RT5kVA and RT6kVA 3U Rack or Tower Uninterruptible Power Supplies-G2

Product Guide

The RT5kVA and RT6kVA 3U Rack or Tower Uninterruptible Power Supply-G2 offerings provide extended power protection with increased efficiency and simplified power management to safeguard high-availability of Lenovo server environments. With efficiency ratings of up to 98%, these compact 3U rack or tower designs can help reduce energy usage without compromising performance or reliability. The 3U Rack or Tower UPS-G2 units can be installed in a data center rack cabinet or can be used as tower UPS units in office and distributed IT environments where extended power protection is required.

The 3U Rack UPS-G2 unit (RT5kVA or RT6kVA) is shown in the following figure.

Figure 1. RT5kVA or RT6kVA 3U Rack UPS-G2 unit

Did you know?

3U Rack or Tower UPS-G2 units feature Advanced Battery Management (ABM) technology that uses a unique three-stage charging technique that significantly extends battery service life and optimizes recharge time, compared to traditional charging methods.

3U Rack or Tower UPS-G2 units can enhance system availability with individual receptacle groups or load segments that can be programmed and controlled, which allows mission-critical devices to be prioritized during shutdown to preserve battery run time if there is a prolonged power outage.

3U Rack or Tower UPS-G2 units support UPS Manager software that integrates seamlessly with the major virtualization platforms, which enables you to view and manage your entire power system from your current dashboard. It also triggers live migration during power outages and avoids data loss by gracefully shutting down virtual machines and hosts in a cluster if there is an extended power outage.

Ordering information

The following tables show the orderable feature code, CTO, LFO and part number codes for the 3U Rack or Tower UPS-G2 models and options.

Tip: Eaton is the vendor for listed models.

Table 1. Ordering feature code, CTO and LFO models

Description	Feature code	CTO	LFO
UPS units			
RT5kVA 3U Rack or Tower UPS-G2 (200-240VAC)	BV3B	7DD5CTO3WW	7DD5A007WW
RT6kVA 3U Rack or Tower UPS-G2 (200-240VAC)	BV3C	7DD5CTO3WW	7DD5A008WW
RT5kVA 3U Rack or Tower UPS-G2 (200-240VAC) without Intelligent Power Manager software	C8U2	7DD5CTO3WW	7DD5A00FWW
RT6kVA 3U Rack or Tower UPS-G2 (200-240VAC) without Intelligent Power Manager software	C8U3	7DD5CTO3WW	7DD5A00EWW
Extended Battery Modules			
5kVA/6kVA 3U Rack or Tower Extended Battery Module-G2	BV3D	7DD5CTO3WW	7DD5A009WW

Table 2. Ordering feature code and Part number option

Description	Feature code	Part number
Environmental Monitoring Probe-G2	BV3H	4XF7A87625

Note: Feature code BV3B and BV3C ship standard with the Network Management Card (NMC) G2 which includes software license for IPM. Feature code C8U2 and C8U3 ship standard with the Network Management Card (NMC) G3 which does not include software license for IPM. All UPS units (feature codes) listed in table above support both BV3D and BV3H. Additionally, if IPM software is needed, please refer to technical specifications section notes.

The RT5kVA and RT6kVA 3U Rack or Tower UPS-G2 model include the following items:

- An accessory kit that contains the following items:
  - Rack-mount kit
  - Rack installation instructions
  - Tower kit
  - Serial cable: 1.2 m (4 ft)
  - USB cable
  - Remote On/Off (ROO) and Remote Power Off (RPO) connector
- Documentation package

The Extended Battery Modules (EBMs) are shipped with the following items:

- An accessory kit that contains the following items:
  - Rack-mount kit
  - Tower kit
  - EBM power cable
  - EBM detection cable
- Documentation package

The RT5kVA and RT6kVA 3U Rack or Tower UPS-G2 models do not ship with line cords.

The NMC provides convenient, over-the-network UPS remote monitoring and management through a standard web browser (IPM software). Figure below shows the UPS NMC.

Figure 2. UPS Network Management Card

The NMC has the following features:

- Versatile connectivity through HTTP, SNMP, SMTP, Telnet, SSL, and SSH
- Simultaneous shutdown of protected servers
- Configuration of automatic email messages in response to UPS alarms and to transmit periodic reports
- Customizable actions, including automatic shutdown if there is an extended power failure with standard UPS Power Protector software
- Control of UPS on/off switching with a web browser
- Adjustment and control of load segments through the HTML interface, including sequential starting of the installation and optimization of backup time by shutting down non-priority systems
- Automatic date and time adjustment through an NTP server
- Dual stack IP v4/IP v6
- Recording of events and measurements in the card log
- Data and event logging in the nonvolatile memory
- Card firmware update through the network
- 10/100 Mb Ethernet (RJ-45 connector) with auto-negotiation
- Measurement of humidity and temperature with the Environmental Monitoring Probe (EMP)
- Includes IPM software

The Environmental Monitoring Probe (part number 4XF7A87625) is used to report local temperature and humidity values and make that information available to management tools.

The EMP connects to the UPS via the NMC. The EMP is shown below.

Figure 3. Environmental Monitoring Probe

The EMP has the following features:

- Monitors temperature, humidity, and status of two user-provided contact devices or sensors
- Connects to an NMC through an RJ-45 CAT5 Ethernet cable (1 m cable included with the EMP)
- Can be located up to 20 m (65.6 ft) from the UPS
- Measures ambient temperatures between 0 - 80 °C (32 - 176 °F) with an accuracy of ±1 °C
- Measures relative humidity between 10 - 90% with an accuracy of ±5%
- Temperature, humidity, and contact closure status can be displayed through a web browser
- Supports user-defined alarm thresholds for temperature, humidity, and contact closure status
- Events are stored in the NMC's event log
- Sends SNMP alarms to network management systems
- Sends e-mail notifications through SMTP

Note: The EMP requires Network Management Card (NMC)

Features

A UPS is a device that acts as a defensive barrier between electronic equipment and incoming power problems. It conditions, regulates, and filters out power disturbances to ensure a clean power source for IT equipment. A UPS also provides battery backup if there is a power failure.

In today’s high availability server environments, unplanned power outages or line quality irregularities can have a considerable financial impact on all sized businesses. The typical utility power is 99.9% available, but that means that there can be almost 9 hours of downtime a year, not to mention brownouts and other power quality problems. Selecting the right UPS can help protect against these potentially costly issues.

The RT5kVA and RT6kVA 3U Rack or Tower UPS-G2 units protect against power failures, power sags, power surges, under-voltage, electrical line noise, over-voltage, frequency variation, switching transients, and harmonic distortion.

The RT5kVA and RT6kVA 3U Rack or Tower UPS-G2 models offer the following features:

- High-efficiency protection delivers more real power (Watts) in a compact tower or 3U rack design,

lowering power and cooling consumption

- A graphical Liquid Crystal Display (LCD) that provides intuitive configuration, management and monitoring capabilities in the following languages to reduce management complexity:
  - English
  - French
  - German
  - Spanish
  - Russian
  - Portuguese
  - Italian
- Hot-swappable batteries for maximum uptime, availability, and ease of maintenance
- Standard UPS Power Manager software that provides effective local or remote power monitoring and management for servers and virtual machines, and allows for graceful remote system shutdown
- ABM technology that significantly extends battery service life and optimizes recharge time
- Load segments for individual control of receptacle groups to manage sequential shut downs and start ups and reserve battery run time for the most critical equipment
- Optional EBMs that provide extra run time to critical systems during a prolonged power outage
- Standard Network Management Card (NMC) for enhanced UPS monitoring and control over-the-network through a standard web browser
- Standard EMP for thermal management requirements (temperature and humidity)
- Dual channel communication through the USB or RS-232 port at the same time to maximize communications flexibility
- Remote flash upgradeable firmware for both the UPS and NMC, which makes it an ideal solution for remote locations
- An ROO and RPO port to control power of the UPS unit through a wired remote switch

Technical specifications

The following table lists the technical specifications for the 5kVA and 6kVA 3U Rack or Tower UPS-G2 models.

Table 3. Technical specifications

Specification	RT5kVA 3U Rack or Tower UPS (200-240VAC)	RT6kVA 3U Rack or Tower UPS (200-240VAC)
General		
Part number	7DD5CTO3WW	7DD5CTO3WW
Form factor	3U Rack or Tower	3U Rack or Tower
Topology	Online, double conversion, sinewave output	
VA/Watts rating	5000 VA/4500 W	6000 VA/5400 W
Efficiency (on utility power)	• Online mode: Up to 94% • High efficiency mode: Up to 98%	• Online mode: Up to 94% • High efficiency mode: Up to 98%
Transfer time	• Online mode: 0 ms (no break) • High efficiency mode: 10 ms maximum (due to loss of utility power)	
Energy Star compliant	Yes	Yes
Electrical input		

Specification	RT5kVA 3U Rack or Tower UPS (200-240VAC)	RT6kVA 3U Rack or Tower UPS (200-240VAC)
Input voltage	200 - 240 V AC	200 - 240 V AC
Input frequency	50/60 Hz	50/60 Hz
Max input amperage	25 A	30 A
Input connector	Hardwired terminal block	Hardwired terminal block
Input line cord	Onsite wiring required	Onsite wiring required
Electrical output		
Output voltage settings	200/208/220/230/240 V AC	200/208/220/230/240 V AC
Output frequency	50/60 Hz	50/60 Hz
Output power capacity	200-240 V AC: 5000 VA/4500 W	200-240 V AC: 6000 VA/5400 W
Output connectors	• 2x IEC 320-C19 (16 A) • 8x IEC 320-C13 (10 A)	• 2x IEC 320-C19 (16 A) • 8x IEC 320-C13 (10 A)
Output load segments	• Master: 2x C19 • Group 1: 4x C13 • Group 2: 4x C13	• Master: 2x C19 • Group 1: 4x C13 • Group 2: 4x C13
Batteries		
Battery type	Valve Regulated Lead Acid (VRLA): Maintenance-free, sealed, leak-proof	
Battery management	ABM technology or temperature-compensated charging method (user selectable), automatic battery test and deep discharge protection, automatic recognition of external battery units.	
Battery replacement	Hot-swap internal battery and extended battery modules	
External battery support	Up to 4 (LFO 7DD5A009WW)	Up to 4 (LFO 7DD5A009WW)
Typical backup times	See Table below	
Communications and management		
USB port (Type B)	Yes	Yes
RS-232 serial port (RJ-45)	Yes	Yes
10/100 Mbps Ethernet port (RJ-45)	Yes (on the NMC)	
Environmental monitoring	Optional EMP 4XF7A87625 (requires NMC *)	
Management software	IPM software	
Control panel	Intelligent 5-button graphical LCD	
LED indicators	Online, On Battery, Bypass, and Fault	
Remote On/Off and Power Off	Remote On/Off (ROO) and Remote Power Off (RPO) terminal block connectors	

* G3 NMC M3 4C57A97269

Note: Lenovo no longer offers the IPM software with the M3 NMC and any 7DD5 UPS units pre-installed with an M3 NMC. An IPM license can be purchased through an Eaton authorized partner. To find the nearest Eaton partner, connect to the following URL, fill in the form and select your country from the Country drop-down list. The US web link allows selecting any other country.

- https://www.eaton.com/us/en-us/locate/backup-power-UPS-surge-it-power-distribution-locator/partner-locator-form.html

Table below lists the expected period that the 3U Rack or Tower UPS-G2 models operate only on batteries, depending on the load.

Note: Battery backup times are approximate and can vary with equipment, configuration, battery age, and temperature.

Table 4. 3U Rack or Tower UPS-G2 runtime chart

Load		Run time, Minutes				
Percentage	**Watts**	**No EBM**	**1x EBM**	**2x EBMs**	**3x EBMs**	**4x EBMs**
RT5kVA 3U Rack or Tower UPS-G2 (200-240VAC)						
25%	1125 W	27	103	175	262	377
50%	2250 W	11	48	88	123	167
75%	3375 W	5.3	27	53	83	109
100%	4500 W	3.2	20	38	54	80
RT6kVA 3U Rack or Tower UPS-G2 (200-240VAC)						
25%	1350 W	22	85	147	214	287
50%	2700 W	8.5	38	71	104	133
75%	4050 W	4.5	24	45	62	90
100%	5400 W	3	16	28	47	58

Connectors and controls

The front of the RT5kVA and RT6kVA 3U Rack or Tower UPS-G2 units feature a 5-button graphical LCD. The display provides useful information about the UPS, load status, events, measurements, and settings.

The following figure shows the control panel on the front of the 3U Rack or Tower UPS-G2

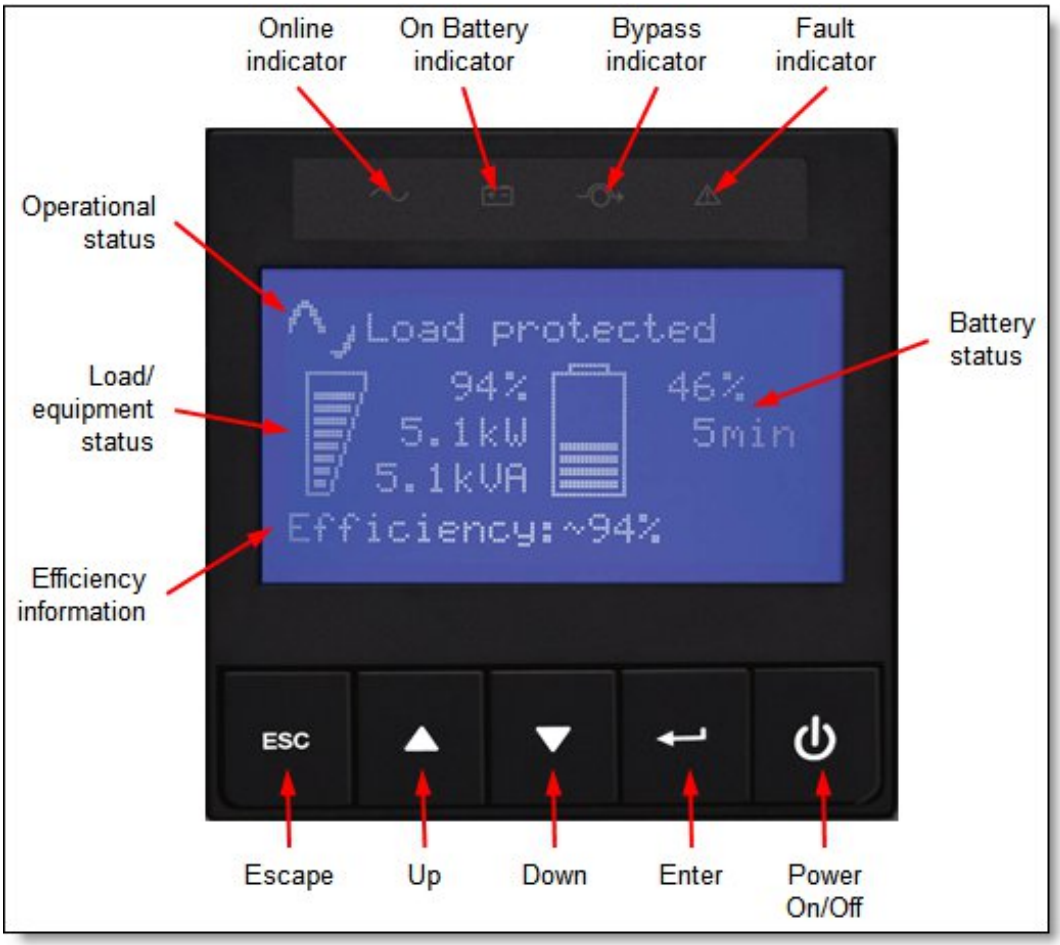

Figure 4. Control panel on the front of the RT5kVA or RT6kVA 3U Rack or Tower UPS-G2

The following functions are available on the control panel:

- Status information: Displays the battery status, load percentage, output power, operational mode, and load group information.
- Measurements: Displays the output Watts, VA, amperage, power factor, voltage, frequency, input voltage, input frequency, battery voltage, efficiency, and power usage.
- Control: Displays the battery test, reset error state, configure load segments, clear power usage measurements, and restore settings.
- Settings: Allows you to change product general parameters and set input and output parameters, on/off conditions, and battery configuration.
- Event log: Displays the stored events, selects faults, alarms and events to display, and clears events.
- Fault log: Displays the event log and alarm history.
- Identification: Displays the machine type, model, and serial number of the unit, and the firmware level of the UPS, including the NMC's firmware level and IP address.

The following figure shows the rear view of the RT5kVA or RT6kVA 3U Rack or Tower UPS-G2 (200-240VAC) (7DD5CTO3WW).

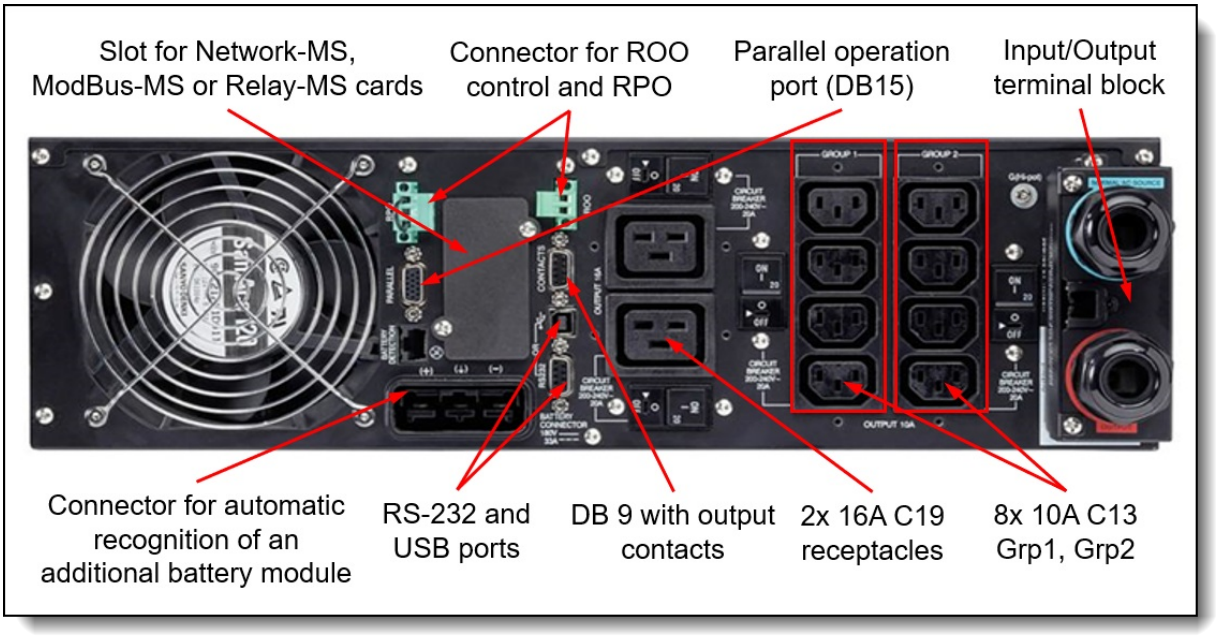

Figure 5. Rear view of the RT5kVA or RT6kVA 3U Rack or Tower UPS-G2 (200-240VAC) (7DD5CTO3WW)

The following figure shows the rear view of the 5kVA/6kVA 3U Rack or Tower Extended Battery Module-G2 (BV3D).

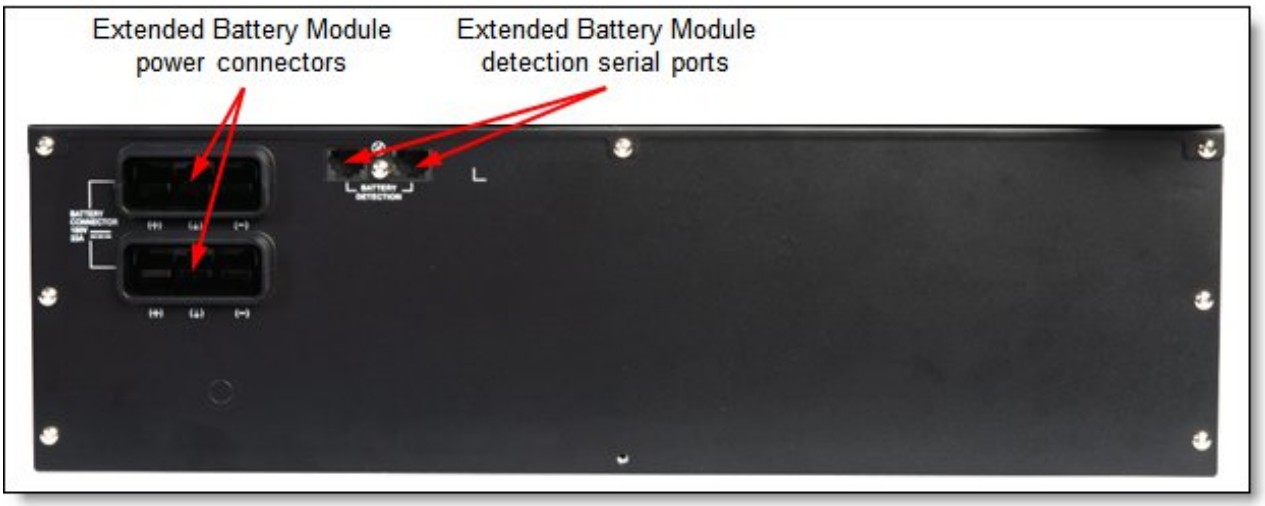

Figure 6. Rear view of the 5kVA/6kVA 3U Rack or Tower Extended Battery Module-G2 (BV3D)

Physical specifications

The 5kVA and 6kVA 3U Rack or Tower UPS-G2 units have the following physical specifications (approximate):

- Height: 130 mm (5.1 in.)
- Width: 441 mm (17.4 in.)
- Depth: 685 mm (27.0 in.)
- Weight: 48 kg (106 lb)

The 5kVA/6kVA 3U Rack or Tower Extended Battery Module-G2 has the following physical specifications (approximate):

- Height: 130 mm (5.1 in.)
- Width: 441 mm (17.4 in.)
- Depth: 645 mm (25.4 in.)
- Weight: 68 kg (150 lb)

Operating environment

The RT5kVA and RT6kVA 3U Rack or Tower UPS-G2 units are supported in the following environment:

- Temperature (operation): 0 - 40 °C (32 - 104 °F), with linear derating for altitude
- Relative humidity: 0 - 95%
- Maximum altitude (operation): 3,000 m (9,843 ft)

Agency approvals

The RT5kVA and RT6kVA 3U Rack or Tower UPS units conform to the following regulations:

- RoHS Compliant
- BESC
- CBSA
- CE
- cUL/CSA
- Pvoc
- SGS
- UKCA
- UL

Warranty

The RT5kVA and RT6kVA 3U Rack or Tower UPS-G2 models and the Extended Battery Module (EBM), including batteries, have a 3-year warranty, 9x5 Next Business Day (NBD) onsite response for hardware only. Software is owned by Eaton.

Management software

Eaton's Intelligent Power Manager (IPM) software for disaster avoidance applications provides the tools you need to monitor and manage power equipment in physical or virtual environments to keep IT devices running during a power or environmental event. This innovative software ensures system uptime and data integrity by allowing you to remotely monitor, manage and control devices on your network. IPM provides a solution that is easy to use, maintains business continuity and allows you to do more with less.

Intelligent Power Manager (IPM)

IPM is an easy-to-use disaster avoidance platform with sophisticated capabilities that include triggering alerts and automating resolutions to keep applications running. IPM enables you to:

- Leverage Eaton's integrations with industry leaders to keep critical applications running and automate resolutions for your entire network risking potential downtime.
- Migrate workloads to increase system uptime and minimize generator load by suspending non-critical virtual machines.
- Power cap servers to keep critical loads running longer by limiting server power consumption.
- Support for 5 nodes.

The Intelligent Power Manager (IPM) offers three levels of licenses

Monitor, manage and optimize. IPM Optimize is the premium offering and provides the most complete set of capabilities.

Table 5. Levels of licenses

Monitor Edition	Manage Edition	Optimize Edition
Choose this option if your key objective is to monitor an IT room	Choose this option if your key objective is to manage a number of UPSs and/or you are looking for basic graceful shutdown	Choose this option if you need virtualization load-shedding
• Contextual visibility of power metrics and constraints • Monitor Eaton and third-party power devices	• Contextual visibility of power metrics and constraints • Monitor Eaton and third-party power devices	• Contextual visibility of power metrics and constraints • Monitor Eaton and third-party power devices • Manage and update Eaton power devices • Define basic business continuity automation configurations with host-level actions • Simple wizard-based automation configuration • Define advanced business continuity automation configurations with VM and cluster-level actions • Graceful shut down

Maintain business continuity: Minimize operating expenses

- Intelligent load-shedding: Increase system uptime while extending battery runtime and minimizing generator load by suspending non-critical virtual machines.

- Site Recovery Manager failover: Reduce data recovery expenses by syncing primary and disaster-recovery sites prior to power failures.
- Power capping on demand: Keep critical workloads running longer during a power outage by limiting server power consumption.

Eaton’s Intelligent Power Manager resources:

Refer to the following resources:

- Setup guide
- IPM User guide
- Intelligent Power Manager (IPM) FAQ

Eaton’s software subscription

Intelligent Power Manager software subscription for eligible Lenovo UPS-G2 models include a 3-year subscription for up to 5 equipment nodes of Eaton’s Intelligence Power Manager (IPM) software (Optimize subscription).

IPM subscription is available from:

- https://Eaton.com/LenovoIPM
- LenovoIPM

Note:
To use the IPM software, you must have the NMC installed.
UPSes, PDUs and ATSs, as well as rack mounted servers, hypervisors, and storage devices count as nodes.

Tip: UPS-G2 models don't support IPP / UPP. If such software is needed please contact vendor Eaton.

Supported servers

The RT5kVA and RT6kVA 3U Rack or Tower UPS-G2 offerings are compatible with all ThinkSystem, System x and ThinkServer systems and other devices that require AC power.

To determine the best fit UPS for a particular configuration, the following needs to be considered:

- Total power load of the hardware that will be connected to the UPS
- Number and type of outlets required
- UPS outlet and group limitations for connecting the hardware to the UPS

To help calculate the power consumption and current value in different deployments, use the Lenovo Capacity Planner (LCP). The tool can be leveraged online from https://datacentersupport.lenovo.com/us/en/solutions/lnvo-lcp

The Lenovo Capacity Planner (LCP) is a useful tool to determine the power draw of other devices such as storage and switching that will be attached to the UPS, refer to the products user manual for the maximum power draw.

Supported rack cabinets

The RT5kVA and RT6kVA 3U Rack or Tower UPS-G2 units can be installed in all 19 inch rack cabinets.

- For specifications about these racks, see the Lenovo Rack Cabinet Reference, available from: https://lenovopress.com/lp1287-lenovo-rack-cabinet-reference

Related publications and links

For more information about this topic, refer to these documents:

- Lenovo Rack Cabinet Reference
  - https://lenovopress.com/lp1287-lenovo-rack-cabinet-reference
- Lenovo Capacity Planner (LCP):
  - https://datacentersupport.lenovo.com/us/en/solutions/lnvo-lcp
- Product specifications and resources - RT6kVA 3U Rack or Tower UPS-G2 (200-240VAC):
  - https://www.eaton.com/gb/en-gb/skuPage.9PX6KIRTN.specifications.html
- Product specifications and resources - RT5kVA 3U Rack or Tower UPS-G2 (200-240VAC):
  - https://www.eaton.com/gb/en-gb/skuPage.9PX5KIRTN.specifications.html
- Network Management Card User Guide:
  - https://www.eaton.com/gb/en-gb/skuPage.NETWORK-M2.html

Related product families

Product families related to this document are the following:

- Uninterruptible Power Supplies

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