



Vertiv™ Liebert®

GXT5 UPS

230 V Input, 230 V Output
Installer/User Guide

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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 www.vertiv.com/support (select your regional page) for additional assistance.

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Important Safety Information

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

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Chapter 1: GXT5 Description

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

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

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

1.1. UPS Features and Available Models

The GXT5 includes the following features. [Table 1-1](#) below, lists the available models and power ratings.

- Enhanced load capacity with an output power factor of 1.
- 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 1-1 UPS Models and Power Ratings

| MODEL NUMBER | NOMINAL POWER RATING @ 230 V INPUT |
|-------------------|------------------------------------|
| GXT5-750IRT2UXL* | 750 VA/750 W |
| GXT5-750IRT2UXLE | |
| GXT5-1000IRT2UXL* | 1000 VA/1000 W |
| GXT5-1000IRT2UXLE | |
| GXT5-1500IRT2UXL* | 1500 VA/1500 W |
| GXT5-1500IRT2UXLE | |
| GXT5-2000IRT2UXL* | 2000 VA/2000 W |
| GXT5-2000IRT2UXLE | |

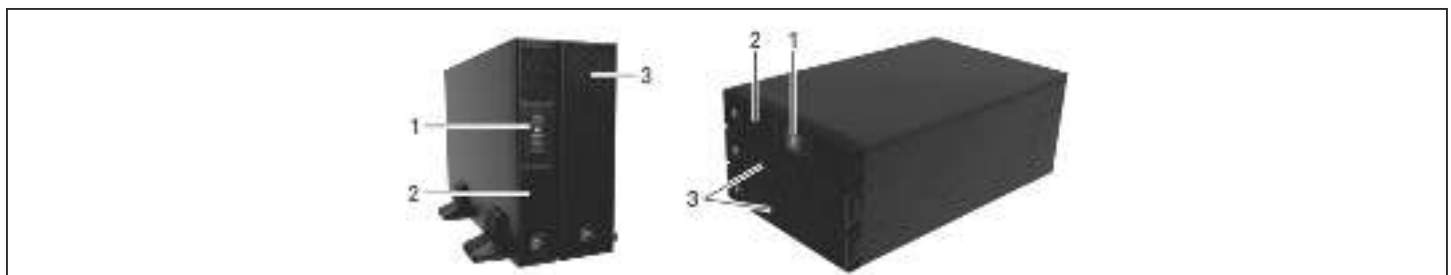
| MODEL NUMBER | NOMINAL POWER RATING @ 230 V INPUT |
|---------------------|------------------------------------|
| GXT5-3000IRT2UXL* | 3000 VA/3000 W |
| GXT5-3000IRT2UXLE | |
| GXT5-3KL620RT2UXL | 3000 VA/2700 W |
| GXT5-3KL630RT2UXL | 3000 VA/3000 W |
| GXT5-5000IRT5UXLN* | 5 kVA/5 kW |
| GXT5-5000IRT5UXLE | |
| GXT5-5000HVRT5UXLN* | |
| GXT5-8000IRT5UXLN* | 8 kVA/8 kW |
| GXT5-8000IRT5UXLE | |
| GXT5-8000HVRT5UXLN* | |
| GXT5-10KIRT5UXLN* | 10 kVA/10 kW |
| GXT5-10KIRT5UXLE | |
| GXT5-10KHVRT5UXLN* | |
| GXT5-16KIRT9UXLN* | 16 kVA/16 kW |
| GXT5-16KIRT9UXLE | |
| GXT5-20KIRT9UXLN* | 20 kVA/20 kW |
| GXT5-20KIRT9UXLE | |

*Only these models are available in the ASIA PACIFIC region.

1.2. Front Panels

The various GXT5 models have the same general appearance, with the main difference being the receptacle types on the rear panel. [Figure 1-1](#) 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.

Figure 1-1 Front View

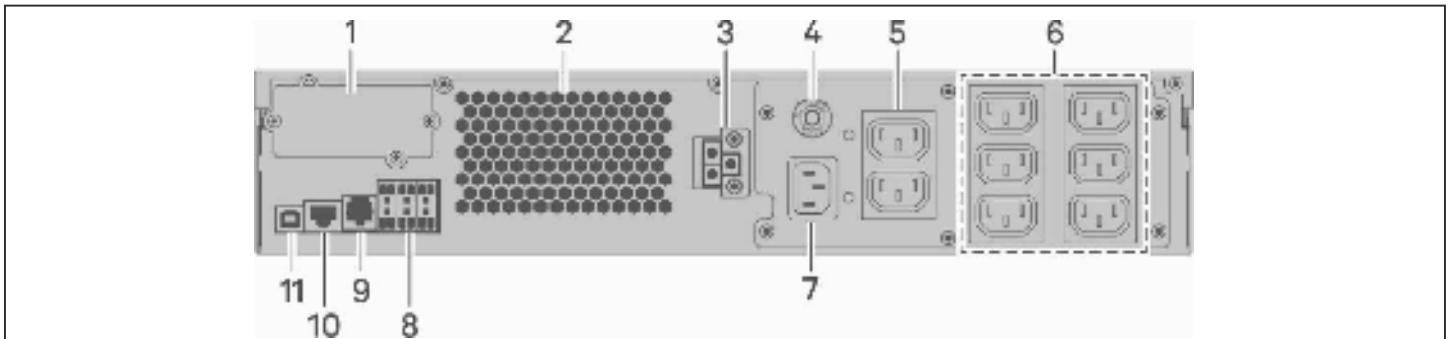


| ITEM | DESCRIPTION |
|------|---------------------------------|
| 1 | Operation/Display panel |
| 2 | Upper bezel |
| 3 | Lower bezel/battery-access door |

1.3. Rear Panels

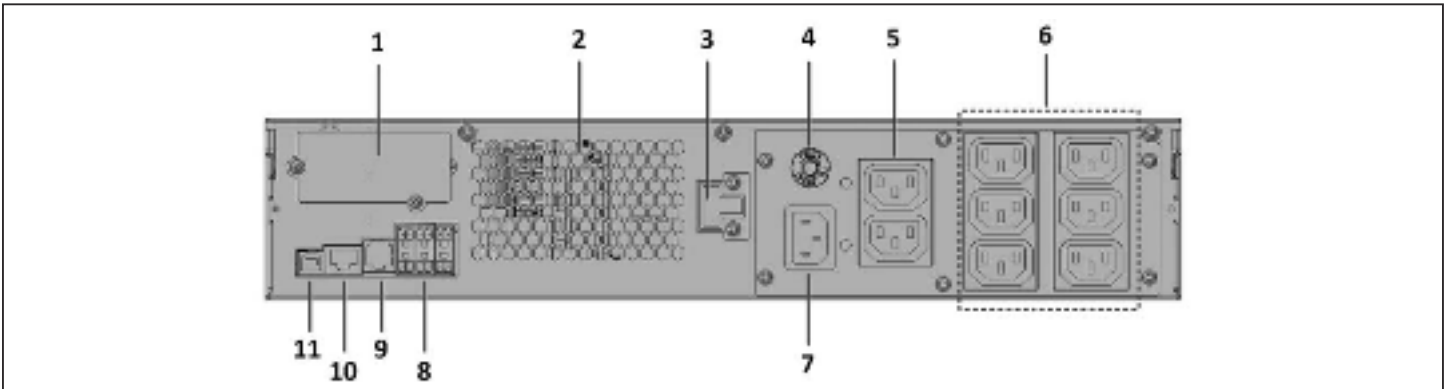
The following figures describe the rear-panel features for each GXT5

model. **Figure 1-2 GXT5-750/1000IRT2UXL (XLE) Rear Panel**

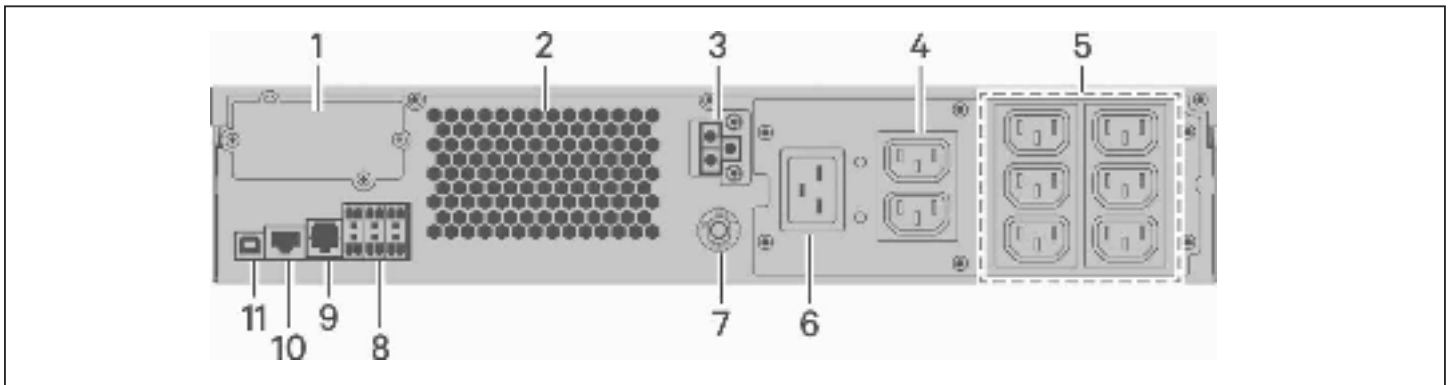


| ITEM | DESCRIPTION |
|------|--|
| 1 | Liebert® IntelliSlot™ port |
| 2 | Ventilation Hole |
| 3 | External-battery-cabinet connector |
| 4 | Input circuit-breaker reset button, 10-A |
| 5 | Non-programmable C13 output receptacles |
| 6 | Programmable C13 output receptacles |
| 7 | C14 input-power 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 1-3 GXT5-1500IRT2UXL (XLE) Rear Panel

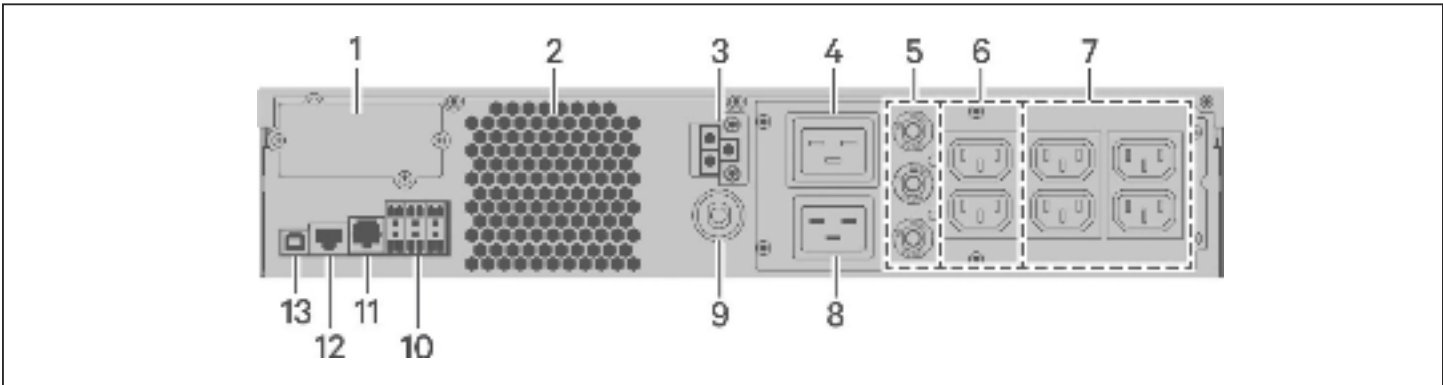


| ITEM | DESCRIPTION |
|------|--|
| 1 | Liebert® IntelliSlot™ port |
| 2 | Ventilation Hole |
| 3 | External-battery-cabinet connector |
| 4 | Input circuit-breaker reset button, 10-A |
| 5 | Non-programmable C13 output receptacles |
| 6 | Programmable C13 output receptacles |
| 7 | C14 input-power 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 |

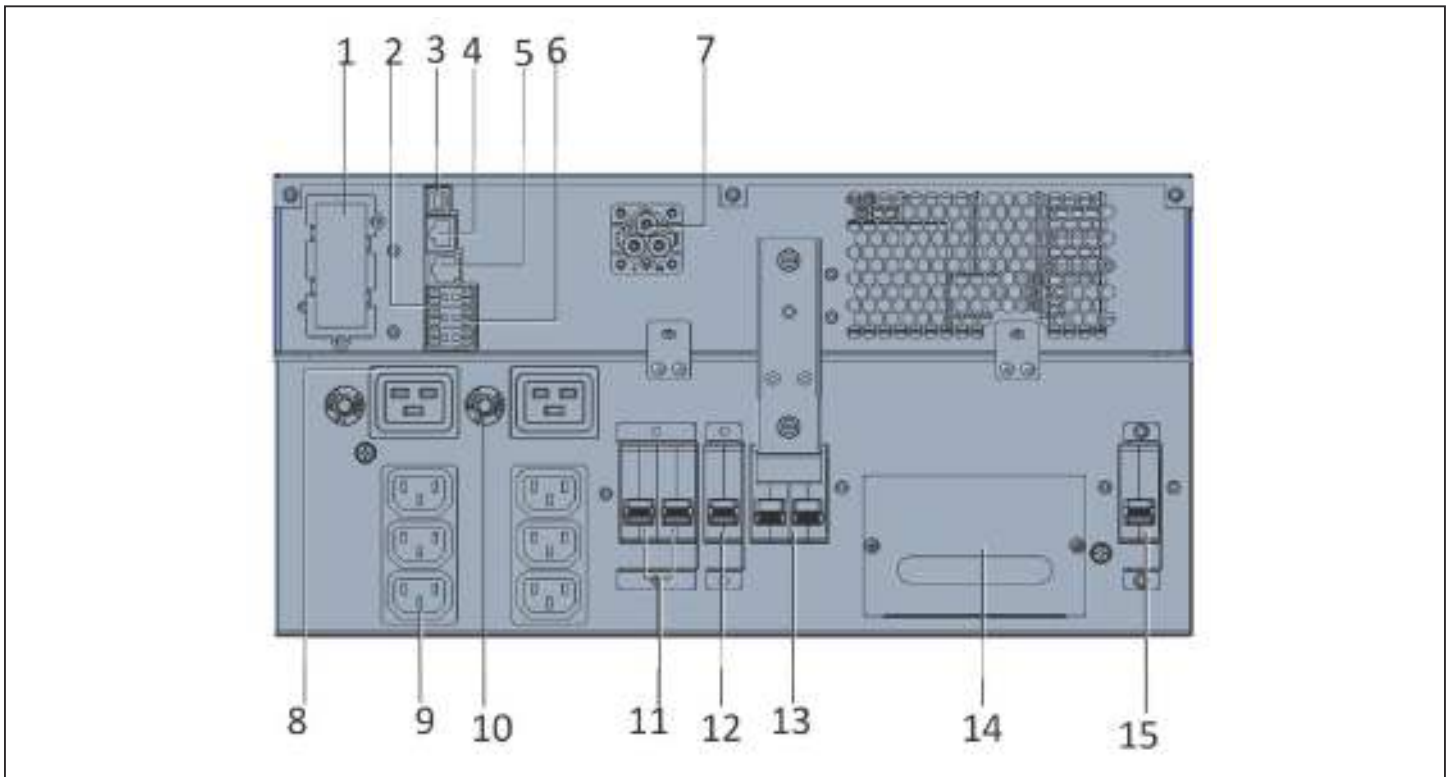
Figure 1-4 GXT5-2000IRT2UXL (XLE) Rear Panel


| ITEM | DESCRIPTION |
|------|--|
| 1 | Liebert® IntelliSlot™ port |
| 2 | Ventilation Hole |
| 3 | External-battery-cabinet 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/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 1-5 GXT5-3000IRT2UXL (XLE) Rear Panel

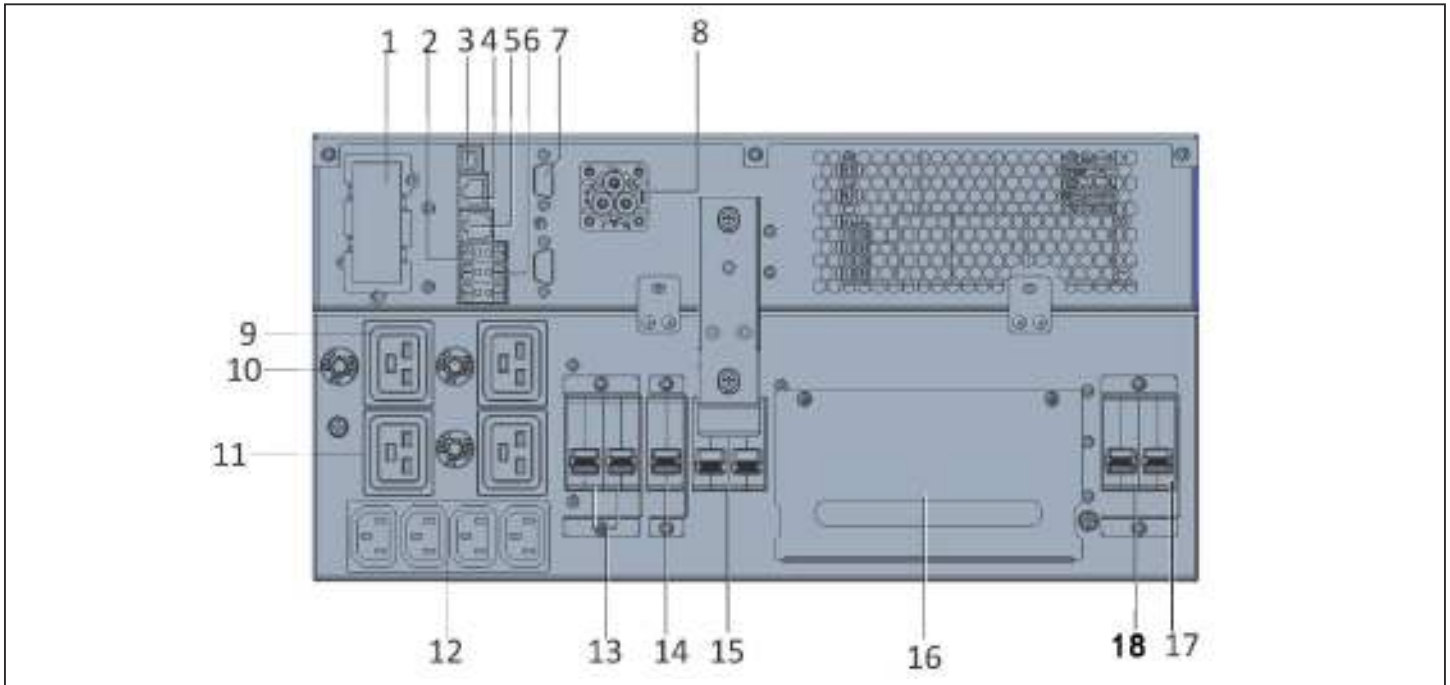


| ITEM | DESCRIPTION |
|------|--|
| 1 | Liebert® IntelliSlot™ port |
| 2 | Ventilation Hole |
| 3 | External-battery-cabinet connector |
| 4 | Non-programmable C19 output receptacle |
| 5 | Output circuit-breaker reset buttons, 10-A |
| 6 | Non-programmable C13 output receptacles |
| 7 | Programmable 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 |

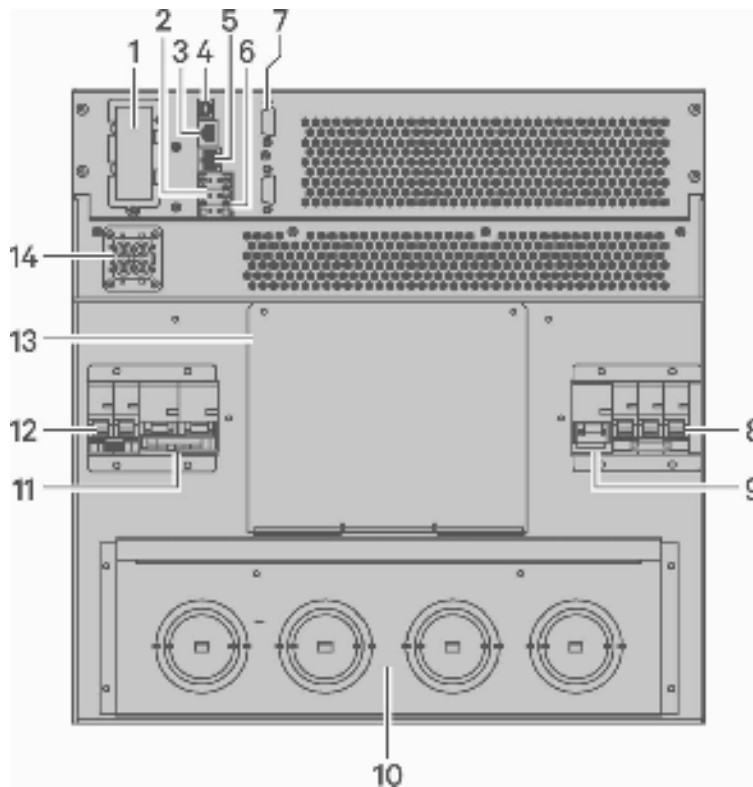
Figure 1-6 GXT5-5000/6000IRT5UXLN (XLE) Rear Panel


| ITEM | DESCRIPTION |
|------|---|
| 1 | 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 | External-battery-cabinet 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 |
| 14 | Removable junction box with cable entry for hard-wire I/O |
| 15 | Input circuit breaker |

Figure 1-7 GXT5-8000/10KIRT5UXLN (XLE) Rear Panel



| ITEM | DESCRIPTION |
|------|--|
| 1 | 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 Section 2.8. Installing a Parallel System |
| 8 | External-battery-cabinet 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 | Maintenance bypass breaker |
| 16 | Removable junction box with cable entry for hard-wire I/O |
| 17 | Input circuit breaker |
| 18 | Bypass circuit breaker |

Figure 1-8 GXT5-16K/20KIRT9UXLN (XLE) Rear Panel


| ITEM | DESCRIPTION |
|------|--|
| 1 | 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 Section 2.8. Installing a Parallel System |
| 8 | Input circuit breaker |
| 9 | Bypass circuit breaker |
| 10 | Knock-outs/cable-entry for hard-wire I/O |
| 11 | Output circuit breaker |
| 12 | POD breaker |
| 13 | Cover for optional POD-installation location |
| 14 | External-battery-cabinet connector |

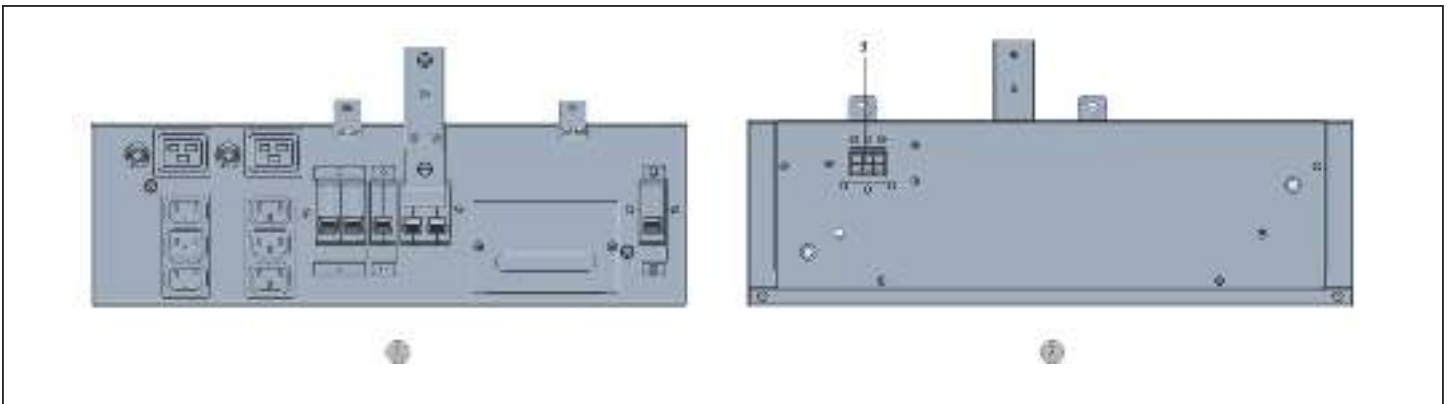
1.4. Removable Power Distribution Box

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

- PD2-108 for models ending in "N" only (North America)
- PD2-200
- PD2-201
- PD2-202
- PD2-204 for models ending in "E" only (European Union)

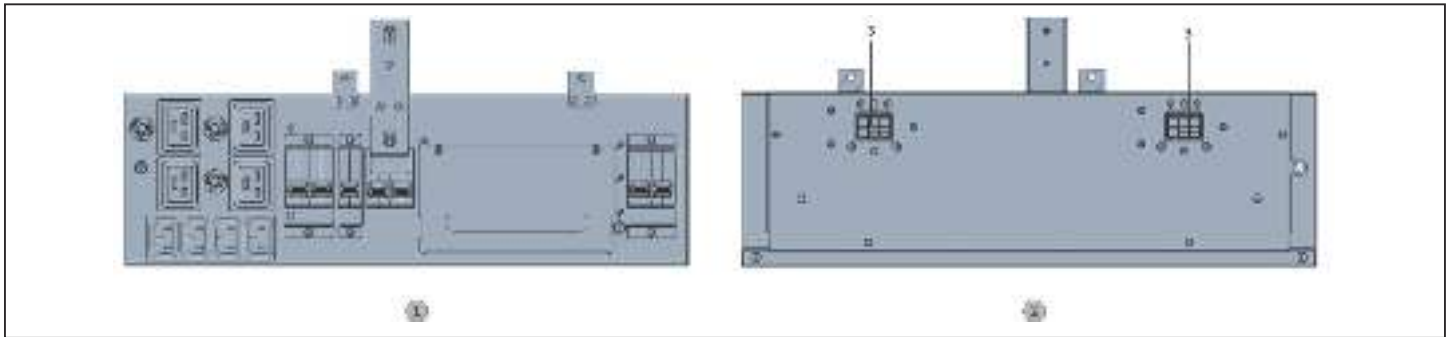
The 5-kVA to 10-kVA models ship with the POD installed. This POD includes the input circuit breaker for the UPS, and the features for each POD are detailed in the following figures.

Figure 1-9 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 |

Figure 1-10 PD5-CE10HDWRMBS for GXT5-8000/10KIRT5UXLN (XLE)

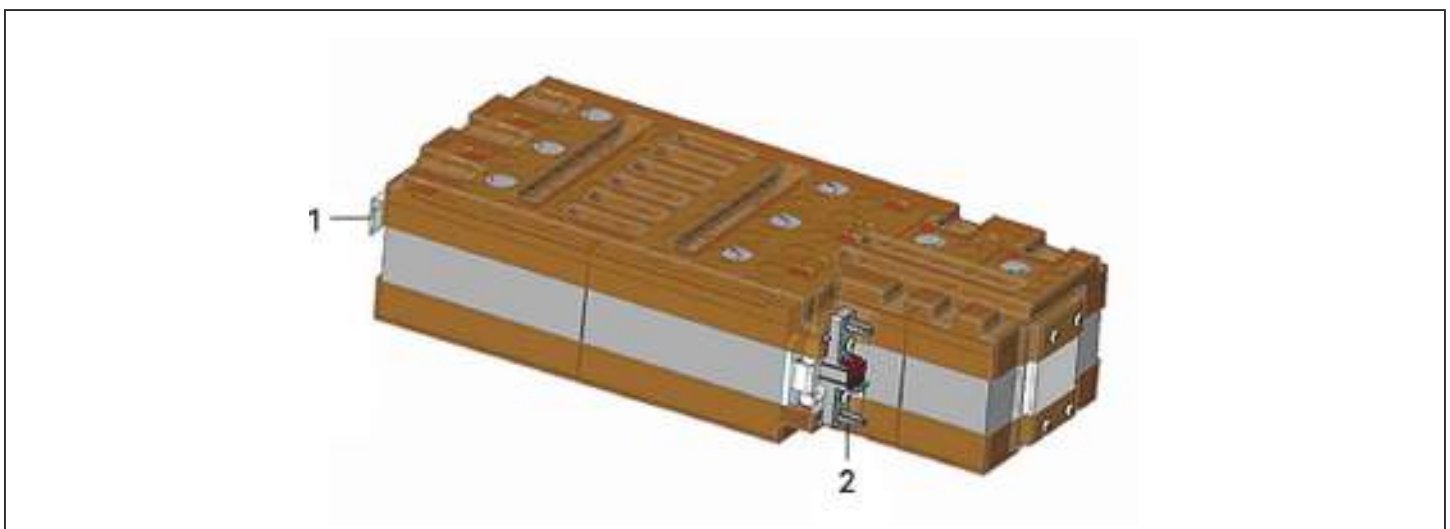


| ITEM | DESCRIPTION |
|------|----------------------------------|
| 1 | POD Panel view (on rear of unit) |
| 2 | POD inner-surface view |
| 3 | Quick connect |

1.5. Internal Battery Packs

An example of the GXT5 internal battery packs is shown in [Figure 1-11](#) 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..

Figure 1-11 Internal Battery Pack

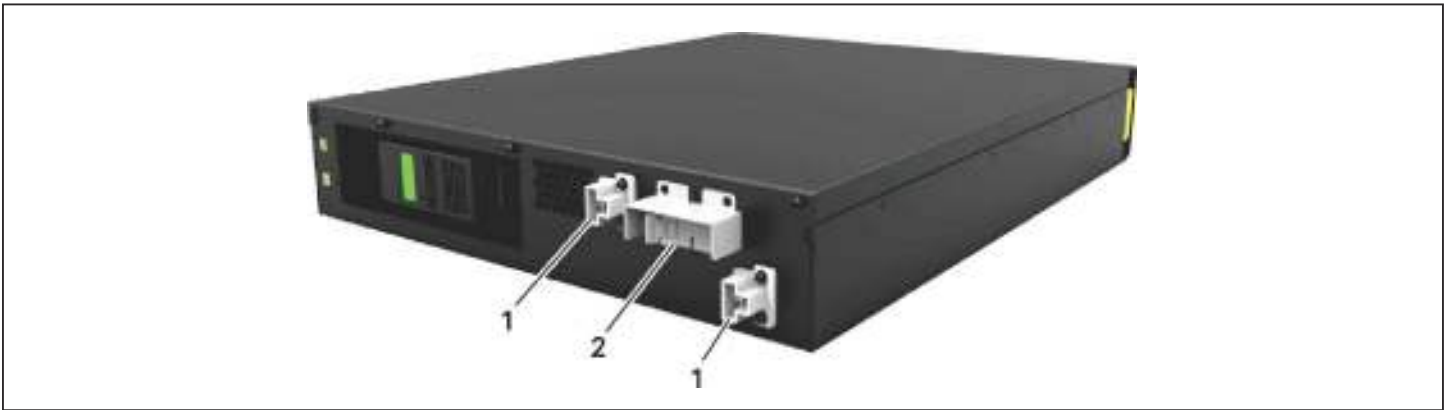


| ITEM | DESCRIPTION |
|------|-------------|
| 1 | Handle |
| 2 | Connector |

1.6. Battery Cabinet

Optional battery cabinets are available for the UPS, and include a single battery-connector cable. Up to 10 battery cabinets can be connected in parallel to the UPS, and up to 6 can be detected using EBC - detection. See [Table 7-8 on page 116](#) and [Table 7-9 on page 117](#) for the cabinet specifications. For approximate battery run times with additional EBCs, see [Battery Run Times on page 118](#). See [Installing External Battery Cabinets on page 26](#), to connect the cabinets.

Figure 1-12 Battery Cabinet



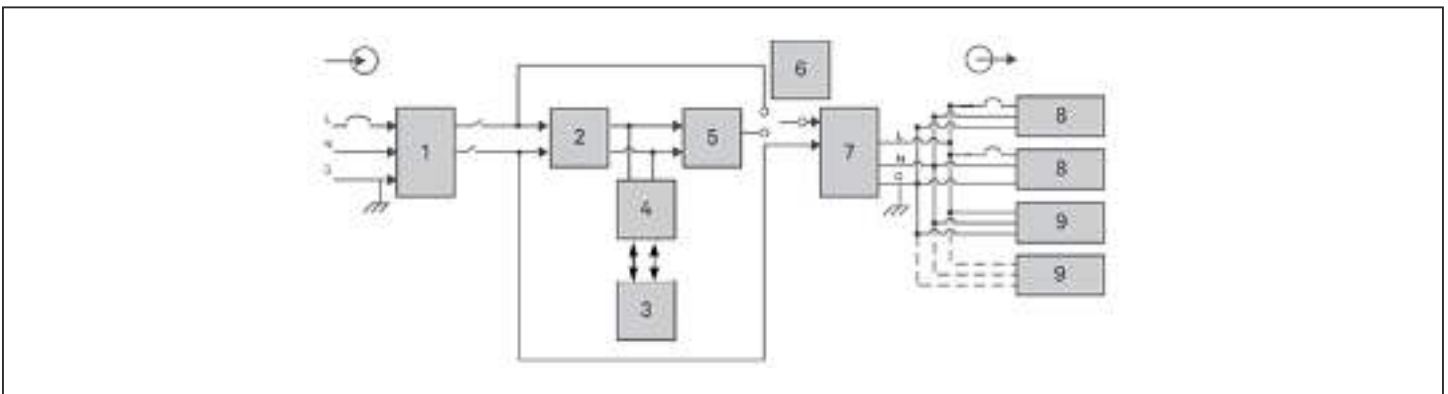
| ITEM | DESCRIPTION |
|------|--------------------|
| 1 | Battery connectors |
| 2 | Isolation breaker |

1.7. Major Internal Components and Operating Principle

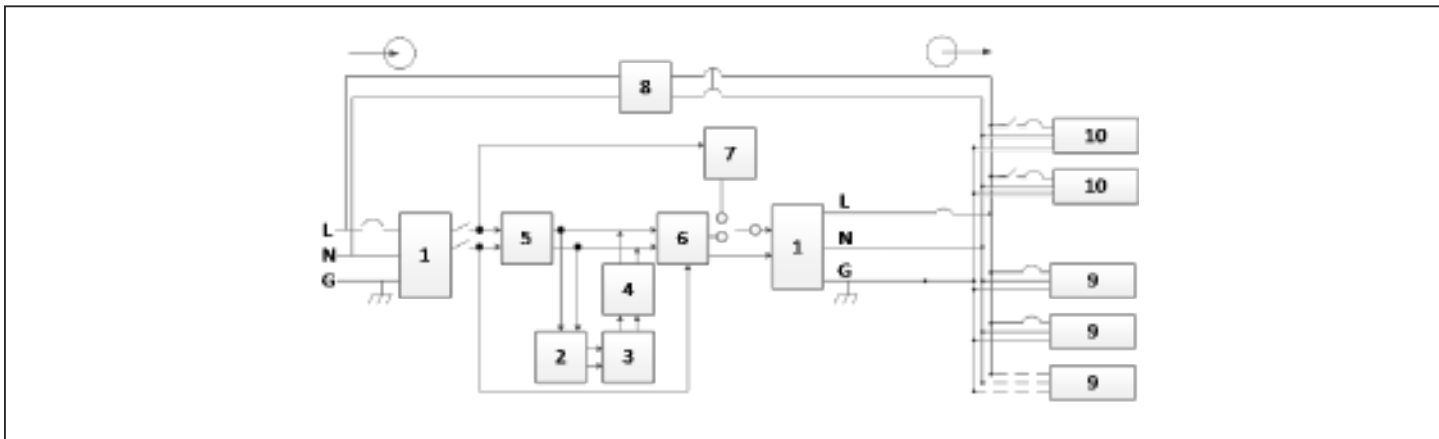
[Figure 1-13](#) below, shows the UPS operating principle. [Table 1-2](#) below describes the function of the major components in the UPS.

Figure 1-13 Basic Operating Principle Diagram

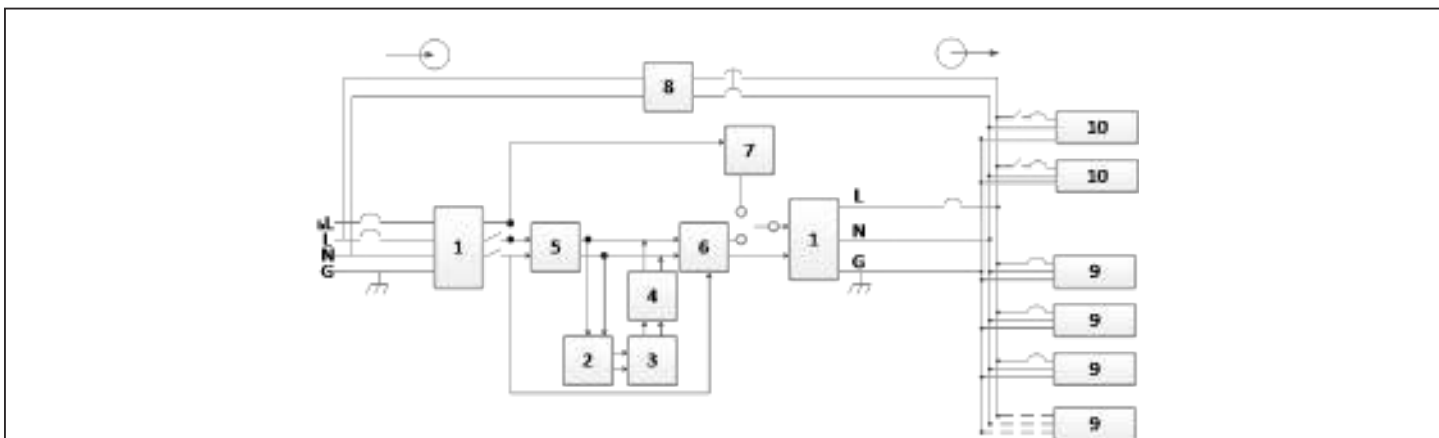
0.75 kVA and 3 kVA models



5 kVA and 6 kVA models



8 kVA and 10 kVA models



16 kVA and 20 kVA models

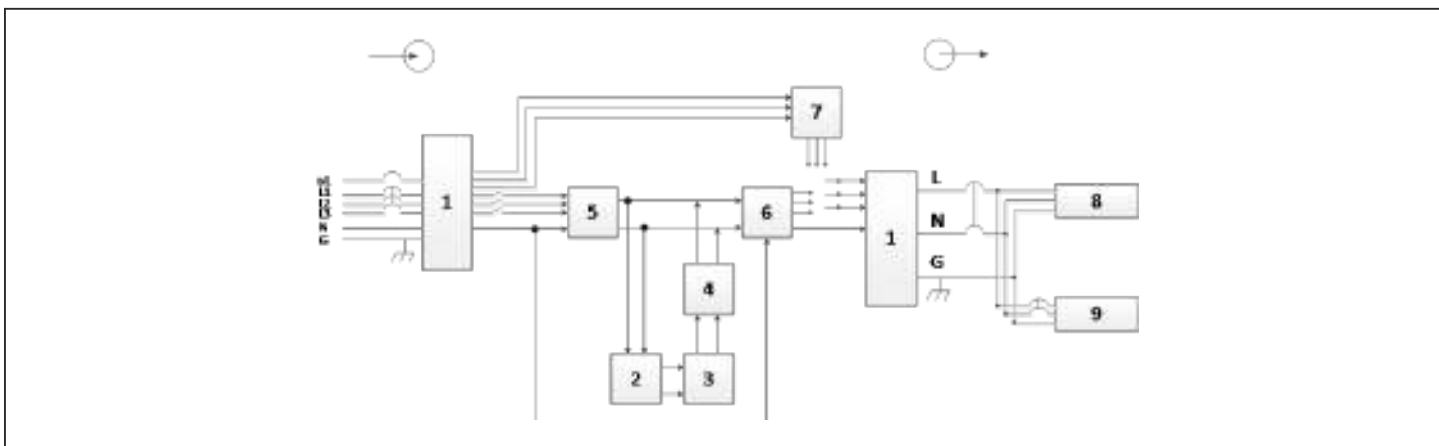


Table 1-2 Major Components (For 0.75 kVA to 3 kVA)

| ITEM | COMPONENT | OPERATION/FUNCTION |
|------|--|---|
| 1 | Transient Voltage Surge Suppression (TVSS) and EMI/RFI Filters | Provide surge protection. Filter electromagnetic interference (EMI) and radio frequency interference (RFI). Minimize surges or interference present in the utility power and protect devices connected on the same branch as the UPS. |
| 2 | Rectifier/Power Factor Correction (PFC) Circuit | In normal operation, converts utility AC power to regulated DC power for use by the inverter while ensuring that the wave shape of the input current used by the UPS is near ideal. Extracting this sine-wave input current ensures efficient use of utility power and reduces reflected harmonic distortion making cleaner power available to devices that are not protected by the UPS. |
| 3 | Batteries | Valve-regulated, non-spillable, lead-acid batteries. NOTE: To maintain battery design life, operate the UPS in an ambient temperature of 59°F to 77°F (15°C to 25°C). |
| 4 | DC-to-DC Converter | Raises the DC voltage from the battery to the optimum operating voltage for the inverter. This allows the inverter to operate continuously at its optimum efficiency and voltage, thus increasing reliability. Convert the bus voltage to the battery port to charge the battery |
| 5 | Inverter | In normal operation, inverts the DC output of the PFC circuit into precise, regulated sine-wave AC power. When utility power fails, the inverter receives DC power from the DC-to-DC converter. In either operating mode, the UPS inverter remains on-line, generating clean, precise, regulated AC-output power. |
| 6 | Dynamic Internal Bypass | In the unlikely event of UPS failure such as overload or over-temperature, automatically transfers the connected load to bypass. To manually transfer the connected load from inverter to bypass, see Transferring from Normal to Bypass Mode on page 50 |
| 7 | EMI/RFI Filters | Filter electromagnetic interference (EMI) and radio frequency interference (RFI). Minimize interference present in the utility power and protect devices connected on the same branch as the UPS. |
| 8 | Outlet group | Programmable output receptacles. |
| 9 | Outlet group | General output receptacles. |

Table 1-3 Major Components (For 5 kVA to 10 kVA)


| ITEM | COMPONENT | OPERATION/FUNCTION |
|------|---|---|
| 1 | Transient Voltage Surge | Provide surge protection. Filter electromagnetic interference (EMI) and radio frequency interference (RFI). Minimize surges or interference present in the utility power and protect devices connected on the same branch as the UPS. |
| 2 | Battery Charger | Regulates input AC power to continuously float-charge the batteries are charges when the UPS is plugged in, even when not powered-on. |
| 3 | Batteries | Valve-regulated, non-spillable, lead-acid batteries. NOTE: To maintain battery design life, operate the UPS in an ambient temperature of 59 °F to 77 °F (15 °C to 25 °C). |
| 4 | DC-to-DC Converter | Raises the DC voltage from the battery to the optimum operating voltage for the inverter. This allows the inverter to operate continuously at its optimum efficiency and voltage, thus increasing reliability. |
| 5 | Rectifier/Power Factor Correction (PFC) Circuit | In normal operation, converts utility AC power to regulated DC power for use by the inverter while ensuring that the wave shape of the input current used by the UPS is near ideal. Extracting this sine-wave input current ensures efficient use of utility power and reduces reflected harmonic distortion making cleaner power available to devices that are not protected by the UPS. |
| 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 50 |
| 8 | Maintenance bypass | Maintenance bypass keeps connected equipment powered with utility power and allows replacement of the UPS in the event of a UPS malfunction. |
| 9 | Outlet group | Output receptacles and terminal block. |
| 10 | Programmable output | Output receptacles |

Table 1-4 Major Components (For 16 kVA to 20 kVA)

| ITEM | COMPONENT | OPERATION/FUNCTION |
|------|--|---|
| 1 | Transient Voltage Surge Suppression (TVSS) and EMI/RFI Filters | Provide surge protection. Filter electromagnetic interference (EMI) and radio frequency interference (RFI). Minimize surges or interference present in the utility power and protect devices connected on the same branch as the UPS. |
| 2 | Battery Charger | Regulates input AC power to continuously float-charge the batteries. Batteries are charged when the UPS is plugged in, even when not powered-on. |
| 3 | Batteries | Valve-regulated, non-spillable, lead-acid batteries. NOTE: To maintain battery design life, operate the UPS in an ambient temperature of 59 °F to 77 °F (15 °C to 25 °C). |
| 4 | DC-to-DC Converter | Raises the DC voltage from the battery to the optimum operating voltage for the inverter. This allows the inverter to operate continuously at its optimum efficiency and voltage, thus increasing reliability. |
| 5 | Rectifier/Power Factor Correction (PFC) Circuit | In normal operation, converts utility AC power to regulated DC power for use by the inverter while ensuring that the wave shape of the input current used by the UPS is near ideal. Extracting this sine-wave input current ensures efficient use of utility power and reduces reflected harmonic distortion making cleaner power available to devices that are not protected by the UPS. |
| 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 50 |
| 8 | Outlet group | Output receptacles |
| 9 | Optional POD output | Output receptacles |

1.7.1. 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.

| | |
|---|--|
|  | <ul style="list-style-type: none"> • <i>The bypass power path does not protect the connected equipment from disturbances in the utility power supply.</i> |
|---|--|

1.8. UPS States and Operating Modes

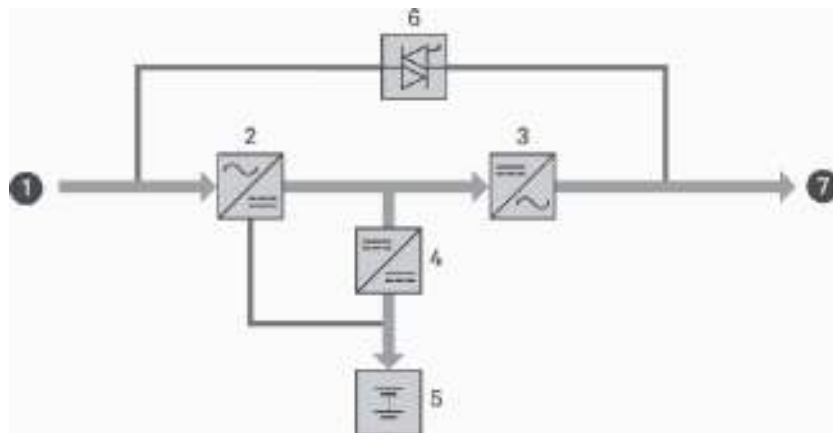


- See [LED Indicators on page 54](#), for description of the run-indicator and alarm-indicator LEDs mentioned this section.

1.8.1. 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 1-14](#) shows the diagram of normal mode.

Figure 1-14 Normal-mode Operation



| ITEM | DESCRIPTION |
|------|-------------------------------------|
| 1 | Mains/Utility input (by-pass input) |
| 2 | Rectifier/PFC |
| 3 | Inverter |
| 4 | Battery charger |
| 5 | Battery |
| 6 | Bypass static switch |
| 7 | UPS output |

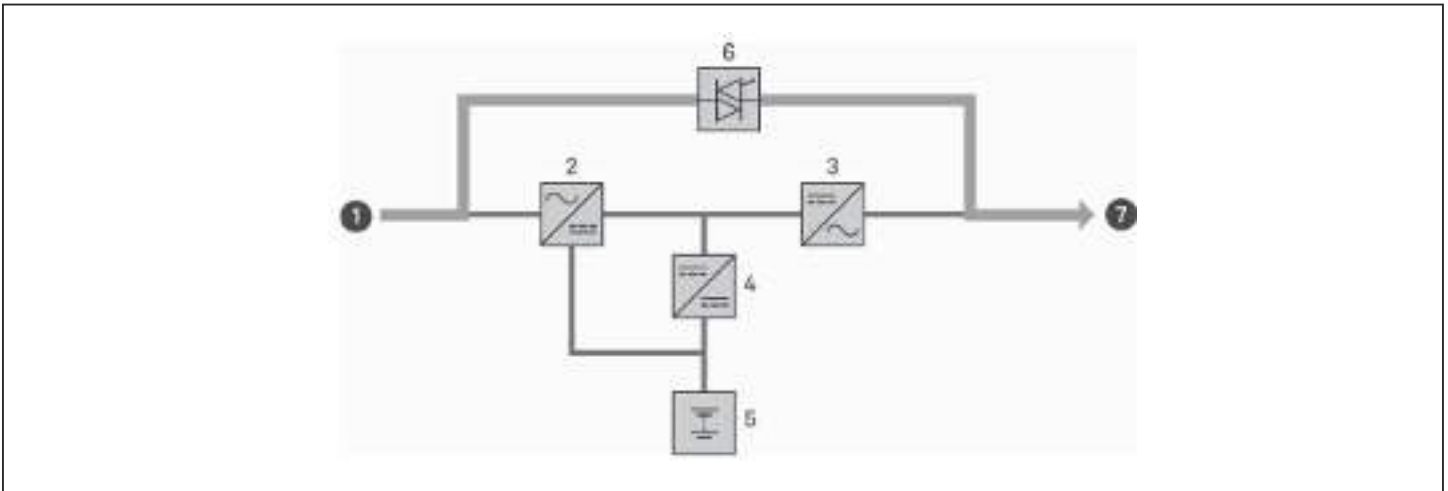
1.8.2. Bypass Mode

Bypass mode supplies power to the load from the bypass source (utility power) if an overload or fault occurs during normal operation. On the front-panel display, the run indicator (green) is ON, the alarm indicator (yellow) is ON, and the buzzer beeps once each seconds. The LCD “Flow” screen displays “On Bypass.” **Figure 1-15.** shows the diagram of bypass mode.



- 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 1-15 Bypass-mode Operation




| ITEM | DESCRIPTION |
|------|-------------------------------------|
| 1 | Mains/Utility input (by-pass input) |
| 2 | Rectifier/PFC |
| 3 | Inverter |
| 4 | Battery charger |
| 5 | Battery |
| 6 | Bypass static switch |
| 7 | UPS output |

1.8.3. 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 1-16** shows the diagram of battery mode.

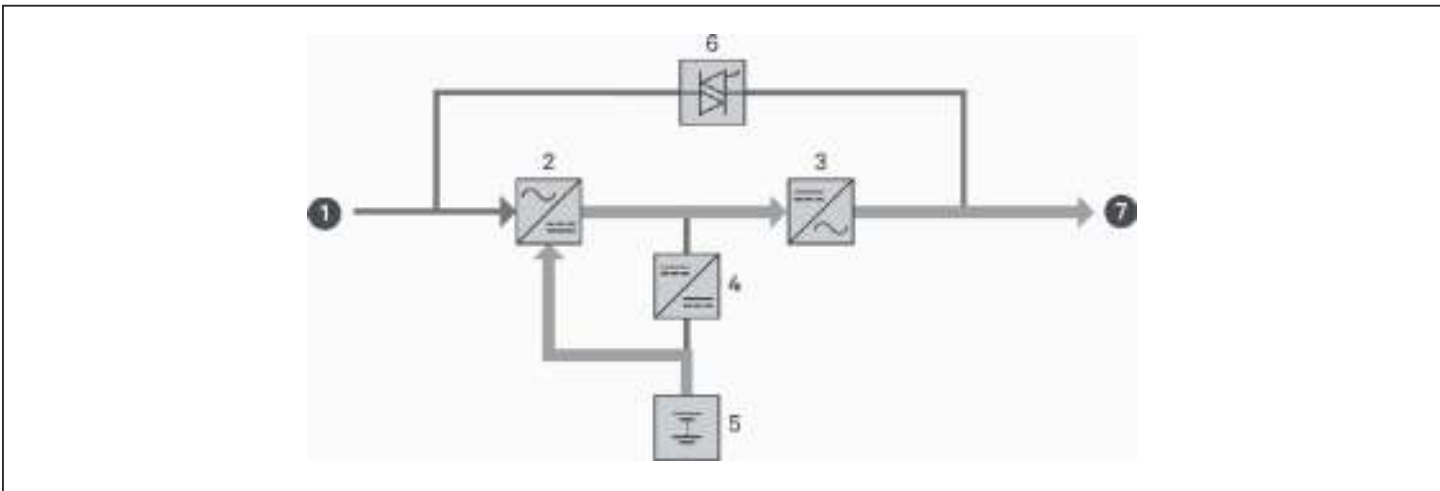


- *The batteries are fully-charged before shipment. However, transportation and storage inevitably cause some loss of capacity. To ensure adequate back-up time, it is recommended to charge the batteries for at least 8 hours before first start-up.*



- *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 1-16 Battery-mode Operation



| ITEM | DESCRIPTION |
|------|-------------------------------------|
| 1 | Mains/Utility input (by-pass input) |
| 2 | Rectifier/PFC |
| 3 | Inverter |
| 4 | Battery charger |
| 5 | Battery |
| 6 | Bypass static switch |
| 7 | UPS output |

1.8.4. ECO Mode

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



- *ECO mode is only available for a single UPS system*



- *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.*

1.8.5. Maintenance Bypass Mode

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



- *5-kVA to 10-kVA models include a circuit breaker to switch the load to bypass. On 16-kVA to 20-kVA-models, a dry contact may be used to trigger maintenance bypass.*

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.

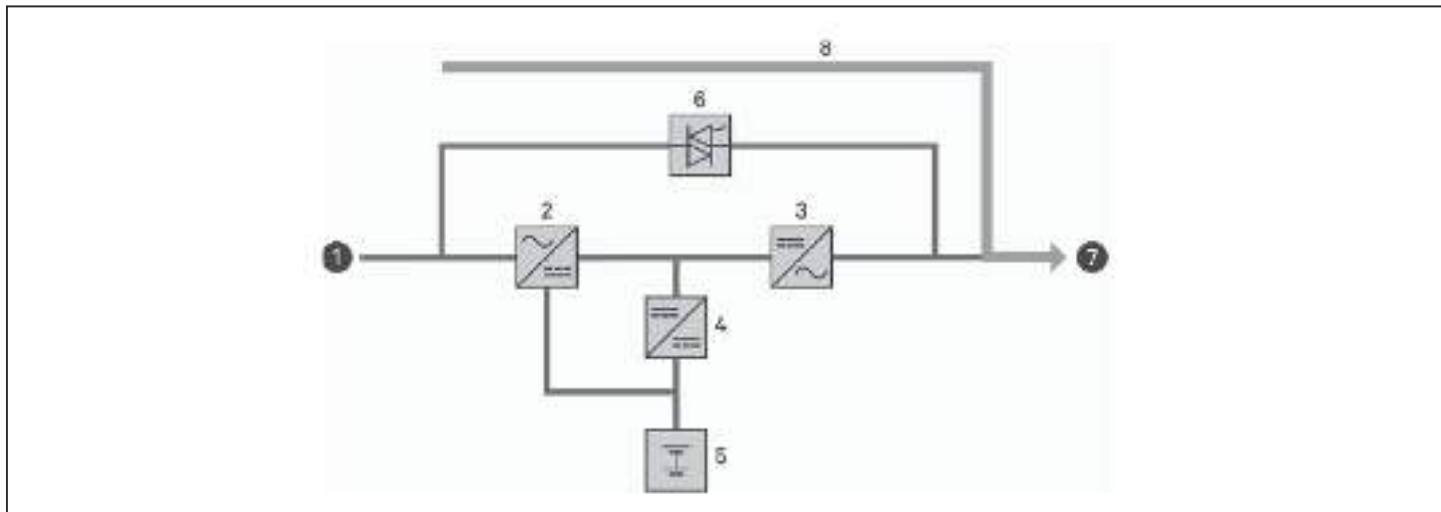


- *Risk of power interruption. Can damage the connected equipment.*
- *If utility power fails or if its quality is out of range while the UPS is in Maintenance Bypass Mode, the UPS may shut down without notice and shut-off output power to the load.*



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

Figure 1-17 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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Chapter 2: 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.

2.1. Unpacking and Inspection

Unpack the UPS and conduct the following checks:

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

Liebert GXT5 UPS - AP Packing list includes the following items (750 VA to 3000 VA):

- Terminal block communications terminal
- USB Cable - one, 2 m (6.56 ft) long
- Cable Strain Relief—two pieces
- Rack mounting hardware, including screws, handles and mounting rail kit (not included with model numbers ending with an “E”)
- Plastic tower stand sets—two (four pieces)
- Printed Quick Start Guide
- Warnings, Safety Instructions booklet and WEEE recycling sheet (ISO 14001 compliance)
- USB Cable - one, 2 m (6.56 ft) long
- Cable Strain Relief—two pieces
- **For 750 VA - 1500 VATION**
 - 10A IEC C13 C14 Output cable-two, 2 m (6-1/2 ft.) long
 - BS 1363 (UK) to IEC C13 Input cord-one, 2.5 m (8.20 ft.) long
 - German plug IEC60320 C13 Input cable-one, 2.5 m (8.20 ft.) long (Applicable for ‘E’ models)
 - Australia type A to SAA Input cord -one, 2.5 m (8.20 ft.) long (Except for E models)
- **For 2000 VA - 3000 VA**
 - 10A IEC C13 C14 Output cable-three, 2 m (6-1/2 ft.) long
 - BS 1363 (UK) to IEC C20 Input cord -one, 2.5 m (8.20 ft.) long
 - German plug IEC60320 C19 Input cable-one, 2.5m (8.20 ft.) long (Applicable for ‘E’ models)
 - Australia type A to SAA Input cord-one, 2.5m (8.20 ft.)long (Except for ‘E’ models) description

Liebert GXT5 UPS - AP Packing list includes the following items (5 kVA to 10 kVA):

- Terminal block communications terminal
- Liebert IntelliSlot Unity card (RDU101), factory installed (not included with “E” models)
- Panels
- USB Cable
- Rack mounting hardware, including screws and handles
- Mounting rail kit (not included with “E” models)
- Power-distribution box (POD), installed on GXT5
- Support-base sets
- Liebert UPS Safety and Regulatory statements booklet
- Quick Start Guide



CAUTION

The UPS is heavy (see [Specifications on page 105](#), for the weight). Take proper precautions when lifting or moving the unit.

2.2. Pre-installation Preparation

- Install the UPS indoors in a controlled environment, where it cannot be accidentally turned Off. The installation environment should meet the specifications listed in [Specifications on page 105](#).
- 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.



- *Operating the UPS above 77°F (25°C) temperature reduces battery life.*

2.2.1. Installation Clearances

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

2.3. Installing the UPS

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

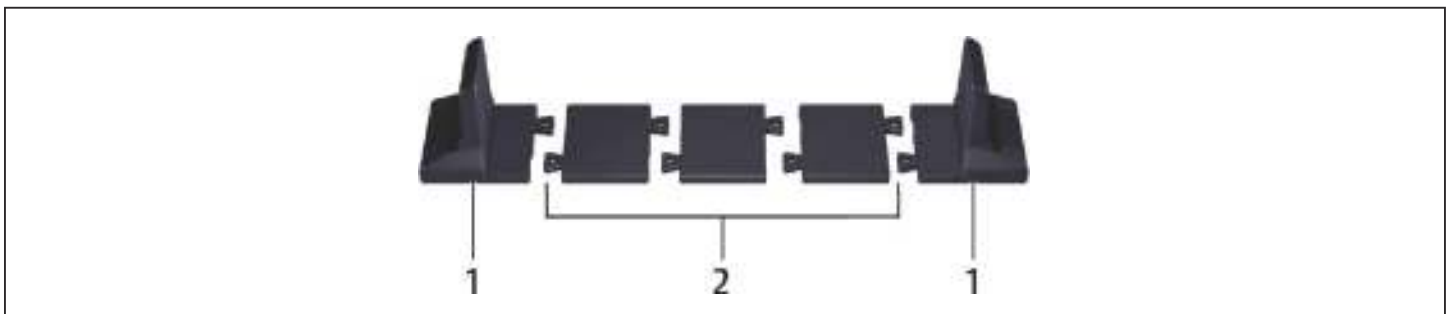


- When installing the UPS or making input and output connections, comply with all relevant safety codes and standards.

2.3.1. Tower Installation

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

Figure 2-1 Support bases




| ITEM | DESCRIPTION |
|------|-------------------------|
| 1 | Support bases |
| 2 | Spacers with connectors |

2. If optional, Liebert® external battery cabinets will be connected, take out the spacers shipped with the battery cabinet.
3. Connect the spacers and the support bases as shown in [Figure 2-1](#) above. Each GXT5 requires 2 support bases, one in the front and one in the rear.
4. Place the GXT5 and any battery cabinets on the 2 support bases.


2.3.2. Rack Installation


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

| | |
|---|----------------|
|  | CAUTION |
| The GXT5 is heavy. The UPS must be installed as near the bottom of a rack as possible. If placed too high, it can make the rack top-heavy and prone to tipping over. For unit weights, see Specifications on page 105 . | |

2.4. Installing External Battery Cabinets

Optional, external battery cabinets (EBC) may be connected in parallel to the UPS to provide additional battery run time. For approximate battery run times with additional EBCs, see [Battery Run Times on page 118](#). External battery cabinets are placed on one side of the UPS in a tower configuration or stacked beneath the UPS in a rack configuration. Up to 10 EBCs may be connected to the UPS, and up to 6 may be detected using EBC-detection.

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

| | |
|--|----------------|
|  | CAUTION |
| The external battery cabinet(s) are heavy, see Specifications on page 105 . Take proper precautions when lifting them. | |

To install the EBC(s):

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



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

4. Verify that the EBC breaker is in the “Off” position.
5. Connect the supplied EBC cable(s) to the rear of the cabinet, then to the rear of the UPS, see [Figure 2-2](#).
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.

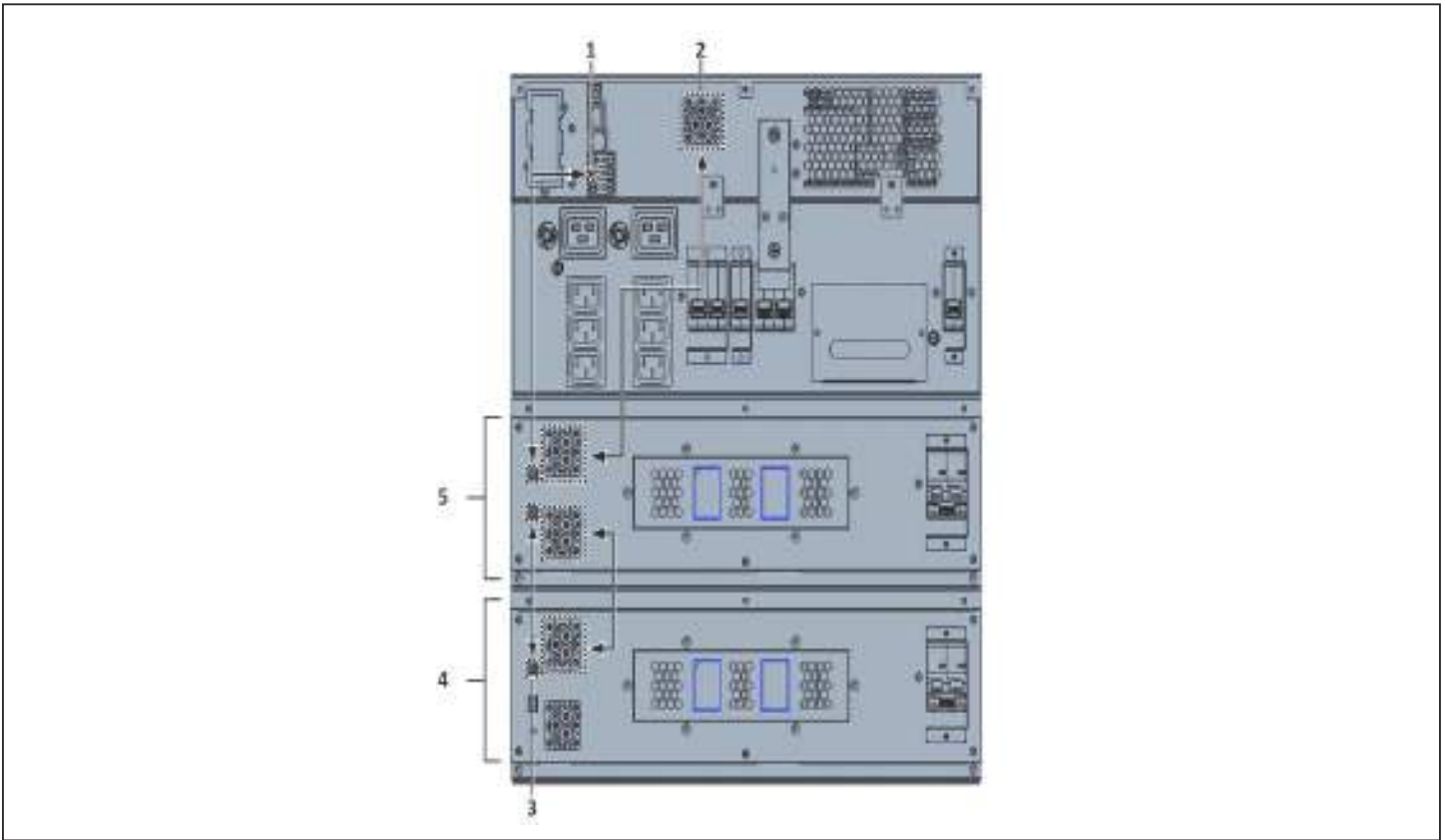


- *When removing an EBC, turn off the circuit breaker on the rear of the cabinet before disconnecting the cable.*



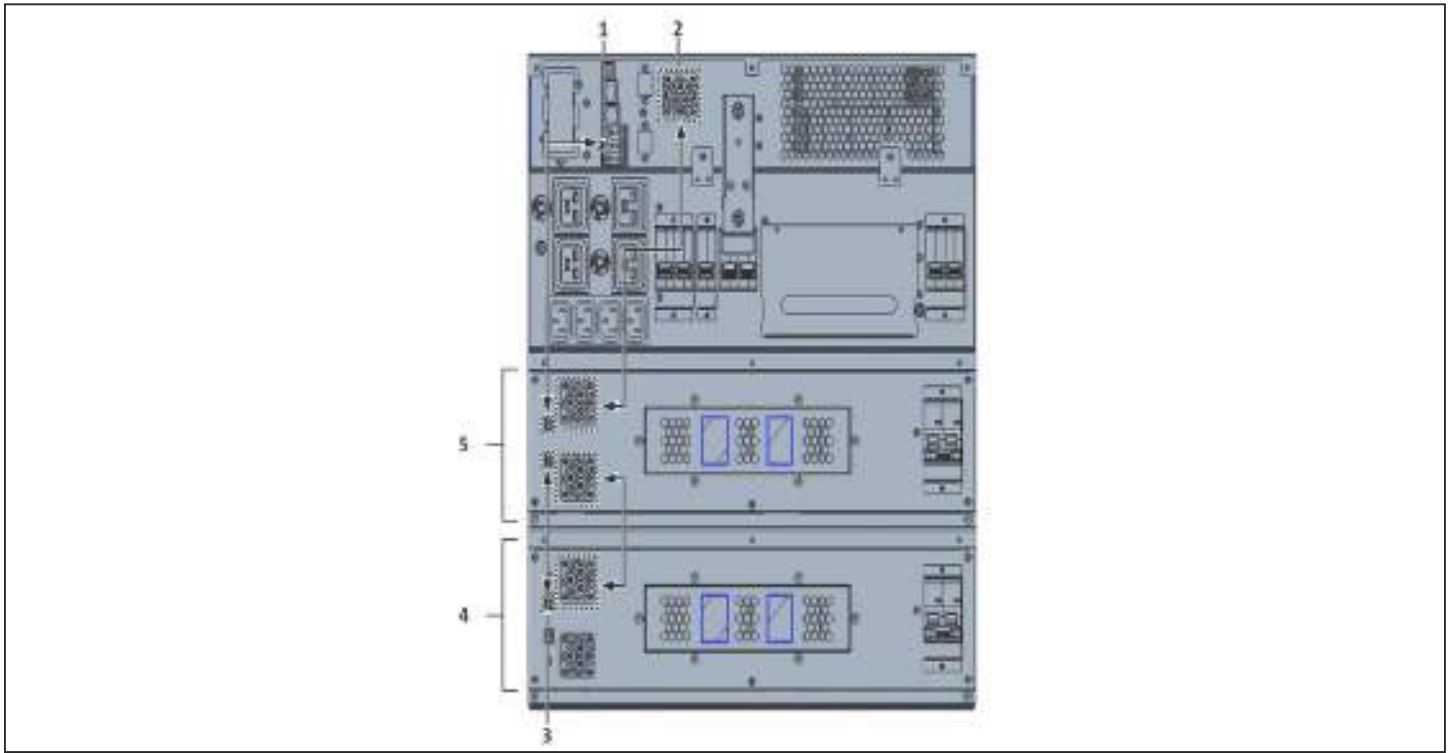
- *If shipping or storing the UPS for an extended time, disconnect the EBC(s) to minimize stand-by current drain on the batteries which help to maintain design life.*

Figure 2-2 EBCs connected to the 5/6 K UPS



| ITEM | DESCRIPTION |
|------|--|
| 1 | EBC-detection dry-contact port (See Table 2-3 on page 33 , for details.) |
| 2 | EBC connector |
| 3 | EBC-detection port |
| 4 | External battery cabinet |
| 5 | External battery cabinet |

Figure 2-3 EBCs connected to the 8/10 K UPS



| ITEM | DESCRIPTION |
|------|--|
| 1 | EBC-detection dry-contact port (See Table 2-3 on page 33 , for details.) |
| 2 | EBC connector |
| 3 | EBC-detection port |
| 4 | External battery cabinet |
| 5 | External battery cabinet |

2.5. 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 Connections on page 33](#), to make the electrical connections to the UPS. For removal, see the appropriate procedures in [Maintenance on page 81](#).

For 16-kVA to 20-kVA models, the POD ships separately and must be attached to the rear of the UPS. See [Removable Power Distribution Box on page 12](#), for the POD options compatible with your GXT5 model.

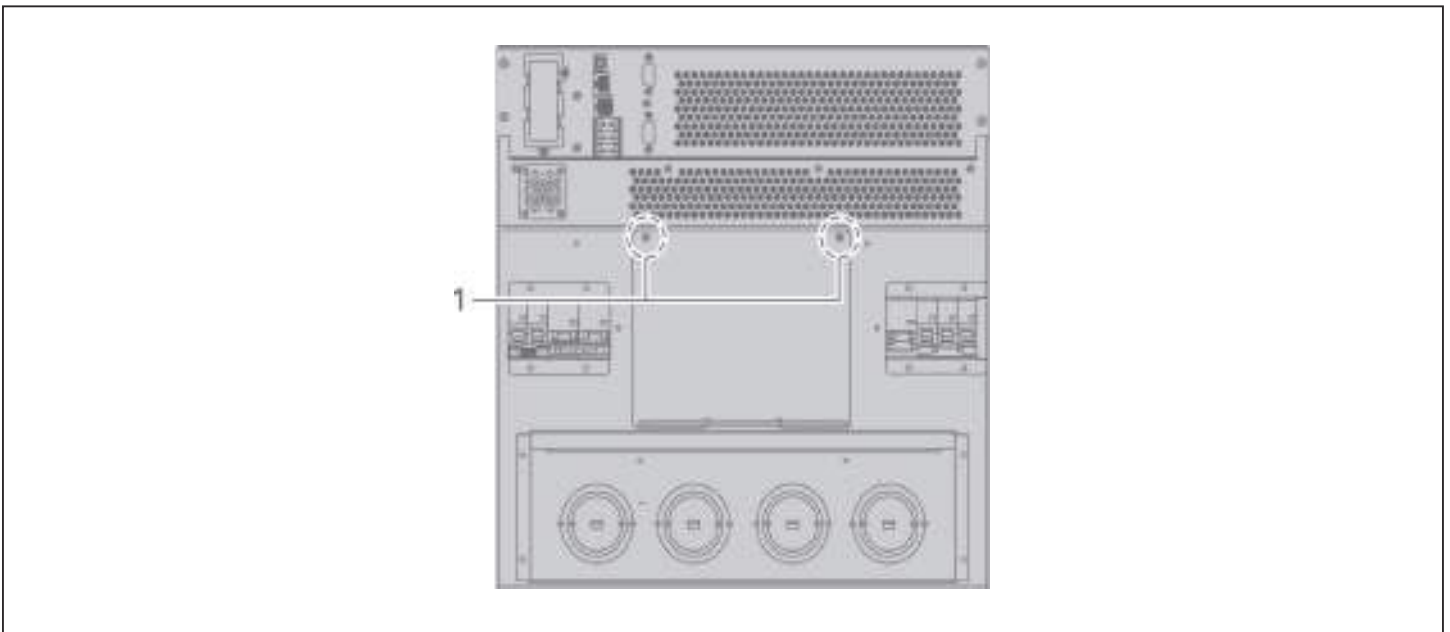


- Do not operate the UPS with the POD removed. To shut off all power to the POD and to the load, utility input power must be disconnected.

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 2-4](#), 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 2-4 POD-location cover on 16-kVA to 20-kVA models



| ITEM | DESCRIPTION |
|------|---------------|
| 1 | Fixing Screws |

2.6. Hardwired Input/Output Connections


| | |
|---|--|
|  | WARNING! Risk of electric shock |
| <p>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.</p> | |

Table 2-1 lists the four types of I/O connection are available depending on the UPS model. Some models offer more than one type.

Table 2-1 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 |

2.6.1. Branch Circuit Breaker

The installer must provide an upstream branch circuit breaker, see **Table 2-2** on the next page, 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. **Figure 2-5** 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.


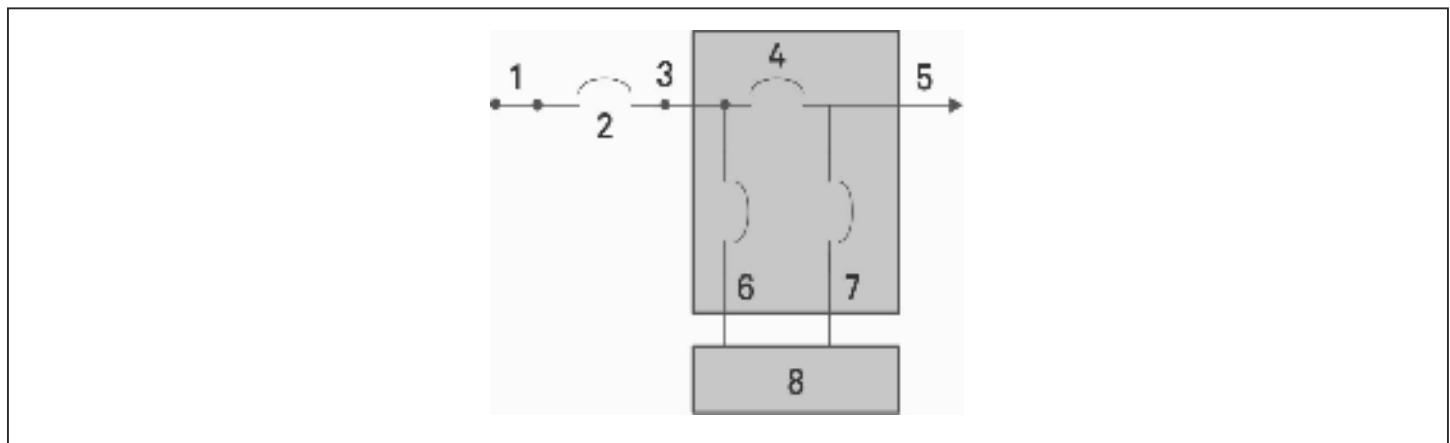
| | |
|---|--|
|  | <ul style="list-style-type: none"> • <i>The input earth leakage current (ELC) generated by the UPS input RFI filter under steady state nominal voltage conditions is above 3.5mA. However in the practical application environment the earth leakage current by the UPS cannot be predicted or quantified due to external supply perturbations. Therefore, we do not recommend the use of an MCB with ELC protection upstream of UPS.</i> |
|---|--|

Table 2-2 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 |
| 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 2-5 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 |

2.6.2. Terminal-block Connections

On 5-kVA and 10-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 12](#), for the location of the input/output knockouts on your GXT5 model. Models below 3000 VA use input cords with plugs instead of terminal block connections.

[Table 2-3](#) below details the electrical-connection specifications.

Table 2-3 Terminal-block electrical specifications

| UPS MODEL | RECOMMENDED EXTERNAL OVERCURRENT PROTECTION | RECOMMENDED WIRE SIZE (INCLUDING GROUND WIRE) (75°C COPPER WIRE) | MAXIMUM WIRE SIZE ACCEPTED BY TERMINAL BLOCK | TERMINAL TIGHTENING TORQUE |
|-------------------|---|--|--|----------------------------|
| GXT5-5000IRT5UXLN | 40 A | 8 AWG | 6 AWG | 20 in.-lb (2.26 Nm) |
| GXT5-5000IRT5UXLE | | | | |
| GXT5-6000IRT5UXLN | 50 A | | | |
| GXT5-6000IRT5UXLE | | | | |
| GXT5-8000IRT5UXLN | 63 A | 6 AWG | | |
| GXT5-8000IRT5UXLE | | | | |
| GXT5-10KIRT5UXLN | | | | |
| GXT5-10KIRT5UXLE | | | | |
| GXT5-16KIRT9UXLN | 1-phase: 140 A 3-phase: 50 A | 35 mm ² (1 AWG) | 53.5 mm ² (1/0 AWG) | 110 in.-lb (12.4 Nm) |
| GXT5-16KIRT9UXLE | | | | |
| GXT5-20KIRT9UXLN | 1-phase: 160 A 3-phase: 63 A | | | |
| GXT5-20KIRT9UXLE | | | | |

To make the terminal-block connections:

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



- 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.

- 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 2-3](#) above.

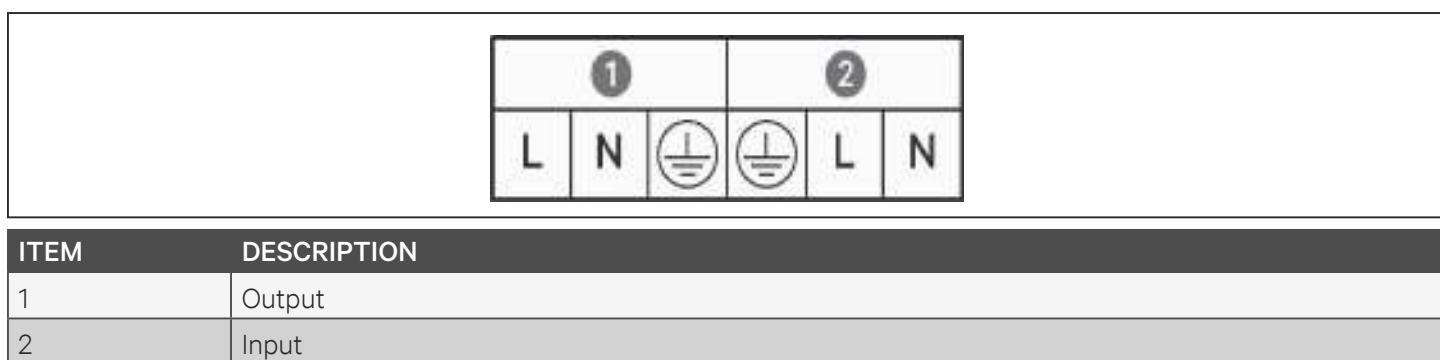
- [Connecting to Terminal Blocks on 5-kVA and 6-kVA model on page 34.](#)
- [Connecting to Terminal Blocks on 8-kVA and 10-kVA models on page 34.](#)
- [Connecting to Terminal Blocks on 16-kVA and 20-kVA models on page 35](#)

3. Re-install the cable-entry/conduit-box cover, and tighten the screws.

2.6.3. 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 2-6](#) below, shows the terminal block. Refer to the details in [Terminal-block Connections on page 33](#), when making the connections.

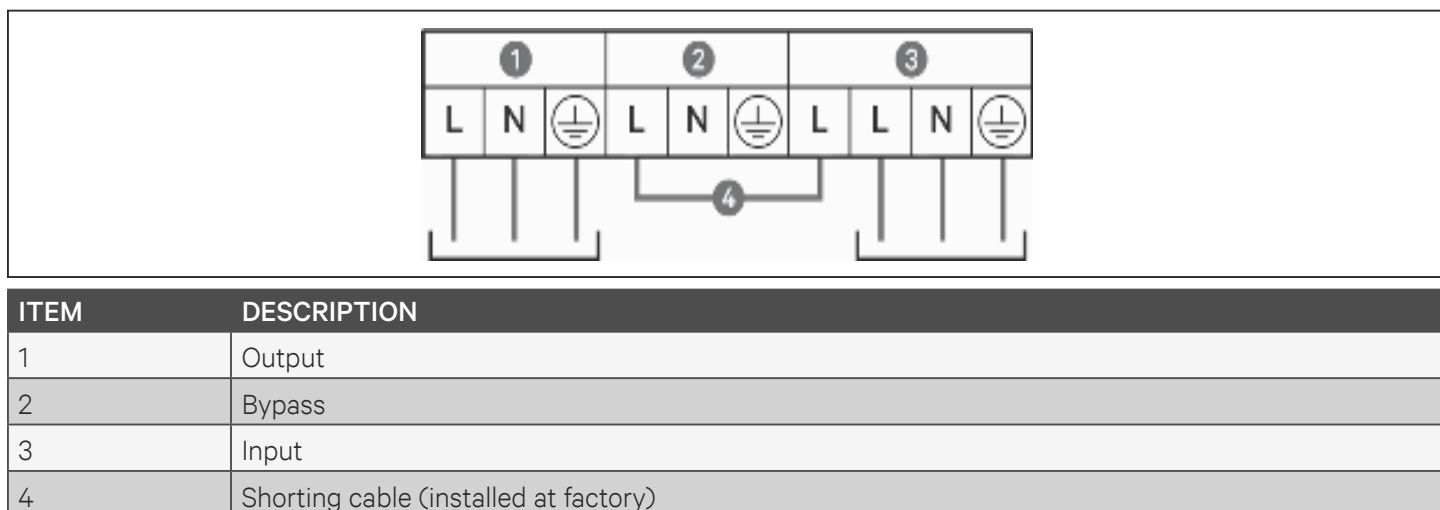
Figure 2-6 Terminal Block 5 kVA and 6 kVA Models



2.6.4. 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 on the terminal block. Refer to the details in [Terminal-block Connections on page 33](#) when making the connections. [Figure 2-7](#) below, shows the shorting cable installed for a common-source connection.

Figure 2-7 Terminal Block 8 kVA to 10 kVA Models

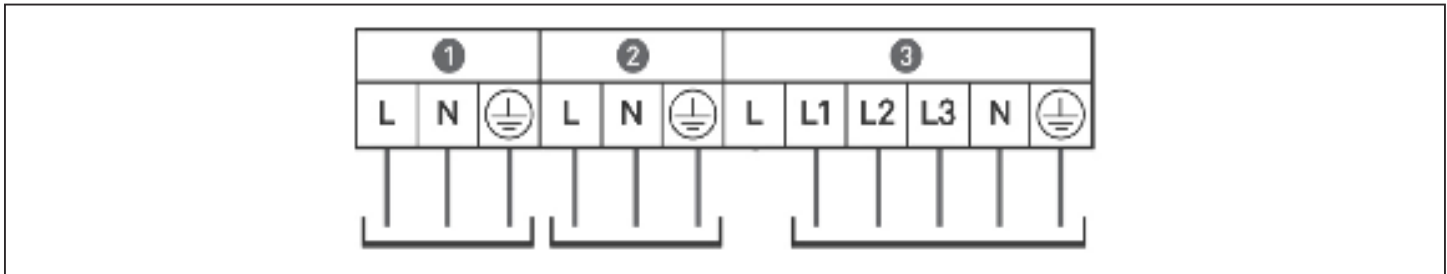


2.6.5. Connecting to Terminal Blocks on 16-kVA and 20-kVA models

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 2-8 below, shows the terminal block. Refer to the details in Terminal-block Connections on page 30, when making the connections.

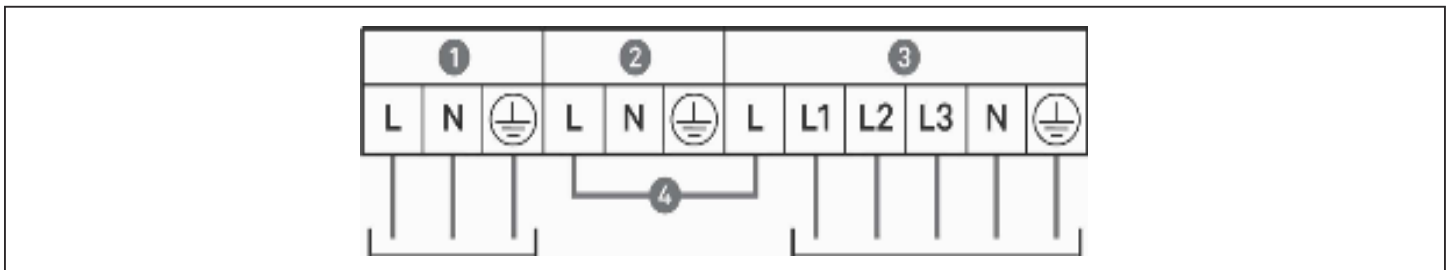
- **Figure 2-8** below, shows the 3-in 1-out split-bypass connection
- **Figure 2-9** below, shows the 3-in 1-out common-source connection
- **Figure 2-10** on the next page, shows the 1-in 1-out split-bypass connection
- **Figure 2-11** on the next page,, shows the 1-in 1-out common-source connection

Figure 2-8 3-in 1-out split-bypass connection



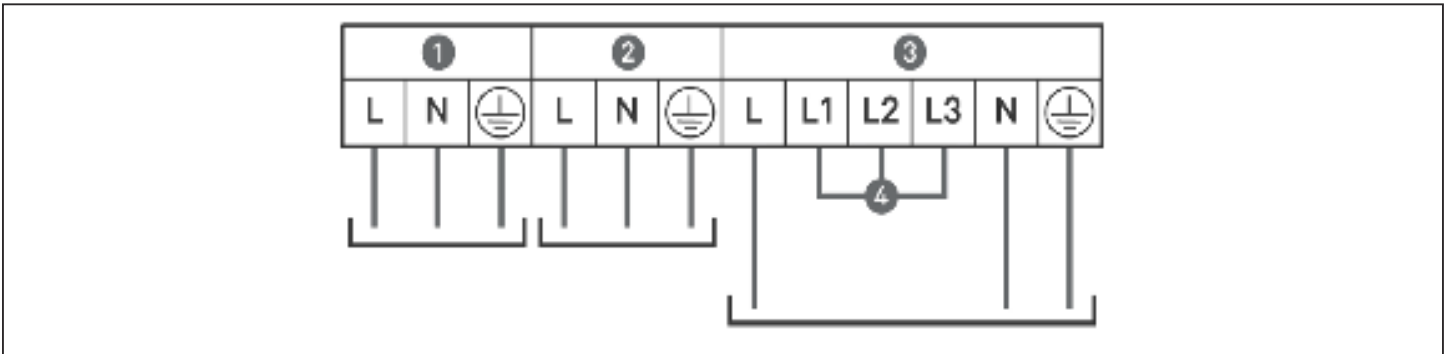
| ITEM | DESCRIPTION |
|------|-------------|
| 1 | Output |
| 2 | Bypass |
| 3 | Input |

Figure 2-9 3-in 1-out Common-source Connection, 16-kVA and 20-kVA models



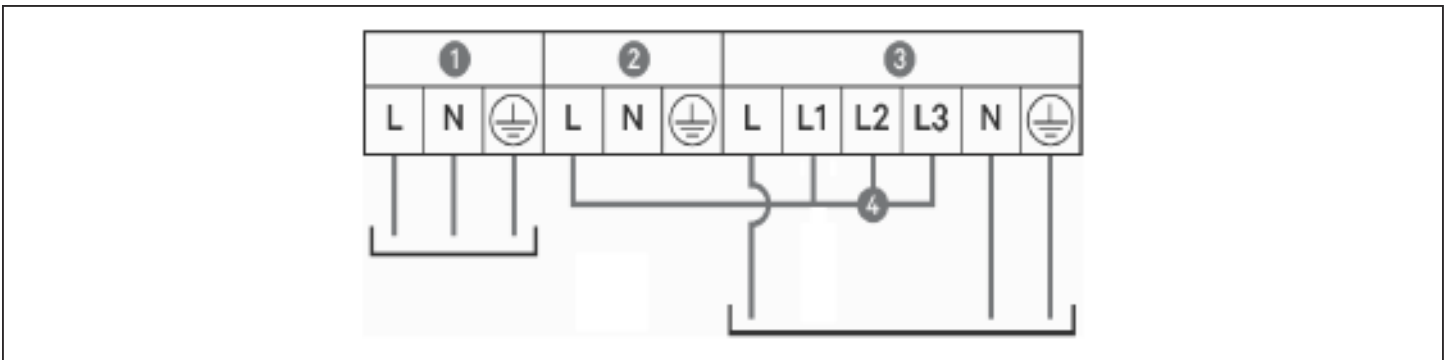
| ITEM | DESCRIPTION |
|------|--|
| 1 | Output |
| 2 | Bypass |
| 3 | Input |
| 4 | Shorting cable (W01), installed at factory |

Figure 2-10 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 2-11 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 |

27. Communication Connections

The UPS offers several communication interfaces and ports.



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

2.7.1. Connecting IntelliSlot Communication

This Liebert® RDU101 card communicates with Building Management Systems via SNMP and LIFE/Remote Services.

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.

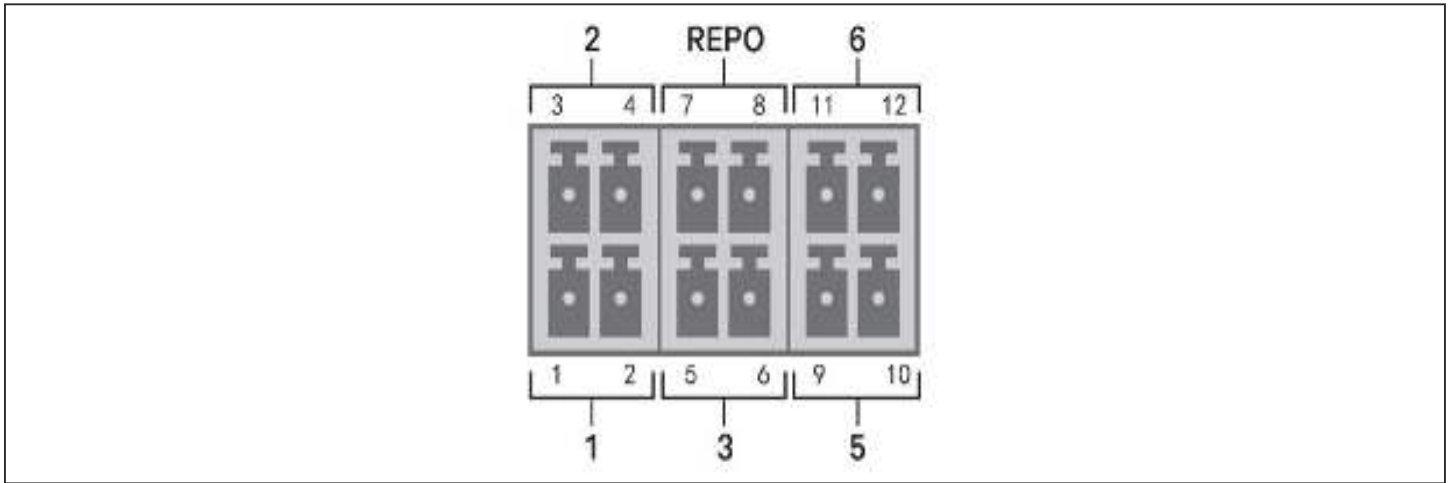
2.7.2. Connecting to the Dry-contact Port


To install an IntelliSlot Card:

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 2-12](#) on the next page shows the ports and [Table 2-4](#) describes each port.

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

Figure 2-12 Dry-contact Port and Pin Layout



 • Pins 7 and 8 are shorted before delivery.


 • 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 40](#).

Table 2-4 Dry-contact Connection and Pin-out Descriptions

| PORT NO. | PORT NAME | PIN NO. | PIN NAME | DESCRIPTION |
|----------|-----------|---------|----------------|---|
| 1 | Input 1 | 1 | Remote Comms 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 65) When NO, Pins 1 and 2 are shorted to trigger the event. When NC, Pins 1 and 2 are opened to trigger the event. Options are: <ul style="list-style-type: none"> • Disable (default) • Battery mode shutdown - If the UPS is running on batteries and this input is triggered, the UPS shuts down • Any mode shutdown - If this input is triggered, the UPS shuts down regardless of current operating mode • Maintenance mode-For 16 & 20 kVA model, If this input is triggered, it means the UPS is in maintenance mode. |
| | | 2. | Signal Ground | Signal Ground |

| PORT NO. | PORT NAME | PIN NO. | PIN NAME | DESCRIPTION |
|----------|------------|---------|----------------------|--|
| 2 | Input 2 | 3 | Remote Comms 2 | <p>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 65) When NO, Pins 3 and 4 are shorted to trigger the event. When NC, Pins 3 and 4 are opened to trigger the event.</p> <p>Options are:</p> <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 • Maintenance mode-For 16 & 20 kVA model, If this input is triggered, it means the UPS is in maintenance mode. |
| | | 4 | Signal Ground | Signal Ground |
| 3 | Battery | 5 | 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 26 . |
| | | 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 26 . |
| 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 page 40 . |
| 5 | Output 5 | 9, 10 | Remote Fault Alert 5 | <p>User configurable dry-contact output that can be set to alert the user to the faults below.</p> <p>The user can also select the dry-contact as either NO or NC. (See System Parameter Options on page 65) When NO, Pins 9 and 10 are shorted when the fault occurs. When NC, Pins 9 and 10 are opened when the fault occurs.</p> <p>Options are:</p> <ul style="list-style-type: none"> • Low battery (default) • On battery • On bypass • UPS fault |
| 6 | Output 6 | 11, 12 | Remote Fault Alert 6 | <p>User configurable dry-contact output that can be set to alert the user to the faults below.</p> <p>The user can also select the dry-contact as either NO or NC. (See System Parameter Options on page 65) When NO, Pins 11 and 12 are shorted when the fault occurs. When NC, Pins 11 and 12 are opened when the fault occurs.</p> <p>Options are:</p> <ul style="list-style-type: none"> • Low battery • On battery • On bypass • UPS fault (default) |

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

The UPS includes an EPO connection in the dry-contact port. See the appropriate figure for your model in [Rear Panels on page 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 output power. When the emergency condition is resolved, the UPS will not return to normal operation until you reset the REPO switch and manually power- on the UPS.

To make the cable for the REPO connection:

[Figure 2-13](#) on the next page, shows the cable required to make the connection. We recommend using 18 AWG to 22 AWG (0.82 mm² to 0.33 mm²) copper-core cable.

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

To connect a UPS to the REPO switch.

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

1. Connect one end of the cable to the remote switch, see [Figure 2-13](#).
2. Remove the factory-installed jumper from pins 7 and 8 of the dry-contact port on the UPS.
3. Connect the plug to pins 7 and 8.

Figure 2-13 Cable/Plug for Connecting REPO switch to UPS REPO port



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

2.7.4. Connecting a USB Cablex

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

The standard, B-type USB port connects the UPS to a network server or other computer system. The USB port supports HID/CDC protocol. The CDC protocol is reserved for service software. To use the HID protocol for monitoring, get Power Assist from www.vertiv.com.

2.7.5. 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 “R232”) is used for CLI connection. See the appropriate figure for your model in [Rear Panels on page 5](#), for the location of the port. The pin-out, described in below table is consistent with the ACS pin-out.

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

2.7.6. Connecting Liebert IRM sensors

The GXT5 supports up to 40 Liebert® IRM sensors (The sensor address must be 1~40). Available sensor types include temperature, and temperature & humidity sensors.

The highest sensor data can be shown in GXT5/battery status page. And the highest temperature from the sensors can be used for battery temperature compensation.

To install an Liebert IRM sensor:

1. Connect the sensor and the RS-485 port using network cable.
2. Place the sensor into the groove of the EBC, as shown in [Figure 2-2](#).

2.8. 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:

- 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 2-14](#) on the next page shows an example of the 10-kVA model connected as a 2 + 1 parallel system connected in a ring configuration.



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



- You must use Vertiv parallel cables for the connection.



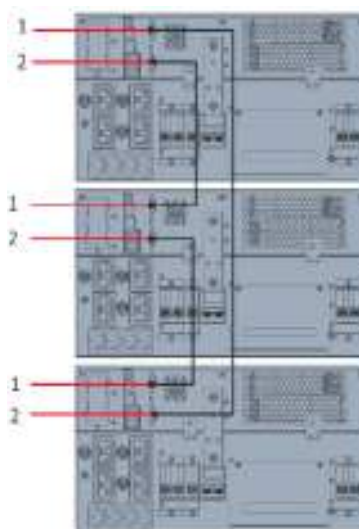
- If a fault occurs during parallel-system operation, shut-off the system and make sure the cables are connected correctly, see [Figure 2-14](#).



CAUTION! Risk of improper disconnection

Can cause equipment damage. Do not disconnect parallel-system cables while the system is

operating. **Figure 2-14 Connection of 2 + 1 Parallel System**



| ITEM | DESCRIPTION |
|------|-----------------|
| 1 | Upper connector |
| 2 | Lower connector |

2.8.1. 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 CBs of all units in the parallel system are open (off), then close (turn on) the input CB 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:



- *If the “System parallel settings async” 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**.




- *To adjust the settings, you must enter a password. See [Editing Display and Operation Settings on page 77](#), 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 validate the settings. For a full description of UPS display functions and settings, see [Operation and Display Panel on page 53](#).
- After confirming the parallel parameters and each UPS is operating normally, commission the parallel system, see [Commissioning Parallel System](#) below.

2.8.2. Commissioning Parallel System


| | |
|--|----------------|
|  | CAUTION |
| When powering-on the parallel system, confirm that the external output CB 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 CB and input CB 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.

2.8.3. 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. | |

| | |
|---|--|
|  | <ul style="list-style-type: none"> • 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](#) above, 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.



- *If your 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.

Chapter 3: Operating the UPS

3.1. Silencing the Audible Alarm

The audible alarm may sound during UPS operation. To silence the alarm, press and hold the ESC button for 2 seconds. The button is located on the front-panel display, see [Operation and Display Panel on page 53](#).

3.2. Starting-up the UPS



IMPORTANT

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



CAUTION

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

The UPS starts in Normal Mode.

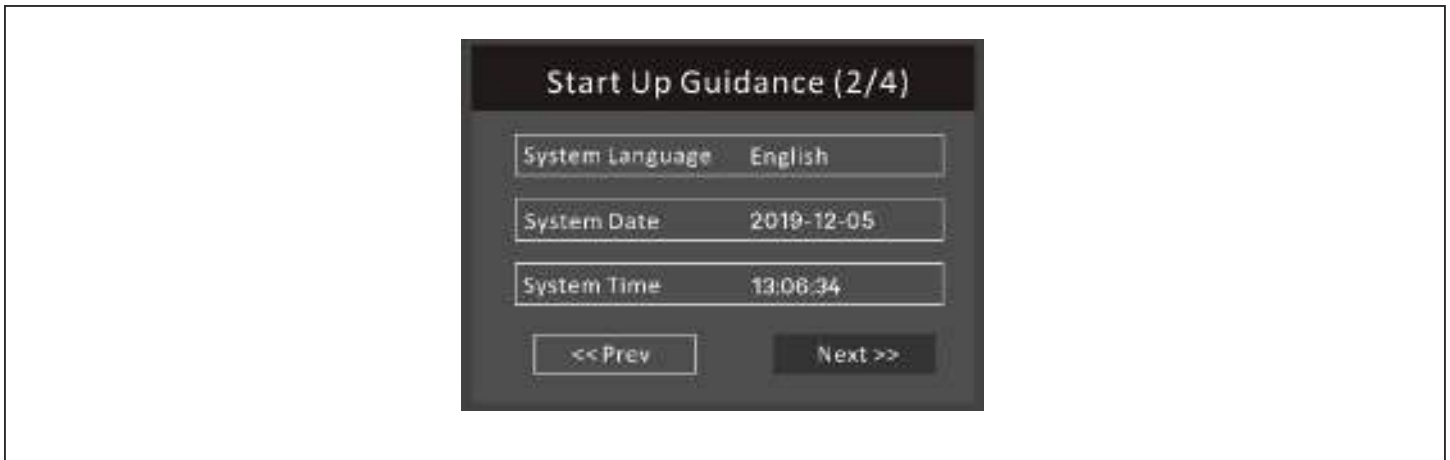
To start the UPS:

1. If included on your UPS model, make sure the maintenance-bypass switch is in the open (off) position and that the guard is secured in place.
2. Ensure that the REPO connector on the rear of the unit has a jumper between pins 7-8 or that it is properly wired to an Emergency Power- Off circuit (normally closed).
3. Make sure the breaker supplying power to the UPS is closed and close the input breaker on the rear of the UPS 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.

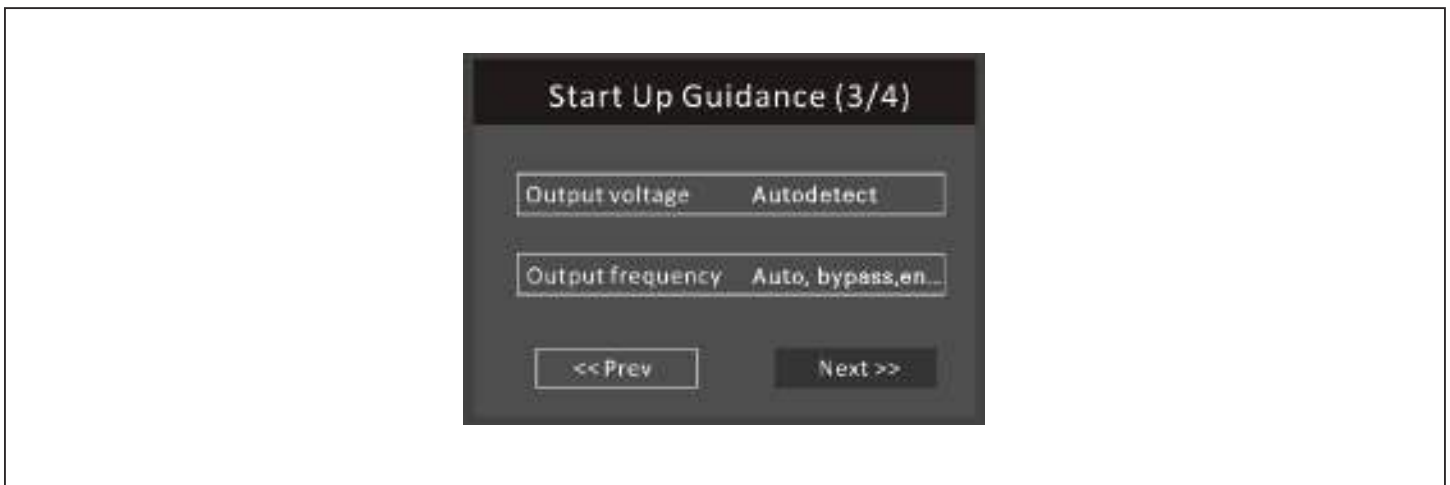
Start up Guidance(1/4)

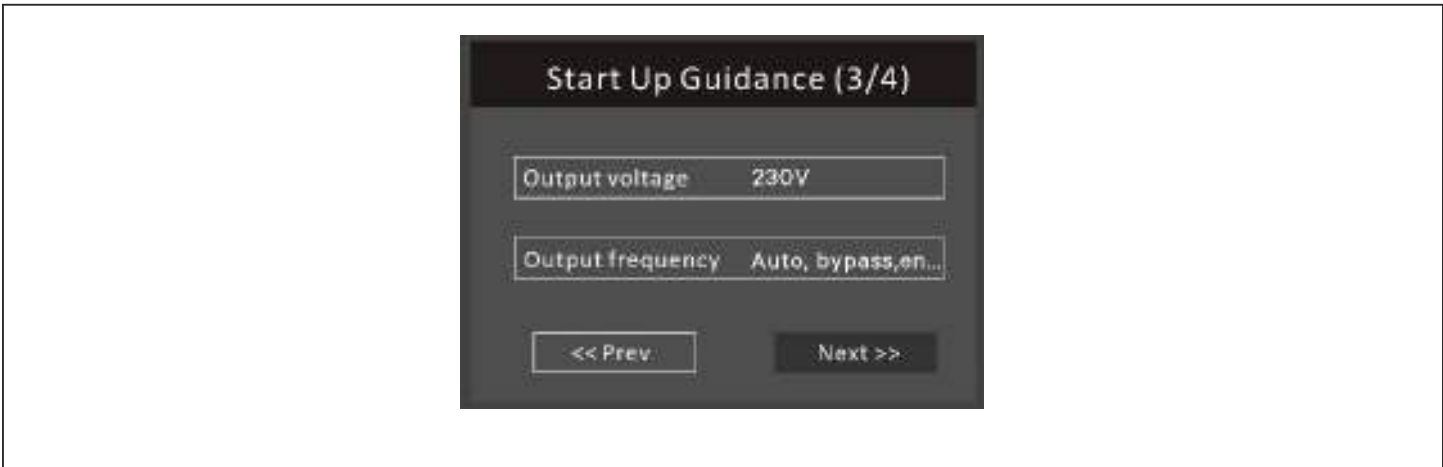
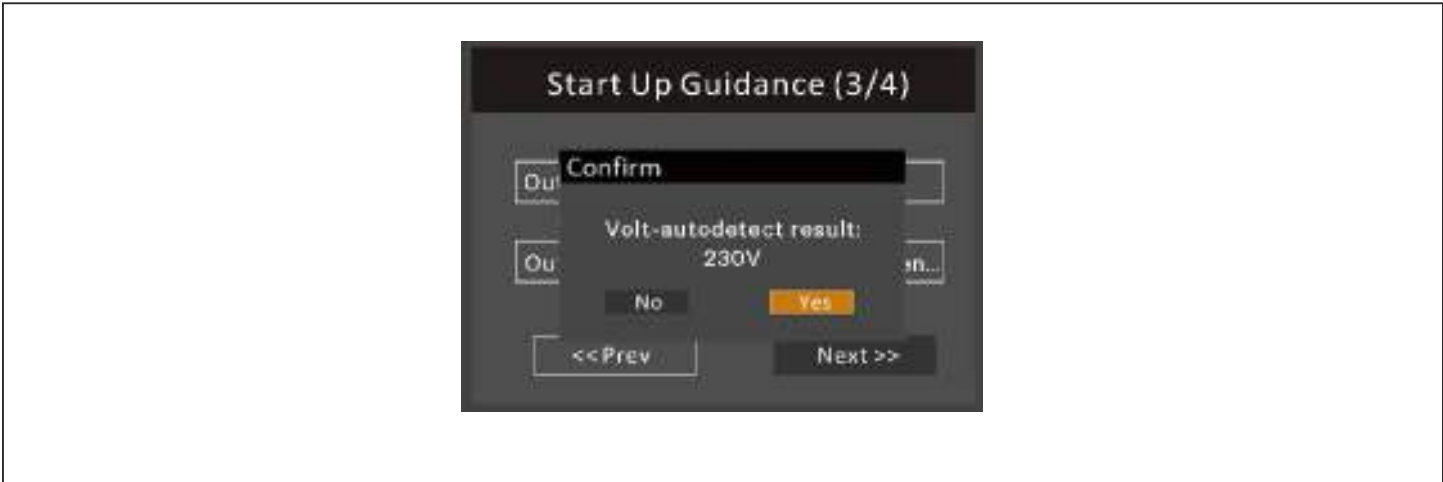


Start up Guidance(2/4)

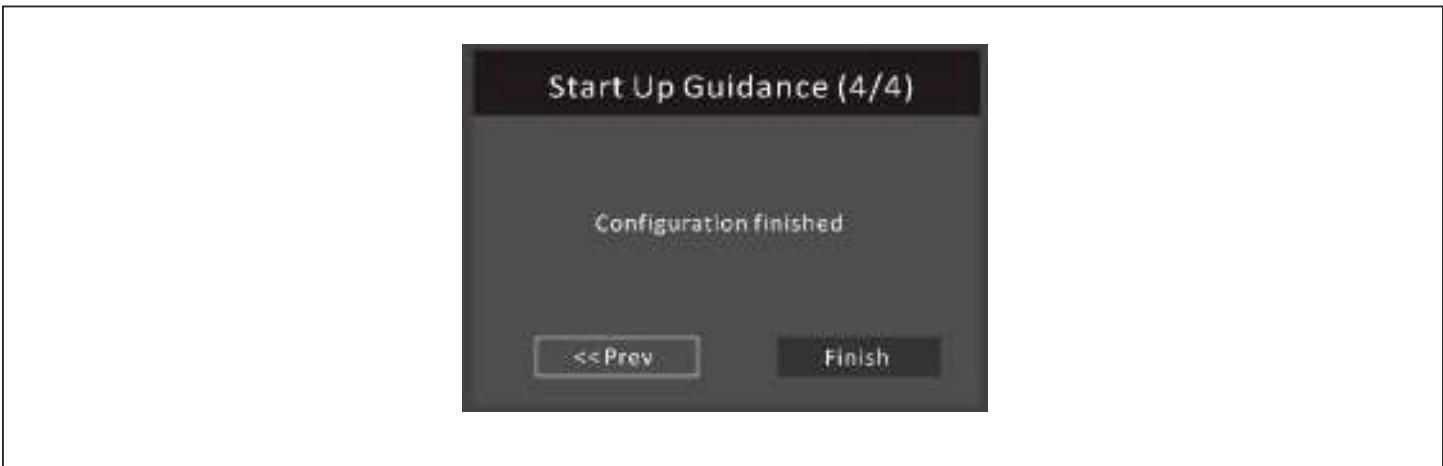


Start up Guidance(3/4)





Start up Guidance(4/4)



For detailed description of UPS display functions and settings, see [Operation and Display Panel on page 53](#).

3.3. Transferring to Battery Mode

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



- *Battery back-up run times are listed in [Battery Run Times](#) on page 118.*

3.4. Transferring from Normal to Bypass Mode

Press and hold the power button for 2 seconds.

If the bypass power is within normal operating range, the option to continue to turn ON to bypass displays:

- a. Use the arrow buttons to select Turn ON to bypass, and press **Enter**.
- b. Use the arrow buttons to select 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.

3.5. Transferring from Bypass to Normal Mode

Press and hold the power button for 2 seconds.

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

- a. Use the arrow buttons to select Turn on UPS, and press **Enter**.
- b. Use the arrow buttons to select Yes, then press **Enter** to confirm.



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

3.6. Shutting-down the UPS Completely



WARNING! Risk of electric shock

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

Transfer to Bypass mode, see [Transferring from Bypass to Normal Mode on page 50](#). Then, if power to the load is not needed, open the MCB.

For systems with direct power distribution, isolate the UPS from AC power by disconnecting the external input MCB. If the main and bypass are independently powered, close the two input MCBs.

3.7. Remote Emergency Power-off (REPO)

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

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

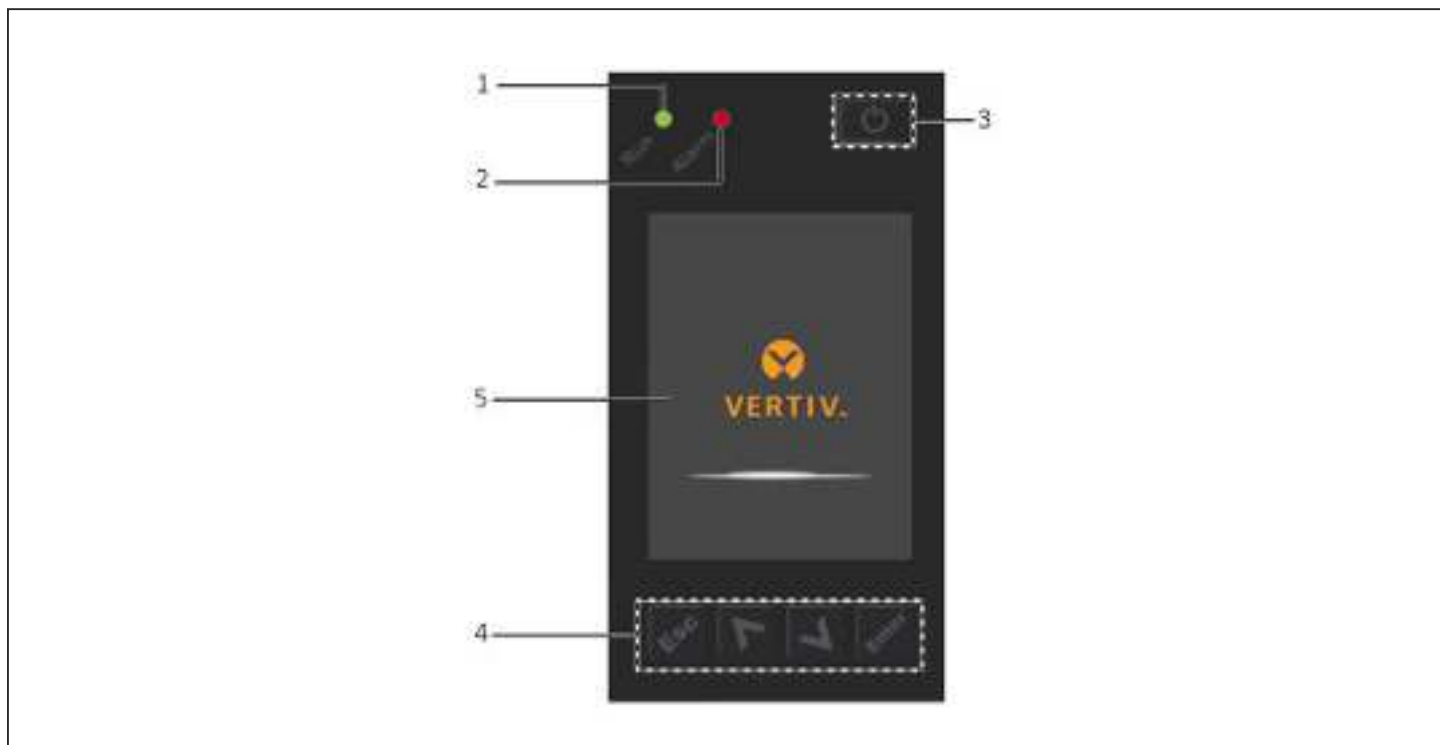
If mains/utility power is present, the UPS control circuit remains active even though output power is disabled. To remove all mains/utility power, disconnect the external main-input circuit breaker.

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Chapter 4: Operation and Display Panel






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


Figure 4-1 Touchscreen Control Panel components



| ITEM | DESCRIPTION |
|------|--|
| 1 | Run indicator LED, see LED Indicators on page 54 . |
| 2 | Alarm indicator LED, see LED Indicators on page 54 . |
| 3 | Power button, see Table 4-1 on the next page. |
| 4 | Menu keys, see Table 4-1 on the next page. |
| 5 | LCD panel. |

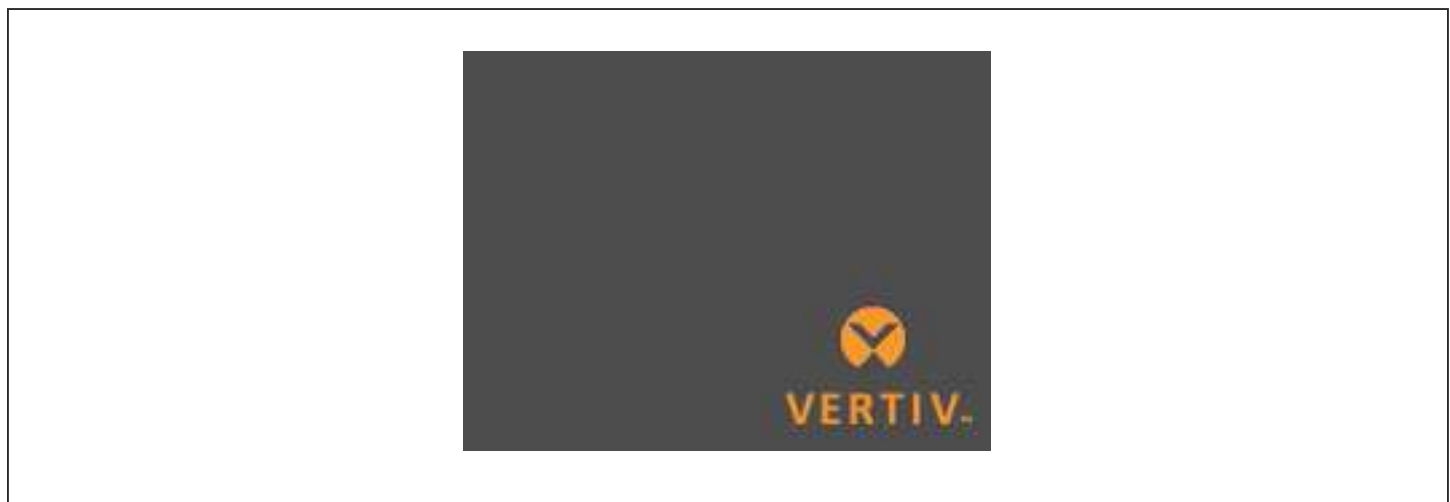
Table 4-1 Display-panel Button Functions and Descriptions

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




- While the UPS is operating, the LCD will dim and display a screen saver if there is no active alarm or user interaction for two minutes, see [Figure 4-2](#). 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 4-2 LCD Screen Saver



4.1. LED Indicators

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



- When an alarm is indicated, an [Alarm Messages is logged on Page 71](#), describes the alarm messages you may see. When a fault is indicated, front-panel display list the fault, which are described in [Table 6-2 on page 102](#)

Table 4-2 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 |

4.2. LCD Menu and Screens

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

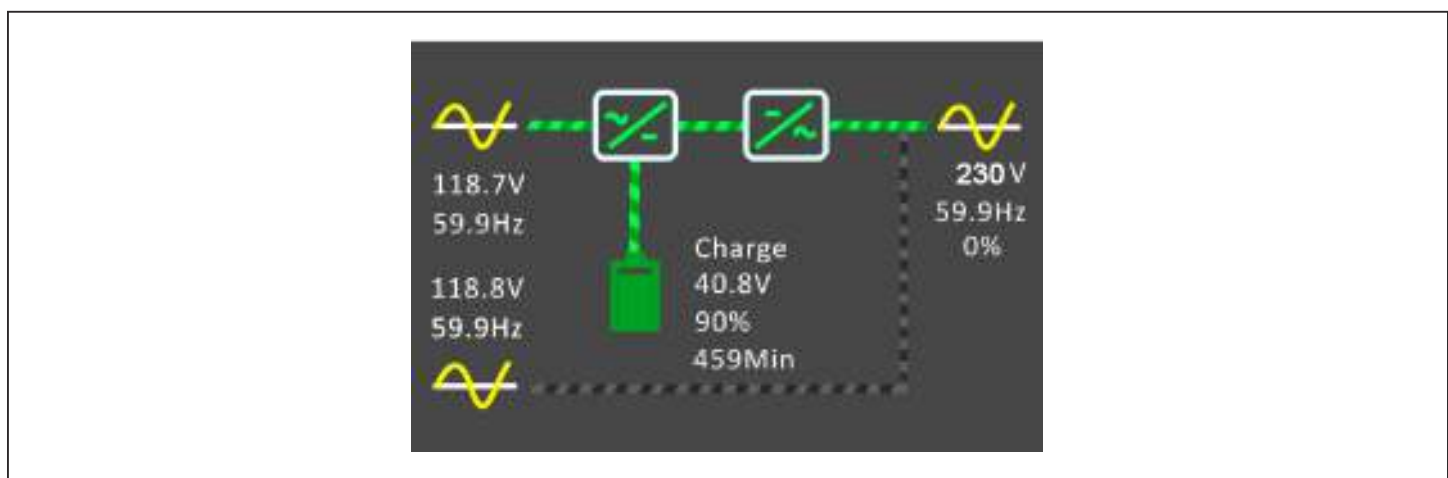
4.2.1. Start-up and Flow Screens

At start-up, the UPS executes a system test and displays the Vertiv logo screen for about 30 seconds, shown in [Figure 4-1 on page 53](#). After the test completes, an overview screen shows status information, the active (green) power path, and the inactive power path (gray).



- *Figure 4-3 is an example flow screen and does not reflect the actual values that you may see on your unit.*

Figure 4-3 UPS Flow Screen



4.2.2. Main Menu

To access the main menu, press **Enter** while at the flow screen. [Table 4-3](#) below, describes the menu options, and [Figure 4-4](#) below, describes the display.

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

Table 4-3 Menu Options

| SUB MENU | DESCRIPTION |
|-------------|---|
| Status | Voltage, current, frequency, and parameters for UPS components, see Status Screen on the facing page. |
| Settings | Display and system parameter settings, see Settings Submenu on page 60 . |
| Control | UPS controls, see Control Screen on page 69 . |
| Log | Current alarms and event history, see Log Screen on page 71 |
| About | Product and network information, see About Screen on page 74 . |
| Maintenance | Service-only, service-password protected page for use only by Vertiv service representatives. |

Figure 4-4 Main Menu



| ITEM | DESCRIPTION |
|------|---------------------|
| 1 | ECO-mode indicator |
| 2 | Ambient Temperature |
| 3 | Date and Time |

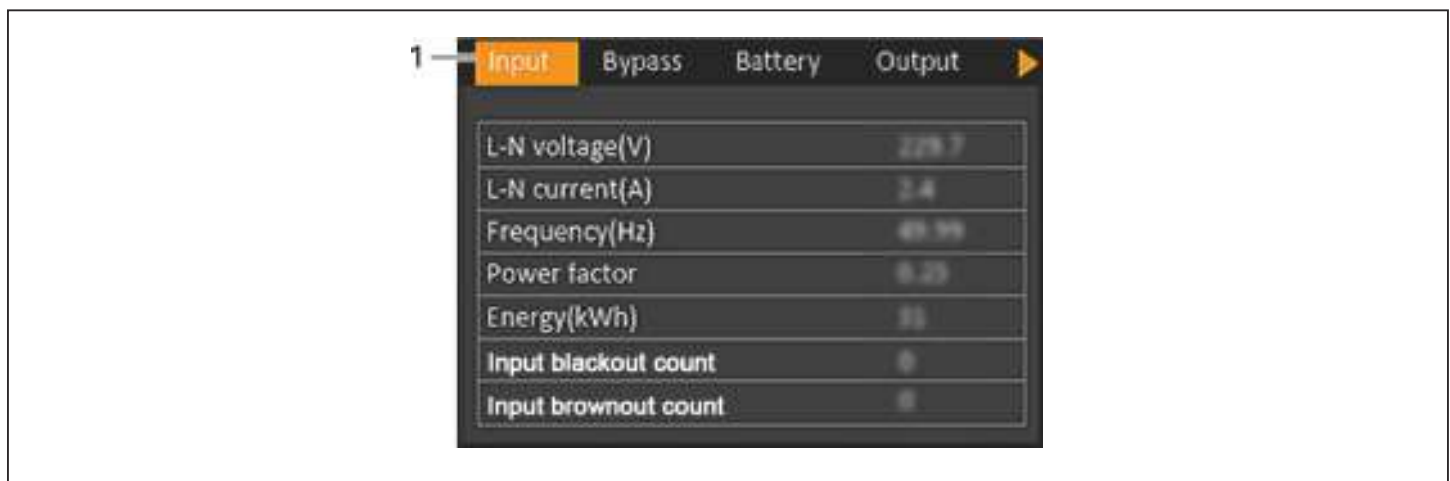
4.2.3. Status Screen

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 4-5 Status-screen tabs



| ITEM | DESCRIPTION |
|------|-------------------------------------|
| 1 | Screen tabs with Input tab selected |



- *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 power.

Power Factor

Power factor of the input power.

Energy (kWh)

Input power.

Input blackout count

The number times that the input voltage was lost or dropped below 60 VAC (black out). Resets to when UPS is powered down.

Input brownout 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.

Battery Status Options**Battery status**

Current battery state: no battery,float charging,equal charging,discharging,fully-charged,idle,test

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 cabinets

Number of external battery cabinets connected.

Battery average temp (°C)

Average temperature of the battery.

Battery highest temp (°C)

Highest temperature battery has reached.

Battery lowest temp (°C)

Lowest temperature battery has reached.

Output Status Options**L-N voltage (V)**

Line-neutral voltage of output power.

L-N current (A)

Line-neutral current of output power.

Frequency (Hz)

Frequency of output power.

Energy (kWh)

Output power.

Load Status Options**Sout (kVA)**

Apparent output power.

Pout (kW)

Active output power.

Power Factor

Power factor of output power.

Load percent (%)

Percentage of recent power rated to output power.

4.2.4.Settings Submenu

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

- Output
- Battery
- Parallel (This item can display when module is GXT5-10KIRT5UXLN, GXT5-10KIRT5UXLE, GXT5-16KIRT9UXLN, GXT5-16KIRT9UXLE, GXT5-20KIRT9UXLN, GXT5-20KIRT9UXLE.)
- Monitor
- System
- Outlet



- *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.

- 125/250 V
- 200 V
- 208 V
- 220 V
- 230 V (default)
- 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 (default)

Frequency selection

Selects the frequency of the output. Options are:

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

Bypass voltage upper limit

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

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

Bypass voltage lower limit

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

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

Run mode

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

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

ECO mode parameters

ECO voltage range (Option only available when Run mode is set to ECO.) Sets the percentage that the input voltage may be above or below the selected output voltage setting and remain in ECO mode.

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

ECO frequency range (Option only available when Run mode is set to ECO.) Sets the amount that the input frequency (Hz) may be above or below the selected frequency setting and remain in ECO mode.

- \pm 1Hz
- \pm 2Hz
- \pm 3Hz (default)

ECO requalification time (Option only available when Run mode is set to ECO.) To ensure the stability of the utility/mains power, this is the length of time that the UPS requires the input voltage and frequency tolerances to be maintained before switching to ECO-mode.

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

Battery Parameter Options

External battery Ah

Sets the amp-hour rating of the external battery. This should only be adjusted when using third-party external batteries with External battery cabinets set to 0. It is calculated automatically when using Vertiv EBCs using the setting of External battery cabinets.

- 0 - 300 Ah (default of 0)

External battery cabinets

Sets the number of attached external battery cabinets or allows the number of EBCs to be detected automatically with Autodetect. Autodetect is used only for Vertiv EBCs. If more than 6 Vertiv EBCs are connected, autodetect does not function and this must be set manually. For third-party external batteries, set this option to 0 and use "External battery Ah" setting above.

- 0 - 10
- Autodetect (default)

Low battery time

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

- 2 - 30 minutes (default of 2)

Battery periodic test

The UPS can periodically self-test the battery.

- Enable
- Disable (default)

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)

Battery Reminder(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)

Max chg curr

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

- 0.9 - 13 A (default of 2.2)



- *The maximum setting of this value always shows as 13 A on the display however it varies based on internal battery Ah and the number of EBCs connected. The actual maximum value that can be supported to set can refer to [Table 7-1](#), [Table 7-2](#), [Table 7-3](#), [Table 7-4](#), [Table 7-5](#), [Table 7-6](#) according to the different model. If the value does not save after it is selected, it is too high for the model.*

Temp compensation

When enabled, the UPS will adjust the charging voltage of the batteries based on temperature in order to preserve battery life. It will increase the voltage if the UPS is operating in a cold environment. It will decrease the voltage if the UPS is operating in a warm environment.

- Enable (default)
- Disable

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 Option

Language

Selects the language of the display, see [Selecting the Display Language on page 79](#). Options are:

- 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 79](#).

Time

Select the current time for the UPS display, HH:MM:SS. See [Setting the Date and Time on page 79](#).

Display orientation

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

- Auto-rotate = Automatically rotates based on the detected orientation of the UPS (default).
- 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 101](#).

- 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 78](#).

System Parameter Options

Auto restart

Allows the automatic restart of the UPS when input power is restored after a complete shutdown via battery EOD of the UPS system.

- Enable = The UPS will restart automatically when the input power is restored after a complete shutdown via battery 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 (default)
- Disable

Start with no battery

Allows the UPS to start when the battery voltage is less than 9 V per section. This can be used to turn on the UPS and power the attached load without battery protection when utility power has been restored after the battery was fully depleted. It works in conjunction with the Auto restart setting above.

- Enable (with Auto restart enable) = The UPS will power the load with no user intervention when mains power returns after the battery has been fully depleted
- Enable (with Auto restart disabled) = The UPS will start up and allow the user to turn on the output when power returns after the battery has been fully depleted

- Disable = The UPS cannot start with a fully depleted battery (default)

Remote control

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

- Enable (default)
- Disable

Any mode shutdown auto restart enable

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

- Enable
- Disable (default)

Output contact NO/NC

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

- Normally open (default)
- Normally closed

Input contact NO/NC

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

- Normally open (default)
- Normally closed.

Dry contact 5 (Output)

Selects the output of dry-contact 5.

- Low battery = 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
- Maintenance mode = For 16&20kVA model, If this input is triggered, it means the UPS is in Maintenance 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
- Maintenance mode = For 16&20kVA model, If this input is triggered, it means the UPS is in Maintenance mode.

Sleep mode

Allows the UPS to turn off the output on a weekly schedule. For instance, turn on every Monday at 01:00 and off every Friday at 23:00.

- Enable
- Disable (default)

Power on day of week

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

- Sunday-Saturday (default 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 is Saturday.)

Power off time

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

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

IT system compatibility

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

- Enable
- Disable (default)

Output 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

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.

- 0 to 30 minutes (default is 0)

Turn off when UPS overload on battery

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 fort

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 0)

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)

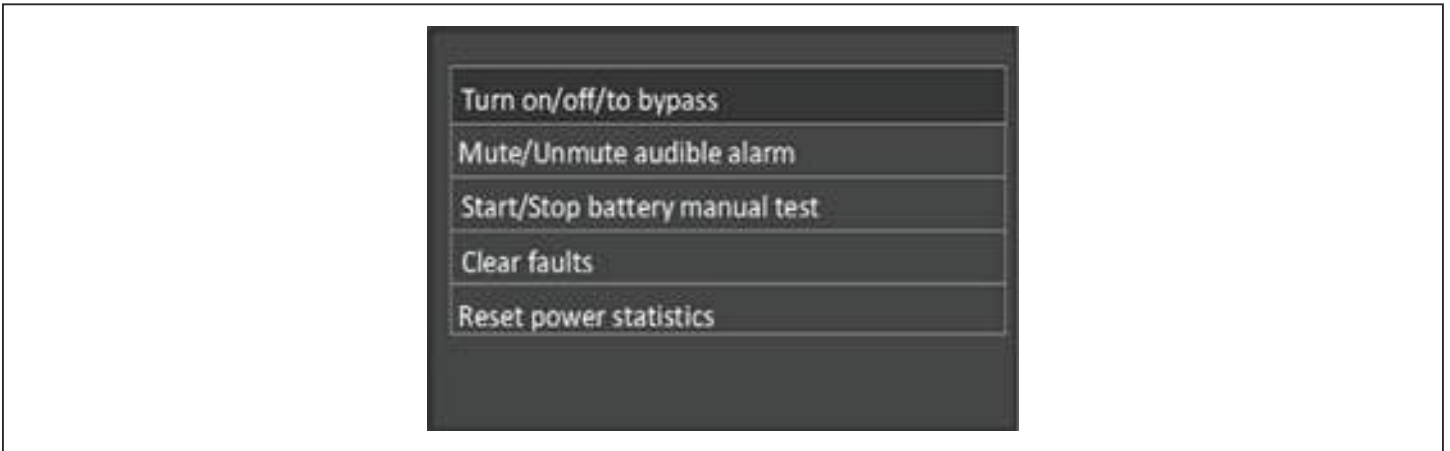
4.2.5. Control Screen

The Control Screen offers UPS-control options.

To adjust the UPS controls:

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

Figure 4-6 Control Screen



Control Options

Turn on/off/to bypass

Opens the dialog to change operating modes, see [Operating the UPS on page 47](#).

Mute/Unmute audible alarm

Silences or un-silences the audible alarm, see [Silencing the Audible Alarm on page 47](#).

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 6-2 on page 102](#), for a description of the faults.

Reset power statistics

Input blackout count, Input brownout count, Battery total discharge time and output energy can be cleared to 0 when set this command.

4.2.6. Log Screen

The Log Screen offers tabs that list the current alarms and the alarm/event history. [Table 4-4](#) below, describes the alarm messages you may see in the logs.

To view the logs:

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

Figure 4-7 Current and History Log Tabs

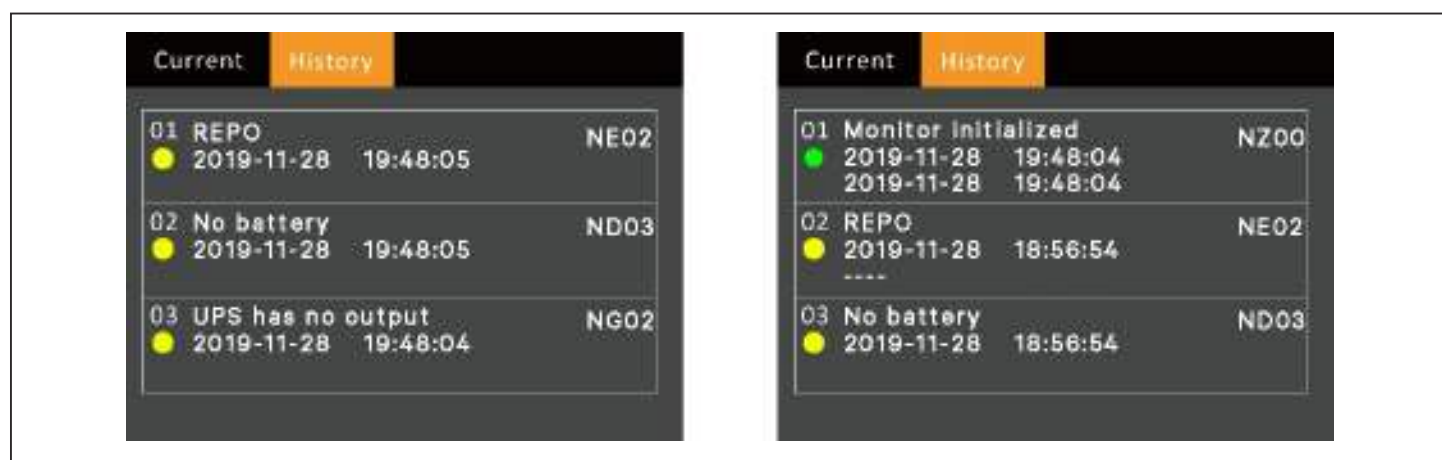


Table 4-4 Alarm Messages

| MESSAGE | DESCRIPTION |
|----------------------------------|--|
| Aux. power fault | UPS internal auxiliary power voltage fault. Contact Vertiv Technical Support. |
| Battery cabinet connect abnormal | More than 10 external battery cabinets are connected to the UPS. Disconnect excess battery cabinets. |
| Battery EOD | The battery has reached the end of discharge and mains/utility power is unavailable. Restore the mains power. The UPS will power off if it is not restored. |
| Battery low 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 operates in battery mode. The alarm will clear when utility power is restored. |
| Battery overtemp | Battery ambient temperature too high. Ensure that the battery ambient temperature is not higher than setting value 40 ~ 60 °C (default: 50 °C) |
| Battery replacement timeout | The system time is past the time set for the batteries to be replaced. If you have disabled the "Batt. note duration" or have no batteries installed, the alarm will not occur. |
| Battery reversed | The battery positive and negative are reversed. Reconnect the battery and check the battery cable connections. |

| MESSAGE | DESCRIPTION |
|-------------------------------|---|
| Battery test fail | The voltage of the battery was low when the periodic or manual self-test was run. Battery replacement is recommended. |
| Battery test started | The battery periodic self-test or manual self-test was started. This will display in the log whenever the event occurs. |
| Battery test stopped | The battery periodic self-test or manual self-test has finished. This will display in the log whenever the event occurs. |
| Battery 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 cable connection |
| Bypass mode | The UPS is on bypass. This will clear when the UPS returns to Normal mode. |
| Bypass over-current | The load is drawing more current than the UPS is rated to supply in bypass mode. Reduce the load. |
| Charger fault | The charger output voltage is abnormal, and the charger is off. Contact Vertiv Technical Support. |
| Communication fail | Internal communication is abnormal. Check that the communication cables are connected correctly. |
| DC bus abnormal | The inverter is off due to DC bus voltage out of acceptable range. The load will transfer to bypass if the bypass is available because the bus voltage is outside of the acceptable range. |
| DC/DC fault | The discharger is faulty, because the bus voltage exceeds the range when the discharger starts. Contact Vertiv Technical Support. |
| EOD turn off | The inverter is off due to EOD. Check the mains power-off state and recover the mains in time |
| Fan fault | At least one fan is faulty. Check if the fan is blocked or the cable connection is loose. |
| Faults cleared | The faults have been cleared using Settings > Controls > Clear faults. This will display in the log whenever the event occurs. |
| Guaranteed shutdown | The battery has finished discharging, then system shuts down because Guaranteed Shutdown is enabled (see Guaranteed shutdown on page 37). This alarm will clear when the UPS is turned on again. |
| Input abnormal | The rectifier and charger are off due to the mains voltage and frequency exceeding normal range. Check that the rectifier input phase voltage and frequency exceed the normal range or that the mains has power-off |
| Input ground lost | Check that the PE line is well connected and that the alarm can be cleared at the display. |

| MESSAGE | DESCRIPTION |
|--|---|
| Input neutral lost | The mains input neutral is not detected. The alarm will clear when the neutral connection has been restored. |
| Input phase reversed | The mains input line and neutral are reversed. Shut off external input breaker and connect the lines correctly. |
| Insufficient capacity to start | The UPS is on bypass and is started with a load greater than 105% of the rated capacity. Reduce the load to the rated capacity or below to start the unit. |
| Inverter fault | The inverter is turned off when the inverter output voltage or current exceed the ranges set. If bypass is available, the UPS will transfer to bypass mode, otherwise the system will power off. Contact Vertiv Technical Support. |
| Inverter overload | Inverter load capacity is larger than the rated value, overload delay time is up, inverter shuts down. If bypass is available, the system will transfer to the bypass mode, otherwise the system will power off. Check the output load. If overloaded, reduce the load, and the system will transfer to the inverter mode after five seconds with no alarm. |
| Inverter relay welded | The inverter relay is shorted. Contact Vertiv Technical Support. |
| Load off due to output short | A short has occurred on the output. Check the output cables and for any equipment that may have shorted. |
| Load off due to shutdown on battery | The system was shut down in battery mode. This will clear when the system is turned back on. |
| Manual power- on | The system was turned on via the display panel. This will display in the log whenever the event occurs. |
| Manual shutdown | The system was shut down via the display panel. This will display in the log whenever the event occurs. |
| No battery | No battery detected. Check the battery and battery cable connection(s). |
| 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 & abnormal bypass | The output is off due to an overload of the UPS output, and the bypass voltage or frequency is outside the acceptable range. Check that the input is normal. |
| Output off, voltage is not zero | This occurs when the output is off and the system detects that there is still voltage on the output. Check output equipment for backfeeds or contact Vertiv Technical Support. |
| Output pending | Remote shutdown has been initiated, and the system will turn off shortly. |
| Output short | A short has occurred on the output. Check the output cables and for any equipment that may have shorted. |
| Rectifier fault | The rectifier is off because the bus voltage is out of the acceptable range when the rectifier starts. Contact Vertiv Technical Support. |
| Rectifier overload | The output power is larger than the rectifier overload point. Check that the input voltage meets the output load, mains input 176 V ~ 100 V, the load 100% ~ 50% linear derating. |

| MESSAGE | DESCRIPTION |
|---------------------------|---|
| 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. |
| Shutdown due to over temp | During the UPS operation, the system checks that the heat sink temperature exceeds the setting range. If over temperature, please check: <ul style="list-style-type: none"> • Ambient temperature too high or not • Dust is blocked or not • Fan fault or not |
| System over temp | Internal heat sink temperature too high, and the inverter is off. The alarm can only be silenced if the heat-sink temperature is lower than the alarm setting. The system can automatically start after over temperature fault is solved. <p>If over temperature, please check:</p> <ul style="list-style-type: none"> • Ambient temperature too high or not • Dust is blocked or not • Fan fault or not |
| 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. |

4.2.7. About Screen

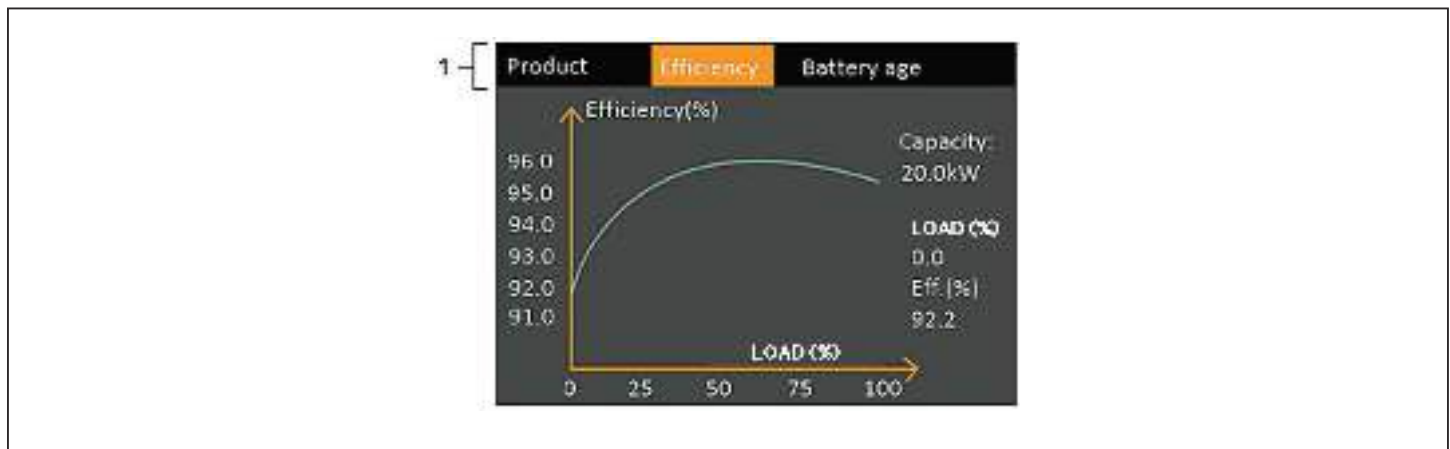
The About screen offers tabs that list information about the product.

- 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 4-8 About Screen Tabs



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

Product Information

Product Type

UPS model number.

Serial number

UPS serial number.

Time since startup

Elapsed time since start-up of the UPS.

Boot FW version

Version of MCU boot firmware on the monitor board.

Monitor FW version

Version of MCU application firmware on the monitor board.

DSP FW version

Version of DSP firmware on the UPS power-module.

MAC address

Shows the MAC address of the RDU101 card. This is only shown when the RDU101 card has been connected.

IPv4 address

Shows the IPv4 address of the RDU101 card. This is only shown when the RDU101 card has been connected.

Subnet mask

Shows the subnet mask of the RDU101 card. This is only shown when the RDU101 card has been connected.

Gateway address

Shows the gateway address of the RDU101 card. This is only shown when the RDU101 card has been connected.

Efficiency Tab**Capacity**

This shows the maximum active capacity of your UPS model.

Load(%)

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 Load(%) 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.

SOH (%)

This shows the current SOH percentage.

4.3. Editing Display and Operation Settings

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

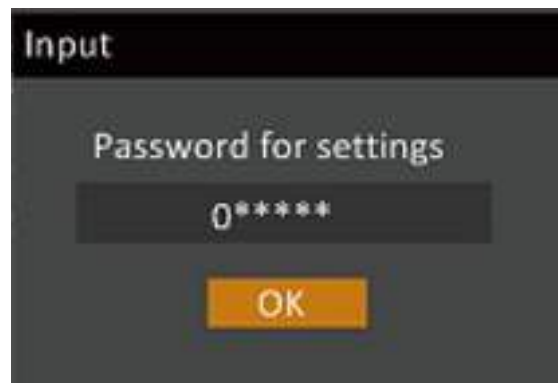


- We recommend that you change the password to protect your system and equipment and record the new password and store it in an accessible location for later retrieval. See [Changing the Password](#) on the next page.

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 4-9 Password Prompt



4.3.1. 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 4-5](#) lists the prompts and their meaning.

Table 4-5 Display Prompts and Meanings

| PROMPT | MEANING |
|--|--|
| Cannot set while on-line, Please shut down output | Appears when changing important output settings (output voltage, output frequency) while UPS is online. |
| Incorrect password! Please input again | Appears when LCD panel Setting or Maintenance password input incorrectly |
| Operation failed! Condition is not met | Appears when attempting to execute a operation for which the required conditions are not met. |
| Password changed OK | Appears upon successful change of the Settings password. |
| Failed to change password! Please try again | Appears when attempting to change the Settings password but the new and confirmation passwords do not match. |
| 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). |

4.3.2.Changing the Password

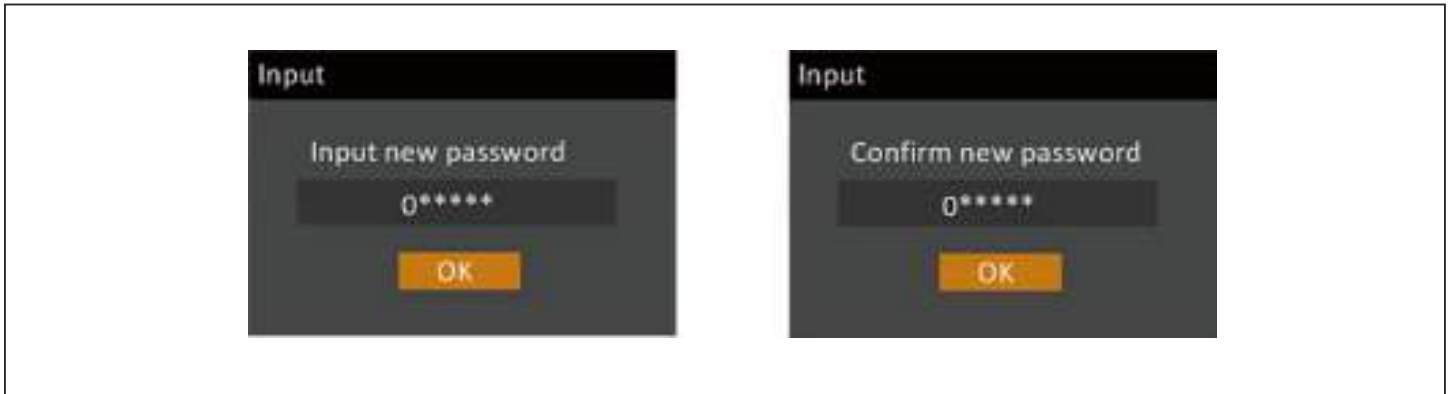
The default password is 111111 (six ones). You must use the current password to change the password.



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

1. At the main menu, select the Settings icon, and press **Enter**.
2. At the password prompt, use the up-arrow to select the first digit, press the down-arrow to move to the next digit, repeat for each digit, then press **Enter** to access the settings.
3. Use the arrow buttons to select the Monitor tab, then press **Enter**.
4. Use the down arrow to highlight *Change Settings Password*, press **Enter**, and re-enter the current password. The Input new password dialog opens, see [Figure 4-10](#) on next page.
5. Enter the new password, then confirm the new password.
A confirmation dialog opens to indicate a successful password change.
6. Press **ESC** to return to the settings or main menu.

Figure 4-10 New and Confirm Password dialogs



4.3.3. 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.

4.3.4. 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.

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Chapter 5: Maintenance



WARNING! Risk of electric shock

Can cause equipment damage, injury and death. A battery can present a risk of electrical shock and high shortcircuit 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 so, then remove the source of the ground. Contact with any part of a grounded battery can result in electrical shock. The likelihood of such shock will be reduced if grounds are removed during installation and maintenance (applicable to a UPS and a remote battery supply not having a grounded supply circuit).

5.1. Replacing Batteries



WARNING! Risk of electric shock

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



WARNING! Risk of electric shock and explosion

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



WARNING! Risk of electric shock

Can cause equipment damage, injury and death. A battery can present a risk of electrical shock and high shortcircuit current.



WARNING! Risk of explosion

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


Read all safety cautions before proceeding. A trained user can replace the internal battery pack when the UPS is in a restricted access location (such as a rack or server closet). To obtain the appropriate replacement battery pack(s), refer to [Table 5-1](#) below, and contact your local dealer or Vertiv representative.

Table 5-1 Replacement Battery-pack Model Numbers

| UPS MODEL NUMBER | BATTERY PACK MODEL NUMBER | QUANTITY REQUIRED |
|-------------------|---------------------------|-------------------|
| GXT5-750IRT2UXL | GXT5-36VBATKIT | 1 |
| GXT5-750IRT2UXLE | | |
| GXT5-1000IRT2UXL | | |
| GXT5-1000IRT2UXLE | | |
| GXT5-1500IRT2UXL | GXT5-48VBATKIT | |
| GXT5-1500IRT2UXLE | | |
| GXT5-2000IRT2UXL | | |
| GXT5-2000IRT2UXLE | | |

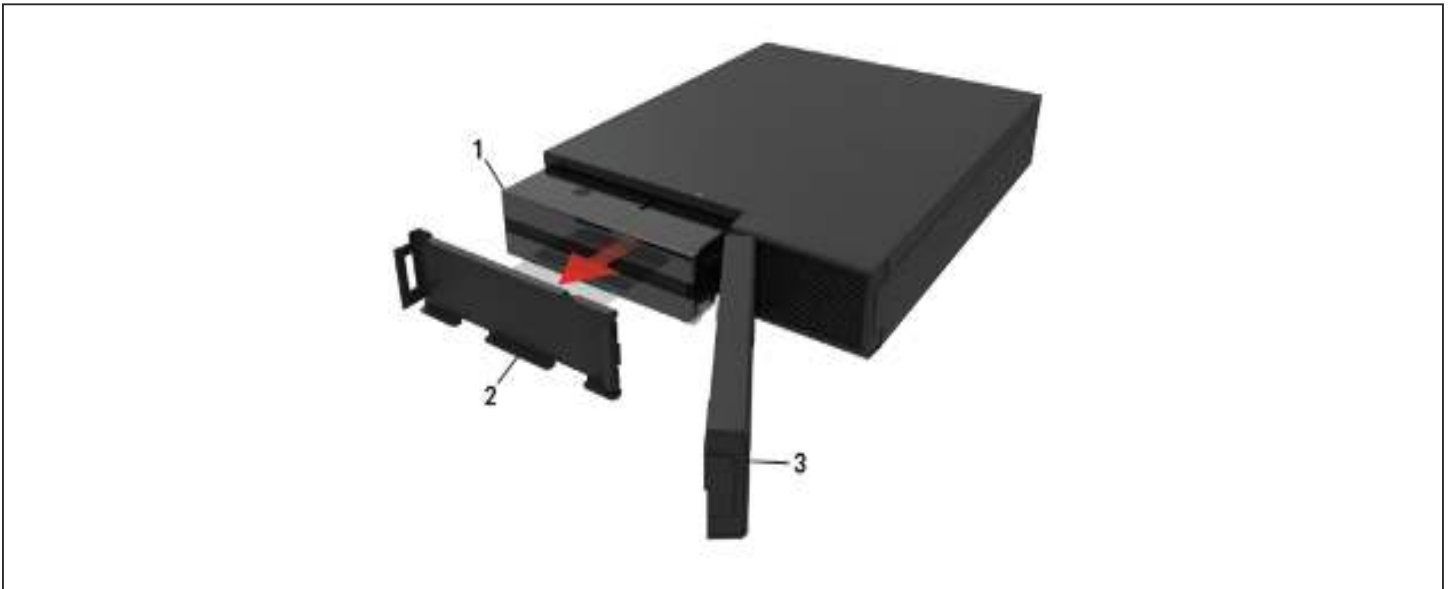
| UPS MODEL NUMBER | BATTERY PACK MODEL NUMBER | QUANTITY REQUIRED | |
|-------------------|---------------------------|-------------------|---|
| GXT5-3000IRT2UXL | GXT5-72VBATKIT | 1 | |
| GXT5-3000IRT2UXLE | | | |
| GXT5-5000IRT5UXLN | GXT5-192VBATKIT | | |
| GXT5-5000IRT5UXLE | | | |
| GXT5-6000IRT5UXLN | | | |
| GXT5-6000IRT5UXLE | | | |
| GXT5-8000IRT5UXLN | | | |
| GXT5-8000IRT5UXLE | | | |
| GXT5-10KIRT5UXLN | | | |
| GXT5-10KIRT5UXLE | | | |
| GXT5-16KIRT9UXLN | GXT5-192VBATKIT | | 2 |
| GXT5-16KIRT9UXLE | | | |
| GXT5-20KIRT9UXLN | | | |
| GXT5-20KIRT9UXLE | | | |

To replace a battery pack:

| | |
|---|---|
|  | <ul style="list-style-type: none"> 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. |
|---|---|

- For 0.75-kVA to 3-kVA models, Press the button on the left-front of the UPS front panel, and pull the panel open, then, loosen and remove the screw from the battery door, see **Figure 5-1** on the next page.
- Lay the battery door and screw aside for reassembly.
- Grasp the battery handle, and pull out the battery pack, see **Figure 5-1** on the next page.
- Unpack the replacement battery pack, taking care not to damage the packaging to re-use when disposing of the old battery.
- Compare the new and old battery pack to make sure they are the same type and model. If so, proceed with step 6. If they are different, stop and contact your Vertiv representative, or Technical Support, <http://www.Vertiv.com/en-us/support/>.
- Line-up and slowly push-in each replacement battery pack. The battery is fully-inserted if the battery door fits flush against the UPS.
- Re-attach the battery door with the screw, and replace the front cover.
- Activate the new battery pack(s) using the operating/display panel.

Figure 5-1 Cable/Plug for Connecting REPO switch to UPS REPO port



| ITEM | DESCRIPTION |
|------|--------------|
| 1 | Battery pack |
| 2 | Battery door |
| 3 | Front panel |

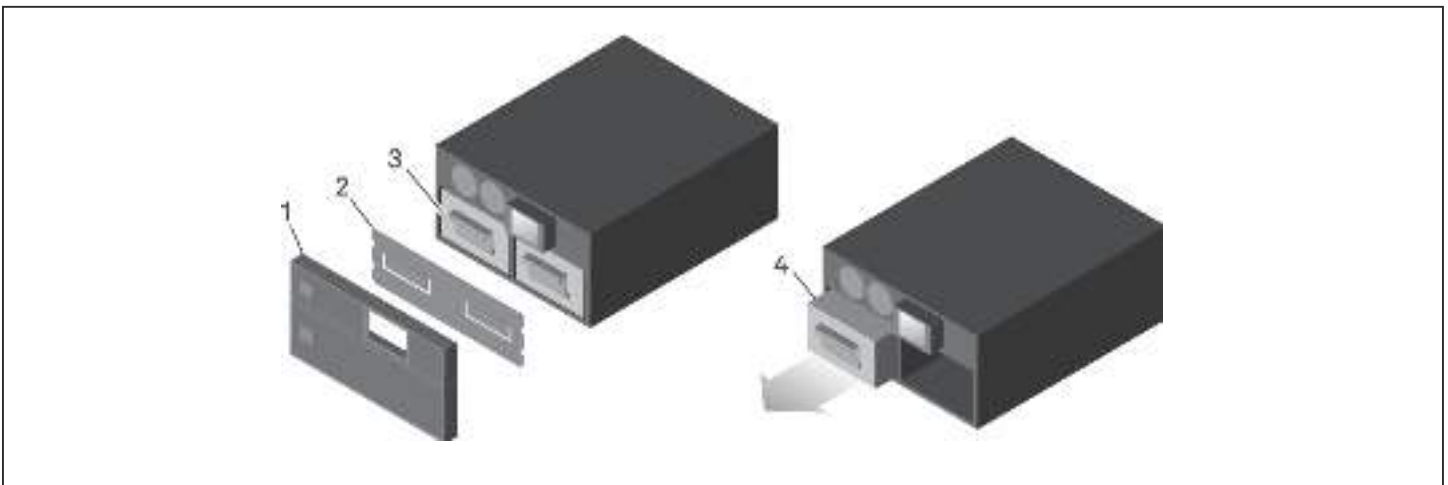
1. For 5-kVA to 20-kVA models, Press the buttons on both sides of the UPS front panel, and pull the panel open, then, loosen and remove the screw from the battery door, see [Figure 5-2](#) on the next page.
2. Lay the battery door and screw aside for reassembly.
3. Grasp the battery handle, and pull out the battery pack, see [Figure 5-2](#) on the next page.
4. Unpack the replacement battery pack, taking care not to damage the packaging to re-use when disposing of the old battery.
5. Compare the new and old battery pack to make sure they are the same type and model. If so, proceed with step [6](#). If they are different, stop and contact your Vertiv representative, or Technical Support, <http://www.Vertiv.com/en-us/support/>.
6. Line-up and slowly push-in each replacement battery pack. 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 pack(s) using the operating/display panel:



- The display menus and functions are described in [Operation and Display Panel on page 53](#).

- 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 79](#).
- Select the *Battery* tab, use the arrows to select *Replace Battery*, and press *Enter*. The replaced battery packs are activated.
- Use **ESC** to return to the main display.

Figure 5-2 Replacing the Battery Pack



| ITEM | DESCRIPTION |
|------|------------------------------------|
| 1 | Front cover |
| 2 | Battery door |
| 3 | Battery handle |
| 4 | Grasp handle and pull battery out. |

5.2. 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.

5.3. Checking UPS Operation



- *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 53](#).
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 71](#).
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.

5.4. Cleaning the UPS



WARNING! Risk of electric shock

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

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.


5.5. Replacing the Power-distribution Box

Use the following procedures to replace the ups


UPS Remove

1. Transfer the connected equipment to the internal bypass.
 - a. Loosen the upper maintenance bypass captive screw over maintenance bypass breaker.


- b. Lift the maintenance bypass breaker cover up and tighten the lower maintenance bypass breaker captive screw.
2. Confirm that the UPS is operating in internal bypass. If not, then manually transfer the connected equipment to bypass as follows:
 - a. From the main menu select CONTROL, then press Enter.
 - b. Select Turn on/off/to bypass and press Enter.
 - c. Select Turn to bypass and press Enter.

| | |
|---|--|
|  | <ul style="list-style-type: none"> • <i>The load is unprotected from disturbances in the power supply while the UPS is on bypass.</i> |
|---|--|

3. Turn maintenance bypass breaker on.
4. Turn the internal bypass off as follows:
 - a. From the main menu select CONTROL, then press Enter.
 - b. Select Turn on/off/to bypass and press Enter.
 - c. Select Turn off UPS and press Enter.
5. Turn off breakers as follows:
 - a. For 5-kVA and 6-kVA models, Turn off input breaker, 40A output breaker.

| | |
|---|----------------|
|  | WARNING |
| Do not turn off 10A output breakers. | |

- b. For 8-kVA and 10-kVA models, Turn off input breaker, bypass breaker, 63A output breaker,

| | |
|---|----------------|
|  | WARNING |
| Do not turn off 10A output breaker and 16A output breaker. | |

6. Do not perform any operations until the UPS is completely turned-off.
7. Loosen other captive screws until the power-distribution box releases.

8. Remove the power distribution box from the UPS and set it aside.
9. On the rear of the panel, loosen the screws of the protective cover for the connectors, slide it over the connectors, and tighten the screws.

UPS Installation

1. Align the connectors and press the power-distribution box onto the UPS.
2. Hold the box firmly against the UPS and tighten the captive screws
3. Turn input breaker(s) on



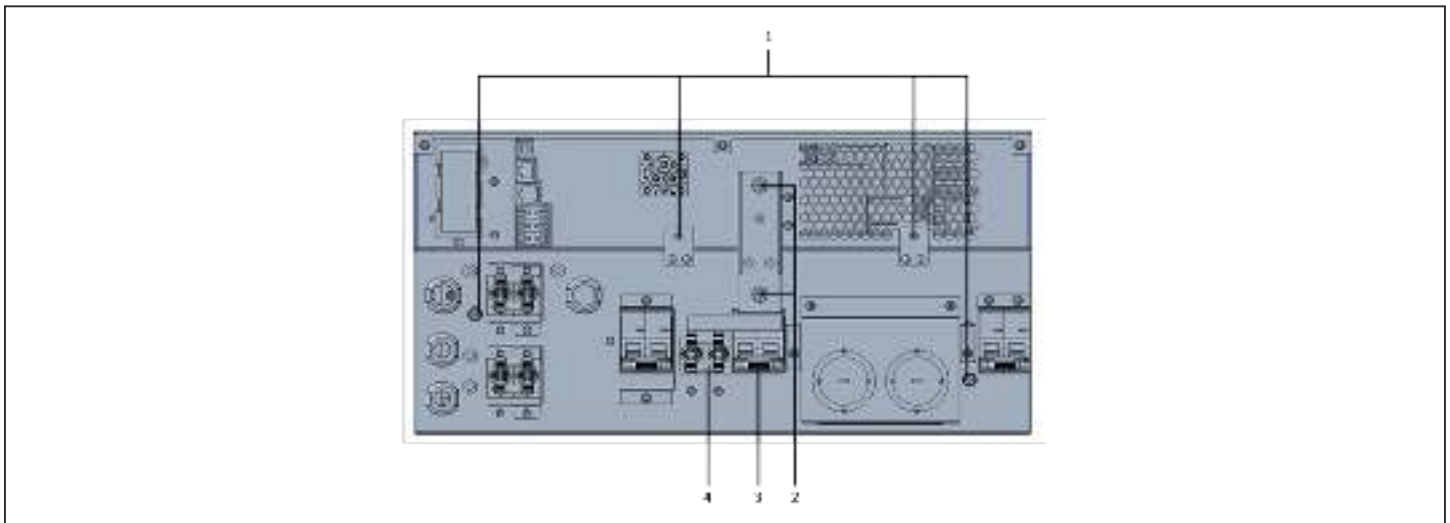
- *If there is bypass breaker on the POD, turn the bypass breaker on at the same time.*

4. Start the UPS according to startup instructions. Make sure the UPS is operating in bypass mode. If the newly installed UPS does not have internal battery, then manually turn on the Start with no battery function and turn on the output, as follows
 - a. From the main menu select Settings, then press Enter.
 - b. Select System and press Enter.
 - c. Select Start with no battery and press Enter.
 - d. Select Enable and press Enter.
 - e. From the main menu select CONTROL, then press Enter.
 - f. Select Turn on/off/to bypass and press Enter.
5. Verify the UPS output is available. Turn output breakers on.
6. Turn maintenance bypass breaker(s) off.
7. Tighten maintenance bypass captive screw over the maintenance bypass breaker.
8. Turn the inverter back on.



- *The captive screws and maintenance-bypass breaker cover is similar for all 5- to 10-kVA models. Figure 5-3 shows an example on the 5-kVA model.*

Figure 5-3 Maintenance-bypass Breaker Cover and Captive Screws



| ITEM | DESCRIPTION |
|------|----------------------------|
| 1 | Captive screws for POD |
| 2 | Connector-cover screws |
| 3 | Maintenance-bypass breaker |

5.6. Firmware Updates

The UPS has two firmware components:

- DSP is the firmware for the power module.
- MCU is the firmware for the display panel.

Both may be updated through a connection the UPS, using CLI method via connecting the RS232 port on the rear of the UPS, if the UPS includes the IntelliSlot RDU101 card, using the RJ-45 port on the card.

The latest firmware is available for download from the GXT5 product page at www.Vertiv.com. Refer to [Table 5-2](#) below, and make sure you have the correct files for the update.

Table 5-2 Upgrade File Names by UPS Model

| UPS MODEL NUMBER | DSP FIRMWARE FILENAME | MCU FIRMWARE NAME | |
|--|---------------------------------|-------------------|--|
| GXT5-750IRT2UXL | GXT5_Micro_0.5k-3k_P***.bin | GXT5_M***.bin | |
| GXT5-750IRT2UXLE | | | |
| GXT5-1000IRT2UXL | | | |
| GXT5-1000IRT2UXLE | | | |
| GXT5-1500IRT2UXL | | | |
| GXT5-1500IRT2UXLE | | | |
| GXT5-2000IRT2UXL | | | |
| GXT5-2000IRT2UXLE | | | |
| GXT5-3000IRT2UXL | | | |
| GXT5-3000IRT2UXLE | | | |
| GXT5-5000IRT5UXLN | GXT5_Small_5k-10k_230_P***.bin | | |
| GXT5-5000IRT5UXLE | | | |
| GXT5-6000IRT5UXLN | | | |
| GXT5-6000IRT5UXLE | | | |
| GXT5-8000IRT5UXLN | | | |
| GXT5-8000IRT5UXLE | | | |
| GXT5-10KIRT5UXLN | GXT5_Small_16k-20k_230_P***.bin | | |
| GXT5-10KIRT5UXLE | | | |
| GXT5-16KIRT9UXLN | | | |
| GXT5-16KIRT9UXLE | | | |
| GXT5-20KIRT9UXLN | | | |
| GXT5-20KIRT9UXLE | | | |
| <p>For DSP update files:</p> <ul style="list-style-type: none"> • “P” represents the power module. The number following “P” is the version of the power module. • “D” represents the rectifier and inverter module. The number following “D” is the version of the rectifier and inverter module. • “K” is included after the version for the DSP kernel upgrade file, for example: GXT5_Micro_0.5k-3k_P***K.bin) <p>For MCU update files:</p> <ul style="list-style-type: none"> • “M” represents the MCU module. The number following “M” represents the MCU software version. | | | |

5.6.1. Updating Firmware with RDU101 Card Connection

If your UPS has an IntelliSlot RDU101 communication card installed (optional on some models), you can update firmware with a computer and network cable connected to the card.



- *The RDU101 card is password protected. Be sure to obtain the user name and password from an administrator. The name and password may have been changed from the default.*



- *For detailed operating instructions for the card, refer to the Liebert® IntelliSlot™ RDU101 Communications Card Installer/User Guide, available at www.Vertiv.com.*

Updating MCU Firmware via RDU101



- *Do not update firmware while the UPS is on Battery mode.*

1. Connect a network cable to the RJ-45 Ethernet port of the RDU101 card. For the card/connection location, refer to the appropriate rear-panel description for your UPS model in [Rear Panels on page 5](#).
2. On a computer connected to the same network as the UPS, open a browser window and enter the IP address of the RDU101 card in the address bar.

You can get the card's IP address from the display panel. Select the About menu then the Product tab, and locate IPv4 address.



- *We recommend using the Google Chrome browser.*

3. Upload the update file using the card's user interface, see [Figure 5-4](#) on the next page.
 - a. Select the "GXT5" tab, then the File Transfer folder in the tab-menu pane on the left-hand side of the page.
 - b. On the file-transfer page, click Choose File, and select the MCU upgrade file, then click Transfer file.
 - c. Enter the Username and Password, then click Login.

The factory-defaults:

Username : Liebert (case-sensitive)

Password: Liebert (case-sensitive)



- *The name and password may have been changed from the default. Be sure to obtain the username and password from an administrator.*

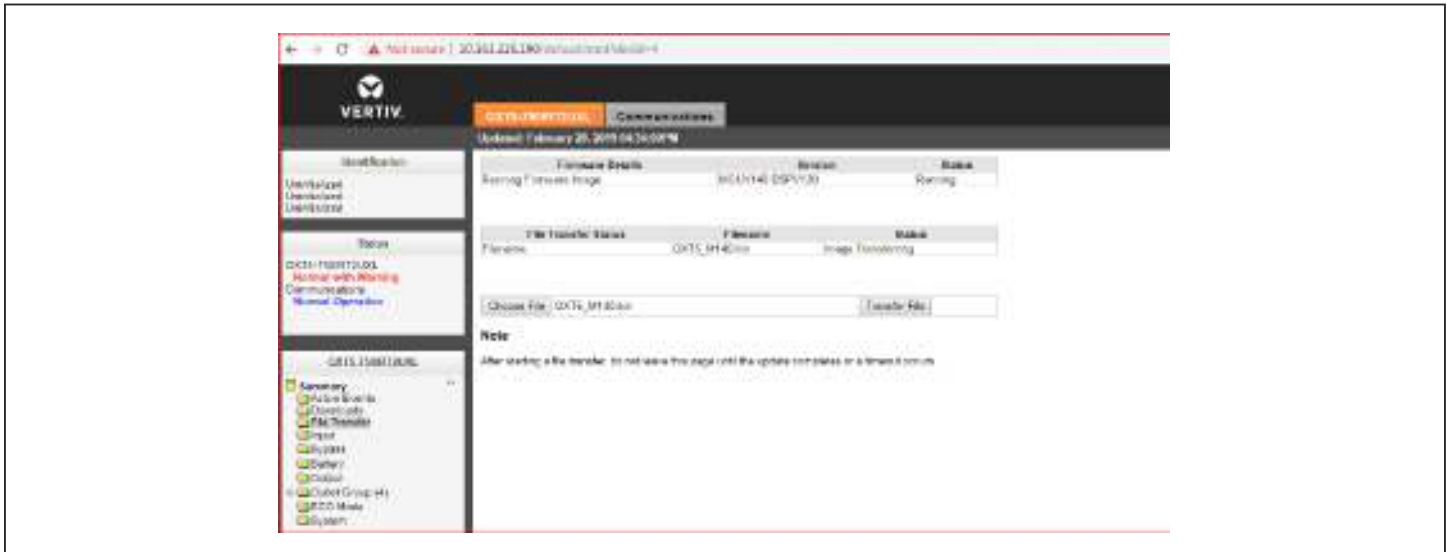
The status of the transfer displays in the File Transfer Status section. After about 2 minutes, the UPS restarts and the web page refreshes.



- *The transfer process takes about 2 minutes. Do not leave or close the page until the status is "Update Complete."*

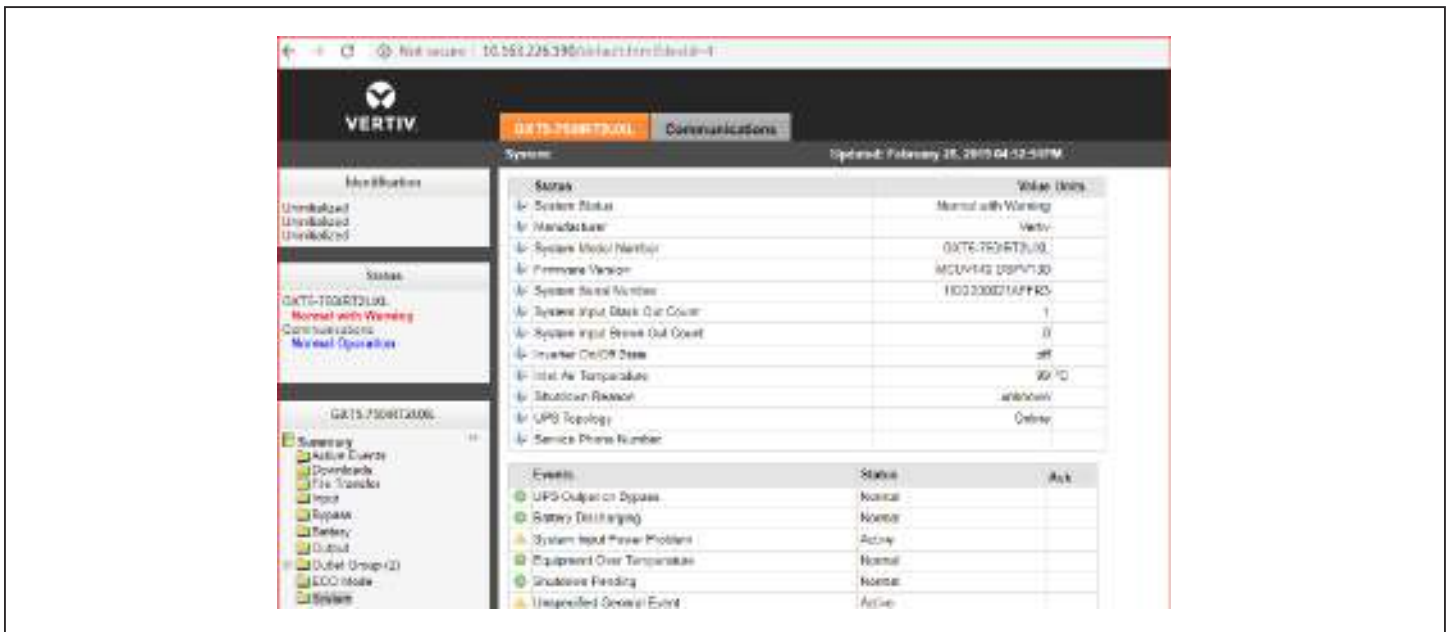
- d. You can check the firmware version, select the System folder in the tab-menu pane on the left-hand side of the page, and check the Firmware Version field, see [Figure 5-5](#) on the next page.

Figure 5-4 File Transfer on the RDU101 User Interface



| ITEM | DESCRIPTION |
|------|---|
| 1 | "UPS" tab, typically the UPS model number |
| 2 | File Transfer folder |
| 3 | Choose File button |
| 4 | Transfer File button |
| 5 | Status of file transfer |

Figure 5-5 Firmware Version on the RDU101 User Interface



Updating DSP Firmware via RDU101



- Only update the DSP firmware while the UPS is in Stand-by mode. The REPO terminal of the UPS must be un-plugged. When the REPO terminal is unplugged the load will lose power. Do not update firmware while the UPS is on Battery mode.

1. Disconnect the REPO terminal from the rear panel of the UPS, see [Figure 5-6](#) below.

Figure 5-6 REPO Terminal



2. Connect a network cable to the RJ-45 Ethernet port of the RDU101 card. For the card/connection location, refer to the appropriate rear-panel description for your UPS model in [Rear Panels on page 5](#).
3. On a computer connected to the same network as the RDU101 open a browser window and enter the IP address of the RDU101 card in the address bar.

You can get the card's IP address from the display panel. Select the About menu then the Product tab, and locate IPv4 address.



- We recommend using the Google Chrome browser.


4. Upload the update file using the card's user interface, see [Figure 5-7](#) on the next page.
 - a. Select the "GXT5" tab, then the File Transfer folder in the tab-menu pane on the left-hand side of the page.
 - b. On the file-transfer page, click Choose File, and select the DSP upgrade file, then click Transfer file.

c. Enter the Username and Password, then click Login.

The factory-defaults:


Username : Liebert (case-sensitive)

Password: Liebert (case-sensitive)



- *The name and password may have been changed from the default. Be sure to obtain the user name and password from an administrator.*

The status of the transfer displays in the File Transfer Status section.



- *The transfer process takes about 2 minutes. Do not leave or close the page until the status is “Update Complete.”*

d. You can check the firmware version, select the System folder in the tab-menu pane on the left-hand side of the page, and check the Firmware Version field, see [Figure 5-8](#).

Figure 5-7 File Transfer on the RDU101 User Interface

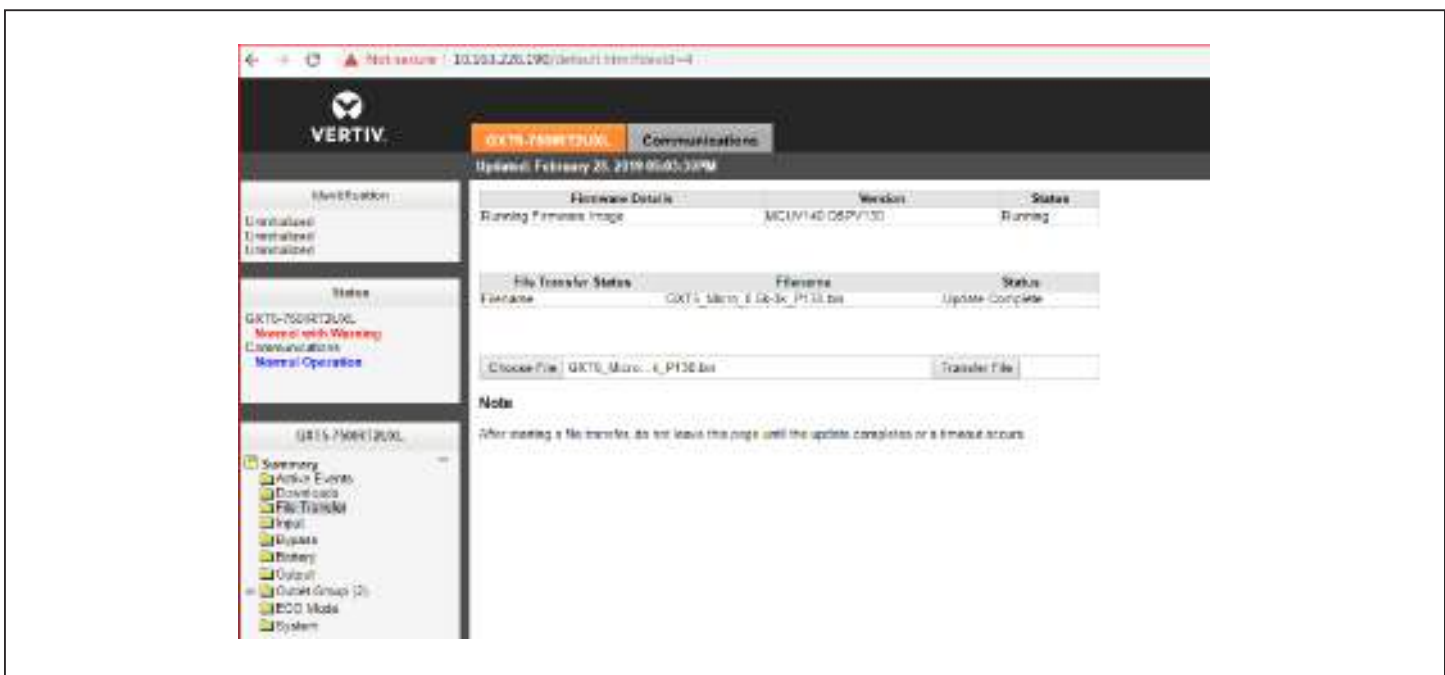
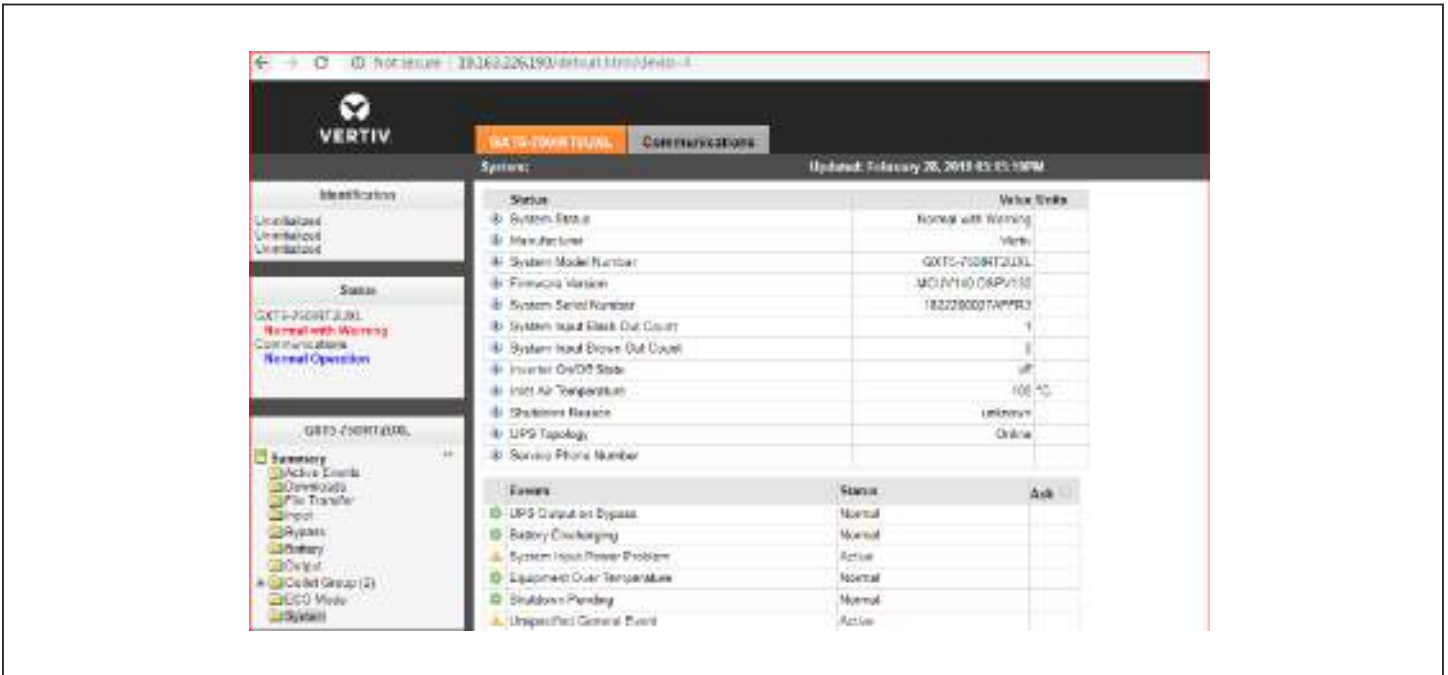


Figure 5-8 Firmware Version on the RDU101 User Interface




5.6.2. Updating Firmware with a CLI Connection

You can use the Vertiv command-line interface to update firmware with a computer connected to the RS232 (RJ-45) port on the rear of the UPS.

To perform the update via CLI, you need the following:

- Serial-terminal emulator with Ymodem transfer ability (for example: ExtraPuTTY)
- Cable with RJ-45 connector on one end and DB9 connector on the other or an RJ45/FTDI USB serial-port adapter

Updating MCU Firmware via CLI




- Do not update firmware while the UPS is on Battery mode.

1. Connect the RJ-45 connector to the RS232 port on UPS. For the connection location, refer to the appropriate rear-panel description for your UPS model in [Rear Panels on page 5](#).
2. Connect the DB9/USB connector to the computer with the serial-terminal emulator installed.
3. Open the serial-terminal emulator, and adjust the settings to communicate with the UPS:

- Select “Serial” connection for the session.
 - Check the computer “device management” settings for the communication port (for example COM6),and select it in the emulator.
 - Select 115200 for the connection speed.
 - Open the emulator session.
4. On the CLI, enter the username and password:
 - Default username = user
 - Default password = 123456
 5. On the command line, enter update, then press d on the keyboard, see [Figure 5-9](#) on the next page
 6. In the menu bar, select Files Transfer > Ymodem, select the MCU upgrade file, then click Send.

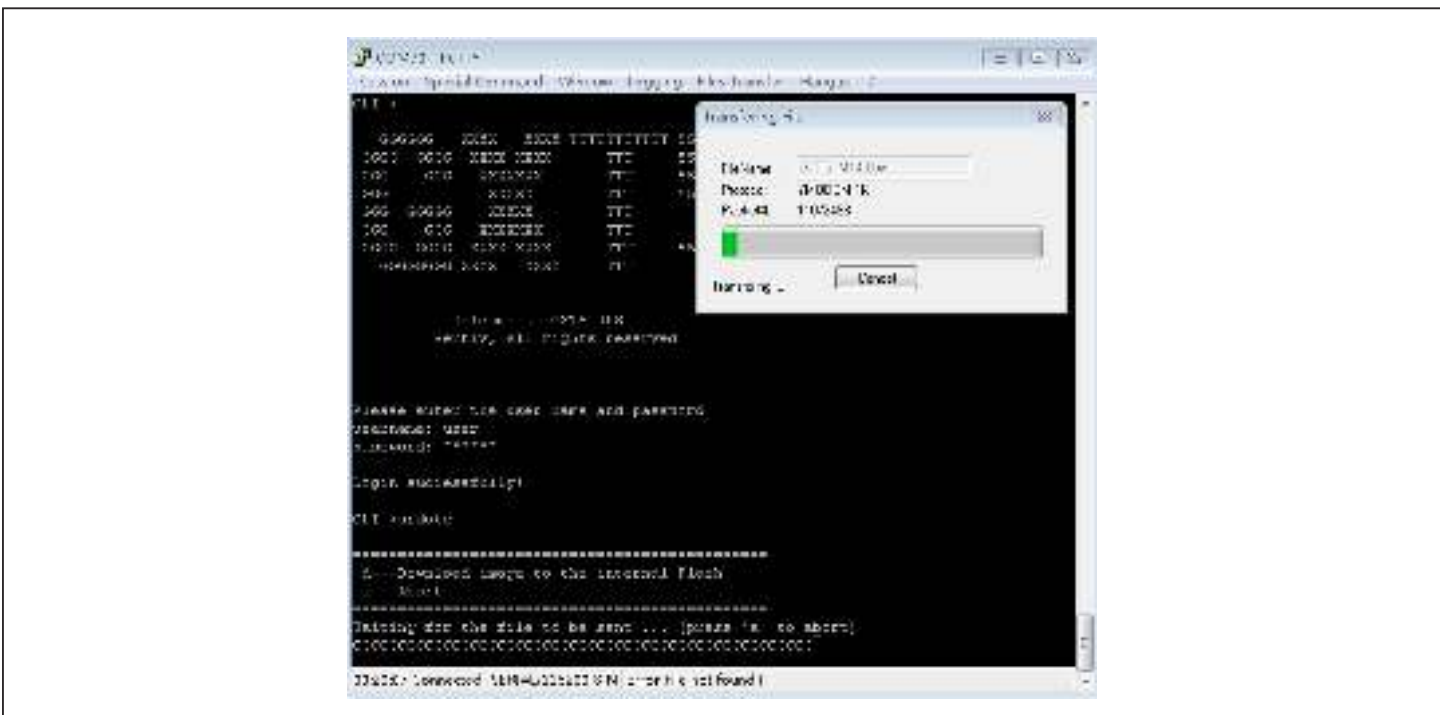
The status of the transfer displays in a status dialog. After about 3 minutes, the UPS restarts and the CLI exits update mode.



- *The transfer process takes about 3 minutes. Do not close the status dialog.*

- a. You can check the firmware version by entering version in the command line.

Figure 5-9 File Transfer with the CLI



Updating DSP Firmware via CLI



- Only update the DSP firmware while the UPS is in Stand-by mode. The REPO terminal of the UPS must be un-plugged. Do not update firmware while the UPS is on Battery mode.


1. Disconnect the REPO terminal from the rear panel of the UPS, see [Figure 5-10](#) below.

Figure 5-10 REPO Terminal



2. Connect the RJ-45 connector to the RS232 port on UPS. For the connection location, refer to the appropriate rear-panel description for your UPS model in [1.Rear Panels on page 5](#).
3. Connect the DB9 connector to a computer with the serial-terminal emulator installed.
4. Open the serial-terminal emulator, and adjust the settings to communicate with the UPS:
 - Select “Serial” connection for the session.
 - Check the computer “device management” settings for the communication port (for example COM6),and select the same port in the emulator.
 - Select 115200 for the connection speed.
 - Open the emulator session.
5. On the CLI, enter the username and password:
 - Default username = user
 - Default password = 123456
6. On the command line, enter update, then press d on the keyboard, see [Figure 5-11](#) on the next page
7. In the menu bar, select Files Transfer > Ymodem, select the DSP upgrade file, then click **Send**.

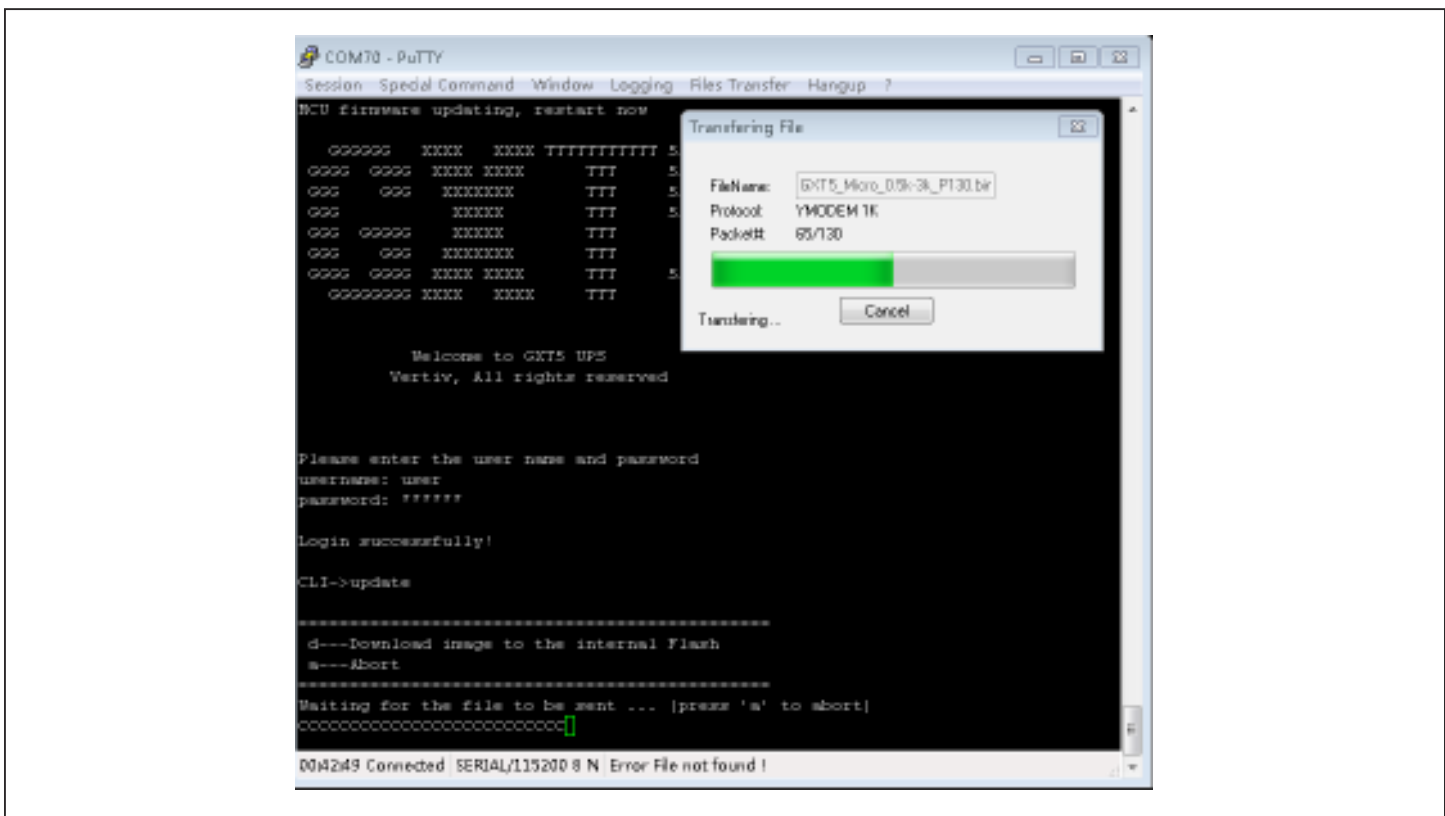
The status of the transfer displays in a status dialog.



- *The transfer process takes about 2 minutes. Do not close the status dialog.*

a. You can check the firmware version by entering Version in the command line..

Figure 5-11 File Transfer with the CLI



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Chapter 6: Troubleshooting

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

6.1. Symptoms that Require Troubleshooting

The following symptoms indicate the UPS is malfunctioning:

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

6.2. Audible Alarm (Buzzer)

An audible alarm accompanies various events during UPS operations. [Table 6-1](#) below, describes the sounds and their meaning. To silence an alarm, see [Silencing the Audible Alarm on page 47](#).

Table 6-1 Audible-alarm Descriptions

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



- *NOTE: When an alarm is indicated, an alarm message is logged. [Table 4-4 on page 71](#), describes the alarm messages you may see. When a fault is indicated, front-panel display list the fault, which are described in [Table 6-2](#) below.*

6.2.1. Faults

When the fault indicator is illuminated, the LCD displays the fault. The faults are described in [Table 6-2](#) below.

Table 6-2 Description of displayed faults

| SOUND | CAUSE | CORRECTIVE STEPS |
|---------------------------------------|--|--|
| Battery test fail | The battery is bad or weak. | Contact technical support. |
| Rectifier fault | Rectifier fault A rectifier failure occurred. | Contact technical support. |
| Inverter overload, Bypass overcurrent | The UPS is overloaded, Bypass is over current. | Reduce the load and contact technical support. |
| Inverter fault | The inverter is faulty. | Contact technical support. |
| Battery aged | The battery is bad or weak. | Replace the battery. |
| Output short | The output connection is short-circuited. | Shut-down the equipment and contact technical support. |
| DC bus abnormal | The DC bus is abnormal. | Contact technical support. |
| System overtemp | Over-temperature condition in the UPS. The UPS will transfer to bypass mode. | Reduce the load and contact technical support. |
| Charger fault | The charger is faulty. | Contact technical support. |
| Fan fault | At least one fan is faulty. | Contact technical support. |
| DC/DC fault | A DC-DC charger failure occurred. | Contact technical support. |

6.3. Troubleshooting UPS Issues

In the event of an issue with the UPS, refer to [Table 6-3](#) below, to determine the cause and solution. If the fault persists, contact Vertiv Technical Support. Visit the GXT5 product page at www.vertiv.com for contact information.

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

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

Table 6-3 Troubleshooting

| PROBLEM | CAUSE | SOLUTION |
|-------------------------------------|--|---|
| UPS fails to start | UPS is short- circuited or overloaded | Ensure UPS is Off. Disconnect all loads and ensure nothing is lodged in output receptacles. Ensure loads are not defective or shorted internally. |
| | Batteries are not charged enough or not connected | Check to ensure the internal battery is connected. If it is not, 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. |

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Chapter 7: Specifications

Table 7-1 UPS Specifications, 750 VA and 1000 VA models

| MODEL GXT5- | 750IRT2UXL* | 750IRT2UXLE | 1000IRT2UXL* | 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, kg (lb) | | | | |
| Unit | 16.5 (36.3) | | | |
| Shipping | 23.5 (51.7) | 21 (46.2) | 23.5 (51.7) | 21 (46.2) |
| Input AC | | | | |
| Voltage Range (typical) | 230 VAC nominal; variable based on output load | | | |
| 90% ~ 100% loading | 168 to 288 VAC | | | |
| 70% ~ 90% loading | 150 to 288 VAC | | | |
| 50%~70% loading | 115 to 288 VAC | | | |
| 0%~50% | 115 to 288 VAC | | | |
| Frequency | 40 Hz to 70 Hz; Auto Sensing | | | |
| Input Power Cord | C14 | | | |
| Output AC | | | | |
| Output Receptacles | C13 × 8 | | | |
| Voltage | 200/208/220/230/240 VAC (user-configurable); ±3% | | | |
| Waveform | Sine wave | | | |
| Utility (AC) Model Overload | >200% for 250 ms; 150 to 200% for 2 seconds 125 to 150% for 50 seconds; 105 to 125% 60 seconds | | | |
| Internal Battery Charger | | | | |
| Charger Current, A | default 2.2 A; Maximum 8 A | | | |
| Battery Parameters | | | | |
| Type | Valve-regulated, non-spillable, lead acid | | | |
| Qty×V×Rating | 3 × 12V × 9.0 Ah | | | |
| Battery Mfr./Part# | LEOCH DJW12-9.0 | | | |
| Back-up time | See Battery Run Times on page 118 . | | | |
| Recharge Time | 3 Hours to 90% capacity after full discharge with 100% load till UPS auto-shutdown (Internal Batteries Only) | | | |
| Bypass Parameters | | | | |
| 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. | | | |

| MODEL GXT5- | 750IRT2UXL* | 750IRT2UXLE | 1000IRT2UXL* | 1000IRT2UXLE |
|---|---|-------------|----------------|--------------|
| RATING | 750 VA/750 W | | 1000 VA/1000 W | |
| Environmental Requirements | | | | |
| Operating Temperature, °F (°C) | +32 to +122 (0 to 50); Operating temperature may be increased to 122 °F (50 °C with a 10% derating of the output power) | | | |
| Storage Temperature, °F (°C) | -4 to +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 @ 3 ft. (1 m) front and sides <43 dBA max @ 3 ft. (1 m) rear | | | |
| Agency | | | | |
| Safety | UL-1778 (Fifth Edition), C-UL listed, IEC 62040-1: 2008 (First Edition) + Am 1:2013, EN 62040-1:2008+A1:2013 | | | |
| Transportation | ISTA Procedure 1A | | | |
| Surge Immunity | ANSI C62.41 Category B | | | |
| RFI/EMI | CISPR22 Class A (RFI)/ FCC Part 15 (Class A) | | | |
| <i>*Only these models are available in the ASIA PACIFIC region.</i> | | | | |

Table 7-2 UPS Specifications, 1500 VA and 2000 VA Models

| MODEL GXT5- | 1500IRT2UXL* | 1500IRT2UXLE | 2000IRT2UXL* | 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 × 10.3 (617 × 570 × 262) | | | |
| Weight, kg (lb) | | | | |
| Unit | 21 (46.2) | | | |
| Shipping | 28 (61.6) | 25.5 (56.1) | 28 (61.6) | 25.5 (56.1) |
| Input AC | | | | |
| Voltage Range (typical) | 230 VAC nominal; variable based on output load | | | |
| 90% ~ 100% loading | 168 to 288 VAC | | | |
| 70% ~ 90% loading | 150 to 288 VAC | | | |
| 50%~70% loading | 115 to 288 VAC | | | |
| 0%~50% | 115 to 288 VAC | | | |
| Frequency | 40 Hz to 70 Hz; Auto Sensing | | | |
| Input Power Cord | C14 | | C20 | |

| MODEL GXT5- | 1500IRT2UXL* | 1500IRT2UXLE | 2000IRT2UXL* | 2000IRT2UXLE |
|--|---|--------------|--|--------------|
| RATING | 1500 VA/1500 W | | 2000 VA/2000 W | |
| Output AC | | | | |
| Output Receptacles | 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 Battery Charger | | | | |
| Charger Current, A | default 2.2 A; Maximum 8 A | | | |
| Battery Parameters | | | | |
| Type | Valve-regulated, non-spillable, lead acid | | | |
| Qty×V×Rating | 4 × 12V × 9.0 Ah | | | |
| Battery Mfr./Part# | LEOCH DJW12-9.0 | | | |
| Back-up time | See Battery Run Times on page 119 . | | | |
| Recharge Time | 3 Hours to 90% capacity after full discharge with 100% load till UPS auto-shutdown (Internal Batteries Only) | | | |
| Bypass Parameters | | | | |
| 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 Requirements | | | | |
| Operating Temperature, °F (°C) | +32 to +122 (0 to 50); Operating temperature may be increased to 122 °F (50 °C with a 10% derating of the output power) | | | |
| Storage Temperature, °F (°C) | -4 to +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 @ 3ft. (1 m) front and sides <45dBA max @ 3 ft. (1 m) rear | | <48 dBA max @ 3ft. (1m) front and sides <48 dBA max @ 3 ft. (1 m) rear | |
| Agency | | | | |
| Safety | UL-1778 (Fifth Edition), C-UL listed, IEC 62040-1: 2008 (First Edition) + Am 1:2013, EN 62040-1:2008+A1:2013 | | | |
| Transportation | ISTA Procedure 1A | | | |
| Surge Immunity | ANSI C62.41 Category B | | | |
| RFI/EMI | CISPR22 Class A (RFI)/ FCC Part 15 (Class A) | | | |
| *Only these models are available in the ASIA PACIFIC region. | | | | |

Table 7-3 UPS Specifications, 3000 VA Models

| MODEL GXT5- | 3000IRT2UXL* | 3000IRT2UXLE |
|------------------------------------|--|--------------|
| RATING | 3000 VA/3000 W | |
| Dimensions, D×W×H, in. (mm) | | |
| Unit | 21.3 x 16.9 x 3.4 (540 x 430 x 85) | |
| Shipping | 28.2 x 22.4 x 10.3 (717 x 570 x 262) | |
| Weight, kg (lb) | | |
| Unit | 28.2 (62) | |
| Shipping | 36 (79.2) | 33 (72.6) |
| Input AC | | |
| Voltage Range (typical) | 230VAC nominal; variable based on output load | |
| 90% ~ 100% loading | 184 to 288 VAC | |
| 70% ~ 90% loading | 161 to 288 VAC | |
| 50%~70% loading | 115 to 288 VAC | |
| 0%~50% | 115 to 288 VAC | |
| Frequency | 40 Hz ~ 70 Hz; Auto Sensing | |
| Input Power Cord | C20 | |
| Output AC | | |
| Output Receptacles | C13×6&C19 | |
| Voltage | 200/208/220/230/240 VAC (user-configurable); ±3% | |
| Waveform | Sine wave | |
| Utility (AC) Model Overload | 200% for 250 ms; 150 to 200% for 2 seconds; 105% to 125% for 55 seconds; 125% to 150% for 55 seconds | |
| Internal Battery Charger | | |
| Charger Current, A | default 2.2 A; Maximum 8 A | |
| Battery Parameters | | |
| Type | Valve-regulated, non-spillable, lead acid | |
| Qty×V×Rating | 6 × 12V × 9.0 Ah | |
| Battery Mfr./Part# | LEOCH DJW12-9.0 | |
| Back-up time | See Battery Run Times on page 120 . | |
| Recharge Time | 3 Hours to 90% capacity after full discharge with 100% load till UPS auto-shutdown (Internal Batteries Only) | |
| Bypass Parameters | | |
| 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. | |

| MODEL GXT5- | 3000IRT2UXL* | 3000IRT2UXLE |
|--|--|--------------|
| RATING | 3000 VA/3000 W | |
| Environmental Requirements | | |
| Operating Temperature, °F (°C) | +32 to +122 (0 to 50); Operating temperature may be increased to 122 °F (50 °C with a 10% derating of the output power | |
| Storage Temperature, °F (°C) | -4 to +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 | <48 dBA max @ 3 ft. (1 m) front and sides <48 dBA max @ 3 ft. (1 m) rear | |
| Agency | | |
| Safety | UL-1778 (Fifth Edition), C-UL listed, IEC 62040-1: 2008 (First Edition) + Am 1:2013, EN 62040-1:2008+A1:2013 | |
| Transportation | ISTA Procedure 1A | |
| Surge Immunity | ANSI C62.41 Category B | |
| RFI/EMI | CISPR22 Class A (RFI)/ FCC Part 15 (Class A) | |
| *Only these models are available in the ASIA PACIFIC region. | | |

Table 7-4 UPS Specifications, 5-kVA and 6-kVA models

| MODEL GXT5- | 5000IRT5UXLN* | 5000IRT5UXLE | 6000IRT5UXLN* | 6000IRT5UXLE |
|---|--|--------------|-----------------------|--------------|
| RATING | 5000 VA/5000 W | | 6000 VA/6000 W | |
| Dimensions, D×W×H, in. (mm) | | | | |
| Unit | 430 × 630 × 217 (16.9 × 24.8 × 8.5) | | | |
| Shipping | 600 × 800 × 520 (23.6 × 31.5 × 20.5) | | | |
| Weight, kg (lb) | | | | |
| Unit | 70.8 (156) | | 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 | | | |
| Operating voltage range without battery operation | 176 to 288 VAC (100 – 176 VAC with power derating) | | | |
| Maximum Allowable VAC | 288 VAC | | | |
| Input frequency without battery operation | 40 to 70 Hz | | | |
| Input Power Connection | PD5-CE6HDWRMBS | | PD5-CE6HDWRMBS | |

| MODEL GXT5- | 5000IRT5UXLN* | 5000IRT5UXLE | 6000IRT5UXLN* | 6000IRT5UXLE |
|-----------------------------------|--|--------------|--|--------------|
| RATING | 5000 VA/5000 W | | 6000 VA/6000 W | |
| Output AC Parameters | | | | |
| AC-AC Efficiency | 94% | | | |
| Factory-default VAC Frequency | 230 VAC, 50 Hz | | | |
| Output Power Connection | PD5-CE6HDWRMBS | | PD5-CE6HDWRMBS | |
| Waveform | Sinewave | | | |
| Main Mode Overload | > 150% minimum 200 mS, 125 to 150% for 60 seconds; 105 to 125% for 5 minutes; ≤ 105% continuous | | | |
| User-configurable VAC | 200/208/220/230/240 VAC (Adjustable using operation/display configuration options) | | | |
| Bypass parameters | | | | |
| 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. | | | |
| Internal Battery Charger | | | | |
| Charger Current, A | default 2.25 A, maximum 5 A | | | |
| Battery Parameters | | | | |
| Type | Valve-regulated, non-spillable, lead acid | | | |
| Qty×V×Rating | 16 x 12V x 9.0AH | | | |
| Battery Mfr./Part# | 9AH; LEOCH/DJW12-9.0 | | | |
| Back-up time | See Battery Run Times on page 120. | | See Battery Run Times on page 121. | |
| Environmental Requirements | | | | |
| Operating Temperature, °F (°C) | 0 to 40 (32 to 104) (no derating) | | | |
| Storage Temperature, °F (°C) | -20 to +60 (-4 to +140) (contain batteries will be from -15 to 40 °C.) | | | |
| Relative Humidity | 0 to 95% non-condensing | | | |
| Operating Elevation | Up to 3,000 m (9,842.5 ft) at 25°C (77°F) without derating | | | |
| Audible Noise | Front and Side <55 dBA | | | |
| Agency | | | | |
| Safety* | IEC 62040-1: 2008 (First Edition) + Am 1:2013, EN 62040-1:2008+A1:2013 | | | |
| 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) | | | |

| MODEL GXT5- | 5000IRT5UXLN* | 5000IRT5UXLE | 6000IRT5UXLN* | 6000IRT5UXLE |
|---|---|--------------|----------------|--------------|
| RATING | 5000 VA/5000 W | | 6000 VA/6000 W | |
| ESD | IEC/EN EN61000-4-2, Level 4, Criteria B | | | |
| Radiated Susceptibility | IEC/EN EN61000-4-3, Level 3, Criteria A | | | |
| Electrical Fast Transient | IEC/EN EN61000-4-4, Level 4, Criteria B | | | |
| Surge Immunity | IEC/EN EN61000-4-5, Level 4, Criteria A; ANSI C62.41 Category B | | | |
| Transportation | ISTA Procedure 1E | | | |
| <i>*Only these models are available in the ASIA PACIFIC region.</i> | | | | |

Table 7-5 UPS Specifications, 8-kVA and 10-kVA models

| MODEL GXT5- | 8000IRT5UXLN* | 8000IRT5UXLE | 10KIRT5UXLN* | 10KIRT5UXLE |
|---|--|--------------|------------------|-------------|
| RATING | 8000 VA/8000 W | | 10000 VA/10000 W | |
| Dimensions, D×W×H, in. (mm) | | | | |
| Unit | 430 × 630 × 217 (16.9 × 24.8 × 8.5) | | | |
| Shipping | 600 × 800 × 520 (23.6 × 31.5 × 20.5) | | | |
| Weight, kg (lb) | | | | |
| Unit | 74.5 (164.2) | | 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 | | | |
| Operating voltage range without battery operation | 176 to 288 VAC (100 to 176VAC with power derating) | | | |
| Maximum Allowable VAC | 288 VAC | | | |
| Input frequency without battery operation | 40 to 70 Hz | | | |

| MODEL GXT5- | 8000IRT5UXLN* | 8000IRT5UXLE | 10KIRT5UXLN* | 10KIRT5UXLE |
|-----------------------------------|--|--------------|--|-------------|
| RATING | 8000 VA/8000 W | | 10000 VA/10000 W | |
| 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 | Sinewave | | | |
| Main Mode Overload | > 150% minimum 200 ms, 125 to 150% for 60 seconds; 105 to 125% for for 5 minutes; ≤ 105% continuous | | | |
| User- configurable VAC | 200/208/220/230/240 VAC (Adjustable using operation/display configuration options) | | | |
| Bypass parameters | | | | |
| 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. | | | |
| Internal Battery Charger | | | | |
| Charger Current, A | default 2.25 A; Maximum 8 A | | | |
| Battery Parameters | | | | |
| Type | Valve-regulated, non-spillable, lead acid | | | |
| Qty×V×Rating | 16 x 12V x 9.0AH | | | |
| Battery Mfr./Part# | 9AH; LEOCH/DJW12-9.0 | | | |
| Back-up time | See Battery Run Times on page 121. | | See Battery Run Times on page 122. | |
| Environmental Requirements | | | | |
| Operating Temperature, °F (°C) | 0 to 40 (32 to 104) (no derating) | | | |
| Storage Temperature, °F (°C) | -20 to +60 (-4 to +140) (contain batteries will be from -15 to 40 °C.) | | | |
| Relative Humidity | 0 to 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 | | | |

| MODEL GXT5- | 8000IRT5UXLN* | 8000IRT5UXLE | 10KIRT5UXLN* | 10KIRT5UXLE |
|---|--|--------------|------------------|-------------|
| RATING | 8000 VA/8000 W | | 10000 VA/10000 W | |
| Agency | | | | |
| Safety* | IEC 62040-1: 2008 (First Edition) + Am 1:2013, EN 62040-1:2008+A1:2013 | | | |
| 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 B | | | |
| Radiated Susceptibility | IEC/EN EN61000-4-3, Level 3, Criteria A | | | |
| Electrical Fast Transient | IEC/EN EN61000-4-4, Level 4, Criteria B | | | |
| Surge Immunity | IEC/EN EN61000-4-5, Level 4, Criteria A; ANSI C62.41 Category B | | | |
| Transportation | ISTA Procedure 1E | | | |
| <i>*Only these models are available in the ASIA PACIFIC region.</i> | | | | |

Table 7-6 UPS Specifications, 16-kVA and 20-kVA models

| MODEL GXT5- | 16KIRT9UXLN* | 16KIRT9UXLE | 20KIRT9UXLN* | 20KIRT9UXLE |
|--|---|---------------|------------------|---------------|
| RATING | 16000 VA/16000 W | | 20000 VA/20000 W | |
| Dimensions, D×W×H, in. (mm) | | | | |
| Unit | 430 × 630 × 394 (16.9 × 24.8 × 15.5) | | | |
| Shipping | 800 × 1200 × 710 (31.5 × 47.2 × 27.9) | | | |
| 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 | | | |
| Operating voltage range without battery operation | 176 to 288 VAC (100 to 176 VAC with power derating) | | | |
| Maximum Allowable VAC | 288 VAC | | | |
| Input frequency without battery operation | 40 to 70 Hz | | | |
| Input Power Connection | Input terminal block | | | |

| MODEL GXT5- | 16KIRT9UXLN* | 16KIRT9UXLE | 20KIRT9UXLN* | 20KIRT9UXLE |
|-----------------------------------|--|-------------|--|-------------|
| RATING | 16000 VA/16000 W | | 20000 VA/20000 W | |
| Output AC Parameters | | | | |
| AC-AC Efficiency | Up to 95.9% | | | |
| Factory-default VAC Frequency | 230 VAC, 50 Hz | | | |
| Output Power Connection | Output terminal block | | | |
| Waveform | Sinewave | | | |
| Main Mode Overload | > 150% minimum 200 mS, 125 to 150% for 60 seconds; 105 to 125% for for 5 minutes; ≤ 105% continuous | | | |
| User- configurable VAC | 200/208/220/230/240 VAC (Adjustable using operation/display configuration options) | | | |
| Bypass parameters | | | | |
| 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. | | | |
| Internal Battery Charger | | | | |
| Charger Current, A | default 2.25 A, maximum 13 A | | | |
| Battery Parameters | | | | |
| Type | Valve-regulated, non-spillable, lead acid | | | |
| Qty×V×Rating | 32 x 12V x 9.0 AH | | | |
| Battery Mfr./Part# | 9 AH; LEOCH/DJW12-9.0 | | | |
| Back-up time | See Battery Run Times on page 122. | | See Battery Run Times on page 123. | |
| Environmental Requirements | | | | |
| Operating Temperature, °F (°C) | 0 to 40 (32 to 104) (no derating) | | | |
| Storage Temperature, °F (°C) | -20 to +60 (-4 to +140) (contain batteries will be from -15 to 40 °C.) | | | |
| Relative Humidity | 0 to 95% non-condensing | | | |
| Operating Elevation | Up to 3,000 m (9,842.5 ft) at 25°C (77°F) without derating | | | |
| Audible Noise | Front and Side <58 dBA | | | |

| MODEL GXT5- | 16KIRT9UXLN* | 16KIRT9UXLE | 20KIRT9UXLN* | 20KIRT9UXLE |
|---|---|-------------|------------------|-------------|
| RATING | 16000 VA/16000 W | | 20000 VA/20000 W | |
| Agency | | | | |
| Safety | UL-1778 (Fifth Edition), C-UL listed, IEC 62040-1:2008 (First Edition) + Am 1:2013, EN 62040-1:2008+A1:2013 | | | |
| 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 B | | | |
| Radiated Susceptibility | IEC/EN EN61000-4-3, Level 3, Criteria A | | | |
| Electrical Fast Transient | IEC/EN EN61000-4-4, Level 4, Criteria B | | | |
| Surge Immunity | IEC/EN EN61000-4-5, Level 4, Criteria A; ANSI C62.41 Category B | | | |
| Transportation | ISTA Procedure 1E | | | |
| <i>*Only these models are available in the ASIA PACIFIC region.</i> | | | | |

Table 7-7 Power-distribution Specifications

| MODEL NUMBER | PD5-CE6HDWRMBS | PD5-CE10HDWRMBS |
|---|---|--|
| Amp Rating | 50 A | 63 A |
| Input Power Connection | Single-phase (L1-L2-G) hard-wired | |
| Output Power Connection | Single-phase (L1-L2-G) hard-wired | |
| Includes | Two IEC320 C19 16A/250V Sockets Six C13 10A/250V Sockets | Four IEC320 C19 16A/250V Sockets, Four C13 10A/250V Sockets |
| Input Branch Circuit Breaker, Supplied by User | 50 A | 63 A |

Table 7-8 External Battery Cabinet Specifications, 750 VA to 3000 VA models

| MODEL NUMBER | GXT5-EBC36VRT2U | GXT5-EBC48VRT2U | GXT5-EBC72VRT2U |
|------------------------------------|--|---------------------------------------|---|
| USED W/UPS MODEL | 750 to 1,000 VA MODELS | 1,500 to 2,000 VA MODELS | 3,000 VA MODELS |
| Dimensions, D×W×H, in. (mm) | | | |
| Unit (with bezel) | 15.7 × 16.9 × 3.4 (400 × 430 × 85) | 18.5 × 16.9 × 3.4 (470 × 430 × 85) | 21.3 × 16.9 × 3.4 (540 × 430 × 85) |
| Shipping | 24.3 × 22.4 × 10.3 (617 × 570 × 262) | | 28.2 × 22.4 × 10.3 (717 × 570 × 262) |
| Weight, kg (lb) | | | |
| Unit | 22.6 (49.72) | 28.8 (63.36) | 41.2 (90.64) |
| Shipping | 28.7 (63.14) | 35 (77) | 47.6 (104.72) |
| Battery | | | |
| Type | Valve-regulated, non-spillable, lead acid | | |
| Qty × V × Rating | 2 × 3 × 12V × 9.0 Ah | 2 × 4 × 12V × 9.0 Ah | 2 × 6 × 12V × 9.0 Ah |
| Battery Mfr./Part# | LEOCH/DJW12-9.0 | | |
| Backup time | See Battery Run Times on page 118 | | |
| Environmental Requirements | | | |
| Operating Temperature, °F (°C) | 32 to 104 (0 to 40) | | |
| Storage Temperature, °F (°C) | 5 to 122 (-15 to 50) High ambient temperatures will reduce battery life | | |
| Relative Humidity | 0% to 95%, non-condensing | | |
| Operating Elevation | Up to 10,000 ft (3,000 m) at 104 °F (40 °C) | | |
| Agency | | | |
| Safety | UL-1778 (Fifth Edition), C-UL listed, IEC 62040-1: 2008 (First Edition) + Am 1:2013, EN 62040-1:2008+A1:2013 | | |
| EMC | EN 62040-2:2006 EN 61000-3-2:2014 EN 61000-3-3:2013 | | |
| Transportation | ISTA Procedure 1A | | |
| Surge Immunity | ANSI C62.41 Category B | | |
| RFI/EMI | CISPR22 Class A (RFI)/ FCC Part 15 (Class A) | | |

Table 7-9 External Battery Cabinet Specifications, 5-kVA to 20-kVA models

| MODEL NUMBER | GXT5-EBC192VRT3U | GXT5-EBC384VRT6U |
|------------------------------------|--|--------------------------------------|
| USED W/UPS MODEL | 5 to 10 KVA MODELS | 16 to 20 KVA MODELS |
| Dimensions, D×W×H, in. (mm) | | |
| 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 | 800 x 600 x 440 (31.5 x 23.6 x 15.7) | 800 x 600 x 580 (31.5 x 23.6 x 22.8) |
| Weight, kg (lb) | | |
| Unit | 57.6 (127) | 112 (246.9) |
| Shipping | 80 (176.4) | 136 (299.8) |
| Battery | | |
| Type | Valve-regulated, non-spillable, lead acid | |
| Qty × Voltage | 16 x 12V | 32 x 12V |
| Battery Mfr./Part# | 9AH; LEOCH/DJW12-9.0 | |
| Backup time | See appropriate table for model size in Battery Run Times on page 118 . | |
| Environmental Requirements | | |
| Operating Temperature, °F (°C) | 0 to 40 (32 to 104) | |
| Storage Temperature, °F (°C) | -15 to 40 (5 to 104) | |
| Relative Humidity | 0 – 95% non-condensing | |
| Operating Elevation | Up to 3,000 m (9,842.5 ft.) at 25°C (77°F) | |
| Agency | | |
| Safety | UL-1778 (Fifth Edition), C-UL listed, IEC 62040-1: 2008 (First Edition) + Am 1:2013, EN 62040-1:2008+A1:2013 | |
| Transportation | ISTA Procedure 1E | |

7.1. Battery Run Times



- 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 7-10 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 |
| 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 7-11 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 | 408.6 | 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 | 350.4 |
| 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 7-12 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 | 1247.1 | 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 | 351.5 | 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 | 243.0 | 285.0 | 326.6 | 369.5 | 412.5 |
| 80 | 1200 | 1200 | 8.2 | 38.6 | 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 7-13 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 | 883.1 | 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 | 63.1 | 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 7-14 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 | 1641.8 | 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 | 168.0 | 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 7-15 Battery Run Time in Minutes Model: 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 7-16 Battery Run Time in Minutes Model: 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 | 441.0 | 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 | 6.0 | 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 7-17 Battery Run Time in Minutes Model: 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 | 254.5 | 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 | 110.0 | 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 7-18 Battery Run Time in Minutes Model: 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 | 17.5 | 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 7-19 Battery Run Time in Minutes Model: 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 7-20 Battery Run Time in Minutes Model: 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 | 656.5 | 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 |

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Appendix I: Open Source Software Legal Notices

The GXT5 product links the FreeRTOS software with Vertiv Group Corporation's proprietary modules that communicate with the FreeRTOS software solely through the FreeRTOS API interface. This use is an exception to the FOSS GPLv2 license. The user is free to redistribute the FreeRTOS software and/or modify it under the terms of the GNU General Public License as published by the Free Software Foundation. A copy of the GNU General Public License is located at www.gnu.org/licenses/old-licenses/gpl-2.0.html. A copy of the exception is located at <https://spdx.org/licenses/freertos-exception-2.0.html>. For a period of three (3) years after purchasing the GXT5 product, the purchaser has the right to obtain a copy of the FreeRTOS software that is incorporated in the GXT5 product. The purchaser can contact Vertiv Technical Support and request the software.

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Appendix II: Technical Support

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

In Asia-Pacific

China

Email: vertiv.service@vertiv.com
Customer Service Hotline: 4008876510

India

Email: vertiv@customercare.com
Customer Service Hotline: 1800 209 6070

Asia

Australia: au.service@vertiv.com

New Zealand: au.service@vertiv.com

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Version Information

V1.0 (July 19, 2019) - Initial Release

V2.0 (April 30, 2020)- Combined User Manual

V2.1 (December 30, 2020)- Updated safety standards



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590-1928-501A