

Critical Power from GE

LP33 Series UPS, S2, 15-100kVA

Multi-Mode Power Protection at 208/120 VAC 60Hz



Touching all Areas of the Energy Industry

GE's diverse portfolio of products and services is helping customers solve problems everyday. We touch all areas of the energy industry including energy management, smart grid modernization, coal, oil, gas, nuclear energy, water, wind, solar and biogas.

Providing Reliable Power to your Mission-Critical Business Needs

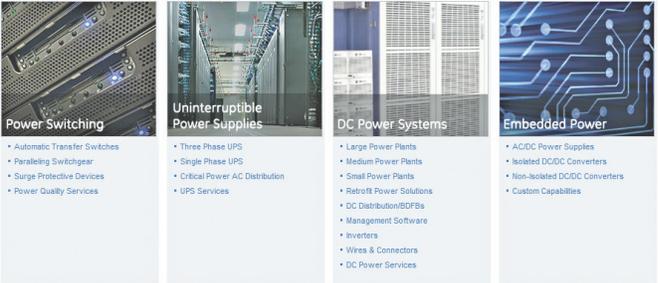
With a comprehensive energy management portfolio, GE is uniquely qualified to provide comprehensive datacenter, commercial and industrial infrastructure solutions from its' Industrial Solutions and Critical Power businesses. Due to the inherent high-efficiencies offered with GE electrical distribution equipment and GE UPS systems, PUE values can be minimized by the integrated use of these solutions. Our critical power products and services can be utilized to deliver reliable datacenter infrastructure support, solid project management and outstanding site service solutions.

Over 15,000 Downloadable Resources for our Customers

GEIndustrial.com/CriticalPower provides customers with access to the latest product and solutions news, downloadable resources and interactive digital tools.

- Access to the entire portfolio of product solutions
 - Brochures
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 - Software
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- Multi-language support in Chinese and Spanish
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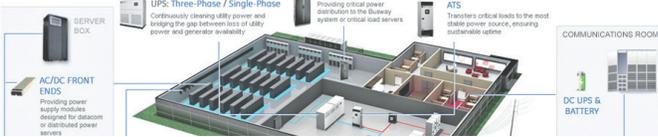
Critical Power
End-to-end Power Solutions for the Building, Box and Board



- Power Switching**
 - Automatic Transfer Switches
 - Paralleling Switchgear
 - Surge Protective Devices
 - Power Quality Services
- Uninterruptible Power Supplies**
 - Three Phase UPS
 - Single Phase UPS
 - Critical Power AC Distribution
 - UPS Services
- DC Power Systems**
 - Large Power Plants
 - Medium Power Plants
 - Small Power Plants
 - Retrofit Power Solutions
 - DC Distribution/EDFBS
 - Management Software
 - Inverters
 - Wires & Connectors
 - DC Power Services
- Embedded Power**
 - AC/DC Power Supplies
 - Isolated DC/DC Converters
 - Non-Isolated DC/DC Converters
 - Custom Capabilities

Application Example: Data Center

Mission critical processes need a power system that is cleaner and more reliable than what a typical utility can provide. GE's Critical Power products achieve power availability of up to 99.999%, the equivalent of just seconds of downtime per year, by providing immediate UPS backup power and power switching solutions, while reducing disturbances on the system.



- SERVER BOX**
- AC/DC FRONT ENDS**: Providing power supply modules designed for datacenter or distributed power servers
- UPS: Three-Phase / Single-Phase**: Continuously cleaning utility power and bridging the gap between loss of utility power and generator availability
- MDU/RDU**: Providing critical power distribution to the Gateway system of critical load servers
- ATS**: Transfers critical loads to the most stable power source, ensuring sustainable uptime
- COMMUNICATIONS ROOM**
- DC UPS & BATTERY**



LP33 UPS Systems - Overview

Introduction

The LP33 Series UPS is a robust, high performance 208/120VAC UPS System suitable for a broad range of mission-critical applications including data centers, data closets, healthcare/medical, telecommunications, transportation, commercial buildings, and industrial critical processes.

Design and Performance

The LP33 Series UPS uses double conversion technology via a true on-line VFI (voltage frequency independent) design. The IGBT Rectifier provides low input current harmonic distortion and a high input power factor to minimize input feeder sizing. The IGBT Inverter with transformerless output ensures low output voltage distortion and fast transient response to high crest factor loads or step loads.

Multi-Mode Efficiency

The LP33 Series UPS can operate up to 98% efficiency when utilized in EcoMode operation. EcoMode continuously monitors the output voltage and frequency, and will instantaneously switch to double conversion mode and inverter usage during voltage and/or frequency disturbances to insure compliance with the ITI (CBEMA) curves for operation on sensitive IT server or other critical loads.

Redundant Parallel Architecture (“RPA”)

Redundant Parallel Architecture can be used on LP33 Series UPS for up to four (4) modules, for redundancy or capacity means. The RPA system design eliminates single points of failure by using redundant controls and an integrated bypass static switch in each UPS module. The RPA system allows for flexibility in output paralleling cabinet design and usage, including load growth scalability/expansion capabilities.

Site Services & Remote Monitoring

GE Critical Power Services offers a wide array of site services, including product startup, preventative maintenance and emergency maintenance. GE's iUPSGuard software allows for remote monitoring of key subsystems within the UPS module and battery, allowing for proactive dispatching and problem resolution when emergency repairs are required.



LP33 UPS Systems - Overview (Cont.)

Features and Benefits

- Transformerless design at 208/120VAC to reduce footprint and weight, yet increase reliability.
- Up to 98% Operating Efficiency obtained via the use of EcoMode operation
- High input power factor and use of a IGBT Rectifier eliminates the use of oversized input feeders, and maximizes standby generator compatibility
- High switching frequency IGBT Inverter provides best-in-class transient response and low output voltage distortion. An output voltage waveform that closely resembles utility power!
- Compact footprint and low audible design, allows for use in most commercial and industrial buildings
- Reliable paralleling of UPS modules via GE's RPA design, which eliminates any and all common mode failure points
- Intelligent Energy Management (IEM) option feature that manages UPS module loading in a parallel configuration, allowing excess UPS module capacity to turn off during light loads
- Wide band of acceptable AC input voltage and frequency, that eliminates nuisance transfers to the battery plant, thus maximizing battery jar life
- Internal battery management & monitoring system (SBM) that enhances battery life and reduces cost of operation. Also eliminates need for costly 3rd party bolt-on battery monitoring systems
- Maintenance Bypass capabilities, via internal switching or external wrap-around cabinetry
- Optional 600VAC or 480VAC input, via matching stepdown transformer cabinetry
- Seismic area capabilities, via seismic restraint hardware and seismic lab testing
- Two Year Parts and Labor Warranty

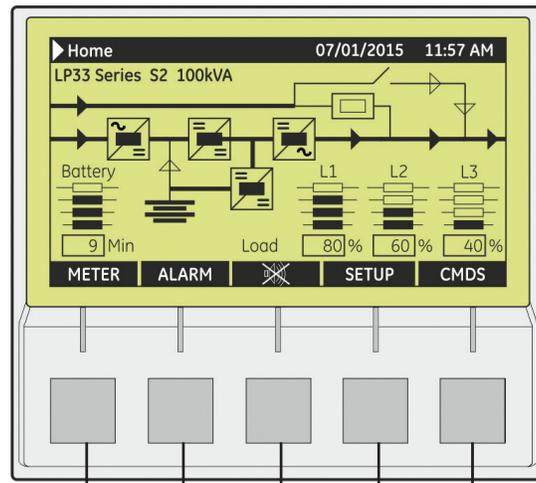
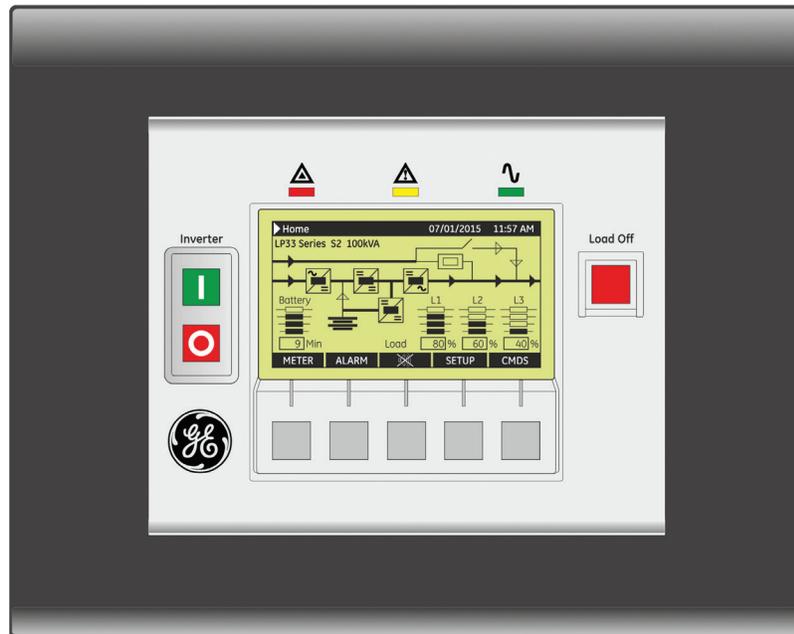
The LP33 Series UPS is perfect for Network IT Rooms such as below.



LP33 UPS System - Display & Control Panel Features

The GE LP33 Series UPS has a well-designed Display & Control Panel that provides the user with many nice features and functionality including:

- Backlit LCD Graphic Display
- Multi-Language Communication Capabilities - 14 total languages
- UPS Status & Control LEDs via block one-line diagram
- Command Keys and Setup Parameter Settings
- AC & DC Metering Information
- History of Events - alarms and messages - up to 255 events

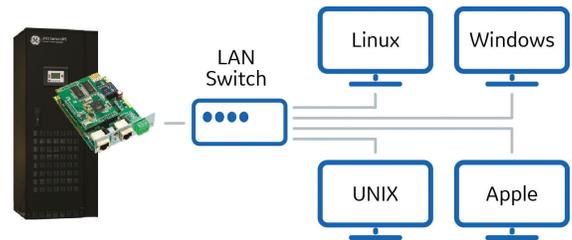


Meter (Meterings)	Alarms	Mute	Setup	CMDS (Commands)
<ul style="list-style-type: none"> • Battery • Booster • Utility (1) • Inverter • Module Load • Counters • Utility(2) 	<ul style="list-style-type: none"> • Alarm (Level 1 - User) • Event NR = 249 • Event NR = 250 • Event NR = 251 • Event NR = 252 • Event NR = 253 • Event NR = 254 <p>Max. 255 Events</p>	<ul style="list-style-type: none"> • Key to reset general alarm and buzzer 	<ul style="list-style-type: none"> • UPS Identification • Setup (Level 1 - User) • Date and Time • Modem (1) • Modem (2) • Display • Eco Mode 	<ul style="list-style-type: none"> • Commands (Lamps Test, Inverters and Boosters) • Commands (Total Off)

LP33 UPS System - Monitoring & Connectivity

UPS Module Status/Alarm Monitoring

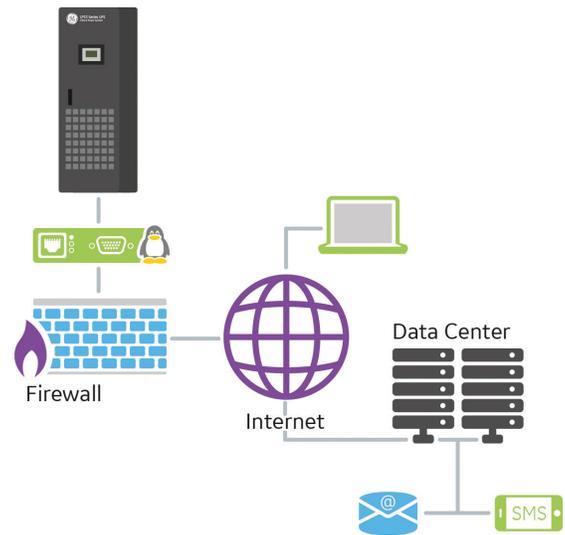
GE Data Protection software can communicate with the UPS over RS-232, USB or SNMP to receive status information and measurement values of the UPS. In case of a critical condition (time on battery, remaining battery autonomy time or low battery) for the load, the software starts a controlled shutdown. An enhanced alarm management system provides the possibility to start applications and send messages and e-mails for every upcoming or disappearing alarm.



iUPSGuard Diagnostic Monitoring

GE's iUPSGuard is a cloud based remote monitoring solution for UPS, providing status monitoring and alarm notification that supports all GE UPS product lines, anytime, anywhere. iUPSGuard notifies personnel of critical alarms and events via email or SMS, allowing a user or GE technician to make timely decisions on critical conditions. With comprehensive data collection and analysis iUPSGuard is not only a remote monitoring & diagnostics (RM&D) system, but the core of the integrated service offering GE Power Diagnostics.

- 24x7 monitoring of UPS status and operating parameters, alarms notification through email and SMS
- Highly secure and efficient data transmission, SSL encrypted with unidirectional communication
- iUPSGuard can communicate through various channels and monitors single UPS or parallel UPS systems through web/SNMP card
- Detailed reporting system of iUPSGuard provides valuable information on equipment operating conditions and trends over period of time
- Predictive algorithm to anticipate issues



Battery Plant Monitoring Via GE SBM System

SBM is a comprehensive and programmable management and monitoring system that protects the UPS battery string life. Batteries are prevented from overcharging and deep discharging.

- During UPS startup, the SBM is programmed with specific battery information.
- Calculates true battery autonomy and remaining battery backup time during utility outage.
- Measures the volts per cell of the battery system and compensates for temperature and load.
- Programmable features allow the user to select the frequency and type of battery tests that are performed. Frequency range can be from once per week to annually. Test type range can be from deep cycle to 3-min discharges.
- All tests logged in the UPS events menu and any failure is reported.
- All tests done automatically with the UPS on-line. Manual tests can be performed at any time.



Redundant Parallel Architecture (RPA)

GE provides RPA, a unique technology that can parallel UPS modules with true redundancy by eliminating any single point of failure. RPA provides a scalable paralleling technique that reduces operating footprint and increases system reliability by eliminating the need for external paralleling equipment and cabinets (centralized bypass and master control).

One of the UPS modules in the system intelligently takes the leadership role, while the other UPS modules have access to all control parameters. If one UPS fails to operate, the load is automatically redistributed among the others. If the lead UPS fails to operate, then another UPS automatically takes on the leadership role. GE's RPA technology is implemented by distributing the control electronics within each UPS module in the system.

RPA System Advantages

No Single Points of Failure

The RPA system provides complete redundancy of all critical components, allows paralleling of up to 6 units for increased load capacity or redundancy.

Scalable and Modular

The system can be easily expanded for higher capacity and redundancy without any interruption to the critical load or transfer to bypass.

Distributed Control Logic

Each module in an RPA system has its own operational controller. Each one continuously communicates with all others in order to manage the entire system like a team.

Redundant Communication

Redundant high speed bus and control electronics provide higher system reliability.

Online Maintenance

N+1 configurations allow maintenance on any single module in the system while other modules provide online protection with battery backup.

Sequential Soft Start

Provides sequential soft start of each module to reduce instantaneous load on input feeders during mains recovery. This helps avoid over-rating of generator and overheating of cable and fuses.

Smaller Footprint

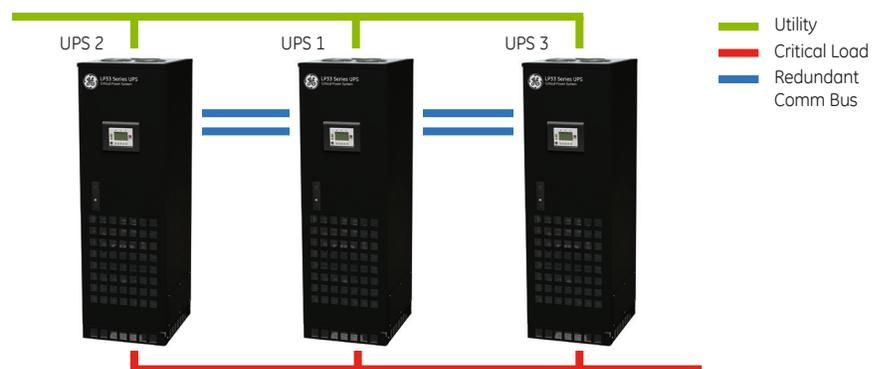
RPA eliminates the centralized control and external static bypass cabinet.

RPA Configuration

Configurable up to 4 units in parallel

- Future expansion
- Safe and reliable power supply
- Redundant Communication Bus
- Easy to install and maintain
- Easy system upgrade/downgrade
- Maintenance operation without load interruption

True Redundancy with Distributed Control & Bypass

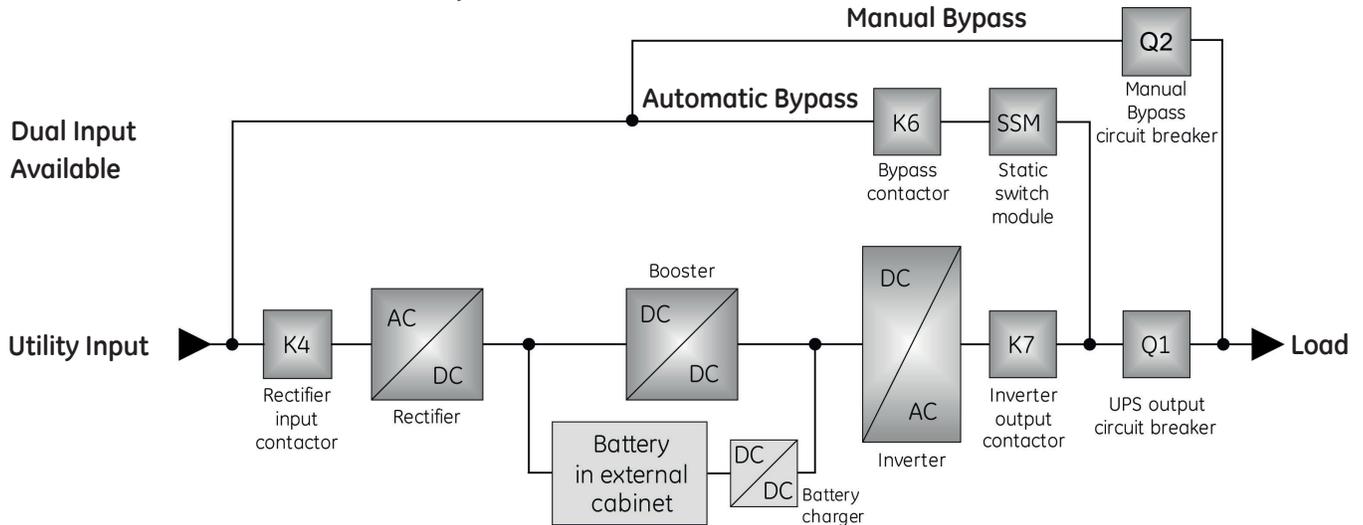


LP33 UPS Module - Technical Data

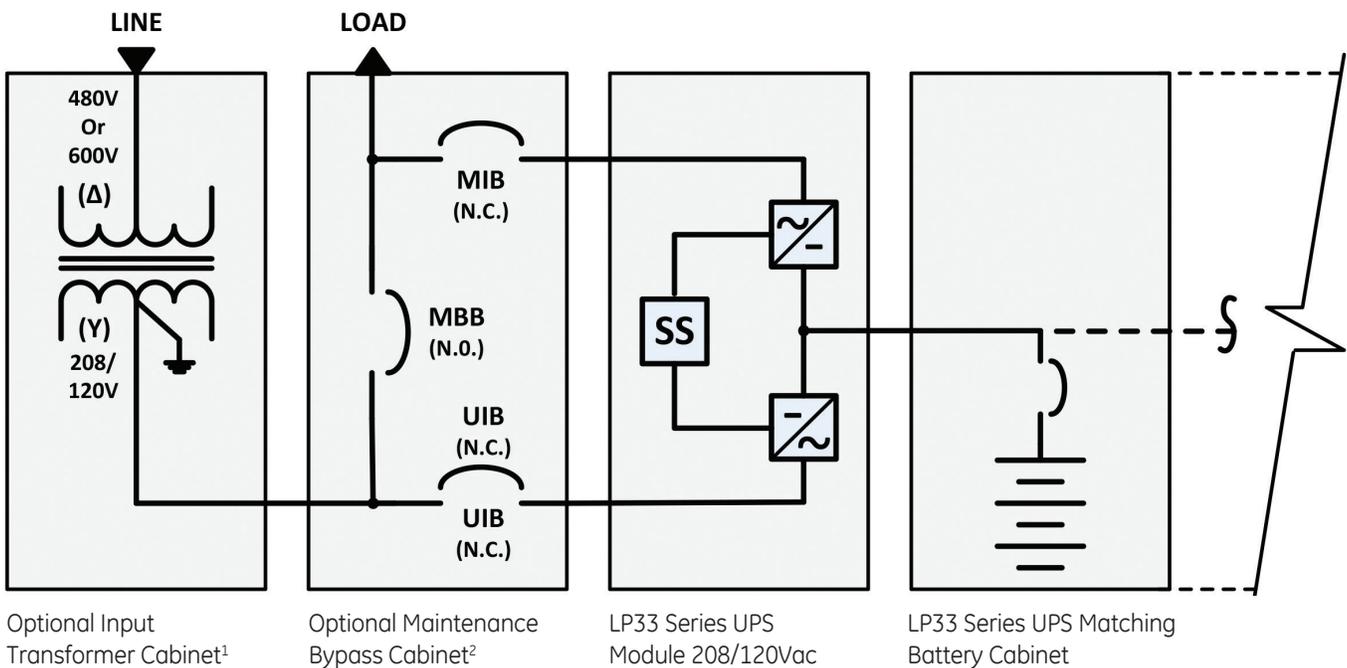
POWER RATINGS	OUTPUT POWER - KVA	15	20	30	50	60	80	100	
		Output Power - kW	13.5	18	27	45	54	72	90
DESIGN	Topology	On-Line Double Conversion w/ EcoMode							
	Rectifier Technology	IGBT Bridge							
	Inverter Technology	IGBT Bridge							
INPUT	Voltage (standard)	208/120VAC 3phase, 4w, plus gnd							
	Voltage (option)	600VAC or 480VAC 3phase, 3w, plus gnd (using matching sidecar)							
	Input Feeds	On 208VAC, single or dual feeds. On 600/480VAC, single feed only							
	Voltage Range	-25%/+20%	-20%/15%		-15%/+10%				
	Frequency	60Hz, +/- 10%							
	Input THD	< 8%	< 10%						
	Input Power Factor	> 0.98 lagging							
OUTPUT	Voltage	208/120VAC 3phase, 4w, plus gnd							
	Frequency	60Hz, +/- 1%							
	Crest Factor	< 3:1							
	Voltage Regulation/Static	+/- 1%							
	Voltage Regulation/100% Step Load	+/- 1%						+/- 2%	
	Voltage Distortion/Linear Load	< 2% THD	< 1.5% THD		< 2% THD				
	Voltage Distortion/Non-Linear Load	< 3% THD							
	Overload Capability/Inverter	125% for 10 minutes / 150% for 1 minute							
BYPASS	Static Bypass Means	100% Rated Static Switch							
	Overload Capability/Bypass	200% for 2 minutes, 2000% for 1/2 cycle							
ENERGY USE	Operating Efficiency	Up to 98% EcoMode ; Up to 90% Dbl Conversion							
BATTERY	Battery Type	Valve Regulated Lead Acid							
	Float Voltage	328VDC @ 68 degr F							
	Min Discharge Voltage	236 VDC (programmable)							
PHYSICAL	Size (w x d x h)	23 x 31 x 52	24 x 30 x 75		29 x 29 x 75		39 x 35 x 75		
	Weight (est - module only) lbs.	430	816	816	1015	1015	1323	1323	
GENERAL	Audible Noise (dba)	55	61	61	65	65	68	68	
	Operating Temp - Module	32-104 degr F (0-40 degr C)							
	Operating Temp - Batteries	77 degr F (25 degr C)							
	Humidity	0-95% non-condensing							
	Control Panel	Backlit LCD Display, Graphic One-Line, 13 Languages							
	Listings/Classifications	UL1778, IEC62040, ISO9001							
	EMI/Surge Protection	FCC Part 15, Class A, IEC62040-2 Class A							
	Connectivity	iUPSGuard, RS232, SNMP, Modbus, programable alarms/relays							
	Std Warranty - UPS Module	24 Months (extended warranties available)							
	Std Warranty - UPS Batteries	24 Months (extended warranties not available)							
	Color	Black							

LP33 UPS System - Diagrams

UPS Module - Internal Subsystems



UPS Module with Matching External Cabinetry^{1,2,3}



¹Input Transformer Cabinet Available In Matching or Non-matching From Factory

²Maintenance Bypass Cabinet Available In Matching or Non-matching From Factory

³Combo Input Transformer and Maintenance Bypass Breakers Available in Matching Cabinet

LP33 UPS System - Cabinetized VRLA Battery Solutions

VRLA BATTERY SYSTEM	OUTPUT POWER - kVA	15	20	30	50	60	80	100
		Output Power - kW	13.5	18	27	45	54	72
NO EXTERNAL CABINET	Available Backup Times (in minutes)	11	Not Avail	Not Avail	Not Avail	Not Avail	Not Avail	Not Avail
1 CABINET	Available Backup Times (in minutes)	9, 13, 25, 36, 59, 74, 85	5, 8, 16, 25, 41, 49, 59	9, 14, 24, 29, 36, 48, 53	3, 7, 11, 14, 18, 26, 28	8, 11, 13, 20, 22	6, 8, 13, 14	5, 8, 9
	Total Physical Size (w x d x h)	30" x 31" x 52"	30" x 30" x 75"	30" x 30" x 75"	30" x 30" x 75"	30" x 30" x 75"	30" x 32" x 75"	30" x 32" x 75"
	Weight Range (lbs)	815-2375	1167-3183	1167-3183	1167-3183	1983-3183	2247-3183	2463-3183
2 CABINETS	Available Backup Times (in minutes)	142, 168, 199	98, 118, 142	75, 86, 112, 120	38, 45, 60, 67	30, 36, 48, 53	20, 24, 33, 37	14, 17, 26, 28
	Total Physical Size (w x d x h)	60" x 31" x 52"	60" x 30" x 75"	60" x 30" x 75"	60" x 30" x 75"	60" x 30" x 75"	60" x 32" x 75"	60" x 32" x 75"
	Weight Range (lbs)	3790-4750	3790-4750	4494-6366	4494-6366	4494-6366	4494-6366	4494-6366
3 CABINETS	Available Backup Times (in minutes)	310	233	143, 178, 197	77, 99, 108	60, 80, 86	41, 55, 60	30, 41, 46
	Total Physical Size (w x d x h)	90" x 31" x 52"	90" x 30" x 75"	90" x 30" x 75"	90" x 30" x 75"	90" x 30" x 75"	90" x 32" x 75"	90" x 32" x 75"
	Weight Range (lbs)	7125	7125	7389-9549	7389-9549	7389-9549	7389-9549	7389-9549
4 CABINETS	Available Backup Times (in minutes)	Not Avail	Not Avail	Not Avail	142, 153	112, 120	80, 85	59, 65
	Total Physical Size (w x d x h)			120" x 30" x 75"	120" x 30" x 75"	120" x 30" x 75"	120" x 32" x 75"	120" x 32" x 75"
	Weight Range (lbs)			7389-9549	12732	12732	12732	12732
5 CABINETS	Available Backup Times (in minutes)	Not Avail	Not Avail	Not Avail	178, 196	150, 160	103, 111	80, 85
	Total Physical Size (w x d x h)				150" x 30" x 75"	150" x 30" x 75"	150" x 32" x 75"	150" x 32" x 75"
	Weight Range (lbs)				15915	15915	15915	15915
6 CABINETS	Available Backup Times (in minutes)	Not Avail	Not Avail	Not Avail	Not Avail	Not Avail	127, 140	97, 106
	Total Physical Size (w x d x h)						180" x 32" x 75"	180" x 32" x 75"
	Weight Range (lbs)						19098	19098

Notes:

1. Each battery cabinet will have its own string level main circuit breaker.
2. DC cables provided between multiple battery cabinets. Installed by others.
3. Seismic rated cabinets are available. Consult application engineering team.
4. For actual weight of the application, consult your GE sales representative.

UPS Top Entry Cabling

For UPS Module installations that require all input and output connections from the top of the UPS Module, the LP33 design utilizes a cable sidecar option with ample room for the installing contractor to bring the cables into the top and loop them into the connection terminals at the bottom-right side of the UPS module.

The cable sidecar has a removable sideplate for use during installation, making the cable entry easy.



LP33 UPS Systems - Optional Maintenance Bypass & Transformer Cabinets

Optional External Maintenance Bypass Cabinets

UPS MBP CABINET TYPE	UPS MODULE kVA	15	20	30	50	60	80	100
MATCHING FREE-STANDING MBP CABINET	3-Pole Breaker Ampacities (Input Isolation/Output Isolation/Bypass)	60/60/60A	70/70/70A	125/125/125A	200/175/175A	250/225/225A	350/300/300A	400/350/350A
	Fault Rating (KAIC)	18 or 65	18 or 65	22 or 65	22 or 65	65	65	65
	Total Physical Size (w x d x h)	18" x 32" x 52"	12" x 32" x 75"					
	Weight (lbs)	350	350	350	350	350	350	350
NON-MATCHING WALL MOUNTED MBP CABINET	3-Pole Breaker Ampacities (Input Isolation/Output Isolation/Bypass)	70/70/70A	70/70/70A	125/125/125A	200/175/175A	250/225/225A	350/300/300A	400/350/350A
	Fault Rating (KAIC)	18	18	22	22	65	65	65
	Total Physical Size (w x d x h)	30" x 10" x 36"	30" x 11" x 42"	30" x 11" x 42"				
	Weight (lbs)	110	110	110	110	110	125	125

Notes:

1. MBP Cabinets to have mechanical interlock. Electrical SKRU interlock at optional add cost.
2. Higher Fault Ratings may be available for the 15/20/30kVA units. Consult GE Application Engineering.
3. Seismic rated cabinets are available. Consult GE Application Engineering.

Optional External Input Transformer Cabinets

UPS MBP CABINET TYPE	UPS MODULE kVA	15	20	30	50	60	80	100
MATCHING FREE-STANDING XFMR CABINET	Transformer kVA Rating (min)	16	24	34	55	66	95	115
	Input Voltages Available (3ph 3w)	600, 480VAC						
	Total Physical Size (w x d x h) Est.	30" x 32" x 52"	30" x 32" x 75"					
	Est. Weight (lbs)	830	830	830	995	1,250	1,250	1,405
NON-MATCHING FLOOR/TRAPEZE MOUNTED XFMR CABINET	Transformer kVA Rating	30	30	45	75	75	150	150
	Input Voltages Available (3ph 3w)	480VAC						
	Total Physical Size (w x d x h)	24" x 18" x 32"	24" x 18" x 32"	24" x 18" x 32"	32" x 24" x 36"	32" x 24" x 36"	35" x 24" x 46"	35" x 24" x 46"
	Weight (lbs)	300	300	365	505	505	775	775

Notes:

1. Transformer output shall 208/120VAC 3ph 4w + gnd ; aluminum windings ; delta-wye configuration. DOE2016 Compliant, K0 Rating.
2. Combination Matching Cabinets are available, with 600 or 480VAC Input Transformer and 208VAC 3-CB MBP Assembly. Same cabinet size. Weight 100lbs heavier.

- 24/7 Emergency Service
- Spare Part Kits
- Product Replacement / Return
- Equipment Rentals
- Battery & Capacitor Replacements
- Maintenance Service Contracts
- Remote Monitoring & Diagnostics
- Technical Services
- Training for Maintenance Staff
- Product Training
- Web-Based Training

Service Hotline: 1 800 637 1738

Our UPS Protects Your Critical Load. Our Service Protects Your UPS Investment.

GE's UPS Services offerings range far beyond standard product support: from on-site services for risk-reducing installation and startup, to availability services to help you proactively reduce downtime and meet your service-level commitments. From installation to product retirement, warranty upgrades to remote monitoring, proactive care to 24/7 problem resolution, you can rely on GE's World service organization for all your electrical infrastructure support needs.



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