible Alarm](#) on page 21.

Table 7.1 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 5.4** on page 37, describes the alarm messages you may see. When a fault is indicated, front panel display list the fault, which are described in **Table 7.2** below.

7.2.1 Faults

When the fault indicator is illuminated, the LCD displays the fault. The faults are described in **Table 7.2** below.

Table 7.2 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 7.2 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.

7.3 Troubleshooting UPS Issues

In the event of an issue with the UPS, refer to **Table 7.3** below, to determine the cause and solution. If the fault persists, contact Vertiv Technical Support. Visit the GXT5 Lithium-Ion 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 LCD select *Main Menu > About*

Table 7.3 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 the output receptacles. Ensure loads are not defective or shorted internally.
	Batteries are not charged enough or not connected	Check to ensure the external battery cabinets is connected. If it is not, check all connections and try to start the unit. If the battery is connected, leave the UPS connected to input power for 4 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 4 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 external battery cabinets. Contact your Vertiv representative or Vertiv Technical Support for replacement battery kit.

8 Specifications

Table 8.1 UPS Specifications

Model	GXT5LI-5000MVRT3UXLN	GXT5LI-6000MVRT3UXLN	GXT5LI-8000MVRT4UXLN	GXT5LI-10KMVRT4UXLN
Rating	5000 VA/5000 W	6000 VA/6000 W	8000 VA/8000 W	10000 VA/10000 W
Dimensions, W×D×H, inches (mm)				
Unit	16.9 x 30.0 x 3.3 (2u) (430 x 865 x 85)	16.9 x 35.4 x 3.3 (2U) (430 x 900 x 85)	16.9 x 36.6 x 3.3 (2U) (430 x 930 x 85)	
Shipping	31.4 x 39.3 x 20.9 (798 x 999 x 532)		31.4 x 39.3 x 29.1 (798 x 999 x 739)	
Weight, lb.(kg)				
Unit with EBCs	104.9 (47.6)	100.0 (45.4)	156.3 (70.9)	
Unit without EBCs	56.4 (25.6)	51.5 (23.4)	59.3 (26.9)	
Shipping	176.3(80)	158.7(72)	247.7 (112.4)	
Input AC				
Operating Frequency (nominal)	50 or 60 Hz (factory-default is 60 Hz)			
Factory default VAC	120/208 VAC at 120 degrees			
User-configurable VAC	100/173V, 100/200, 110/190.5, 110/220, 115/199, 115/230, 120/208, 120/240, 125/216.5, 125/250			
Allowable Input Phase Angle	120, 180, 240 degrees, auto-sensing on application of alternating current.(Restrictions for L-N voltages other than 120 VAC.)			
Input Frequency without Battery Operation	40 to 70 Hz			
Input Power Connection	L14-30 plug and cord 10 ft. (3 m)	Hard wired terminal block 3W+ G (L1-L2-N-G)		
Input Circuit Breaker	30 A	40 A	60 A	
L1-N, L2-N Maximum Allowable VAC	150 VAC			
Output AC				
Online Efficiency at 25% Load	92.5%	93.5%	93.5%	94.0%
Online Efficiency at 50% Load	93.5%	94.0%	93.5%	94.0%
Online Efficiency at 75% Load	93.5%	93.5%	93.5%	93.5%
Online Efficiency at 100% Load	92.5%	93.0%	92.5%	92.5%
Factory default VAC	120/208 VAC at 120 degrees			

Table 8.1 UPS Specifications (continued)

Model	GXT5LI-5000MVRT3UXLN	GXT5LI-6000MVRT3UXLN	GXT5LI-8000MVRT4UXLN	GXT5LI-10KMVRT4UXLN
Rating	5000 VA/5000 W	6000 VA/6000 W	8000 VA/8000 W	10000 VA/10000 W
L1-L2 Factory default Output Phase Angle	120 degrees			
Allowable Output Phase Angle	120, 180, 240 degrees, auto-sensing on initial application of input AC			
Factory-default L1-N, L2-N VAC	120 VAC nominal			
L1-N, L2-N, Operating Load Range	105% to 125% for 5 minutes 125% to 150% for 60 seconds >150% (impact load) minimum 200 ms			105% to 125% for 5 minutes 125% to 150% for 50 seconds >150% (impact load) minimum 200 ms
Output Power Connection	L14-30R (2)	Hard wired terminal block 3W+ G (L1-L2-N-G)		
Output Circuit Breaker	30A	40A	60A	
Bypass Protection Limits				
Re-enable Bypass Operation	If input voltage returns to within ±10% nominal output voltage			
Disable Bypass Operation	When the input frequency prevents synchronous operation.			
Battery				
Type	Lithium Ion (LiFePO4) Battery(26650PFS)			
Qty×V x Rating	3.2 × 60V (6 Ah) (60s2p)			
Backup Time	See Battery Run Times on page 54			
Recharge Time	2 Hours to 90% capacity after full discharge with 100% load until UPS auto-shutdown			
Charger Current A	3A (default), 5A Maximum with additional external battery cabinets			
Environmental Requirements				
Operating Temperature, °F (°C)	32 to 104 (0 to 40)			
Storage Temperature, °F (°C)	-4 to +140 (-20 to 60)			
Relative Humidity	0% to 95%, non-condensing			
Operating Elevation	Up to 10,000 ft. (3000 m) at 77 °F (25 °C) without derating			
Audible Noise	<58 dBA,at 3.2 ft (1 m) from the front and sides, <58 dBA, at 3.2 ft (1 m) from rear			
Agency				
Safety	UL1778 and CSA 22.2 No. 107.3 c-UL listed UL1973 & UL1642 (for battery pack and cell) UL991+UL1998/UL60730-1 UL1973			
RFI/EMI	FCC Part 15 (Class A CISPR22 Class A)			
Surge Immunity	IEEE/ANSI C62.41 Category B			
Transportation	ISTA Procedure 3E UN38.3 (for lithium battery)			

Table 8.2 External Battery Cabinet Specifications

Model	VEBCLI-192VRT1U			
Used With UPS Model	GXT5LI-5000MVRT3UXLN	GXT5LI-6000MVRT3UXLN	GXT5LI-8000MVRT4UXLN	GXT5LI-10KMVRT4UXLN
Replacement/Additional EBC SKU Information				
EBC SKU	VEBCLI-192VRT1U (Ships with 1 x VEBCLI-192VRT1U EBC)		VEBCLI-192VRT1UX2 (Ships with 2 x VEBCLI-192VRT1U EBCs)	
Dimensions, W×D×H, inches (mm)				
Unit	16.9 x 30.7 x 1.67 (430 x 780 x 42.5)	For each EBC: 16.9 x 30.7 x 1.67 (430 x 780 x 42.5)		
	31.4 x 39.3 x 11.2 (800 x 1000 x 285)			
Shipping	31.4 x 39.3 x 11.2 (800 x 1000 x 285)		31.4 x 39.3 x 29.1 (800 x 1000 x 740)	
Weight, lb.(kg)				
	48.5 (22)			
Unit	48.5 (22)		For each EBC: 48.5 (22)	
Shipping	106.9 (48.5)		188.2 (85.4)	
Battery				
Type	Lithium battery (26650PFS)			
Qty x Voltage	60 x 3.2V (60s2p)			
Backup Time	See Battery Run Times on the next page .			
Environmental Requirements				
Operating Temperature, °F (°C)	32 to 104 (0 to 40)			
Storage Temperature, °F (°C)	-4 to +140 (-20 to 60)			
Relative Humidity	0% to 95%, non-condensing			
Operating Elevation	Up to 10,000 ft (3,000 m) at 104 °F (40 °C)			
Agency				
Safety	Cell: UL1642 BMS: UL60730-1 Cabinet: UL&CUL1973			
RFI/EMI	FCC Part 15 Class A			
Surge Immunity	IEEE/ANSI C62.41 Category B			
Transportation	ISTA Procedure 3E UN38.3			

8.1 Battery Run Times

NOTE: Run times in this table are approximate. They are based on new, fully charged batteries at 77°F (25°C), with fully resistive loads. Run times can vary $\pm 5\%$ due to manufacturing variances.

Table 8.3 Battery Run Times in Minutes, GXT5LI-5000MVRT3UXLN

Load			Number of External Battery Cabinets							
			1	2	3	4	5	6	7	8
%	VA	W								
10	500	500	118.5	222.5	312.5	413.5	517.5	621.5	725.5	829.5
20	1000	1000	64.0	118.5	172.5	222.5	272.5	328.0	383.0	438.0
25	1250	1250	54.0	100.0	145.0	188.0	231.0	275.0	318.0	361.0
30	1500	1500	44.0	82.0	118.5	155.0	190.0	224.0	261.5	299.5
40	2000	2000	33.0	64.0	90.5	118.5	146.0	172.5	198.0	225.0
50	2500	2500	25.0	52.0	74.5	96.0	118.5	140.5	162.0	183.0
60	3000	3000	20.5	44.0	64.0	82.0	100.0	118.5	137.0	155.0
70	3500	3500	17.5	38.0	55.5	71.5	87.0	102.5	118.5	134.5
75	3750	3750	16.0	35.0	52.0	67.0	82.0	96.0	111.0	126.0
80	4000	4000	15.0	33.0	49.0	64.0	77.5	90.5	104.5	118.5
90	4500	4500	13.0	28.5	44.0	57.5	70.0	82.0	93.5	106.0
100	5000	5000	12.0	25.0	39.5	52.0	64.0	74.5	85.5	96.0

Table 8.4 Battery Run Times in Minutes, GXT5LI-6000MVRT3UXLN

Load			Number of External Battery Cabinets							
			1	2	3	4	5	6	7	8
%	VA	W								
10	600	600	100.0	205.0	309.5	392.5	463.0	526.5	593.5	635.0
20	1200	1200	54.0	106.0	162.0	217.5	269.0	312.5	353.5	392.5
25	1500	1500	45.0	89.0	135.0	182.0	227.0	268.0	307.0	346.0
30	1800	1800	37.0	73.0	109.5	147.5	186.0	222.5	254.0	284.0
40	2400	2400	26.5	56.0	82.0	110.0	139.0	168.0	196.5	222.5
50	3000	3000	20.5	45.0	67.0	88.0	110.5	133.5	157.0	180.0
60	3600	3600	17.0	37.5	56.5	74.0	91.5	110.5	130.0	149.5
70	4200	4200	14.5	31.5	48.5	64.0	79.0	94.5	111.0	127.5

Table 8.4 Battery Run Times in Minutes, GXT5LI-6000MVRT3UXLN (continued)

Load			Number of External Battery Cabinets							
			1	2	3	4	5	6	7	8
75	4500	4500	13.0	29.0	45.0	60.0	74.0	88.0	103.0	119.0
80	4800	4800	12.5	26.5	42.5	56.5	70.0	83.0	96.5	111.0
90	5400	5400	11.0	23.5	37.5	50.5	62.5	74.5	86.0	98.5
100	6000	6000	9.5	21.0	33.5	45.5	56.5	67.5	78.0	88.5

Table 8.5 Battery Run Times in Minutes, GXT5LI-8000MVRT4UXLN

Load			Number of External Battery Cabinets							
			2 EBCs 1 set	4 EBCs 2 sets	6 EBCs 3 sets	8 EBCs 4 sets	10 EBCs 5 sets	12 EBCs 6 sets	14 EBCs 7 sets	16 EBCs 8 sets
%	VA	W								
10	800	800	130.0	246.5	353.0	450.5	541.5	650.5	759.5	868.0
20	1600	1600	68.5	130.0	190.0	246.5	301.0	353.0	402.5	450.5
25	2000	2000	57.0	109.0	160.0	208.0	255.0	299.0	342.0	384.0
30	2400	2400	46.5	88.0	130.0	170.0	209.0	246.5	283.0	318.5
40	3200	3200	34.5	68.5	98.5	130.0	160.0	190.0	218.5	246.5
50	4000	4000	26.5	55.5	80.0	104.5	130.0	154.0	178.0	201.5
60	4800	4800	21.5	46.5	68.5	88.0	109.0	130.0	150.0	170.0
70	5600	5600	18.5	40.0	59.5	77.0	93.5	112.0	130.0	147.5
75	6000	6000	17.0	37.0	56.0	72.0	88.0	105.0	122.0	138.0
80	6400	6400	16.0	34.5	52.5	68.5	83.0	98.5	114.5	130.0
90	7200	7200	14.0	30.0	46.5	61.5	75.0	88.0	102.0	116.0
100	8000	8000	12.5	26.5	42.0	55.5	68.5	80.0	92.0	104.5

NOTE: EBCs must be connected in pairs for GXT5LI-8000MVRT4UXLN and GXT5LI-10KMVRT4UXLN models.

Table 8.6 Battery Run Times in Minutes, GXT5LI-10KMVRT4UXLN

Load			Number of External Battery Cabinets							
			2 EBCs 1 set	4 EBCs 2 sets	6 EBCs 3 sets	8 EBCs 4 sets	10 EBCs 5 sets	12 EBCs 6 sets	14 EBCs 7 sets	16 EBCs 8 sets
%	VA	W								
10	1000	1000	104.5	215.0	324.0	432.5	540.5	624.0	701.5	773.5
20	2000	2000	55.5	109.5	167.0	224.0	280.5	337.5	394.0	445.5
25	2500	2500	46.0	91.0	138.0	186.0	233.0	281.0	328.0	373.0
30	3000	3000	37.0	73.5	110.0	148.5	187.0	225.0	263.0	301.0

Table 8.6 Battery Run Times in Minutes, GXT5LI-10KMVRT4UXLN (continued)

Load			Number of External Battery Cabinets							
			2 EBCs 1 set	4 EBCs 2 sets	6 EBCs 3 sets	8 EBCs 4 sets	10 EBCs 5 sets	12 EBCs 6 sets	14 EBCs 7 sets	16 EBCs 8 sets
40	4000	4000	26.5	56.0	82.5	110.5	139.5	168.5	197.5	226.0
50	5000	5000	20.5	45.5	67.0	88.0	111.0	134.0	157.5	181.0
60	6000	6000	17.0	37.5	56.5	74.5	92.0	111.0	130.5	150.0
70	7000	7000	14.5	31.5	49.0	64.5	79.5	95.0	111.5	128.5
75	7500	7500	13.0	29.0	45.0	60.0	75.0	89.0	104.0	120.0
80	8000	8000	12.0	27.0	42.5	57.0	70.5	83.5	97.0	112.0
90	9000	9000	11.0	23.5	38.0	51.0	63.0	75.0	86.5	99.0
100	10000	10000	9.5	21.0	33.5	46.0	57.0	68.0	78.5	89.0

NOTE: EBCs must be connected in pairs for GXT5LI-8000MVRT4UXLN and GXT5LI-10KMVRT4UXLN models.

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. Visit <https://www.vertiv.com/en-us/support/> for additional assistance. Alternatively, please call or email us:

In Europe, Middle East, and Africa (EMEA)

Multi-language technical support and warranty

Email: warranty.channel.emea@vertiv.com

Phone: Toll free 0080011554499

Asia-Pacific (APAC)

Technical support and warranty

Email: DPG.Warranty@vertiv.com

Phone: Australia: 1300-367-686 option 1

Phillipines: 620-3655 option 2

Singapore: 1800-467-2326 option 2

Malaysia: 1800-221-388

United States/Canada

UPS technical support

Email: liebert.upstech@vertiv.com

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

Software and monitoring technical support

Email: liebert.monitoring@vertiv.com

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

Warranty support

Email: microups.warranty@vertiv.com

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

Latin America

Technical support and warranty

Peru:

Email: CallCenter.Peru@vertiv.com

Phone: 0800 - 77737

Chile:

Email: CallCenter.Chile@vertiv.com

Phone: 800 - 395429

Argentina:

Email: CallCenter.Argentina@vertiv.com

Phone: 0800 - 1220869

Columbia:

Email: CallCenter.Colombia@vertiv.com

Phone: 018000 - 125527

Mexico:

Email: CallCenter.Mexico@vertiv.com

Phone: 01800 - 2530414

Central America and Caribbean countries:

Email: CallCenter.CA@vertiv.com

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