



Liebert[®] GXT5 UPS

Installer/User Guide

230 V Input, 230 V Output (I)

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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.

Comply with all warnings and operating instructions in this manual strictly. Save this manual and carefully read the following instructions before installing the unit. Do not operate this unit before reading all safety information and operating instructions carefully.

Transportation

Only transport the UPS system in the original packaging to protect against shock and impact.

Preparation

- Condensation may occur if the UPS system is moved directly from a cold to a warm environment. The UPS system must be absolutely dry before being installed. Please allow at least two hours for the UPS system to acclimate the environment.
- Do not install the UPS system near water or in moist environments.
- Do not install the UPS system where it would be exposed to direct sunlight or near a heater.
- Do not block ventilation holes in the UPS housing.

Installation

- Do not connect appliances or devices which would overload the UPS system (e.g. laser printers) to the UPS output sockets.
- Place cables in such a way that no one can step on or trip over them.
- Do not connect domestic appliances such as hair dryers to UPS output sockets.
- Connect the UPS system only to an earthed shockproof outlet which must be easily accessible and close to the UPS system.
- Please use only VDE-tested, CE-marked mains cable (e.g. the mains cable of your computer) to connect the UPS system to the building wiring shockproof outlet.
- Please use only VDE-tested, CE-marked power cables to connect the loads to the UPS system.
- When installing the equipment, ensure that the sum of the leakage current of the UPS and the connected devices does not exceed 3.5 mA.

Operation

- Do not disconnect the mains cable on the UPS system or the building wiring shockproof outlet during operations since this would cancel the protective earthing of the UPS system and of all connected loads.
- The UPS system features its own, internal power source (batteries). The UPS output sockets or output terminal blocks may be electrically live even if the UPS system is not connected to the building wiring outlet.
- In order to fully disconnect the UPS system, first press the OFF/Enter button to disconnect the mains.
- Prevent fluids and foreign objects from entering the inside of the UPS system.

Maintenance, Service, and Faults

- The UPS system operates with hazardous voltages. Repairs may be carried out only by qualified maintenance personnel.



WARNING! Risk of electric shock. Even after the unit is disconnected from the mains (building wiring outlet), components inside the UPS system are still connected to the battery and electrically live and dangerous.

- Before carrying out any kind of service and/or maintenance, disconnect the batteries and verify that no current is present and no hazardous voltage exists in the terminals of high energy capacitors such as Bus capacitors.
- Only persons that are adequately familiar with batteries and with the required precautionary measures may replace batteries and supervise operations. Unauthorized persons must be kept well away from the batteries.



WARNING! Risk of electric shock. The battery circuit is not isolated from the input voltage. Hazardous voltages may occur between the battery terminals and the ground. Before touching, please verify that no voltage is present!

- Batteries may cause electric shock and have a high short-circuit current. Please take the precautionary measures specified below and any other measures necessary when working with batteries:
 - Remove wristwatches, rings, and other metal objects.
 - Use only tools with insulated grips and handles.
- When changing batteries, install the same number and same type of batteries.
- Do not attempt to dispose of batteries by burning them. This could cause battery explosion.
- Recycle or dispose of batteries properly according to local regulations.
- Do not open or destroy batteries. Escaping electrolyte can cause injury to the skin and eyes. It may be toxic.
- Please replace fuses only with the same type and amperage in order to avoid fire hazards.
- Do not dismantle the UPS system.

Output Short Circuit Current

Table 1.1 Output Short Circuit Current

| Model | Max Peak for AC Mode | Max RMS for AC Mode |
|-------------|----------------------|-------------------------------|
| 20KIRT9UXLN | 468.0 A | 189.2 A (Duration: 155.3 ms) |
| 1000IRT2UXL | 13.21 A | 9.375 A (Duration: 153.00 ms) |
| 2000IRT2UXL | 27.54 A | 20.48 A (Duration: 172.48 ms) |
| 3000IRT2UXL | 39.92 A | 28.6 A (Duration: 134.0 ms) |

2 Product Description

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

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

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

2.1 UPS Features and Available Models

The Liebert® GXT5 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.
- Optional tower or rack installation to meet varying installation requirements.
- Parallel-connection capability for 10 kVA, 16 kVA, and 20 kVA models achieves up to 2 + 1 parallel redundant power.
- 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.
- Programmable terminals on 10 kVA and lower models protect key devices when load is heavy.
- Operation and display panel with model-specific color LCD offers simple configuration and control of the UPS.
- ECO power supply mode and smart-sleep mode help you save the maximum amount of energy.

Table 2.1 UPS Models and Power Ratings

| Model Number | Nominal Power Rating at 230 V Input |
|-------------------|-------------------------------------|
| GXT5-750IRT2UXL | 750 VA/750 W |
| GXT5-750IRT2UXLE | |
| GXT5-1000IRT2UXL | 1000 VA/1000 W |
| GXT5-1000IRT2UXLE | |
| GXT5-1000IRT2UXLA | |
| GXT5-1500IRT2UXL | 1500 VA/1500 W |
| GXT5-1500IRT2UXLE | |
| GXT5-1500IRT2UXLA | |
| GXT5-2000IRT2UXL | 2000 VA/2000 W |
| GXT5-2000IRT2UXLE | |
| GXT5-2000IRT2UXLA | |

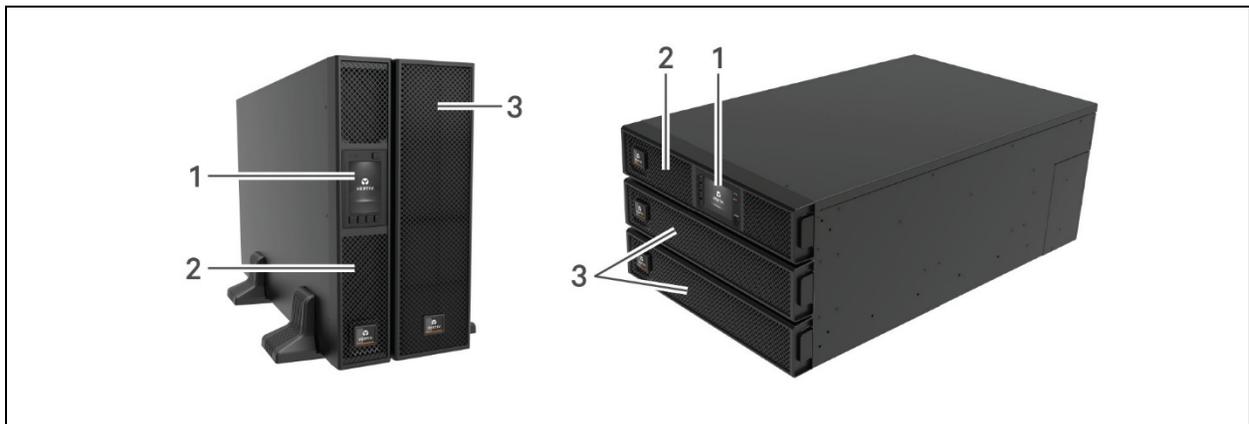
Table 2.1 UPS Models and Power Ratings (continued)

| Model Number | Nominal Power Rating at 230 V Input |
|-------------------|-------------------------------------|
| GXT5-3000IRT2UXL | 3000 VA/3000 W |
| GXT5-3000IRT2UXLE | |
| GXT5-3000IRT2UXLA | |
| GXT5-5000IRT5UXLN | 5 kVA/5 kW |
| GXT5-5000IRT5UXLE | |
| GXT5-6000IRT5UXLN | 6 kVA/6 kW |
| GXT5-6000IRT5UXLE | |
| GXT5-8000IRT5UXLN | 8 kVA/8 kW |
| GXT5-8000IRT5UXLE | |
| GXT5-10KIRT5UXLN | 10 kVA/10 kW |
| GXT5-10KIRT5UXLE | |
| GXT5-16KIRT9UXLN | 16 kVA/16 kW |
| GXT5-16KIRT9UXLE | |
| GXT5-20KIRT9UXLN | 20 kVA/20 kW |
| GXT5-20KIRT9UXLE | |

2.2 Front Panels

The various Vertiv™ Liebert® GXT5 models have the same general appearance, with the main difference being the receptacle types on the rear panel. **Figure 2.1** below, shows the 5 kVA to 10 kVA model in a tower and a rack configuration. When mounted in a rack, all units are turned 90 degrees. Do not rotate display and handling instructions.

Figure 2.1 Front View

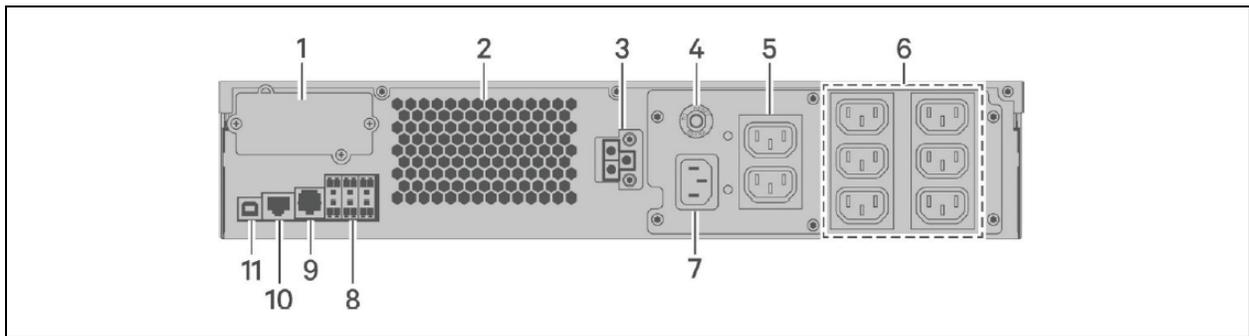


| Item | Description |
|------|---------------------------------|
| 1 | Operation/Display panel |
| 2 | Upper bezel |
| 3 | Lower bezel/battery access door |

2.3 Rear Panels

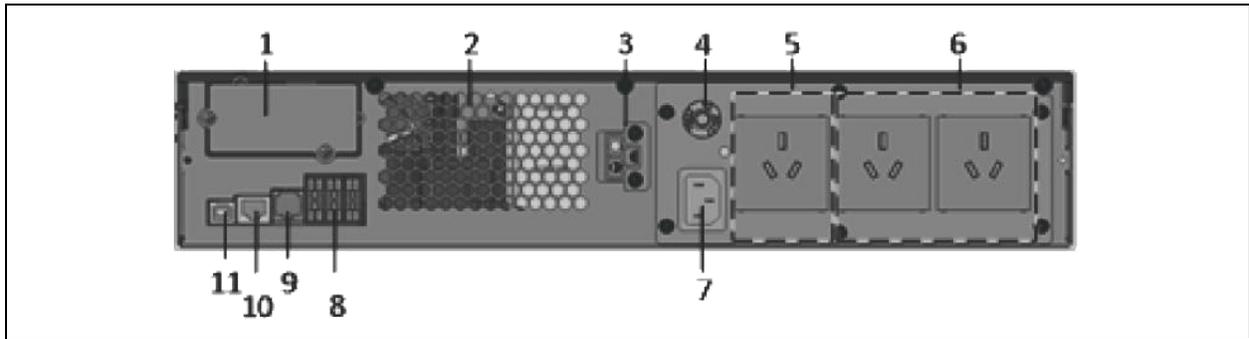
The following figures detail the rear panel features for each Vertiv™ Liebert® GXT5 model.

Figure 2.2 GXT5-750/1000IRT2UXL (XLE) Rear Panel



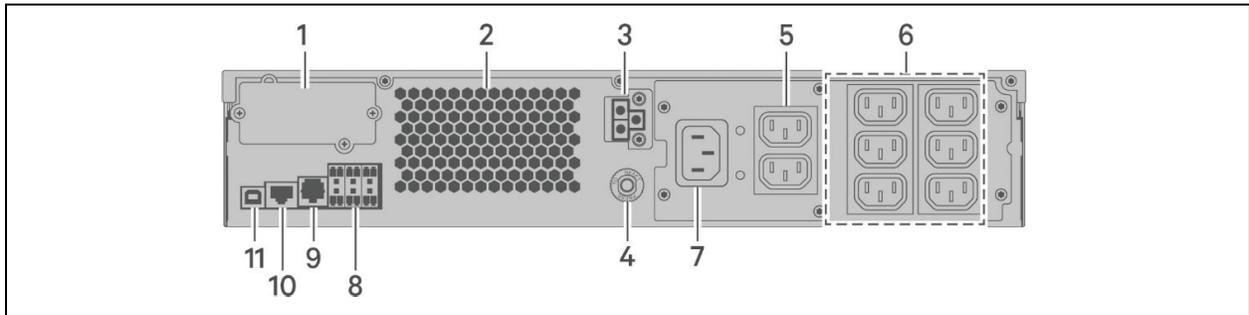
| Item | Description |
|------|--|
| 1 | Vertiv™ Liebert® IntelliSlot™ port |
| 2 | Ventilation hole |
| 3 | External battery Cabinets (EBC) connector |
| 4 | Input circuit breaker reset button, 10 A |
| 5 | Non-programmable C13 output receptacles |
| 6 | Programmable C13 output receptacles |
| 7 | C14 input-power plug and cable |
| 8 | Terminal-block communication connectors |
| 9 | RS-232 port - RJ-45/RJ-11 connection used for command line interface |
| 10 | RS-485 port - RJ-45 connection used for external temperature sensors |
| 11 | USB port |

Figure 2.3 GXT5-1000IRT2UXLA Rear Panel



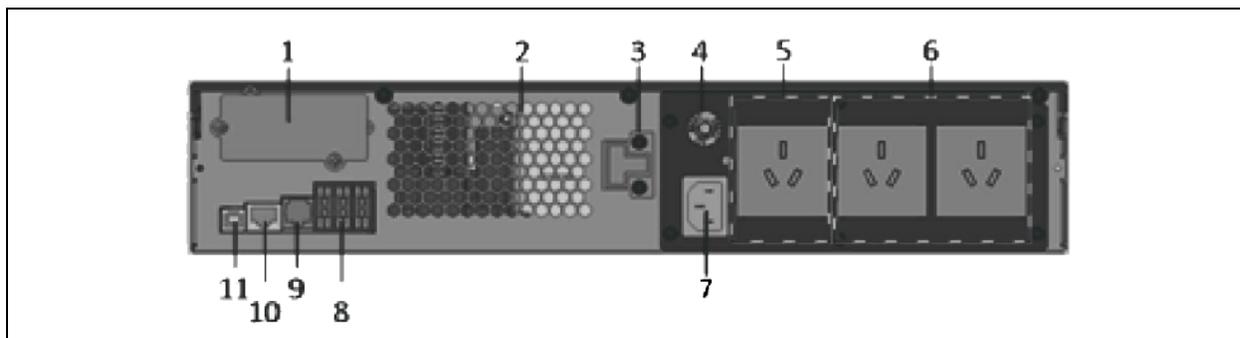
| Item | Description |
|------|--|
| 1 | Vertiv™ Liebert® IntelliSlot™ port |
| 2 | Ventilation Hole |
| 3 | EBC connector |
| 4 | Input circuit breaker |
| 5 | Non-programmable output receptacles |
| 6 | Programmable output receptacles |
| 7 | Input-power plug and cable |
| 8 | Dry contacts, Battery Detection (3), REPO input (REPO) |
| 9 | RS-232 port – Used for CLI |
| 10 | RS-485 port – Used for external temperature sensors |
| 11 | USB port |

Figure 2.4 GXT5-1500IRT2UXL (XLE) Rear Panel



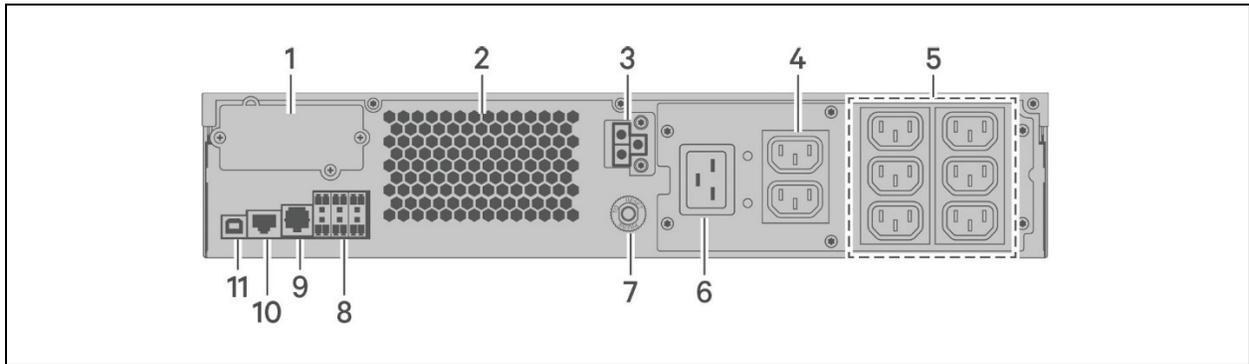
| Item | Description |
|------|--|
| 1 | Vertiv™ Liebert® IntelliSlot™ port |
| 2 | Ventilation Hole |
| 3 | EBC connector |
| 4 | Input circuit breaker reset button, 10 A |
| 5 | Non-programmable C13 output receptacles |
| 6 | Programmable C13 output receptacles |
| 7 | C14 input-power plug and cable |
| 8 | Terminal- block/Dry contact communication connectors |
| 9 | RS-232 port - RJ-45/RJ-11 connection used for command line interface |
| 10 | RS-485 port - RJ-45 connection used for external temperature sensors |
| 11 | USB port |

Figure 2.5 GXT5-1500IRT2UXLA Rear Panel



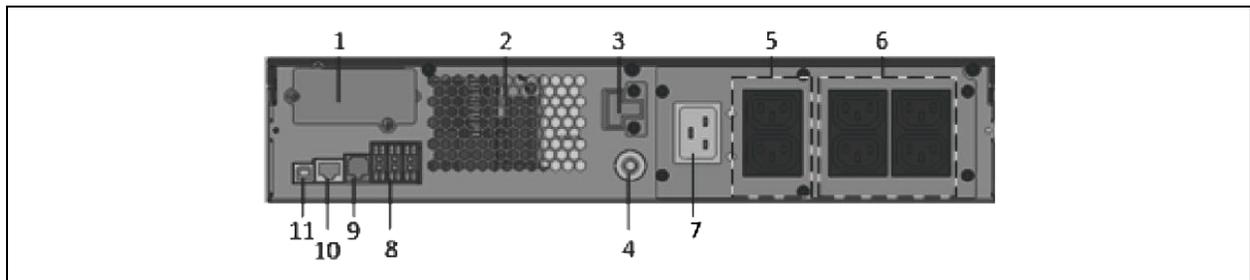
| Item | Description |
|------|--|
| 1 | Vertiv™ Liebert® IntelliSlot™ port |
| 2 | Ventilation Hole |
| 3 | EBC connector |
| 4 | Input circuit breaker |
| 5 | Non-programmable output receptacles |
| 6 | Programmable output receptacles |
| 7 | Input-power plug and cable |
| 8 | Dry contacts, Battery Detection (3), REPO input (REPO) |
| 9 | RS-232 port – Used for CLI |
| 10 | RS-485 port – Used for external temperature sensors |
| 11 | USB port |

Figure 2.6 GXT5-2000IRT2UXL (XLE) Rear Panel



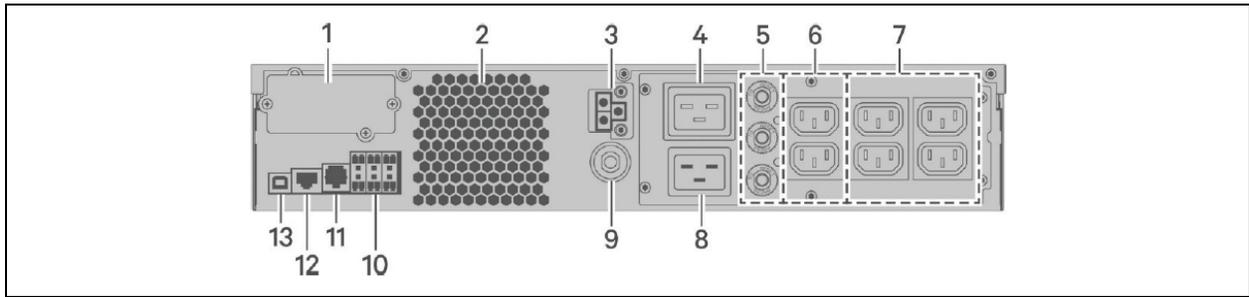
| Item | Description |
|------|--|
| 1 | Vertiv™ Liebert® IntelliSlot™ port |
| 2 | Ventilation Hole |
| 3 | EBC connector |
| 4 | Non-programmable C13 output receptacles |
| 5 | Programmable C13 output receptacles |
| 6 | C20 input-power plug and cable |
| 7 | Input circuit-breaker reset button, 16 A |
| 8 | Terminal-block/Dry contact communication connectors |
| 9 | RS-232 port - RJ-45/RJ-11 connection used for command line interface |
| 10 | RS-485 port - RJ-45 connection used for external temperature sensors |
| 11 | USB port |

Figure 2.7 GXT5-2000IRT2UXLA Rear Panel



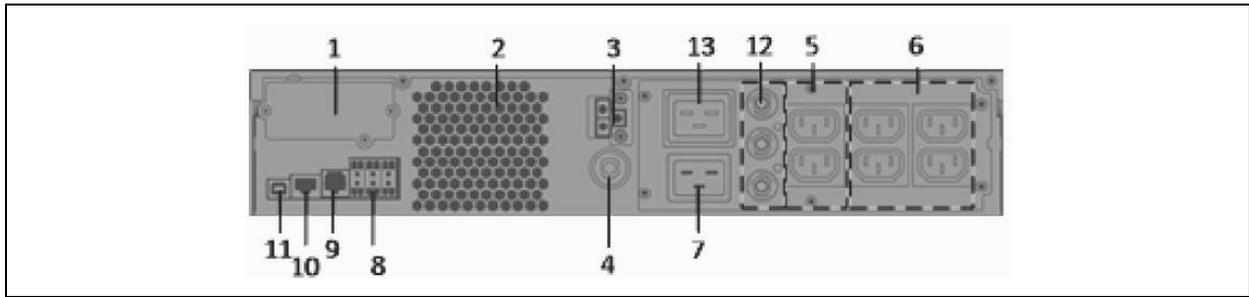
| Item | Description |
|------|--|
| 1 | Vertiv™ Liebert® IntelliSlot™ port |
| 2 | Ventilation Hole |
| 3 | EBC connector |
| 4 | Input circuit breaker |
| 5 | Non-programmable output receptacles |
| 6 | Programmable output receptacles |
| 7 | Input-power plug and cable |
| 8 | Dry contacts, Battery Detection (3), REPO input (REPO) |
| 9 | RS-232 port – Used for CLI |
| 10 | RS-485 port – Used for external temperature sensors |
| 11 | USB port |

Figure 2.8 GXT5-3000IRT2UXL (XLE) Rear Panel



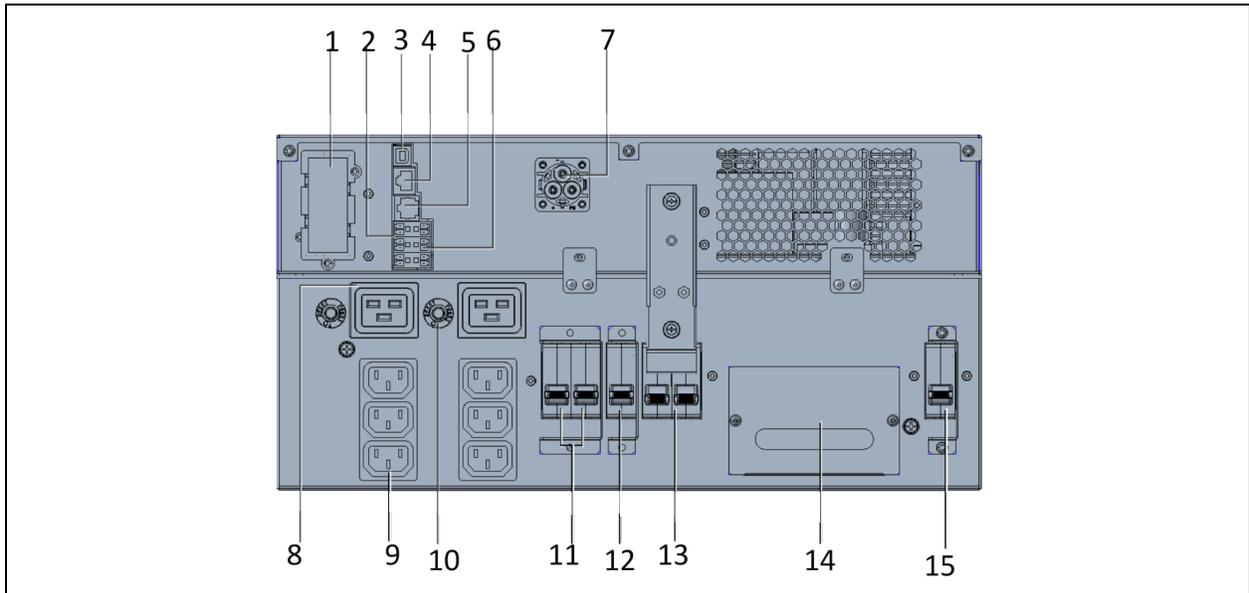
| Item | Description |
|------|--|
| 1 | Vertiv™ Liebert® IntelliSlot™ port |
| 2 | Ventilation Hole |
| 3 | EBC connector |
| 4 | Non-programmable C19 output receptacle |
| 5 | Output circuit-breaker reset buttons, 10 A |
| 6 | Non-programmable C13 output receptacles |
| 7 | Programmable C13 output receptacles |
| 8 | C20 Input-power plug and cable |
| 9 | Input circuit-breaker reset button, 20 A |
| 10 | Terminal-block/Dry contact communication connectors |
| 11 | RS-232 port - RJ-45/RJ-11 connection used for command line interface |
| 12 | RS-485 port - RJ-45 connection used for external temperature sensors |
| 13 | USB port |

Figure 2.9 GXT5-3000IRT2UXLA Rear Panel



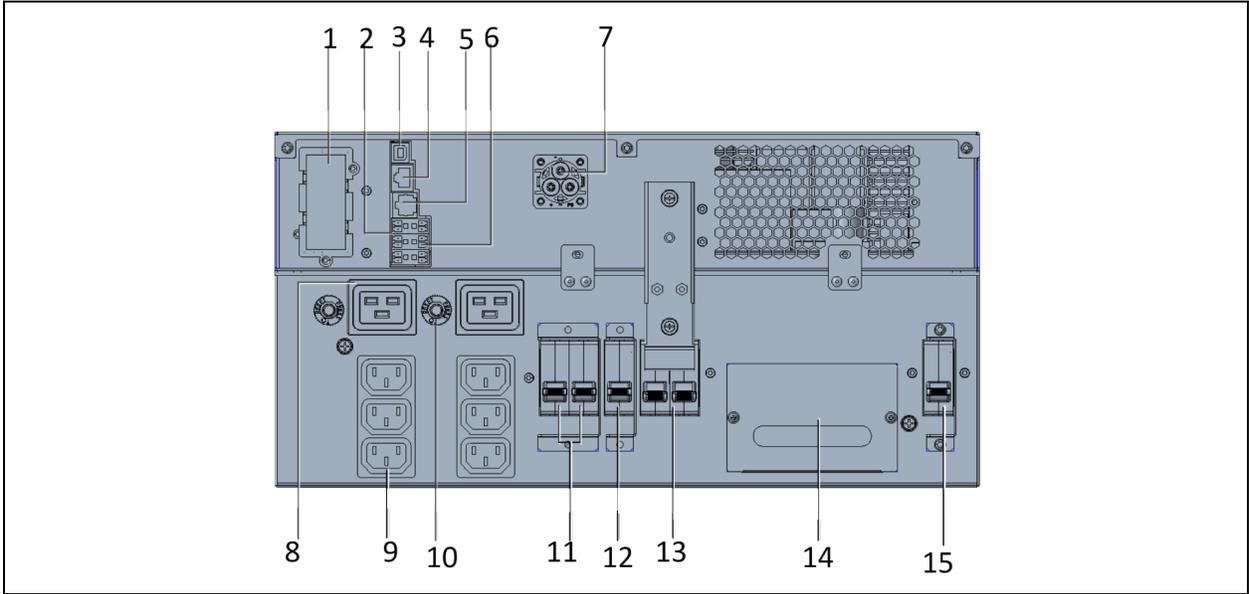
| Item | Description |
|------|--|
| 1 | Vertiv™ Liebert® IntelliSlot™ port |
| 2 | Ventilation Hole |
| 3 | EBC connector |
| 4 | Input circuit breaker |
| 5 | Non-programmable output receptacles |
| 6 | Programmable output receptacles |
| 7 | Input-power plug and cable |
| 8 | Dry contacts, Battery Detection (3), REPO input (REPO) |
| 9 | RS-232 port – Used for CLI |
| 10 | RS-485 port – Used for external temperature sensors |
| 11 | USB port |
| 12 | Output circuit breakers |
| 13 | Output-power plug and cable |

Figure 2.10 GXT5-5000/6000IRT5UXLN (XLE) Rear Panel



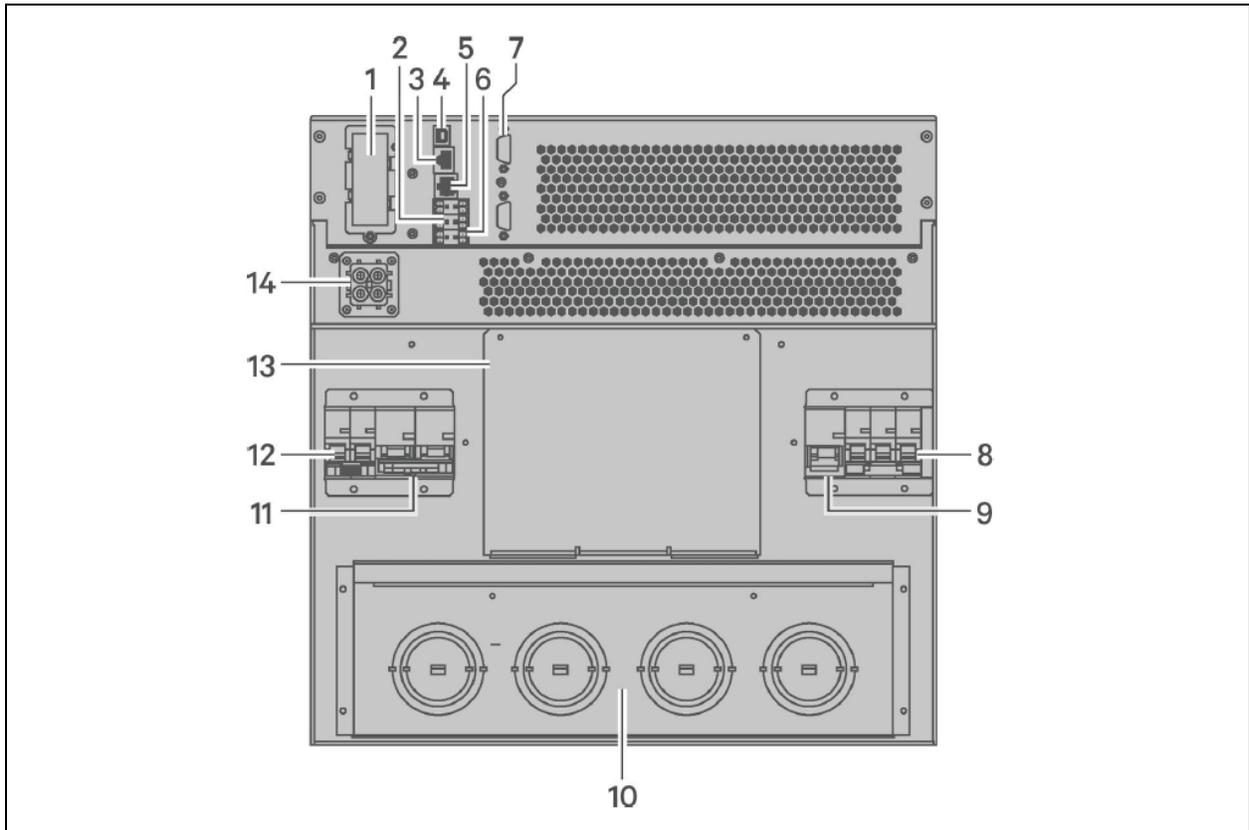
| Item | Description |
|------|---|
| 1 | Vertiv™ Liebert® IntelliSlot™ port |
| 2 | Terminal-block communication connectors |
| 3 | USB port |
| 4 | RS-485 port - RJ-45 connection used for external temperature sensors |
| 5 | RS-232 port - RJ-45/RJ-11 connection used for command line interface |
| 6 | REPO connector |
| 7 | EBC connector |
| 8 | C19 output receptacles (x2) |
| 9 | Programmable C13 output receptacles (x2) |
| 10 | C19 output overload protector (x2) |
| 11 | Programmable output circuit breaker, 10 A (x2) |
| 12 | Output circuit breaker - Controls terminal block output and non-programmable output receptacles |
| 13 | Maintenance bypass breaker (MBB) |
| 14 | Removable junction box with cable entry for hard-wire I/O |
| 15 | Input circuit breaker |

Figure 2.11 GXT5-8000/10KIRT5UXLN (XLE) Rear Panel



| Item | Description |
|------|---|
| 1 | Vertiv™ Liebert® IntelliSlot™ port |
| 2 | Terminal-block communication connectors |
| 3 | USB port |
| 4 | RS-485 port - RJ-45 connection used for external temperature sensors |
| 5 | RS-232 port - RJ-45/RJ-11 connection used for command line interface |
| 6 | REPO connector |
| 7 | DB9 ports - Used for communication when operating in a parallel system, see Installing a Parallel System on page 46 |
| 8 | EBC connector |
| 9 | C19 output receptacles (x3) |
| 10 | Overload protector, 15 A (x3) |
| 11 | Programmable C19 output receptacle |
| 12 | Programmable C13 output receptacles |
| 13 | Programmable output breakers |
| 14 | Output circuit breaker - Controls terminal block output and non-programmable output receptacles |
| 15 | MBB |
| 16 | Removable junction box with cable entry for hard-wire I/O |
| 17 | Input circuit breaker |

Figure 2.12 GXT5-16K/20KIRT9UXLN (XLE) Rear Panel

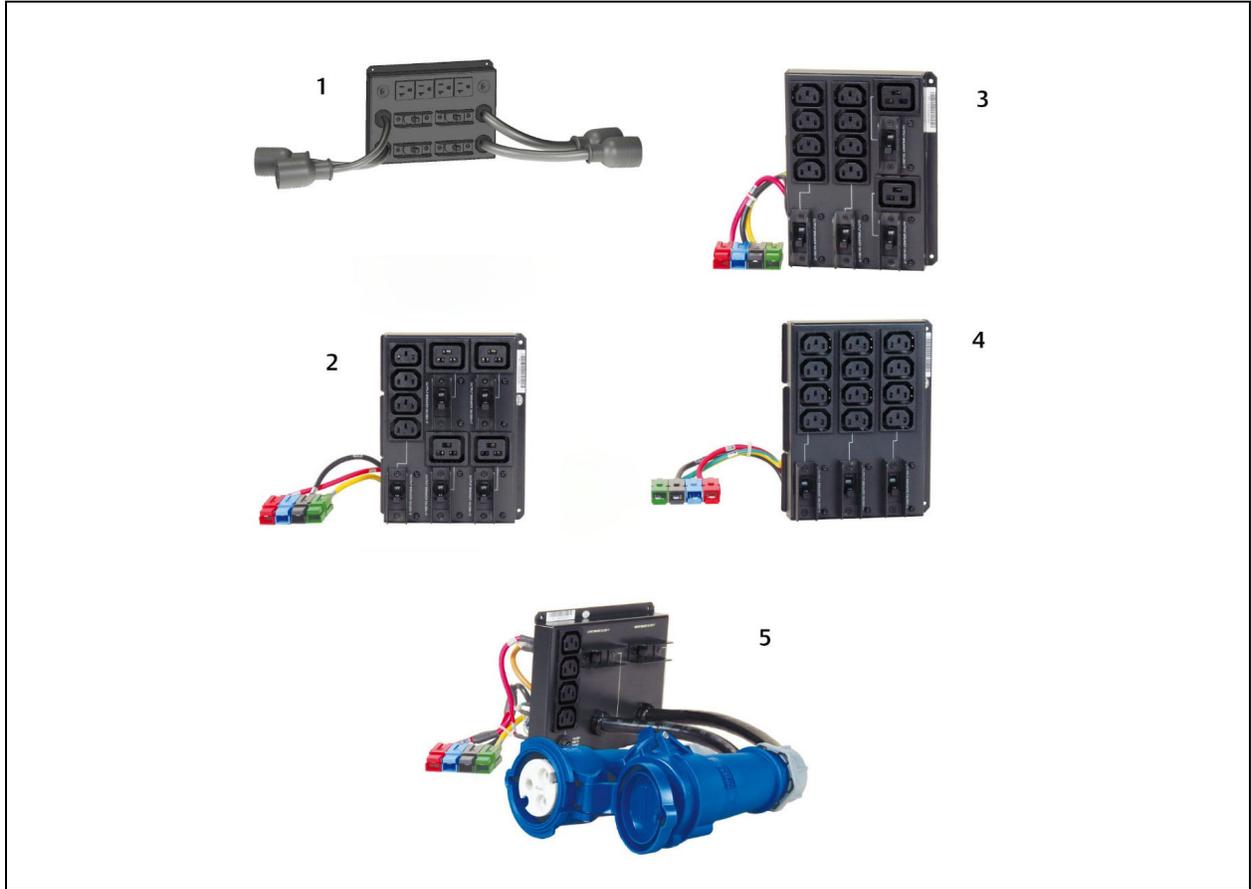


| Item | Description |
|------|---|
| 1 | Vertiv™ Liebert® IntelliSlot™ port |
| 2 | Terminal-block communication connectors |
| 3 | RS-485 port - RJ-45 connection used for external temperature sensors |
| 4 | USB port |
| 5 | RS-232 port - RJ-45/RJ-11 connection used for command line interface |
| 6 | REPO connector |
| 7 | DB9 ports - Used for communication when operating in a parallel system, see Installing a Parallel System on page 46 |
| 8 | Input circuit breaker |
| 9 | Bypass circuit breaker |
| 10 | Knock-out /cable-entry for hard-wire I/O |
| 11 | Output circuit breaker |
| 12 | POD breaker |
| 13 | Cover for optional POD - installation location |
| 14 | EBC connector |

2.4 Removable Power Distribution Box

The 16 kVA and 20 kVA do not ship with an installed power distribution box (POD). The optional PODs for the 16 kVA and 20 kVA models are shown below.

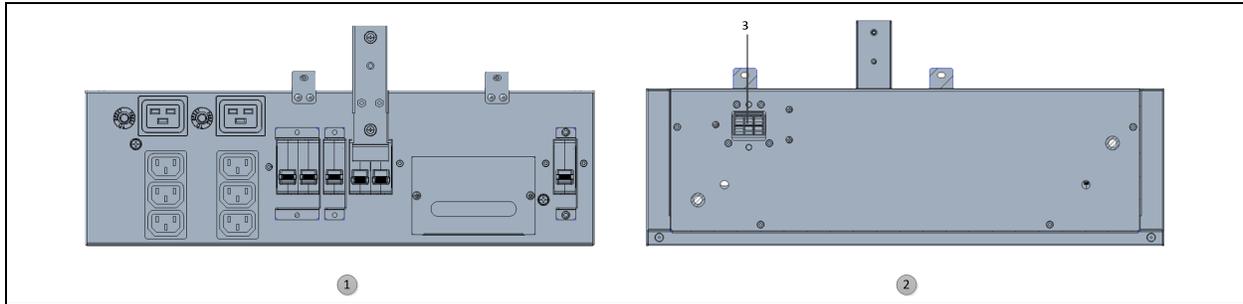
Figure 2.13 Additional POD Options (16/20k I POD information)



| Item | Part Number | Output Connections |
|------|-------------|-------------------------------|
| 1 | PD2-107 | 4x L5-20R, 4x 5-15/20R T slot |
| 2 | PD2-200 | 4x IEC320-C19, 4x IEC320-C13 |
| 3 | PD2-201 | 2x IEC320-C19, 8x IEC320-C13 |
| 4 | PD2-202 | 12x IEC320-C13 |
| 5 | PD2-204 | 2x IEC309-32A, 4x IEC320-C13 |

The 5 kVA to 10 kVA models ship with the POD installed. This POD includes the input circuit breaker for the UPS, and the features for each POD are detailed in the following figures.

Figure 2.14 PD5-CE6HDWRMBS for GXT5-5000/6000IRT5UXLN (XLE)



| Item | Description |
|------|----------------------------------|
| 1 | POD Panel view (on rear of unit) |
| 2 | POD inner-surface view |
| 3 | Quick connect |

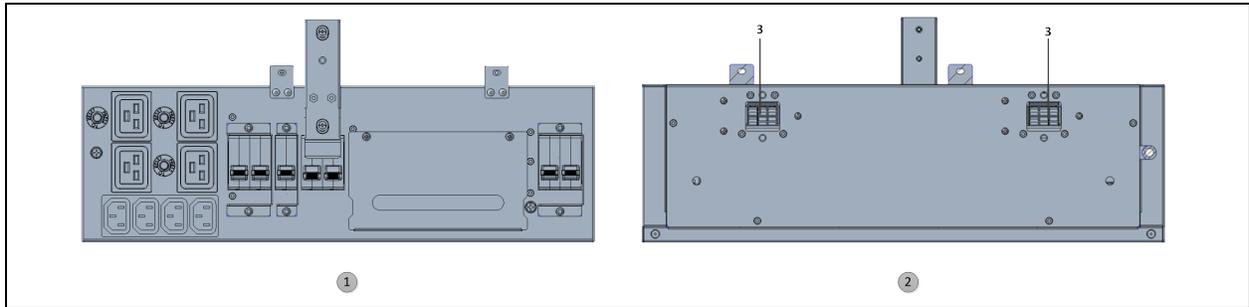
Table 2.2 POD Specifications for 8 kVA to 10 kVA Models

| Model PD2- | 101 | 102 | 103 | 104 | 105 | 106 | 107 | 108 | 109 |
|------------------------------------|---|---------------------------|---------------------------|---|---|---------------------------|-------------------------------|----------------------------|---------------|
| Dimensions, D×W×H, in. (mm) | | | | | | | | | |
| Unit | 7.4 × 5.7 (188 × 145) | | | | | | | | |
| Shipping | 11.9 × 20.6 × 8.7 (302 × 522 × 220) | | | | | | | | |
| Weight, lb. (kg) | | | | | | | | | |
| Unit | 4.4 (2) | 6.6 (3) | | | 4.4 (2) | 6.6 (3) | | | |
| Shipping | 6.6 (3) | 8.8 (4) | | | 6.6 (3) | 8.8 (4) | | | |
| Electrical Specifications | | | | | | | | | |
| Amp Rating | 2-pole 60 A input breaker | | | | | | | | |
| Input Power Connection | Custom connector 3W + G (L-L-N-G) to UPS | | | | | | | | |
| Output Power Connection | "(2) L6-30R (8) 5-20R" | "(4) L6-20R (4) 5-20R" | "(4) 5-20R (4) L6-30R" | "(4) 5-20R (2) L6-30R (2) L6-20R" | "(4) 5-20R (2) L6-30R (2) L6-20R" | "(4) L6-20R (4) 5-20R" | "(4) L5-20R (4) 5-15 /20R" | "(2) L6-20R (2) L6-30R" | "(2) L14-30R" |

Table 2.3 Additional POD Specifications for 8 kVA to 10 kVA Models

| Model PD2- | 200 | 201 | 202 | 204 |
|------------------------------------|---|------------------------------------|-----------------|------------------------------------|
| Dimensions, D×W×H, in. (mm) | | | | |
| Unit | 7.4 × 5.7 (188 × 145) | | | |
| Shipping | 11.9 × 20.6 × 8.7 (302 × 522 × 220) | | | |
| Weight, lb. (kg) | | | | |
| Unit | 6.6 (3) | 4.4 (2) | | 6.6 (3) |
| Shipping | 15 (6.8) | 6.6 (3) | | 15 (6.8) |
| Electrical Specifications | | | | |
| Amp Rating | 2-pole 60 A input breaker | | | |
| Input Power Connection | Custom connector 3W + G (L-L-N-G) to UPS | | | |
| Output Power Connection | "(4) IEC320-C19 (4) IEC320-C13" | "(2) IEC320-C19 (8) IEC320-C13" | (12) IEC320-C13 | "(2) IEC309-32A (4) IEC320-C13" |

Figure 2.15 PD5-CE10HDWRMBS for GXT5-8000/10KIRT5UXLN (XLE)

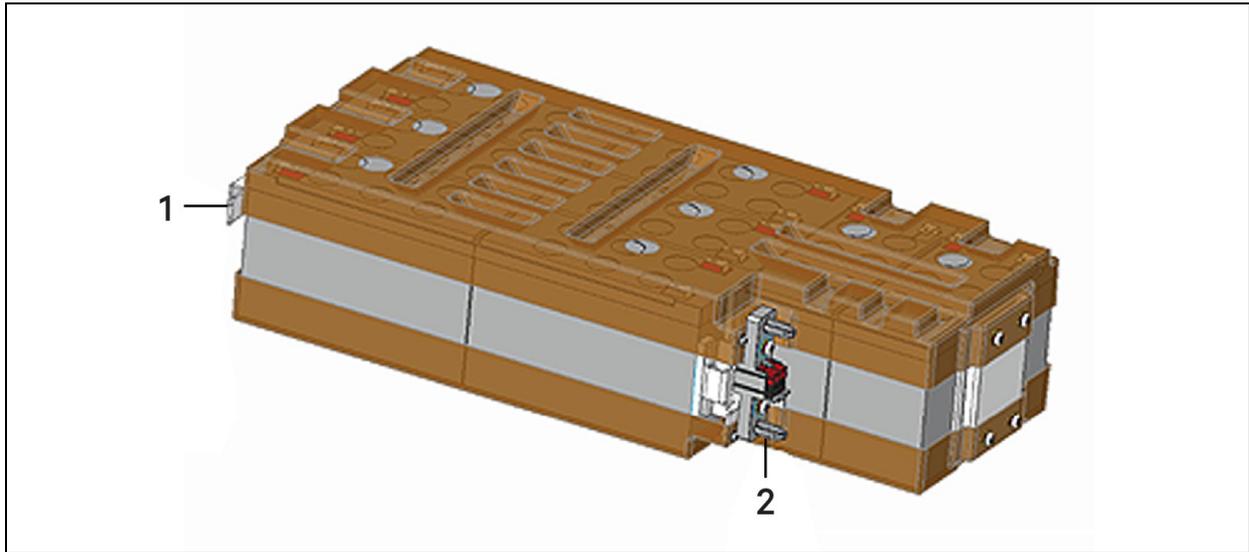


| Item | Description |
|------|----------------------------------|
| 1 | POD Panel view (on rear of unit) |
| 2 | POD inner surface view |
| 3 | Quick connect |

2.5 Internal Battery Packs

An example of the Vertiv™ Liebert® GXT5 internal battery packs is shown in **Figure 2.16** below. They are located behind the access door on the front of the UPS. 3 kVA and below units have 1 battery pack, 5 kVA and 10 kVA units have 2 battery packs, and 16 kVA to 20 kVA units have 4 battery packs. The battery pack size varies based on:

Figure 2.16 Internal Battery Pack



| Item | Description |
|------|-------------|
| 1 | Handle |
| 2 | Connector |

Table 2.4 Major Components (continued)

| Item | Component | Operation/Function |
|------|-----------------|---|
| 6 | 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. |
| 7 | 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 51. |
| 8 | Outlet group | Output receptacles. |

2.6.1 Maintenance Bypass

On 5 kVA to 10 kVA models, the UPS includes manual maintenance bypass in a removable section of the rear of the UPS. Maintenance bypass keeps connected equipment powered with utility power and allows replacement of the UPS in the event of a UPS malfunction.

NOTE: The bypass power path does not protect the connected equipment from disturbances in the utility power supply.

Maintenance bypass procedure

5 to 10 kVA and HV and L6-30 Replacement with or without external MBC

1. Download the parameters via ParamSet (if possible) or manually record the parameters from the Setting page
2. Follow the appropriate CoHE procedure to Partially De-energize System
3. Remove the front bezels of the UPS and lay the bezels aside for reassembly.
4. Loosen and remove the screws on the battery door.
 - a. Lay the screws and battery door aside for reassembly
 - b. Grasp the battery handle, then pull out the/each battery module
5. Remove all accessories, if applicable:
 - a. Disconnect the EBC cables
 - b. Remove the card in the Vertiv™ Liebert® IntelliSlot™ port
 - c. Remove the control wires from the rear terminal blocks
6. Disconnect the PD5 from the back of the UPS by removing the 4-6 screws connecting the two units and pulling them apart, separating the internal Andersons.
7. Remove the old UPS from the rack shelf or tower feet
8. Install the new UPS into the rack shelf or tower feet
9. Reconnect the PD5 to the back of the UPS by pushing them together, snapping in the internal Andersons and installing the 4-6 screws connecting the two units.
10. Reconnect all previously installed accessories, if applicable:
 - a. Reconnect the EBC cables
 - b. Reinstall the card in the Liebert® IntelliSlot™ port.
 - c. Reinstall the control wires into the rear terminal blocks
11. Line up and slowly push in the each new battery module until 2/3 of the length is in the bay.

Lift up and slowly push slowly until the battery pack is fully inserted in the bay

The battery is fully inserted if the battery door fits flush against the UPS.

12. Reattach the battery door with the screws, then replace the front bezels.
13. Follow the appropriate CoHE Procedure to Re-Energize (Turn on) Partially De-energized System.
14. Update the UPS parameters based on those previously installed and customer preference.

15 to 20 kVA MV Replacement without external MBC

1. Download the parameters via ParamSet (if possible) or manually record the parameters from the Setting page.
2. Notify the customer that the load will be de-energized.

Figure 2.18 GXT5-6KL630RT5UXLN

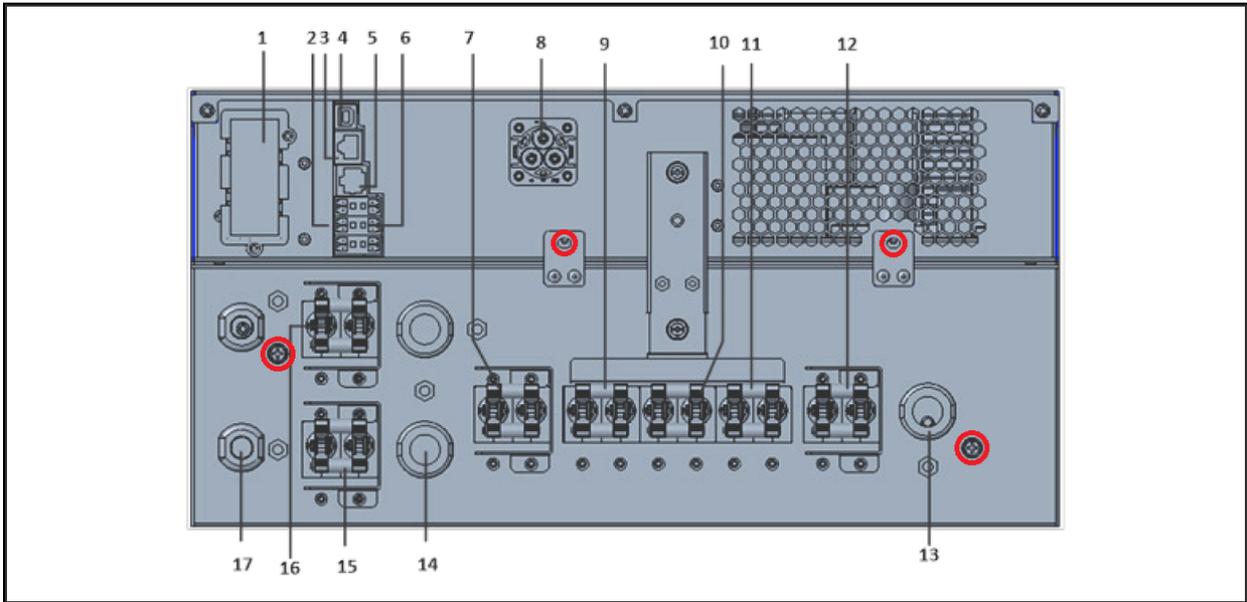


Figure 2.19 GXT5-5000HVRT5UXLN

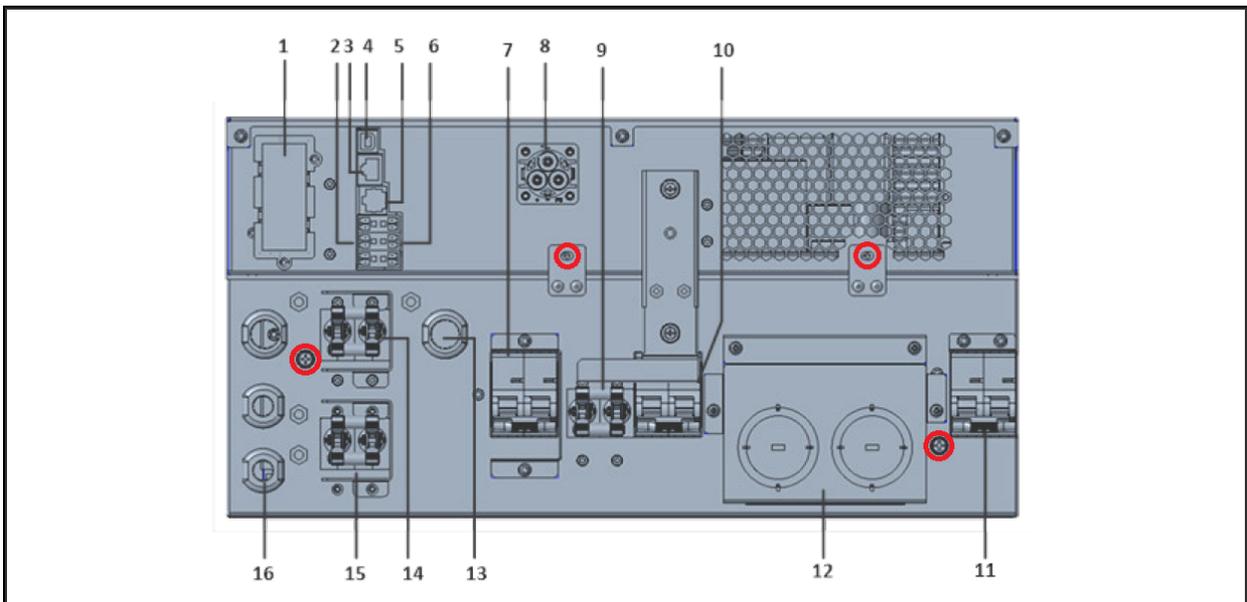


Figure 2.20 GXT5-8000/10KHVRT5UXLN

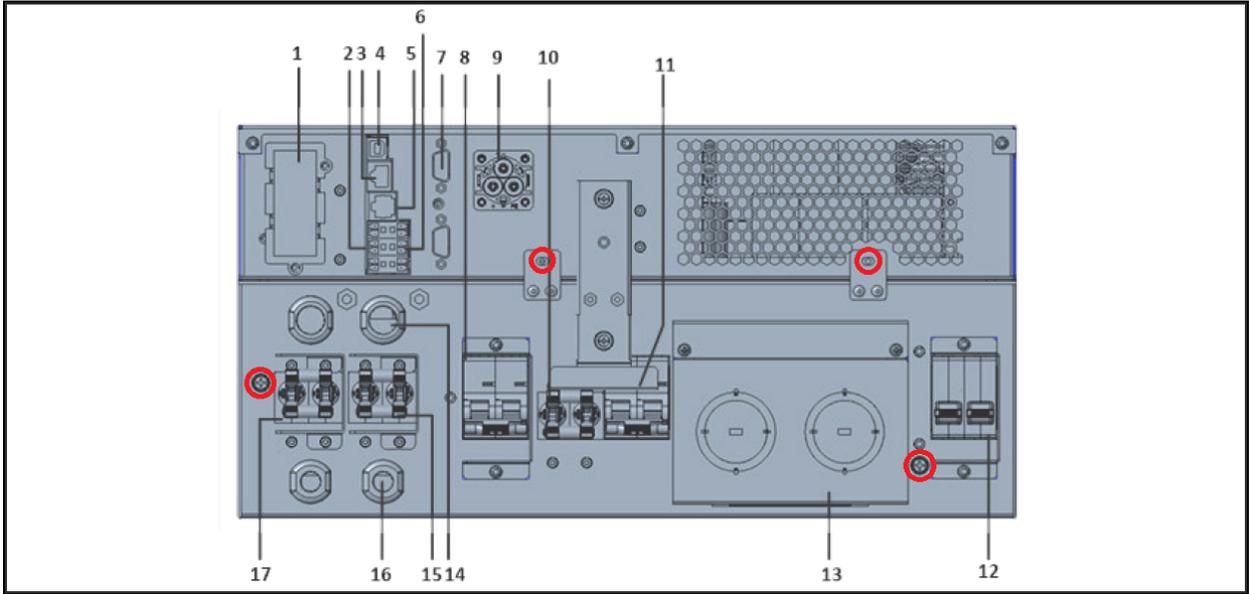


Figure 2.21 GXT5-5000/6000MVRT4UXLN

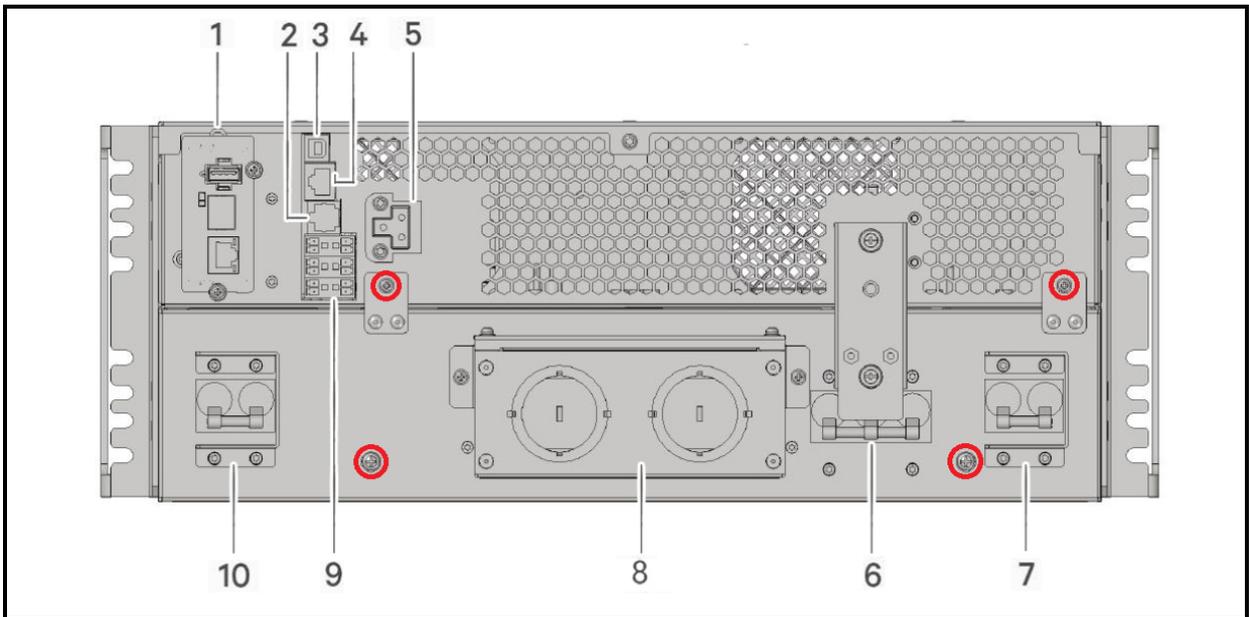


Figure 2.22 GXT5-8000/10KMVRT6UXLN

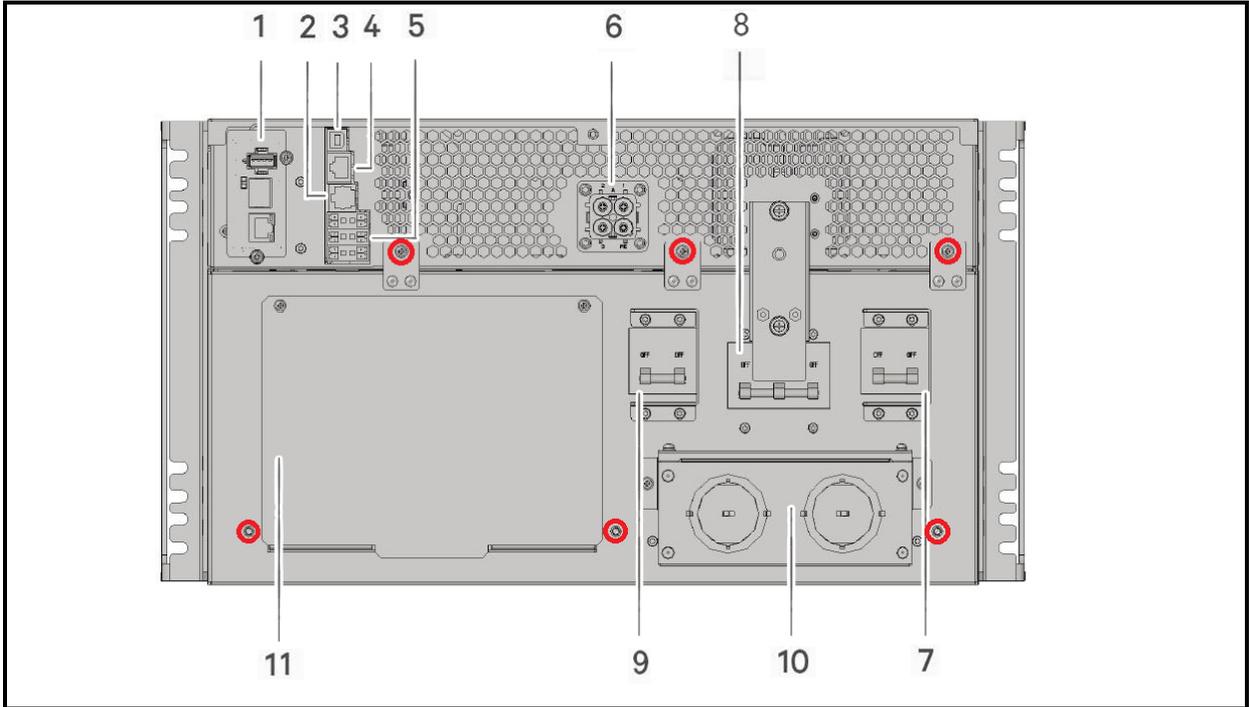


Figure 2.23 GXT5-8000/10KMVRT6UXLN UPS' PD5 front



Figure 2.24 GXT5-8000/10KMVRT6UXLN UPS' PD5 back



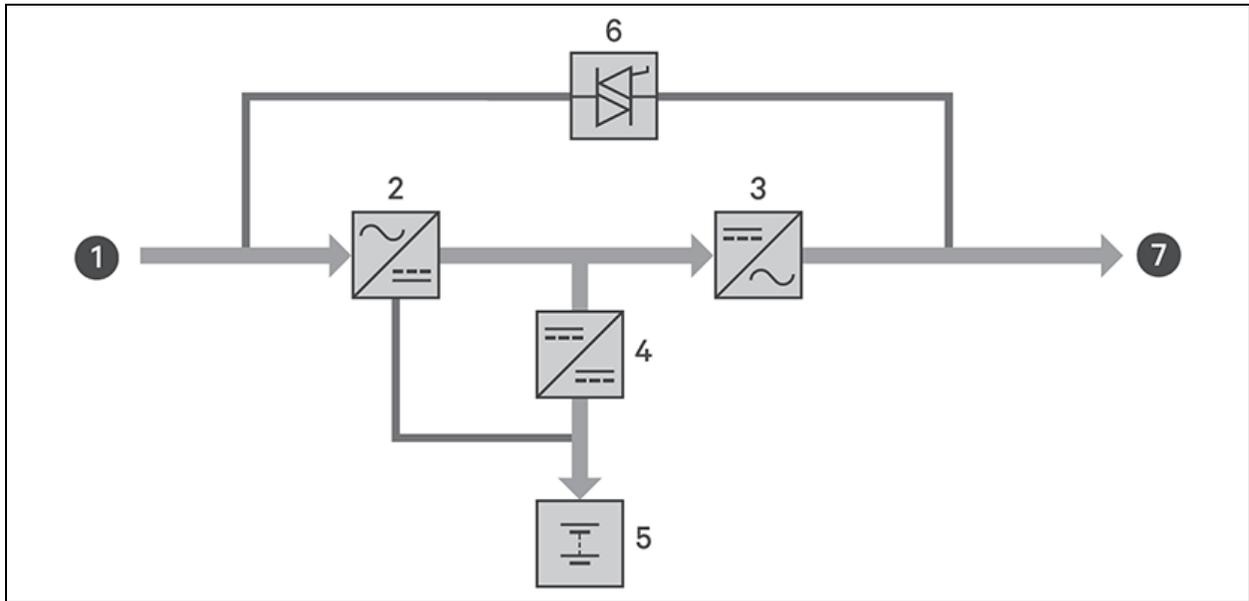
2.7 UPS States and Operating Modes

NOTE: See [LED Indicators](#) on page 56, for description of the run-indicator and alarm-indicator LEDs

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. **Figure 2.25** below shows the diagram of normal mode.

Figure 2.25 Normal Mode Operation



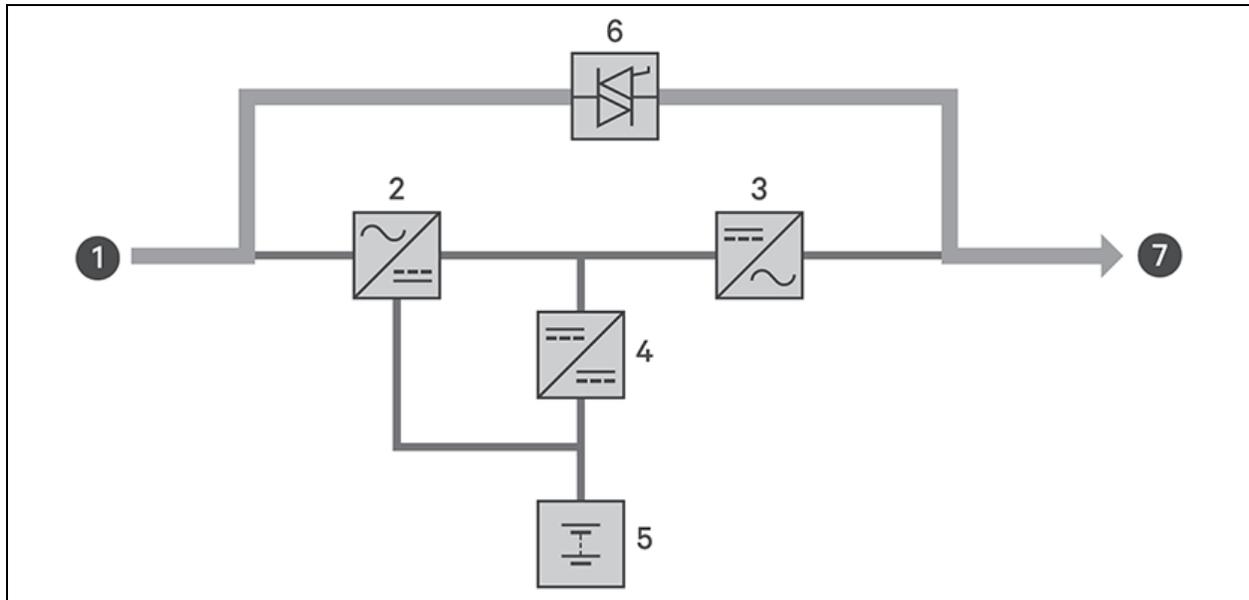
| Item | Description |
|------|------------------------------------|
| 1 | Mains/Utility input (bypass input) |
| 2 | Rectifier/PFC |
| 3 | Inverter |
| 4 | Battery charger |
| 5 | Battery |
| 6 | Bypass static switch |
| 7 | UPS output |

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 every two seconds. The LCD *Flow* screen displays *On Bypass*. **Figure 2.26** on the facing page shows the diagram of bypass mode.

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.

Figure 2.26 Bypass Mode Operation



| Item | Description |
|------|-----------------------------------|
| 1 | Main/Utility input (bypass input) |
| 2 | Rectifier/PFC |
| 3 | Inverter |
| 4 | Battery charger |
| 5 | Battery |
| 6 | Bypass static switch |
| 7 | UPS output |

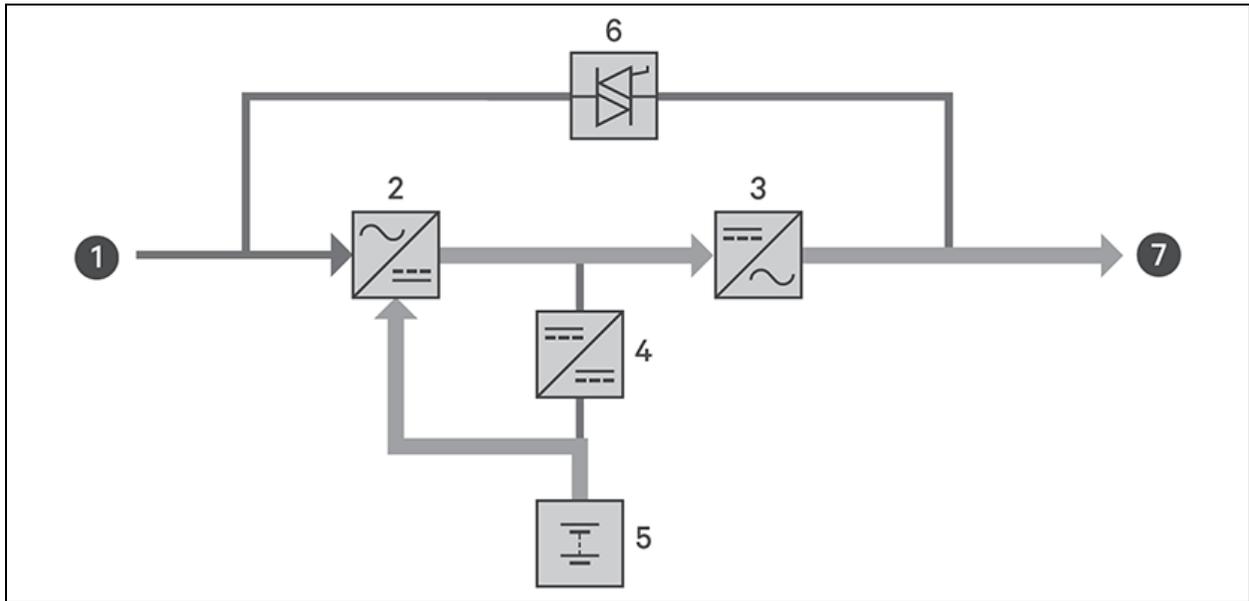
2.7.3 Battery Mode

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 *On Battery*. **Figure 2.27** on the next page shows the diagram of battery mode.

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

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

Figure 2.27 Battery Mode Operation



| Item | Description |
|------|------------------------------------|
| 1 | Mains/Utility input (bypass input) |
| 2 | Rectifier/PFC |
| 3 | Inverter |
| 4 | Battery charger |
| 5 | Battery |
| 6 | Bypass static switch |
| 7 | UPS output |

2.7.4 ECO Mode

NOTE: ECO mode is only available on a single UPS system.

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

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

2.7.5 Maintenance Bypass Mode

Integrated maintenance bypass is available on 5 kVA to 10 kVA UPS models. For smaller models, an optional Micro POD may be purchased to provide this functionality if needed.

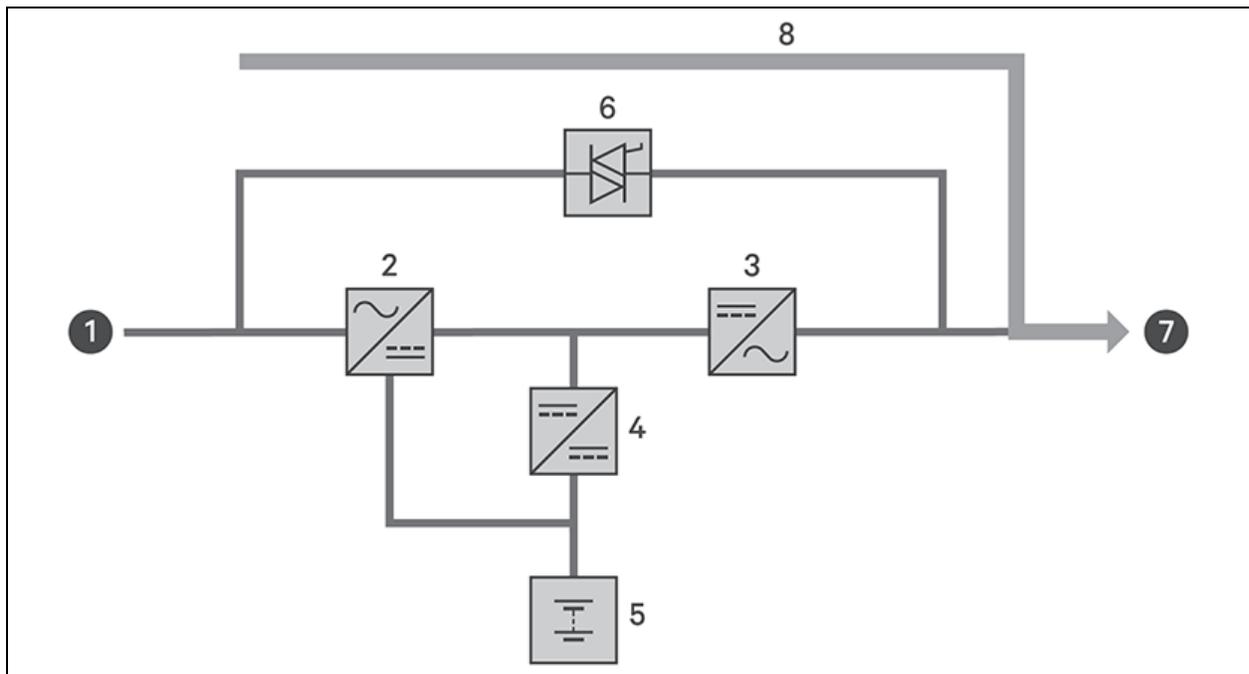
Used when the UPS requires maintenance or repair, maintenance bypass mode powers the connected equipment with utility power while electrically isolating the internal UPS components.

NOTE:

- Risk of power interruption. Can damage the connected equipment.
- If utility power fails or if its quality is out of range while the UPS is in Maintenance Bypass Mode, the UPS may shut down without notice and shut-off output power to the load.

NOTE: The UPS has no user serviceable parts. If the UPS malfunctions and requires service, visit <http://www.Vertiv.com/emea/support/> or contact your local Vertiv representative.

Figure 2.28 Maintenance Bypass Mode Operation



| Item | Description |
|------|------------------------------------|
| 1 | Mains/Utility input (bypass input) |
| 2 | Rectifier/PFC |
| 3 | Inverter |
| 4 | Battery charger |
| 5 | Battery |
| 6 | Bypass static switch |
| 7 | UPS output |
| 8 | Maintenance bypass |

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3 Installation

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



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](#) on page 85, for the weight). 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](#) on page 85.
- Place the UPS in an area of unrestricted air-flow around the unit, away from water, flammable liquids, gases, corrosives, and conductive contaminants. Avoid direct sunlight.

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

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

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

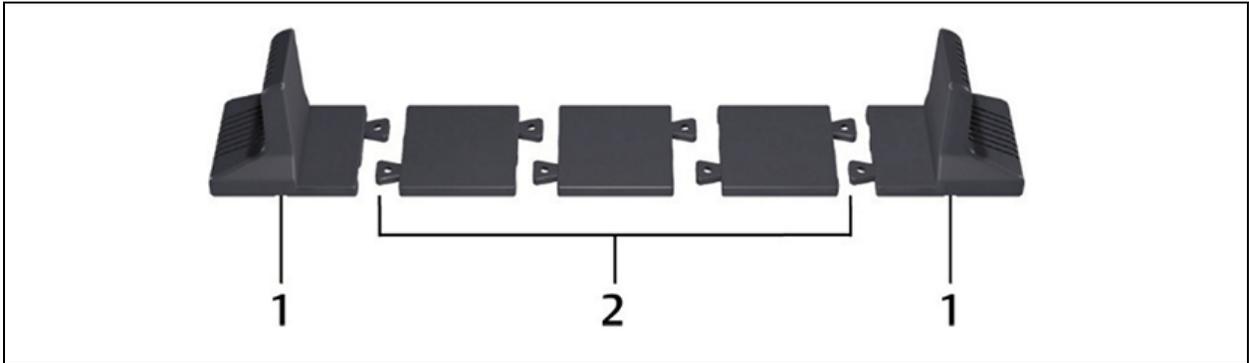
NOTE: When installing the UPS or making input and output connections, comply with all relevant safety codes and standards.

3.3.1 Tower Installation

To install the UPS as a tower:

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

Figure 3.1 Support Bases



| Item | Description |
|------|-------------------------|
| 1 | Support bases |
| 2 | Spacers with connectors |

2. If optional, external battery cabinets will be connected, take out the spacers shipped with the battery cabinet.
3. Connect the spacers and the support bases as shown in **Figure 3.1** above. Each Vertiv™ Liebert® GXT5 requires 2 support bases, one in the front and one in the rear.
4. Place the Liebert® GXT5 and any battery cabinets on the 2 support bases.

3.3.2 Rack Installation

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



CAUTION: The Liebert® GXT5 is heavy. The UPS must be installed as near the bottom of a rack as possible. If placed too high, it can make the rack top heavy and prone to tipping over. For unit weights, see [Specifications](#) on page 85.

3.4 Installing External Battery Cabinets

Optional, external battery cabinets (EBC) may be connected in parallel to the UPS to provide additional battery run time. For approximate battery run times with additional EBCs, see [Battery Run Times](#) on page 99. External battery cabinets are placed on one side of the UPS in a tower configuration or stacked beneath the UPS in a rack configuration. Up to 10 EBCs may be connected to the UPS, and up to 6 may be detected using EBC auto-detection.

For applications where the number of EBCs exceeds 6 or for legacy applications where EBC auto-detection is not possible, please contact Vertiv service for assistance.



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 cabinets are heavy, see [Specifications](#) on page 85. Take proper precautions when lifting them.

To install the EBCs:

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

- or -
3. For rack installation:
 - Rack-mount hardware ships with the EBC.
 - Refer to the instructions included with the rack-mount kit to install.

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

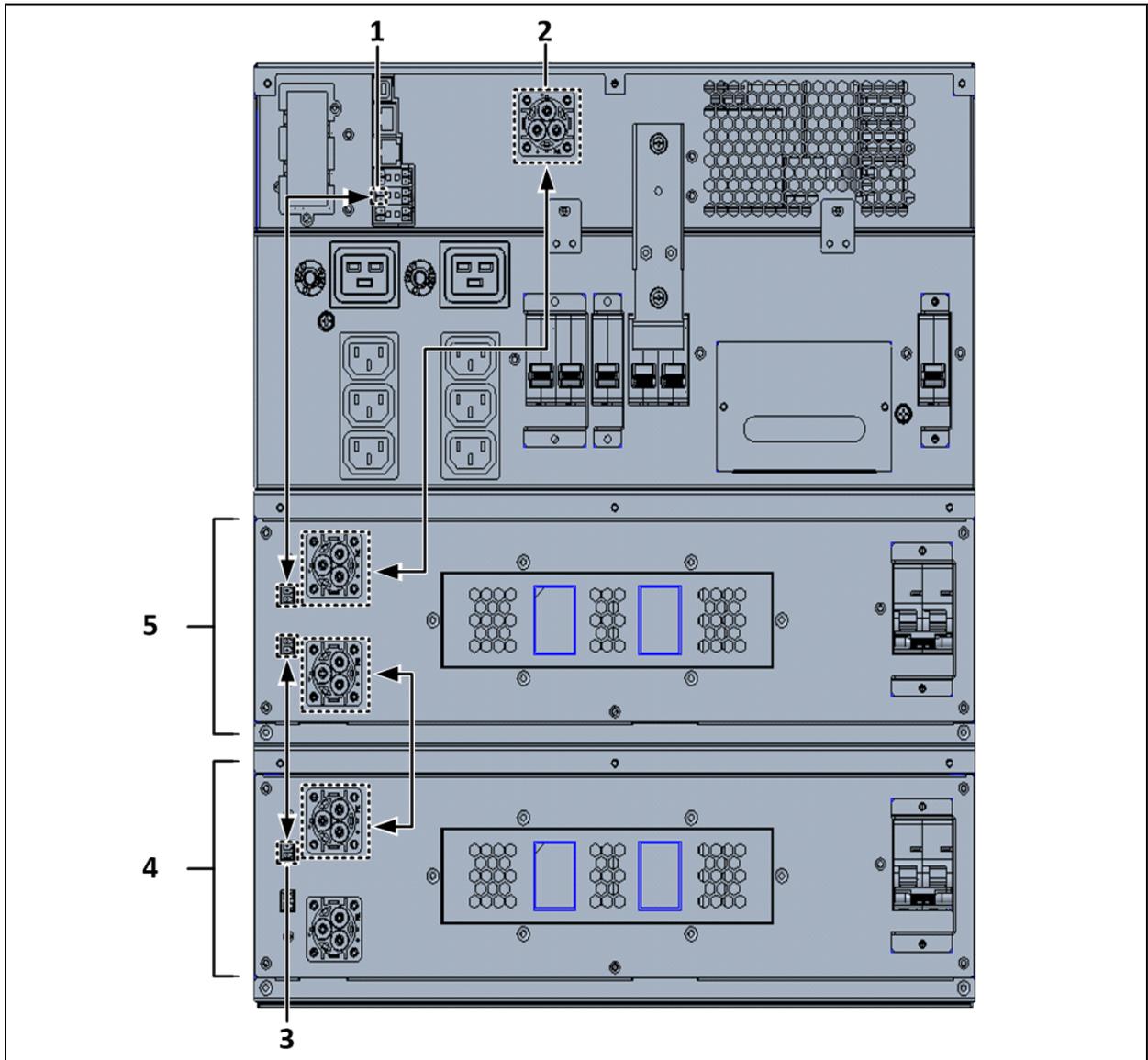
4. Verify that the EBC breaker is in the *Off* position.
5. Connect the supplied EBC cables to the rear of the cabinet, then to the rear of the UPS, see **Figure 3.2** on the next page.
6. Turn the EBC breaker to the *On* position.
7. Verify the circuit breaker on the EBC is in the *On* position.

The additional back-up run time is now enabled.

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

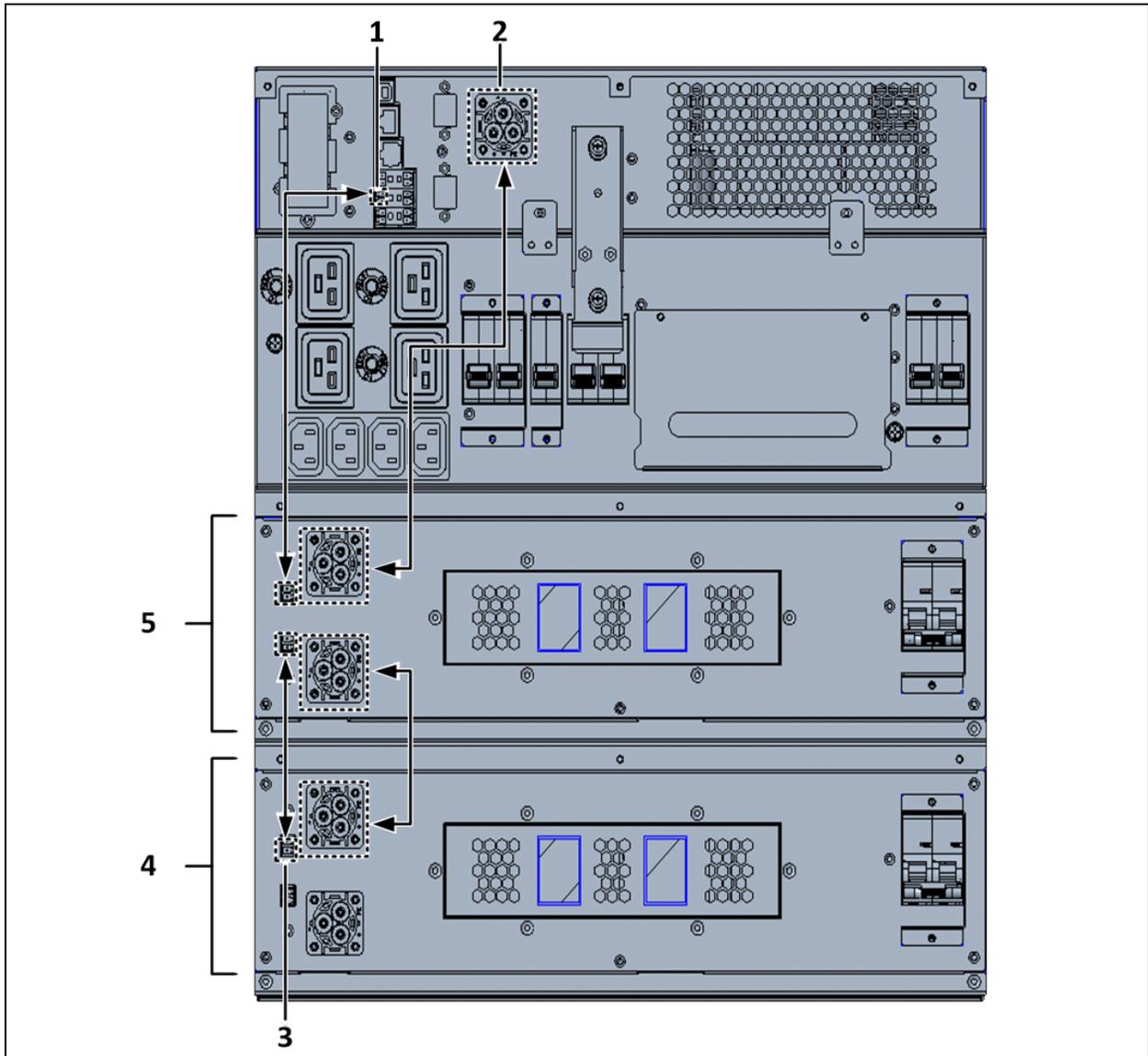
NOTE: If shipping or storing the UPS for an extended time, disconnect the EBCs to minimize stand-by current drain on the batteries and help maintain design life.

Figure 3.2 Example of EBCs Connected to the 5/6 K UPS



| Item | Description |
|------|--|
| 1 | EBC-detection dry contact port (See Table 3.3 on page 39, for details.) |
| 2 | EBC connector |
| 3 | EBC-detection port |
| 4 | External battery cabinet |
| 5 | External battery cabinet |

Figure 3.3 Example of EBCs Connected to the 8/10 K UPS



| Item | Description |
|------|---|
| 1 | EBC-detection dry contact port. See Table 3.3 on page 39, for details. |
| 2 | EBC connector |
| 3 | EBC-detection port |
| 4 | EBC |
| 5 | EBC |

3.5 Installing a Power Distribution Box



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.

The 5 kVA to 10 kVA models ship with a removable power distribution box (POD) installed, see [Terminal-Block Electrical Specifications](#) on page 39, to make the electrical connections to the UPS. For removal, see the appropriate procedures in [Maintenance](#) on page 77.

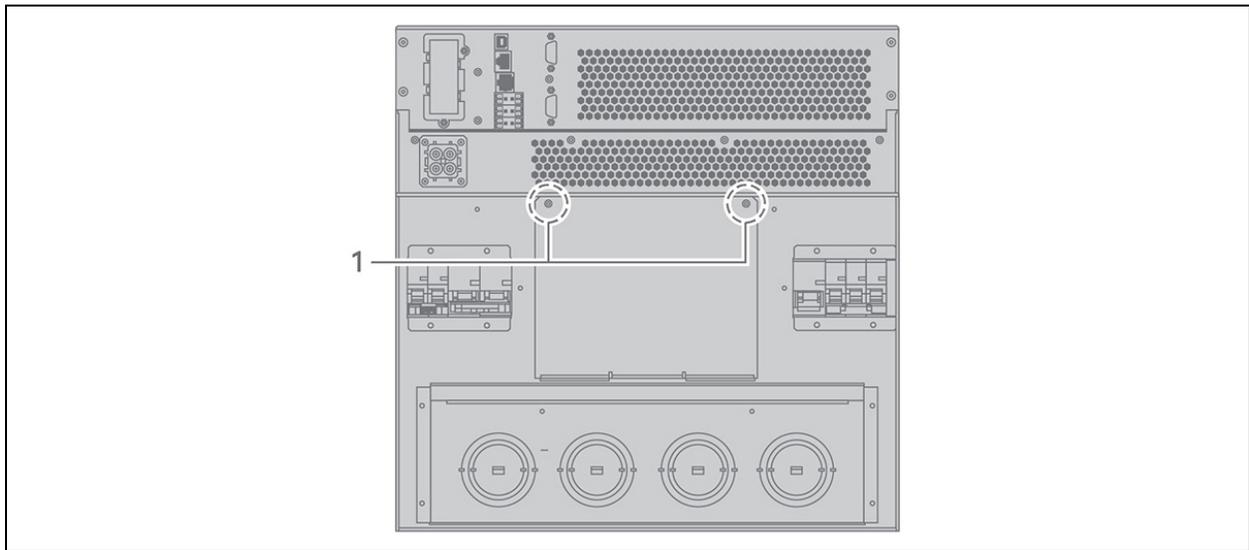
For 16 kVA to 20 kVA models, the POD is optional, ships separately, and must be attached to the rear of the UPS. See [Removable Power Distribution Box](#) on page 16, for the POD options compatible with your Vertiv™ Liebert® GXT5 model.

NOTE: Do not operate the UPS with the POD removed. To shut off all power to the POD and to the load, utility input power must be disconnected.

To attach the POD on 16 kVA to 20 kVA units:

1. On the rear of the unit, unscrew the two fixing screws from the POD location cover, see **Figure 3.4** below, and remove the cover.
2. Insert the POD receptacles into the ports, and connect the PP75 terminal.
3. Align the POD with the installation hole, then insert and secure the POD.

Figure 3.4 POD-location Cover on 16 kVA to 20 kVA Models



| Item | Description |
|------|---------------|
| 1 | Fixing Screws |

3.6 Hardwired Input/Output Connections



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.

Table 3.1 below lists the four types of I/O connection are available depending on the UPS model. Some models offer more than one type.

Table 3.1 I/O Connection Types by Model

| Model | Lines in/out | Configuration |
|----------------|--------------------------|-------------------------------|
| 5 kVA, 6 kVA | 1-in 1-out | Common source |
| 8 kVA, 10 kVA | 1-in 1-out | Common Source or Split bypass |
| 16 kVA, 20 kVA | 1-in 1-out or 3-in 1-out | Common Source or Split bypass |

3.6.1 Branch Circuit Breaker

The installer must provide an upstream branch circuit breaker, see **Table 3.2** below, for the ratings. The input circuit breaker on the distribution box and the output circuit breaker on the rear of the power distribution box disconnect all power between the main cabinet and the distribution box. **Table 3.4** on page 44 shows a diagram of the circuit breakers.

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.
- We recommend using a Class D circuit breaker.
- 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.

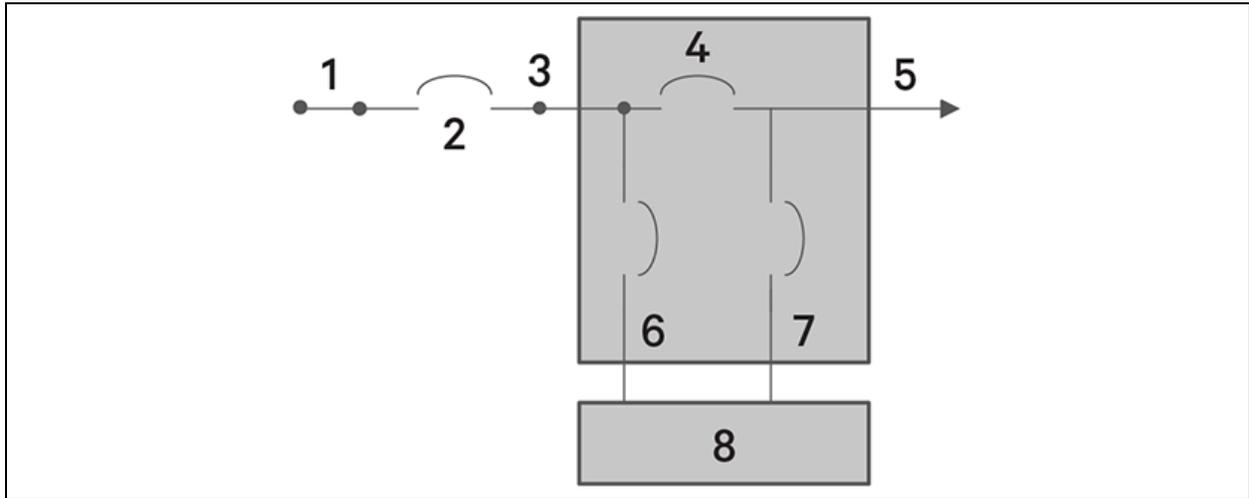
Table 3.2 Branch Circuit Breaker Rating

| Unit Rating | Recommended Breaker Rating |
|-------------|----------------------------|
| 750 VA | 10 A |
| 1000 VA | |
| 1500 VA | |
| 2000 VA | 16 A |
| 3000 VA | 20 A |
| 5 KVA | 40 A |
| 6 KVA | 50 A |

Table 3.2 Branch Circuit Breaker Rating (continued)

| Unit Rating | Recommended Breaker Rating |
|-------------|---------------------------------|
| 8 KVA | 63 A |
| 10 KVA | |
| 16 KVA | 1-phase: 140 A 3-phase: 50 A |
| 20 KVA | 1-phase: 160 A 3-phase: 63 A |

Figure 3.5 Circuit Breakers Diagram



| Item | Description |
|------|------------------------------------|
| 1 | Mains/Utility |
| 2 | External Branch Circuit Breaker |
| 3 | Input |
| 4 | Maintenance Bypass Circuit Breaker |
| 5 | Output |
| 6 | Input Circuit Breaker |
| 7 | Output Circuit Breaker |
| 8 | UPS-PFC, battery inverter |

3.6.2 Terminal Block Connections

On 5 kVA to 20 kVA models, the hard wire connections to the terminal blocks are made through knockouts on the POD attached to the rear of the unit. See [Removable Power Distribution Box](#) on page 16, for the location of the input/output knockouts on your Vertiv™ Liebert® GXT5 model. Models below 3000 VA use input cords with plugs instead of terminal block connections.

Table 3.3 on the facing page details the electrical connection specifications.

Table 3.3 Terminal-Block Electrical Specifications

| UPS Model | Recommended External Over-current Protection | Recommended Wire Size (Including Ground Wire) (90°C Copper Wire) | Maximum Wire Size Accepted by Terminal Block | Terminal Tightening Torque |
|-------------------|--|---|--|----------------------------|
| GXT5-5000IRT5UXLN | 40 A | 10 mm ² (8 AWG) | 6 AWG | 20 lb-in (2.26 Nm) |
| GXT5-5000IRT5UXLE | | | | |
| GXT5-6000IRT5UXLN | 50 A | | | |
| GXT5-6000IRT5UXLE | | | | |
| GXT5-8000IRT5UXLN | 63 A | 16 mm ² (6 AWG) | | |
| GXT5-8000IRT5UXLE | | | | |
| GXT5-10KIRT5UXLN | | | | |
| GXT5-10KIRT5UXLE | | | | |
| GXT5-16KIRT9UXLN | 1-phase: 140 A | 1-phase: 35 mm ² (1 AWG) 3-phase: 10 mm ² (8 AWG) for L1, L2, L3, 1 AWG for N, G | 53.5 mm ² (1/0 AWG) | 110 lb-in (12.4 Nm) |
| GXT5-16KIRT9UXLE | 3-phase: 50 A | | | |
| GXT5-20KIRT9UXLN | 1-phase: 160 A | | | |
| GXT5-20KIRT9UXLE | 3-phase: 63 A | | | |

To make the terminal-block connections:

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

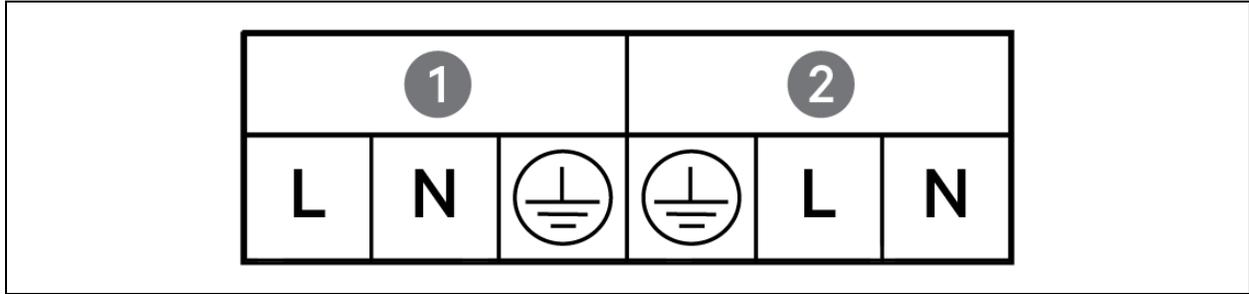
NOTE: We recommend using the knockouts to install input and output wiring in separate conduit. You must use a suitable cable gland or risk electric shock.

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 3.3** above.
 - Connecting to Terminal Blocks on 5 kVA and 6 kVA Model
 - Connecting to Terminal Blocks on 8 kVA and 10 kVA Models
 - Connecting to Terminal Blocks on 16 kVA and 20 kVA models
3. Re-install the cable-entry/conduit-box cover, and tighten the screws.

3.6.3 Connecting to Terminal Blocks on 5 kVA and 6 kVA Model

These models offer a single type of I/O connection, 1-in 1-out common source. **Figure 3.6** on the next page, shows the terminal block. Refer to the details in [Terminal Block Connections](#) on the previous page, when making the connections.

Figure 3.6 Terminal Block 5 kVA and 6 kVA Models

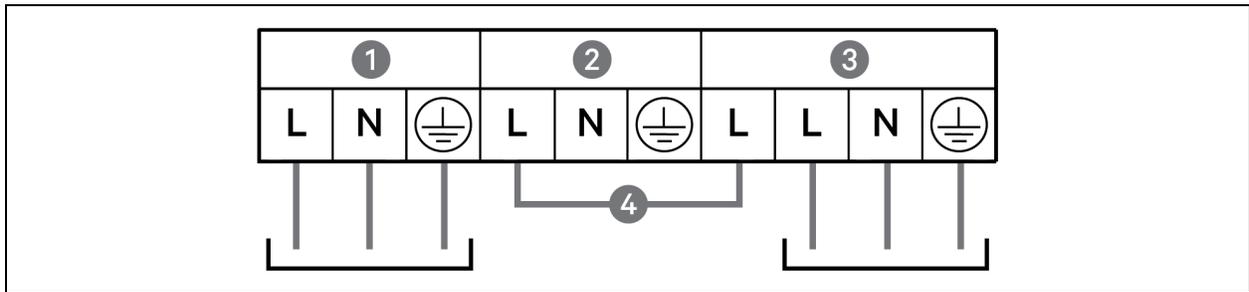


| Item | Description |
|------|-------------|
| 1 | Output |
| 2 | Input |

3.6.4 Connecting to Terminal Blocks on 8 kVA and 10 kVA Models

These models offer a single type of I/O connection. A single shorting cable ships installed on the terminal block. Refer to the details in [Terminal Block Connections](#) on page 38, when making the connections. **Figure 3.7** below, shows the shorting cable installed for a split-bypass connection.

Figure 3.7 Terminal Block 8 kVA to 10 kVA Models



| Item | Description |
|------|---------------------------------------|
| 1 | Output |
| 2 | Bypass |
| 3 | Input |
| 4 | Shorting cable (installed at factory) |

3.6.5 Connecting to Terminal Blocks on 16 kVA and 20 kVA models

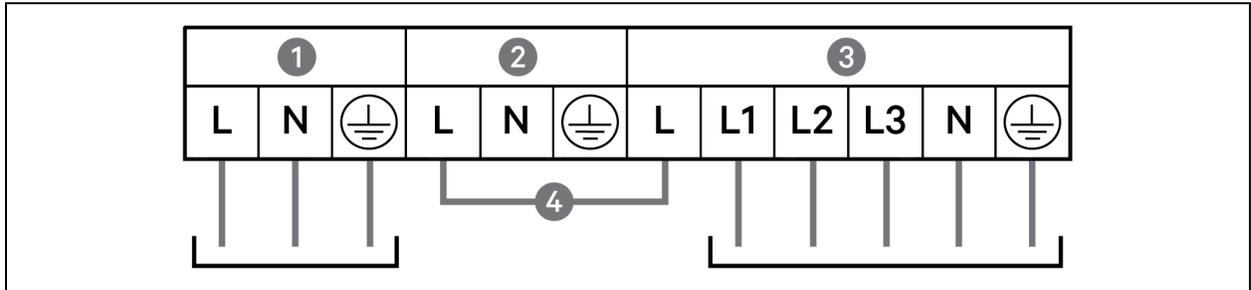
These models offer a four types of I/O connection. One shorting cable (W01) ships installed on the terminal block.

Two additional shorting cables are included with the accessories to wire the different types **Figure 3.8** on the facing page, shows the terminal block. Refer to the details in [Terminal Block Connections](#) on page 38, when making the connections.

- **Figure 3.8** on the facing page, shows the 3-in 1-out common source connection
- **Figure 3.9** on the facing page, shows the 1-in 1-out split-bypass connection

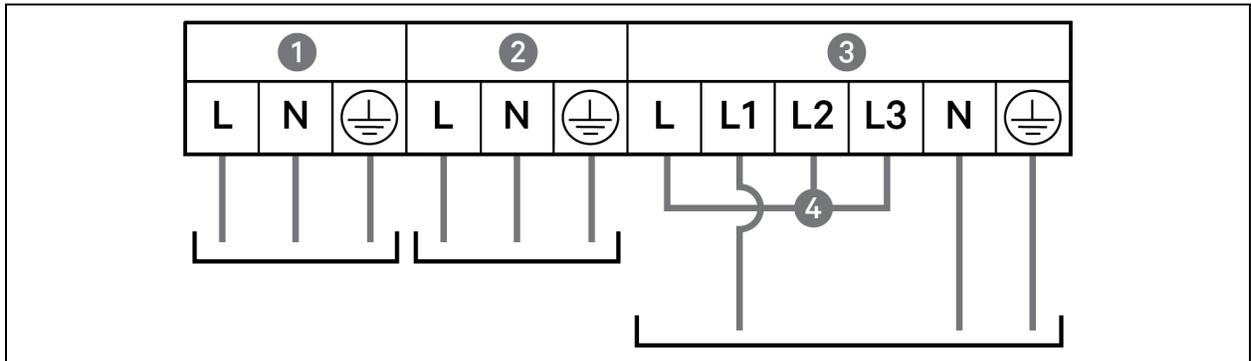
- Figure 3.10 on the next page, shows the 1-in 1-out common source connection

Figure 3.8 3-in 1-out Common Source Connection, 16 kVA and 20 kVA Models



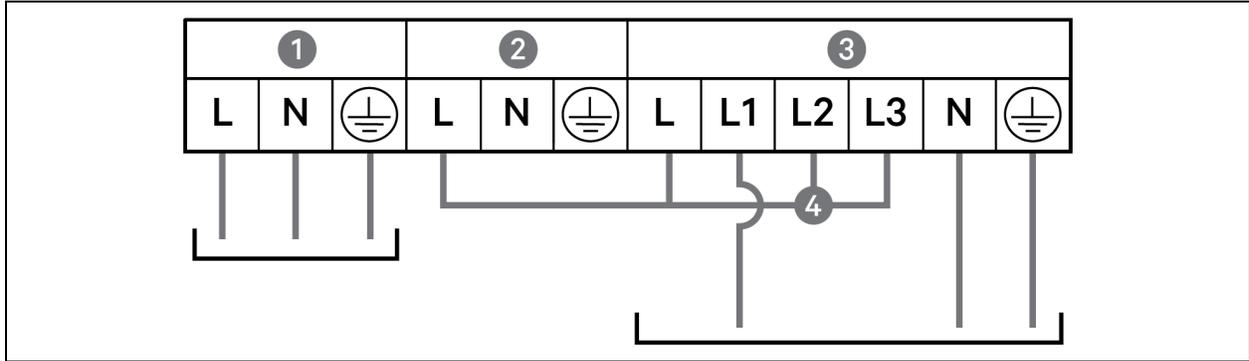
| Item | Description |
|------|--|
| 1 | Output |
| 2 | Bypass |
| 3 | Input |
| 4 | Shorting cable (W01), installed at factory |

Figure 3.9 1-in 1-out Split Bypass Connection, 16 kVA and 20 kVA Models



| Item | Description |
|------|---|
| 1 | Output |
| 2 | Bypass |
| 3 | Input |
| 4 | Shorting cable (W02), included with accessories |

Figure 3.10 1-in 1-out Common Source Connection, 16 kVA and 20 kVA Models



| Item | Description |
|------|---|
| 1 | Output |
| 2 | Bypass |
| 3 | Input |
| 4 | Shorting cable (W03), included with accessories |

3.7 Communication Connections

The UPS offers several communication interfaces and ports.

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

3.7.1 Connecting IntelliSlot Communication

The Vertiv™ Liebert® IntelliSlot™ RDU101 provides SNMP and/or RS-485 monitoring of the UPS across the network and/or building management system.

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

To install an IntelliSlot Card:

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

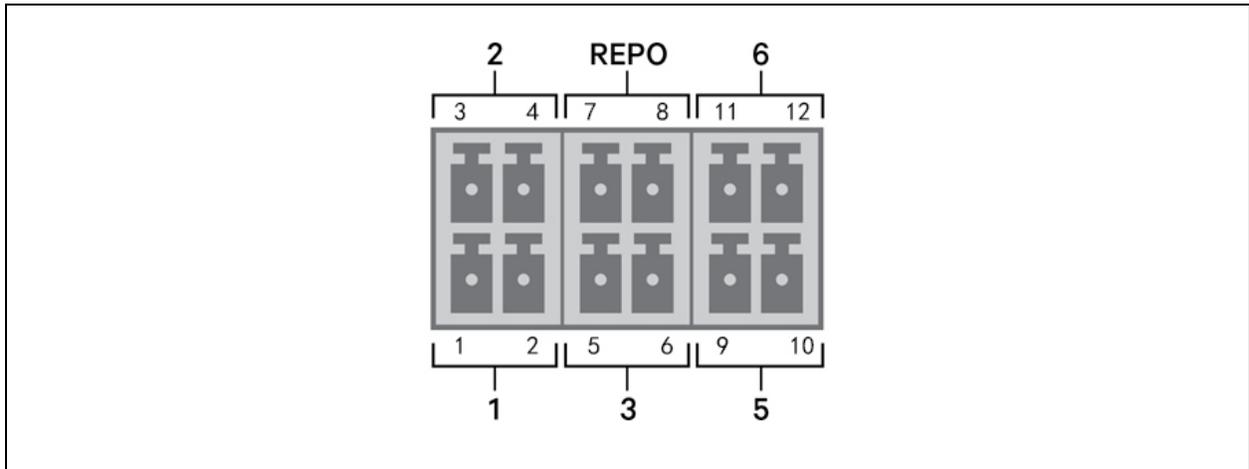
To make connections to the card, refer to the Installer/User Guide for the appropriate IntelliSlot card available at www.vertiv.com.

3.7.2 Connecting to the Dry contact Port

The UPS includes a dry contact port. See the appropriate figure for your model in [Rear Panels](#) on page 5, for the location of the port. **Figure 3.11** on the facing page, shows the ports and **Table 3.4** on page 44 describes each port.

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

Figure 3.11 Dry Contact Port and Pin Layout



NOTE: Pins 7 and 8 are shorted before delivery.

NOTE: The emergency power off (EPO) action of the UPS closes the rectifier, inverter and static bypass, but it cannot disconnect the UPS mains input inside. To completely disconnect the UPS, disconnect the upstream input circuit breaker when generating the EPO. For details on REPO connection and operation, see [Connecting a Remote Emergency Power Off \(REPO\) Switch](#) on page 45.

Table 3.4 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 System Parameter Options on page 64) 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 |
| | | 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 System Parameter Options on page 64) 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 |
| 3 | Battery Detection | 5, 6 | EBC Detection | Automatically detects number of external battery cabinets when pins 5 and 6 are connected to the detection port, see Installing External Battery Cabinets on page 32 . |
| REPO | REPO Input | 7 | +5V | REPO power supply, 5-Vdc 100-mA |
| | | 8 | REPO Coil - NC | NC, activated when Pin 7 and Pin 8 is open NOTE: For details on REPO connection and operation, see Connecting a Remote Emergency Power Off (REPO) Switch on the facing page. |
| 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 System Parameter Options on page 64) 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 System Parameter Options on page 64) 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) |

3.7.3 Connecting a Remote Emergency Power Off (REPO) Switch

The UPS includes an EPO connection in the dry contact port. See the appropriate figure for your model in [Rear Panels](#) on page 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 cut off the UPS input power. When the REPO switch trips, the UPS generates an alarm and immediately cuts-off battery charging and 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 3.12 below, shows the cable required to make the connection. We recommend using 18 AWG to 22 AWG (0.82 mm² to 0.33 mm²) copper core cable.

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

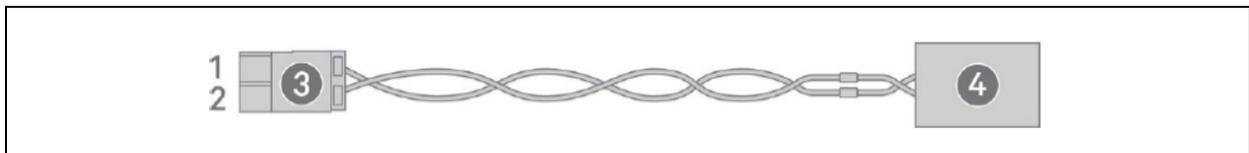
To connect a UPS to the REPO switch.



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

1. Connect one end of the cable to the remote switch, see **Figure 3.12** 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 3.12 Cable/Plug for Connecting REPO Switch to UPS REPO Port



| Item | Description |
|------|-------------------------------------|
| 1 | Terminal 1 |
| 2 | Terminal 2 |
| 3 | Plug (connects to REPO port on UPS) |
| 4 | REPO switch |

3.7.4 Connecting a USB Cable

The UPS includes a USB type-B connector. See the appropriate figure for your model in [Rear Panels](#) on page 5, for the location of the port.

The 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, download Power Assist from www.Vertiv.com/PowerAssist.

3.7.5 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 RS-232) 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.

| Item | Description |
|------|-------------|
| 1 | NC |
| 2 | NC |
| 3 | TXD (out) |
| 4 | GND |
| 5 | NC |
| 6 | RXD (in) |
| 7 | NC |
| 8 | NC |

3.8 Installing a Parallel System

10 kVA, 16 kVA, and 20 kVA models may be configured in a parallel system. The UPS parallel system provides support to the following options:

- 3 active systems
- 2 active systems
- 2 active systems plus 1 redundant system
- 1 active system plus 1 redundant system

All electrical requirements, including external distribution panel and branch circuit breaker, apply to each UPS in a parallel system, which are then connected in ring configuration for redundancy and additional reliability. System load information can be accessed via any controller/display in the system.

The following are requirements for the parallel connected system:

- Each UPS must have the same capacity and must be connected to the same mains/utility source.
- If a residual current detector (RCD) is required, it must be correctly set and installed before the same neutral line input terminal. See safety and regulatory information, available at <https://www.vertiv.com/ComplianceRegulatoryInfo>.
- The output of each ups must be connected to the same output bus.
- The parameter configuration for each UPS must be identical.

- Because the parallel system is not fitted with auxiliary contact detection devices for the output circuit breaker or the maintenance bypass circuit breaker of each UPS, You must strictly follow the procedures for transferring between operating modes when removing a single UPS from the parallel system before maintenance and when adding a single UPS after maintenance. Failure to observe the procedures may affect the reliability of the load power supply.

Figure 3.13 below shows an example of the 10 kVA model connected as a 2 + 1 parallel system connected in a ring configuration.

NOTE: 8 kVA and lower models do not support paralleling at this time.

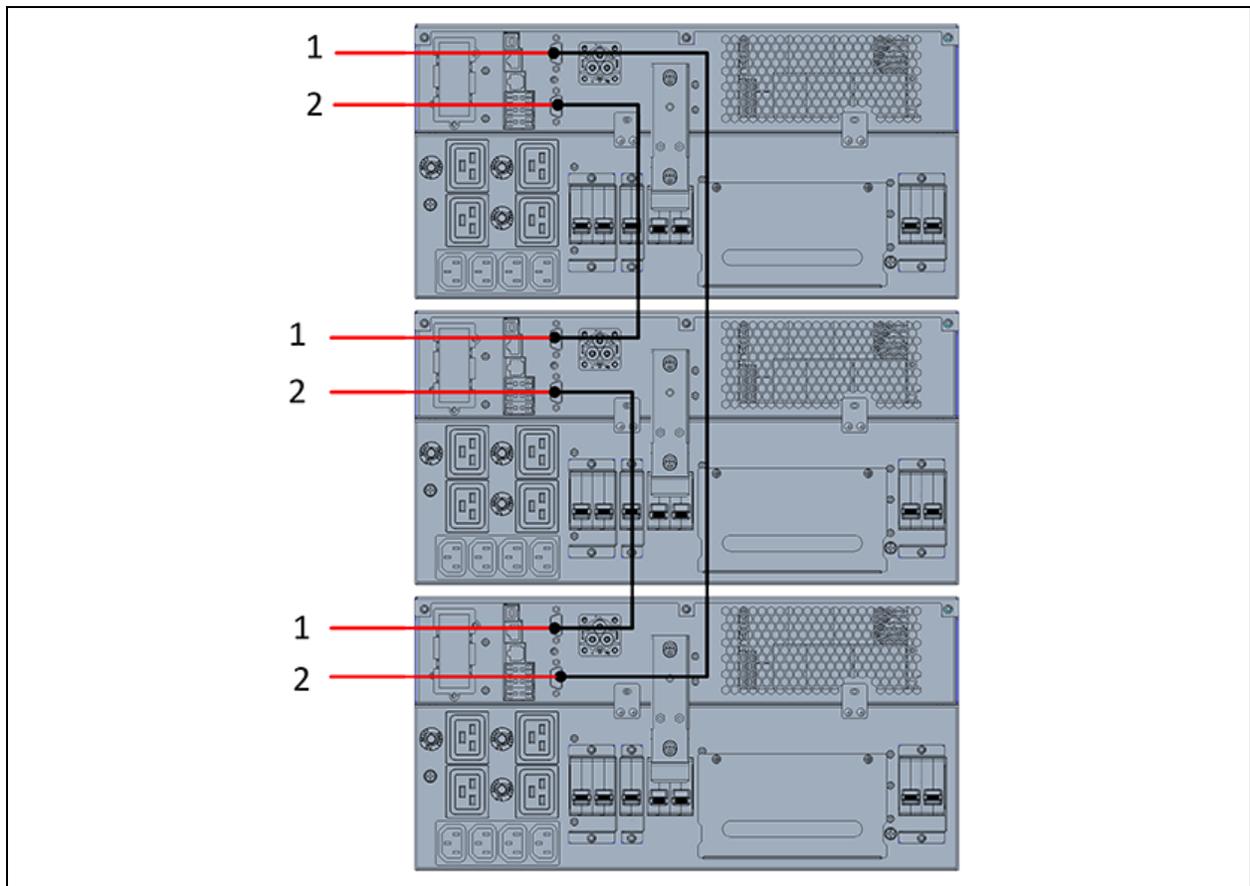
NOTE: You must use Vertiv parallel cables for the connection.

NOTE: If a fault occurs during parallel system operation, shut off the system and make sure the cables are connected correctly, see **Figure 3.13 below.**



CAUTION: Risk of improper disconnection. Can cause equipment damage. Do not disconnect parallel system cables while the system is operating.

Figure 3.13 Connection of 2 + 1 Parallel System



| Item | Description |
|------|-----------------|
| 1 | Upper connector |
| 2 | Lower connector |

3.8.1 First Time Start-up of a Parallel System

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



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

The *Parallel* parameters for each UPS in the system must be set and synchronized at first start-up.

To start and set parameters for the parallel system:

1. Make sure that the output circuit breaker of all units in the parallel system are open (off), then close (turn on) the input circuit breaker on each UPS. Each UPS powers on, a self-check screen displays, and the alarm/run indicators are lit for about 5 seconds.
2. Wait about 30 seconds to allow the rectifier start-up to finish, then at each UPS, set the parallel parameters as follows:

NOTE: If the *Parallel Comm Fail* alarm displays, clear it and proceed. Communication should not fail after the parallel settings are synchronized.

- On the display, press **Enter** to display the Main Menu, then use the arrow buttons to select Settings, and press **Enter**.

NOTE: To adjust the settings, you must enter a password. See [Editing Display and Operation Settings](#) on page 74, for details on entering the password and editing the setting parameters.

- Use the arrow buttons to select the Parallel tab, then press **Enter** to display the parameters list.
- Select and enter each parameter setting, and then use last item in the list, Sync parallel parameters, to copy the settings to the other units in the system. For a full description of UPS display functions and settings, see [Operation and Display Panel](#) on page 55.
- 3. After confirming the parallel parameters and each UPS is operating normally, commission the parallel system, see [Commissioning Parallel System](#) below.

3.8.2 Commissioning Parallel System



CAUTION: When powering on the parallel system, confirm that the external output circuit breaker for each UPS is closed and that all of the inverter output is connected in parallel.



CAUTION: To avoid load power failure, confirm that the system is working normally, then feed power to the load.

To commission the parallel system:

1. Close the external output circuit breaker and input circuit breaker on each UPS, then wait about 30 seconds to allow the rectifier startup to finish.
2. At the first UPS, press the **Power** button for 2 seconds and note that the run indicator (green) is lit, then measure the output voltage and verify that it is normal.
3. Repeat step 2 for each UPS in the parallel system.

3.8.3 Adding a Single UPS to the Parallel System



CAUTION: When adding or replacing a UPS in the parallel system, make sure that all parallel cabling is correct before powering on the additional/replacement unit.

NOTE: You may also use this procedure when replacing a faulty UPS in the system. The difference is noted in the procedure steps.

1. Connect the power cables and parallel communication cables, and make sure that they are properly connected, without any short circuits.
2. Refer to [Commissioning Parallel System](#) on the previous page, to verify operation of the added unit then completely power off the added UPS.
3. At any other UPS in the system, update the parallel parameters as follows:
 - On the display, press **Enter** to display the Main Menu, then use the arrow buttons to select Settings, and press **Enter**.
 - Use the arrow buttons to select the Parallel tab, then press **Enter** to display the parameters list.
 - Set the system count from N to N + 1, and then use last item in the list, Sync parallel parameters.

NOTE: If you are replacing a unit, do not update the system count, just sync the parallel parameters.

4. On the added UPS, close the input and output breakers, wait about 30 seconds to allow the rectifier start-up to finish, then power on the inverter.
5. Make sure that there are no alarms and that the UPS and the parallel system are operating normally.

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4 Operating the UPS

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 55.

4.2 Starting-up the UPS

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



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

The UPS starts in Normal Mode.

To start the UPS:

1. If included on your UPS model, make sure the maintenance bypass switch is in the open (off) position and that the guard is secured in place.
2. Ensure that the REPO connector on the rear of the unit has a jumper between pins 7-8 or that it is properly wired to an Emergency Power off circuit (normally closed).
3. Make sure the breaker supplying power to the UPS is closed and close the input breaker on the rear of the UPS if included on your UPS model or if necessary press the input circuit breaker reset buttons at the rear of the UPS.
4. If included on your UPS model, close the bypass breaker on the rear of the UPS.
5. Close all output breakers on the rear of the UPS (or in an external panel board, if used).
6. If external battery cabinets are attached, close the breakers on the rear of each cabinet.
7. Power on the UPS by pressing and holding the **Power** button on the operation and display panel until the confirmation dialog appears. Use the Up/ Down arrows to select YES, then press **Enter**.
8. If this is the first time start-up of the UPS, the Start-up guidance wizard opens to set the basic parameters of the UPS. Follow the prompts.

For detailed description of UPS display functions and settings, see [Operation and Display Panel](#) on page 55.

4.3 Transferring to Battery Mode

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

NOTE: Battery back-up run times are listed in [Battery Run Times](#) on page 99.

4.4 Transferring from Normal to Bypass Mode

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

If the bypass power is within normal operating range, the option to continue to turn-on or turn-off the UPS displays:

- a. Use the arrow buttons to select *Turn to Bypass or Turn off UPS*, and press **Enter**.
- b. Use the arrow buttons to select *No or Yes*, then press **Enter** to confirm.

If the bypass power is outside normal operating range, 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 or turn-off the UPS displays:

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

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

4.6 Transferring from Normal Mode to Standby

NOTE: Transferring to Standby Mode will turn off the UPS output to the load

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

If the UPS is operating normally, without faults, the option to continue to turn-on or turn-off the UPS displays:

- a. Use the arrow buttons to select *Turn off output*, and press **Enter**.
- b. Use the arrow buttons to select *No or Yes*, then press **Enter** to confirm.

4.7 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.

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

If the UPS is operating normally, without faults, the option to continue to turn-on or turn-off the UPS displays:

- a. Use the arrow buttons to select *Turn off UPS*, and press **Enter**.
- b. Use the arrow buttons to select *No or Yes*, then press **Enter** to confirm.
- c. Follow the on screen instructions to disconnect input power to the UPS.
- d. The UPS will show *Shutdown in Process* for approximately 1 minute until the shutdown procedure is complete.

4.8 Remote Emergency Power off (REPO)

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

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

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

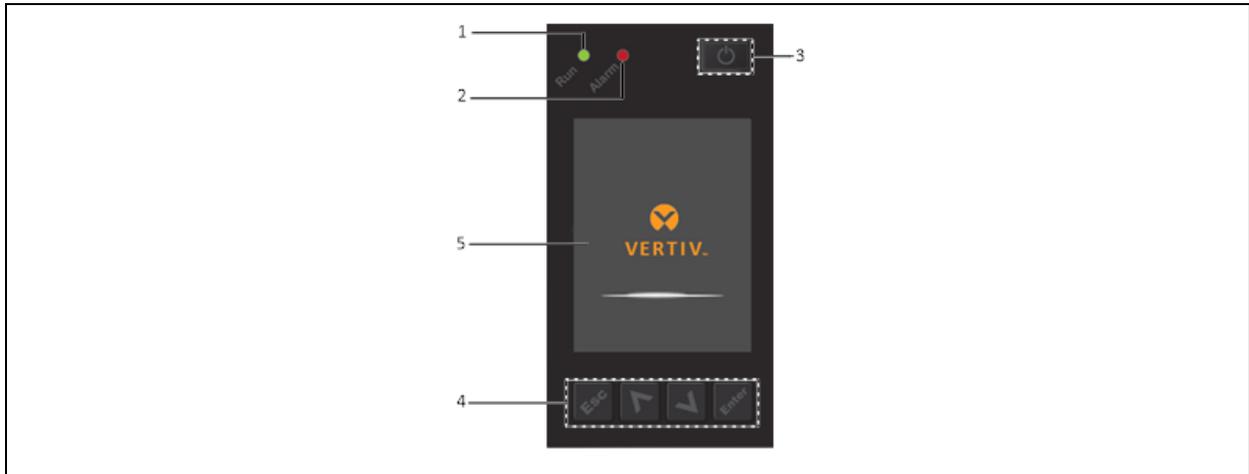
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5 Operation and Display Panel

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

IMPORTANT! Do not rotate display. UPS has a gravity sensor function.

Figure 5.1 UPS Front panel Display



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

Table 5.1 Display Panel Button Functions and Descriptions

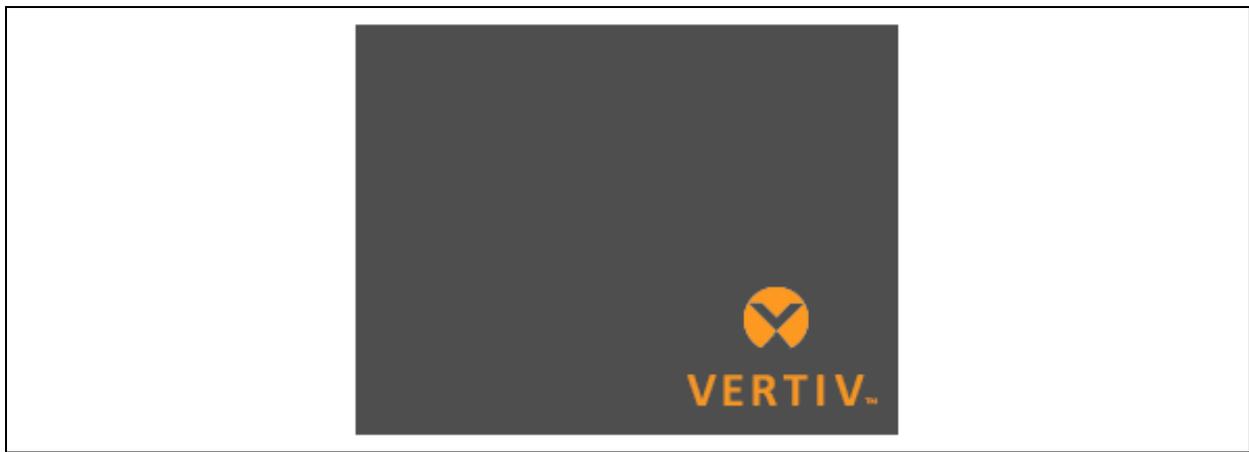
| Button | Function | Description |
|---|----------|---|
|  | Enter | Confirm or enter selection. |
|  | Up | Move to previous page, increase value, move left. |
|  | Down | Move to next page, decrease value, move right. |

Table 5.1 Display Panel Button Functions and Descriptions (continued)

| Button | Function | Description |
|---|----------|---|
|  | 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 on, describes the alarm messages you may see. When a fault is indicated, the front panel display will list the fault. Faults are described in **Table 7.2** on page 83.

Table 5.2 LED Functions

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

5.2 LCD Menu and Screens

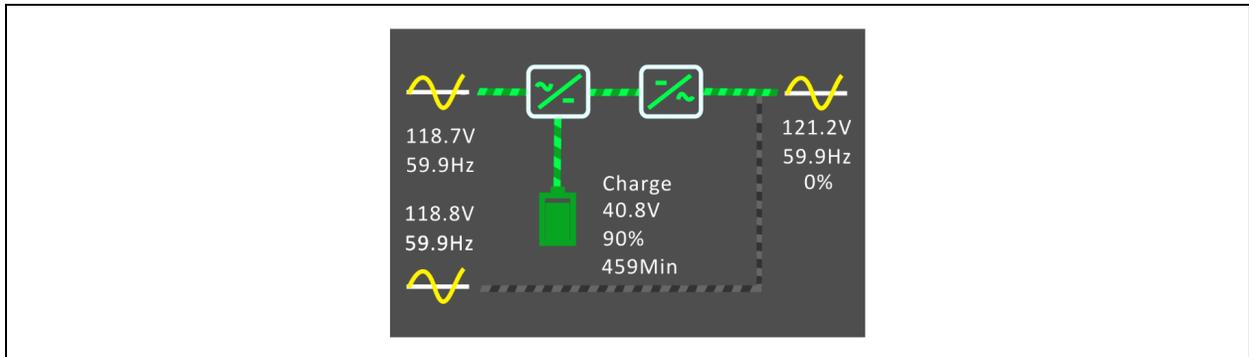
The menu driven LCD user interface lets you browse the UPS status, view operating parameters, customize settings, control operation, and view alarm/event history. Use the function keys to navigate through the menu, and view statuses or select settings in the screens.

5.2.1 Startup and Flow Screens

At start-up, the UPS executes a system test and displays the Vertiv logo screen for about 10 seconds, shown in **Figure 5.1** on page 55. After the test completes, an overview screen shows status information, the active (green) power path, and the inactive power 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

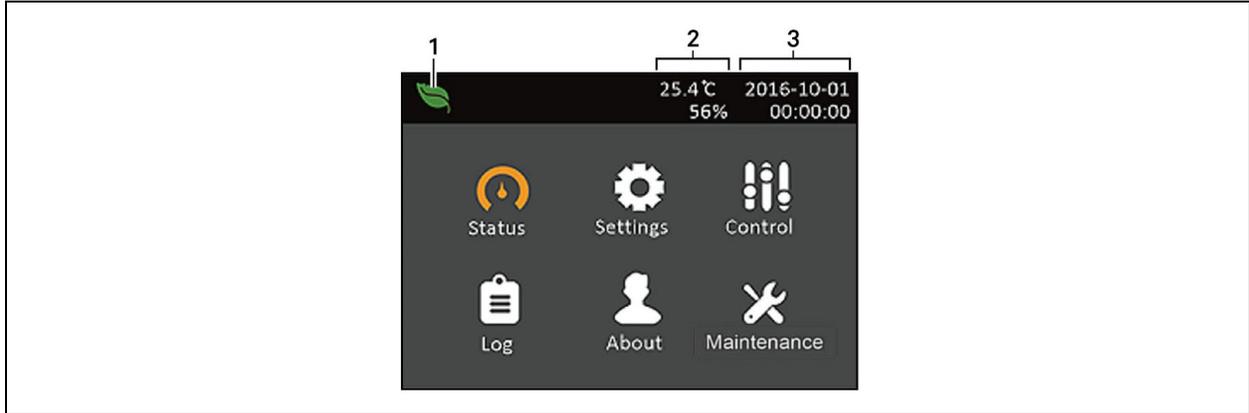
To access the main menu, press **Enter** while at the flow screen. **Table 5.3** below, describes the menu options, and **Figure 5.4** on the next page, describes the display.

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

Table 5.3 Menu Options

| Sub Menu | Description |
|-------------|---|
| Status | Voltage, current, frequency, and parameters for UPS components, see Status Screen on the next page. |
| Settings | Display and system parameter settings, see Settings Submenu on page 61. |
| Control | UPS controls, see Control Screen on page 68. |
| Log | Current alarms and event history, see Log Screen on page 69. |
| About | Product and network information, see About Screen on page 72. |
| 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 |

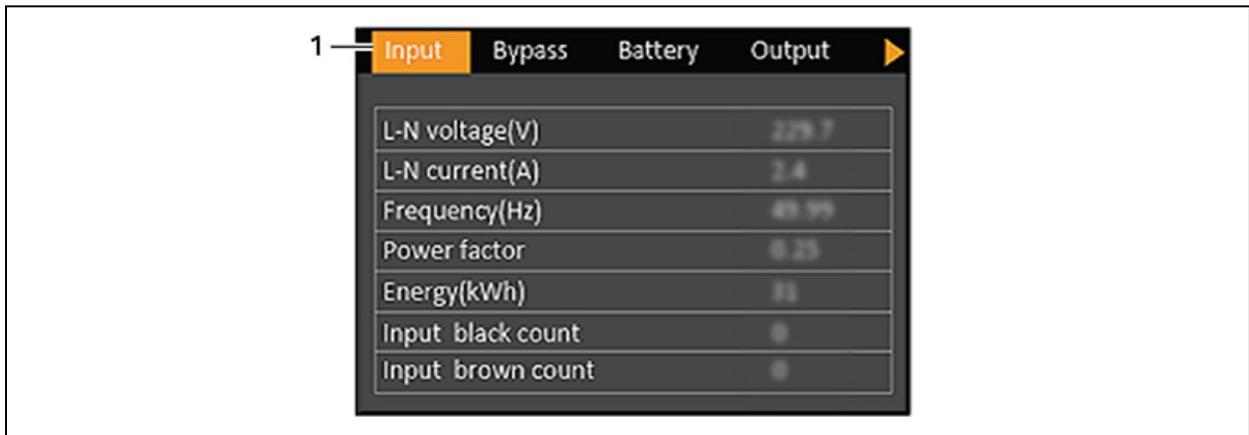
5.2.3 Status Screen

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

To view the UPS status information:

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

Figure 5.5 Status Screen Tabs



| Item | Description |
|------|-------------------------------------|
| 1 | Screen tabs with Input tab selected |

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

Input 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: charging, discharging, or fully charged.

Battery voltage (V)

Voltage of battery power.

Battery current (A)

Current of battery power.

Backup time (Min)

Amount of back-up time remaining for battery.

Remaining capacity (%)

Percent of capacity remaining for battery.

Discharge count

Number of discharges for the battery module.

Total discharge time (Min)

Number of minutes until battery is fully discharged.

Battery running time (Day)

Number of days the batteries have been in operation.

Battery replacement time

Date of last time battery was replaced.

External battery cabinet group No.

Number of external battery cabinets connected.

Battery average temp (°C)

Average temperature of the battery.

Battery highest temp (°C)

Highest temperature battery has reached.

Battery lowest temp (°C)

Lowest temperature battery has reached.

Output Status Options

L-N voltage (V)

Line-neutral voltage of output power.

L-N Current (A)

Line-neutral current of output power.

Frequency (Hz)

Frequency of output power.

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

- Output
- Battery
- Parallel
- Monitoring

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

To modify UPS settings:

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

Output Parameter Options

Voltage selection

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

- 200 V
- 208 V
- 220 V
- 230 V
- 240 V
- Autodetect

Startup on bypass

Allows the UPS to start-up in bypass mode.

- Enable — Start the UPS in bypass mode
- Disable — Start the UPS in normal mode.

Frequency selection

Selects the frequency of the output.

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

Bypass voltage upper limit

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

Battery Parameter Options

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 is 2)

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)

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)

Batt. note duration (month)

Sets the length of time after the batteries are replaced to generate an alarm to remind the user to replace the batteries.

- Disable (default)
- 1 - 72 months

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 of 4320)

Equal charge enable

Sets the charge mode of the battery. Equal charge mode is a quick charge mode that can reduce the amount of time needed to charge the battery. Float charge mode can have a longer battery life.

- Enable — Equal charge mode
- Disable — Float charge mode (default)

Replace battery

Activates newly installed battery packs after replacement and reset all battery statistics for new battery packs.

- Provides a confirmation window with Yes/No options to confirm replacement of batteries.

Monitor Settings Options

Language

Selects the language of the display, see [Selecting the Display Language](#) on page 76.

- English (default)
- French
- Portuguese
- Spanish
- Chinese
- German
- Japanese

- Russian

Date

Selects the current date for the UPS display, YYYY-MM-DD. See [Setting the Date and Time](#) on page 76.

Time

Select the current time for the UPS display, HH:MM:SS. See [Setting the Date and Time](#) on page 76.

Display orientation

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

- Auto-rotate — 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 83.

- 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 75.

System Parameter Options

Auto restart

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

- Enable — The UPS will restart automatically when the input power is restored after EOD. (default)
- 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)

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 re-applied. 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
- Disable (default)

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 — The contacts switch when the UPS reaches the amount of time left on battery configurable from *Low battery time*. (default)
- 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 — The contacts switch when a UPS fault has occurred. (default)

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)

Sleep mode cycle time

Sets the amount of weeks that the UPS will sleep. If set to 52, the UPS will sleep every week permanently without stopping after 52 weeks. This option is only shown when sleep mode is enabled.

- 0 - 52 (default of 0)

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 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 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 Friday)

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 00:00)

IT system compatibility

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

- Enable
- Disable (default)

Outlet Parameter Options

Apply the same settings as outlet 1

Available on outlets 2 through 4, this applies the settings for Outlet1 to this outlet. This lets you apply the settings for Outlet1 and apply identical settings to any other programmable outlet.

Turn on/off outlet

Turns on or turns off the outlet based on the current state. Provides a confirmation window with Yes / No options to confirm turning on the outlet.

Turn on delay

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

- 0 to 30 minutes (default is 0)

Turn off when UPS overloads

Sets whether or not to turn off the outlet if the UPS is overloaded while on battery power. This can be used to disable lower priority equipment in the event of an overload while in battery mode.

- Yes
- No (default)

Outlet settings based on discharging time

Threshold of turning off the outlet

Length of time that the outlet is powered after the batteries begin to discharge. Select the checkbox to enable or disable (default) the option.

- 0 to 30 minutes (default is 5)

Turn on when power returns for

Length of time after the mains input power returns before turning on the outlet. Select the checkbox to enable (default) or disable the option.

- 0 to 30 minutes (default is 5)

Outlet settings based on backup time

Threshold of turning off the outlet

When the selected amount of time remains on battery mode, the outlet is turned off. Select the checkbox to enable or disable (default) the option.

- 0 to 30 minutes (default is 5)

Turn on when power returns for

Length of time after the mains input power returns before turning on the outlet. Select the checkbox to enable or disable (default) the option.

- 0 to 30 minutes (default is 0)

Outlet settings based on capacity

Threshold of turning off the outlet

When the selected percentage of capacity remains in battery mode, the outlet turns off. Select the checkbox to enable or disable (default) the option.

- 20 to 80% (default is 20%)

Turn on when power returns

Length of time after the mains input power returns before turning on the outlet. Select the checkbox to enable or disable (default) the option.

- 0 to 30 minutes (default is 0)

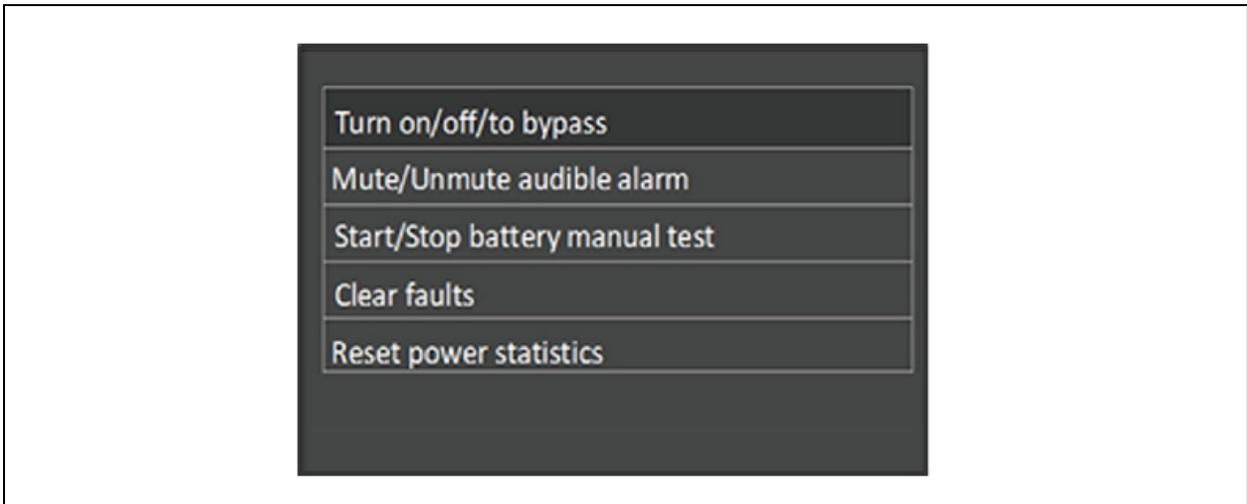
5.2.5 Control Screen

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**.

Figure 5.6 Control Screen



Control Options

Turn on/off/to bypass

Opens the dialog to change operating modes, see [Operation and Display Panel](#) on page 55.

Mute/Unmute audible alarm

Silences or un-silences the audible alarm, see [Silencing the Audible Alarm](#) on page 51.

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 83, for a description of the faults.

Reset power statistics

Resets the values tracked to calculate the Efficiency graph, see **About Screen** on page 72.

5.2.6 Log Screen

The Log Screen offers tabs that list the current alarms and the alarm/event history. **Table 5.4** below, describes the alarm messages you may see in the logs.

To view the logs:

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

Figure 5.7 Current and History Log Tabs

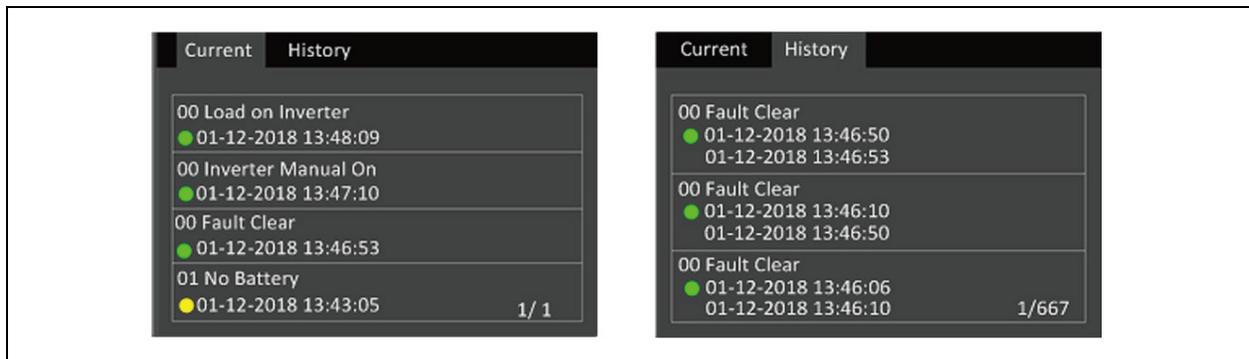


Table 5.4 Alarm Messages

| Message | Description |
|----------------------------------|--|
| Aux. power fault | UPS internal auxiliary power voltage fault. Contact Vertiv Technical Support. |
| Battery cabinet connect abnormal | More than 6 external battery cabinets are connected to the UPS with the auto-detect feature in use. Contact Vertiv service if using more than 6 EBCs. |
| 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 pre-warning | 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 to 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 <i>Batt. note duration</i> or have no batteries installed, the alarm will not occur. |

Table 5.4 Alarm Messages (continued)

| Message | Description |
|--------------------------------|--|
| Battery reversed | The battery positive and negative are reversed. Reconnect the battery and check the battery cable connections. |
| Battery test fail | The remaining energy at the end of the periodic or manual self-test was deemed lower than acceptable. 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 to utility transition | The UPS has transferred the load to the mains power from the battery. This will display in the log whenever the event occurs. |
| Battery voltage abnormal | The battery voltage exceeds the normal range. Check if the battery terminal voltage exceeds the normal range. |
| 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 wiring. |
| 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 64). 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 if the input voltage and frequency are within the normal range or if the mains input has gone down. |
| 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. |

Table 5.4 Alarm Messages (continued)

| Message | Description |
|--|---|
| 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 and 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, if the mains input falls to 176 V - 100 V, the load is derated linearly from 100% - 50%. |
| 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. |
| 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, <i>Restore Factory Defaults</i> has been set while the UPS is in the stand-by state. This will return settings to their factory settings. |
| Shutdown due to over temp | During the UPS operation, the system checks if the heat sink temperature exceeds the setting range. If an overtemperature occurs, check if: <ol style="list-style-type: none"> 1. The ambient temperature is too high. 2. Dust is blocking any of the UPS vents. 3. A fan fault has occurred. |

Table 5.4 Alarm Messages (continued)

| Message | Description |
|-------------------|---|
| System over temp | 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. If an overtemperature occurs, check if : 1. The ambient temperature is too high. 2. Dust is blocking any of the UPS vents. 3. 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.

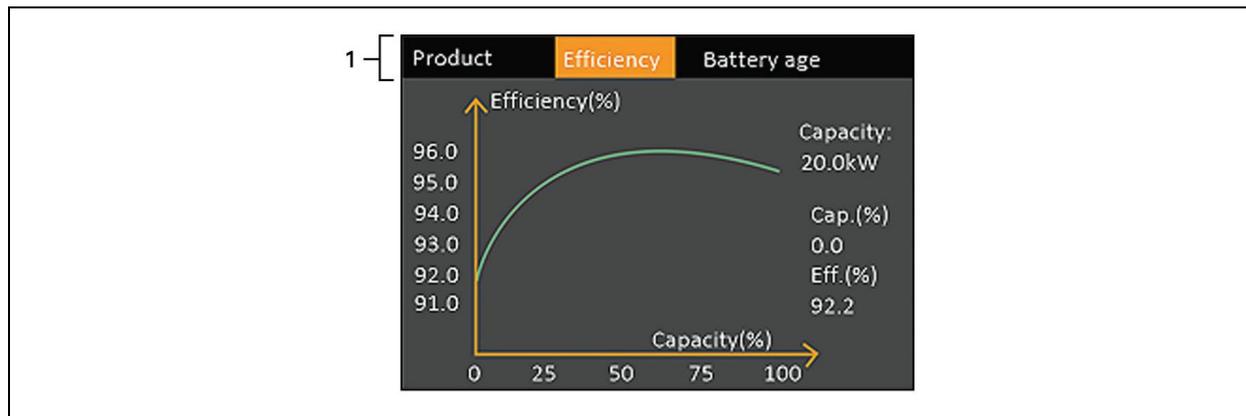
- Product tab — shows UPS identification information, firmware versions, and information about the communication card (when the card is installed).
- Efficiency tab — shows a curve of the efficiency of your UPS model vs the load capacity used.
- Battery age tab — shows the curve of the percent state of health (SOH) of the installed battery versus time. The

UPS calculates one value per week and plots it on the graph. The values are based on the battery temperature, age, and the actual amount of energy discharged from the battery if the battery has been discharged fully.

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 Efficiency tab selected. NOTE: The tab shown in the figure is an example and will change according to the model. |

Product Information

Product Type

UPS model number.

Serial number

UPS serial number.

Time since startup

Elapsed time since start-up of the UPS.

Boot FW version

Version of MCU boot firmware on the monitor board.

Monitor FW version

Version of MCU application firmware on the monitor board.

DSP FW version

Version of DSP firmware on the UPS power module.

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 Tab

Capacity

This shows the maximum capacity of your UPS model.

Cap. (%)

This shows the percentage of the maximum capacity your UPS is currently using.

Eff. (%)

This shows the efficiency the UPS is currently operating at based on the Cap. (%) value.

Battery Age

This page also displays the following values:

Battery recommended replacement date

This shows the date that it is recommend to replace the battery. It is 5 years from the time the battery was installed.

SOH (%)

This shows the current SOH percentage.

5.3 Editing Display and Operation Settings

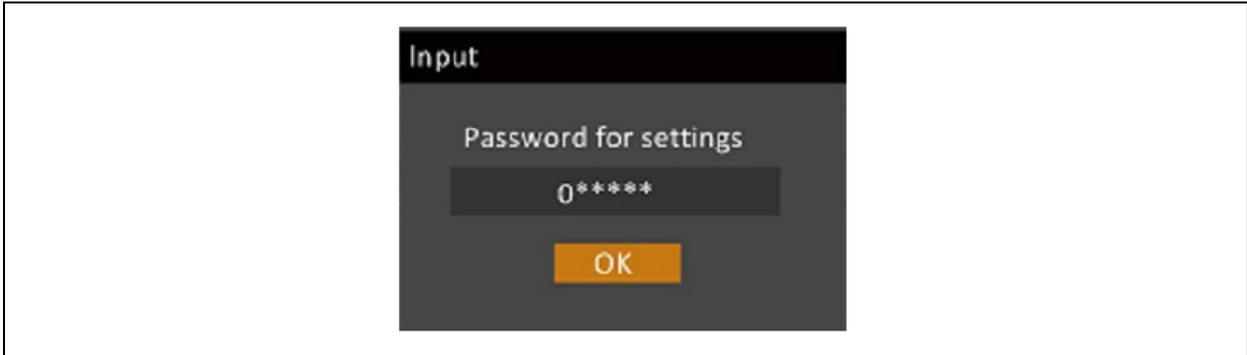
You may adjust the display settings and UPS configuration via the LCD. The display and operation settings are password protected. The default password is 111111 (six ones).

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](#) on the facing page.

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 an operation for which the required conditions are not met. |
| Password changed OK | Appears upon successful change of the Settings password. |

Table 5.5 Display Prompts and Meanings (continued)

| Prompt | Meaning |
|---|---|
| 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.

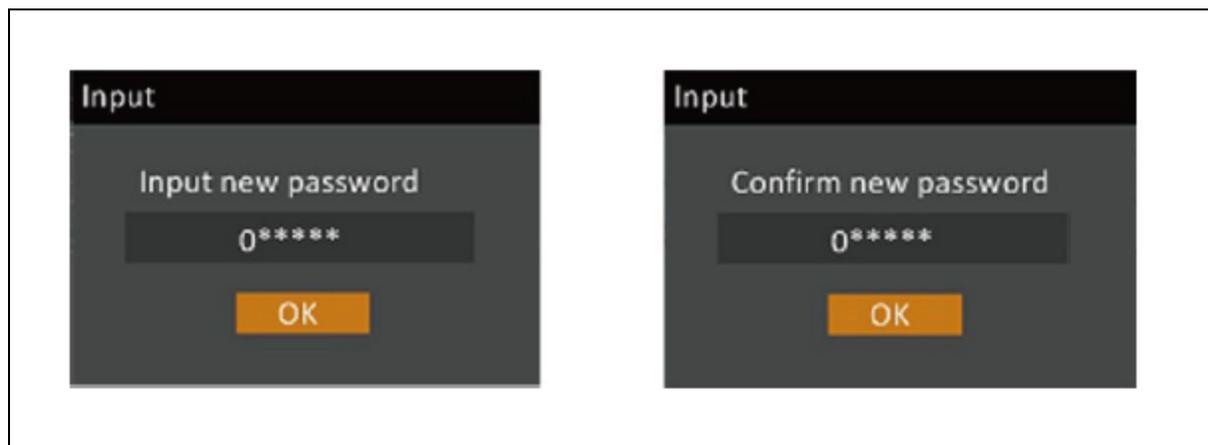
NOTE: We recommend that you change the password from the default to protect your system and equipment. Record the new password and store it in an accessible location for later retrieval.

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 English, French, Portuguese, Spanish, Chinese, German, Japanese, and Russian.

To change the language:

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

All the LCD elements 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 equipment damage, injury and death. A battery can present a risk of electrical shock and high short circuit current.

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 (applicable to a UPS and a remote battery supply not having a grounded supply circuit).

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 electrolyte is toxic and is harmful to skin and eyes. If electrolyte comes into contact with the skin, wash the affected area immediately with plenty of clean water and get medical attention.



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



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

Read all safety cautions before proceeding. A trained user can replace the internal battery pack when the UPS is in a restricted access location (such as a rack or server closet). To obtain the appropriate replacement battery packs, refer to **Table 6.1** on the next page and contact your local dealer or Vertiv representative.

NOTE: EBC batteries are not replaceable. When EBC batteries have aged, please purchase a new EBC of the same part number to replace. Save packaging and return the aged EBCs to Vertiv for recycling or recycle locally.

Table 6.1 Replacement Battery Pack Model Numbers

| UPS Model Number | Battery Pack Model Number | Quantity Required |
|-------------------|---------------------------|-------------------|
| GXT5-750IRT2UXL | GXT5-36VBATKIT | 1 |
| GXT5-750IRT2UXLE | | |
| GXT5-1000IRT2UXL | | |
| GXT5-1000IRT2UXLE | | |
| GXT5-1000IRT2UXLA | | |
| GXT5-1500IRT2UXL | GXT5-48VBATKIT | |
| GXT5-1500IRT2UXLE | | |
| GXT5-1500IRT2UXLA | | |
| GXT5-2000IRT2UXL | | |
| GXT5-2000IRT2UXLE | | |
| GXT5-2000IRT2UXLA | GXT5-72VBATKIT | |
| GXT5-3000IRT2UXL | | |
| GXT5-3000IRT2UXLE | | |
| GXT5-3000IRT2UXLA | GXT5-192VBATKIT | |
| GXT5-5000IRT5UXLN | | |
| GXT5-5000IRT5UXLE | | |
| GXT5-6000IRT5UXLN | | |
| GXT5-6000IRT5UXLE | | |
| GXT5-8000IRT5UXLN | | |
| GXT5-8000IRT5UXLE | | |
| GXT5-10KIRT5UXLN | | |
| GXT5-10KIRT5UXLE | GXT5-384VBATKIT | |
| GXT5-16KIRT9UXLN | | |
| GXT5-16KIRT9UXLE | | |
| GXT5-20KIRT9UXLN | | |
| GXT5-20KIRT9UXLE | | |

To replace a battery pack:

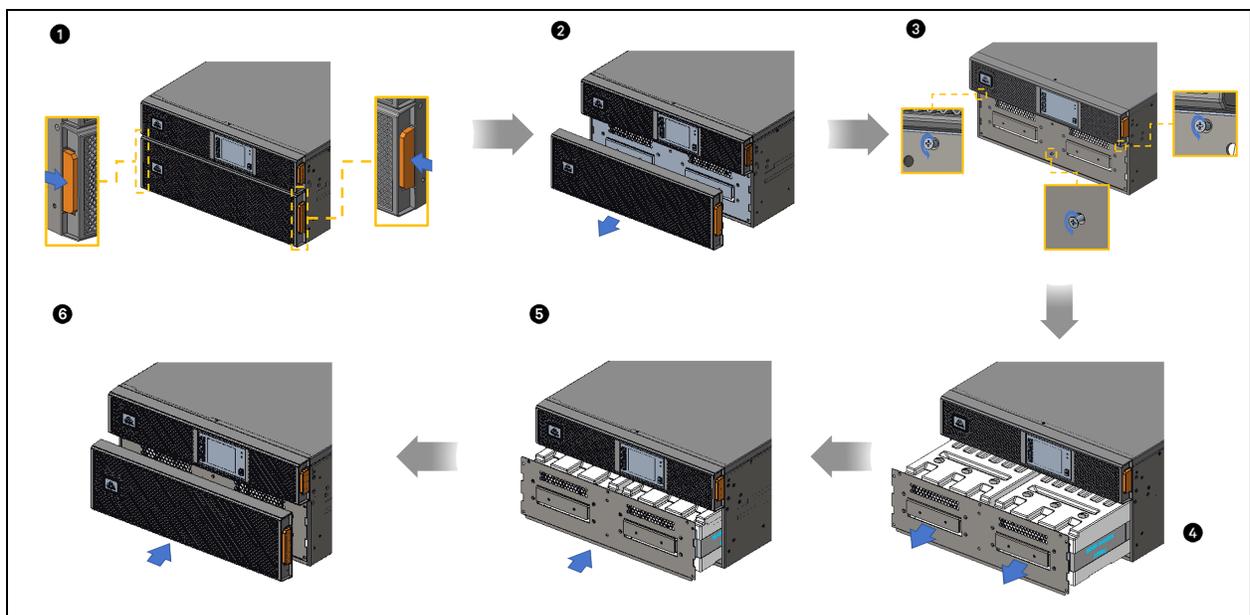
NOTE: The internal battery pack is hot swappable. However, you must exercise caution because; during this procedure, the load is unprotected from disturbances and power outages. Do not replace the battery while the UPS is operating in Battery Mode. This will result in a loss of output power and will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

1. Press the button on the left-front of the UPS front panel, and pull the panel open, then, loosen and remove the screw from the battery door, see **Figure 6.1** below.
2. Lay the cover, battery door, and screw aside for reassembly.
3. Grasp the battery handle, and pull out the battery pack, see **Figure 6.1** below.
4. Unpack the replacement battery pack, taking care not to damage the packaging to re-use when disposing of the old battery.
5. Compare the new and old battery pack to make sure they are the same type and model. If so, proceed with step 6. If they are different, stop and contact your Vertiv representative, or Technical Support, <http://www.Vertiv.com/emea/support/>.
6. Line-up and slowly push-in each replacement battery pack. until 2/3 of the length is in the bay, then lift up and continue to push smoothly until the battery pack is fully inserted in the bay. The battery is fully inserted if the battery door fits flush against the UPS.
7. Re-attach the battery door with the screw, and replace the front cover.
8. Activate the new battery packs using the operating/display panel:

NOTE: The display menus and functions are described in Operation and Display Panel on page 55.

9. From the main menu, select Settings, then the Monitoring tab and verify that the date and time are correct. If the date or time need correction, see [Setting the Date and Time](#) on page 76.
10. Select the Battery tab, use the arrows to select Replace Battery, and press Enter. The replaced battery packs are activated.
11. Use **ESC** to return to the main display.

Figure 6.1 Replacing the Battery Pack



| Item | Description |
|------|---|
| 1 | Press both side buttons on the bezel at the same time |
| 2 | Pull back both bezel one by one |
| 3 | Remove the screws from the plate |
| 4 | Pull out both batteries kits one by one |
| 5 | Insert replacement batteries |
| 6 | Place the screws from the plate |
| 7 | Put back both bezels |

NOTE: When battery replacement for EBC is required replace entire EBC.

NOTE: EBC internal batteries are not user replaceable.

6.2 Charging Batteries

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

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

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](#) on page 55.
2. Check for any alarm or fault indicators on the operation/display panel.
3. Make sure that there are no audible or silenced alarms. Select the Log, and look at the Current tab for alarm and fault history, see [Log Screen](#) on page 69.
4. Check the flow screen to ensure the UPS is operating in Normal mode. If the UPS is operating in Bypass mode, contact Vertiv Technical Support.
5. Check the flow screen to see if batteries are discharging (operating in Battery mode) while utility power is normal. If so, 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 Replacing the UPS from the Power Distribution Box

Use the following procedures to replace the UPS from power distribution box.



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.

1. Transfer the connected equipment to bypass mode.

NOTE: The programmable output receptacles are powered-off when transferred to Bypass mode.

- a. Loosen the upper captive screw over the MBB, see **Figure 6.2** on the next page.
- b. Lift the MBB cover up, and tighten the lower captive screw. The programmable output receptacles are now powered-off.
2. Confirm that the UPS is operating in bypass mode. If not, then manually transfer the connected equipment to bypass as follows:
 - a. Press and hold the **Power** button for 2 seconds..
 - b. Select *Turn to bypass* and press **Enter**.

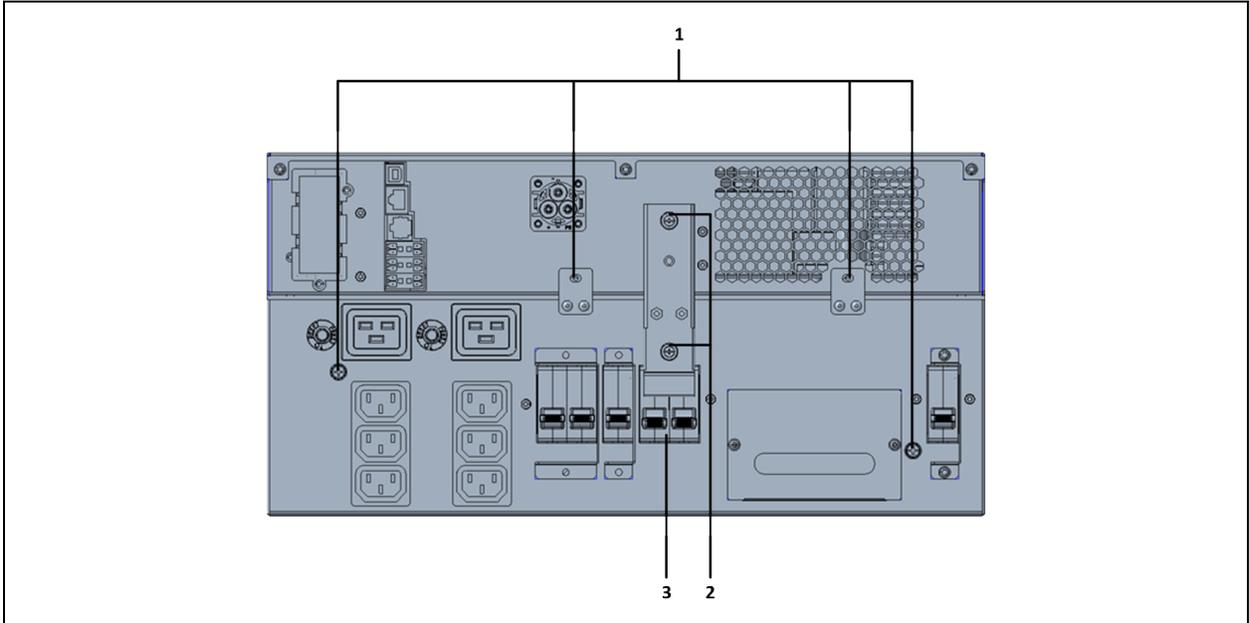
NOTE: The load is unprotected from disturbances in the power supply while the UPS is on bypass.

3. Turn the MBB On.
4. Wait 1 minute if the UPS is working on battery mode, then confirm that the UPS is turned-off.
5. Turn the output and input breakers Off. On 8 kVA and 10 kVA models, also turn off the bypass breaker.
6. Loosen the remaining captive screws until the power distribution boxes releases the UPS.
7. Remove the UPS from power distribution boxes and set it aside.
8. On the rear panel of the new UPS, remove the new power distribution box from the UPS.
9. Mount and connect the new UPS to the old power distribution box and secure with the previously removed screws.
10. Turn ON the input breaker on the rear of the UPS and leave the output breakers OFF. The UPS will begin to startup.
11. Confirm that the UPS is operating in bypass mode. If not, then manually transfer the connected equipment to bypass as follows:
 - a. Press and hold the **Power** button for two seconds.
 - b. Select *Turn to bypass* and press **Enter**.
12. Turn on the output breakers.
13. Power on the UPS by pressing and holding the **Power** button on the operation and display panel until the confirmation dialog appears. Use the Up/Down arrows to select *YES*, then press **Enter**.
14. Turn OFF the maintenance bypass breaker and replace the upper connector cover screw.
15. Use the **Power** button to switch the output to the UPS inverter.

NOTE: The captive screws and MBB cover is similar for all 5 to 10 kVA models. Figure 6.2 on the next page shows an example on the 5 kVA model.

NOTE: Secure only one captive screw on the MBB cover; do not attempt to force the second screw.

Figure 6.2 MBB Cover and Captive Screws



| Item | Description |
|------|------------------------|
| 1 | Captive screws for POD |
| 2 | MBB |
| 3 | Connector cover screws |

6.6 Firmware Updates

Firmware updates are available via the [Vertiv website](#). Firmware update instructions are provided with the firmware download.

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 alarm indicator illuminates, 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 can be activated during different UPS operations. **Table 7.1** below, describes the sounds and their meaning. To silence an alarm, see [Silencing the Audible Alarm](#) on page 51.

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 message is logged. **Table 5.4** on page 69, 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. | Reduce the load and 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 product page at www.vertiv.com for contact information.

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

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

Table 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 output receptacles. Ensure loads are not defective or shorted internally. |
| | Batteries are not charged enough or not connected | Check to ensure the internal battery is connected. If it is not, fully remove and reinstall the battery, and try to start the unit. If the battery is connected, leave the UPS connected to input power for 24 hours to recharge batteries, then try to start the unit. |
| UPS has reduced battery backup time | Batteries are not fully charged | Keep UPS plugged in continuously at least 24 hours to recharge batteries. |
| | UPS is overloaded | Check load level indicator and reduce the load on the UPS. |
| | Batteries may not be able to hold a full charge due to age | Replace batteries. Contact your Vertiv representative or Vertiv Technical Support for replacement battery kit. |

8 Specifications

Table 8.1 UPS Specifications, 750 VA and 1000 VA Models

| Model GXT5 | 750IRT2UXL | 750IRT2UXLE | 1000IRT2UXL | 1000IRT2UXLA | 1000IRT2UXLE |
|-----------------------------|---|-------------|----------------|--------------|--------------|
| Rating | 750 VA/750 W | | 1000 VA/1000 W | | |
| Dimensions, D×W×H, in. (mm) | | | | | |
| Unit | 15.7 x 16.9 x 3.4 (400 x 430 x 85) | | | | |
| Shipping | 24.3 x 22.4 x 10.3 (617 x 570 x 262) | | | | |
| Weight, lb. (kg) | | | | | |
| Unit | 36.3 (16.5) | | | | |
| Shipping | 51.7 (23.5) | 46.2 (21) | 51.7 (23.5) | | 46.2 (21) |
| Input AC | | | | | |
| Voltage (typical) | 230 VAC nominal; variable based on output load | | | | |
| 90% to 100% loading | 168 to 288 VAC | | | | |
| 70% to 90% loading | 150 to 288 VAC | | | | |
| 50% to 70% loading | 115 to 288 VAC | | | | |
| 0 to 50% loading | 115 to 288 VAC | | | | |
| Frequency | 40 Hz to 70 Hz; Auto Sensing | | | | |
| Input Power Cord | C14 | | | | |
| Output AC | | | | | |
| Output Receptacles | C13×8 | | IRAM×3 | C13×8 | |
| Voltage | 200/208/220/230/240 VAC (user configurable); ±3% | | | | |
| Waveform | Sine wave | | | | |
| Utility (AC) Model Overload | >200% for 250 ms 150-200% for 2 seconds 125-150% for 50 seconds 105-125% 60 seconds | | | | |
| Internal Charger | | | | | |
| Charging current | Nominal 2.2 A; Maximum 8 A | | | | |
| Battery | | | | | |
| Type | Valve-regulated, non-spillable, lead acid | | | | |
| Qty×V×Rating | 3 × 12 V × 9.0 Ah | | | | |
| Backup time | See Battery Run Times on page 99. | | | | |
| Recharge Time | 3 Hours to 90% capacity after full discharge with 100% load until UPS auto-shutdown (Internal Batteries Only) | | | | |

Table 8.1 UPS Specifications, 750 VA and 1000 VA Models (continued)

| Model GXT5 | 750IRT2UXL | 750IRT2UXLE | 1000IRT2UXL | 1000IRT2UXLA | 1000IRT2UXLE |
|--|---|-------------|-------------|---|--------------|
| Rating | 750 VA/750 W | | | 1000 VA/1000 W | |
| Environmental Requirements | | | | | |
| Operating Temperature, °F (°C) | Operation temperature (full rating): 32 to 104 (0 to 40) | | | | |
| Extended Operating Temperature, °F (°C) | 32 to 122 (0 to 50); output derated by 1% per 1 °C above 40 °C | | | | |
| Storage Temperature, °F (°C) | 5 °F to 122 °F (-15 °C to 50 °C) (contain batteries will be from -15 to 40 °C) | | | | |
| 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 | <46 dBA max at 3 ft. (1 m) front and sides <43 dBA max at 3 ft. (1 m) rear | | | | |
| Agency | | | | | |
| Safety | 1 IEC 62040-1:2008+A1 | | | EN 62040-1:2008+A1:2013; GS mark; UL 1778 5th Edition and CSA 22.2 No.107.3 | |
| EMC | EN 62040-2:2006 EN 61000-3-2:2014 EN 61000-3-3:2013 | | - | EN 62040-2:2006 EN 61000-3-2:2014 EN 61000-3-3:2013 | |
| Transportation | ISTA Procedure 1A | | - | ISTA Procedure 1A | |
| Surge Immunity | ANSI C62.41 Category B IEC 61000-4-5 | | - | ANSI C62.41 Category B IEC 61000-4-5 | |
| RFI/EMI | CISPR22 Class A | | - | CISPR22 Class A | |
| *For GXT5-1000IRT2UXL—The product fulfils the requirement of IEC 62040-1: 2017+A1:2021, AS 62040.1:2019, EN IEC 62040-1:2019+A11:2021 and BS EN IEC 62040-1:2019+A11:2021. | | | | | |

Table 8.2 UPS Specifications, 1500 VA and 2000 VA Models

| Model GXT5 | 1500IRT2UXL | 1500IRT2UXLA | 1500IRT2UXLE | 2000IRT2UXL | 2000IRT2UXLA | 2000IRT2UXLE |
|------------------------------------|--|--------------|--------------|----------------|--------------|--------------|
| Rating | 1500 VA/1500 W | | | 2000 VA/2000 W | | |
| Dimensions, D×W×H, in. (mm) | | | | | | |
| Unit | 18.5×16.9×3.4 (470×430×85) | | | | | |
| Shipping | 24.3 ×22.4 x 10.3 (617 x 570 x 262) | | | | | |
| Weight, lb.(kg) | | | | | | |
| Unit | 46.2 (21) | | 56.1 (25.5) | 61.6 (28) | | 56.1 (25.5) |
| Shipping | 61.6 (28) | | | | | |
| Input AC | | | | | | |
| Voltage (typical) | 230 VAC nominal; variable based on output load | | | | | |

Table 8.2 UPS Specifications, 1500 VA and 2000 VA Models (continued)

| Model GXT5 | 1500IRT2UXL | 1500IRT2UXLA | 1500IRT2UXLE | 2000IRT2UXL | 2000IRT2UXLA | 2000IRT2UXLE |
|-----------------------------|---|--------------|--------------|----------------|--------------|--------------|
| Rating | 1500 VA/1500 W | | | 2000 VA/2000 W | | |
| 90% to 100% loading | 168 to 288 VAC | | | | | |
| 70% to 90% loading | 150 to 288 VAC | | | | | |
| 50% to 70% loading | 115 to 288 VAC | | | | | |
| 0 to 50% loading | 115 to 288 VAC | | | | | |
| Frequency | 40 Hz to 70 Hz; Auto Sensing | | | | | |
| Input Power Cord | C14 | | | C20 | | |
| Output AC | | | | | | |
| Output Receptacles | C13×8 | IRAM×3 | C13×8 | C13×8 | C13×6 | C13×8 |
| Voltage | 200/208/220/230/240 VAC (user-configurable); ±3% | | | | | |
| Waveform | Sine wave | | | | | |
| Utility (AC) Model Overload | >200% for 250 ms 150-200% for 2 seconds 125-150% for 50 seconds 105-125% 60 seconds | | | | | |
| Internal Charger | | | | | | |
| Charging current | Nominal 1.8 A; Maximum 8 A | | | | | |
| Battery | | | | | | |
| Type | Valve-regulated, non-spillable, lead acid | | | | | |
| Qty×V×Rating | 4 × 12V × 9.0 Ah | | | | | |
| Backup time | See Battery Run Times on page 99. | | | | | |
| Recharge Time | 4 Hours to 90% capacity after full discharge with 100% load until UPS auto-shutdown (Internal Batteries Only) | | | | | |

Table 8.2 UPS Specifications, 1500 VA and 2000 VA Models (continued)

| Model GXT5 | 1500IRT2UXL | 1500IRT2UXLA | 1500IRT2UXLE | 2000IRT2UXL | 2000IRT2UXLA | 2000IRT2UXLE |
|--|---|---------------------|---|--|---|--------------|
| Rating | 1500 VA/1500 W | | | 2000 VA/2000 W | | |
| Environmental Requirements | | | | | | |
| Operating Temperature, °F (°C) | Operating temperature (full rating): 32 to 104 (0 to 40) | | | | | |
| Extended Operating Temperature, °F (°C) | 32 to 122 (0 to 50); output derated by 1% per 1 °C above 40 °C | | | | | |
| Storage Temperature, °F (°C) | -4to +140 (-20 to 60) (contain batteries will be from -15 to 40 °C.) | | | | | |
| 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 | <46 dBA max at 3 ft. (1 m) front and sides <45 dBA max at 3 ft. (1 m) rear | | | <48 dBA max at 3 ft. (1 m) front and sides <48 dBA max at 3 ft. (1 m) rear | | |
| Agency | | | | | | |
| Safety | EN 62040-1:2008+A1:2013; GS mark; UL 1778 5th Edition and CSA 22.2 No.107.3 | IEC 62040-1:2008+A1 | EN 62040-1:2008+A1:2013; GS mark; UL 1778 5th Edition and CSA 22.2 No.107.3 | IEC 62040-1:2008+A1 | EN 62040-1:2008+A1:2013; GS mark; UL 1778 5th Edition and CSA 22.2 No.107.3 | |
| EMC | EN 62040-2:2006 EN 61000-3-2:2014 EN 61000-3-3:2013 | - | EN 62040-2:2006 EN 61000-3-2:2014 EN 61000-3-3:2013 | - | EN 62040-2:2006 EN 61000-3-2:2014 EN 61000-3-3:2013 | |
| Transportation | ISTA Procedure 1A | - | ISTA Procedure 1A | - | ISTA Procedure 1A | |
| Surge Immunity | ANSI C62.41 Category B IEC 61000-4-5 | - | ANSI C62.41 Category B IEC 61000-4-5 | - | ANSI C62.41 Category B IEC 61000-4-5 | |
| RFI/EMI | CISPR22 Class A | - | CISPR22 Class A | - | CISPR22 Class A | |
| *For 2000IRT2UXL —The product fulfils the requirement of IEC 62040-1: 2017+A1:2021, AS 62040.1:2019, EN IEC 62040-1:2019+A11:2021 and BS EN IEC 62040-1:2019+A11:2021. | | | | | | |

Table 8.3 UPS Specifications, 3000 VA Models

| Model GXT5 | 3000IRT2UXL | 3000IRT2UXLA | 3000IRT2UXLE |
|---|---|---------------------|---------------------|
| Rating | 3000 VA/3000 W | | |
| Dimensions, D×W×H, in.(mm) | | | |
| Unit | 21.3 x 16.9 x 3.4 (540 × 430 × 85) | | |
| Shipping | 28.2 x 22.4 x 10.3 (717 x 570 x 262) | | |
| Weight, lb.(Kg) | | | |
| Unit | 62 (28.2) | | |
| Shipping | 79.2 (36) | | 72.6 (33) |
| Input AC | | | |
| Voltage (typical) | 230 VAC nominal; variable based on output load | | |
| 90% to 100% loading | 184 to 288 VAC | | |
| 70% to 90% loading | 161 to 288 VAC | | |
| 50% to 70% loading | 115 to 288 VAC | | |
| 0 to 50% loading | 115 to 288 VAC | | |
| Frequency | 40 Hz to 70 Hz; Auto Sensing | | |
| Input Power Cord | C20 | | |
| Output AC | | | |
| Output Receptacles | C13 x 6 and C19 x 1 | C13 x 6 and C19 x 1 | C13 x 6 and C19 x 1 |
| Voltage | 200/208/220/230/240 VAC (user-configurable); ±3% | | |
| Waveform | Sine wave | | |
| Utility(AC) Model Overload | >200% for 250 ms 150- 200% for 2 seconds 125- 150% for 50 seconds 105-125% 60 seconds | | |
| Internal Charger | | | |
| Charging current | Nominal 1.8 A; Maximum 8 A | | |
| Battery | | | |
| Type | Valve-regulated, non-spillable, lead acid | | |
| Qty×V×Rating | 6 × 12V × 9.0 Ah | | |
| Backup time | See Battery Run Times on page 99. | | |
| Recharge Time | 3 Hours to 90% capacity after full discharge with 100% load until UPS auto-shutdown (Internal Batteries Only) | | |
| Environmental Requirements | | | |
| Operating Temperature, °F (°C) | Operating temperature (full rating): 32 to 104 (0 to 40) | | |
| Extended Operating Temperature, °F (°C) | 32 to 122 (0 to 50); output derated by 1% per 1 °C above 40 °C | | |
| Storage Temperature, °F (°C) | 5 to 122 (-15 to 50) | | |

Table 8.3 UPS Specifications, 3000 VA Models (continued)

| Model GXT5 | 3000IRT2UXL | 3000IRT2UXLA | 3000IRT2UXLE |
|--|--|---------------------|--|
| Rating | 3000 VA/3000 W | | |
| 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 | <48 dBA max at 3 ft. (1 m) front and sides <48 dBA max at 3 ft. (1 m) rear | | |
| Agency | | | |
| Safety | EN 62040-1:2008+A1:2013; GS mark; UL 1778 5th Edition and CSA 22.2 No. 107.3 | IEC 62040-1:2008+A1 | EN 62040-1:2008+A1:2013; GS mark; UL 1778 5th Edition and CSA 22.2 No. 107.3 |
| EMC | EN 62040-2:2006 EN 61000-3-2:2014 EN 61000-3-3:2013 | - | EN 62040-2:2006 EN 61000-3-2:2014 EN 61000-3-3:2013 |
| Transportation | ISTA Procedure 1A | - | ISTA Procedure 1A |
| Surge Immunity | ANSI C62.41 Category B IEC 61000-4-5 | - | ANSI C62.41 Category B IEC 61000-4-5 |
| RFI/EMI | CISPR22 Class A | - | CISPR22 Class A |
| *The product fulfils the requirement of IEC 62040-1:2017+A1:2021, AS 62040.1:2019, EN IEC 62040-1:2019+A11:2021 and BS EN IEC 62040-1:2019+A11:2021. | | | |

Table 8.4 UPS Specifications, 5 kVA and 6 kVA Models

| Model GXT5 | 5000IRT5UXLN | 5000IRT5UXLE | 6000IRT5UXLN | 6000IRT5UXLE |
|---|---|--------------|-----------------------|--------------|
| Rating | 5000 VA/5000 W | | 6000 VA/6000 W | |
| Dimensions, mm (in.) | | | | |
| Unit, W x D x H | 430×630×217 (16.9×24.8×8.5) | | | |
| Shipping, W x D x H | 646×816×520 (25.4×32.1×20.5) | | | |
| Weight, kg (lb) | | | | |
| Unit | 70.8 (156) | | | |
| Shipping | 92 (202.8) | 89 (196.2) | 92 (202.8) | 89 (196.2) |
| Input AC Parameters | | | | |
| Operating Frequency, Nom. | 50 or 60 Hz (factory default is 50 Hz) | | | |
| Factory-default VAC | 230 VAC | | | |
| User-configurable VAC | 200/208/220/230/240 VAC (Adjustable using operation/display configuration options) | | | |
| Operating voltage range without battery operation | 176 – 288 VAC (100 – 176 VAC with power derating) | | | |
| Maximum Allowable VAC | 288 VAC | | | |
| Input frequency without battery operation | 40 – 70 Hz | | | |
| Input Power Connection | PD5-CE6HDWRMBS | | PD5-CE6HDWRMBS | |
| Output AC Parameters | | | | |
| AC-AC Efficiency | 94% | | | |
| Factory-default VAC Frequency | 230 VAC, 50 Hz | | | |
| Output Power Connection | PD5-CE6HDWRMBS | | PD5-CE6HDWRMBS | |
| Waveform | Sine wave | | | |
| Normal Mode Overload | > 150% minimum 200 ms; 125 – 150% for 60 seconds; 105 – 125% for 5 minutes; ≤ 105% continuous | | | |
| Internal Battery Charger | | | | |
| Charger Current, A | 2.25 A default, maximum 5 A | | | |

Table 8.4 UPS Specifications, 5 kVA and 6 kVA Models (continued)

| Model GXT5 | 5000IRT5UXLN | 5000IRT5UXLE | 6000IRT5UXLN | 6000IRT5UXLE |
|---|--|--------------|------------------------------------|--------------|
| Rating | 5000 VA/5000 W | | 6000 VA/6000 W | |
| Battery Parameters | | | | |
| Type | Valve-regulated, non-spillable, lead acid | | | |
| Quantity x Voltage x Rating | 16 x 12V x 9.0 AH | | | |
| Back-up time | See Table 8.16 on page 102. | | See Table 8.17 on page 103. | |
| Upper-limit selections | +10%, +15%, +20%; default +10%. | | | |
| Lower-limit selections | -10%, -15%, -20%; default -15% | | | |
| Disable-bypass operation | When the input frequency prevents synchronous operation. | | | |
| Environmental Parameters | | | | |
| Operating Temperature, °F (°C) | Operating temperature (full rating): 32 to 104 (0 to 40) | | | |
| Extended Operating Temperature, °F (°C) | 32 to 122 (0 to 50); output derated by 1% per 1 °C above 40 °C | | | |
| Storage Temperature, °F (°C) | 5 to 122 (-15 to 50) | | | |
| Relative Humidity | 0 – 95% non-condensing | | | |
| Operating Elevation | Up to 3,000 m (9,842.5 ft) at 25 °C (77 °F) without derating | | | |
| Audible Noise | <55 dBA, at 1 meter from the front, <50 dBA, at 1 meter from rear or sides | | | |
| Agency Parameters | | | | |
| Safety | IEC62040-1:2008 version, GS mark | | | |
| EMI/EMC/C-Tick EMC | IEC/EN/AS 62040-2 2nd Ed (Cat 2 – Table 6) | | | |
| ESD | IEC/EN EN61000-4-2, Level 4, Criteria A Radiated Susceptibility | | | |
| Radiated Susceptibility | IEC/EN EN61000-4-3, Level 3, Criteria A | | | |
| Electrical Fast Transient | IEC/EN EN61000-4-4, Level 4, Criteria A | | | |
| Surge Immunity | IEC/EN EN61000-4-5, Level 4, Criteria A | | | |
| Transportation | ISTA Procedure 1E | | | |

Table 8.5 UPS Specifications, 8 kVA and 10 kVA Models

| Model GXT5 | 8000IRT5UXLN | 8000IRT5UXLE | 10KIRT5UXLN | 10KIRT5UXLE |
|---|--|--------------|----------------------------------|-------------|
| Rating | 8000 VA/8000 W | | 10000 VA/10000 W | |
| Dimensions, mm (in.) | | | | |
| Unit, WxDxH | 430×630×217 (16.9×24.8×8.5) | | | |
| Shipping, WxDxH | 646×816×520 (25.4×32.1×20.5) | | | |
| Weight, kg (lb) | | | | |
| Unit | 74.5 (164.2) | | | |
| Shipping | 95 (209.4) | 93 (205) | 95 (209.4) | 93 (205) |
| Input AC Parameters | | | | |
| Operating Frequency, Nom. | 50 or 60 Hz (factory default is 50 Hz) | | | |
| Factory default VAC | 230 VAC | | | |
| User configurable VAC | 200/208/220/230/240 VAC (Adjustable using operation/display configuration options) | | | |
| Operating voltage range without battery operation | 176 – 288 VAC (100 – 176 VAC with power derating) | | | |
| Maximum Allowable VAC | 288 VAC | | | |
| Input frequency without battery operation | 40 – 70 Hz | | | |
| Input Power Connection | PD5-CE10HDWRMBS | | PD5-CE10HDWRMBS | |
| Output AC Parameters | | | | |
| AC-AC Efficiency | 94.5% | | 95% | |
| Factory default VAC Frequency | 230 VAC, 50 Hz | | | |
| Output Power Connection | PD5-CE10HDWRMBS | | PD5-CE10HDWRMBS | |
| Waveform | Sine wave | | | |
| Main Mode Overload | > 150% minimum 200 ms 125 – 150% for 60 seconds 105 – 125% for 5 minutes ≤ 105% continuous | | | |
| Internal Battery Charger | | | | |
| Charger Current, A | 1.8 A default, maximum 8 A | | | |
| Battery Parameters | | | | |
| Type | Valve-regulated, non-spillable, lead acid | | | |
| Quantity x Voltage x Rating | 16 x 12 V x 9.0 AH | | | |
| Back-up time | See Table 8.8 on page 97. Table 8.18 on page 103 | | See Table 8.9 on page 98. | |
| Upper-limit selections | +10%, +15%, +20%; default +10%. | | | |
| Lower-limit selections | -10%, -15%, -20%; default -15% | | | |
| Disable-bypass operation | When the input frequency prevents synchronous operation. | | | |
| Environmental Parameters | | | | |

Table 8.5 UPS Specifications, 8 kVA and 10 kVA Models (continued)

| Model GXT5 | 8000IRT5UXLN | 8000IRT5UXLE | 10KIRT5UXLN | 10KIRT5UXLE |
|---|--|--------------|------------------|-------------|
| Rating | 8000 VA/8000 W | | 10000 VA/10000 W | |
| Operating Temperature, °F (°C) | Operating temperature (full rating): 32 to 104 (0 to 40) | | | |
| Extended Operating Temperature, °F (°C) | 32 to 122 (0 to 50); output derated by 1% per 1 °C above 40 °C | | | |
| Storage Temperature, °F (°C) | 5 to 122 (-15 to 50) | | | |
| Relative Humidity | 0 – 95% non-condensing | | | |
| Operating Elevation | Up to 3,000 m (9,842.5 ft) at 25 °C (77 °F) without derating | | | |
| Audible Noise | <55 dBA, at 1 meter from the front, <50 dBA, at 1 meter from rear or sides | | | |
| Agency Parameters | | | | |
| Safety | IEC62040-1:2008 version, GS mark | | | |
| EMI/EMC/C-Tick EMC | IEC/EN/AS 62040-2 2nd Ed (Cat 2 – Table 6) | | | |
| ESD | IEC/EN EN61000-4-2, Level 4, Criteria A | | | |
| Radiated Susceptibility | IEC/EN EN61000-4-3, Level 3, Criteria A | | | |
| Electrical Fast Transient | IEC/EN EN61000-4-4, Level 4, Criteria A | | | |
| Surge Immunity | IEC/EN EN61000-4-5, Level 4, Criteria A | | | |
| Transportation | ISTA Procedure 1E | | | |

Table 8.6 UPS Specifications, 16 kVA and 20 kVA Models

| Model GXT5 | 16KIRT9UXLN | 16KIRT9UXLE | 20KIRT9UXLN | 20KIRT9UXLE |
|---|--|---------------|------------------------------------|---------------|
| Rating | 16000 VA/16000 W | | 20000 VA/20000 W | |
| Dimensions, mm (in.) | | | | |
| Unit, W x D x H | 430×630×394 (16.9×24.8×15.5) | | | |
| Shipping, W x D x H | 900×1200×700 (35.4×47.2×27.6) | | | |
| Weight, kg (lb) | | | | |
| Unit | 135.2 (298) | | | |
| Shipping | 190 (418.9) | 186.7 (411.6) | 190 (418.9) | 186.7 (411.6) |
| Input AC Parameters | | | | |
| Operating Frequency, Nom. | 50 or 60 Hz (factory default is 50 Hz) | | | |
| Factory default VAC | 230 VAC | | | |
| User configurable VAC | 200/208/220/230/240 VAC (Adjustable using operation/display configuration options) | | | |
| Operating voltage range without battery operation | 176 – 288 VAC (100 – 176 VAC with power derating) | | | |
| Maximum Allowable VAC | 288 VAC | | | |
| Input frequency without battery operation | 40 – 70 Hz | | | |
| Input Power Connection | Input terminal block | | | |
| Output AC Parameters | | | | |
| AC-AC Efficiency | 95% | | | |
| Factory default VAC Frequency | 230 VAC, 50 Hz | | | |
| Output Power Connection | Output terminal block | | | |
| Waveform | Sine wave | | | |
| Main Mode Overload | > 150% minimum 200 ms; 125 – 150% for 60 seconds 105 – 125% for 5 minutes; ≤ 105% continuous | | | |
| Internal Battery Charger | | | | |
| Charger Current, A | 2.25 A default, maximum 13 A | | | |
| Battery Parameters | | | | |
| Type | Valve-regulated, non-spillable, lead acid | | | |
| Quantity x Voltage x Rating | 32 x 12 V x 9.0 AH | | | |
| Back-up time | See Table 8.20 on page 104. | | See Table 8.21 on page 105. | |
| Upper-limit selections | +10%, +15%, +20%; default +10%. | | | |
| Lower-limit selections | -10%, -15%, -20%; default -15% | | | |
| Disable bypass operation | When the input frequency prevents synchronous operation. | | | |
| Environmental Parameters | | | | |

Table 8.6 UPS Specifications, 16 kVA and 20 kVA Models (continued)

| Model GXT5 | 16KIRT9UXLN | 16KIRT9UXLE | 20KIRT9UXLN | 20KIRT9UXLE |
|--|---|-------------|------------------|-------------|
| Rating | 16000 VA/16000 W | | 20000 VA/20000 W | |
| Operating Temperature, °F (°C) | Operating temperature (full rating): 32 to 104 (0 to 40) | | | |
| Extended Operating Temperature, °F (°C) | 32 to 122 (0 to 50); output derated by 1% per 1 °C above 40 °C | | | |
| Storage Temperature, °F (°C) | 5 to 122 (-15 to 50) | | | |
| Relative Humidity | 0 – 95% non-condensing | | | |
| Operating Elevation | Up to 3,000 m (9,842.5 ft) at 25 °C (77 °F) without derating | | | |
| Audible Noise | <58 dBA, at 1 meter from the front, <51 dBA, at 1 meter from rear or sides | | | |
| Agency Parameters | | | | |
| Safety | IEC62040-1:2008 version, GS mark; UL1778, c-UL listed | | | |
| EMI/EMC/C-Tick EMC | IEC/EN/AS 62040-2 2nd Ed (Cat 2 – Table 6); FCC Part 15 (Class A) CISPR22 Class A (RFI) | | | |
| ESD | IEC/EN EN61000-4-2, Level 4, Criteria A | | | |
| Radiated Susceptibility | IEC/EN EN61000-4-3, Level 3, Criteria A | | | |
| Electrical Fast Transient | IEC/EN EN61000-4-4, Level 4, Criteria A | | | |
| Surge Immunity | IEC/EN EN61000-4-5, Level 4, Criteria A; ANSI C62.41 Category B | | | |
| Transportation | ISTA Procedure 1E | | | |
| *The product fulfills the requirement of IEC 62040-1: 2017+A1:2021, AS 62040.1:2019, EN IEC 62040-1:2019+A11:2021 and BS EN IEC 62040-1:2019+A11:2021. | | | | |

Table 8.7 Power Distribution Specification

| Model Number | PD5-CE6HWRMBS | PD5-CE10HWRMBS |
|--|---|---|
| | PD5-CE6HWRMBSU | PD5-CE10HWRMBSU |
| Amp Rating | 50 A | 63 A |
| Input Power Connection | Single-phase (L-N-G) hard-wired | |
| Output Power Connection | Single-phase (L-N-G) hard-wired | |
| Includes | Two IEC320 C19 16 A/250 V Sockets Six C13 10 A/250 V Sockets | Four IEC320 C19 16 A/250 V Sockets Four C13 10 A/250 V Sockets |
| Input Branch Circuit Breaker, Supplied by User | 50 A | 63 A |

Table 8.8 External Battery Cabinet Specifications, 750 VA to 3000 VA Models

| Model Number | GXT5-EBC36VRT2U | | GXT5-EBC48VRT2U | |
|---|---|--|---|--|
| Used W/UPS Model | 750 – 1,000 VA Models | | 1,500 – 2,000 VA Models | 3,000 VA Models |
| Dimensions, D×W×H, in. (mm) | | | | |
| Unit | 14.6 x 16.9 x 3.3 (370 x 430 x 85) | | 19.7 x 16.9 x 3.3 (497 x 430 x 85) | 23.7 x 16.9 x 3.3 (602 x 430 x 85) |
| Shipping | 24.3 x 22.4 x 10.3 (617 x 570 x 262) | | | |
| Weight, lb.(Kg) | | | | |
| Unit | 48.4 (22) | | 57.3 (28.5) | 97.84 (44.38) |
| Shipping | 91.3 (41.5) | | 86 (41.5) | 104.9 (47.6) |
| Battery | | | | |
| Type | Valve-regulated, non-spillable, lead acid | | | |
| Qty × V | Two parallel strings of three 12 V/9 Ah batteries in series. | | Two parallel strings of four 12 V/9 Ah batteries in series. | Two parallel strings of six 12 V/9 Ah batteries in series. |
| Backup time | See appropriate table for model size in Battery Run Times on page 99. | | | |
| EBC Breaker Size | 50 A | | 63 A | |
| Environmental Requirements | | | | |
| Operating Temperature, °F (°C) | 32 to 104 (0 to 40) | | | |
| Extended Operating Temperature, °F (°C) | 32 to 122 (0 to 50); output derated by 1% per 1 °C above 40 °C | | | |
| Storage Temperature, °F (°C) | 5 to 104 (-15 to 40) High ambient temperatures will reduce battery life | | | |
| Relative Humidity | 0% to 95%, non-condensing | | | |
| Operating Elevation | Up to 10,000 ft. (3000 m) at 77 °F (25 °C) without derating | | | |
| Agency | | | | |
| Safety | EN 62040-1:2008+A1:2013; GS mark; UL 1778 5th Edition and CSA 22.2 No. 107.3 | | | |
| EMC | EN 62040-2:2006 EN 61000-3-2:2014 EN 61000-3-3:2013 | | | |
| Safety | UL 1778 5th Edition and CSA 22.2 No. 107.3 | | | |
| Transportation | ISTA Procedure 1A | | | |
| Surge Immunity | ANSI C62.41 Category B | | | |
| RFI/EMI | FCC Part 15 (Class A) | | | |

Table 8.9 External Battery Cabinet Specifications, 5 kVA to 20 kVA Models

| Model Number | GXT5-EBC192VRT3U | GXT5-EBC384VRT6U |
|---|---|--------------------------------------|
| Used with UPS model | 5 – 10 KVA Models | 16 – 20 KVA Models |
| Dimensions, WxDxH, mm (in.) | | |
| Unit (with bezel) | 430 x 630 x 130 (16.9 x 24.8 x 5.1) | 430 x 630 x 261 (16.9 x 24.8 x 10.3) |
| Shipping | 840 x 670 x 465 (33 x 26.4 x 18.3) | 840 x 670 x 595 (33 x 26.4 x 23.4) |
| Weight, kg (lb) | | |
| Unit | 57.6 (127) | 112 (246.9) |
| Shipping | 80 (176.4) | 136 (299.8) |
| Battery Parameters | | |
| Type | Valve-regulated, non-spillable, lead acid | |
| Quantity x Voltage | 16 x 12 V | 32 x 12 V |
| Back-up Time | See appropriate table for model size in Battery Run Times on the facing page. | |
| EBC Breaker Size | 50 A | 63 A |
| Environmental Parameters | | |
| Operating Temperature, °F (°C) | 32 to 104 (0 to 40) | |
| Extended Operating Temperature, °F (°C) | 32 to 122 (0 to 50); output derated by 1% per 1°C above 40 °C | |
| Storage Temperature, °F (°C) | 5 to 104 (-15 to 40) | |
| Relative Humidity | 0 – 95% non-condensing | |
| Operating Elevation | Up to 3,000 m (9,842.5 ft.) at 25 °C (77 °F) | |
| Agency Parameters | | |
| Safety | IEC62040-1:2008 version, GS mark; UL1778, c-UL listed | |
| Transportation | ISTA Procedure 1E | |

Table 8.10 GXT5 EBC Breaker Sizes

| Extended Battery Cabinet | Extended Battery Cabinet Notes | Size (Capacity) |
|------------------------------|---|-----------------|
| GXT5-EBC36VRT2U 02312369 | 6 PCS 9 AHbatteries ,36 V, one unit can use 10 cabinet in Max | 50 A 1Pin |
| GXT5-EBC36VRT2UE 02312370 | 6 PCS 9 AHbatteries ,36 V, one unit can use 10 cabinet in Max | 50 A 1Pin |
| GXT5-EBC48VRT2U 02312371 | 8 PCS 9 AHbatteries ,48 V,one unit can use 10 cabinet in Max | 63 A 1Pin |
| GXT5-EBC48VRT2UE 02312372 | 8 PCS 9 AHbatteries ,48 V,one unit can use 10 cabinet in Max | 63 A 1Pin |
| GXT5-EBC72VRT2U 02312373 | 12 PCS 9 AHbatteries ,72 V,one unit can use 10 cabinet in Max | 63 A 1Pin |
| GXT5-EBC72VRT2UE 02312374 | 12PCS 9 AHbatteries ,72 V,one unit can use 10 cabinet in Max | 63 A 1Pin |
| GXT5-EBC144VRT2U 02312367 | 12 PCS 9 AHbatteries ,144 V,one unit can use 10 cabinet in Max, Battery Cabinet shipping without internal battery kit | 63 A 2Pin |
| GXT5-EBC288VRT4U 02312368 | 24 PCS 9 AHbatteries 288 V,one unit can use 11 cabinet in Max, Battery Cabinet shipping without internal battery kit | 63 A 2Pin |
| GXT5-EBC192VRT3U 02312376 | 16 PCS 9 AHbatteries ,192 V,one unit can use 10 cabinet in Max, Battery Cabinet shipping with internal battery kit | 63 A 2Pin |
| GXT5-EBC384VRT3U 02312377 | 32 PCS 9 AHbatteries ,384 V,one unit can use 10 cabinet in Max, Battery Cabinet shipping with internal battery kit | 63 A 2Pin |

8.1 Battery Run Times

NOTE: Run times in this table are approximate. Times are based on new, fully charged, standard battery modules at a temperature of 77 °F (25 °C) with 100% resistive UPS loading. Run times listed above can vary by ±5% due to manufacturing variances of the individual batteries.

Table 8.11 Battery Run Time, 750 VA Models

| Load | | | Internal Battery Only | Number of External Battery Cabinets | | | | | | | | | |
|------|-----|-----|-----------------------|-------------------------------------|-------|--------|--------|--------|--------|--------|--------|--------|--------|
| | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| % | VA | W | Minutes | | | | | | | | | | |
| 10 | 75 | 75 | 135.4 | 444.1 | 770.8 | 1123.4 | 1452.2 | 1695.4 | 1863.8 | 1987.3 | 2081.7 | 2156.3 | 2216.6 |
| 20 | 150 | 150 | 68.0 | 229.0 | 401.4 | 581.6 | 760.5 | 952.0 | 1147.8 | 1330.7 | 1499.7 | 1635.5 | 1745.4 |
| 30 | 225 | 225 | 44.1 | 163.7 | 281.7 | 407.9 | 537.8 | 663.9 | 800.6 | 939.7 | 1080.9 | 1221.8 | 1350.2 |
| 40 | 300 | 300 | 33.7 | 127.1 | 218.3 | 316.1 | 416.5 | 519.9 | 620.3 | 724.8 | 833.9 | 944.6 | 1056.5 |

Table 8.11 Battery Run Time, 750 VA Models (continued)

| Load | | | Internal Battery Only | Number of External Battery Cabinets | | | | | | | | | |
|------|-----|-----|-----------------------|-------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 50 | 375 | 375 | 25.7 | 103.2 | 178.9 | 255.9 | 337.1 | 420.2 | 505.5 | 592.1 | 672.6 | 761.7 | 852.0 |
| 60 | 450 | 450 | 20.4 | 84.8 | 149.0 | 212.4 | 280.7 | 350.0 | 420.3 | 492.6 | 565.3 | 631.7 | 706.8 |
| 70 | 525 | 525 | 16.7 | 72.0 | 128.2 | 183.8 | 238.8 | 298.1 | 358.3 | 419.6 | 481.8 | 544.9 | 607.0 |
| 80 | 600 | 600 | 14.1 | 59.7 | 112.1 | 161.6 | 208.6 | 260.6 | 313.2 | 366.4 | 420.4 | 475.8 | 531.1 |
| 90 | 675 | 675 | 12.1 | 53.0 | 99.5 | 143.9 | 188.3 | 232.1 | 278.8 | 326.1 | 374.6 | 423.3 | 473.1 |
| 100 | 750 | 750 | 10.5 | 46.3 | 88.3 | 130.2 | 170.8 | 208.8 | 251.5 | 294.1 | 337.6 | 381.7 | 426.5 |

Table 8.12 Battery Run Time, 1000 VA Models

| Load | | | Internal Battery Only | Number of External Battery Cabinets | | | | | | | | | |
|------|------|------|-----------------------|-------------------------------------|-------|-------|--------|--------|--------|--------|--------|--------|--------|
| | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| % | VA | W | Minutes | | | | | | | | | | |
| 10 | 100 | 100 | 101.8 | 332.7 | 584.9 | 841.2 | 1114.7 | 1373.2 | 1590.9 | 1750.8 | 1873.0 | 1969.6 | 2047.7 |
| 20 | 200 | 200 | 50.1 | 179.8 | 311.9 | 453.2 | 595.8 | 736.7 | 888.2 | 1042.4 | 1199.1 | 1340.5 | 1476.5 |
| 30 | 300 | 300 | 33.7 | 127.1 | 218.3 | 316.1 | 416.5 | 519.9 | 620.3 | 724.8 | 833.9 | 944.6 | 1056.5 |
| 40 | 400 | 400 | 23.8 | 95.8 | 168.9 | 239.3 | 316.4 | 394.3 | 474.5 | 555.3 | 629.9 | 713.6 | 798.3 |
| 50 | 500 | 500 | 17.8 | 76.3 | 135.1 | 193.0 | 251.8 | 314.0 | 377.3 | 443.1 | 506.8 | 573.0 | 632.6 |
| 60 | 600 | 600 | 14.1 | 59.7 | 112.1 | 161.6 | 208.6 | 260.6 | 313.2 | 366.4 | 420.4 | 475.8 | 531.1 |
| 70 | 700 | 700 | 11.5 | 50.7 | 95.3 | 139.4 | 181.7 | 224.1 | 268.6 | 315.0 | 361.0 | 428.6 | 457.6 |
| 80 | 800 | 800 | 9.6 | 43.3 | 83.4 | 120.8 | 160.1 | 197.6 | 235.3 | 275.3 | 316.3 | 357.1 | 399.0 |
| 90 | 900 | 900 | 8.1 | 38.2 | 73.0 | 107.4 | 141.0 | 174.8 | 206.9 | 241.5 | 277.6 | 314.0 | 250.4 |
| 100 | 1000 | 1000 | 6.8 | 33.3 | 62.8 | 94.6 | 125.7 | 156.3 | 187.0 | 216.1 | 248.0 | 280.4 | 313.1 |

Table 8.13 Battery Run Time, 1500 VA Models

| Load | | | Internal Battery Only | Number of External Battery Cabinets | | | | | | | | | |
|------|------|------|-----------------------|-------------------------------------|-------|-------|--------|--------|--------|--------|--------|--------|--------|
| | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| % | VA | W | Minutes | | | | | | | | | | |
| 10 | 150 | 150 | 107.3 | 350.3 | 612.3 | 885.6 | 1173.2 | 1436.2 | 1644.5 | 1797.2 | 1914.0 | 2006.2 | 2080.9 |
| 20 | 300 | 300 | 52.8 | 187.9 | 325.3 | 472.1 | 618.0 | 769.6 | 927.7 | 1089.0 | 124.71 | 1393.8 | 1526.8 |
| 30 | 450 | 450 | 32.7 | 123.9 | 213.1 | 309.0 | 407.6 | 508.2 | 609.2 | 708.8 | 815.3 | 923.4 | 1033.0 |
| 40 | 600 | 600 | 22.2 | 89.2 | 159.1 | 226.4 | 297.8 | 371.9 | 448.5 | 523.5 | 600.5 | 672.1 | 751.6 |
| 50 | 750 | 750 | 16.3 | 70.2 | 125.3 | 179.9 | 234.5 | 292.4 | 341.5 | 411.5 | 472.8 | 533.9 | 596.2 |
| 60 | 900 | 900 | 12.7 | 55.1 | 103.5 | 148.3 | 194.8 | 239.7 | 289.0 | 338.1 | 387.8 | 439.9 | 489.9 |
| 70 | 1050 | 1050 | 10.1 | 44.5 | 85.9 | 125.6 | 165.6 | 203.4 | 234.0 | 285.0 | 326.6 | 369.5 | 412.5 |
| 80 | 1200 | 1200 | 8.2 | 39.6 | 73.8 | 108.4 | 142.3 | 176.3 | 208.4 | 244.0 | 280.4 | 316.9 | 353.6 |
| 90 | 1350 | 1350 | 6.7 | 32.7 | 61.7 | 93.2 | 124.1 | 154.3 | 184.8 | 213.4 | 245.0 | 277.0 | 309.4 |
| 100 | 1500 | 1500 | 5.6 | 28.2 | 54.3 | 83.4 | 111.2 | 138.5 | 165.8 | 192.5 | 218.4 | 246.7 | 275.3 |

Table 8.14 Battery Run Time, 2000 VA Models

| Load | | | Internal Battery Only | Number of External Battery Cabinets | | | | | | | | | |
|------|------|------|-----------------------|-------------------------------------|-------|-------|-------|--------|--------|--------|--------|--------|--------|
| | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| % | VA | W | Minutes | | | | | | | | | | |
| 10 | 200 | 200 | 78.5 | 258.8 | 455.3 | 650.5 | 861.7 | 1078.7 | 1289.4 | 1482.1 | 1636.0 | 1757.5 | 1855.8 |
| 20 | 400 | 400 | 36.2 | 134.8 | 231.0 | 334.0 | 442.2 | 550.0 | 653.9 | 767.6 | 833.1 | 1000.1 | 1118.7 |
| 30 | 600 | 600 | 21.8 | 88.2 | 156.6 | 223.1 | 293.8 | 366.4 | 441.9 | 515.7 | 592.1 | 662.0 | 740.7 |
| 40 | 800 | 800 | 14.8 | 63.7 | 115.9 | 167.7 | 216.8 | 269.8 | 324.8 | 380.4 | 437.8 | 493.7 | 551.2 |
| 50 | 1000 | 1000 | 10.7 | 47.1 | 89.2 | 131.9 | 172.7 | 211.1 | 254.6 | 297.4 | 341.8 | 386.1 | 432.1 |
| 60 | 1200 | 1200 | 8.2 | 38.5 | 73.5 | 108.1 | 141.9 | 175.8 | 208.0 | 243.2 | 279.6 | 316.0 | 352.7 |
| 70 | 1400 | 1400 | 6.3 | 31.0 | 58.9 | 89.2 | 119.1 | 148.5 | 178.3 | 206.2 | 236.1 | 266.8 | 297.8 |
| 80 | 1600 | 1600 | 5.0 | 25.9 | 50.1 | 78.1 | 103.9 | 129.3 | 154.3 | 179.9 | 204.6 | 230.7 | 257.6 |
| 90 | 1800 | 1800 | 4.0 | 22.0 | 42.9 | 66.5 | 88.9 | 113.0 | 136.0 | 158.2 | 180.4 | 202.5 | 225.2 |
| 100 | 2000 | 2000 | 3.2 | 18.8 | 38.1 | 57.1 | 79.8 | 99.9 | 119.3 | 140.7 | 161.0 | 180.6 | 200.6 |

Table 8.15 Battery Run Time, 3000 VA Models

| Load | | | Internal Battery Only | Number of External Battery Cabinets | | | | | | | | | |
|------|------|------|-----------------------|-------------------------------------|-------|-------|-------|--------|--------|--------|---------|--------|--------|
| | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| % | VA | W | Minutes | | | | | | | | | | |
| 10 | 300 | 300 | 78.9 | 260.2 | 457.8 | 654.1 | 866.5 | 1084.9 | 1296.1 | 1488.8 | 164.1.8 | 1762.7 | 1860.5 |
| 20 | 600 | 600 | 36.7 | 136.3 | 233.3 | 337.8 | 447.1 | 556.0 | 660.9 | 775.9 | 892.7 | 1011.1 | 1131.0 |
| 30 | 900 | 900 | 21.9 | 88.4 | 157.2 | 223.8 | 294.7 | 367.6 | 443.3 | 517.4 | 594.0 | 664.2 | 743.1 |
| 40 | 1200 | 1200 | 14.9 | 63.3 | 116.1 | 168.2 | 217.3 | 270.3 | 325.4 | 381.2 | 438.7 | 494.7 | 552.4 |
| 50 | 1500 | 1500 | 10.8 | 47.5 | 89.6 | 132.6 | 173.6 | 212.5 | 256.0 | 299.0 | 343.8 | 388.2 | 434.7 |
| 60 | 1800 | 1800 | 8.3 | 38.8 | 74.2 | 109.0 | 143.0 | 177.1 | 209.4 | 245.5 | 282.0 | 318.7 | 355.6 |
| 70 | 2100 | 2100 | 6.4 | 31.4 | 59.4 | 89.8 | 119.9 | 149.5 | 179.5 | 207.6 | 237.8 | 268.8 | 300.0 |
| 80 | 2400 | 2400 | 5.1 | 26.2 | 50.6 | 78.7 | 104.8 | 130.4 | 155.7 | 181.3 | 206.0 | 232.5 | 259.6 |
| 90 | 2700 | 2700 | 4.1 | 22.4 | 43.3 | 67.6 | 89.7 | 114.2 | 137.5 | 160.2 | 182.6 | 204.5 | 227.9 |
| 100 | 3000 | 3000 | 3.3 | 19.1 | 38.7 | 57.9 | 80.9 | 101.6 | 121.1 | 142.6 | 163.5 | 183.4 | 203.2 |

Table 8.16 Battery Run Time, 5 kVA Models

| Load | | | Internal Battery Only | Number of External Battery Cabinets | | | | | | | | | |
|------|------|------|-----------------------|-------------------------------------|-------|-------|-------|-------|--------|--------|--------|--------|--------|
| | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| % | VA | W | Minutes | | | | | | | | | | |
| 10 | 500 | 500 | 120.0 | 272.5 | 427.5 | 582.5 | 737.5 | 892.5 | 1047.5 | 1202.5 | 1357.5 | 1512.5 | 1667.5 |
| 20 | 1000 | 1000 | 59.0 | 129.0 | 211.0 | 294.0 | 377.0 | 460.0 | 543.0 | 625.5 | 708.5 | 791.5 | 874.5 |
| 30 | 1500 | 1500 | 36.5 | 85.0 | 133.0 | 189.5 | 246.0 | 303.0 | 359.5 | 416.5 | 473.0 | 530.0 | 586.5 |
| 40 | 2000 | 2000 | 25.0 | 62.5 | 99.0 | 136.0 | 179.5 | 222.5 | 266.0 | 309.5 | 353.0 | 396.5 | 439.5 |
| 50 | 2500 | 2500 | 18.5 | 48.0 | 78.0 | 107.5 | 138.0 | 173.0 | 208.0 | 243.0 | 278.0 | 313.5 | 348.5 |
| 60 | 3000 | 3000 | 14.5 | 38.5 | 63.5 | 88.0 | 113.0 | 138.5 | 168.0 | 197.0 | 226.5 | 256.0 | 285.5 |
| 70 | 3500 | 3500 | 11.5 | 31.0 | 53.0 | 74.0 | 95.5 | 117.0 | 139.0 | 164.5 | 189.5 | 214.5 | 240.0 |
| 80 | 4000 | 4000 | 9.5 | 26.0 | 45.0 | 64.0 | 82.5 | 101.0 | 120.0 | 139.5 | 161.5 | 183.5 | 206.0 |
| 90 | 4500 | 4500 | 8.0 | 22.0 | 38.5 | 55.5 | 72.0 | 89.0 | 105.5 | 122.0 | 140.0 | 159.5 | 179.0 |
| 100 | 5000 | 5000 | 7.0 | 19.0 | 33.5 | 49.0 | 64.0 | 79.0 | 94.0 | 109.0 | 124.0 | 140.0 | 158.0 |

Table 8.17 Battery Run Time, 6 kVA Models

| Load | | | Internal Battery Only | Number of External Battery Cabinets | | | | | | | | | |
|------|------|------|-----------------------|-------------------------------------|-------|-------|-------|-------|-------|--------|--------|--------|--------|
| | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| % | VA | W | Minutes | | | | | | | | | | |
| 10 | 600 | 600 | 100.0 | 226.0 | 357.5 | 489.0 | 621.0 | 752.5 | 884.5 | 1016.0 | 1148.0 | 1279.5 | 1411.5 |
| 20 | 1200 | 1200 | 48.0 | 107.0 | 172.0 | 242.0 | 312.0 | 382.0 | 452.0 | 522.0 | 592.0 | 661.5 | 731.5 |
| 30 | 1800 | 1800 | 29.0 | 70.0 | 110.0 | 154.0 | 201.5 | 249.5 | 297.5 | 345.5 | 393.0 | 411.0 | 489.0 |
| 40 | 2400 | 2400 | 19.5 | 50.5 | 81.5 | 112.5 | 145.0 | 181.5 | 218.0 | 254.5 | 291.0 | 327.5 | 364.0 |
| 50 | 3000 | 3000 | 14.5 | 38.5 | 63.5 | 88.0 | 113.0 | 138.5 | 168.0 | 197.0 | 226.5 | 256.0 | 285.5 |
| 60 | 3600 | 3600 | 11.0 | 30.0 | 51.0 | 72.0 | 92.5 | 113.5 | 134.0 | 158.5 | 183.5 | 208.0 | 232.5 |
| 70 | 4200 | 4200 | 9.0 | 24.0 | 42.0 | 60.5 | 78.0 | 96.0 | 113.5 | 131.5 | 152.5 | 173.5 | 194.5 |
| 80 | 4800 | 4800 | 7.5 | 20.0 | 35.5 | 51.5 | 67.0 | 82.5 | 98.5 | 114.0 | 129.5 | 147.5 | 166.0 |
| 90 | 5400 | 5400 | 4.0 | 17.0 | 30.5 | 44.5 | 58.5 | 72.5 | 86.5 | 100.5 | 114.0 | 128.0 | 143.5 |
| 100 | 6000 | 6000 | 5.5 | 14.5 | 26.0 | 39.0 | 51.5 | 64.5 | 77.0 | 89.5 | 102.0 | 114.5 | 127.0 |

Table 8.18 Battery Run Time, 8 kVA Models

| Load | | | Internal Battery Only | Number of External Battery Cabinets | | | | | | | | | |
|------|------|------|-----------------------|-------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
| | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| % | VA | W | Minutes | | | | | | | | | | |
| 10 | 800 | 800 | 75.0 | 166.0 | 267.5 | 369.0 | 471.0 | 572.5 | 674.5 | 776.0 | 878.0 | 979.5 | 1081.0 |
| 20 | 1600 | 1600 | 33.5 | 79.0 | 124.5 | 176.0 | 229.5 | 283.0 | 336.5 | 390.0 | 443.5 | 496.5 | 550.0 |
| 30 | 2400 | 2400 | 19.5 | 50.5 | 81.5 | 112.5 | 145.0 | 181.5 | 218.0 | 254.4 | 291.0 | 327.5 | 364.0 |
| 40 | 3200 | 3200 | 13.0 | 35.0 | 59.0 | 82.0 | 105.5 | 128.5 | 155.0 | 183.0 | 210.5 | 238.0 | 265.5 |
| 50 | 4000 | 4000 | 9.5 | 26.0 | 45.0 | 64.0 | 82.5 | 101.0 | 120.0 | 139.5 | 161.5 | 183.5 | 206.0 |
| 60 | 4800 | 4800 | 7.5 | 20.0 | 35.5 | 51.5 | 67.0 | 82.5 | 98.5 | 114.0 | 129.5 | 147.5 | 166.0 |
| 70 | 5600 | 5600 | 6.0 | 16.0 | 29.0 | 42.5 | 56.0 | 69.5 | 83.0 | 96.5 | 11.0 | 123.5 | 137.5 |
| 80 | 6400 | 6400 | 4.5 | 13.5 | 24.0 | 35.5 | 48.0 | 59.5 | 71.5 | 83.0 | 95.0 | 106.5 | 118.5 |
| 90 | 7200 | 7200 | 4.0 | 11.5 | 20.5 | 30.5 | 41.0 | 52.0 | 62.5 | 73.0 | 83.5 | 94.0 | 104.5 |
| 100 | 8000 | 8000 | 3.5 | 9.5 | 17.5 | 26.5 | 36.0 | 45.5 | 55.5 | 64.5 | 74.0 | 83.5 | 93.0 |

Table 8.19 Battery Run Time, 10 kVA Models

| Load | | | Internal Battery Only | Number of External Battery Cabinets | | | | | | | | | |
|------|-------|-------|-----------------------|-------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| % | VA | W | Minutes | | | | | | | | | | |
| 10 | 1000 | 1000 | 59.0 | 129.0 | 211.0 | 294.0 | 377.0 | 460.0 | 543.0 | 625.5 | 708.5 | 791.5 | 874.5 |
| 20 | 2000 | 2000 | 25.0 | 62.5 | 99.0 | 136.0 | 179.5 | 222.5 | 266.0 | 309.5 | 353.0 | 396.5 | 439.5 |
| 30 | 3000 | 3000 | 14.5 | 38.5 | 63.5 | 88.0 | 113.0 | 138.5 | 168.0 | 197.0 | 226.5 | 256.0 | 285.5 |
| 40 | 4000 | 4000 | 9.5 | 26.0 | 45.0 | 64.0 | 82.5 | 101.0 | 120.0 | 139.5 | 161.5 | 183.5 | 206.0 |
| 50 | 5000 | 5000 | 7.0 | 19.0 | 33.5 | 49.0 | 64.0 | 79.0 | 94.0 | 109.0 | 124.0 | 140.0 | 158.0 |
| 60 | 6000 | 6000 | 5.5 | 14.5 | 26.0 | 39.0 | 51.5 | 64.5 | 77.0 | 89.5 | 102.0 | 114.5 | 127.0 |
| 70 | 7000 | 7000 | 4.0 | 12.0 | 21.0 | 31.5 | 42.5 | 54.0 | 64.5 | 75.0 | 86.0 | 97.0 | 107.5 |
| 80 | 8000 | 8000 | 3.5 | 9.5 | 13.5 | 26.5 | 36.0 | 45.5 | 55.5 | 64.5 | 74.0 | 83.5 | 93.0 |
| 90 | 9000 | 9000 | 2.5 | 8.0 | 15.0 | 22.5 | 30.5 | 39.5 | 48.0 | 56.5 | 65.0 | 73.0 | 81.5 |
| 100 | 10000 | 10000 | 2.0 | 7.0 | 13.0 | 19.5 | 26.5 | 34.5 | 42.0 | 50.0 | 57.5 | 65.0 | 72.5 |

Table 8.20 Battery Run Time, 16 kVA Models

| Load | | | Internal Battery Only | Number of External Battery Cabinets | | | | | | | | | |
|------|-------|-------|-----------------------|-------------------------------------|-------|-------|-------|-------|-------|-------|-------|--------|--------|
| | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| % | VA | W | Minutes | | | | | | | | | | |
| 10 | 1600 | 1600 | 79.0 | 176.0 | 283.0 | 390.0 | 496.5 | 603.5 | 710.5 | 817.5 | 924.0 | 1031.0 | 1138.0 |
| 20 | 3200 | 3200 | 35.0 | 82.0 | 128.5 | 183.0 | 238.0 | 293.0 | 348.0 | 403.5 | 458.5 | 513.5 | 568.5 |
| 30 | 4800 | 4800 | 20.0 | 51.5 | 82.5 | 114.0 | 147.5 | 184.5 | 221.5 | 258.5 | 295.5 | 332.5 | 369.5 |
| 40 | 6400 | 6400 | 13.5 | 35.5 | 59.5 | 83.0 | 106.5 | 130.5 | 157.5 | 185.5 | 213.5 | 241.5 | 269.0 |
| 50 | 8000 | 8000 | 9.5 | 26.5 | 45.5 | 64.5 | 83.5 | 102.5 | 121.5 | 141.5 | 164.0 | 186.5 | 209.0 |
| 60 | 9600 | 9600 | 7.5 | 20.5 | 36.0 | 52.5 | 68.0 | 84.0 | 100.0 | 115.5 | 131.5 | 150.0 | 168.5 |
| 70 | 11200 | 11200 | 6.0 | 16.5 | 29.5 | 43.5 | 57.5 | 71.0 | 84.5 | 98.0 | 112.0 | 125.5 | 140.5 |
| 80 | 12800 | 12800 | 5.0 | 14.0 | 24.5 | 36.5 | 49.0 | 61.0 | 73.0 | 85.0 | 97.0 | 109.0 | 121.0 |
| 90 | 14400 | 14400 | 4.0 | 11.5 | 21.0 | 31.0 | 42.0 | 53.0 | 63.5 | 74.5 | 85.0 | 95.5 | 106.5 |
| 100 | 16000 | 16000 | 3.5 | 10.0 | 18.0 | 27.0 | 36.5 | 46.5 | 56.5 | 66.0 | 75.5 | 85.0 | 94.5 |

Table 8.21 Battery Run Time, 20 kVA Models

| Load | | | Internal Battery Only | Number of External Battery Cabinets | | | | | | | | | |
|------|-------|-------|-----------------------|-------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| % | VA | W | Minutes | | | | | | | | | | |
| 10 | 2000 | 2000 | 62.5 | 136.0 | 222.5 | 309.5 | 396.5 | 483.0 | 570.0 | 645.5 | 743.5 | 830.5 | 917.0 |
| 20 | 4000 | 4000 | 26.0 | 64.0 | 101.0 | 139.5 | 183.5 | 228.0 | 272.5 | 316.5 | 361.0 | 405.0 | 449.5 |
| 30 | 6000 | 6000 | 14.5 | 39.0 | 64.5 | 89.5 | 114.5 | 140.5 | 170.5 | 200.0 | 230.0 | 259.5 | 289.5 |
| 40 | 8000 | 8000 | 9.5 | 26.5 | 45.5 | 64.5 | 83.5 | 102.5 | 121.5 | 141.5 | 164.0 | 186.5 | 209.0 |
| 50 | 10000 | 10000 | 7.0 | 19.5 | 34.5 | 50.0 | 65.0 | 80.5 | 95.5 | 111.0 | 126.0 | 142.5 | 161.0 |
| 60 | 12000 | 12000 | 5.5 | 15.0 | 27.0 | 40.0 | 53.0 | 65.5 | 78.5 | 91.5 | 104.0 | 117.0 | 129.5 |
| 70 | 14000 | 14000 | 4.0 | 12.0 | 21.5 | 32.5 | 43.5 | 55.0 | 66.0 | 76.5 | 87.5 | 98.5 | 109.5 |
| 80 | 16000 | 16000 | 3.5 | 10.0 | 18.0 | 27.0 | 36.5 | 46.5 | 56.5 | 66.0 | 75.5 | 85.0 | 94.5 |
| 90 | 18000 | 18000 | 3.0 | 8.5 | 15.0 | 23.0 | 31.0 | 40.0 | 48.5 | 57.5 | 66.0 | 74.5 | 83.0 |
| 100 | 20000 | 20000 | 2.5 | 7.0 | 13.0 | 19.5 | 27.0 | 34.5 | 42.5 | 50.5 | 58.0 | 66.0 | 73.5 |

Table 8.22 Battery Recharge Time, 0% to 90%, 3 kVA or lower Models

| Number of EBCs | Charging Time to 90% |
|----------------|----------------------|
| 0 EBC | 3 h |
| 1 EBC | 3 h |
| 2 EBC | 5 h |
| 3 EBC | 6 h |
| 4 EBC | 9 h |
| 5 EBC | 11 h |
| 6 EBC | 13 h |
| 7 EBC | 15 h |
| 8 EBC | 17 h |
| 9 EBC | 19 h |
| 10 EBC | 21 h |

Table 8.23 Battery Recharge Time, 0% to 90%, 5-6 kVA Models

| Number of EBCs | Charging Time to 90% |
|----------------|----------------------|
| 0 EBC | 3 h |
| 1 EBC | 3 h |
| 2 EBC | 5 h |
| 3 EBC | 5.7 h |
| 4 EBC | 7.5 h |
| 5 EBC | 10 h |
| 6 EBC | 11 h |
| 7 EBC | 13 h |
| 8 EBC | 15 h |
| 9 EBC | 16 h |
| 10 EBC | 18 h |

Table 8.24 Battery Recharge Time, 0% to 90%, 8-10 kVA Models

| Number of EBCs | Charging Time to 90% |
|----------------|----------------------|
| 0 EBC | 3 h |
| 1 EBC | 3 h |
| 2 EBC | 3 h |
| 3 EBC | 3.5 h |
| 4 EBC | 5 h |
| 5 EBC | 5.5 h |
| 6 EBC | 6 h |
| 7 EBC | 7.5 h |
| 8 EBC | 9 h |
| 9 EBC | 10.5 h |
| 10 EBC | 11 h |

Table 8.25 Battery Recharge Time, 0% to 90%, 16-20 kVA Models

| Number of EBCs | Charging Time to 90% |
|----------------|----------------------|
| 0 EBC | 3 h |
| 1 EBC | 3 h |
| 2 EBC | 3 h |
| 3 EBC | 3 h |
| 4 EBC | 3 h |
| 5 EBC | 3.5 h |
| 6 EBC | 4 h |
| 7 EBC | 5 h |
| 8 EBC | 5.3 h |
| 9 EBC | 5.7 h |
| 10 EBC | 6 h |

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Appendices

Appendix A: Technical Support and Contacts

A.1 Technical Support/Service in the United States

Vertiv Group Corporation

24x7 dispatch of technicians for all products.

1-800-543-2378

Liebert® Thermal Management Products

1-800-543-2378

Liebert® Channel Products

1-800-222-5877

Liebert® AC and DC Power Products

1-800-543-2378

A.2 Locations

United States

Vertiv Headquarters

505 N Cleveland Ave

Westerville, OH 43082

Europe

Via Leonardo Da Vinci 8 Zona Industriale Tognana

35028 Piove Di Sacco (PD) Italy

Asia

7/F, Dah Sing Financial Centre

3108 Gloucester Road, Wanchai

Hong Kong

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SL-70547_REV3_03-24