PowerUPS 100 Series

Installer/User Guide

500 VA / 700 VA / 900 VA / 1100 VA UPS; 120 VAC; VRLA

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Refer to local regulations and building codes relating to the application, installation, and operation of this product. The consulting engineer, installer, and/or end user is responsible for compliance with all applicable laws and regulations relation to the application, installation, and operation of this product.

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Technical Support Site

If you encounter any installation or operational issues with your product, check the pertinent section of this manual to see if the issue can be resolved by following outlined procedures.

Visit https://www.vertiv.com/en-us/support/ for additional assistance.

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1 Important Safety Information

IMPORTANT! This manual contains important safety instructions that must be followed during the installation and maintenance of the UPS and batteries. Read this manual thoroughly and the safety and regulatory information, available at https://www.vertiv.com/ComplianceRegulatoryInfo, before attempting to install, connect to supply, or operate this UPS.

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2 Product Description

The Vertiv™ PowerUPS 100 Series is a compact and lightweight standby/offline UPS designed to provide reliable power protection for computers, workstations, retail point of sale (POS) equipment, wireless networks, and surveillance systems. Designed with controls for user friendly operation, the Vertiv PowerUPS 100 Series UPS delivers dependable power protection designed to meet your needs.

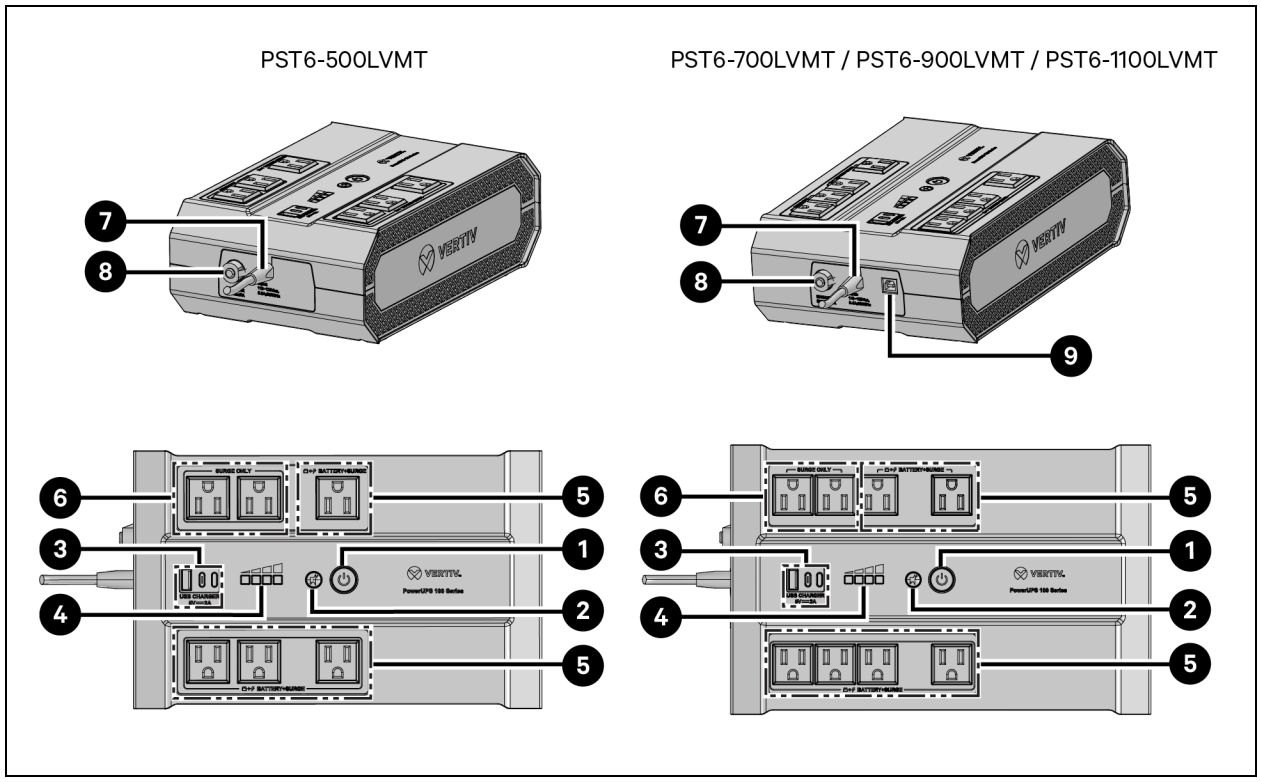
2.1 Available Models

Table 2.1 Vertiv PowerUPS 100 Series 120V Models

Model Number	Nominal Power Rating
PST6-500LVMT	500 VA / 305 W
PST6-700LVMT	700 VA / 425 W
PST6-900LVMT	900 VA / 550 W
PST6-1100LVMT	1100 VA / 670 W

2.2 Front Panel Overview

Figure 2.1 Vertiv™ PowerUPS 100 Series 120V Models—Panel Details



Item	Description
1	Power button
2	Mute button
3	USB charging ports 5 V/2 A maximum (Type A and C)
4	Battery capacity LED
5	Battery-backed and surge-protected receptacles
6	Surge only protected outlet receptacles
7	Input power cord
8	Circuit breaker
9	USB communication port (Type B)

3 Installation

3.1 What's Included

- Vertiv™ PowerUPS 100 Series UPS
- Quick Installation Guide
- Safety and Regulatory Guide
- One USB Cable: 1.2 m (4 ft)
- Wall Mount Hardware

3.2 Unpacking and Inspection

Unpack the UPS and conduct the following checks:

- Inspect the UPS for shipping damage. If any shipping damage is found, report it to the carrier and your local dealer or your Vertiv representative immediately.
- Check the accessories included in the packaging list. If there is any discrepancy, contact your local dealer or your Vertiv representative immediately.

3.3 Preparation for Installation

3.3.1 Installation Environment

- Install the UPS indoors in a controlled environment, where it cannot be accidentally turned off. The installation environment should meet the criteria listed in Specifications on page 15.
- Place it in an area of unrestricted air flow around the unit, away from water, flammable liquids, gases, corrosives, and conductive contaminants. Avoid direct sunlight.
- The mains socket outlet that supplies the UPS should be near the UPS and easily accessible.

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

3.3.2 Installation Clearances

Maintain at least 4 in. (100 mm) clearance around all sides of the UPS. Do not obstruct the air inlets on both sides of the UPS. Blocking the air inlets reduces ventilation and heat dissipation, shortening the service life of the UPS.

3.4 Installing the UPS

3.4.1 Connecting Loads

The Vertiv™ PowerUPS 100 Series UPS models have 6 battery-backed and surge-protected outlet receptacles and 2 surge-protected-only outlet receptacles except for the 500 VA model which has 4 battery-backed and surge-protected outlet receptacles and 2 surge-protected-only outlet receptacles. Plug your critical equipment (such as computers, monitors, printers and other peripherals etc.) into the battery-backed and surge-protected outlet receptacles. Ensure that the load does not exceed the output load rating of the UPS.

3.4.2 USB Communication Connection

User can connect the Vertiv PowerUPS 100 Series UPS to a computer via USB allowing unattended, controlled shutdown of your computer using Vertiv™ Power Assist software in case of UPS input power failure. The UPS works with the computer running software built-in within the Microsoft Windows operating system. To use this feature, plug the provided USB cable into USB Type B port located on the rear panel of the UPS and the other end into an open USB port on your computer. Use of this port is optional and does not interfere with the normal operation of the UPS.

3.4.3 Connecting AC Input

Ensure that all the loads are first powered off. Connect to an input power supply/wall outlet that is properly protected by a circuit breaker in accordance with national and local electrical codes. The input receptacle must be grounded. See Specifications on page 15, for input cord rating.

Once the UPS is plugged into the wall outlet, it begins charging the battery.

NOTE: While every precaution has been taken to ensure that the battery is in good condition, we recommend allowing the UPS to be plugged into AC input and to charge the battery for at least 24 hours prior to providing full backup time protection for any utility power abnormality.

4 Operation

4.1 Modes of Operation

In all of the following modes, the UPS provides surge protection and input fuse protection to all outlets.

4.1.1 Off/Standby Mode

The UPS input is plugged into a stable, 120 VAC source, but the outlets are turned off. The internal batteries are charging.

NOTE: The surge-only outlets will still have power.

4.1.2 On/Normal Mode

The UPS input is plugged into a stable, 120 VAC source, and the outlets are turned on. The internal batteries are charging.

4.1.3 On/Battery Mode

The UPS input is not plugged in, or the voltage source has become extremely low or high and unusable. The UPS will automatically switch to the internal battery to provide normal, usable voltage to the outlets.

4.1.4 Fault Mode

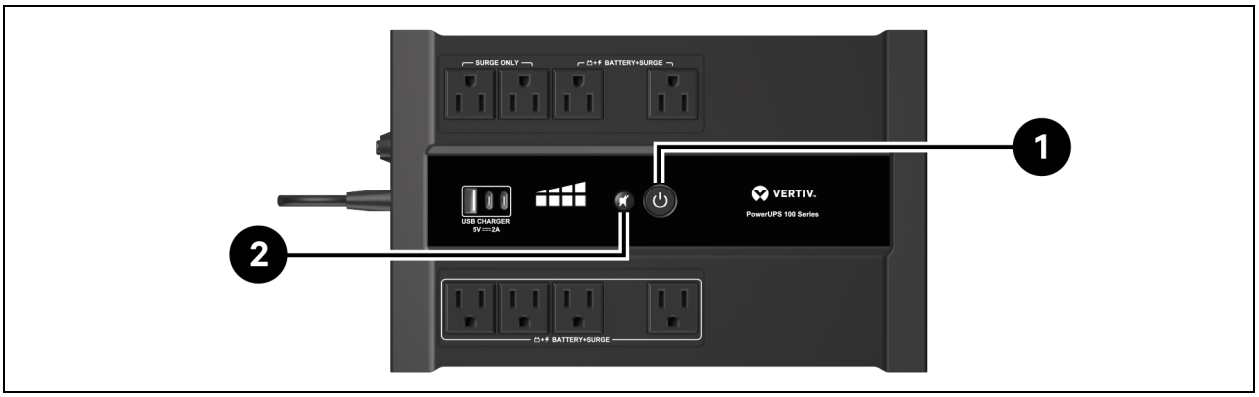
An error or fault condition has occurred. The outlets are shut off, and the internal batteries are not charging.

4.1.5 Battery Self Test Mode

The battery self test mode occurs automatically every 8 weeks as a self check. The UPS enters a cycle of approximately 10 seconds during which it tests the internal battery. The outlets are temporarily powered by the internal battery. If the system determines the battery needs replacement, it will issue a warning (beep every 5 seconds) and exit the test. If the battery is healthy, the UPS will complete the self check and return to normal mode.

4.2 Controls

Figure 4.1 Front Panel Buttons

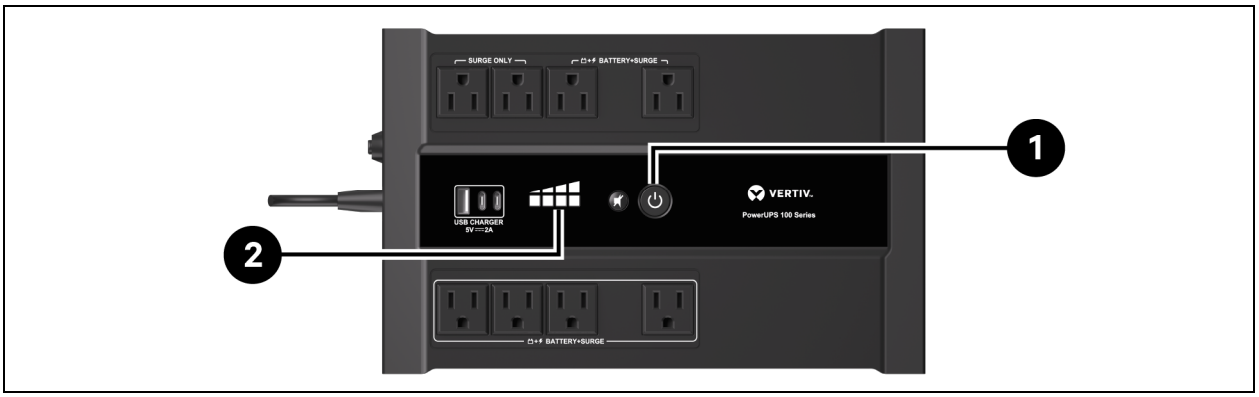


Item	Description

1	Power button
	• Press and hold for 3 seconds to cycle between *On* and *Off* mode.
	• Press and hold for 10 seconds to set voltage sensitivity.
	  • Quick press to cycle between low (green), medium (white) and high (red) voltage sensitivity.
	  • **Low:** Equipment less sensitive to voltage fluctuations.
	  • **Medium:** The factory default for normal operating conditions.
	  • **High:** Equipment sensitive to voltage fluctuations.

2	Mute button • Press and hold for 1 second to mute or unmute an alarm.

Figure 4.2 Front Panel LED Indicators



Item	Description

1	Power button LED
	• **Solid white:** Normal operation
	• **Blinking green:** Battery mode
	• **Blinking red:**
	  • Overload warning
	  • Low battery warning
	  • Battery replacement
	• **Solid red:** UPS fault

2	Indicator—Battery capacity LED display in 25% increment.

4.3 Normal Startup

1. Make sure that the UPS connected to AC input.
2. Press and hold the power button for 3 seconds.

4.4 Normal Shutdown

1. Press and hold the power button for 3 seconds. The outlets are turned off.
2. Disconnect AC input power.

4.5 Full Shutdown

1. Press and hold the power button for 3 seconds. The outlets are turned off.
2. Disconnect AC input power.
3. Remove the battery cover and disconnect the battery wires. The unit is fully shut down.

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5 Maintenance

5.1 Precautions

Even though the Vertiv™ PowerUPS 100 Series models are 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 UPS 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 UPS power cord where it might be damaged.

5.2 Battery Charging

The batteries are valve regulated, non-spillable, lead acid and should be kept charged to attain their design life. The Vertiv PowerUPS 100 Series UPS charges the batteries continuously when it is connected to the utility input power. If the Vertiv PowerUPS 100 Series UPS will be stored for a long time, we recommend connecting the UPS to input power for at least 24 hours every 4 to 6 months to ensure full recharge of the batteries.

5.3 Battery Replacement

IMPORTANT! Before you proceed, please review the battery safety precautions available at https://www.vertiv.com/ComplianceRegulatoryInfo.

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

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

WARNING! Risk of explosion. Can cause equipment damage, injury and death.
A battery can explode if the battery is replaced by an incorrect type. Dispose of used batteries according to the instructions included with the battery pack.

User may safely replace the internal battery pack. See Specifications on page 15, for the part number of the replacement battery for your UPS model number.

To replace the battery, follow the steps below and refer to the Figure 5.1 on the next page:

1. Power off the UPS and disconnect the input power.
2. Turn the UPS on its side.
3. Remove the battery compartment cover.
    a. Unscrew the battery compartment cover.

b. Remove the cover to access the battery by sliding the cover in the direction of the arrow indentation on it.

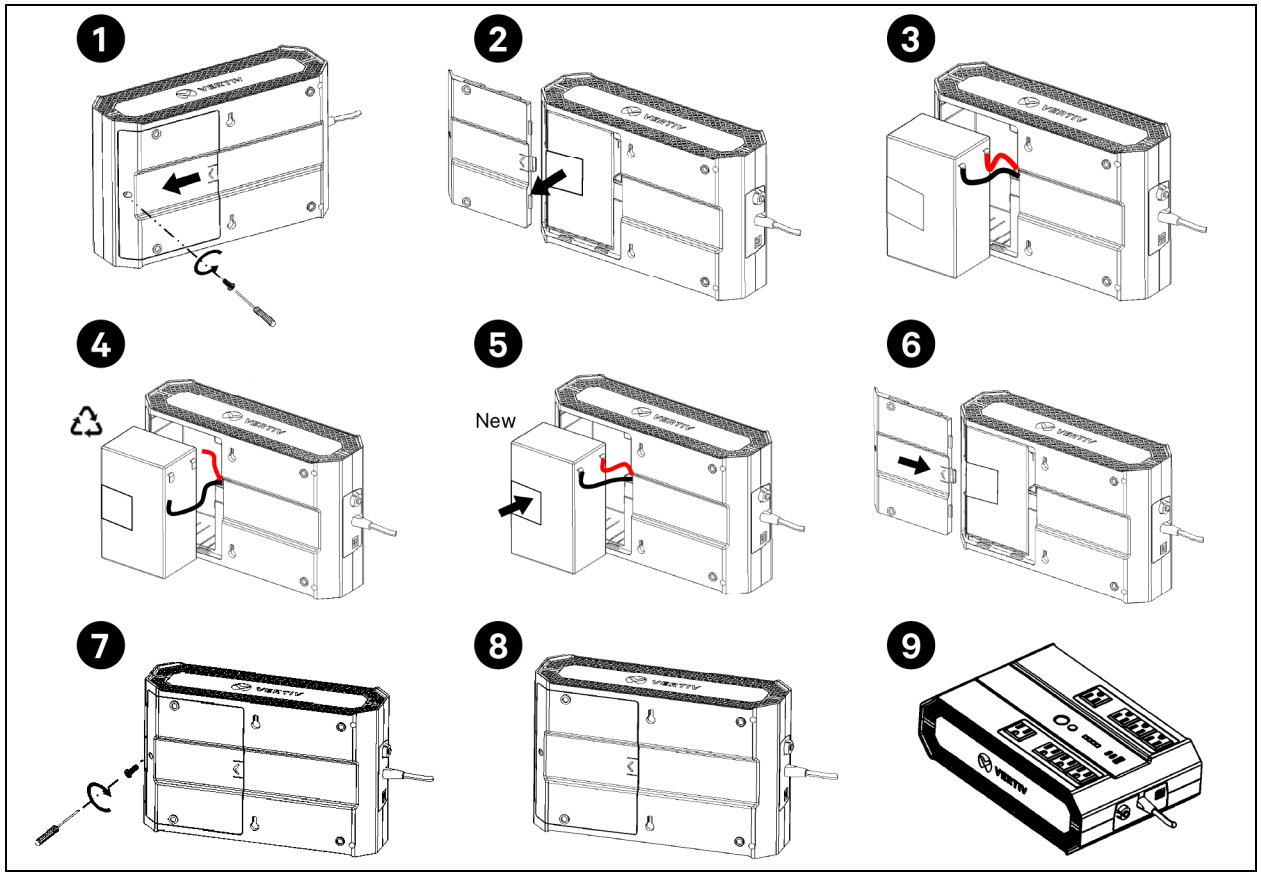
NOTE: Make sure to disconnect the red wire first, then the black.

4. Lift the white tab and pull the battery out and disconnect the battery by disconnecting the red and black cables from the two battery terminals.

NOTE: Always plug in the black wire first, then the red. Ensure the black wire connects to the black terminal and the red wire to the red terminal.

5. Plug the removed cables into the terminals of the new replacement battery.
6. Orient the cables and the replacement battery in the same way as the removed battery and slide into the UPS.
7. Install the battery compartment cover.
   a. Slide the cover in the direction opposite to the arrow indentation.
   b. Secure it by tightening the screw.
8. Return the UPS to its upright position.
9. Press and hold the power button for 3 seconds to initiate the battery self test and clear any previous battery fault warning.
10. Properly dispose of the old batteries at an appropriate recycling facility or return them to Vertiv using the packing material of the new batteries.

Figure 5.1 Battery Replacement



6 Troubleshooting

This chapter indicates various UPS symptoms you may encounter and provides a troubleshooting guide in the event the UPS develops a problem. Use the information provided in this chapter to determine whether external factors caused the problem and how to remedy the situation.

6.1 Status Indicators

The UPS has the following warning indicators that allow the UPS to function normally for a short period before the outputs are shut off. An audible alarm accompanies various events during UPS operations. Table 6.1 below describes the warnings and sounds and their meaning.

Table 6.1 Audible Alarm and LED Indicator Description

Power Button LED Indicator	Sound	Indicates
Blinking green	One beep every 2 seconds	Battery mode
Blinking red	One beep every 0.5 seconds	UPS overload warning
Blinking red	One beep every second	Low battery warning
Solid yellow	No audible noise	Battery self check
Blinking red	One beep every 5 seconds	Battery replacement warning. To replace the battery, refer Battery Replacement on page 11.
Solid red	Continuous beep	UPS fault

6.2 Faults

On Vertiv™ PowerUPS 100 Series models, a fault condition is indicated when the power button LED illuminates red on the front panel. If this warning/fault LED is on solid, and there is a continuous audible beep, the UPS has detected a problem and automatically shut off the output.

To troubleshoot the fault:

1. Turn off the UPS, disconnect all connected equipment (loads), and restart the UPS.
2. Check the fault status:
   - If the fault is still active, refer to the Table 6.2 below to identify and resolve the issue. If the fault persists after referring to the table, contact Vertiv Technical Support for assistance or replacement.
   - If the fault is no longer active but the connected equipment is still not receiving power, the issue may be with the equipment itself. Reconnect devices one at a time to identify the faulty device.

Table 6.2 Troubleshooting

Symptom	Possible Cause	Corrective Action
UPS does not turn on.	The power button is not pressed.	Press and hold the power button for 3 seconds and then release it to power on the UPS.
UPS operates only in battery mode, even when there is normal AC present. Power button is illuminated red.	UPS input cord is not plugged in or outside AC circuit breaker is tripped.	Ensure the UPS is plugged into a properly wired and grounded outlet. Avoid using extension cords, adapters or other connectors.
	The wall outlet is without electricity due to the tripping of an external AC circuit breaker.	Reset the circuit breaker on the external panel. If the AC circuit breaker trips after UPS starts up, contact Vertiv Technical Support for assistance or replacement.
	UPS input circuit breaker is tripped.	Reset the circuit breaker by pressing the plunger back in. If the AC circuit breaker trips after UPS starts, reduce the load to below the UPS rating specified in **Table 2.1** on page 3.
Power button is illuminated red.	UPS has detected an internal fault.	Contact Vertiv Technical Support for assistance or replacement.
UPS does not provide expected runtime.	The batteries may be fully discharged or at the end of useful services life.	Charge the batteries for at least 8 hours and retest. If runtime is still less than expected, check that the UPS is not overloaded.
	Battery has a defect.	Replace the battery with the same model number specified in **Table 7.1** on page 15. For replacement instructions, see Battery Replacement on page 11.
Equipment shuts off when operating in battery mode.	UPS has shutdown.	The battery has discharged, wait for input AC power to return for the UPS to restart and provide output power.
Battery mode/green LED is blinking in normal mode.	Power cord is loose.	Reconnect the power cord properly.
NOTE: Call 1-800-543-2378 for service/warranty replacement. Find country specific support lines in Appendices on page 19.		

7 Specifications

Table 7.1 Vertiv™ PowerUPS 100 Series UPS Specifications

Model Number	PST6-500LVMT	PST6-700LVMT	PST6-900LVMT	PST6-1100LVMT
Capacity (VA / W)	500 / 305	700 / 425	900 / 550	1100 / 670
Unit Dimensions, in. (mm) W x D x H	6.6 x 10.4 x 3.5 (167 x 264 x 89)	7.3 x 11.3 x 3.5 (185 x 288 x 89)		
Unit Weight, lbs. (kg)	6.6 (3.0)	9.3 (4.2)	9.5 (4.3)	9.7 (4.4)
Shipping Dimensions, in. (mm) W x D x H	7.7 x 14.4 x 10.4 (195 x 367 x 265)	7.7 x 15.5 x 11.1 (195 x 393 x 282)		
Shipping Weight, lbs. (kg)	7.9 (3.6)	10.6 (4.8)	10.8 (4.9)	11.0 (5.0)
Input AC				
Nominal Voltage	120 VAC			
Voltage Range	88 to 142 VAC			
Input Voltage Measurement Tolerance	±5%			
Frequency Range	50/60 Hz, ±5 Hz (auto-sensing)			
Internal Rear Panel Input Breaker	6 A, 250 VAC	8 A, 250 VAC	10 A, 250 VAC	12 A, 250 VAC
Surge Energy Rating	375 Joules	600 Joules		
Input Cord Length and Connector	6 ft (attached cable with NEMA 5-15P)			
Output AC (On Utility)				
Nominal Voltage	120 VAC			
Voltage Range	88 to 142 VAC			
Frequency Range	50/60 Hz, ±5 Hz (auto-sensing)			
Efficiency	>97% at full load			
Overload Capacity in Normal Mode (measurement tolerance ±10%)	110%—Alarm warning and shutdown after 5 minutes 120%—Alarm warning and immediate shutdown			
Output AC (On Battery)				
Nominal Voltage	120 VAC			
Voltage Range	Nominal ±8% VAC			
Frequency Range	50/60 Hz, ±1 Hz (auto-sensing)			
Waveform	Simulated Sine wave			
Transfer Time	8 ms (10 ms, maximum)			
Overload Capacity in Battery Mode (measurement tolerance ±10%)	110%—Alarm warning and shutdown after 5 seconds 120%—Alarm warning and immediate shutdown			
Protection	Electronic (over current, short circuit, over charge)			
Battery Type	Valve Regulated Lead Acid (VRLA)			
Battery Manufacturer / Model	Vertiv / VBATKIT101	Vertiv / VBATKIT104		Vertiv / VBATKIT105

Table 7.1 Vertiv™ PowerUPS 100 Series UPS Specifications (continued)

Model Number	PST6-500LVMT	PST6-700LVMT	PST6-900LVMT	PST6-1100LVMT
Series Connected Battery Quantity x VDC x Ah	1 x 12 V x 5 Ah		2 x 12 V x 9 Ah	
Battery Backed and Surge Protected Outlets	4 (NEMA 5-15R)		6 (NEMA 5-15R)	
Surge-Only Protected Outlets	2 (NEMA 5-15R)		2 (NEMA 5-15R)	
Environmental Requirements				
Operating Temperature, °F (°C)	32 to 104 (0 to 40)			
Operating Elevation, feet (meter)	0 to 9,842 (0 to 3,000)			
Relative Humidity	0 to 95% non-condensing			
Storage Temperature, °F (°C)	14 to 122 (-10 to 50)			
Storage Elevation, feet (meter)	0 to 49,212 (0 to 15,000)			
Audible Noise	<45 dBA at 3 ft (1 m) from all sides			
Agency				
Safety	cTUVus, UL 1778, UL 1973, NOM			
RFI / EMI	FCC Part 15 Class B/ ICES-003-Category B			
Surge Immunity	EN61000-4-5, Level 2 (Line-Neutral) EN61000-4-5, Level 3 (Line-Ground) EN61000-4-5, Level 3 (Neutral-Ground)			
Environmental	RoHS, REACH, WEEE, TSCA, 3TG, Energy Star 2.0, DOE			
Transportation	ISTA Procedure 3A			

7.1 Battery Run Times

Table 7.2 Battery Run Times in Minutes

Load Percent of Capacity	Model and Rating			
	PST6-500LVMT	PST6-700LVMT	PST6-900LVMT	PST6-1100LVMT
	500 VA / 305 W	700 VA / 425 W	900 VA / 550 W	1100 VA / 670 W
10%	50	73	49	44
20%	22	34	24	20
25%	19	22	19	14
30%	17	18	15	12
40%	10.5	13.3	10	8
50%	8	10	8	5
60%	6	7.5	4.8	3
70%	4	5	4	2.1
75%	3	4.8	2.5	1.5
80%	3	4.5	2.5	1.5
90%	2.5	3	2.2	1.3
100%	2	2	1.5	1

NOTE: Run times in this table are approximate. They are based upon new, fully charged standard battery modules at a temperature of 25 °C (77 °F) with 100% resistive UPS loading. Run time may vary ±5% due to manufacturing tolerances of the batteries.

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Appendices

Appendix A: Technical Support and Contacts

A.1 Technical Support/Service in the United States

Vertiv Group Corporation

24x7 dispatch of technicians for all products.

1-800-543-2378

Liebert® Thermal Management Products

1-800-543-2778

Liebert® Channel Products

1-800-222-5877

Liebert® AC and DC Power Products

1-800-543-2378

A.2 Vertiv™ PowerUPS 100 Series

Our Technical Support staff is ready to assist you with any installation or operating issues you may encounter with your Vertiv product. Visit https://www.vertiv.com/en-us/support/ for additional assistance. Alternatively, please call or email us:

Technical support:

e: liebert.upstech@vertiv.com

p: 1-800-543-2378 menu option 1

Monitoring support:

e: liebert.monitoring@vertiv.com

p: 1-800-543-2378 menu option 3

Warranty support:

e: microups.warranty@vertiv.com

p: 1-800-543-2378 menu option 5

A.3 Locations

United States

Vertiv Headquarters

505 N Cleveland Ave

Westerville, OH, 43082, USA

Europe

Victor-von-Bruns Strasse 21,

8212 Neuhausen am Rheinfall, Switzerland

Asia

7/F, Dah Sing Financial Centre

3108 Gloucester Road, Wanchai

Hong Kong

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