



**Liebert®**

GXT4™ UPS

Installer/User Guide

230 V, 5000 VA

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### **Technical Support Site**

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

# TABLE OF CONTENTS

<b>1 Important Safety Precautions</b> .....	<b>7</b>
<b>2 GXT4 Description</b> .....	<b>11</b>
2.1 Features .....	11
2.2 Available Models .....	11
2.3 Front Panel and Controls .....	12
2.4 Rear Panel Features .....	12
2.5 Removable Power Distribution Box .....	13
2.6 Internal Battery Packs .....	14
2.7 Major Components .....	14
2.7.1 Transient Voltage Surge Suppression (TVSS) and EMI/RFI Filters .....	15
2.7.2 Rectifier/Power Factor Correction (PFC) Circuit .....	15
2.7.3 Inverter .....	15
2.7.4 Battery Charger .....	15
2.7.5 DC-to-DC Converter .....	15
2.7.6 Battery .....	15
2.7.7 Internal Bypass .....	15
2.7.8 Maintenance Bypass .....	16
2.8 Operating Modes .....	16
2.8.1 Mains Mode .....	16
2.8.2 Manual Bypass Mode .....	16
2.8.3 Battery Mode .....	16
2.8.4 Battery Recharge Mode .....	17
2.8.5 Frequency Converter Mode .....	17
2.8.6 Active ECO Mode .....	17
<b>3 Installation</b> .....	<b>19</b>
3.1 What's Included .....	19
3.2 Unpacking and Inspection .....	19
3.3 Preparation for Installation .....	20
3.3.1 Installation Environment .....	20
3.3.2 Installation Clearances .....	20
3.4 Installing the UPS .....	20
3.4.1 Tower Installation .....	20
3.4.2 Rack Installation .....	21
3.5 Installing External Battery Cabinets .....	22
3.5.1 Installing the Optional Liebert® IntelliSlot™ Card and Communication Cables .....	23
3.6 Connecting Input/Output Power .....	23
3.6.1 Installing the Power Distribution Box .....	23
3.6.2 Electrical Connections for the Power-distribution Box .....	24
3.6.3 Removing the Power Distribution Box .....	25
<b>4 Operation and Display Panel</b> .....	<b>27</b>

4.1 LED Indicators .....	27
4.2 Control Buttons .....	28
4.3 LCD .....	28
4.4 Menu Structure .....	29
4.4.1 Startup Screen .....	30
4.4.2 Default Screen .....	30
4.4.3 Main Menu Screen .....	30
4.5 Prompt List .....	33
4.6 Warning List .....	34
4.7 Fault List .....	34
<b>5 Operation .....</b>	<b>37</b>
5.1 Startup Checklist for the GXT4 .....	37
5.2 Starting the UPS .....	37
5.3 Performing a Manual Battery Test .....	37
5.4 Performing Manual Bypass .....	38
5.5 Shutting Down the GXT4 .....	38
5.6 Disconnecting Input Power from the GXT4 .....	38
5.7 Placing UPS in Maintenance Bypass .....	38
<b>6 Communication .....</b>	<b>39</b>
6.1 Liebert® IntelliSlot Communication Cards .....	39
6.2 USB Port Communication .....	39
6.2.1 Configuration Program .....	39
6.3 Terminal Block Communication .....	40
6.3.1 Any Mode Shutdown .....	41
6.3.2 Battery Mode Shutdown .....	41
6.3.3 On Battery .....	41
6.3.4 Low Battery .....	42
6.4 Remote Emergency Power Off .....	42
<b>7 Maintenance .....</b>	<b>43</b>
7.1 Replacing the Internal Battery Pack .....	43
7.1.1 Battery Replacement Procedures .....	43
7.2 Charging Batteries .....	45
7.3 Precautions .....	45
7.4 Checking UPS Status .....	45
7.5 Checking UPS Functions .....	46
<b>8 Troubleshooting .....</b>	<b>47</b>
8.1 Symptoms that Require Troubleshooting .....	47
8.1.1 Faults .....	47
8.1.2 Audible Alarm .....	48
8.2 Troubleshooting UPS Issues .....	48
<b>9 Specifications .....</b>	<b>51</b>
9.1 Auto-Learning Battery Run Times .....	54

<b>Appendices</b> .....	<b>55</b>
Appendix A: Technical Support .....	55



# 1 IMPORTANT SAFETY PRECAUTIONS

## SAVE THESE INSTRUCTIONS

This manual contains important safety instructions that must be followed during the installation and maintenance of the UPS and batteries. Read this manual thoroughly before attempting to install or operate this UPS.

### UPS Safety Notes

This UPS contains no user-serviceable parts except the internal battery pack. The Off/Bypass push button does not electrically isolate internal parts. Under no circumstances attempt to gain internal access other than to replace the batteries due to risk of electric shock or burn. Do not continue to use the UPS if the front panel indications are not in accordance with these operating instructions or if the UPS performance alters in use. Refer all faults to your local dealer, Vertiv representative or Vertiv Channel Support.

This UPS has an internal battery, and the output receptacles of the UPS may carry live voltage even if the UPS is not connected to utility input power.

Before moving or rewiring this UPS, disconnect utility input power and the battery and make sure that the UPS is completely shut down. Otherwise, the output terminal may carry live voltage, presenting an electric shock hazard.

To ensure human safety and normal UPS operation, the UPS must be properly grounded before use.

When the UPS is connected to an IT power distribution system, a short-circuit protection device must be installed on the neutral line.

Install and use the Liebert® GXT4 in the following environments:

- Temperature: 32°F - 104°F (0°C - 40°C), relative humidity: 0% to 95% non-condensing
- Out of direct sunlight
- Away from heat sources
- Stable surface, not subject to vibrations or shocks
- Away from dust and other particulates
- Away from corrosive substances, salts and flammable gases

Keep the air inlet and outlet of this UPS unobstructed. Poor ventilation will increase the internal temperature of the UPS and can adversely affect the UPS and its batteries.

Keep liquid and foreign objects away from the UPS.

In case of fire, use a dry chemical fire extinguisher to put out the fire. Using a fluid fire extinguisher may cause electric shock.

This product is designed for commercial/industrial use only. This UPS is not intended for use with life support and other designated critical devices. Maximum load must not exceed that shown on the UPS rating label. This UPS is designed for data processing equipment. If uncertain, consult your local dealer or Vertiv representative.

This UPS is not for use in a computer room as defined in the standard for the Protection of Electronic Computer/Data Processing Equipment, ANSI/NFPA 75.

## Battery Safety



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



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

The following precautions should be observed when working on batteries:

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

**ELECTROMAGNETIC COMPATIBILITY** The Liebert® GXT4 series complies with the limits for a CLASS A DIGITAL DEVICE, PURSUANT TO Part 15 of FCC rules. Operation is subject to the following conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

Operating this device in a residential area is likely to cause harmful interference that users must correct at their own expense.

The Liebert® GXT4 series complies with the requirements of EMC Directive 2004/108/EC and the published technical standards. Continued compliance requires installation in accordance with these instructions and use of accessories approved by Vertiv.



## Information for the Protection of the Environment

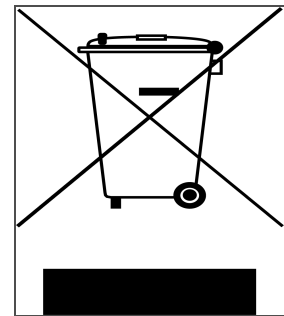
**UPS Servicing:** UPS makes use of components dangerous for the environment (electronic cards, electronic components). The components removed must be taken to specialized collection and disposal centers.

**NOTICE TO EUROPEAN UNION CUSTOMERS: DISPOSAL OF OLD APPLIANCES**—This product has been supplied from an environmentally aware manufacturer that complies with the Waste Electrical and Electronic Equipment (WEEE) Directive 2002/96/CE.

The “crossed-out wheelee bin” symbol at right is placed on this product to encourage you to recycle wherever possible. Please be environmentally responsible and recycle this product through your recycling facility at its end of life. Do not dispose of this product as unsorted municipal waste. Follow local municipal waste ordinances for proper disposal provisions to reduce the environmental impact of waste electrical and electronic equipment (WEEE). C

For information regarding the scrapping of this equipment, please browse <https://www.vertivco.com/en-emea/> or call our worldwide technical support.

- Toll Free: 00 80011554499
- Toll Number Based in Italy: +39 0298250222



**Table 1.1 Glossary of Symbols**

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	Risk of electrical shock		Recycle
	Indicates caution followed by important instructions		DC voltage
	AC input		Equipment grounding conductor
	AC output		Bonded to ground
	Requests the user to consult the manual		AC voltage
	Indicates the unit contains a valve-regulated lead acid battery		

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## 2 GXT4 DESCRIPTION

The Liebert® GXT4 is a compact, online uninterruptible power system (UPS) that continuously conditions and regulates its output voltage. The Liebert® GXT4 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® GXT4 protects equipment from these disturbances. The Liebert® GXT4 continuously charges its batteries from the mains, enabling it to supply power to connected loads, even when the mains fail.

### 2.1 Features

- Intelligent battery management to extend the battery life
- LCD for user-friendly operation and local monitoring and configuration of operational parameters
- Fan fault self-inspection and automated diagnostic function
- Intelligent fan operation, automatically changing rotation speed depending on system requirements, to decrease power consumption and noise
- Input circuit breaker to ease recovery from overloads
- Safety approval from UL and cUL
- Communication options: USB port, Liebert® IntelliSlot™ port and terminal-block communication
- Dry contacts for remote monitoring
- Input power factor greater than 0.99
- Output voltage selection function

### 2.2 Available Models

Available models of the UPS are listed in the following table.

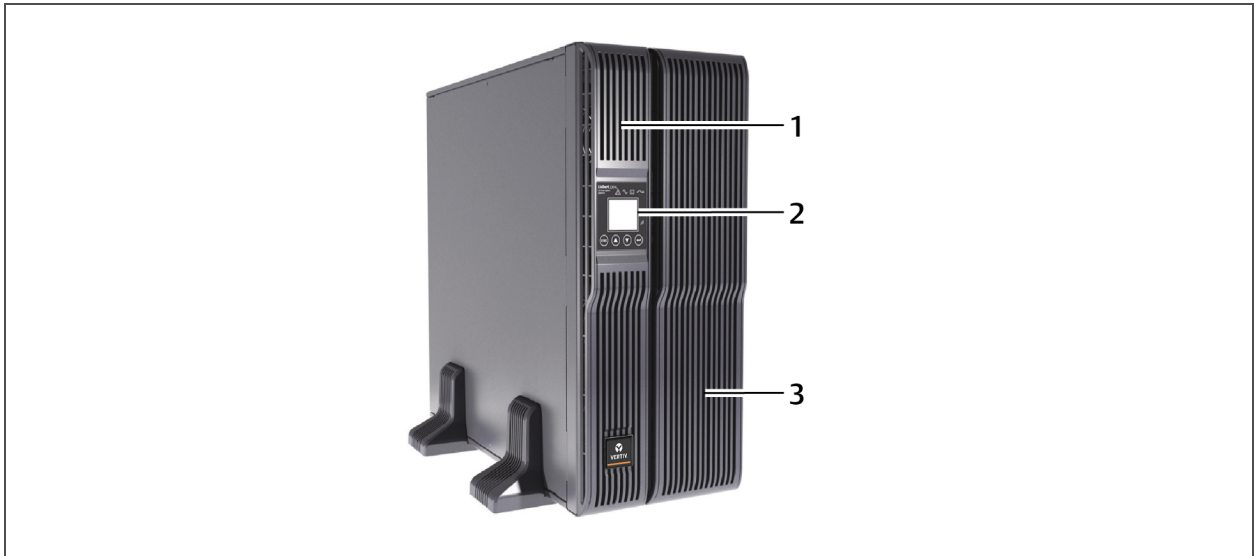
**Table 2.1 UPS models, power ratings**

MODEL NUMBER	NOMINAL POWER RATING
GXT4-5000RT230U	5000VA / 4000W

## 2.3 Front Panel and Controls

The Liebert GXT4 rack/tower models in various power ratings have the same general appearance, controls and features as shown in the following figure. The various rack/tower models differ largely in the type of receptacles each has.

Figure 2.1 Front view



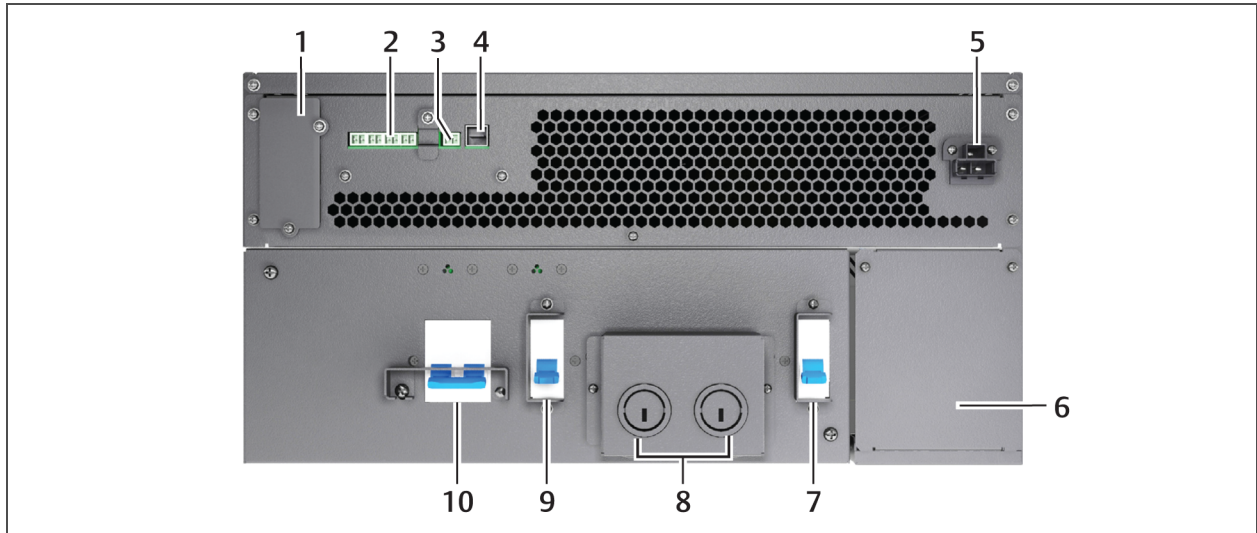
NO.	DESCRIPTION
1	Upper bezel
2	Operation and display panel
3	Lower bezel and battery-access door

## 2.4 Rear Panel Features

The rear panel of the Liebert® GXT4 has these features:

- Liebert® IntelliSlot™ Port
- USB port
- Input Circuit Breaker
- Maintenance Bypass Circuit Breaker
- REPO connection
- External Battery Connector
- Cooling Fan
- Terminal Block Communication
- Output Circuit Breakers

Figure 2.2 Rear panel—5000VA



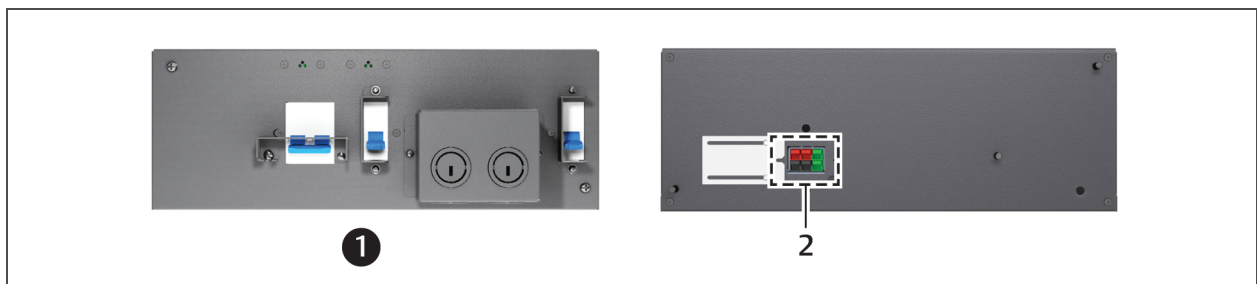
NO.	DESCRIPTION	NO.	DESCRIPTION
1	Liebert® IntelliSlot port	6	IT Power System access cover
2	Terminal-block communication	7	Input circuit breaker
3	REPO	8	Knockouts for hard-wired power input and output
4	USB port	9	Output circuit breaker
5	External battery connector	10	Maintenance bypass circuit breaker

**NOTE:** Hard-wired and hard-wired/receptacle boxes that include a manual bypass switch permit AC power to continue to flow from the utility input to the load while the box is removed from the UPS. For details, refer to [Connecting Input/Output Power](#) on page 23.

## 2.5 Removable Power Distribution Box

The UPS ships with a power-distribution pack installed. This box contains the UPS input circuit breaker.

Figure 2.3 Power distribution box

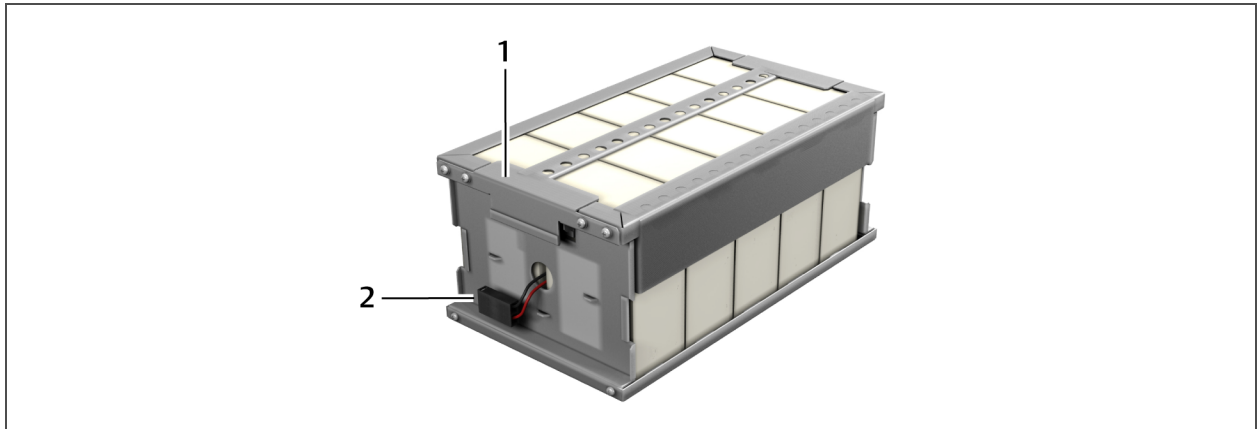


NO.	DESCRIPTION
1	Outer-surface view
2	Quick-connect

## 2.6 Internal Battery Packs

The UPS has two internal battery packs behind a battery-access door on the front of the unit. Each internal battery pack is fitted with a connector to link to the UPS.

**Figure 2.4** Internal battery pack with connector

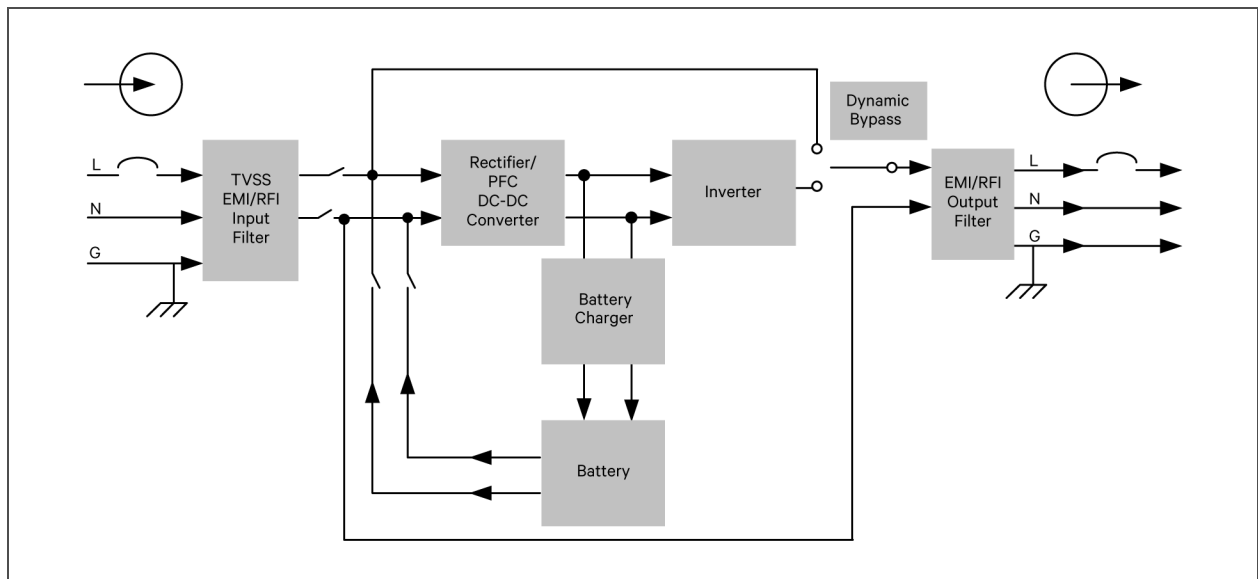


NO.	DESCRIPTION
1	Battery handle
2	Battery connector

## 2.7 Major Components

The UPS is composed of mains input, TVSS and EMI/RFI filters, rectifier/PFC, inverter, battery charger, DC-to-DC converter, battery, dynamic bypass and UPS output.

**Figure 2.5** Operating principle diagram



### **2.7.1 Transient Voltage Surge Suppression (TVSS) and EMI/RFI Filters**

The UPS has surge protection and filters that protect the connected load from power surges, electromagnetic interference (EMI) and radio frequency interference (RFI). These features can minimize any surges or interference present in the mains power. The filters also prevent surges or interference generated by the UPS from adversely affecting devices connected on the same branch as the UPS.

### **2.7.2 Rectifier/Power Factor Correction (PFC) Circuit**

In normal operation, the rectifier/PFC circuit converts mains 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 achieves two objectives:

- Efficient power use by the UPS
- Reduced reflected harmonics

This results in cleaner power available to other devices in the building that are not protected by the GXT4.

### **2.7.3 Inverter**

In normal operation, the inverter utilizes the DC output of the PFC circuit to produce precise, regulated sine-wave AC power. When mains power fails, the inverter receives DC power from the DC-to-DC Converter. In either operation mode, the UPS inverter is online, continuously generating clean, precise, regulated AC output power.

### **2.7.4 Battery Charger**

The battery charger utilizes energy from the mains power and precisely regulates it to continuously float charge the batteries. The batteries are being charged whenever the GXT4 is plugged in, even when the UPS is not turned On.

### **2.7.5 DC-to-DC Converter**

The DC-to-DC converter raises the DC voltage from the battery to the optimum operating voltage for the inverter. This allows the inverter to operate continuously at its optimum efficiency and voltage, thus increasing reliability.

### **2.7.6 Battery**

The GXT4 uses valve-regulated, non-spillable, lead acid batteries. To maintain battery design life, Operate the GXT4 in an ambient temperature of 15°C to 25°C (59°F to 77°F).

Optional external battery cabinets are available to extend battery run times.

### **2.7.7 Internal Bypass**

The GXT4 provides an alternate path for mains power to the connected load in the unlikely event of a UPS malfunction. Should the UPS have an overload, over-temperature or any other UPS failure condition, the UPS automatically transfers the connected load to bypass. Bypass operation is indicated by an audible alarm and illuminated amber Bypass LED (other LEDs may be illuminated to indicate the diagnosed problem).

To manually transfer the connected load from the inverter to bypass, press the Standby/Manual Bypass button once and hold it for about 2 seconds

### 2.7.8 Maintenance Bypass

The GXT4 provides a manual maintenance bypass in a removable section of the rear of the UPS. This allows replacement of the UPS in the event of a UPS malfunction while keeping the connected equipment powered with utility power.

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

## 2.8 Operating Modes

The UPS operation modes include the following: Mains (AC) Mode, Bypass Mode, Battery Mode, Battery Recharge Mode, Active ECO Mode and Frequency Converter Mode.

Refer to [Operation and Display Panel](#) on page 27 for details about the operating mode indicators and control buttons.

### 2.8.1 Mains Mode

During Mains Mode, the mains provides input power to the GXT4. The filters, PFC circuit and inverter process this power to provide high-quality sine wave power to connected loads. The UPS maintains the batteries in a fully-charged state.

### 2.8.2 Manual Bypass Mode

Manual Bypass Mode occurs when the unit is manually placed in internal bypass by navigating the LCD menu to select *3 Control > 1 Turn On & Off > Turn UPS Bypass*. Bypass operation is indicated by an audible alarm and illuminated amber bypass indicator. (If other indicators are illuminated, refer to [Troubleshooting](#) on page 47). During Bypass Mode, mains power bypasses the inverter and provides energy to the connected load.

#### NOTICE

Risk of loss of power to the connected load. Can cause equipment damage.

Turning Off the UPS in Bypass Mode will result in loss of output power to the connected load.

### 2.8.3 Battery Mode

The GXT4 enters Battery Mode when mains power fails or is outside acceptable limits. The battery system supplies power through the DC-to-DC converter to the inverter to generate clean AC power for the connected loads.

When the GXT4 enters Battery Mode, the UPS sounds a half-second beep at 10-second intervals. When approximately 2 minutes of run time remains, the beeps sound every 5 seconds to warn that the battery is getting low (this Low Battery Warning is user-configurable).

In Battery Mode, the battery indicator will illuminate and the LCD will show the prompt *utility power not available*.



Press either the Up or Down button once, then press the Enter button to clear the prompt and silence the audible alarm. Once the alarm prompt has been acknowledged, the screen showing the estimated battery run time and battery capacity will be visible. Refer to [Troubleshooting](#) on page 47.

For approximate battery run times, refer to .

#### NOTICE

Risk of loss of power to the connected load. Can cause equipment damage.

Turning Off the GXT4 when it is in Battery Mode will result in loss of output power to the connected load.

If the UPS is turned Off manually, it must be manually restarted after mains power returns.

If the UPS is turned Off by a communication signal or because the batteries are depleted, it will operate as set in the configuration program for Auto-Restart (Refer to [Configuration Program](#) on page 39).

### 2.8.4 Battery Recharge Mode

Once mains power is applied to the GXT4, the Battery Charger begins charging the batteries.

### 2.8.5 Frequency Converter Mode

All models of the GXT4 are capable of frequency conversion. Frequency Conversion Mode can be selected using the configuration program. Allowable frequency operating modes include:

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

**NOTE: The default for all models of the Liebert® GXT4 is “Auto Sensing - 50 Hz or 60Hz – Bypass Enabled.”**

### 2.8.6 Active ECO Mode

All Liebert® GXT4 models can operate in Active ECO Mode. In this mode, the connected equipment is powered through the bypass path to increase efficiency, reducing the electrical costs.


Active ECO mode keeps the rectifier and inverter operating, allowing the inverter to remain synchronized to bypass. This synchronization allows the transfer of the connected equipment to UPS inverter power almost seamlessly if bypass power falls outside the user-set limits. Once bypass power returns within the acceptable parameters, the UPS will return to Active ECO Mode operation.

The default setting is Active ECO Mode Off.

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## 3 INSTALLATION

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

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

### 3.1 What's Included

- Terminal Block Communication Terminals
- Compact Disk with:
  - Configuration Program
  - User Manual (electronic version)
- USB Cable—one, 2 m (6-1/2 ft) long
- Rack mounting hardware, including screws, mounting rail kit
- Two plastic, tower-stand support-base sets (four pieces)
- Warnings, Safety Instructions booklet and WEEE recycling sheet (ISO 14001 compliance)

**NOTE:** The GXT4 External Battery Cabinet shipping package includes one battery cabinet, two spacers for tower configuration and one DC-power cable and rack-mounting hardware, including screws, handles and mounting rail kit.

### 3.2 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 dealer or your Vertiv representative immediately.
- Check the accessories included in packaging list. If there is any discrepancy, contact your local dealer or your Vertiv representative immediately.

 **CAUTION:** The UPS is heavy (see [Specifications](#) on page 51). Take proper precautions when lifting or moving it.

### 3.3 Preparation for Installation

#### 3.3.1 Installation Environment

- 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 51.
- Place it in an area of unrestricted air-flow around the unit, away from water, flammable liquids, gases, corrosives, and conductive contaminants. Avoid direct sunlight.

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

#### 3.3.2 Installation Clearances

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

### 3.4 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](#) below or [Rack Installation](#) on the facing page.

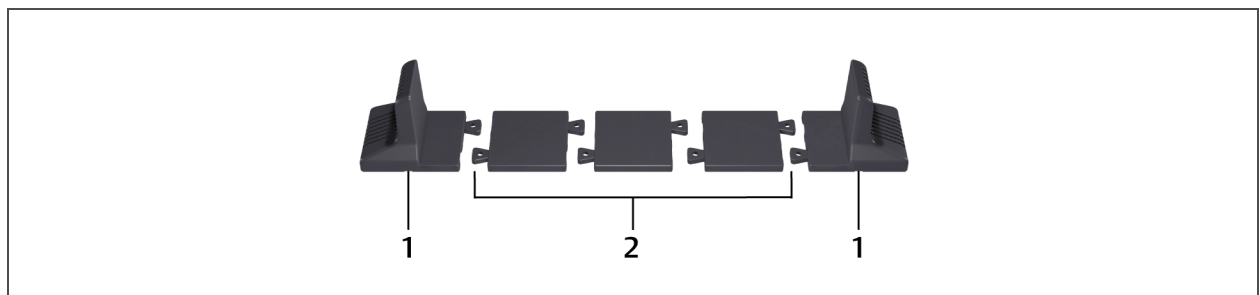
**NOTE:** When installing the UPS or making input and output connections, comply with all relevant safety codes and standards

#### 3.4.1 Tower Installation

To install the GXT4 as a tower:

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

**Figure 3.1** Support bases

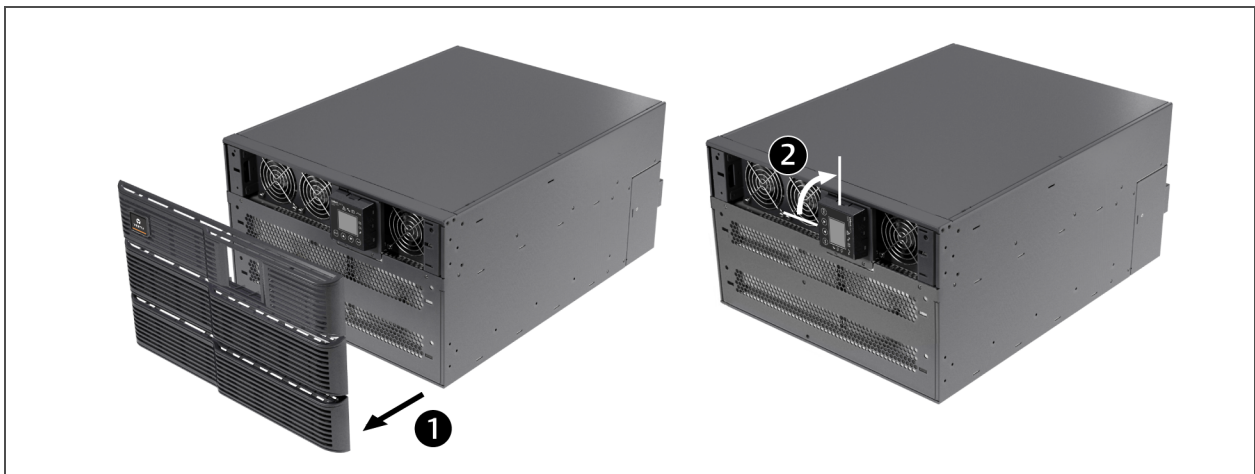


NO.	DESCRIPTION
1	Support bases
2	Spacers with connectors

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 3.1** above. Each GXT4 requires 2 support bases, one in the front and one in the rear.

4. Adjust the direction of the operation and display panel and logo on the GXT4.
  - a. Remove the front plastic bezel cover as shown the following figure.
  - b. Pull the operation and display panel gently, rotate it 90 degrees clockwise and snap it back into position, as shown.
  - c. Pull the logo on the front plastic bezel cover gently, rotate it 90 degrees clockwise and snap it back into position.
  - d. Replace the front plastic bezel cover.  
The operation and display panel and logo have been rotated 90 degrees clockwise, for upright viewing.

**Figure 3.2 Remove the front plastic bezel cover and rotate display**



NO.	DESCRIPTION
1	Remove bezel cover.
2	Rotate display 90 degrees.

5. Place the GXT4 and any battery cabinets on the 2 support bases.

### 3.4.2 Rack Installation

When installed in a rack enclosure, the GXT4 UPS and external battery cabinets (EBC) must be supported by a shelf or rack-mount rails. The GXT4 and EBC units ship with all required hardware for rack-mount installation. Because different rack-mount options install differently, refer to the installation instructions provided with the rack mount kit being used.



**CAUTION: The GXT4 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 51.**

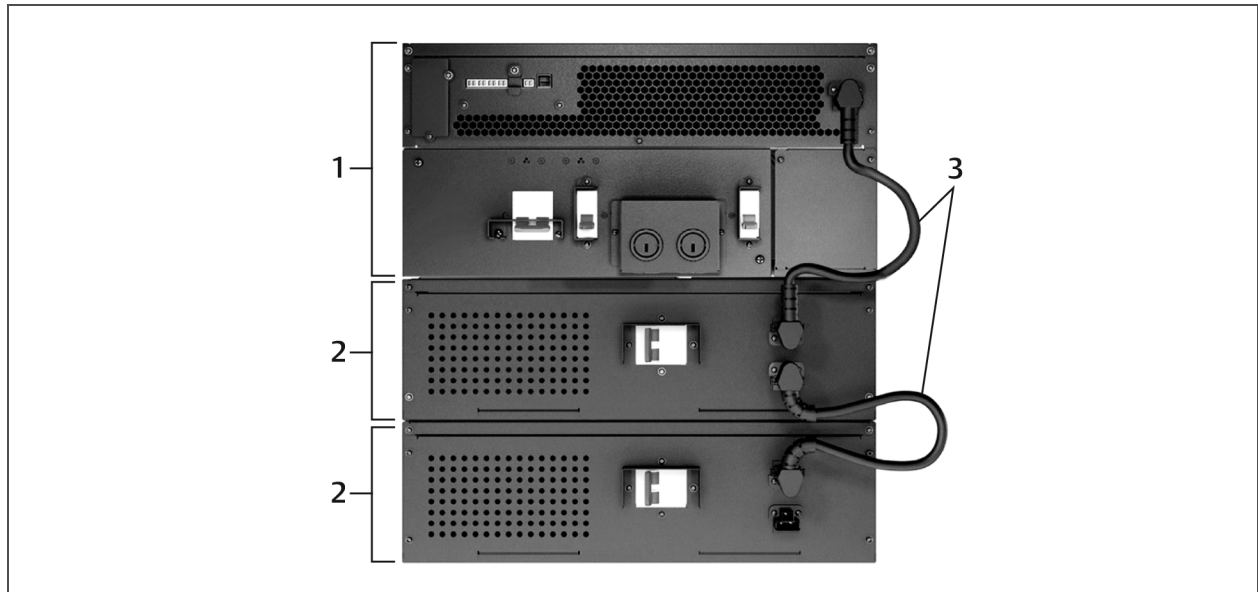
### 3.5 Installing External Battery Cabinets

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

**!** **CAUTION:** The external battery cabinet(s) are heavy (see **Table 9.3** on page 53). Take proper precautions when lifting them.

Optional, Liebert® external battery cabinets (EBC) may be connected to the UPS to provide additional battery run time. External battery cabinets are placed on one side of the UPS in a tower configuration or stacked beneath the UPS in a rack configuration.

**Figure 3.3** External battery cabinets connected to GXT4



NO.	DESCRIPTION
1	GXT4
2	External battery cabinet (EBC)
3	Cable connects EBC to GXT4.

To install the external battery cabinet(s):

1. Inspect the EBC for freight damage. Report damage to the carrier and your local dealer or Vertiv representative.
2. Optional rack-mount hardware is shipped with the external battery cabinet and may be installed at this time.

- Securing hardware and slide rails are sold separately. Please contact your local dealer or Vertiv representative for these additional options and any assistance needed. Fasten the slides into position with the screws per the instructions included with the slide rails.
3. Use the enclosed support bases for the tower option to prevent tip-over. One additional set of support-base extensions ships with each EBC.
  4. Verify the that the EBC breaker is in the "Off" position.
  5. Connect the supplied EBC cable to the rear of the cabinet, then to the rear of the UPS.
  6. Turn the EBC breaker to the "On" position.
  7. Verify the circuit breaker on the EBC is in the "On" position.
  8. Use the included configuration program or the LCD display to program the UPS with the number of external battery cabinets connected. Instructions for the configuration program are in [Configuration Program](#) on page 39.

The UPS is now equipped with additional back-up battery run time. For approximate battery run times, refer to **Table 9.4** on page 54.

**NOTE: When removing an EBC, the circuit breaker on the rear of the cabinet must be turned off before disconnecting the cable.**

**NOTE: If the UPS will be shipped or stored for an extended time, the connector should be disconnected. This will minimize any stand-by current drain on the batteries and help attain their design life.**

### 3.5.1 Installing the Optional Liebert® IntelliSlot™ Card and Communication Cables

1. On the GXT4, remove the protective cover of the Liebert® IntelliSlot port and set it aside.
2. Insert the IntelliSlot card into the IntelliSlot port and secure it with screws.
3. To connect any cable associated with and IntelliSlot card, refer to the quick-installation guide provided with the card.

To configure and use the Liebert® IntelliSlot communication card, refer to the card's user manual. Find manuals online at <http://www.VertivCo.com/en-us/support/>.

## 3.6 Connecting Input/Output Power

The GXT4 ships with a power distribution box attached.

Refer to the following instructions for removal and installation.

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

### 3.6.1 Installing the Power Distribution Box

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 except the one over the maintenance bypass breaker.
3. Turn the output and input breakers "On."
4. Start the UPS according to start-up instructions.
5. Verify that the UPS lamp is illuminated.
6. Turn the maintenance bypass breaker "Off."

7. Insert the maintenance-bypass-interlock bracket behind the captive screw and tighten the screw.

**NOTE: The maintenance bypass breaker interlock bracket must be installed behind the captive screw, and the screw must be tightened for the UPS to operate in inverter mode.**

### 3.6.2 Electrical Connections for the Power-distribution Box

Electrical connections are made through a removable power distribution box that attaches to the rear of the UPS.

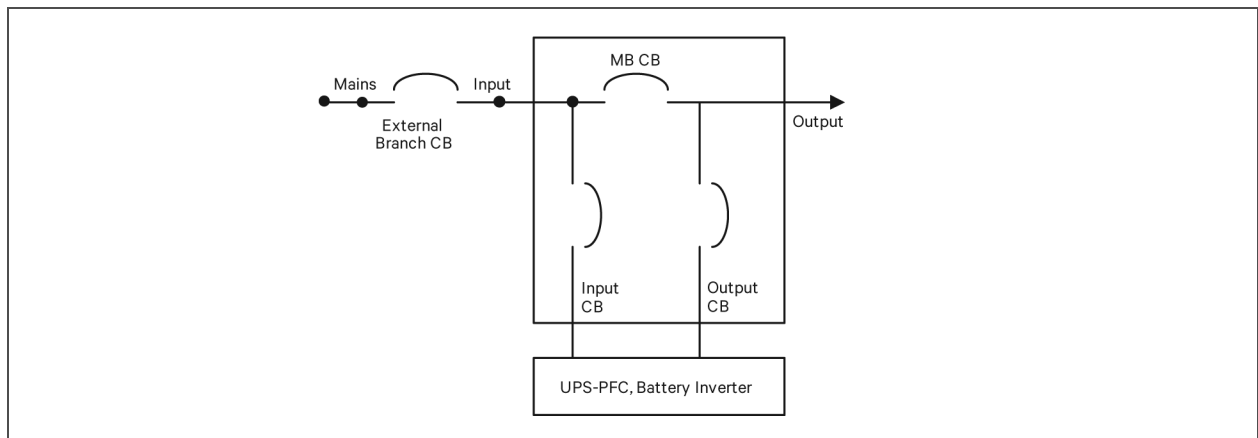
The installer must provide an upstream branch circuit breaker. The input circuit breaker on the distribution box and the output circuit breaker on the rear of the power distribution box disconnect all power between the main cabinet and the distribution box.

Models equipped with a manual bypass breaker pass bypass power directly to the bypass breaker from the input terminal block. The input circuit breaker on the distribution box does not disconnect power from the manual bypass breaker.

**Table 3.1 Branch circuit breaker ratings**

UNIT RATING	MAXIMUM BREAKER RATING
5000VA	D Type 35-A

**Figure 3.4 Distribution box electrical connections diagram**



### Terminal Block Connections

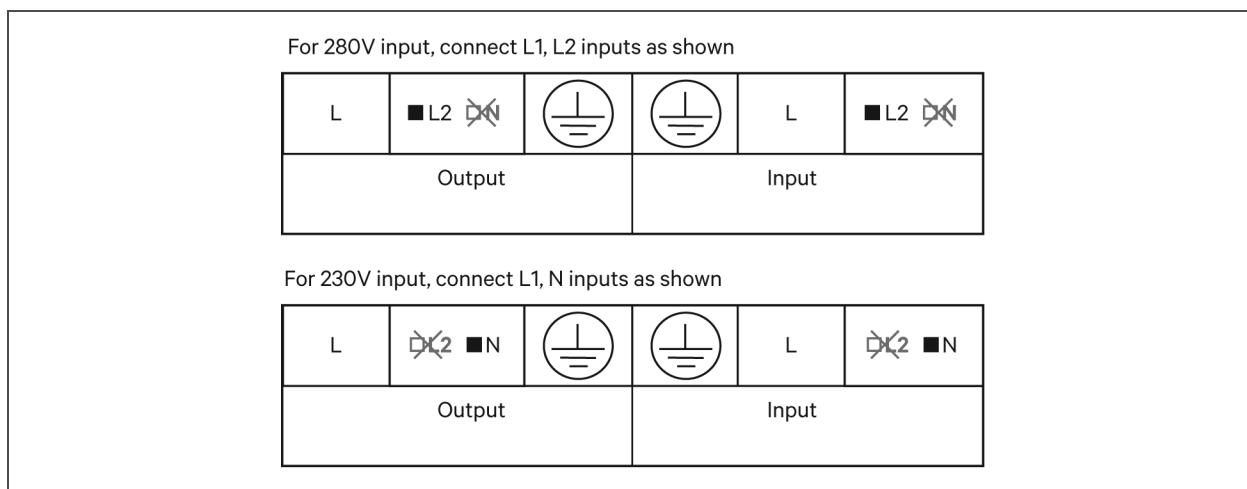
Conduit entry holes are provided on the rear and side of the box. Input and output wiring should not share the same conduit. We recommend using strain relief when installing the wire.



**Table 3.2 Terminal-block Electrical specifications**

UPS MODEL	RECOMMENDED (MAXIMUM) EXTERNAL OVERCURRENT PROTECTION	RECOMMENDED WIRE (INCLUDING GROUND WIRE) (75°C COPPER WIRE)	MAXIMUM WIRE ACCEPTED BY TERMINAL BLOCK	TERMINAL TIGHTENING TORQUE
GXT4 5000RT230U	35-A	4 mm <sup>2</sup> (10 AWG)	6 mm <sup>2</sup> (8 AWG)	1.13 Nm (10 in-lb)

**Figure 3.5 Terminal block connections**



1. We recommend installing a breaker upstream of unit.
2. The installer must provide circuit breaker protection according to local codes. The mains disconnect should be within sight of the UPS or have appropriate an appropriate lock-out. Maintain service space around the UPS or use flexible conduit.
3. The installer must provide output distribution panels, circuit breaker protection or emergency disconnects according to local codes. Output circuits must not share a common conduit with any other wiring.

### 3.6.3 Removing the Power Distribution Box

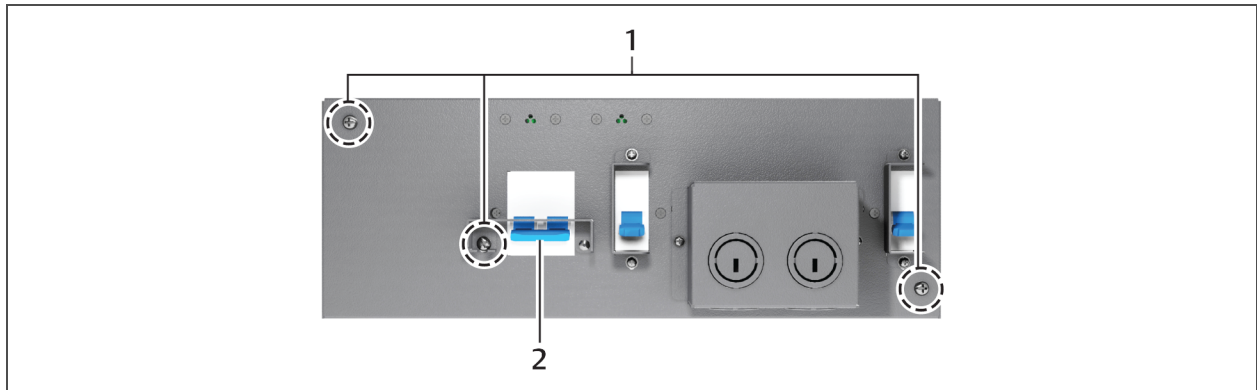
1. Manually transfer the connected equipment to the internal bypass.
  - a. From the main menu select CONTROL, then press **Enter**.
  - b. Select *TURN ON & OFF* and press **Enter**.
  - c. Select *TURN ON UPS BYPASS* and press **Enter**.  
The UPS transfers the connected loads to the internal bypass. (For help, refer to [Performing Manual Bypass](#) on page 38.)
  - d. Loosen the captive screw over the maintenance bypass breaker (see the following figure for the breaker’s location).
  - e. Turn the maintenance bypass breaker On.

#### NOTICE

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

2. Turn the output and input breakers Off.
3. Loosen other captive screws until the power distribution box releases.
4. Remove the power distribution box from the UPS and set it aside.
5. 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.

**Figure 3.6 Power distribution box removal**

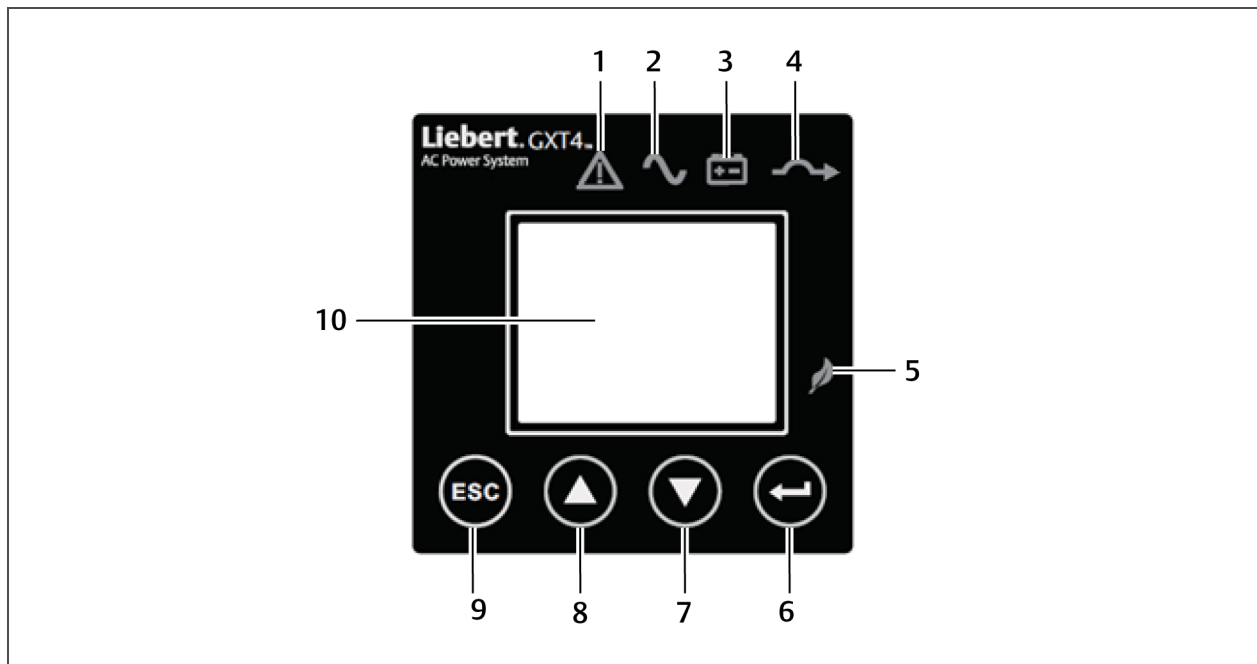


NO.	DESCRIPTION
1	Captive screws to loosen.
2	Maintenance bypass breaker

## 4 OPERATION AND DISPLAY PANEL

The operation and display panel on the front of the GXT4 has control buttons, LED indicators and a liquid-crystal display (LCD).

**Figure 4.1** Operation and display panel



NO.	DESCRIPTION	NO.	DESCRIPTION
1	Fault indicator	6	Enter button
2	Inverter indicator	7	Down button
3	Battery indicator	8	Up button
4	Bypass indicator	9	Escape button
5	ECO mode indicator	10	LCD panel

### 4.1 LED Indicators

The LED indicators on the front of the operation and display panel are:

- Inverter
- Battery
- Bypass
- ECO Mode
- Fault

**Figure 4.1** above, shows the indicators' locations. Their descriptions and functions are as follows.

**Table 4.1 LED indicators**

INDICATOR	COLOR	DESCRIPTION
Inverter	Green	On when the inverter is supplying power
Bypass	Amber	On when the load is supplied by the mains through automatic/manual bypass
Battery	Amber	On when the load is supplied by the battery
Fault	Red	On when an error has occurred within the UPS
ECO Mode	Green	On when the UPS is in ECO Mode

## 4.2 Control Buttons

The control buttons are described in the following table.

**Table 4.2 Control buttons**

BUTTON	DESCRIPTION
ESC	Pressing this button returns to the previous menu or aborts any change in the input data field before confirming.
Up	Pressing this button can move the cursor up or increase the value displayed in the input data field. When a menu is displayed on several screens, pressing the button can scroll up.
Down	Pressing this button can move the cursor down or decrease the value displayed in the input data field. When a menu is displayed on several screens, pressing the button can scroll down.
Enter	Pressing this button can enter the next level menu or confirm the parameter setting value.

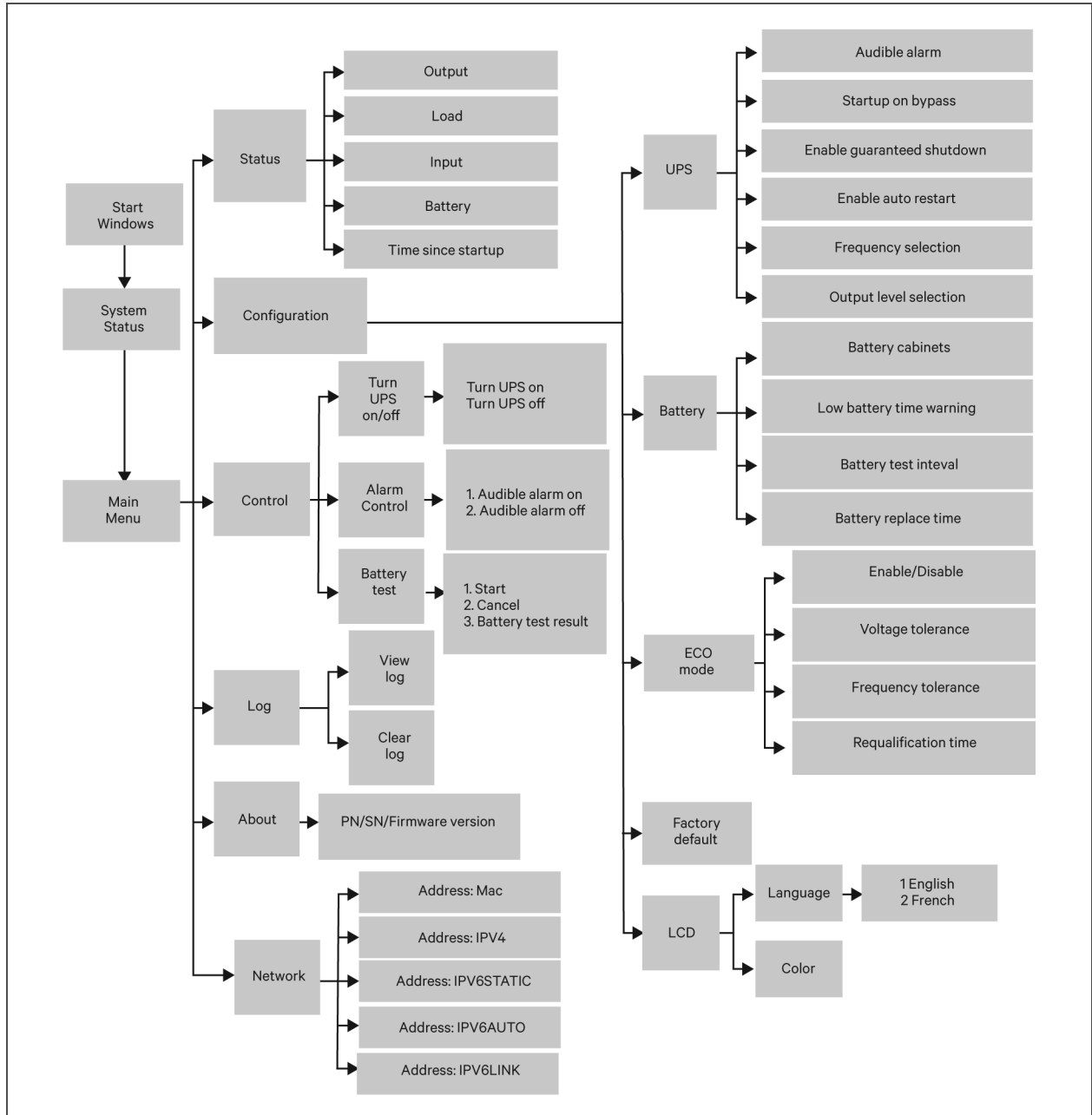
## 4.3 LCD

The LCD panel shows the UPS status and enables changes to the UPS settings by assisting in navigating through the GXT4 menu (see [Menu Structure](#) on the facing page).

## 4.4 Menu Structure

The menu structure of the LDC display is shown in the following figure.

Figure 4.2 Menu structure



### 4.4.1 Startup Screen

When the GXT4 is starting up, it initiates a self-test and displays the start-up screen about 10 seconds.

After about 10 seconds, the LCD shows one of the "On" screens. The screen shown depends on whether or not input power is available.

- When input power is available: TURN ON UPS.
- When input power is not available: AC NOT AVAILABLE START ON BATTERY?

To turn On the UPS, press the Up or Down button to select *YES* and press the Enter button. The UPS will start up, the LCD will display *UPS STARTING* and then *START SUCCESSFUL* after the UPS is turned On.

### 4.4.2 Default Screen

Press any button in the START SUCCESSFUL screen to enter the default interface.

**NOTE: Values shown in the default screen will vary depending on installation and configuration.**

In the default screen, the LCD shows the UPS model, output parameters, input parameters, battery capacity with run time estimate and load percentage. The UPS operation mode (online/inverter, ECO, Battery or Bypass) will be indicated by the LED indicators.

If no control button (ESC, Up, Down, Enter) is pressed for 2 minutes, the LCD will enter the screen-saver mode (back light turns off). It will remain off until a control button is pressed.

### 4.4.3 Main Menu Screen

Press the Enter button in the default screen to enter the MAIN MENU screen.

To select a sub menu, press the Up or Down button to move the cursor to the required item, then press the Enter button to enter its sub menu or set its parameter.

#### Menu options

---

#### STATUS Screen

In the MAIN MENU screen, select *STATUS* to enter the Status Screen, displaying OUTPUT, LOAD, INPUT, BATTERY and TIME SINCE STARTUP.

#### CONFIGURATION Screen

Select *MAIN MENU > CONFIGURATION* to enter the Configuration menu

In the CONFIGURATION screen, press the Up or Down button to move the cursor to the required item, then press the Enter button to enter a sub menu or set its parameters.

#### UPS Screen

Select *MAIN MENU > CONFIGURATION > UPS* to enter the UPS screen. This menu has six screens.

Press the Up or Down button to move the cursor to the required item, and press the Enter button to confirm the settings.

### **Battery Screen**

Select *MAIN MENU > CONFIGURATION > BATTERY* to enter the BATTERY screen. This menu has four screens.

Press the Up or Down button to increase or decrease the value of the settings, and press the Enter button to confirm it.

### **ECO Mode Screen**

Select *MAIN MENU > CONFIGURATION > ECO MODE* to enter the ECO MODE screens.

Press the Up or Down button to move the cursor to the required item, and press the Enter button to confirm the settings.

### **Outlet1 Output Control Screen**

Select *MAIN MENU > 2 CONFIGURATION > 4 OUTLET1* to enter the OUTLET1 screen. This menu has two sub menus

Select *1 OUTLET CONTROL* and press the Enter button to enter the OUTLET CONTROL screen.

Press the Up or Down button to move the cursor to the required item, and press the Enter button to confirm the settings.

### **Outlet1 Outlet Setting screen**

Select *MAIN MENU > 2 CONFIGURATION > 4 OUTLET1* to enter the OUTLET1 screen. This menu has two sub menus

Select *2 Outlet Setting* and press the Enter button to enter the OUTLET SETTING screen.

### **Outlet2 Screen**

The Outlet2 screens are the same as the Outlet1 screens. The same settings are available as on the Outlet1 screen. If the Outlet2 group will have the same settings as the Outlet1 group, GXT4 offers a programming shortcut. When configuring the Outlet2 group, select *YES* and press the Enter button to apply the Outlet1 settings to the Outlet2 screen.

Press the Up or Down button to move the cursor to the required item, and press the Enter button to confirm the settings.

### **LCD screen**

Select *Main Menu > 2 CONFIGURATION > 6 LCD* to enter the LCD screen. This menu has two sub menus, *LANGUAGE* and *COLOR*.

Select *1 LANGUAGE* and press the Enter button to enter the *LANGUAGE* screen.

### **Language screen**

GXT4 supports multiple languages. For the list of supported languages and instructions on how to upload them, refer to the Configuration Program user manual on the included CD.

### **Color screen**

Select *2 COLOR* and press the Enter button to enter the *COLOR* screen.

## **FACTORY DEFAULT screen**

Select *MAIN MENU > 2 CONFIGURATION > 7 FACTORY DEFAULT* to enter the FACTORY DEFAULT screen.

## **Control Screen**

Select *MAIN MENU > 3 CONTROL* to enter the CONTROL screen. This screen has three sub menus, TURN ON & OFF, ALARM CONTROL and BATT TEST.

In the CONTROL screen, press the Up or Down button to move the cursor to the required item, and press the Enter button to enter its sub menu.

## **TURN ON & OFF screen**

Select *MAIN MENU -> 3 CONTROL -> 1 TURN ON & OFF* to enter the TURN ON & OFF screen. This screen shows one of two displays, TURN ON UPS and TURN OFF UPS, depending on the state of the UPS.

## **ALARM CONTROL screen**

Select *MAIN MENU -> 3 CONTROL -> 2 ALARM CONTROL* to enter the ALARM CONTROL screen. This section allows active audible alarms to be silenced.

To completely turn off the audible alarm, select *CONFIGURATION > UPS*.

## **BATT TEST screen**

Select *MAIN MENU -> 3 CONTROL -> 3 BATT TEST* to enter the BATT TEST screen.

## **Log Screen**

Select *MAIN MENU -> 4 LOG* to enter the LOG screen. This screen has two submenus, VIEW LOG and CLEAR LOG.

## **CLEAR LOG Screen**

Select *MAIN MENU > LOG > CLEAR LOG* to enter the CLEAR LOG screen.

Press the Up or Down button to move the cursor to the required item. Press the Enter button to confirm the settings.

## **ABOUT Screen**

Select *MAIN MENU > ABOUT* to enter the ABOUT screen. The ABOUT screen displays UPS model, serial number, software version and hardware version.

## **Network**

Select *MAIN MENU > NETWORK* to enter the NETWORK screen.

The NETWORK screen displays the MAC address and the IPv4 IP address. If the GXT4 is fitted with an optional Liebert® IntelliSlot Web card (Liebert IS-WEBCARD), the screen will display IPv6 IP address settings (IPv6 requires configuration).



## 4.5 Prompt List

A prompt screen is displayed during the operation of the system to alert you to certain conditions and/or to require your confirmation of a command or other operation. See the following table for the prompts and meanings.

**Table 4.3 System prompts and meanings**

PROMPT	MEANINGS
Mains Power Restored	The mains power returns and the UPS transfers back to mains (AC) mode.
UPS Return From A Low Battery Condition	The UPS transfers back to mains (AC) mode from battery low mode.
UPS Return From Battery Mode	The UPS transfers back to mains (AC) mode from battery mode.
UPS Self Test Successful	The UPS self-test is successfully performed.
UPS Shutdown Command Received	The UPS shut down was initiated through communication.
UPS Turn Off	The UPS shuts down and has no output power.
UPS Turn On	The UPS starts up successfully and supplies protected power to the load.
UPS Shutdown Process Had Been Canceled	The shutdown command sent through SNMP card to the UPS is canceled.
ECO Mode Enabled	The UPS is configured to ECO mode operation,
ECO Mode Disabled	The UPS is configured to Online mode, supplying protected power to the load through the inverter.
UPS Internal Temperature Return To Normal	The internal temperature of the UPS recovers to normal range.
UPS Load Return From Overload	The loads are reduced, and the UPS recovers to normal state from overload.
Load On Inverter	The inverter is on and supplies protected power to the load.
Load On ECO Bypass	The UPS is on ECO mode; the mains is supplying power to the load directly to reduce energy usage.
Bypass Power Restored	The bypass power recovered and the UPS can now transfer to bypass.

## 4.6 Warning List

All UPS warning messages are described the following table.

**Table 4.4 Warning list**

WARNING	DESCRIPTION
Mains Power Not Available	The mains power is not available, or it cannot satisfy the input requirements for the UPS to operate from mains power
UPS Batteries Low And Exhausted Soon	The battery capacity is low and will be exhausted soon
UPS Has Switched To Battery Mode	The mains power is abnormal or the PFC side is faulty, the UPS transfers back to Battery mode
Load On Bypass	The UPS transfers to Bypass mode, at this point, the input mains power supplies power to the load directly, and the load is not protected
Input Power Wiring Error	L-N line reverse or PE not connected.
Bypass Power Not Available	The bypass power is not available, or it cannot satisfy the requirements for the UPS transfers to bypass
UPS Maintenance Bypass Output	The UPS transfers to maintenance bypass.
AC input not qualified, cannot start UPS	The utility power is not qualified, the inverter cannot be powered up
Output disabled	REPO terminal connect error

## 4.7 Fault List

All UPS fault messages are described the following table.

**Table 4.5 Fault list**

FAULT	DESCRIPTION
UPS Self-Test Failed	The battery is bad or weak or not connected.
UPS Overload	The UPS is overloaded.
Inverter Out Of Order	The inverter has failed.
Battery Weak/Bad	The battery is bad or weak.
Output Short Circuit	The output connection is short-circuited.
DC Bus Overvoltage	The DC bus is faulty.
UPS Overtemperature	Overtemperature occurs to the UPS and the UPS will transfer to Bypass mode.
Charger Out Of Order	The charger has failed.
Fan Out Of Order	At least one fan is failed.
DC Bus Discharge Fail	DC-DC failure occurs.
Rectifier Out Of Order	Rectifier failure occurs.

If a fault occurs, the UPS automatically switches to Bypass Mode. The original operating mode will be maintained only in the case of a battery disconnection fault. The fault message alternates with UPS Mode once a second, the red fault indicator on the operation and display panel lights up and the alarm sounds continuously.

**If a fault occurs:**

1. Enter the ALARM CONTROL screen, and select *AUDIBLE ALARM ON* or *AUDIBLE ALARM OFF* to switch the alarm On or Off.
2. Enter the EVENT LOG screen, and select *VIEW LOG* to view the entire event log.

**NOTE: There will be a short delay before the EVENT LOG screen displays the historical fault log to allow the log to load.**

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## 5 OPERATION

This section describes checks to be made before starting the UPS, how to start the UPS, manual battery test, manual bypass, shutting down the UPS and disconnecting mains power from the UPS.

**NOTE: The GXT4's battery has been fully-charged before delivery, but some charge will be lost during storage and shipping. To ensure that the battery has adequate reserve power to protect the connected load, charge the battery for 5 hours before putting the UPS into service.**

### 5.1 Startup Checklist for the GXT4

Before starting the UPS, perform these checks:

1. Check that the unit was wired by a qualified electrician and loads are connected properly and reliably.
2. Check that the battery cable is connected properly.
3. Check that the communication cables are connected properly.

### 5.2 Starting the UPS

1. Verify that the unit is wired by a qualified electrician and the circuit breaker in the feeder panel is closed.
2. Close the input breaker on the rear of the unit.
3. The UPS will begin the start-up sequence once AC power is present.

**NOTE: The UPS will sound an audible alarm, this is normal.**

4. On the LCD, press either the Up or Down button once, then press the Enter button to turn On the UPS.  
*The UPS will sound the audible alarm again as the output receptacles are now being powered by the internal bypass, then will sound one more time as the inverter powers the connected equipment.*
5. Check the LCD and LED indicators to ensure that the UPS is operating normally.
6. Check the load percentage on the default screen to ensure that the connected equipment is not exceeding the UPS's rated capacity.

The UPS is now providing conditioned and protected power to the connected equipment.

### 5.3 Performing a Manual Battery Test

To initiate a manual battery test, select *MAIN MENU > CONTROL > BATT TEST > START*.

- If the battery test results show *FAILED*, allow the UPS to recharge the batteries for 24 hours.
- Retest the batteries after 24 hours of charging.
- After the batteries have been retested, if the battery test still shows *FAILED*, contact your local Vertiv representative or Technical Support.

## 5.4 Performing Manual Bypass

To manually transfer the connected equipment to the internal bypass:

1. From the main menu select Control then press enter.
2. Select *TURN ON & OFF* and press Enter.
3. Select *TURN UPS BYPASS* and press Enter. The UPS will transfer the connected loads to the internal bypass.

If the internal bypass is not available because of input power problems, pressing this button once will be ignored. Bypass operation is indicated by an audible alarm and illuminated amber Bypass indicator. (If other indicators are illuminated, refer to [Troubleshooting](#) on page 47.)

## 5.5 Shutting Down the GXT4

To shut down the UPS from the LCD:

1. From the Main Menu select *CONTROL*, press Enter, then select *TURN ON & OFF*.
2. Press the Enter key.
3. Select *TURN UPS OFF*, then press Enter. Press either the Up or Down button to move the cursor to confirm the turn off command and press Enter.  
*The UPS will sound an audible alarm. This is normal.*
4. Power to the connected equipment is now Off.

The UPS display will still be illuminated because the batteries are still being charged. The UPS may now be disconnected from AC power, and the UPS will completely shut down in approximately 15 seconds.

## 5.6 Disconnecting Input Power from the GXT4

1. After the UPS has been shut down as detailed in [Shutting Down the GXT4](#) above, disconnect the input cable from the wall socket.
2. Wait 30 seconds and verify that all indicators have turned Off and the fan has stopped. This indicates that the power-off is complete.
3. Turn the external battery cabinet breaker switch to the Off position if the UPS has an external battery cabinet.

After powering Off the UPS, the UPS ceases output and the load is powered Off.

## 5.7 Placing UPS in Maintenance Bypass

Maintenance Bypass Mode is used when maintenance or replacement is required. To place the unit in Maintenance Bypass:

1. Place the UPS on internal bypass. This may be done by either of the following methods:
  - a. Refer to [Performing Manual Bypass](#) above.
  - b. Slide the bracket away from the manual bypass breaker on the rear of the UPS. This requires loosening the captive screw and sliding the bracket up and away from the Manual Bypass breaker.
2. Move the Manual Bypass breaker on the rear of the UPS to the bypass position. This requires loosening the captive screw and sliding the bracket up and away from the Manual Bypass breaker.

## 6 COMMUNICATION

This section describes the communication ports on the rear of the UPS:

- Liebert® IntelliSlot™ port
- USB port (standard B-type)
- Terminal Block Communication



**CAUTION:** To maintain safety (SELV) barriers and for electromagnetic compatibility, signal cables should be segregated and run separate from all other power cables.

### 6.1 Liebert® IntelliSlot Communication Cards

The Liebert® IntelliSlot port accepts the following optional cards:

- Liebert® IntelliSlot Web Card (IS-WEBCARD)
- Liebert® IntelliSlot Unity Card (IS-UNITY-DP)

The Liebert® IntelliSlot Web Card provides SNMP monitoring and control of the UPS across the network.

The Liebert® IntelliSlot Unity Card provides SNMP and/or RS-485 monitoring of the UPS across the network and/or building management system. The Liebert® IntelliSlot UNITY card also enables monitoring external temperature, humidity and contact closure inputs using external sensors.

Follow instructions provided with the Liebert IntelliSlot card to configure the UPS or any additional ancillary product for the Liebert® GXT4. The instructions are available at <http://www.VertivCo.com/en-us/support/>.

### 6.2 USB Port Communication

The standard B-type USB port is used to connect the UPS and network server or other computer system.

A standard B-type USB port is provided to allow connection to a computer or network server. The USB port can be used to communicate with the GXT4 configuration program (see section [Configuration Program](#) below for details) or the Microsoft Windows shut-down feature.

#### 6.2.1 Configuration Program

The configuration program is on the Liebert® GXT4 CD and can be used instead of making configuration setting changes from the LCD panel. The configuration program communicates to a computer running a Microsoft® Windows® operating system via the included USB cable.

For most users, the factory-default settings are adequate. This section give a brief overview of the features and parameters that are available for modification, as well as the factory-default settings. Should any changes be necessary, refer to the Configuration Program User Manual that is located on the included CD for further details.

The configuration program allows these features of the GXT4 to be changed:

- Change and set the display language
- Enable/Disable Auto-Restart (default is Enable)

- Select frequency converter operation with a fixed output frequency of 50 Hz or 60 Hz, bypass disabled (default is Auto-Select with bypass enabled)
- Set the Low Battery Warning alarm time from 2 to 30 minutes (default is 2 minutes)
- Enable/Disable the Auto-Battery test (default is Enable)
- Enable/Disable Auto-Restart after removing Remote shutdown (default is Disable)
- Set the wiring mode of Remote shutdown (default is normally open)
- Set the Auto-Enable output after remote shutdown (default is Disable)
- Set the Auto-Battery test to 8, 12, 16, 20, or 26 weeks (default is 8 weeks)
- Select the number of external battery cabinets connected to the UPS to adjust the remaining run time calculated by Vertiv software products (default is zero)
- Select one of multiple output voltages to match various voltages.

**Table 6.1 Output voltage option**

UPS MODEL	FACTORY DEFAULT SETTING	OUTPUT VOLTAGE OPTION
All models	230 VAC	220V, 230V, 240V

**NOTICE**

The output voltage settings cannot be changed while the UPS is On and powering connected loads.

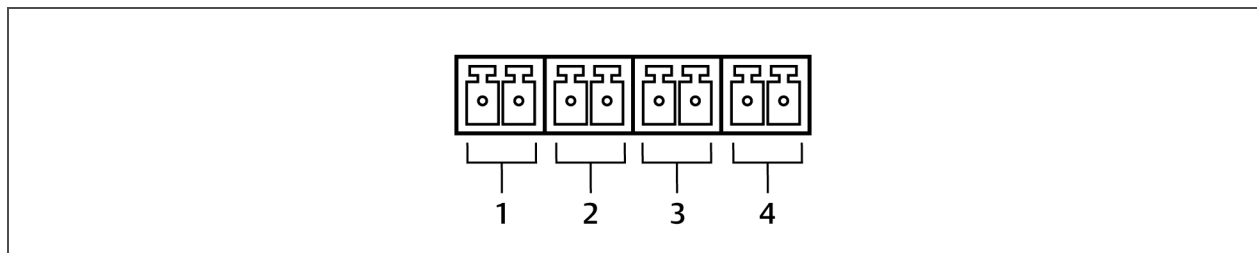
**NOTE: This program is compatible with UPS models beginning with ‘GXT4,’ as in ‘GXT4-3000RT230.’ It is not compatible with earlier versions of the Liebert® GXT UPS.**

**A computer running Microsoft® Windows 2000®, Windows XP®, Windows Vista®, Windows 7 or Windows 8 is required to set up and run the configuration program.**

### 6.3 Terminal Block Communication

The Terminal Block includes eight pins, as shown the figure

**Figure 6.1 Terminal-block communication pin layout**



NO.	DESCRIPTION
1	Low battery warning
2	On-battery warning
3	Any mode shutdown
4	Battery mode shutdown



### 6.3.1 Any Mode Shutdown

The purpose of Any Mode Shutdown is to shut down the UPS output by turning Off the rectifier, inverter and static switch so that there is no power to the loads.

Any Mode Shutdown can be operated locally or remotely:

- Local Any Mode Shutdown can be performed by shorting the pins in terminal 3.
- Remote Any Mode Shutdown can be performed using a switch mounted at a remote location and connected to the pins in terminal 3.

**NOTE: Remote Power Off will be performed either by NO or NC contact of Any Mode Shutdown, depending on the settings in the configuration program.**

**A current-limited source for this optocoupler (+12 VDC, 50 mA) will be available from the UPS.**

**The connection to the UPS for remote connection will be via terminal block connector.**

**Any Mode Shutdown wiring must conform to all national, regional and local wiring regulations.**



**WARNING! When the Auto-Enable output option is selected and the UPS output is disabled using Any Mode Shutdown, the GXT4 output can turn On automatically and without warning if the connection is changed.**

### 6.3.2 Battery Mode Shutdown

Battery Mode Shutdown permits shutting down the UPS by turning Off the rectifier, inverter and static switch so that there is no power to the load when the UPS is On Battery. The auxiliary power for the UPS will still be active.

Battery Mode Shutdown can be performed locally or remotely:

- Local Battery Mode shutdown can be performed by shorting the pins in terminal 4.
- Remote Battery Mode Shutdown can be performed using a switch mounted in a remote location and connected to the pins in terminal 4.

**NOTE: Remote Power Off will be performed by NO contact.**

**A current-limited source (+12 VDC, 50 mA) will be available from UPS.**

**The connection to the GXT4 for remote connection will be via terminal block connector.**

**Battery Mode Shutdown wiring must conform to all national, regional and local wiring codes and laws.**

**This signal must last for 1.5 seconds or longer.**

**A battery shutdown signal will not cause an immediate shutdown. It will start a 2-minute shutdown timer. This timer cannot be stopped once triggered. If the mains power returns during this countdown, the GXT4 will still shut down and must remain shut down for 10 seconds. Whether the UPS turns back On when the power is restored depends on the auto-restart setting.**

### 6.3.3 On Battery

On Battery signal is a Normally Open (NO) dry contact. When the UPS is supplying output power from the battery this dry contact will be closed.

### 6.3.4 Low Battery

Low Battery signal is a Normally Open (NO) dry contact. When the UPS is supplying output power from the battery and has reached the Low Battery Warning time selected in the configuration program, this dry contact will be closed.

The rated values for the dry contacts for the On Battery and Low Battery signals are:

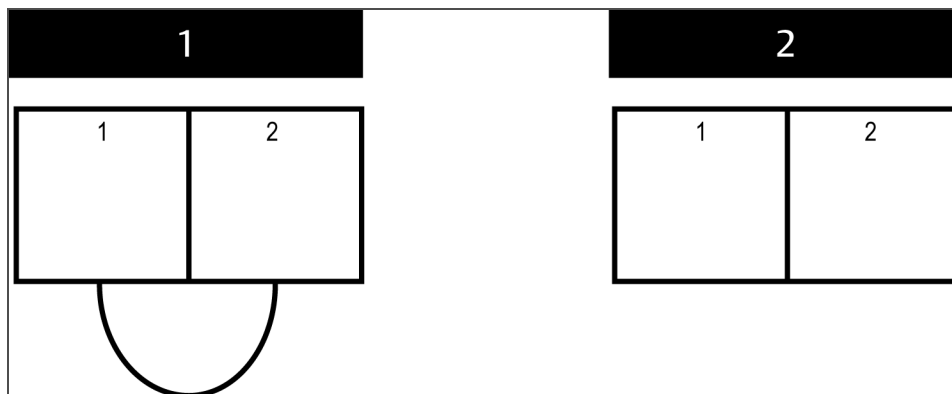
- Rated Voltage: 30 V (AC or DC)
- Rated Current: 300 mA

### 6.4 Remote Emergency Power Off

The UPS is equipped with a Remote Emergency Power Off (REPO) connector.

The user must supply a means of interfacing with the REPO circuit to allow disconnecting the UPS input feeder breaker to remove all sources of power to the UPS and connected equipment to comply with national and local wiring codes and regulations.

Figure 6.2 REPO switch connection diagram



NO.	DESCRIPTION
1	UPS ships with REPO jumper installed, allowing the UPS to operate. Normally-closed switch system (fail-safe)
2	Opening the REPO connection disables the UPS. Manual restart using the front panel is required after the REPO connection is closed again.



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

## 7 MAINTENANCE



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

Observe the following precautions when working on batteries:

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

### 7.1 Replacing the Internal Battery Pack

The GXT4 allows you to replace the internal battery pack safely. Refer to **Table 7.1** below, for internal battery pack part numbers for GXT4:

**Table 7.1 Replacement internal battery pack model number**

UPS MODEL NUMBER	REPLACEMENT INTERNAL BATTERY PACK MODEL NUMBER	QUANTITY REQUIRED
GXT4-5000RT230U	GXT4-240VBATKIT	2

#### 7.1.1 Battery Replacement Procedures

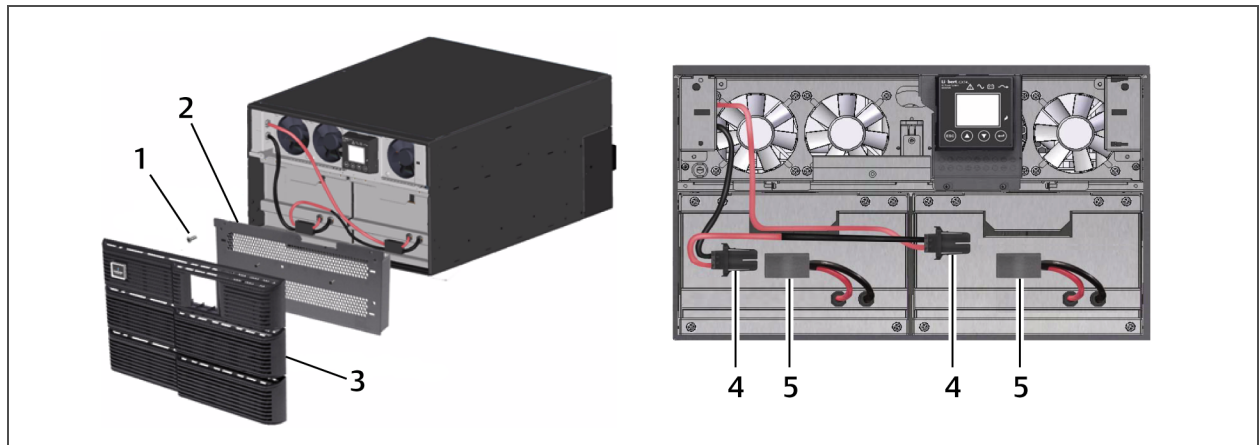
Read all safety cautions before proceeding. A trained user can replace the internal battery pack when the UPS is always in a restricted access location (such as a rack or server closet). Contact your local dealer or Vertiv representative to obtain the pricing of the appropriate replacement battery pack.



**CAUTION: Risk of explosion if battery is replaced by an incorrect type. Dispose of used batteries according to the instructions.**

1. Remove the front plastic bezel cover from the UPS.
2. Loosen and remove the screws on the battery door, as shown in **Figure 7.1** on the next page.
3. Lay the battery door and screws aside for reassembly.
4. Gently pull the battery wire out and disconnect the battery plug and battery receptacle, as shown in **Figure 7.1** on the next page.

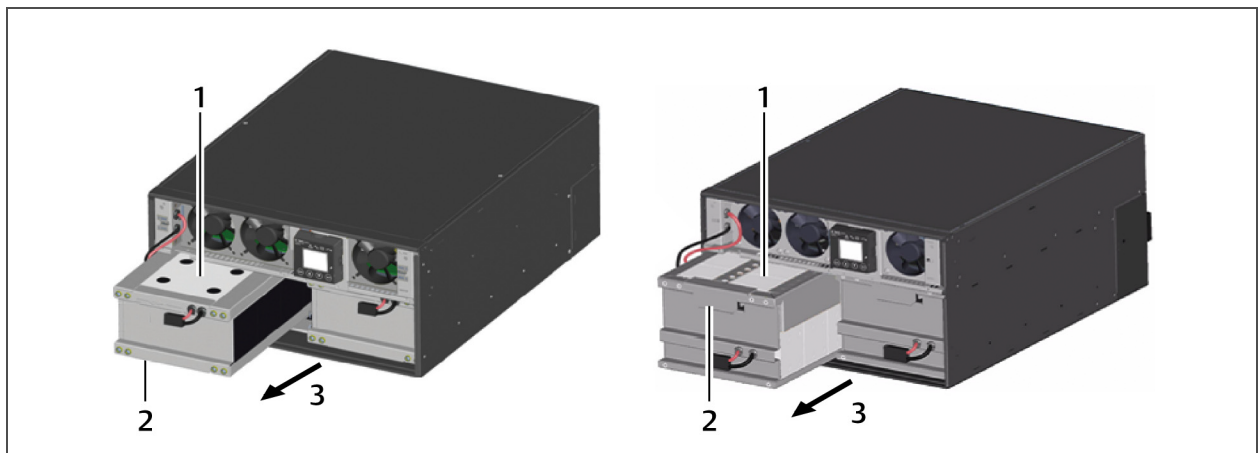
Figure 7.1 Removing the front bezel cover and battery door



NO.	DESCRIPTION	NO.	DESCRIPTION
1	Screws, 6	4	Battery connector
2	Battery door	5	Battery receptacle
3	Front bezel		

- Grasp the battery handle, and pull the internal battery pack out of the UPS, as shown in the following figure.  
Repeat this step if both battery packs will be replaced. Each model has two battery packs.

Figure 7.2 Pull out the battery



NO.	DESCRIPTION
1	Internal battery pack (one of two)
2	Battery handles
3	Pull out battery pack with handle.

6. Unpack the new internal battery pack. Take care not to destroy the packing. Compare the new and old internal battery pack to make sure they are the same type and model. If so, proceed with 7. If they are different, stop and contact your Vertiv representative, or Technical Support.
7. Line up and slide in the new internal battery pack.
8. Reconnect the battery plug and battery receptacle.
9. Push the battery wire and internal battery pack back into the UPS.
10. Reattach the front battery door with the 6 screws.
11. Reattach the front plastic bezel cover to the UPS.

**NOTE: The internal battery pack is hot-swappable. However, caution should be exercised 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.**

## 7.2 Charging Batteries

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

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

## 7.3 Precautions

Although the Liebert® GXT4 is designed and manufactured to ensure personal safety, improper use can result in electrical shock or fire. To ensure safety, observe the following precautions:

- Turn Off and unplug the GXT4 before cleaning it.
- Wear rubber gloves and boots.
- Clean the UPS with a dry cloth. Do not use liquid or aerosol cleaners.
- Never block or insert any objects into the ventilation holes or other openings of the GXT4.
- Do not place the GXT4 power cord where it might be damaged.

## 7.4 Checking UPS Status

We recommend checking the UPS operation status every six months.

- Check if the UPS is faulty: Is the Fault Indicator On? Is the UPS sounding an alarm?
- Check if the UPS is operating in Bypass mode: Normally, the UPS operates in Normal Mode. If it is operating in Bypass Mode, stop and contact your local Vertiv representative or Technical Support.
- Check if the battery is discharging: When the utility input is normal, the battery should not discharge. If the UPS is operating in Battery Mode, stop and contact your Vertiv representative or Technical Support.

## 7.5 Checking UPS Functions

**NOTE: UPS function check procedures may interrupt power supply to the connected load.**

We recommend checking the UPS functions once every 6 months.

Back-up the load data before conducting the UPS functions check. Procedures are as follows:

1. Press the Standby/Manual Bypass button to check whether the alarm and indicators are normal.
2. Press the On/Alarm Silence/Manual Battery Test button to check again whether the indicators are On and the UPS is operating normally.
3. Press the On/Alarm Silence/Manual Battery Test button for three seconds after Inverter Mode. The UPS should initiate battery self-test. Check to determine whether the battery is operating normally. If not, stop and contact your Vertiv representative or Technical Support.

## 8 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.

### 8.1 Symptoms that Require Troubleshooting

The following symptoms indicate the UPS is malfunctioning:

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

#### 8.1.1 Faults

When the fault indicator is illuminated, the LCD displays the fault. The faults are described in **Table 8.1** below.

**Table 8.1 Description of displayed faults**

DISPLAYED FAULT	CAUSE	CORRECTIVE STEPS
UPS self test failed	The battery is bad or weak.	Contact technical support.
UPS shutdown command received	The UPS shuts down through communication.	Contact customer service.
UPS overload	The UPS is overloaded.	Reduce the load and contact technical support.
Inverter Out of Order	The inverter is faulty.	Contact technical support.
Battery Weak/Bad	The battery is bad or weak.	Replace the battery.
Output Short Circuit	The output connection is short-circuited.	Shut down the equipment and contact technical support.
DC Bus Overvoltage	The DC bus is faulty.	Contact technical support.
UPS Overtemperature	Over-temperature occurs to the UPS and the UPS will transfer to Bypass mode.	Reduce the load and contact technical support.
Charger Out of Order	The charger is faulty.	Contact technical support.
Fan Out of Order	At least one fan is faulty.	Contact technical support.
DC Bus Discharge Fail	A DC-DC failure occurs.	Contact technical support.

**NOTE: If the UPS encounters a fault and no correction attempt is performed within 2 minutes, the LCD back light will flash (on 1 second and off 1 second) as an alert.**

**Press any button to exit the alert mode. If no correction attempt is performed on the UPS, the LCD back light will flash again until the UPS fault is corrected.**

## 8.1.2 Audible Alarm

An audible alarm will sound in conjunction with the visual indicators to indicate a change in UPS operating status. The audible alarm will sound as described in the following table.

**Table 8.2 Audible alarm description**

CONDITION	ALARM
Battery discharge	Half-second beep every 10 seconds
Low battery	Two half-second beeps every 5 seconds
UPS fault, load on bypass	1-second beep every 4 seconds
UPS fault, no power to load	Continuous
Overload	Half-second beep every half second
Battery replacement	2-second beep every 2 minutes
Battery loss	Continuous
Wiring problem (loss of proper grounding for UPS)	Continuous
Bypass reminder	1-second beep every 60 seconds

## 8.2 Troubleshooting UPS Issues

In the event of an issue with the UPS, refer to the following table to determine the cause and solution. If the fault persists, contact Vertiv Technical Support. See [Technical Support](#) on page 55

**Table 8.3 Troubleshooting table**

PROBLEM	CAUSE	SOLUTION
UPS fails to start	UPS is short-circuited or overloaded	Ensure UPS is Off. Disconnect all loads and ensure nothing is lodged in output receptacles. Ensure loads are not defective or shorted internally.
	Batteries are not charged enough or not connected	Check to ensure the internal battery is connected. If it is not, make the connection and try to start the unit. If the battery is connected, leave the UPS connected to input power for 24 hours to recharge batteries, then try to start the unit.
Battery indicator is illuminated	UPS is not plugged in	UPS is operating from battery mode. Ensure UPS is securely plugged into the wall receptacle.
	UPS input protection fuse has blown/opened	UPS is operating from battery mode. Save data and close applications. Replace UPS input fuse, then restart UPS.
	Mains power is out of tolerance	UPS is operating from battery mode. Save data and close applications. Ensure mains supply voltage is within acceptable limits for UPS.
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.



**Table 8.3 Troubleshooting table (continued)**

PROBLEM	CAUSE	SOLUTION
	Batteries may not be able to hold a full charge due to age	Replace batteries. Contact your local dealer, Vertiv representative or Technical Support for replacement battery kit.
Battery indicator is flashing.	Battery source is not available; continuous horn.	Check battery connections, completely power down and restart UPS. NOTE: If the battery circuit opens while the UPS is running, it will be detected when the next battery test is performed.
Bypass indicator is flashing.	Because the voltage or frequency is outside acceptable limits, the bypass is disabled.	The AC input powers the PFC input and serves as the bypass source. If the AC is present but the voltage or frequency exceeds the acceptable range for safe operation with a load, the bypass will be disabled and this indicator will flash, indicating that the bypass is unavailable.

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*.

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## 9 SPECIFICATIONS

Table 9.1 Specifications

<b>MODEL NUMBER</b>	<b>GXT4-5000RT230U</b>
<b>RATING</b>	<b>5000VA/4000W</b>
<b>Dimensions, mm (in)</b>	
Unit, W x D x H	570 x 430 x 220 (22.4 x 16.9 x 8.7)
Shipping, W x D x H	745 x 530 x 516 (29.3 x 20.9 x 20.3)
<b>Weight, kg (lb)</b>	
Unit	60 (132.2)
Shipping	75 (165.4)
<b>Input AC Parameters</b>	
Operating Frequency, Nom	50 or 60Hz (Factory Default = 50)
Factory Default VAC	230VAC
User-Configurable VAC	220/230/240VAC (May be modified using included configuration program)
Operating Voltage Range Without Battery Operation	176 - 280VAC
Maximum Allowable VAC	280VAC
Input Frequency Without Battery Operation	40 - 70Hz
Input Power Connection	Hard-Wire Terminal Block Standard (See <a href="#">Removable Power Distribution Box</a> on page 13)
<b>Output AC Parameters</b>	
Factory Default VAC	230VAC
Output Connections	Hard-Wire Terminal Block Standard (See <a href="#">Removable Power Distribution Box</a> on page 13)
Frequency	50 Hz or 60Hz, Nominal
Waveform	Sinewave
Main Mode Overload	>200% for 5 cycles; 151 - 200% for 1 seconds; 131-150% 10 seconds; 105 - 130% 1 minute
<b>Battery Parameters</b>	
Type	Valve-regulated, non-spillable, lead acid
Quantity x V	20 x 12V
Battery Mfr. / Part #	5AH battery, CSB HR1221W or YUASA NPH5-12
Backup Time	See <a href="#">Battery run times, minutes</a> on page 54 and
Recharge Time (Internal Batteries)	5 hr. to 90% capacity after full discharge into 100% load

**Table 9.1 Specifications (continued)**

<b>MODEL NUMBER</b>	<b>GXT4-5000RT230U</b>
<b>RATING</b>	<b>5000VA/4000W</b>
<b>Bypass Protection Limits</b>	
Disable Bypass Operation	If input voltage exceeds $\pm 15\%$ of the nominal voltage
Re-Enable Bypass Operation	If input voltage returns to within $\pm 10\%$ of nominal output voltage
Disable Bypass operation	When the input frequency prevents synchronous operation
<b>Environmental</b>	
Operating Temperature, °C (°F)	0 to 40 (32 to 104); no derating
Storage Temperature, °C (°F)	-15 to 50 (5 to 122)
Relative Humidity	0-95% non-condensing
Operating Elevation	Up to 1000m (3281 ft) at 25°C (77°F) without derating
Audible Noise	<55 dBA at 1 meter from the rear; <50 dBA, at 1 meter from the front or sides
<b>Agency</b>	
Safety	IEC62040-1:2008 version; UL 1778, c-UL Listed
EMI/EMC	IEC/EN/AS 62040-2 2nd Ed (Cat 2 – Table 6); FCC Class A
ESD	EN61000-4-2, Level 4, Criteria A
Radiated Susceptibility	EN61000-4-3, Level 3, Criteria A
Electrical Fast Transient	EN61000-4-4, Level 4, Criteria A
Surge Immunity	EN61000-4-5, Level 3, Criteria A
Transportation	ISTA Procedure 1E

**Table 9.2 Power-distribution specifications**

<b>MODEL NUMBER</b>	<b>PD2-CE5HDWRMBSU</b>
PD2-Amp Rating	32 Amps
Input Power Connection	3-Wire Hard-Wired, 6-10mm <sup>2</sup> (8-10AWG)
Output Power Connection	3-Wire Hard-Wired, 6-10mm <sup>2</sup> (8-10AWG)
Input Branch Circuit Breaker Supplied by User	32-A

**Table 9.3 External battery cabinet specifications**

<b>MODEL NUMBER</b>	<b>GXT4-240VBATT</b>
<b>USED WITH UPS MODEL</b>	<b>GXT4-5000RT230U</b>
<b>Dimensions, WxD xH, mm (in.)</b>	
Unit (with bezel)	430 x 581 x 173 (16.9 x 22.9 x 6.8)
Shipping	530 x 745 x 475 (20.9 x 29.3 x 18.7)
<b>Weight, kg (lb)</b>	
Unit	65 (143.3)
Shipping	76 (167.6)
<b>Battery Parameters</b>	
Type	Valve-regulated, non-spillable, lead acid
Quantity x V	1 x 20 x 12V x 9.0AH
Battery Manufacturer, Part #	CSB UPS12460F2; CSB HR1234WF2
Backup Time	See <a href="#">Battery run times, minutes</a> on the next page
<b>Environmental</b>	
Operating Temp, °C (°F)	0 to 40 (32 to 104)
Storage Temp, °C (°F)	-15 to 50 (5 to 122)
Relative Humidity	0-95% non-condensing
Operating Elevation	Up to 1000m (3280.83 ft.) at 25°C (77°F)
<b>Agency</b>	
Safety	IEC62040-1:2008 version
Transportation	ISTA Procedure 1E

**Table 9.4 Battery run times, minutes**

NUMBER OF BATTERIES/CABINETS	LOAD PERCENT OF CAPACITY									
	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Internal Battery	95	42	36	29	24	18	14	12	11	9
Internal Battery + 1 External Battery Cabinet	273	143	107	80	64	49	38	33	29	24
Internal Battery + 2 External Battery Cabinets	476	254	191	146	119	94	72	63	56	47
Internal Battery + 3 External Battery Cabinets	689	374	274	211	173	137	111	97	88	74
Internal Battery + 4 External Battery Cabinets	910	499	363	277	225	182	148	130	118	100
Internal Battery + 5 External Battery Cabinets	1143	626	455	345	281	224	184	163	148	125
Internal Battery + 6 External Battery Cabinets	1367	750	547	416	338	270	217	196	178	152

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

## 9.1 Auto-Learning Battery Run Times

As batteries age, the estimated run times may become less accurate. The Liebert® GXT4 is programmed to “learn” from a full battery discharge and modify the estimated run time for the measured battery capacity. This can improve accuracy and compensate for aging batteries or batteries that operate at different ambient temperatures.

The UPS will update the anticipated run time calculation only under certain conditions.

- The UPS must have a steady load that is greater than 20%.
- The UPS must be at 100% charge at the start of a battery discharge.
- The battery discharge must continue uninterrupted until the batteries reach their end-of-discharge voltage.

If all conditions are not met, the run time calculation will not be modified.

If the configuration program is used to change the number of battery cabinets, then the values in the battery above table will be restored. This will override any value that is auto-learned.

## APPENDICES

### Appendix A: Technical Support

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

In Europe, Middle East, and Asia:

EMEA Multi-Language Technical support:

e: [eoc@vertivco.com](mailto:eoc@vertivco.com)

p: Toll free 0080011554499

p: Toll +39 02 98250222

In the United States:

Technical support:

e: [liebert.upstech@vertivco.com](mailto:liebert.upstech@vertivco.com)

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

Monitoring support:

e: [liebert.monitoring@vertivco.com](mailto:liebert.monitoring@vertivco.com)

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

Warranty support:

e: [microups.warranty@vertivco.com](mailto:microups.warranty@vertivco.com)

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

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