

Liebert® GXT4™

User Manual – 5000VA ~ 10000VA (230V)



Important Safety Precautions

Save These Instructions

This manual contains important safety instructions. Read all safety and operating instructions before operating the uninterruptible power system (UPS). Adhere to all warnings on the unit and in this manual. Follow all operating and user instructions. This equipment can be operated by individuals without previous training.

This product is designed for commercial/industrial use only. It 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. The UPS is designed for data processing equipment. If uncertain, consult your dealer or local Emerson Network Power representative.

This UPS is designed for use on a properly earthed (grounded), 220-240 VAC, 50Hz or 60Hz supply, for installation by qualified personnel. A qualified electrician must review and approve customer supplied wiring, circuit breakers, intended loads and verify correct input, output and earth connections to ensure compliance with technical standards and local electrical codes of practice.

Installation instructions and warning notices only for use by qualified personnel are located after the UPS operator instructions in this manual.

Warning

The battery can present a risk of electrical shock and high short circuit current. The following precautions should be observed when replacing the battery pack:

- Wear rubber gloves and boots
- Remove rings, watches and other metal objects.
- Use tools with insulated handles.
- Do not lay tools or other metal objects on the batteries.
- If the battery kit is damaged in any way or shows signs of leakage, contact your local Emerson representative immediately.
- Do not dispose of batteries in a fire. The batteries may explode.
- Handle, transport and recycle batteries in accordance with local regulations.

Warning

Although the Liebert GXT4 has been 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 Liebert GXT4 before cleaning it.
- 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 UPS.
- Do not place the Liebert GXT4 power cord where it might be damaged.

Notice

If this UPS is supplied from an 'IT' electrical power system, the jumper on the rear panel must be disconnected. Refer to *8.8 IT Power System Configuration* for details. If connecting to an 'IT' system, the installer must provide a 2-pole upstream circuit breaker. Refer to all local and national codes when installing the upstream breaker.

ELECTROMAGNETIC COMPATIBILITY—The Liebert® GXT4™ complies with the limits of Category C2, pursuant to IEC/EN/AS 62040-2. Operation is subject to the following conditions:

- The output cables shall be no longer than 10m (32ft).
- 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 Emerson.

Notice

1. This is a Category C2 UPS product. In a residential environment, this product may cause radio interference, in which case the user may be required to take additional measures.
2. Operate the UPS in an indoor environment only in an ambient temperature range of 0-40°C (32-104°F). Install it in a clean environment, free from moisture, flammable liquids, gases and corrosive substances.
3. This UPS contains no user-serviceable parts except the internal battery pack. The UPS Enter push button do not electrically isolate internal parts. Under no circumstances attempt to gain access internally due to the risk of electric shock or burn.
4. Do not continue to use the UPS if the front panel indications are not in accordance with these operating instructions or the UPS performance alters in use. Refer all faults to your dealer.
5. Servicing of batteries should be performed or supervised by personnel knowledgeable of batteries and the required precautions. Keep unauthorized personnel away from the batteries. Keep unauthorized personnel away from the batteries. Proper disposal of batteries is required. Refer to your local laws and regulations for disposal requirements.
6. Never block or insert any object into the ventilation holes or other openings.
7. DO NOT CONNECT equipment that could overload the UPS or demand DC current from the UPS, for example: electric drills, vacuum cleaners, laser printers, hair dryers or any appliance using halfwave rectification.
8. Storing magnetic media on top of the UPS may result in data loss or corruption.
9. Turn Off and isolate the UPS before cleaning it. Use only a soft cloth, never liquid or aerosol cleaners.

Information for the Protection of the Environment

UPS SERVICING—This 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 wheellie 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).

For information regarding the scrapping of this equipment, please browse <http://www.eu.emersonnetworkpower.com> ('Products session' or 'Contact us' session) or call our worldwide technical support.

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Chapter 1 Introduction

Congratulations on your choice of the Liebert® GXT4™ uninterruptible power system (UPS). The Liebert GXT4 comes in nominal power ratings of 5000VA, 6000VA and 10,000VA. It is designed to provide conditioned power to microcomputers and other sensitive electronic equipment.

When it is generated, alternating current is clean and stable. However, during transmission and distribution it is subject to voltage sags, spikes and complete power failure that may interrupt computer operations, cause data loss and even damage equipment. The Liebert GXT4 protects equipment from these disturbances.

The Liebert GXT4 is a compact, on-line UPS. An on-line UPS continuously conditions and regulates its output voltage, whether utility power is present or not. It supplies connected equipment with clean, sinewave power. Sensitive electronic equipment operates best from sinewave power.

The Liebert GXT4 features a multicolor LCD display to indicate load percentage, input/output voltage and current, runtime of battery and so on. It also provides self-diagnostic tests by visual configuration.

The Liebert GXT4 can be operated at high efficiency mode (Green Mode) which efficiency could up to 97%.

The Liebert GXT4 includes E models without rack slide kits for different requirement of user.

The Liebert GXT4 has a Liebert IntelliSlot® port for communication between the UPS and a network server or other computer systems. This port provides detailed operating information including voltages, currents and alarm status to the host system when used in conjunction with Liebert MultiLink®. Liebert MultiLink can also remotely control UPS operation.

Chapter 2 System Description

The operating principle of the UPS is shown in Figure 2-1.

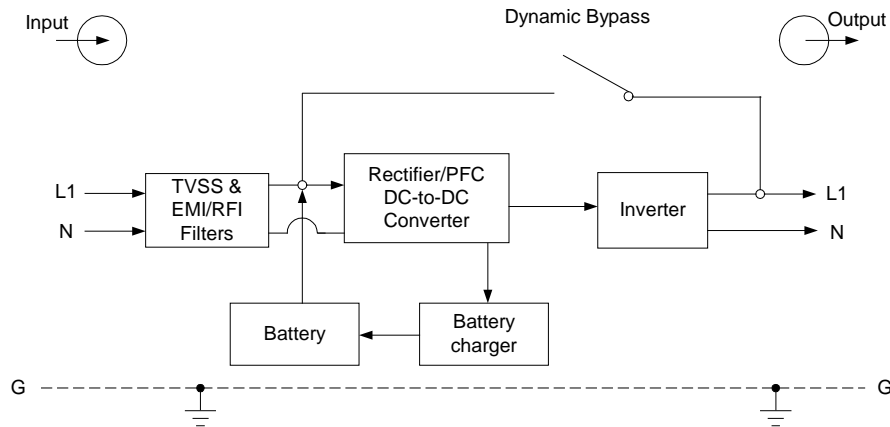


Figure 2-1 Operating principle diagram

2.1 Transient Voltage Surge Suppression (TVSS) and EMI/RFI Filters

These UPS components provide surge protection and filter both electromagnetic interference (EMI) and radio frequency interference (RFI). They minimize any surges or interference present in the utility line and keep the sensitive equipment protected.

2.2 Rectifier/Power Factor Correction (PFC) Circuit

In normal operation, the rectifier/power factor correction (PFC) circuit converts utility AC power to regulated DC power for use by the inverter while ensuring that the waveshape of the input current used by the UPS is near ideal. Extracting this sinewave input current achieves two objectives:

- The utility power is used as efficiently as possible by the UPS.
- The amount of distortion reflected on the utility is reduced.

This results in cleaner power being available to other devices in the building not being protected by the Liebert® GXT4™.

2.3 Inverter

In normal operation, the inverter utilizes the DC output of the power factor correction circuit and inverts it into precise, regulated sinewave AC power. Upon a utility power failure, the inverter receives its required energy from the battery through the DC-to-DC converter. In both modes of operation, the UPS inverter is on-line and continuously generating clean, precise, regulated AC output power.

2.4 Battery Charger

The battery charger utilizes energy from the utility power and precisely regulates it to continuously float charge the batteries. The batteries are being charged whenever the Liebert GXT4 is connected to mains power.

2.5 DC-to-DC Converter

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

2.6 Battery

The Liebert® GXT4™ utilizes valve-regulated, nonspillable, lead acid batteries. To maintain battery design life, operate the UPS 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. For run times, see Table 11-5.

2.7 Dynamic Bypass

The Liebert GXT4 provides an alternate path for utility power to the connected load in the unlikely event of a UPS malfunction. Should the UPS have an overload, overtemperature or any other UPS failure condition, the UPS automatically transfers the connected load to bypass.

**NOTE**

The bypass power path does NOT protect the connected equipment from disturbances in the mains supply.

Chapter 3 Major Components

The Liebert® GXT4™ is composed of three major assemblies to provide easier handling, installation and versatility.

3.1 Main Frame and Electronics

The cabinet is shipped with internal batteries installed and a basic, hardwire distribution box attached and ready to install.

Note: 10,000VA model's front layout is identical; the battery compartment is larger.

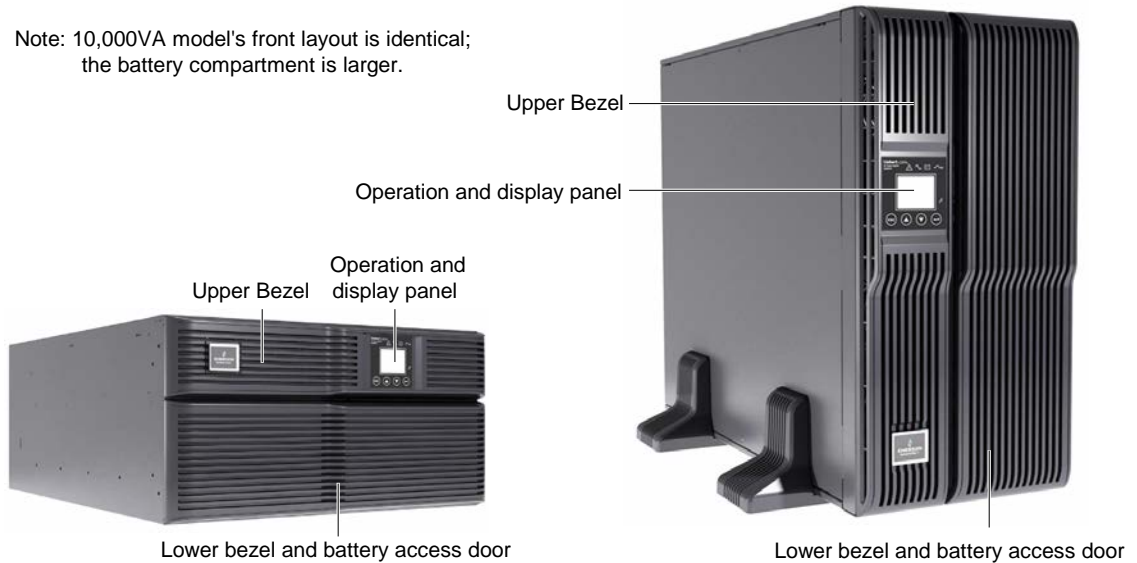
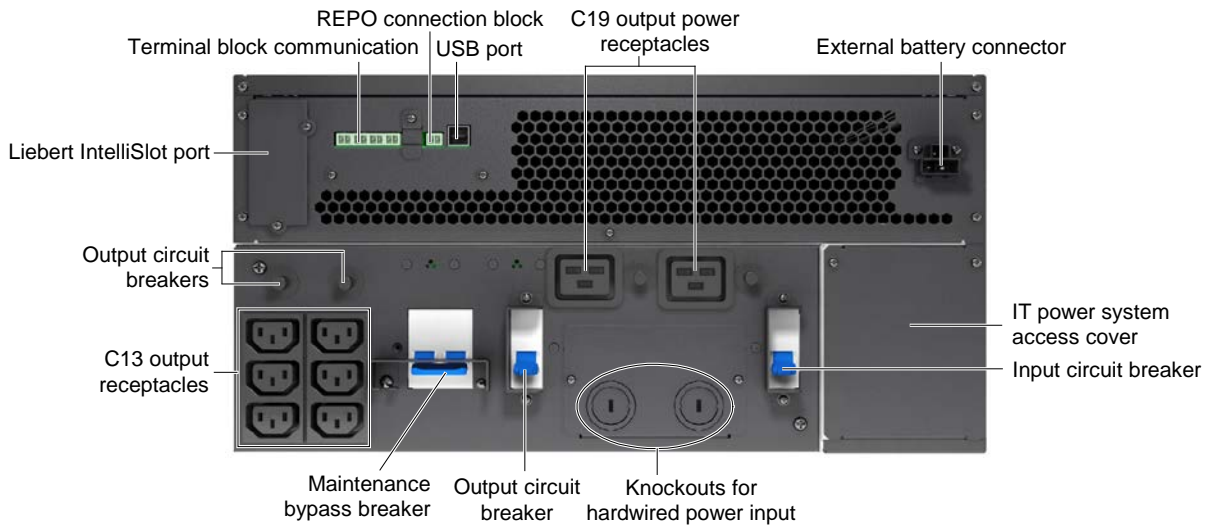
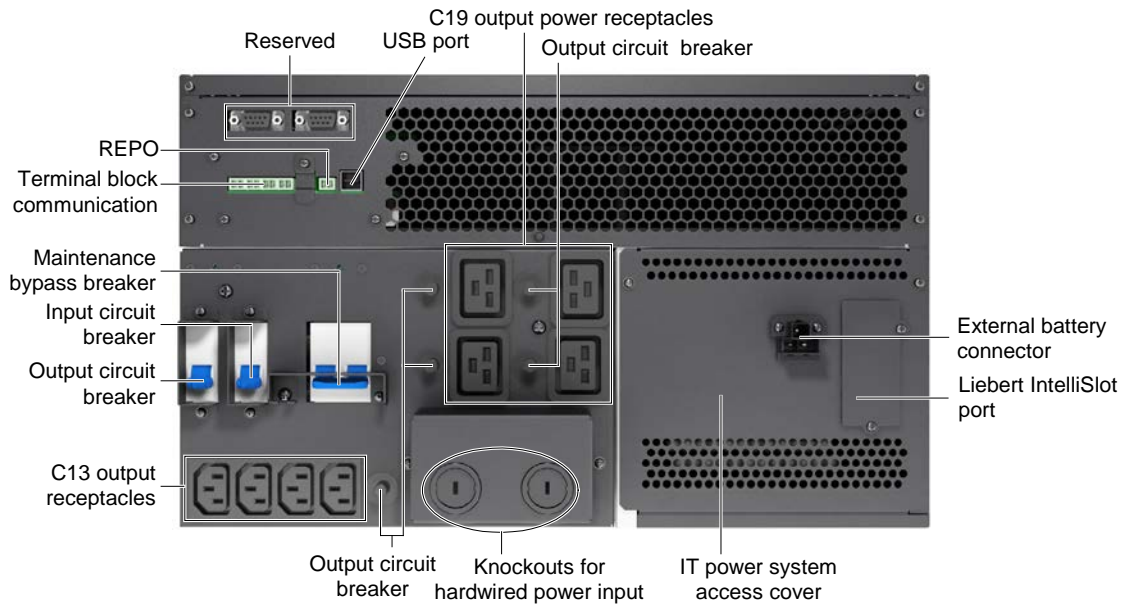


Figure 3-1 Liebert GXT4 5000VA and 6000VA (front view)



Liebert GXT4 5000VA and 6000VA

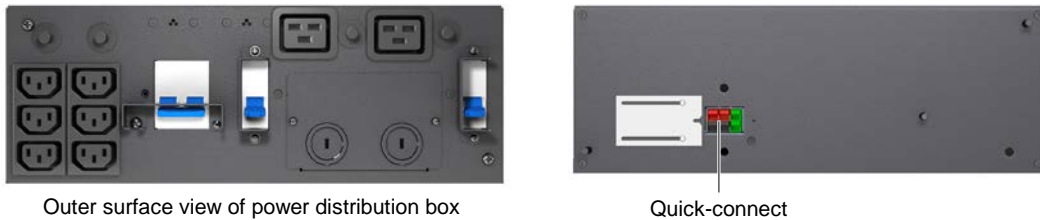


Liebert GXT4 10,000VA

Figure 3-2 Liebert® GXT4™ (rear view)

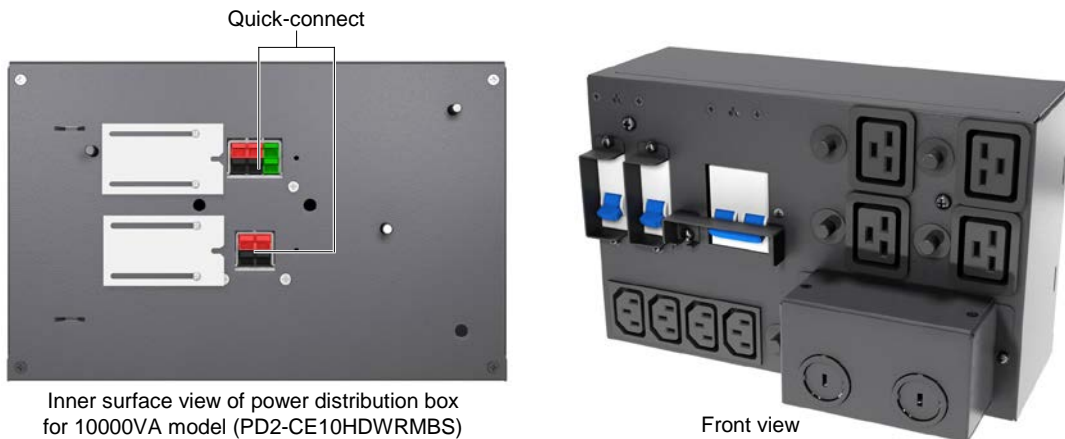
3.2 Removable Power Distribution Box

The UPS is shipped with a power distribution pack installed, as shown in Figure 3-3 and Figure 3-4. This box contains the UPS input circuit breaker.



Outer surface view of power distribution box for 5000VA and 6000VA models PD2-CE6HDWRMBS

Figure 3-3 Power distribution box for GXT4 5000VA and 6000VA models



Inner surface view of power distribution box for 10000VA model (PD2-CE10HDWRMBS)

Figure 3-4 Power distribution box for GXT4 10,000VA model

Note

Hardwire and hardwire/receptacle boxes that include a manual bypass switch allow AC power to continue to flow from the mains input to the load while the box is removed from the UPS. For details, refer to 5.3 *Connect Input/Output Power*.

3.3 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.

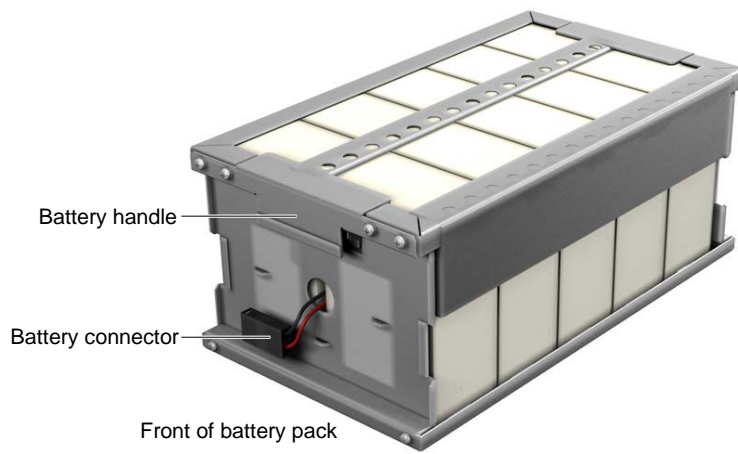


Figure 3-5 Internal battery pack features

Chapter 4 What's Included

The Liebert® GXT4™ is shipped with the following items:

- Terminal Block Communication terminals
- Compact disc with:
 - Liebert MultiLink®
 - Configuration program & Multi-languages package
 - User manual (electronic version)
- USB cable, one; 2m (6-1/2 ft.) long
- Mounting hardware, including screws and handles
- Rack slide kits(E models do not include)
- Power Distribution Box, installed on Liebert GXT4
- Support base set, one
- Warnings, safety instructions booklet and WEEE recycling sheet (ISO 14001 compliance)



Note

The Liebert GXT4 External Battery Cabinet shipping package includes one battery cabinet, two spacers for tower configuration and one DC power cable.

Chapter 5 Installation and Configuration

Do NOT attempt to start the UPS, turn on any circuit breaker or energize the input power until instructed to do so in [8.2 Initial Startup And Electrical Checks](#).

Visually inspect the UPS for shipping damage. Report any damage to the carrier and your local dealer or Emerson representative.

Caution

The UPS is heavy (refer to [Chapter 11 Specifications](#)). Take proper precautions when lifting or moving it.

Install the Liebert® GXT4™ indoors in a controlled environment, where it cannot be accidentally turned off. Place it where air flows unrestricted around the unit. The installation location must be free of water, flammable liquids, gases, corrosives and conductive contaminants. Maintain a minimum clearance of 100mm (4 inches) in the front and rear of the UPS. Maintain an ambient temperature range of 0 to 40°C (32°F ~104°F).

Note

UPS operation in sustained temperatures outside the range of 15°C ~ 25°C (59°F ~ 77°F) reduces battery life.

5.1 Install Main Cabinet

The Liebert GXT4 may be installed in either a tower configuration or in a rack, depending on available space and use considerations. Determine the type of installation and follow the appropriate instructions in either [5.1.1 Tower UPS Installation](#) or [5.1.2 Rack-Mount UPS Installation](#).

5.1.1 Tower UPS Installation

To install the Liebert GXT4 as a tower:

1. Take the support bases out of the accessories bag (see [Figure 5-1](#)).

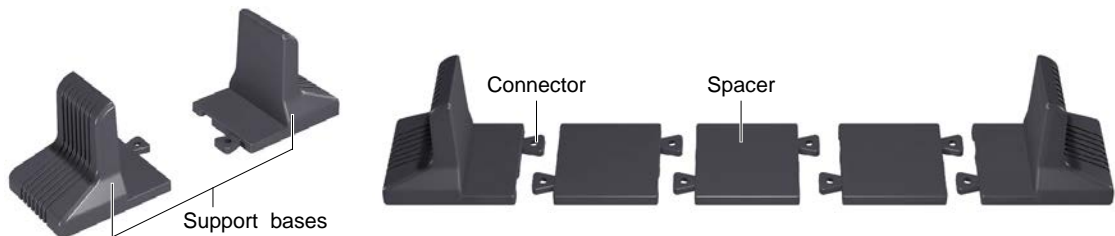


Figure 5-1 Support bases

2. If optional Liebert external battery cabinets will be connected to the Liebert GXT4, take out the spacers shipped with the battery cabinet.
3. Connect the spacers and the support bases as shown in [Figure 5-1](#). Each Liebert GXT4 needs two assembled 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 Liebert GXT4.
 - 1) Remove the front plastic bezel cover as shown in [Figure 5-2](#).



Figure 5-2 Remove the front plastic bezel cover

2) Pull the operation and display panel gently, rotate it 90 degrees clockwise and snap it back into position, as shown in Figure 5-3.



Figure 5-3 Rotate the operation and display panel

3) Pull the logo on the front plastic bezel cover gently, rotate it 90 degrees clockwise and snap it back into position. The rotated front plastic bezel cover is shown in Figure 5-3.

4) Replace the front plastic bezel cover on the Liebert® GXT4™. At this point, the UPS operation and display panel and logo have been rotated 90 degrees clockwise, which provides upright viewing for users.

5. Place the Liebert GXT4 and any battery cabinets on the support bases. Each Liebert GXT4 needs two support assemblies, as shown Figure 3-1.

5.1.2 Rack-Mount UPS Installation

When using the Liebert GXT4 in a rack, the UPS must be supported by a slide kit, fixed rails or a shelf.

When using the Adjustable Rack Mount Kit, you will use the following instructions. The figures accompanying 5.1.3 *Installing Adjustable Rack-Mount Kit—Sold Separately* shows the positioning of the rack-mounting brackets. Emerson recommends taking the internal batteries out of the UPS during rack installation. This will make the UPS cabinet lighter and easier to handle.

Caution

The Liebert GXT4 is heavy; refer to *Chapter 12 Specifications*. 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.

5.1.3 Installing Adjustable Rack-Mount Kit—Sold Separately

This kit contains parts needed to mount several different models of UPS and external battery cabinets into EIA310-D standard four-post racks that are 18" ~ 32" deep (457mm ~ 813mm). The weight limit per pair of adjustable rack-mounting brackets is 91kg (200lb). Parts included are shown in Table 5-1.

Table 5-1 Included parts in rack-mount kit

| Item | Quantity |
|-----------------------|----------|
| Rear bracket members | 2 |
| Front bracket members | 2 |
| Inner bracket members | 2 |
| M4 machine screws | 16 |
| M4 locking hex nuts | 8 |
| M5 machine screws | 8 |

Tools needed for installation are:

- one Phillips screwdriver
- one 7mm wrench

The adjustable rack-mounting brackets (Part#: RMKIT18-32) feature retaining latches to prevent users from inadvertently sliding the UPS or battery cabinet out of the rack.

To install the rack mount brackets:

1. Unpack two rack-mounting bracket assemblies and mounting hardware from this kit. Bracket assemblies are interchangeable between left-hand or right-hand.
2. Remove inner member of each bracket assembly shown in Figure 5-4 by extending it to its outermost position, depressing the retaining latch and then pulling the inner member out of the bracket assembly.

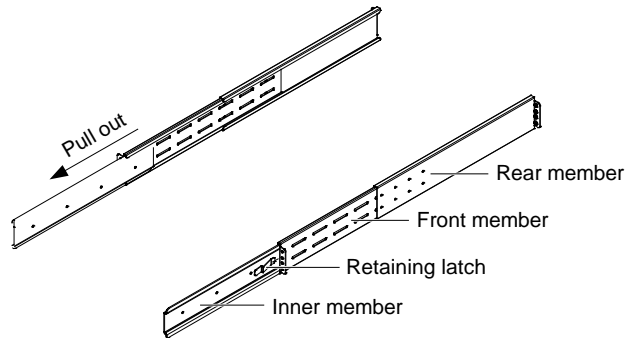


Figure 5-4 Removing inner member of each bracket assembly

3. Determine the height position inside the rack enclosure where you want to mount the UPS or battery cabinet.

Caution

Reduce the risk of tipping the rack enclosure by placing the UPS or battery cabinet in the lowest possible rack position.

4. Install the rear member of each bracket assembly into the rack enclosure with two M5 screws provided in this kit (see figure at right). The return flanges on the bracket assembly fit to the inside of rack mounting rails. Insert screws loosely (finger-tight) into the top and bottom holes of the return flange on the rear member.

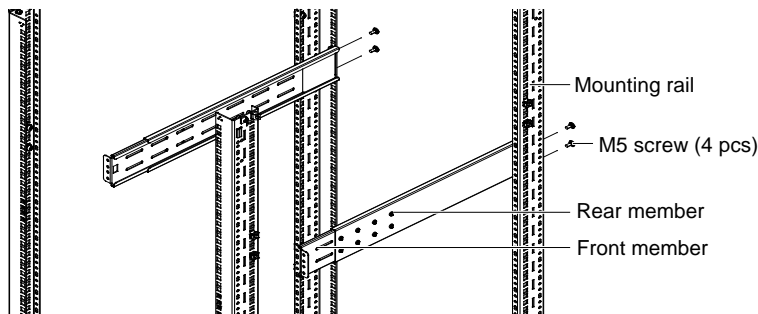


Figure 5-5 Installing rear member of each bracket assembly

5. Extend the bracket assembly by sliding the front member forward until it touches the front rack mounting rail. Insert two M5 screws loosely (finger-tight) into the top and bottom holes of the return flange on each front member. Make sure that the bracket assemblies are at the same mounting height on all four (4) rack mounting rails.

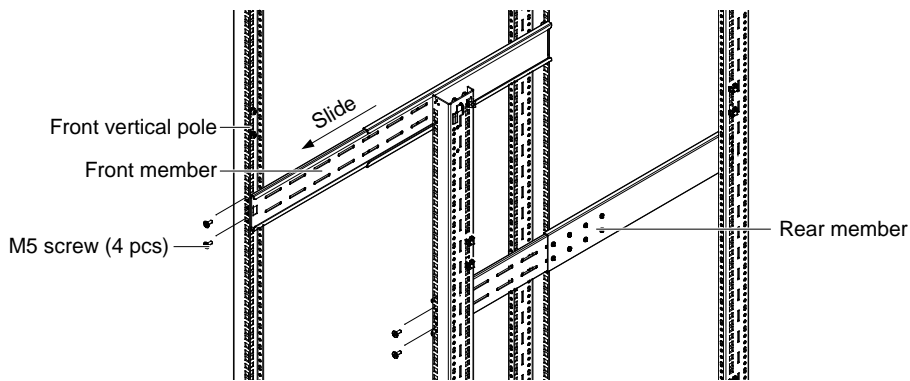


Figure 5-6 Installing front member of each bracket assembly

6. Get eight M4 screws and eight M4 nuts from the hardware pack in this kit. Each nut has a locking, nylon insert that begins gripping the screw when it is halfway tight. Make sure to tighten the nut and screw completely to ensure locking action. Fasten the rear member and the front member together using four screws and four nuts per bracket assembly as shown in Figure 5-6. For maximum support, insert fasteners for each bracket assembly as far apart as possible, depending on rack depth, while still joining both members (see figures at right). Check alignment of bracket assemblies and **TIGHTEN ALL SCREWS FROM Step 3 to Step 5.**

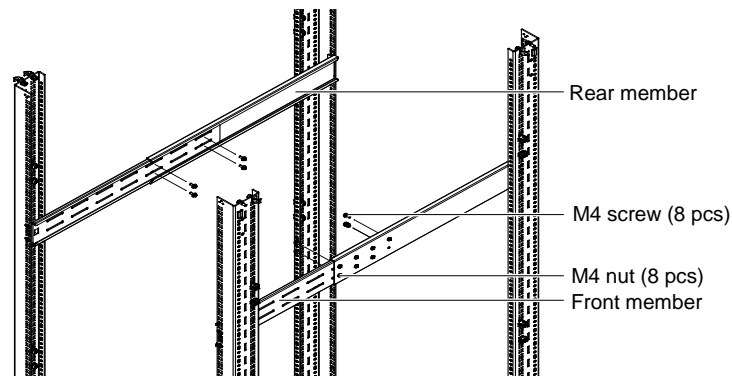


Figure 5-7 Fastening the rear member and the front member together

7. Prepare the UPS or battery cabinet (the 'equipment') for rack mounting by following instructions in the equipment's user manual. The equipment may require additional parts to be added or parts to be removed for rack mounting. After it is prepared, lay the equipment in rack-mounting position. Fasten the inner members from Step 2 to the equipment on both sides as shown at right with eight M4 screws provided in the kit. Make sure retaining latch is near the rear of the equipment as shown (see figure at right).

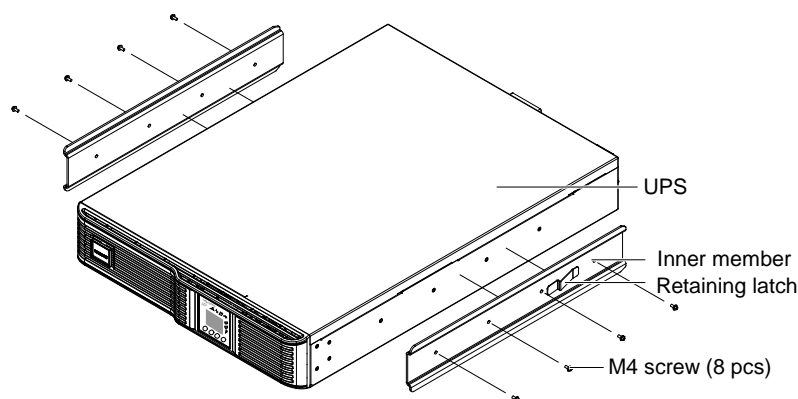


Figure 5-8 Fastening the inner members to the equipment

8. If available, apply a bead of grease 1" (25mm) long at four places inside the bottom, curved tracks of the front members as shown below right. The grease will allow the equipment to slide into the bracket assemblies more easily.

Caution

1. Lifting equipment into the rack may be a two-person job, depending on the weight of the equipment.
2. Liebert® recommends taking the internal batteries out of the UPS during rack installation. This will make the UPS cabinet lighter and easier to handle.
3. The Liebert GXT4™ weighs 151 lb. (67kg). For the UPS weight, see Table 11-1; for the battery cabinet's weight, see Table 11-5.
4. Factory-supplied rack handles are not intended to be used to lift the UPS. The handles are intended to be used to slide the UPS into and out of the rack.

9. Insert the equipment, with inner members attached in Step 7, into the bracket assemblies by inserting the top and bottom edges of the inner members into the top and bottom curved tracks of the front members and sliding the equipment into the rack (see Figure 5-9). Ends of inner members are tapered to allow the rear of the equipment to be angled upward before insertion, if space allows.

Then the rear, bottom edges of the inner members can be placed into the front edge of the bottom tracks and the front of the equipment can be tipped up so they are level to insert the top edges of the inner members before sliding the equipment into the rack (see Figure 5-9). The equipment should move smoothly into the bracket assemblies. If it does not, recheck the alignment of the front and rear members from Steps 4 and 5.

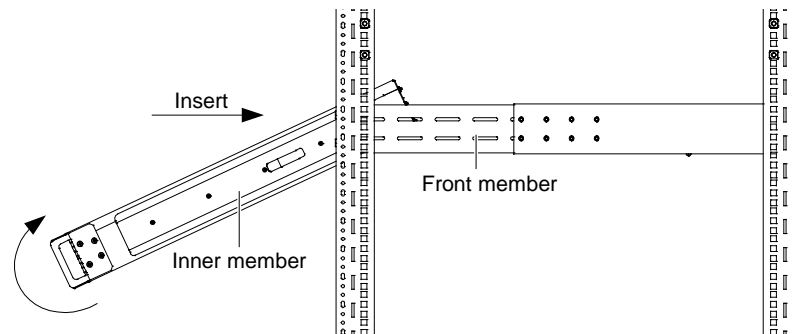


Figure 5-9 Inserting the UPS

10. Secure the front of the equipment to the rack mounting rails to prevent the equipment from sliding out of position. If securing holes are provided on the front of the equipment that align with the center holes on the return flange of the front members, you can use the four extra M5 screws provided in the kit to secure the equipment. Otherwise, the equipment should be secured to the front of the rack with four customer-supplied fasteners.

5.2 External Battery Cabinet Installation

Optional Liebert® external battery cabinets may be connected to the UPS to provide additional battery run time. External battery cabinets are designed to be placed on one side of the UPS or stacked beneath the UPS. External battery cabinets can be used in either a rack-mount or tower configuration.

Caution

The external battery cabinet(s) are heavy (refer to *Chapter 12 Specifications*). Take proper precautions when lifting them.

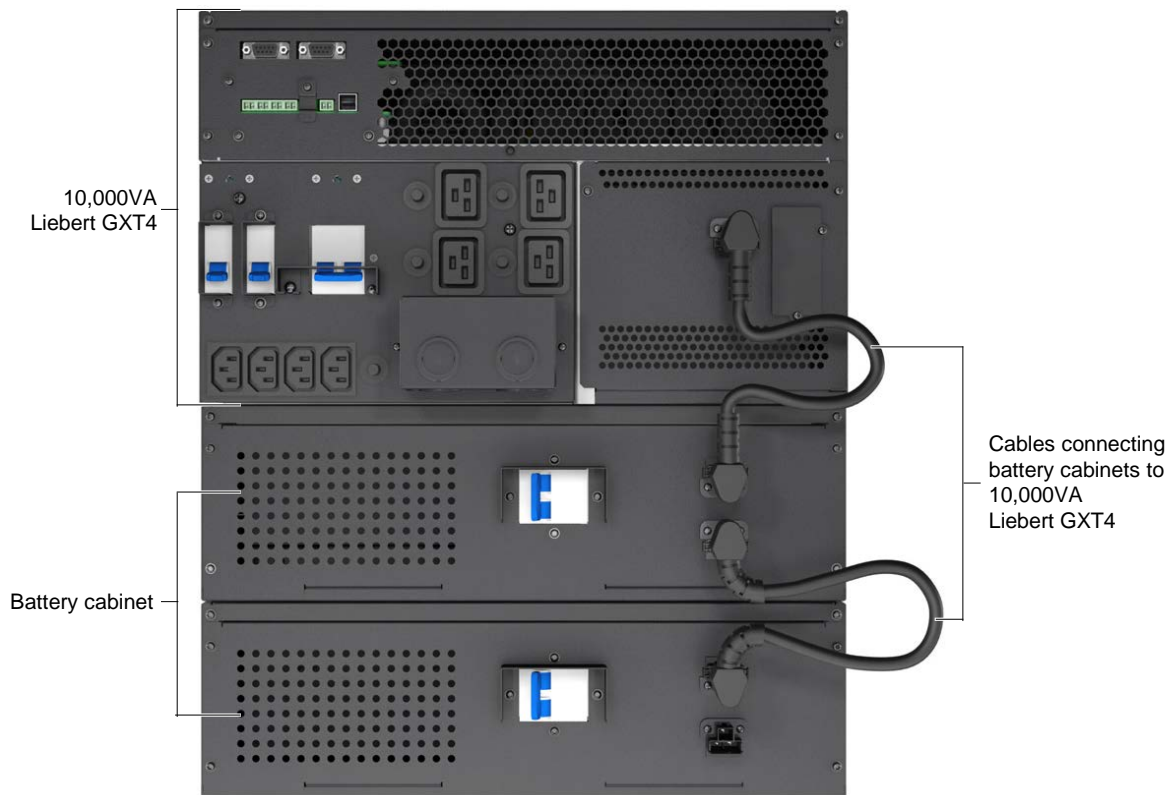


Figure 5-10 External battery cabinets connected to 10,000VA Liebert® GXT4™

1. Inspect the external battery cabinet for freight damage. Report damage to the carrier and your local dealer or Emerson representative.
2. For slide rail installations, first remove the top/side fin. Top/side fin slides forward and then lift up to remove. Optional rack-mount handles are shipped with the external battery cabinet and may be installed at this time if desired.
3. Securing hardware and slide rails are sold separately. Please contact your local dealer or Emerson 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.
4. Use the enclosed support bases for the tower option to prevent tip-over. One additional set of support base extensions ships with each external battery cabinet.
5. Put the UPS in Bypass Mode by operating LCD configuration
6. Verify the External Battery Cabinet breaker is in the Off position.
7. Connect the supplied external battery cabinet cable to the rear of the external battery cabinet, then to the rear of the UPS.
8. Turn the External Battery Cabinet breaker to the On position.
9. Operating LCD panel to return the unit to Inverter Mode.
10. Verify the circuit breaker on the External Battery Cabinet is in the On position.
11. Use the included configuration program or LCD to program the UPS for the number of external battery cabinets connected. Instructions for the configuration program are in *6.0 Configuration Program*.
12. The UPS is now equipped with additional backup battery run time. For approximate battery run times, refer to Table 11-5.

Note

1. When removing the External Battery Cabinet, the circuit breaker on the rear of the cabinet must be turned off before disconnecting the cable.
2. If the UPS is to be shipped or stored for an extended time, the connector should be disconnected. This will minimize any standby current drain on the batteries and help attain their design life.

5.3 Connect Input/Output Power

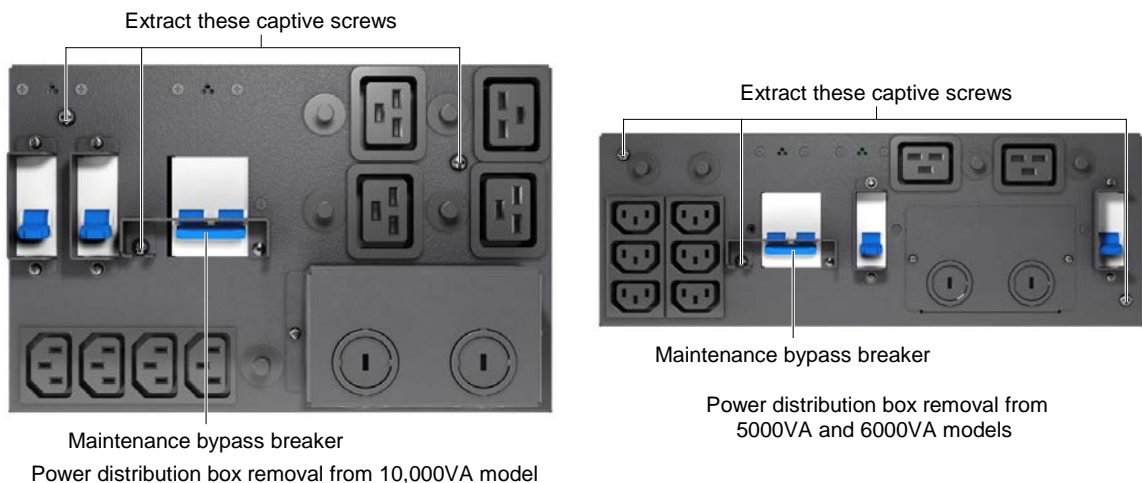


Figure 5-11 Power Distribution box removal—captive screws and maintenance bypass breaker

The UPS should arrive with the power distribution box attached. If the box needs to be removed for maintenance or replacement, follow these instructions to remove and install the power distribution pack.

To remove:

1. Ensure maintenance bypass lamp is on. To place the unit in maintenance bypass, refer to 8.4 *Put Liebert GXT4 In Bypass*.
2. Loosen one captive screw over the maintenance bypass breaker.
3. Turn the maintenance bypass breaker on.

Notice

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

4. Turn the output and input breaker off.
5. Loosen other captive screws until the power distribution box releases.
6. Remove the power distribution box from the UPS and set it aside.
7. Loosen screws over the plastic cover for the connector on the rear of the panel.
8. Slide plastic cover over connector and tighten screws.

Note

Do not operate the UPS with this box removed. To disconnect all power to this box and load, the utility input power also must be disconnected.

To install:

1. Align connectors and press box onto UPS
2. Hold box firmly against UPS and tighten captive screws except one over the maintenance bypass breaker.
3. Turn the output and input breaker on.
4. Start the UPS according to startup instructions.
5. Verify that the UPS lamp is illuminated.
6. Turn the maintenance bypass breaker off.
7. Insert the maintenance bypass cover behind the captive screw and tighten the screw.

Note

The maintenance bypass breaker cover must be installed behind the captive screw and the screw must be tightened for the UPS to operate in inverter mode.

Distribution box electrical connections

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

- PD2-CE6HDWRMBS fits the 5000 and 6000VA models of the Liebert GXT4
- PD2-CE10HDWRMBS fits the 10,000VA model of the Liebert GXT4

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 5-2 Branch circuit breaker ratings

| Unit Rating | Maximum Breaker Rating |
|-------------|------------------------|
| 5000VA | D Type 32A |
| 6000VA | |
| 10,000VA | D Type 63A |

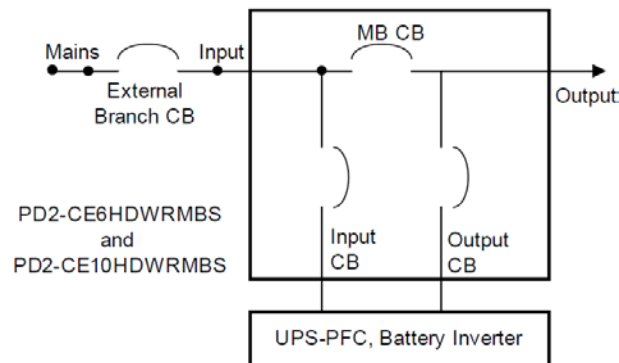


Figure 5-12 Distribution box electrical connections diagram

Terminal block connections—PD2-CE6HDWRMBS and PD2-CE10HDWRMBS

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

Table 5-3 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 |
|--|---|---|---|----------------------------|
| GXT4-5000RT230 GXT4-5000RT230E GXT4-6000RT230 GXT4-6000RT230E | 32A | 4mm ² (10AWG) | 6mm ² (8AWG) | 2.26Nm (20 in-lb) |
| GXT4-10000RT230 GXT4-10000RT230E | 63A | 10mm ² (6AWG) | 16mm ² (4AWG) | |

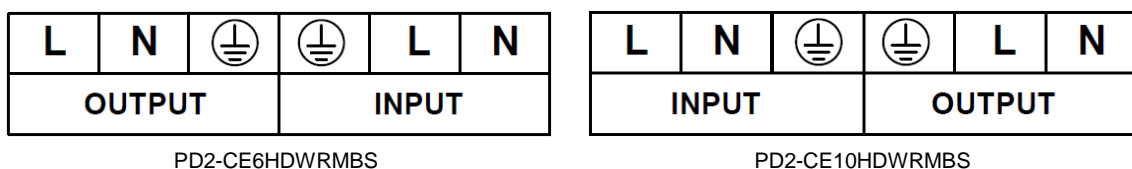


Figure 5-13 Terminal block connections—PD2-CE6HDWRMBS and PD2-CE10HDWRMBS



Note

1. The installer must provide circuit breaker protection according to local codes. The utility 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.
 2. 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.
-

Chapter 6 Configuration Program

The final step of installation may require custom configuration of your UPS using the enclosed configuration program. Some configuration settings may be changed only while the UPS is off. These should be set before the UPS is put into full-time service powering the critical load.

For most users operating with 230VAC and with no external batteries, the factory default settings will be adequate.

6.1 Configuration Program Features

- Select L-N output voltages to match local voltages.
- Enable/Disable Auto-Restart.
- Select frequency converter operation with a fixed output frequency of 50 or 60 Hz.
- Set the Low Battery Warning alarm time from 2 to 30 minutes.
- Enable/Disable the Auto-Battery test.
- Set the Auto-Battery test to 8, 12, 16, 20 or 26 weeks.
- Specify the number of external battery cabinets connected to the UPS to adjust the remaining run time calculations reported by Liebert® software products.
- Modify the shutdown setting of the terminal block (for information on pin assignments, see Table 5-3).

6.2 What You Will Need

In addition to the Liebert GXT4™ UPS, you will need the configuration program CD and USB cable included in the UPS accessory box. A Windows 95® or later computer, desktop or laptop, is also required to set up and run the configuration program.

Chapter 7 Operation And Display Panel

This chapter describes the operation and display panel of the Liebert GXT4, including LED indicators, control buttons and LCD display panel.

The operation and display panel is on the front panel of the Liebert GXT4 (see Figure 7-1), which provides four control buttons, seven LED indicators and a LCD display panel, as shown in Figure 7-1.

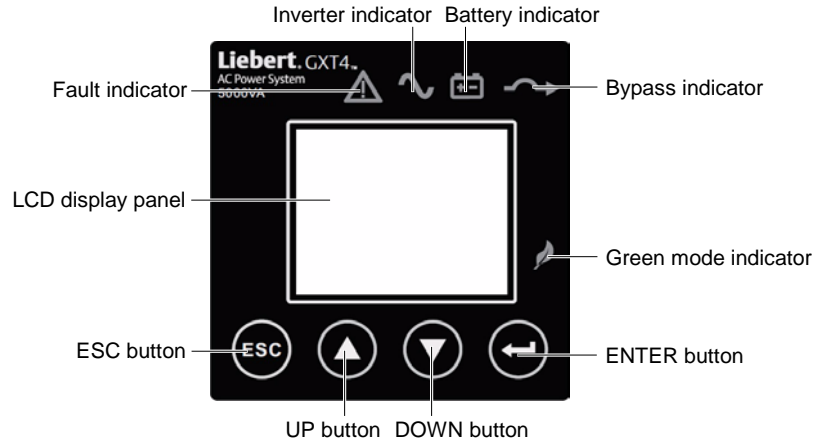


Figure 7-1 Operation and display panel

7.1 LED Indicators

The operation and display panel provides seven LED indicators: inverter indicator, bypass indicator, battery indicator, fault indicator, and green mode indicator. Their descriptions are listed in Table 7-1.

Table 7-2 LED indicators

| LED Indicators | LED color | Description |
|----------------------|-----------|--|
| Inverter indicator | Green | On when the inverter is supplying power, and off otherwise |
| Bypass indicator | Amber | On when the load is supplied by the mains through automatic/manual bypass, and off otherwise |
| Battery indicator | Amber | On when the load is supplied by the battery, and off otherwise |
| Fault indicator | Red | On when an error has occurred within the UPS, and off otherwise |
| Green mode indicator | Green | On when the UPS is in green mode, and off otherwise |

Caution

Do not switch off the UPS or switch from online to bypass, otherwise the loads will no longer be supported.

7.2 Control Buttons

The operation and display panel provides four control buttons: ESC button, UP button, DOWN button and ENTER button. Their descriptions are listed in Table 7-2.

Table 7-3 Control buttons

| Control buttons | Description |
|-----------------|---|
| ESC button | Pressing this button returns to the previous menu or aborts any change in the input data field before confirming |
| UP button | 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 button | 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 button | Pressing this button can enter the next level menu or confirm the parameter setting value |

7.3 LCD Display Panel

The operation and display panel provides a LCD display panel, enabling you to view the UPS status and change the UPS settings.

7.3.1 Startup Screen

When the UPS is starting up, the UPS begins self-testing, and then the LCD display panel will display EMERSON icon for about 10s, as shown in Figure 7-2.



Figure 7-2 Startup screen

7.3.2 ON Screen

About 10s later, the LCD display panel will display the corresponding ON screen depending on whether the AC is available, as shown in Figure 7-3.

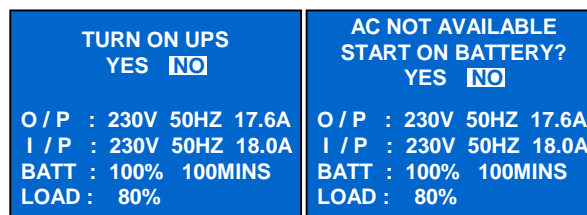


Figure 7-3 Startup screen

Select 'YES' and press the ENTER button, the UPS will start up, and the LCD display panel will display 'START SUCCESSFUL', as shown in Figure 7-4.

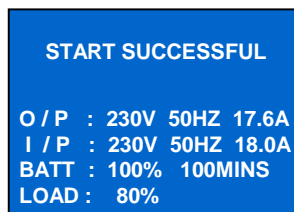


Figure 7-4 'START SUCCESSFUL' screen

7.3.3 Default Screen

Press any button in the 'STARTUP SUCCESSFULLY' screen to enter the default interface, as shown in Figure 7-5.

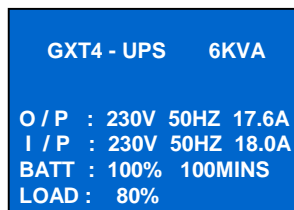


Figure 7-5 Default screen

In the default screen, the LCD display panel will display the UPS model, operation mode (ONLINE, GREEN, GREEN AUTO, and BYPASS), output parameters, input parameters, battery capacity and load percentage.

If no control button is pressed within two minutes, the LCD display panel will enter a screen-protection state (the back lighting is off) until any control button is pressed.

7.3.4 Main Menu Screen

Press any button in the default screen to enter the Main Menu screen, as shown in Figure 7-6.

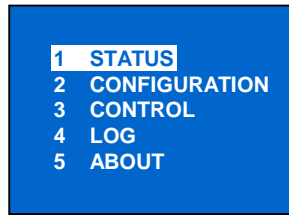


Figure 7-6 Main Menu screen

To select a submenu, press the UP or DOWN button to move the cursor to the required item, and press the ENTER button to enter its submenu or set its parameter.

STATUS screen

Select Main Menu -> 1 STATUS to enter the STATUS screen, displaying OUTPUT, LOAD, INPUT, PARALLEL, BATTERY and TIME SINCE STARTUP, as shown in Figure 7-7.

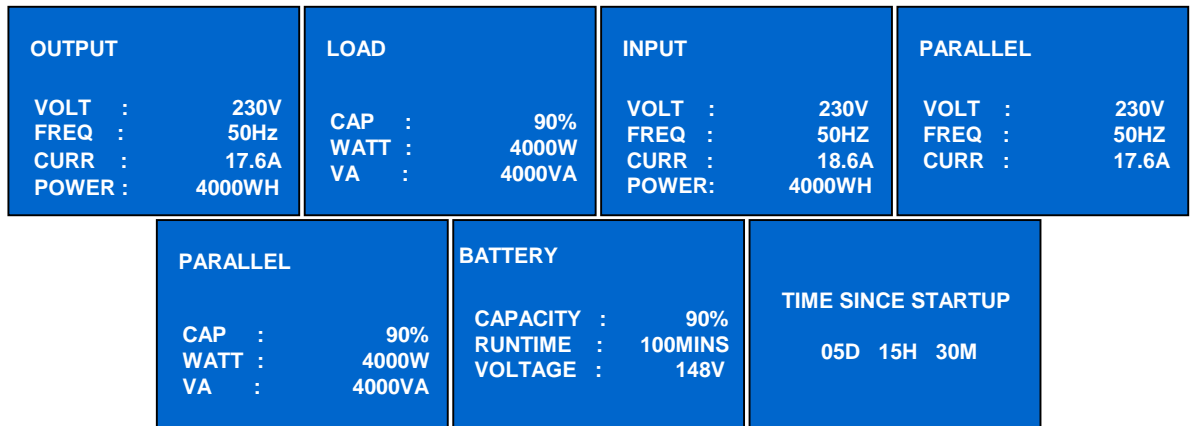


Figure 7-7 STATUS screen

CONFIGURATION screen

Select Main Menu -> 2 CONFIGURATION to enter the CONFIGURATION screen. This menu has five submenus, as shown in Figure 7-8.

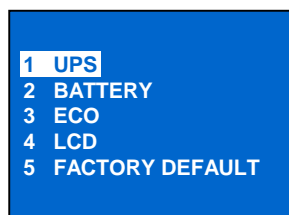


Figure 7-8 CONFIGURATION screen

In the CONFIGURATION screen, press the UP or DOWN button to move the cursor to the required item, and press the ENTER button to enter its submenu or set its parameter.

1. UPS screen

Select Main Menu -> 2 CONFIGURATION -> 1 UPS to enter the UPS screen. This menu has seven screens, as shown in Figure 7-9.

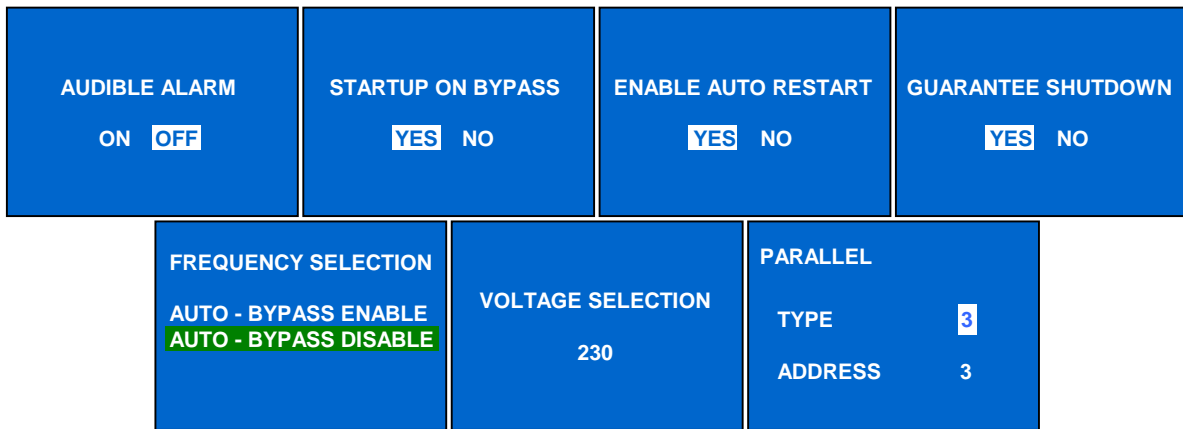


Figure 7-9 UPS screen

Press the UP or DOWN button to move the cursor to the required item, and press the ENTER button to confirm the settings.

2. BATTERY screen

Select Main Menu -> 2 CONFIGURATION -> 2 BATTERY to enter the BATTERY screen. This menu has four submenus, as shown in Figure 7-10.

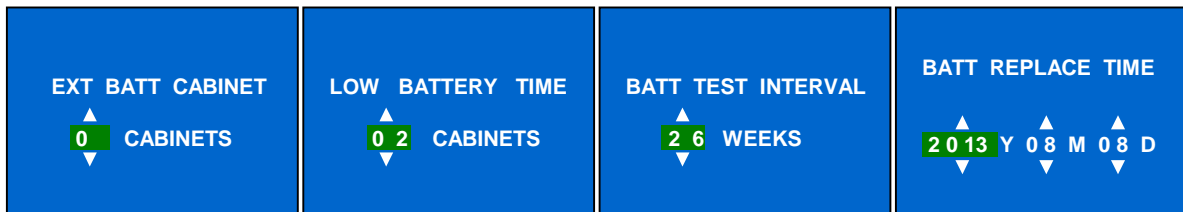


Figure 7-10 BATTERY screen

Press the UP or DOWN button to increase or decrease the value of the settings, and press the ENTER button to confirm it.

3. OPERATION MODE screen

Select Main Menu -> 2 CONFIGURATION -> 3 OPERATION MODE to enter the OPERATION MODE screen, as shown in Figure 7-11.

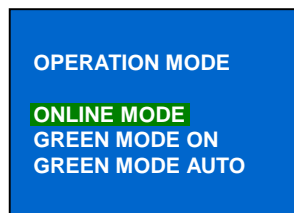


Figure 7-11 OPERATION MODE screen

Press the UP or DOWN button to move the cursor to the required item, and press the ENTER button to confirm the settings.

4. LCD screen

Select Main Menu -> 2 CONFIGURATION -> 6 LCD to enter the LCD screen. This menu has two submenus, as shown in Figure 7-12.

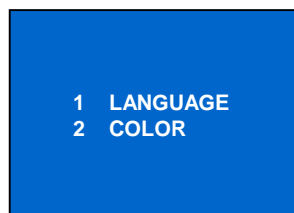


Figure 7-12 LCD screen

1) Select '1 LANGUAGE' and press the ENTER button to enter the LANGUAGE screen, as shown in Figure 7-13.



Figure 7-13 LANGUAGE screen

2) Select '2 COLOR' and press the ENTER button to enter the COLOR screen, as shown in Figure 7-14.

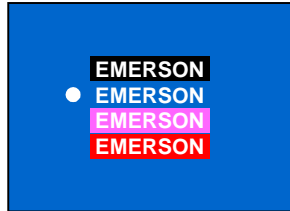


Figure 7-14 COLOR screen

5. FACTORY DEFAULT screen

Select Main Menu -> 2 CONFIGURATION -> 7 FACTORY DEFAULT to enter the FACTORY DEFAULT screen, as shown in Figure 7-15.

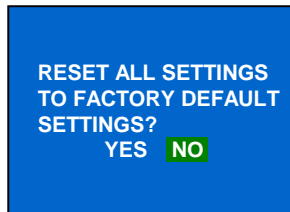


Figure 7-15 FACTORY DEFAULT screen

CONTROL Screen

Select Main Menu -> 3 CONTROL to enter the CONTROL screen, as shown in Figure 7-16.

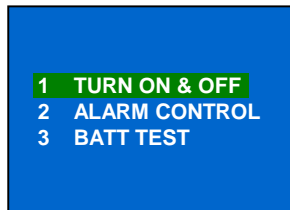
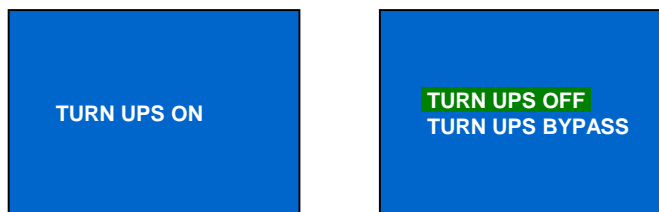


Figure 7-16 CONTROL screen

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 submenu.

1. TURN ON & OFF screen

Select Main Menu -> 3 CONTROL -> 1 TURN ON & OFF to enter the TURN ON & OFF screen, as shown in Figure 7-17.



The UPS is off

The UPS is on

Figure 7-17 TURN ON & OFF screen

2. ALARM CONTROL screen

Select Main Menu -> 3 CONTROL -> 2 ALARM CONTROL to enter the ALARM CONTROL screen, as shown in Figure 7-18.

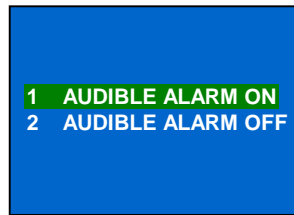


Figure 7-18 ALARM CONTROL screen

3. BATT TEST screen

Select Main Menu -> 3 CONTROL -> 3 BATT TEST to enter the BATT TEST screen, as shown in Figure 7-19.

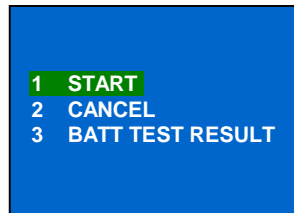


Figure 7-19 BATT TEST screen

LOG Screen

Select Main Menu -> 4 LOG to enter the LOG screen, as shown in Figure 7-20.

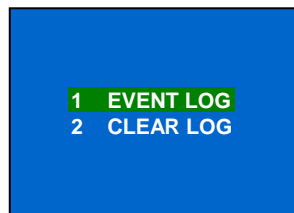


Figure 7-20 LOG screen

1. Select Main Menu -> 4 LOG -> 1 EVENT LOG to enter the EVENT LOG screen, as shown in Figure 7-21.

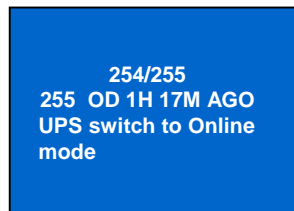


Figure 7-21 ALL LOG screen

2. Select Main Menu -> 4 LOG -> 2 CLEAR LOG to enter the CLEAR LOG screen, as shown in Figure 7-22.

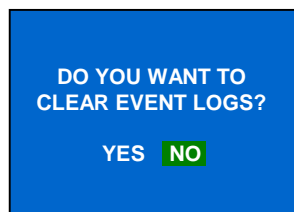


Figure 7-22 CLEAR LOG screen

Press the UP or DOWN button to move the cursor to the required item, and press the ENTER button to confirm the settings.

ABOUT Screen

Select Main Menu -> 5 ABOUT to enter the ABOUT screen, as shown in Figure 7-23.



Figure 7-23 ABOUT screen

The ABOUT screen displays: UPS model, SN, software version and hardware version.

Menu structure

The menu structure of the LCD display panel is shown in Figure 7-24.

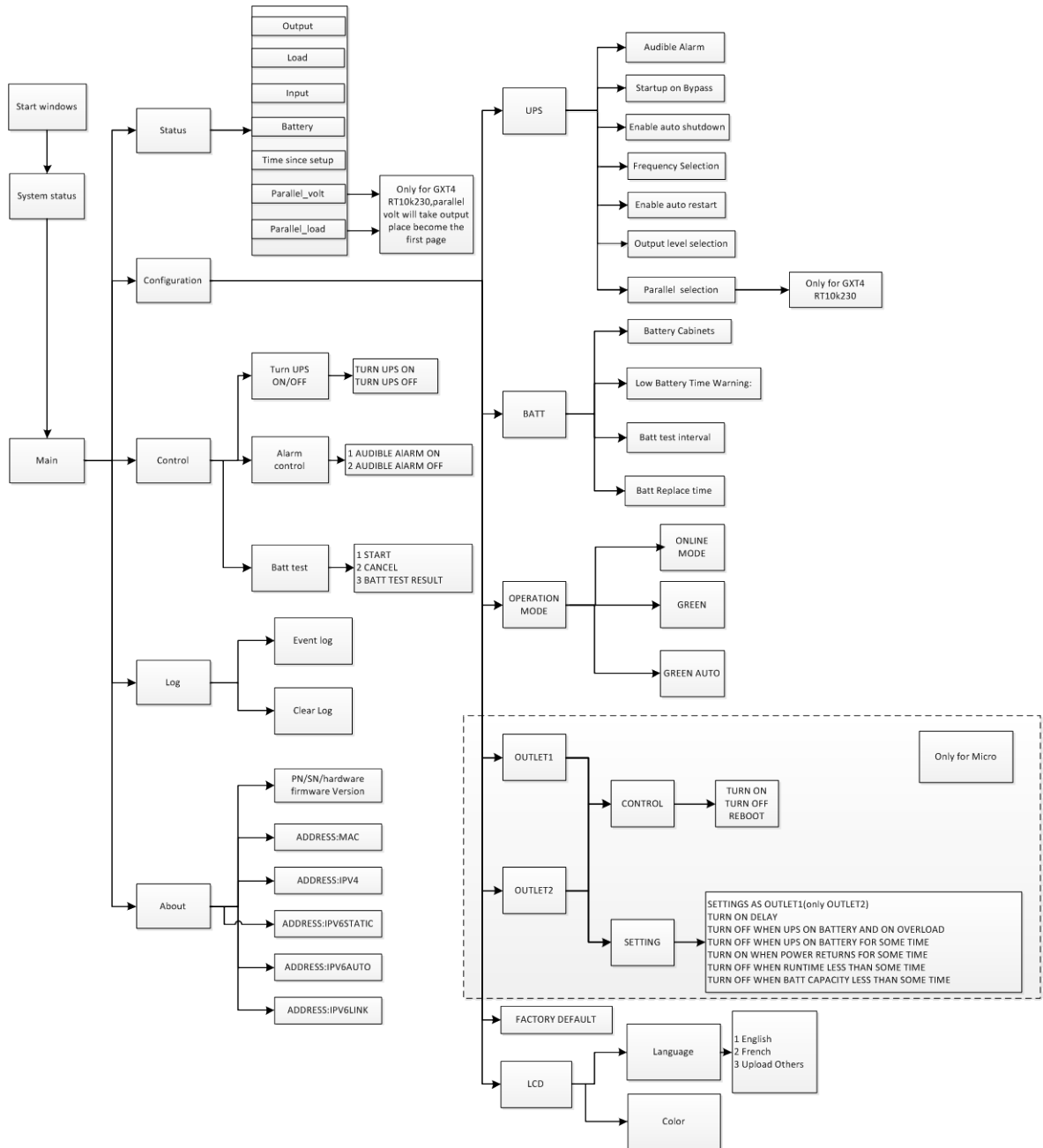


Figure 7-24 Menu structure

7.3.5 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. The prompts and meanings are given in Table 7-3.

Table 7-4 Prompts and meanings

| No. | Prompt | Meanings |
|-----|---|--|
| 1 | Utility power restored | The utility power recovers, and the UPS transfers back to Utility (AC) mode |
| 2 | Bypass power restored | The bypass power recovers, and the UPS can transfers back to bypass |
| 3 | UPS return from a low battery condition | The UPS transfers back to Utility (AC) mode from Battery low mode |
| 4 | UPS return from battery mode | The UPS transfers back to Utility (AC) mode from Battery mode |
| 5 | UPS battery test unallowed | Conditions of battery test do not meet,UPS battery test is not allowed |
| 6 | UPS self test successful | The UPS self-test is successfully performed |
| 7 | UPS self test in progress | The UPS is performing self-test |
| 8 | UPS turn off | The UPS shuts down and has no output |
| 9 | UPS TURN ON | The UPS starts up successfully and supplies power to the load |
| 10 | UPS Maintenance bypass output | The UPS Maintenance bypass output |
| 11 | UPS shutdown command received | The UPS shuts down through communication |
| 12 | UPS shutdown process had been cancelled | The shutdown command sent through Multilink or SNMP card to the UPS is cancelled |
| 13 | UPS switch to Green mode | The UPS transfers back to Green mode, saving more electricity |
| 14 | UPS switch to Auto Green mode | When the input utility power satisfies the condition of Auto Green mode, the UPS will transfer back to Auto Green mode |
| 15 | UPS switch to Online mode | The UPS transfers back to Online mode, supplying power to the load through the inverter |
| 16 | UPS internal temperature return to normal | The internal temperature of the UPS recovers to normal range |
| 17 | UPS load return from overload | The loads are reduced, and the UPS recovers to normal state from overload |
| 18 | Beeper Disable | The beeper is disabled, and no audible alarm will be generated when faults or warnings occur again |
| 19 | Beeper Enable | The beeper is enabled, and audible alarms will be generated when faults or warnings occur again |

7.3.6 Warning List

All UPS warning messages are described in Table 7-4.

Table 7-5 Warning list

| No. | Warning | Description |
|-----|--------------------------------------|--|
| 1 | Utility power not available | The utility power is not available, or it cannot satisfy the requirements for the UPS to operate |
| 2 | UPS batteries low and exhausted soon | The battery capacity is low and will be exhausted soon |
| 3 | UPS has switched to battery mode | The utility power is abnormal or the PFC side is faulty, the UPS transfers back to Battery mode |
| 4 | UPS Switch to Bypass | The UPS transfers back to Bypass mode, at this point, the input utility power supplies power to the load directly, and the load is not protected |
| 5 | Bypass power not available | The bypass power is not available, or it cannot satisfy the requirements for the UPS to transfers to bypass (include phase angle abnormal for two phase model) |
| 6 | Input power wiring error | Ground is not connected or L/N wires are reversed or Input phase error |

7.3.7 Fault List

All UPS fault messages are described in Table 7-5.

Table 7-6 Fault list

| No. | Fault | Description |
|-----|-----------------------|---|
| 1 | UPS self test failed | The battery is bad or weak |
| 2 | PFC Out of Order | PFC failure occurs |
| 3 | UPS overload | The UPS is overloaded |
| 4 | Inverter Out of Order | The inverter is faulty |
| 5 | Battery Weak/Bad | The battery is bad or weak |
| 6 | Output Short-circuit | The output connection is short-circuited |
| 7 | DC Bus Over-voltage | The DC bus is faulty |
| 8 | UPS Over-temperature | Over-temperature occurs to the UPS and the UPS will transfer to Bypass mode |
| 9 | Charger Out of Order | The charger is faulty |
| 10 | Fan Out of Order | At least one fan is faulty |
| 11 | DC Bus Discharge Fail | DCDC failure occurs |

If a fault occurs, the UPS automatically switches to Bypass mode. Only in the case of a battery disconnection fault will the original operating mode be maintained. 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, proceed as follows:

1. Enter the ALARM CONTROL screen (see Figure 7-18), and select 'AUDIBLE ALARM ON' or 'AUDIBLE ALARM OFF' to switch on/off the alarm.
2. Enter the EVENT LOG screen (see Figure 7-21), and select '3 CRITICAL' to view the fault log.



Note

Please wait patiently when you enter the EVENT LOG screen to view the historical fault log. Because the LCD display panel needs to read the faults from the DSP at a relatively slow reading speed, the reading time depends on the uploaded information quantity.

Chapter 8 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 the utility power from the UPS.

Note

The Liebert® 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 three hours before putting the UPS into service.

8.1 Startup Checklist For Liebert GXT4™

Before starting the UPS, perform these checks:

1. Check that the input plugs 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.

8.2 Initial Startup And Electrical Checks

1. Verify that the Input/Output circuit breakers are off.
2. During initial system checks, disconnect all loads (open load disconnects).
3. Inspect all wiring, cables and connection.
4. If external battery cabinets are used, verify that the battery interconnect cables are fully inserted in the sockets.
5. Place the manual bypass breaker in BYPASS position.
6. Turn on the branch circuit disconnect to apply voltage to the input terminal block.
7. Using a voltmeter, verify the expected L1-N (L2) voltage.

Verify that the same voltages appear at the Output terminals. The Bypass lamp by the switch will light.

8. After verifying proper input voltage to the UPS terminal block, turn off the branch circuit power, close all access panels to the distribution box and reapply input power.
9. Close the Input circuit breaker located on the distribution box. The green AC INPUT lamp should illuminate on the front panel.
10. Select Main Menu -> 3 CONTROL -> 1 TURN ON & OFF to enter the TURN ON & OFF screen, and select 'TURN UPS ON' to turn on the UPS.
11. Close the Output circuit breaker on the rear of the power distribution box. The light by the input breaker will illuminate.
12. Return the breaker to the Inverter position. The output terminal block will be powered at this time.
13. Connect all loads for normal operation.

8.3 Manual Battery Test

To initiate a manual battery test,

Select Main Menu -> 3 CONTROL -> 3 BATT TEST to enter the BATT TEST screen, and select '1 START' to start manual battery test.

while the UPS is operating from utility power with no alarm conditions present.

8.4 Put Liebert® GXT4™ In Bypass

Select Main Menu -> 3 CONTROL -> 1 TURN ON & OFF to enter the TURN ON & OFF screen, and select 'TURN UPS BYPASS' to transfer the UPS to bypass.

8.5 Shut Down Liebert GXT4

Select Main Menu -> 3 CONTROL -> 1 TURN ON & OFF to enter the TURN ON & OFF screen, and select 'TURN UPS OFF' to turn off the UPS.

8.6 Disconnecting Input Power From Liebert GXT4

1. After the UPS has been shut down as detailed in 8.5 *Shut Down Liebert GXT4*, turn off the Output Circuit Breaker.
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.

8.7 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. Turn the UPS to internal bypass based on 8.4 Put the Liebert GXT4 Bypass
 - 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.

8.8 IT Power System Configuration

1. Remove screws on the IT Power System Access Cover, as shown in Figure 8-1.



Figure 8-1 Removing cover from IT Power System Connectors compartment

2. Disconnect the connectors, as shown in Figure 8-2.

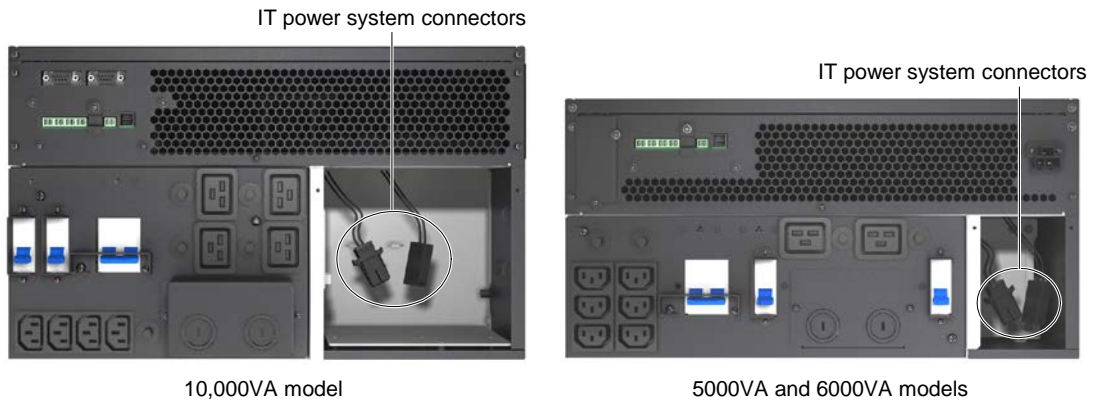


Figure 8-2 Disconnecting the connectors

3. Install IT Power System Access Cover and screws.

Chapter 9 Communication

This chapter introduces communication of the Liebert® GXT4™ UPS, including communication interface port, terminal block, Liebert IntelliSlot® communication cards and remote emergency power off.

9.1 Communication Interface Port

The Liebert® GXT4™ UPS has a terminal block on the rear of the UPS unit. Several signals are provided on this port and are assigned as follows.

9.2 Terminal Block

The terminal block includes eight pins, as shown in Figure 9-1.

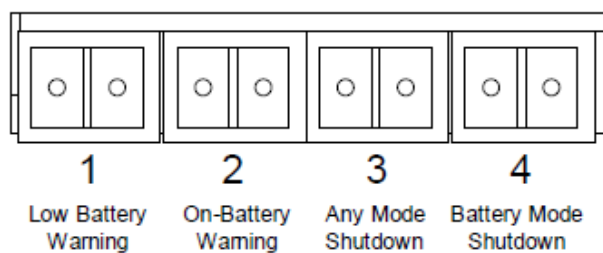


Figure 9-1 Terminal block communication pin layout

9.2.1 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 Set 3.
- Remote Any Mode Shutdown can be performed using a switch connected to the pins in Set 3 and mounted at a remote location.

Activation of the Any Mode Shutdown will be logged as an event in the event history log.

Note

Remote Power Off will be performed either by NO or NC contact of Any Mode Shutdown. The current limited source for the optocoupler (+12VDC, 50mA) will be available from UPS. The connection to UPS for remote connection will be via terminal block connector. Any Mode Shutdown wiring must conform to all national, regional and local wiring codes and laws.

Warning

When the Auto-enable output option is selected and the UPS output is disabled using the pins in Set 3, the Liebert GXT4's output can turn On automatically and without warning if the connection of the pins in Set 3 is changed.

9.2.2 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 Set 4.
- Remote Battery Mode Shutdown can be performed using a switch connected to the pins in Set 4 and mounted at remote location.

Activation of the Battery Mode Shutdown will be logged as an event in the event history log.



Note

1. Remote Power Off will be performed by NO contact.
2. The current limited source for the optocoupler (+12VDC, 50mA) will be available from UPS. The connection to the Liebert® GXT4™ for remote connection will be via terminal block connector.
3. Battery Mode Shutdown wiring must conform to all national, regional and local wiring codes and laws.
4. This signal must last for 1.5 seconds or longer.
5. 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 utility power returns during this countdown, the Liebert 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.

9.2.3 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.

9.2.4 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.



Note

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

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

9.3 Liebert IntelliSlot® Communication Cards

The Liebert IntelliSlot port accepts three optional cards:

- Liebert IntelliSlot SNMP Card
- Liebert IntelliSlot Relay Card
- Liebert IntelliSlot 485 Card

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

The Liebert IntelliSlot Relay Card provides dry contact relay outputs for custom-wired applications and delivers support for built-in shutdown for AS/400 systems.

The Liebert IntelliSlot 485 Card is used to connect the UPS and computer system.

Follow instructions provided with the Liebert IntelliSlot card to configure Liebert MultiLink®, the UPS or any additional ancillary product for the Liebert GXT4. These instructions are available at multilink.liebert.com

9.3.1 Liebert® MultiLink®

Liebert MultiLink monitors the UPS continuously and can shut down a computer or server in the event of an extended power failure.

Liebert MultiLink can also be configured for use without the USB cable when the Liebert IntelliSlot® SNMP/Web card is installed in the UPS. Additionally, Liebert MultiLink can be configured to coordinate shutdown across the network with other computers running Liebert MultiLink when you purchase a Liebert MultiLink License Kit. For more information about the Liebert IntelliSlot SNMP/Web


Card and Liebert MultiLink License Kits, visit our Web site (www.liebert.com) or contact your local dealer or Emerson representative.

Several option cards are available for use in the Liebert IntelliSlot port of the Liebert GXT4™. The

Liebert IntelliSlot SNMP/Web Card provides SNMP and Web-based monitoring and control of the UPS across the network.

The Liebert IntelliSlot MultiPort 4 Card allows installing Liebert MultiLink software on four computers and coordinate shutdown in the event of a power failure.

The Liebert IntelliSlot Relay Card provides dry contact relay outputs for custom wired applications and delivers support for built-in shutdown for AS/400 systems.

 **Caution**

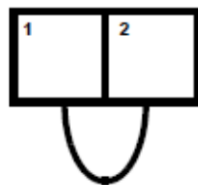
To maintain safety (SELV) barriers and for electromagnetic compatibility, signal cables should be shielded and run separate from all other power cables, where applicable.

9.4 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.

UPS ships with REPO jumper installed allowing the UPS to operate.




Normally closed switch system (fail-safe)

Opening the REPO connection will disable the UPS. Manual restart using the front panel is required after the REPO connection is closed again.



Figure 9-2 REPO switch connection diagram

 **Caution**

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

Chapter 10 Maintenance

This section describes replacing the internal battery pack, battery charging, precautions, checking UPS status, checking UPS functions.

10.1 Replacing Internal Battery Pack

The Liebert GXT4™ is designed to allow the user to replace the internal battery pack safely. Read the safety cautions before proceeding. Contact your local dealer or Emerson representative to obtain the part number and pricing of the appropriate replacement battery pack.

Battery replacement procedures

1. Gently remove the front plastic bezel cover from the UPS.
2. Loosen and remove the six screws on the battery door, as shown in Figure 10-1.
3. Lay the battery door and screws aside for reassembly.

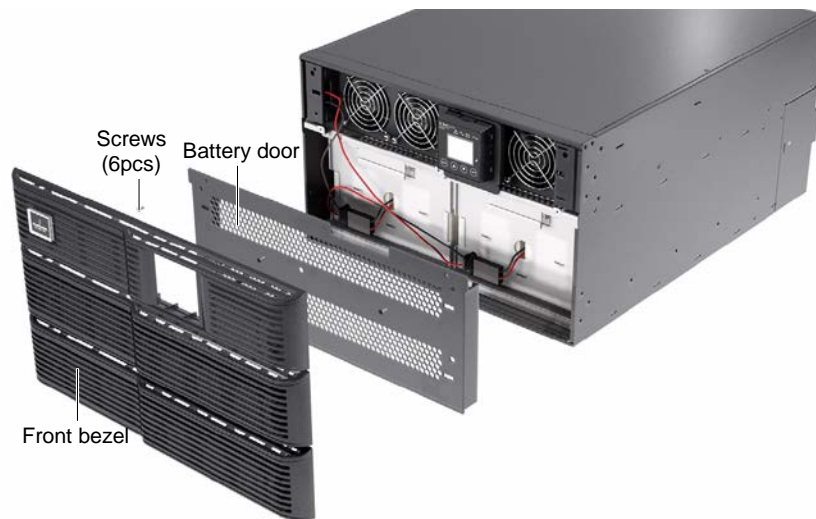


Figure 10-1 Removing the front plastic bezel cover and battery door

Note

10,000VA model is shown in Figure 10-1; 5000VA / 6000VA model arrangement is the same except smaller.

4. Gently pull the battery wires out and disconnect the battery plugs and battery receptacles, as shown in Figure 10-2.



Figure 10-2 Disconnecting the battery plug and battery receptacle (front view)

Note

10,000VA model is shown in Figure 10-2; 5000VA / 6000VA model arrangement is the same except smaller.

5. Grasp the battery handle and pull one of the internal battery packs out of the UPS, as shown in Figure 10-3. Repeat this step if both battery packs will be replaced. Each model has two battery packs.

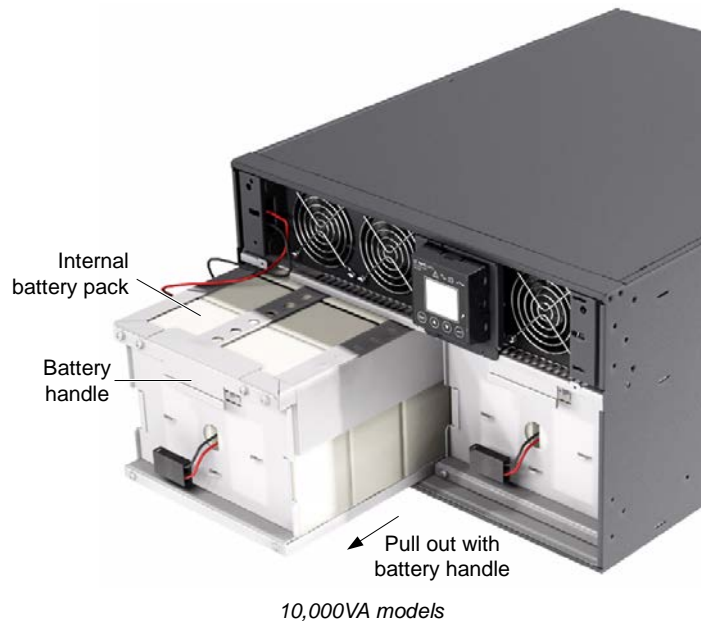
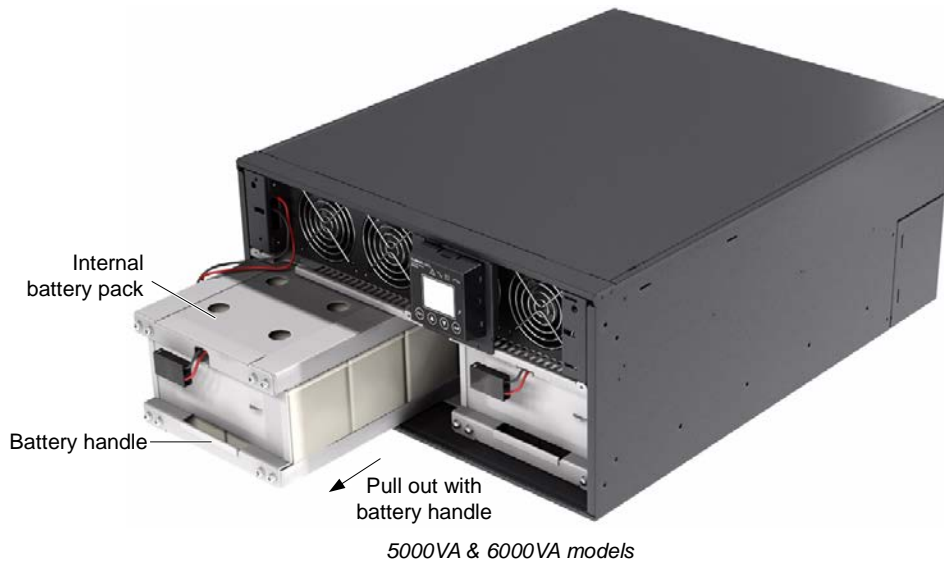



Figure 10-3 Pulling out the battery packs

6. Unpack a new internal battery pack. Take care not to destroy the packing. Compare the new and old internal battery packs to make sure they are the same type and model. If they are the same, proceed with Step 7; if they are different, stop and contact your local Emerson representative or Emerson Channel Support.
7. Line up and slide in the new internal battery pack.
8. Repeat Steps 6 and 7 if replacing both battery packs. Each model has two battery packs
9. Reconnect the battery plugs and battery receptacles.
10. Gently push the battery wire into the UPS battery compartment.
11. Reattach the front battery door with the six screws.
12. Reattach the front plastic bezel cover to the UPS.

 **Note**

The internal battery pack is hot-swappable. However, caution should be exercised because the load is unprotected from disturbances and power failures during this procedure. 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.

10.2 Battery Charging

The batteries are valve-regulated, nonspillable, lead acid and should be kept charged to attain their design life. The Liebert® GXT4™ charges the batteries continuously when it is connected to the utility input power.

If the Liebert GXT4 will be stored for a long time, Emerson recommends connecting the UPS to input power for at least 24 hours every four to six months to ensure full recharge of the batteries.

10.3 Precautions

Although the Liebert GXT4 has been 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 Liebert 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 UPS.
- Do not place the Liebert GXT4 power cord where it might be damaged.

10.4 Checking UPS Status

Emerson recommends checking the UPS operation status every six months.

- Check whether the UPS is faulty: Is the Fault Indicator on? Is the UPS sounding an alarm?
- Check whether 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 Emerson representative, or Emerson Channel Support.
- Check whether 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 local Emerson representative or Emerson Channel Support.

10.5 Checking UPS Functions

 **Note**

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

Emerson recommends checking the UPS functions once every six months.

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

1. Select Main Menu -> 3 CONTROL -> 1 TURN ON & OFF to enter the TURN ON & OFF screen, and select 'TURN UPS BYPASS' to transfer the UPS to bypass. Check whether the LCD display panel displays the warning normally.
2. Select Main Menu -> 2 CONFIGURATION -> 3 OPERATION MODE to enter the OPERATION MODE screen (see Figure 3-11), and select 'GREEN MODE ON' or 'GREEN MODE AUTO' to control the UPS operation mode. Check whether the LCD display panel displays the mode normally.
3. Select Main Menu -> 3 CONTROL -> 3 BATT TEST to enter the BATT TEST screen, and select '1 START' to start manual battery test. Check whether the UPS can operate normally in Battery mode. If not, stop and contact your local Emerson representative or Emerson Channel Support.

Chapter 11 Specifications

Table 11-1 UPS specifications

| Parameters | Product model | | |
|---|--|--|--|
| | GXT4-5000RT230 GXT4-5000RT230E 4000W/5000VA | GXT4-6000RT230 GXT4-6000RT230E 4800W/6000VA | GXT4-10000RT230 GXT4-10000RT230E 9000W/10000VA |
| Dimensions, Rack Mount, W x D x H | | | |
| Unit, mm (in) | 430 x 574 x 217 (16.9 x 22.4 x 8.5) | | 430 x 581 x 261 (16.9 x 22.9 x 10.3) |
| Shipping, mm (in) | 516 x 745 x 530 (20.3 x 29.3 x 20.9) | | 530 x 745 x 563 (20.9 x 29.3 x 22.2) |
| Weight, kg (lb) | | | |
| Unit, kg (lb) | 60 (132.2) | | 70 (154.3) |
| Shipping, kg (lb) | | | |
| Input AC Parameters | | | |
| Nominal Operating Frequency | 50Hz or 60Hz (Factory Default is 50Hz) | | |
| Factory Default VAC | 230Vac | | |
| User Configurable VAC | 220/230/240Vac (May be modified using included configuration program) | | |
| Operating Voltage Range Without Battery Operation | 176Vac ~ 280Vac | | |
| Input Frequency w/o Battery Operation | 40Hz ~ 70Hz | | |
| Maximum Allowable VAC | 280Vac | | |
| Input Power Connection | PD2-CE6HDWRMBS Standard (See 3.2 Removable Power Distribution Box) | PD2-CE10HDWRMBS Standard (See 3.3 Removable Power Distribution Box) | |
| Output AC Parameters | | | |
| Factory Default VAC | 230Vac | | |
| AC-AC Efficiency | 92% AC-AC | | |
| Output Connections | PD2-CE6HDWRMBS Standard (See 3.2 Removable Power Distribution Box) | PD2-CE10HDWRMBS Standard (See 3.2 Removable Power Distribution Box) | |
| Frequency | 50Hz 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 | | |
| Internal Battery Charger | | | |
| Charger Current | 1.3 | 2.6 | |
| Battery Parameters | | | |
| Type | Valve-regulated, non-spillable, lead acid | | |
| Quantity x V | 20 x 12V | | |
| Battery Mfr. / Part # | 5AH battery, CSB HR1221W or YUASA NPH5-12 | 9AH battery, CSB HR1234W or Panasonic UP-RW 1245 | |
| Backup Time | See Table 11-5 | | |
| Recharge Time (Internal Batteries) | 3 hr. to 90% capacity after full discharge into 100% load | | |
| Bypass Protection Limits | | | |
| 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 | | |
| Environmental | | | |
| Operating Temp, °C (°F) | 0 to 40 (32 to 104)see Table 11-2 | | |
| Storage Temp, °C (°F) | -15 to 50 (5 to 122) | | |
| Relative Humidity | 0% to 95%, non-condensing | | |
| Operating Elevation | Up to 1000m (3281 ft) at 25°C (77°F) without derating | | |
| Audible Noise less than <55 dBA, at 1 meter from the rear <50 dBA, at 1 meter from the front or sides | | | |

| Parameters | Product model | | |
|---------------------------|---|---|--|
| | GXT4-5000RT230 GXT4-5000RT230E 4000W/5000VA | GXT4-6000RT230 GXT4-6000RT230E 4800W/6000VA | GXT4-10000RT230 GXT4-10000RT230E 9000W/10000VA |
| Agency | | | |
| Safety | IEC62040-1:2008 version, GS mark | | |
| EMI/EMC/C-Tick EMC | IEC/EN/AS 62040-2 2nd Ed (Cat 2 – Table 6) | | |
| ESD | IEC/EN EN61000-4-2, Level 4, Criteria A | | |
| Radiated Susceptibility | IEC/EN EN61000-4-3, Level 3, Criteria A | | |
| Electrical Fast Transient | IEC/EN EN61000-4-4, Level 4, Criteria A | | |
| Surge Immunity | IEC/EN EN61000-4-5, Level 3, Criteria A | | |
| Transportation | ISTA Procedure 1A&E | | |

Table 11-2 Operating temperature parameters

| Ambient Temperature, °C (°F) | pf @30°C ± 3°C (pf @ 86°F ± 5.4°F) | pf @40°C ± 3°C (pf @ 104°F ± 5.4°F) |
|---|------------------------------------|-------------------------------------|
| GXT4-5000/6000RT230 GXT4-5000/6000RT230E | 0.8pf | 0.8pf |
| GXT3-10000RT230 GXT3-10000RT230E | 0.9pf | 0.8pf |

Table 11-3 Power distribution specifications

| Model Number | PD2-CE6HDWRMBS | PD2-CE10HDWRMBS |
|--|--|---|
| Amp Rating | 32 Amps | 63 Amps |
| Input Power Connection | Single-phase (L-N-G) hard-wired, 6mm ² ~ 10mm ² (8 ~ 10AWG) | |
| Output Power Connection | Single-phase (L-N-G) hard-wired, 6mm ² ~ 10mm ² (8 ~ 10AWG) | |
| Includes: | Two IEC320 C19 16A/250V Sockets Six C13 10A/250V Sockets Manual Bypass Switch with Indicator Lamps | Four IEC320 C19 16A/250V Sockets, Four C13 10A/250V Sockets Manual Bypass Switch with Indicator Lamps |
| Input Branch Circuit Breaker, Supplied by User | 32A | 63A |

Table 11-4 External battery cabinet specifications

| Parameter | Model Number | |
|--|---|--|
| | GXT4-240VBATT | GXT4-240VBATTE |
| Used UPS model | GXT4-5000RT230 GXT4-6000RT230 GXT4-10000RT230 | GXT4-5000RT230E GXT4-6000RT230E GXT4-10000RT230E |
| Dimensions, Rack Mount, W x D x H, mm (in) | | |
| Unit | 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) | |
| Weight, kg (lb) | | |
| Unit | 65 (143.3) | |
| Shipping | 79.8 (175.6) | 76 (167.6) |
| Battery Parameters | | |
| Type | Valve-regulated, non-spillable, lead acid | |
| Quantity x V x Rating | 20 x 12V x 9.0 AH | |
| Battery Mfr / Part # | CSB/HR12460 | |
| Backup Time | See Table 11-5 | |
| Environmental | | |
| Operating Temp, °C (°F) | 0 to 40 (32 to 104);see Table 11-2 | |
| Storage Temp, °C (°F) | -15 to 50 (5 to 122) | |
| Relative Humidity | 0% to 95%, non-condensing | |
| Operating Elevation | Up to 1000m (3280.83 ft.) at 25°C (77°F) | |
| Agency | | |
| Safety | IEC62040-1:2008 version | |
| Transportation | ISTA Procedure 1E | |

Table 11-5 Battery run time

| Number of batteries | Load | 230VAC RT Models | | |
|--|------|------------------|--------|---------|
| | | 5000VA | 6000VA | 10000VA |
| Internal battery | 10% | 96 | 91 | 104 |
| | 20% | 59 | 50 | 48 |
| | 30% | 45 | 35 | 26 |
| | 40% | 31 | 23 | 18 |
| | 50% | 25 | 18 | 13 |
| | 60% | 19 | 14 | 10 |
| | 70% | 14 | 11 | 7 |
| | 80% | 13 | 9 | 6 |
| | 90% | 11 | 8 | 4 |
| Internal battery + 1 external battery cabinet | 100% | 9 | 7 | 4 |
| | 10% | 337 | 309 | 268 |
| | 20% | 171 | 133 | 112 |
| | 30% | 121 | 93 | 64 |
| | 40% | 86 | 67 | 48 |
| | 50% | 70 | 48 | 35 |
| | 60% | 52 | 38 | 27 |
| | 70% | 40 | 30 | 21 |
| | 80% | 35 | 25 | 17 |
| Internal battery + 2 external battery cabinets | 90% | 30 | 22 | 14 |
| | 100% | 25 | 19 | 13 |
| | 10% | 617 | 563 | 423 |
| | 20% | 337 | 276 | 207 |
| | 30% | 248 | 178 | 110 |
| | 40% | 164 | 120 | 77 |
| | 50% | 128 | 93 | 57 |
| | 60% | 99 | 73 | 49 |
| | 70% | 75 | 62 | 40 |
| Internal battery + 3 external battery cabinets | 80% | 68 | 53 | 29 |
| | 90% | 63 | 46 | 25 |
| | 100% | 53 | 39 | 23 |
| | 10% | 842 | 751 | 576 |
| | 20% | 509 | 364 | 278 |
| | 30% | 344 | 294 | 167 |
| | 40% | 274 | 201 | 112 |
| | 50% | 216 | 146 | 83 |
| | 60% | 155 | 113 | 66 |
| Internal battery + 4 external battery cabinets | 70% | 120 | 93 | 55 |
| | 80% | 102 | 77 | 47 |
| | 90% | 93 | 67 | 39 |
| | 100% | 77 | 62 | 35 |
| | 10% | 1208 | 1099 | 668 |
| | 20% | 656 | 540 | 335 |
| | 30% | 486 | 354 | 232 |
| | 40% | 336 | 279 | 151 |
| | 50% | 291 | 221 | 113 |
| Internal battery + 4 external battery cabinets | 60% | 236 | 159 | 87 |
| | 70% | 173 | 132 | 73 |
| | 80% | 147 | 106 | 58 |
| | 90% | 132 | 94 | 52 |
| | 100% | 107 | 85 | 48 |

| Number of batteries | Load | 230VAC RT Models | | |
|---|------|------------------|--------|---------|
| | | 5000VA | 6000VA | 10000VA |
| Internal battery + 5 external battery cabinets | 10% | 1427 | 1340 | 905 |
| | 20% | 772 | 649 | 452 |
| | 30% | 605 | 497 | 275 |
| | 40% | 454 | 326 | 207 |
| | 50% | 336 | 278 | 140 |
| | 60% | 290 | 228 | 113 |
| | 70% | 239 | 178 | 89 |
| | 80% | 208 | 142 | 75 |
| | 90% | 179 | 127 | 61 |
| | 100% | 142 | 111 | 57 |
| Internal battery + 6 external battery cabinets | 10% | 1574 | 1500 | 1091 |
| | 20% | 1021 | 722 | 535 |
| | 30% | 685 | 593 | 305 |
| | 40% | 556 | 414 | 247 |
| | 50% | 443 | 317 | 188 |
| | 60% | 327 | 274 | 137 |
| | 70% | 283 | 232 | 113 |
| | 80% | 257 | 189 | 88 |
| | 90% | 233 | 158 | 77 |
| | 100% | 189 | 140 | 69 |

Using the configuration program, the user may specify the number of external battery cabinets attached to the UPS. The factory default is programmed for internal batteries only.

Table 11-5 shows the estimated run times at different loads.

Auto-Learning Battery Run Times

As batteries age, the estimated runtimes 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 Table 11-5 will be restored. This will override any value that is Auto-Learned.

Chapter 12 Product Warranty Registration

To register for warranty protection, visit the Quick Links section of the Liebert Web site at:

<http://www.liebert.com>

Click on Product Warranty Registration and fill in the form.

If you have any questions, contact Emerson Channel Support at:

North America: 800-222-5877

Outside North America: 00-800-1155-4499

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