Vertiv™ Liebert® GXT5
3-10kVA 208V Rack-Tower
GUIDE SPECIFICATIONS

1.0 GENERAL

1.1 Summary

This specification shall define the electrical and mechanical characteristics and requirements for a continuous-duty, single-phase, solid-state uninterruptible power system (UPS). The UPS shall provide high-quality AC power for sensitive electronic equipment loads. The UPS is not designed to support large inductive or half-wave rectified loads, for example: motors, compressors, vacuum pumps, electric drills, laser printers, and hair dryers.

1.2 Standards

The UPS shall be designed in accordance with applicable sections of the current revision of the following documents. Where a conflict arises between these documents and statements made herein, the statements in this specification shall govern.

Safety
UL 1778 4th Edition and CSA 22.2 No. 107.1

Emission (Low limits - Conducted and radiated)
FCC Part 15 (Class A)
CISPR22 Class A (RFI)

Surges
ANSI C62.41 Category B

Transportation and Shipping
3kVA and below UPS: ISTA 1A (individually packaged units)
5kVA and above UPS: ISTA 1E (palletized units)

Additional Agency Compliance
NOM (Liebert affiliate in Mexico will pursue the certification)
WEEE and ROHS2 (6 by 6)
REACH

1.3 System Description

1.3.1 Modes of Operation

The UPS shall be designed to operate as a true on-line double-conversion system in the following modes:

1. Normal- In normal operation incoming AC power shall be fed to the input power factor corrected (PFC) rectifier that converts the AC power to DC power for the inverter. In this mode, power shall also be derived from utility power for the battery charger. The inverter shall derive DC power from the PFC rectifier to regenerate filtered and regulated AC sinewave power for the connected load. The unit shall begin charging the battery once the UPS is connected to utility power, regardless of whether the UPS is ON or OFF. In the event of a utility outage or severe abnormality (sag or swell), the inverter shall support the connected load from battery power until the battery is discharged or the utility power returns, whichever occurs first.

2. Battery- Upon failure of utility / mains AC power, the critical AC load shall be supplied by the inverter, which obtains power from the battery. There shall be no interruption in power to the critical load upon failure or restoration of the utility / mains AC source.

3. Recharge- Upon restoration of utility / mains AC power, after a utility / mains AC power outage, the input converter shall automatically restart and resume supplying power to the inverter and the battery charger begins to recharge the battery.

4. Automatic Restart- Upon restoration of utility / mains AC power, after a utility / mains AC power outage and complete battery discharge, the UPS shall automatically restart and resume supplying power to the critical load and the battery charger automatically recharges the battery. This feature shall be capable of being disabled by the user.

5. Bypass- The integral bypass shall perform an automatic transfer of the critical AC load from the inverter to the bypass source, in the event of an overload, PFC failure, internal over temperature, DC bus overvoltage or inverter failure conditions.

6. ECO- The UPS shall allow the user to enable and place the UPS in ECO mode of operation to reduce electrical consumption. The ECO mode operation shall be an Active type, whereas the UPS will power the connected equipment through the bypass path and the UPS inverter shall be on and operating at no load in order to stay synchronized to the bypass to ensure rapid transfers to inverter power when input power falls outside of the user customizable parameters. The UPS shall also have a user customizable requalification time that input power must remain within the ECO mode parameters before transferring back to ECO operation. This is to minimize the number of transfers between bypass and inverter.

1.1.1 Design Requirements

A. Voltage

Input/output voltage specifications of the UPS shall be:

- Input: 0 - 288VAC, 50/60Hz, single-phase, 2-wire-plus-ground.
- Output: 208VAC (user configurable: 200V, 220V, 230V, 240V) ±3%, 50/60Hz, single-phase, 2-wire-plus-ground.

B. **Output Load Capacity**

The specified output load capacity of the UPS at 208VAC Input shall be:

Model Number	VA	W	Output PF
GXT5-3KL620RT2UXL	3,000	3,000	1.0
GXT5-3KL630RT2UXL	3,000	3,000	1.0
GXT5-5000HVRT5UXLN	5,000	5,000	1.0
GXT5-6KL630RT5UXLN	4,900	4,600	0.94
GXT5-8000HVRT5UXLN	8,000	8,000	1.0
GXT5-10KHVRT5UXLN	10,000	10,000	1.0

C. **Internal Battery**

The UPS shall utilize valve-regulated, non-spillable, lead acid cells.

D. **Reserve Time**

- GXT5-3KL620RT2UXL: 3.0 minutes
- GXT5-3KL630RT2UXL: 3.0 minutes
- GXT5-5000HVRT5UXLN: 4.5 minutes
- GXT5-6KL630RT5UXLN: 5.5 minutes
- GXT5-8000HVRT5UXLN: 3.5 minutes
- GXT5-10KHVRT5UXLN: 2.0 minutes

These times shall be at full load with ambient temperature of 77°F (25°C) with resistive loading.

E. **Battery Recharge**

The UPS shall contain a three-stage battery charger designed to prolong battery life. Recharge time for UPS internal batteries after a full discharge to 90% capacity shall be a maximum of 3 hours.

1.3.2 Performance Requirements

1. AC Input to UPS

a. Voltage: The point at which the UPS transfers to battery operation shall be dependent on the amount of load that the UPS is supporting. The UPS shall operate from the following voltage ranges without drawing power from the batteries:

- Low Line Voltage Range
- From 0 to 50% load the low line voltage shall be constant.
- From 51-100% load the low line voltage shall increase at a linear rate.
- For loads over 100%, the low line voltage remains constant.

Load		Low Line Voltage
100% to 51%	L-N Transfer	60 - 90 ± 3.1VAC
	L-N Comeback	68 - 98 ± 3.1VAC
50% to 0%	L-N Transfer	60 ± 3.1VAC
	L-N Comeback	68 ± 3.1VAC

- High Line Voltage Range

High Line Voltage	120/208V Models
High Line Transfer	149.5 ± 3.1VAC
High Line Comeback	142.5 ± 3.1VAC

b. Frequency: The UPS shall auto-sense input frequency when first powered up and shall operate within the following frequency specifications. UPS shall be capable of cold start with default frequency of 60Hz. Once started the frequency operating window shall be 40-70Hz. Three frequency settings shall be available in the Vertiv™ Liebert® GXT5 Configuration program: Auto frequency sensing (factory default setting), 50Hz frequency conversion and 60Hz frequency conversion.

c. Input Power Factor: >0.99 lagging at rated load.

d. Input Current Harmonic Distortion: THD shall be less than or equal to 3% at linear, full load operation. THD shall be less than or equal to 5% at nonlinear, full load operation.

e. Input Current Ratings: The maximum input current for each unit shall be as shown below:

Model Number	Input	VA	Watt	Hz	VAC	Max Amps
GXT5-3KL620RT2UXL	L6-20P	3000	2700	50/60	208	16
GXT5-3KL630RT2UXL	L6-30P	3000	3000	50/60	208	18
GXT5-5000HVRT5UXLN	Hard-Wired L-L-G	5000	5000	50/60	200 - 240	29
GXT5-6KL630RT5UXLN	L6-30P	4900	4600	50/60	200 - 240	24
GXT5-8000HVRT5UXLN	Hard-Wired L-L-G	8000	8000	50/60	200 - 240	46
GXT5-10KHVRT5UXLN	Hard-Wired L-L-G	10,000	10,000	50/60	200 - 240	51

f. **Inrush Current (Initial startup, no load):** The UPS shall have a maximum inrush current of 6 times the full load peak input current.

g. **Surge Immunity:** UPS shall conform to ANSI C62.41, Category B Surge Protection Standard.

h. **Surge Protection:** MOV (Metal oxide varistors) ratings shall be 190V, 80 Joules minimum connected L1-L2, L1-G and L2-G.

2. AC Output, UPS Inverter

a. **Voltage Configuration:** 208VAC default, 50/60Hz, single-phase, 2-wire-plus-ground (L-L-G), configuration program selectable (200V, 208V, 220V, 230V, 240V).

b. **Voltage Regulation:** ± 1% steady state.

c. **Frequency Regulation:** ±3.5Hz synchronized to bypass. ±0.1Hz free running or on-battery operation.

d. **Frequency Slew Rate:** 1.0Hz per second maximum

e. **Voltage Distortion:** <2% total harmonic distortion (THD) typical into a 100% linear load, <5% THD typical into a 100% non-linear load. For parallel units, <3% total harmonic distortion (THD) typical into a 100% linear load, <6% THD typical into a 100% non-linear load.

f. **Load Power Factor Range:** The load power factor range shall be 0.65 lagging to 1.0 (unity) leading without power derating.

g. **Output Power Rating:** Output power rating shall be as shown below:

Model Number	VA	W
GXT5-3KL620RT2UXL	3,000	2,700
GXT5-3KL630RT2UXL	3,000	3,000
GXT5-5000HVRT5UXLN	5,000	5,000
GXT5-6KL630RT5UXLN	4,900	4,600
GXT5-8000HVRT5UXLN	8,000	8,000
GXT5-10KHVRT5UXLN	10,000	10,000

h. Inverter Overload Capability

- 3kVA Models:

Overload Percent	Duration Inverter shall support rated load
105% to 125%	15 seconds
125% to 150%	10 seconds
150% to 200%	2 seconds
>150%	Minimum of 250ms

- 5-10kVA Models:

Overload Percent	Duration Inverter shall support rated load
105% to 125%	5 minutes
125% to 150%	60 seconds
>150%	Minimum of 200ms

i. Voltage Transient Response: The transient response of the output voltage with resistor step loading will be +/-5% for input supply from off to on and for a load from 0% to 100% and 100% to 0%. Transient response in the output voltage with resistor step loading will be +/-4% for input supply from off to on and for a load from 20% to 100% and 100% to 20%.

j. **Transient Recovery Time:** To nominal voltage within 60ms.

k. **AC-AC Efficiency:** The UPS shall be EPA Energy Star Qualified.

Model Number	AC-AC Efficiency (at full rated linear load)
GXT5-3KL620RT2UXL	92.6%
GXT5-3KL630RT2UXL	93.5%
GXT5-5000HVRT5UXLN	94.6%
GXT5-6KL630RT5UXLN	94.4%
GXT5-8000HVRT5UXLN	93.7%
GXT5-10KHVRT5UXLN	93.1%

1.4 Environmental Conditions

1. Ambient Temperature

- **Operating**: The ambient temperature range, when UPS is operational, shall be from 32°F to 104°F (0°C to 40°C). There shall not be any degradation in the performance when operating in this range. Automatic derating shall occur for operation in higher ambient temperatures.

- **Storage:** 5°F to 104°F (-15°C to 40°C)

2. Relative Humidity

- Operating: 0 to 95% non-condensing.

- Storage: 0 to 95% non-condensing.

3. Altitude

10,000 ft. (3,000m) max., without power derating when operated within the temperature specified in Section 1.4, Item A. Ambient temperature shall be derated 9°F (5°C) for each additional 1600 ft. (500m) above 10,000 ft. (3,000m).

4. Audible Noise

- **3kVA Models:** The audible noise of the UPS shall be less than 48dBA max when measured at 1 meter from front, sides, or rear.

- **5-10kVA Models:** The audible noise of the UPS shall be less than 55dBA max when measured at 1 meter from front, sides, or rear.

1.5 User Documentation

The specified UPS system shall be supplied with Safety Instruction & Warning Sheet, WEEE recycling sheet (ISO 14001 compliance), printed copy of quick start guide, printed copy of factory test report. The user manual shall be downloaded from the web and includes installation instructions, a functional description of the equipment with block diagrams, safety precautions, illustrations, step-by-step operating procedures and general maintenance guidelines.

1.6 Warranty

The UPS manufacturer shall warrant the UPS against defects in materials and workmanship for three (3) years. The no-hassle replacement warranty shall include shipping costs to the customer site for the new replacement unit and shipping costs from the customer site for the return of the failed unit. Optional two (2) year full coverage extension warranties shall be available from the manufacturer. The manufacturer's standard and extended warranties shall cover all parts, including the battery.

1.7 Quality Assurance

1.7.1 Manufacturer Qualifications

More than 40 years' experience in the design, manufacture, and testing of solid-state UPS systems shall be required. The manufacturer shall be certified to ISO 9001:2008.

1.7.2 Factory Testing

Before shipment, the manufacturer shall fully and completely test the system to ensure compliance with the specification.

2.0 PRODUCT

2.1 Fabrication

All materials and components making up the UPS shall be new, of current manufacture and shall not have been in prior service except as required during factory testing. All relays shall be provided with dust covers.

2.1.1 Wiring

Wiring practices, materials and coding shall be in accordance with the requirements the standards listed in Section 1.2 and other applicable codes and standards. All wiring shall be copper.

2.1.2 Cabinet

The UPS unit shall be composed of: input PFC converter, IGBT inverter, battery charger, input filter and internal bypass circuit; and batteries consisting of the appropriate number of sealed battery cells; and shall be housed in a rack-tower NEMA type 1 enclosure and shall meet the requirements of IP20. The UPS cabinet shall be cleaned, primed and painted RAL 7021 Black. Unit dimensions and weights shall be (rack mount orientation):

Model Number	Dimensions W x D x H, in. (mm)	Weight lb. (kg)
GXT5-3KL620RT2UXL	16.9 x 21.3 x 3.4 (430 x 540 x 85)	65.1 (29.6)
GXT5-3KL630RT2UXL	16.9 x 21.3 x 3.4 (430 x 540 x 85)	65.1 (29.6)
GXT5-5000HVRT5UXLN	16.9 x 24.8 x 8.5 (430 x 630 x 217)	156.7 (71.1)
GXT5-6KL630RT5UXLN	16.9 x 23.6 x 8.5 (430 x 600 x 217)	149.1 (68.0)
GXT5-8000HVRT5UXLN	16.9 x 24.8 x 8.5 (430 x 630 x 217)	164.2 (74.5)
GXT5-10KHVRT5UXLN	16.9 x 24.8 x 8.5 (430 x 630 x 217)	166.4 (75.5)

2.1.3 Cooling

The UPS shall be forced-air cooled by an internally mounted, continuously operating fan. Fan speed shall be controlled by the UPS from 50% to 100%. Air intake shall be through the front of the unit and exhausted out the rear of the unit.

2.2 Components

2.2.1 Input Converter

1. General

Incoming AC power shall be converted to a regulated DC output by the input converter supplying DC power to the inverter. The input converter shall provide input power factor correction (PFC) and input current distortion reduction.

2. AC Input Current Limit

The input converter shall be provided with AC input current limiting whereby the maximum input current is limited to 125% of the full load input current rating.

3. Input Protection

The UPS shall have built-in protection against under voltage, over current and overvoltage conditions including low-energy lightning surges, introduced on the primary AC source. The UPS shall be able to sustain input surges without damage per criteria listed in ANSI C62.41, Category B.

4. Battery Recharge

The UPS shall contain a three-stage battery charger designed to prolong battery life. Recharge time for the internal UPS batteries shall be 3 hours maximum to 90% capacity (full-load discharge rate). There shall be DC overvoltage protection so that if the DC voltage exceeds the pre-set limit, the UPS will shut down automatically and the critical load will be transferred to bypass.

2.2.2 Inverter

5. General

The UPS inverter shall be a pulse-width-modulated (PWM) design capable of providing the specified AC output. The inverter shall convert DC power from the input converter output or the battery into precise sinewave AC power for supporting the critical AC load.

6. Overload

The inverter shall be capable of supplying current and voltage for overloads exceeding 100% and up to 200% of full load current. A visual indicator and audible alarm shall indicate overload operation. For greater currents or longer time duration, the inverter shall have electronic current-limiting protection to prevent damage to components. The inverter shall be self-protecting against any magnitude of connected output overload. Inverter control logic shall sense and disconnect the inverter from the critical AC load without the requirement to clear protective devices.

7. Inverter DC Protection

The inverter shall be protected by the following DC shutdown levels:

- DC Overvoltage Shutdown
- DC Under voltage Shutdown (End of Discharge)
- DC Under voltage Warning (Low Battery Reserve); factory default set at 2 minutes (user configurable 2 to 30 minutes).

8. Output Frequency

An oscillator shall control the output frequency of the UPS. The inverter shall maintain the output frequency to ±0.1Hz of nominal frequency during Battery mode, Frequency Converter mode or when otherwise not synchronized to the utility/mains source.

9. Output Protection

The UPS inverter shall employ electronic current limiting circuitry.

10. Battery Over Discharge Protection

To prevent battery damage from over discharging, the UPS control logic shall automatically raise the shutdown voltage set point; depending on output load and connected battery system at the onset of battery operation.

2.2.3 Display and Controls

1. General

The UPS shall be provided with a microprocessor-based unit status display and controls section designed for convenient and reliable user operation. The monitoring functions such as voltages, currents, UPS status and alarm indicators shall be displayed on a full color graphical LCD display.

2. System

- UPS display shall also include LED based system indicators. The system level indicators shall be: run indicator, and alarm indicator:

Indicator	LED Color	LED State	Indication
Run Indicator	Green	On	UPS has output
		Blinking	Inverter is starting
		Off	UPS has no output
Alarm Indicator	Yellow	On	Alarm occurs
	Red	On	Fault occurs
	N/A	Off	No alarm, no fault

3. Controls

UPS startup and shutdown operations shall be accomplished by using power button on the front panel of the UPS. The display shall be menu driven navigation and use four control buttons for ease of navigation and selection of the configurable parameters.

4. Control Buttons

The UPS display control button functionality shall be as follows:

- ESC button: This button shall return to the previous menu or abort any change before confirming the change
- Up/Left arrow button: This button shall move the cursor up or left, or increase the value displayed when changing parameters. This button shall also be used to scroll up for navigating the screens
- Down/Right arrow button: This button shall move the cursor down or right, or decrease the value displayed when changing parameters. This button shall also be used to scroll down for navigating the screens
- Enter button: This button shall enter the next level menu or confirm the parameter changes

5. Display Menu Structure

The UPS display shall have the following menu structure with the following status and configuration screens

A. UPS Flow Screen (Default screen)

The UPS flow screen shall be the default screen after system start-up. It shall display an overview screen showing status information, the active (green) power path, and non-working power path (gray).

Details in this default screen include operating mode, the input voltage and frequency; output voltage and frequency; battery capacity and estimated battery time remaining; loading percentage. To prolong display life, the UPS LCD display will dim and display a screen saver after two minutes of no user interaction if there is no active alarm. Pressing the ENTER shall wake up the display and this action shall not perform any operation. If an alarm or fault occurs the display shall also wake up the display.

B. Main Menu

The main menu shall list 6 submenu selections, from left to right, then top to bottom:

- Status
- Settings
- Control
- Log
- About
- Maintenance

C. Status

The UPS status screens shall provide the following information:

- Input
- L-N voltage (V)
- L-N current (A)
- Frequency (Hz)
- Power Factor
- Energy (kWh)
- Input black count (count of input voltage lost)
- Input brown count (count of PFC overload to battery)
- Bypass
- L-N voltage (V)
- Frequency (Hz)
- Battery
- Battery status
- Battery voltage (V)
- Battery current (A)
- Backup time (min)
- Remaining capacity (%)
- Discharge count (number of discharges for the battery module)
- Total discharge time (min)
- Batt running time (day)
- Battery replacement time (date of last replacement)
- External battery cabinet group No.
- Battery average temp (°C)
- Battery highest temp (°C)
- Battery lowest temp (°C)
- Output
- L-N voltage (V)
- L-N current (A)
- Frequency (Hz)
- Energy (kWh)
- Load
- Sout (apparent output power, kVA)
- Pout (active output power, kVA)
- Power Factor
- Load Percent (%)
- Time Since Startup
- Days / Hours / Minutes

D. Settings

- The UPS Configuration screens shall provide the following customizable parameters: (default values are listed first)
- Output
- Voltage selection
- Startup on Bypass (Enable/Disable)
- Frequency Selection (Auto bypass Enable/Auto bypass disable/50Hz no bypass/60Hz no bypass)
- Bypass voltage upper limit
- Bypass voltage lower limit
- Run mode (normal mode, or ECO mode)
- ECO voltage range
- ECO frequency range
- ECO requalification time
- Battery
- External Battery AH
- External battery cabinet group No. (0-10)
- Low Battery time
- Battery replaced time
- Battery periodic test enable
- Batt. Note duration (month)
- Discharge protect time
- Equal charge enable
- Max charge current
- Temperature compensation
- Replace Battery

E. Monitor

- Language
- Date
- Time
- Display Orientation (Auto-rotate, rack, tower)
- Audible Alarm (enable/disable)
- Change settings password

F. System

- Auto restart
- Auto restart delay
- Guaranteed shutdown
- Start with no battery
- Remote control
- Any mode shutdown auto restart enable
- Output contact NO/NC
- Input contact NO/NC
- Dry contact 5 output (Low battery, On bypass, On battery, UPS fault)
- Dry contact 6 output (Low battery, On bypass, On battery, UPS fault)
- Dry contact 1 output (Low battery, On bypass, On battery, UPS fault)
- Dry contact 2 output (Low battery, On bypass, On battery, UPS fault)
- Sleep mode
- IT system compatibility
- Outlet Parameter Options
- Apply same settings across outlets
- Turn on Outlet
- Turn on Delay
- Outlet Settings Based on Discharging Time
- Threshold of turning off the outlet
- Turn on when power returns
- Outlet Settings Based on Backup Time
- Threshold of turning off the outlet
- Turn on when power returns
- Outlet Settings Based on Capacity
- Threshold of turning off the outlet

- Turn on when power returns

G. Control

- The UPS shall have the following controls from the display:
- UPS ON/OFF/Bypass
- Turn UPS ON
- Turn UPS OFF
- Turn ON Bypass (manually transfer to bypass power)
- Audible Alarm
- Turn audible alarm ON (test alarm)
- Turn audible alarm OFF (alarm silence)
- Battery Test
- Start battery self-test
- Clear Faults
- Reset Power Statistics

H. Log

The UPS shall be have an event log to record 255 events and shall be viewable from the display:

- View Log
- Navigate the event log to view the last 255 events.
- Clear Log
- User shall be able to clear the event log
- The event log once full will begin to replace the first event logged to provide a FIFO process for maintaining event history. The event history shall record and display the number of events out of the 255 (xxx/255) as well as the time (days, hours, mins) from when viewing the event and the event that occurred.

I. About

- The UPS shall be have an about screen to display the UPS model number, serial number, time since startup, hardware version, and firmware version

J. Maintenance

- The UPS shall be have the ability to display the network information of the RDU101 SNMP/webcard when installed. Information available shall be MAC address and IP address.

K. Automatic Battery Test

- The UPS shall feature an automatic battery test with the factory default test interval set at every 8 weeks. The battery test shall ensure the capability of the battery to supply power to the inverter while loaded. If the battery fails the test, the UPS shall display a warning message to indicate the internal batteries need replaced. The Automatic Battery test feature shall be capable of being disabled or configured to operate every 8, 12, 16, 20, or 26 weeks through the UPS Configuration Program or from the LCD display.

2.3 Bypass

2.3.1 General

A bypass circuit shall be provided as an integral part of the UPS. The bypass shall have a make-before-break transfer, shall have a maximum detect and transfer time of 4-6 milliseconds and shall be a double-pole device. The bypass circuit shall be designed to ensure the simultaneous transfer of the L1 and L2 poles. The bypass shall be configured to wrap around the PFC converter, battery charger, DC-DC converter, inverter and battery. The bypass circuit shall use the rear-panel mounted UPS input circuit breaker and route bypass power through the UPS input filters and surge suppression circuit. The bypass circuit default position shall be in the Bypass mode (utility).

2.3.2 Automatic Transfers

The transfer control logic shall activate the bypass automatically, transferring the critical AC load to the bypass source, after the transfer logic senses one of the following conditions:

- UPS overload
- UPS over temperature
- PFC failure
- Inverter failure
- DC bus overvoltage

Once the overload condition is reduced, the load shall be automatically transferred back to inverter power. An over temperature requires manual transfer back to inverter power after cooling.

2.4 Internal Battery

Valve-regulated, non-spillable, lead acid cells (VRLA) shall be used as a stored-energy source for the specified UPS system. The internal battery shall be user replaceable and includes a blind-mate style connector located on the rear of the battery kit. The battery shall be housed internal to the UPS cabinet and sized to support the inverter at rated load and power factor, with ambient temperature of 25°C (77°F) for a minimum of 3 minutes reserve time. The expected life of the battery shall be 3-5 years or a minimum 260 complete discharge cycles. The UPS units have the capability to allow the operator to replace the internal battery.

2.5 Optional External Battery Cabinet

All UPS models shall allow connection of up to six external battery cabinets to provide extended run time capabilities. External battery cabinets shall match the UPS in aesthetics and color.

2.6 Output Distribution

Output distribution shall be as shown for the 3kVA Models shown below:

Model Number	Input Connection	Output Connections
GXT5-3KL620RT2UXL	L6-20P, 10ft Input Cord	(2) x L6-15R, (2) x L6-20R
GXT5-3KL630RT2UXL	L6-30P, 10ft Input Cord	(2) x L6-15R, (2) x L6-30R

Power Output Distribution (POD) on 5-10kVA models below shall be factory installed and available to the UPS cabinet, located on the rear of the unit. This POD shall be available with break-before-make maintenance bypass switch to allow for complete shutdown and isolation of the UPS for service without powering down the connected loads. Output distribution configurations shall be as shown below:

Model Number	Utility/Input Connection	Output Connections
GXT5-5000HVRT5UXLN	Hard-wired terminal block (LLG)	Hard-wired terminal block (LLG) (2) x L6-30R (2) x L6-20R Programmable Group
GXT5-6KL630RT5UXLN	L6-30P, 10ft Input Cord	(2) x L6-15R, (2) x L6-30R
GXT5-8000HVRT5UXLN	Hard-wired terminal block (LLG)	Hard-wired terminal block (LLG) (2) x L6-30R (2) x L6-20R Programmable Group
GXT5-10KHVRT5UXLN	Hard-wired terminal block 2-wire-plus-ground (L-L-G)	Hard-wired terminal block (LLG) (2) x L6-30R (2) x L6-20R Programmable Group

2.7 Communication Options

1. Vertiv™ Liebert® IntelliSlot Communication

The UPS shall include one Liebert® IntelliSlot communication port to allow the operator to field-install an optional Liebert® IntelliSlot communication card. A Liebert® IntelliSlot card may be installed during any state of UPS operation (On, Standby or Off states). Available Liebert® IntelliSlot options are described below.

Vertiv™ Liebert® Intellislot RDU101 Communications Card

The optional Liebert® Intellislot RDU101 card shall deliver SNMP and web access to the UPS via 10/100 Mb/s ethernet port. This card shall enable remote or local field upgrades of the SNMP firmware, and managed device firmware and configuration updates. This card shall support environmental monitoring via Liebert SN Sensors.

Liebert® IntelliSlot Relay Interface Card (IS-RELAY)

The optional Liebert® IntelliSlot Relay Interface Card shall provide contact closure for remote monitoring of alarm conditions in the UPS, delivering signals for On Battery, On Bypass, Low Battery, Summary Alarm, UPS Fault and On UPS. The contacts shall be rated for 24VAC or 24VDC at 1A. Connections shall be to a terminal block connector with cable provided by the end user.

2. Terminal Block Connections

The UPS shall contain on the rear panel a terminal block to provide low voltage signals for On Battery, Low Battery, Any Mode Shutdown and Battery Mode Shutdown.

a. Any-mode Shutdown

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

Any-Mode Shutdown can be operated locally and remotely, as described as follows:

- Local Any-mode Shutdown can be entered from the battery mode shutdown device on the back of the unit.
- Remote Any-mode Shutdown can be initiated by a battery mode shutdown button mounted at a remote location.

Remote Power Off shall be performed either by NO or NC contact of Any-mode Shutdown, depending on the settings in the configuration program.
A current-limited source (+12VDC, 50mA) shall be available from the UPS.
The connection to the UPS for remote connection shall be via terminal block connector.
Any-mode Shutdown wiring shall conform to all national, regional and local wiring regulations.

b. Battery Mode Shutdown

- Battery Mode Shutdown shall permit shutting down the UPS by turning Off the rectifier, inverter and bypass so that there is no power to the load when the UPS is on Battery. Battery Mode Shutdown shall be able to be performed locally or remotely.
- Local Any-Mode Shutdown can be entered from the battery mode shutdown device on the back of the unit.
- Remote Any-Mode Shutdown can be initiated by a battery mode shutdown button mounted at a remote location.
- The actuation of the battery mode shutdown shall be logged as an event in the event history log.
- Remote power off shall be performed by a NC/NO contact.
- The remote connection shall be provided via terminal block connector.
- A 12Vdc, 50mA current limited source shall be available from the UPS for relay drive.
- The battery shutdown signal will not cause an immediate shutdown, it will instead start a 2 minute shutdown timer. This timer cannot be stopped once it is triggered. If the utility voltage returns during this count down timer then the UPS will still shutdown and must remain shut down for 10 seconds. The auto-restart setting shall then dictate whether the UPS turns back ON when the power is restored.
- Battery mode Shutdown wiring shall conform to all national, regional and local wiring regulations.

3. USB Port

The USB communications port (Version 2.0) shall meet the HID Power Device standard, version 1.0 or later. All models shall work with the Power Management system in Microsoft Windows XP or later. They shall also support the equivalent functions in Linux, and Mac OSX.

4. Serial Port

A serial port (RS-232) shall be provided on the rear of the UPS, with an RJ-45 connector. This connector shall enable use of the Vertiv UPS Command Line Interface.