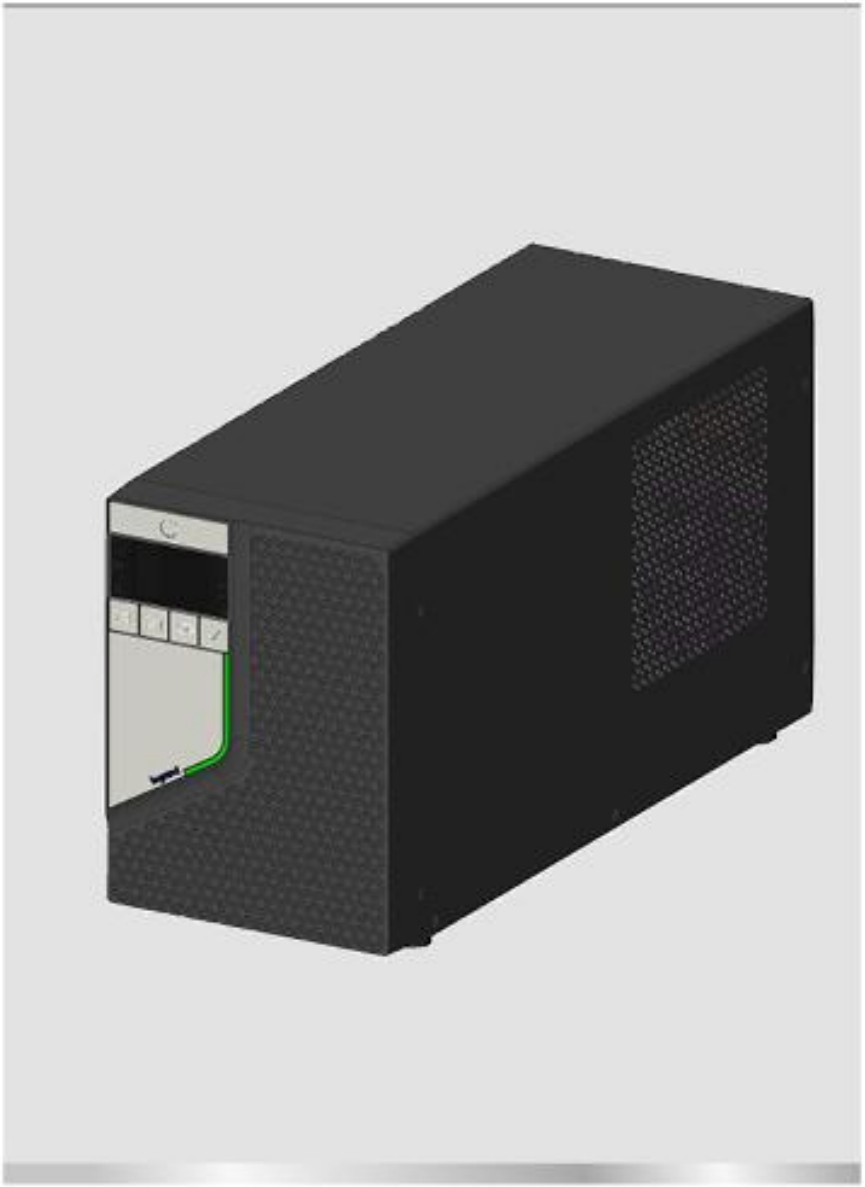
KEOR SPE TOWER

Installation and User manual



Part. LE13806AA - 21/07

Table of Contents

1. Introduction

DANGER
It is necessary to read the whole manual carefully before doing any operation.
Keor SPE must be used only in residential and commercial environments.

1.1 Purpose of the manual

The purpose of this manual is to provide the user with instructions for safely installing and using the Keor SPE UPS, also called “equipment” in the rest of the manual.
Only skilled technicians can carry out ordinary maintenance procedures as explained in the appendix.

Extraordinary maintenance operations are not dealt with because they are the sole preserve of the LEGRAND Technical Support Service.

The intended use and configurations envisaged for the equipment as shown in this manual are the only ones allowed by the Manufacturer.
Any other use or configuration must be previously agreed with the Manufacturer in writing and, in this case, the written agreement will be attached to the installation and user manuals.

The original text of this publication, drafted in English, is the only reference for the resolution of disputes of interpretation linked to translations into other languages.

1.2 Update of the manual

The manual reflects the state of the art when the equipment was put onto the market. The publication conforms to the directives current on that date. The manual cannot be considered inadequate when new standards come into force or modifications are made to the equipment.

Any addition to the manual the Manufacturer considers appropriate to send to the users, must be kept together with the manual of which they will become an integral part.
The version of the manual updated to its latest release is available on the Internet at http://www.ups.legrand.com

1.3 Guarantee terms

The guarantee terms may vary depending on the country where the UPS is sold. Check the validity and duration with LEGRAND's local sale representative.

If there should be a fault in the product, contact the LEGRAND Technical Support Service which will provide all the instructions on what to do.
Do not send anything back without LEGRAND's prior authorization.

LEGRAND is not responsible for costs such as:
- losses of profits or earnings;
- losses of equipment, data or software;
- claims by third parties;
- any damage to persons or things due to improper use, unauthorized technical alterations or modifications;
- any damage to persons or things due to installations where the full compliance with the standard regulating the specific usage applications have not been guaranteed.

The Manufacturer declines all indirect or direct responsibility arising from:
- assembly and cabling made by personnel not fully qualified according to national standards to work on equipment presenting electrical hazards;

- failure to observe the installation and maintenance instructions and use of the equipment which differs from the specifications in the manuals;
- use by personnel who have not read and thoroughly understood the content of the user manual;
- use that does not comply with the specific standards used in the country where the equipment is installed;
- modifications made to the equipment, software, functioning logic unless they have been authorized by the Manufacturer in writing;
- repairs that have not been authorized by the LEGRAND Technical Support Service;
- damage caused intentionally, through negligence, by acts of God, natural phenomena, fire, or liquid infiltration.

1.4 Copyright

2. Regulatory and safety requirements

This section contains important safety and operating instructions that should always be followed during the installation, use and maintenance of the UPS.

DANGER

The UPS works with dangerous voltages. Only skilled technicians qualified and authorized by LEGRAND must perform ordinary maintenance operations. No part of the UPS can be repaired by the user. Extraordinary maintenance operations must be carried out by LEGRAND Technical Support Service personnel.

• This product should be installed in compliance with installation rules, preferably by a qualified electrician. Incorrect installation and use can lead to risk of electric shock or fire. Before carrying out the installation, read the instructions and take account of the product's specific mounting location. Do not open up, dismantle, alter or modify the device except where specifically required to do so by the instructions. All Legrand products must be opened and repaired exclusively by personnel trained and approved by Legrand. Any unauthorised opening or repair completely cancels all liabilities and the rights to replacement and guarantees. Use only Legrand brand accessories.
• Ensure that the mains supply voltage and frequency match those of the UPS (see the product label and the technical specifications).
• If any visible damage is found on the product during the unpacking operation, do not install the UPS but repack the unit and return it to your reseller or distributor.
• Before operating the UPS or connecting any load equipment, ensure the UPS is connected to a properly grounded mains socket.
• The load applied must not exceed the one indicated on the type label of the UPS.
• The ON/OFF button of the UPS does not electrically isolate the internal parts. To isolate the UPS, unplug it from the mains power socket.
• Do not attempt to open or disassemble the UPS; there are no user replaceable parts. Opening the case will void the warranty and introduces the risk of electric shock even when the mains plug is disconnected.
• Since the non-detachable power supply cable acts as a separation device, the mains power supply socket shall be installed near the UPS and shall be easily accessible.
• In case of a mains power supply failure, do not unplug the power supply cable. Earth continuity must be ensured to the connected loads.
• Do not plug non-computer-related items such as medical, life-support and house electric equipment to the UPS output.
• Do not plug laser printers to the UPS back-up outputs because of their high start-up current.
• The UPS functions with TT and TN systems.
• The UPS has dangerous high voltages on its input and output connections. Contact with these voltages may be life threatening.
• In case of emergency, immediately turn off the equipment and disconnect the power cord from the AC power supply to disable the UPS.
• Do not allow any liquid or any foreign object to enter the UPS.
• The UPS is intended for indoor installation in a ventilated, controlled indoor environment with a range of temperature between 0°C (+32°F) and +40°C (+104°F) and non-condensing humidity <95%.
• Do not install the UPS in locations with sparks, smoke, and hazardous gas or where there is water and excessive humidity. Dusty, corrosive, and salty environments can damage the UPS.
• Do not plug the UPS input into its own output.
• Do not attach a power strip or surge suppressor to the UPS.
• Ensure that the cables connecting the loads to the UPS are not longer than 10 meters.
• Keep a clearance of 20 cm beyond the UPS rear panel. Avoid exposing it to direct sunlight or installing it near heat emitting appliances.
• Unplug the UPS prior to cleaning and do not use liquid or spray detergent.

• Do not place the UPS near equipment that generate strong electromagnetic fields and/or near equipment that are sensible to electromagnetic fields.
• The battery of the UPS should be recharged every 2-3 months if unused. To do so, connect the power cable to a suitable grounded mains socket.
• To safeguard the batteries as well as possible it is necessary to bear in mind that their average lifetime is strongly influenced by the operating room temperature. Position the UPS in an environment with a temperature range between +20°C (+68°F) and +25°C (+77°F) to guarantee the optimum life of the batteries.
• The UPS is equipped with an auto-restart system. In case of return of the input mains after an end of battery operation, the UPS switches on and returns to normal operation by supplying the output loads.
• The UPS is equipped with an automatic backfeed protection system.

DANGER

The UPS is powered by its own DC energy source (batteries). If the UPS is switched on when no AC power is available, there is hazardous voltage at the output sockets.
Disconnect all batteries before performing any installation and/or maintenance operation.

CAUTION

The batteries inside the UPS are not user-replaceable. Servicing of batteries must be performed only by electrical hazard authorized personnel.
A battery can present a risk of electrical shock and burns by high short-circuit circuit current. Failed batteries can reach temperatures that exceed the burn thresholds for touchable surfaces. The following precautions should be observed when working on batteries:
a) remove watches, rings or other metal objects.
b) use tools with insulated handles.
c) wear rubber gloves and boots.
d) do not lay tools or metal parts on top of batteries.
e) disconnect the charging source prior to connecting or disconnecting battery terminals.
f) determine if battery is inadvertently grounded. If inadvertently grounded, remove source from ground. Contact with any part of a grounded battery can result in electrical shock. The likelihood of such shock can be reduced if such grounds are removed during installation and maintenance (applicable to equipment and remote battery supplies not having a grounded supply circuit).
g) never leave live cable terminals without an insulated protection.
h) When replacing batteries, replace with the same type and number of batteries or battery packs. There is the risk of explosion if batteries are replaced by an incorrect type.

CAUTION

Do not dispose of batteries in a fire. The batteries may explode.
Do not open or mutilate batteries. Released electrolyte is harmful to the skin and eyes. It may be toxic. The batteries installed inside the cabinet must be disposed of correctly. For the disposal requirements refer to local laws and relevant standards.

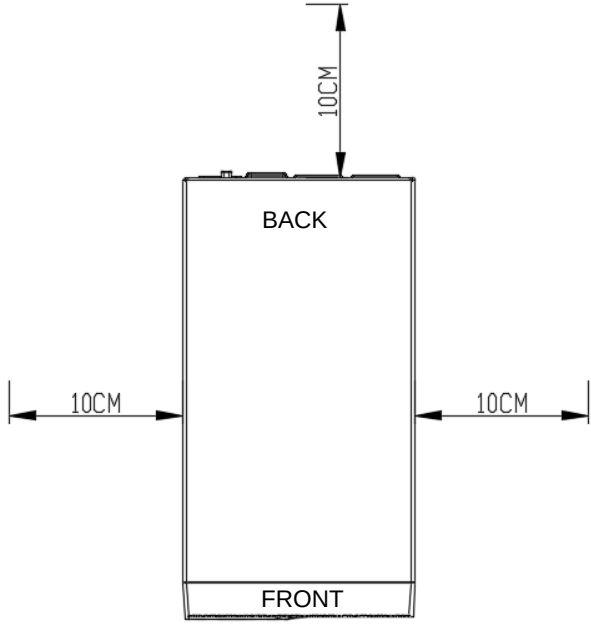
WARNING

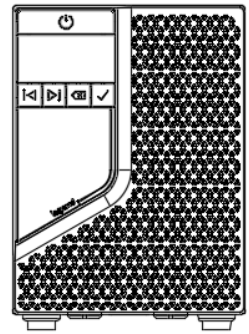
Keor SPE is a category C2 UPS product according to the EN 62040-2
In a residential environment, this product may cause radio interference, in which case the user may be required to take additional measures.

3. Installation

3.1 Positioning constraints

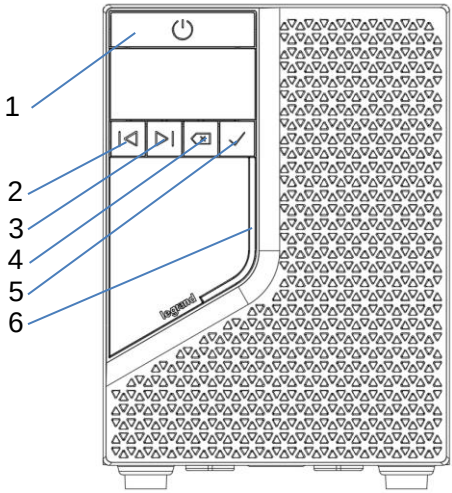
The UPS must be placed on a support surface as shown in the following drawings.
Keep at least 100 mm of free space around the UPS for air flow.





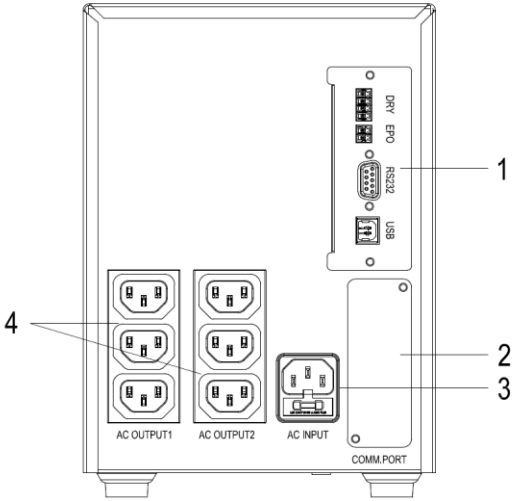
4. Operation

4.1 Overview



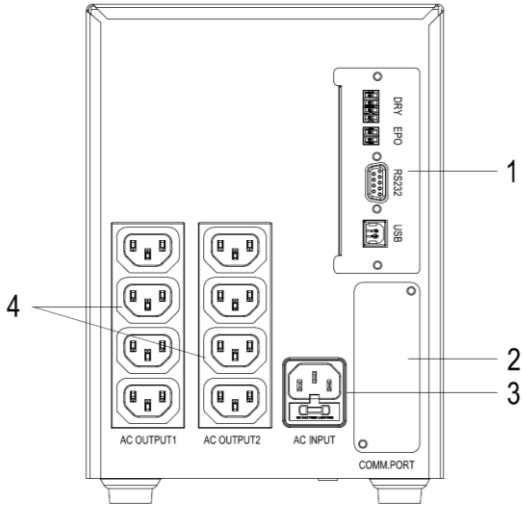
1.ON/OFF button
2. Scrolling left
3. Scrolling right
4. ESC
5. Enter
6. LED

Front View



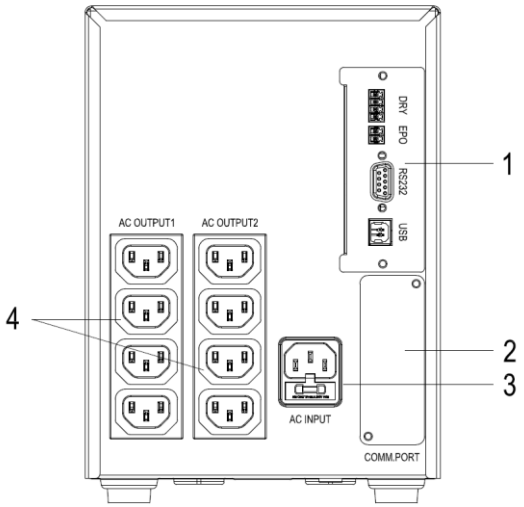
1. Communication Ports
2. SNMP Slot
3. AC Input Inlet and input fuse
4. Outlets

Rear View of 750VA



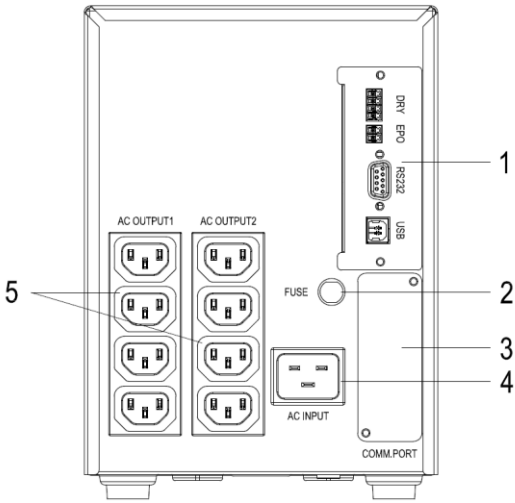
1. Communication Ports
2. SNMP Slot
3. AC Input Inlet and input fuse
4. Outlets

Rear View of 1000VA



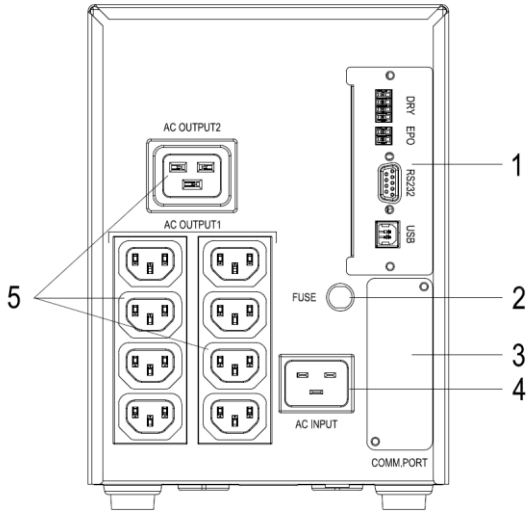
1. Communication Ports
2. SNMP Slot
3. AC Input Inlet and input fuse
4. Outlets

Rear View of 1500VA



1. Communication Ports
2. Input Fuse
3. SNMP Slot
4. AC Input Inlet
5. Outlets

Rear View of 2000VA



1. Communication Ports
2. Input Fuse
3. SNMP Slot
4. AC Input Inlet
5. Outlets

Rear View of 3000VA

4.2 Start-up procedure

4.2.1 Normal mode

1. Ensure that the mains power supply to be used has a suitable voltage/frequency and an upstream protection rated at either 10A or 16 A (according to the UPS power).
2. Plug the UPS power cord on the UPS inlet on one side and on the mains power supply socket on the other side.
3. The UPS recharges the battery each time it is connected to a mains power supply (even if it is powered down). It is recommended to charge the battery at least 6 hours before connecting the loads.
4. Connect the loads to the UPS outlets. Ensure that the power of the loads can be managed by the UPS.
5. Press the ON/OFF button to start-up the UPS and power the loads. The led bar is lit in green with a 1-second-long acoustic signal.

INDICATION

The UPS has an auto-restart function. In case the mains power fail and the UPS reaches the end of the back-up time, the load will be automatically powered when the mains power is back if the auto-start setting is enabled.

4.2.2 Cold start

1. Make sure the internal battery is fully charged.
2. Connect the loads to the outlets.
3. Press the ON/OFF button to start-up the UPS and power the loads in battery mode.

INDICATION

The output frequency in this condition is the last one seen by the UPS when the mains input was present.

4.3 Buzzer ON/OFF

When the buzzer is active, press the  button for 0.1 seconds to silence the current alarm.
In case of a new alarm, the buzzer will be re-activated automatically. When the buzzer is muted, press the button for 0.1 seconds to turn it on again.

4.4 Shutdown

1. Press and hold the ON/OFF button until the UPS turns off.
2. The UPS stops powering the outlets.
3. Unplug the UPS from the mains power supply socket.

4.5 Battery test

It is possible to execute a manual battery test if the UPS is working in normal mode.

Press and hold the  button for 3 seconds and release it after you hear one beep: the UPS will switch to battery mode and perform a 10-second battery test. After that, UPS will return to line mode.
If the test result is ok, the display will show ‘PAS’ for 7 seconds, then return to the previously viewed data.
If the test result is abnormal, the display will show ‘FAL’ for 7 seconds, then return to the previously viewed data. The no-battery/ battery replacement icon () will flash until the ON/OFF button (fault clear) is pressed.
In case of attempting to perform a battery test while the UPS is running in battery mode, the display will show ‘noP’ for 7 seconds, then return to the previously viewed data.

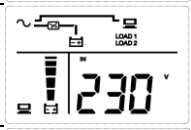
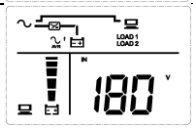
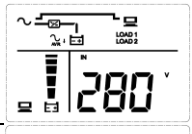
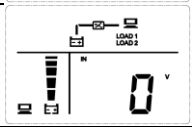
4.6 Multi-function buttons

	ON / OFF The button has three functions: **1. Turn on** • In standby mode, press and hold the button for 1 second, release it after you hear one beep and the UPS will run in line mode. • Cold start: When there is no AC input, press and hold the button for 3 seconds, release it after you hear one beep and the UPS will start up in battery mode. **2. Turn off** • In line mode, press and hold the button for 3 seconds, release it after you hear one beep and the output will be off and the UPS will transfer to run in standby mode. The UPS will keep charging the batteries when the UPS is in standby mode. To fully turn off the UPS, please completely disconnect the UPS from the input power. • In battery mode, press and hold the button for 3 seconds, release it after you hear one beep and the UPS will turn off its output. **3. Fault Clear** When the UPS has a fault condition, press and hold the button for 1 second, release it after you hear one beep and the UPS will clear the fault condition
	**LEFT** Press the button for 0.1 second to: • Normal mode: go to the previous display • Setup mode: decrease a number or change a setting value
	**RIGHT** Press the button for 0.1 second to: • Normal mode: go to the next display • Setup mode: increase a number or change a setting value
	**ESC - BUZZER ON/OFF - BATTERY TEST** The button has three functions: **1. Exiting the Setup Mode** In Setup Mode, press and hold the button for 3 seconds to exit the Setup Mode. **2. Exit setting entry without confirm** In Setup Mode, press the button for 0.1 seconds to exit the current setting entry without confirm the changes. **3. Battery Test** Execute a manual battery test: • Only possible if the UPS is working in line mode • Not possible during the Setup Mode Press and hold the button for 3 seconds and release it after you hear one beep: the UPS will switch to battery mode and perform a 10-second battery test. After that, UPS will return to line mode. • If the test result is ok, the 7-segment display will show 'PAS' for 7 seconds, then return to the previously viewed data. • If the test result is abnormal, the 7-segment display will show 'FAL' for 7 seconds, then return to the previously viewed data. The no-battery/ battery replacement icon ( ) will flash until the ON/FF button (fault clear) is pressed. • In case of attempting to perform a battery test while the UPS is

	running in battery mode, the 7-segment display will show 'noP' for 7 seconds, then return to the previously viewed data.
	**ENTER** The button has three functions: **1. Buzzer ON/OFF** When the buzzer is active, press the button for 0.1 seconds to silence the current alarm. In case of a new alarm (same or different alarm; no matter), the buzzer will reactivate automatically. When the buzzer is muted, press the button for 0.1 seconds to turn it on again. Not available in setup mode. **2. Enter the Setup Mode** Press and hold the button for 3 seconds until you hear one beep and the "SET" icon will be turned on. **3. Confirm** In Setup Mode, press the button for 0.1 seconds to: • Enable the editing of the current setting. As confirmation, the value on the digits will start to flash. • Save the changes of the current setting. As confirmation, you will hear one beep and the value on the digits stop to flash.

4.7 LCD Display

4.7.1 Working Diagrams

DIAGRAM	MODE	DESCRIPTION
	Stand-by	UPS is operating in standby mode. Input is normal but the output is not present.
	Line	UPS is operating in Line mode. Input is normal and the output is present.
 	AVR	UPS is operating in AVR mode. Input is low/high, and the output is present.
	Battery	UPS is operating in battery mode. Input is not present, and the output is present.

4.7.2 Icons

ICON	NAME	DESCRIPTION
	AC power	Indicates the input source status. • **ON**: the AC input is within the acceptable input range • **Flashing**: the AC input is out of the acceptable input range, but it is still enough to charge the battery • **OFF**: the AC input is out of the acceptable input range and is not enough to charge the battery. It means that UPS is working on battery mode.
	Load banks	Indicates the output status. • **ON**: There is output to the load bank 1/ load bank 2 • **OFF**: There is no output to the load bank 1/ load bank 2.
	Battery	Indicates the battery status. • **ON**: Battery is normal. • **Flashing**: Battery abnormal / disconnected
	AVR	UPS is working in AVR mode to stabilize the output voltage.
	Buzzer mute	The buzzer is disabled
	Warning	Indicates that there is an internal failure or an environmental fault. The error code will also be shown on the 7-segment display. Please refer to the Fault Error Codes paragraph for the list and display for relevant 7-segment display information.
	Load Level Bar	Indicates the level of the load. • **ON**: the bar graph illuminates according to the load level • **Flashing**: there is an overload

		condition
	Battery Level Bar	Indicates the level of the battery charge. • **ON**: the bar graph illuminates according to the remaining battery capacity • **Flashing**: the first segment flashes when a low-battery situation occurs

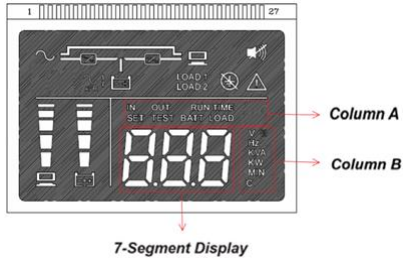
Load Level Bar
1%-20%: the first segment will illuminate
21%-40%: the first two segments will illuminate.
41%-60%: the first three segments will illuminate.
61%-80%: the first four segments will illuminate.
81%-100%: all segments will illuminate.
> 100%: all segments will be illuminated and will flash

Battery Level Bar

Charging mode:
0%-19%: the first segment will flash
20%-39%: the first segment will be illuminated, the second segment will flash
40%-59%: the first 2 segments will be illuminated, the third segment will flash
60%-79%: the first 3 segments will be illuminated, the 4th segment will flash
80%-99%: the first 4 segments will be illuminated, the 5th segment will flash
100%: all 5 segments will be illuminated

Discharging mode:
100%: all 5 segments will be illuminated
99%-80%: the first 4 segments will be illuminated
79%-60%: the first 3 segments will be illuminated
59%-40%: the first 2 segments will be illuminated
39%-20%: the first segment will be illuminated
19%-1%: the first segment will flash
0%: no segments are illuminated

4.7.3 7-Segment display



Column A	Column B	DESCRIPTION
IN	**V**	Input voltage
	Hz	Input frequency
OUT	**V**	Output voltage
	Hz	Output frequency
RUN TIME	**MIN**	Remaining back-up time with the current load, in minutes
SET	**various**	It means that the UPS is in the setup mode. Pease refer to *Setup Entries* paragraph for details
TEST		A battery test is running
BATT	**%**	Battery Charge level
	V	Battery voltage
	AH	Total capacity of installed batteries (internal + external), expressed in Ah. (If the UPS is not expandable, this parameter won't be visible)
LOAD	**%**	Total load value, in percentage
	kVA	Total load value, in kVA.
	kW	Total load value, in kW
	°C	Internal temperature, in Celsius degrees

Display items: scroll menu

- Input Voltage
- Input Frequency
- Output Voltage
- Output Frequency
- Battery Voltage
- Battery Charge Level
- Runtime
- Load KVA
- Load KW

- Load Percentage
- Environment Temperature
- Total capacity of installed batteries (internal + external). Not visible in case the UPS is not expandable

Setup Entries

FUNCTION	DESCRIPTION
SET + OUT + V	Output voltage (200/208/220/230/240). Default value: 230V. Available in Rack 1U/2U/3U model.
SET + 	Buzzer on/off. Default value: ON.
SET + LOAD 1	Manually turn on/off Load 1 bank. Default: ON Except for the rack version (1U), this option won't be available: it means that this output bank will always ON.
SET + LOAD 2	Manually turn on/off Load 2 bank. Default: ON
SET + BATT + AH	Total capacity of installed batteries (internal + external), expressed in Ah. Option: Ato, and nn Ah nn is the Ah of user selected battery. Ato enables the EBC auto detection. If the UPS is not expandable, this parameter will be hidden
SET + IN + OUT	Auto Restart on/off. Default: ON
SET	EPO/ROO Setting for NO/NC There are two pages for this setting: The main page is the selection for 'EPO' or 'ROO' The subpage is the selection for the NO/NC Use the ENTER/ESC button to enter/exit the main/sub page

4.8 LED bar and Alarm indicators

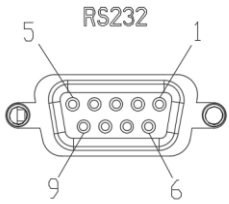
LED BAR			ALARM	UPS STATUS
Green	Yellow	Red		
Fixed	-	-		mains present and regular, batteries recharging
-	Fixed	-	Intermittent every 0.5 sec	- Warning status (UPS in battery mode, overload) - Fan lock, battery disconnect, EPO activation
-	Fixed	-	Intermittent every 5 sec	UPS operating in battery mode with battery status >50%
-	Fixed	-	Intermittent every 2 sec	UPS operating in battery mode with battery status <25%
-	Flashing	-	Intermittent every 0.5 sec	end of autonomy
-	Fixed	-	Intermittent every 5 sec	Test
Fixed	-	-	-	Auto-restart after end of autonomy
-	-	Fixed	Intermittent every 2 sec	EPO activation
-	-	Fixed	Intermittent every 0.5 sec	- Failure - Battery overload (battery mode)
-	-	Fixed	Continuous sound	Overload shutdown fault

4.9 Communication devices

The UPS has a standard RS232 serial port, one USB (type B) port and one SNMP slot.

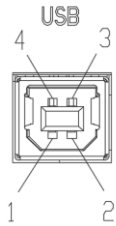
The UPS can also be connected to NAS devices or to computers.
By connecting the UPS to a computer, it is possible to perform functions like:
- displaying all operating and diagnostic data in case of problems;
- setting special functions like the control of the load banks;
- performing automatic shutdown of all computers powered by the UPS (if connected to the TCP/IP network).

It is possible to download some free of charge software from the website http://www.ups.legrand.com



RS232 CONNECTOR :

PIN NO.	PIN DEFINE
1	NA
2	RX
3	TX
4	NA
5	GND
6	NA
7	NA
8	NA
9	NA



USB CONNECTOR :

PIN NO.	PIN DEFINE
1	SUB_VDD
2	DM
3	DP
4	GND_SELV

5. Troubleshooting

INDICATION	POSSIBLE CAUSE	SOLUTION
The UPS works on battery mode even though the mains power is available	The input fuse blew up	Replace the fuse with a new one
	The mains power supply socket is not supplying power to the UPS	Check if the UPS works on another socket. If so, have the first mains power supply socket checked by a qualified electrician.
	-	Check that the input power cord is properly connected to the inlet and to the mains socket
	The input line is out of the allowed UPS range	Check the input line
Continuous sound alarm sound with the UPS working in normal mode	Overload	Disconnect some non-critical loads from the UPS outlets until the overload ceases
The UPS is working normally but the loads are not powered	-	Check that all power cords are properly connected to the outlets and to the load. If the problem persists, contact the LEGRAND Technical Support Service
The UPS does not operate in battery mode: it shuts down or immediately signals it is close to the operating limit	The UPS has operated with no mains voltage for a long time and has not been able to recharge the battery	Recharge it for at least 8 hours by connecting the UPS to the mains
	The battery is flat due to not using the UPS for a long period.	Recharge it for at least 6 hours by connecting the UPS to the mains. If the batteries are no longer working, contact a skilled technician to replace them.
	The battery has run down due to being used frequently, to ambient conditions, or to having exceeded its average service life	Contact a skilled technician or the LEGRAND Technical Support Service to replace the batteries
Strange noise or smell	UPS fault	Shut down immediately the UPS. Unplug the UPS from the mains socket and contact the LEGRAND Technical Support Service

Fault error codes

ERROR CODE	Description	Turn off output	Fault Clear (how Fault Clear works)	Comments
E01	Inverter voltage is high	Y	Y	
E02	Inverter voltage is low	Y	Y	
E03	Output voltage is short	Y	Y	
E06	Relay welding	Y	Y	
E11	Inverter soft start timeout	Y	Y	
E17	Charger voltage is high	N	N	Warning
E18	Comm. with EEPROM is abnormal	N	N	Warning. Will use default setting.
E19	The ambient temperature is over	Y	N	
E20	Overload is present	Y	Y	When the overload curve is expired, turn off the output
E22	The battery is disconnected	N	N	Warning.
E23	The battery is weak	N	N	Warning.
E25	The battery voltage is low warning	N	N	Warning.
E26	The battery voltage is low and cutoff the output	Y	N	Low battery and shut down to protect the battery
E27	The inverter temperature is over	Y	N	
E28	The Fan is lock	N	N	Warning.
E29	The EPO activated	Y	N	Turn off UPS completely, standard requires that UPS should be turned off completely to avoid any unexpected accidents.

6. Maintenance

CAUTION

All operations listed in this chapter must be carried out only by a SKILLED TECHNICIAN.

This definition refers to people who have specific technical qualification and are aware of the methods of installing, assembling, repairing, and using the equipment safely.

The skilled technician is qualified according to national safety standards to work under dangerous electrical voltage and uses the personal protective equipment required by national safety standards.

6.1 Battery Replacement

DANGER

A battery can present a risk of electrical shock and high short circuit current.

Before the replacement, it is mandatory the reading of chapter 2.

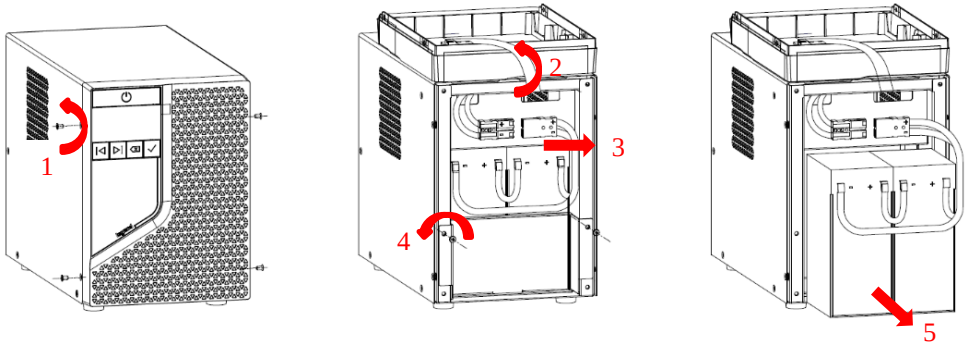
Batteries may only be replaced with the same number and type. Batteries must be brand new.

If the battery brand is different from the one originally installed by Legrand, the estimated battery autonomy indicated on the display of the UPS may not be reliable

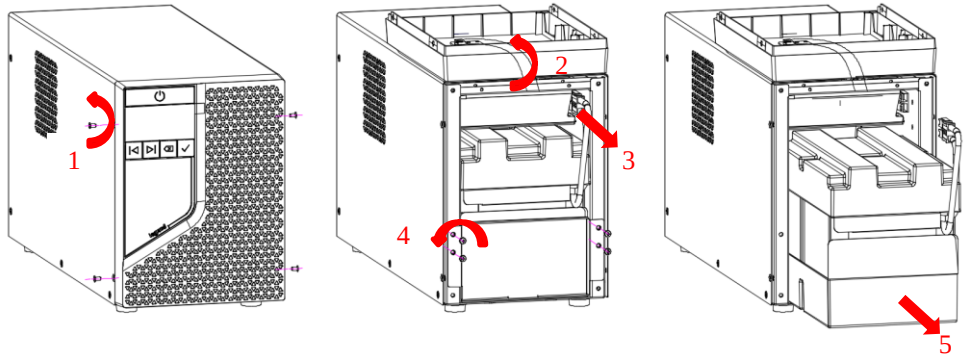
1)Switch off the UPS.

2)Unplug the power cable from the mains socket.

KEOR SPE 750-1000



KEOR SPE 1500-2000-3000



Step 1 - Using a Phillips head screwdriver, remove the four (4) black screws located on the sides of the UPS;
Step 2 - Place the front plate on the top of the UPS for easy access to the battery connections.
Step 3 - Disconnect the red connector from the battery pack.
Step 4 - Using a Phillips head screwdriver，remove the sliver screws (the KEOR SPE 750-1000 is two (2) screws, the KEOR SPE 1500-2000-3000 is four (4) screws) from the silver battery pack retaining plate.
Step 5 - Pull on the transparent tab in order to slide the battery pack out of the UPS.

6.2 Battery information

Model	Battery source 1	Battery source 2
750 VA	2 PCS Minhua type MS7-12	2 PCS Ritar type RT1270
1000 VA	2 PCS Minhua type MS9-12	2 PCS Ritar type RT1290
1500 VA	3 PCS Minhua type MS9-12	3 PCS Ritar type RT1290
2000 VA	4 PCS Minhua type MS9-12	4 PCS Ritar type RT1290
3000 VA	4 PCS Minhua type MS9-12	4 PCS Ritar type RT1290EP

7. Warehousing and Dismantling

7.1 Warehousing

The UPS can be stored in an environment with a room temperature between -20°C (-4°F) and +50°C (+122°F) and humidity less than 90% (not condensing).
However, it is recommended to store the UPS in an environment with a room temperature between +20°C (+68°F) and +25°C (+77°F) to preserve the battery life.
The battery installed inside the UPS is lead/acid sealed and does not require maintenance (VRLA). The battery should be charged for 8 hours every 3 months by connecting the UPS to the mains supply socket. Repeat this procedure every two months if the storage ambient temperature is above +25°C (+77°F).

INDICATION
Batteries must never be stored if partially or totally discharged.
LEGRAND is not liable for any damage or bad functioning caused to the UPS by wrong warehousing of the batteries.

7.2 Dismantling

DANGER
Dismantling and disposal operations must be carried out only by a qualified electrician.
The instructions in this chapter are to be considered indicative: in every country there are different regulations regarding the disposal of electronic or hazardous waste such as batteries. It is necessary to strictly adhere to the standards in force in the country where the equipment is used.
Do not throw any component of the equipment in the ordinary rubbish.

7.2.1 Battery disposal

Batteries must be disposed of in a site intended for the recovery of toxic waste.
Disposal in the traditional rubbish is not allowed.
Apply to the competent agencies in your countries for the proper procedure.

WARNING
A battery may constitute a risk of electric shock and high short-circuit current.
When working on batteries, the prescriptions indicated in chapter 2 must be adhered to.

7.2.2 UPS dismantling

The dismantling of the UPS must occur after the dismantling of the various parts it consists of.
For the dismantling operations, it is necessary to wear Personal Protective Equipment.
Sub-divide the components separating the metal from the plastic, from the copper and so on according to the type of selective waste disposal in the country where the equipment is dismantled.
If the dismantled components must be stored before their disposal, be careful to keep them in a safe place protected from atmospheric agents to avoid soil and groundwater contamination.

7.2.3 Electronic component dismantling

For the disposal of electronic waste, it is necessary to refer to the relevant standards.

This symbol indicates that in order to prevent any negative effects on the environment and on people, this product should be disposed of separately from other household waste, by taking it to authorised collection centres, in accordance with the EU countries local waste disposal legislations. Disposing of the product without following local regulations may be punished by law. It is recommended to check that this equipment subject to WEEE legislations in the country where it is used.

8. Technical specifications

GENERAL CHARACTERISTICS

	3 110 60 Keor SPE 750	3 110 61 Keor SPE 1000	3 110 62 Keor SPE 1500	3 110 63 Keor SPE 2000	3 110 64 Keor SPE 3000
Nominal power (VA)	750	1000	1500	2000	3000
Active power (W)	600	800	1200	1600	2400
Technology	Line interactive (VI)				
Waveform	sinewave (during battery mode)				
Transfer time	2-8 (typical)				
Insulation class (IEC 61140)	I				
Overvoltage category	OVC II				
Rated short-time withstand current (kA)	$1 \leq I_{CW} \leq 6$				

INPUT ELECTRICAL CHARACTERISTICS

	3 110 60 Keor SPE 750	3 110 61 Keor SPE 1000	3 110 62 Keor SPE 1500	3 110 63 Keor SPE 2000	3 110 64 Keor SPE 3000
Rated voltage (V)	230 ~ 1ph				
Range of voltage (V)	175 to 288 (at full load)				
Rated frequency (hz)	50 / 60 ± 3 with auto-sensing				
Maximum current (A)	3.66	4.88	7.33	9.77	14.67
Replaceable fuse					
Inlet	IEC C14			IEC C20	

OUTPUT ELECTRICAL CHARACTERISTICS

	3 110 60 Keor SPE 750	3 110 61 Keor SPE 1000	3 110 62 Keor SPE 1500	3 110 63 Keor SPE 2000	3 110 64 Keor SPE 3000
Rated voltage (V)	230 ~ 1ph Battery mode: ±10%				
Rated frequency (Hz)	50 / 60 ± 1 (battery mode)				
Maximum current (A)	3.40	4.54	6.82	9.09	13.64
Overload capacity	Normal mode 110%< load <120% : 5 min 120%< load <130% : 10 sec load > 130% : immediate shutdown Battery mode load > 110 % ±10% : 1.5 sec				
Outlets	6 x IEC C13	8 x IEC C13			8 x IEC C13 1 x IEC C19
Efficiency	up to 96%		up to 97%		

BATTERIES AND BATTERY CHARGER CHARACTERISTICS

	3 110 60 Keor SPE 750	3 110 61 Keor SPE 1000	3 110 62 Keor SPE 1500	3 110 63 Keor SPE 2000	3 110 64 Keor SPE 3000
Number of batteries	2	2	3	4	4
Battery type	12V – 7Ah 6 cell VRLA valve-regulated lead-acid, maintenance free	12V – 9Ah 6 cell VRLA valve-regulated lead-acid, maintenance free			
Operating time at 80% of the load (min)	3.7				3
Charging time	6-8 hours at 90% of the charge				

FEATURES

	3 110 60 Keor SPE 750	3 110 61 Keor SPE 1000	3 110 62 Keor SPE 1500	3 110 63 Keor SPE 2000	3 110 64 Keor SPE 3000
Visual Interface	7-segments display with four pushbuttons and LEDs				
Communication Ports	Dry Contacts RS232 USB type B Communication slot for SNMP Card				
Protections	Electronic protection against overloading and short-circuiting and excessive battery discharge Shutdown on reaching operating limit and overheating Automatic shutdown due to protection triggering Backfeed protection embedded Emergency Power Off (EPO)				
Outputs	2 banks (1 programmable)				

MECHANICAL CHARACTERISTICS

	3 110 60 Keor SPE 750	3 110 61 Keor SPE 1000	3 110 62 Keor SPE 1500	3 110 63 Keor SPE 2000	3 110 64 Keor SPE 3000
Dimensions W x D x H (mm)	238 x 325 x 170		238 x 438 x 170		
Net weight with batteries (kg)	14.0±5%	14.5±5%	18.9±5%	23.0±5%	26.5±5%

ENVIRONMENTAL CONDITIONS

	3 110 60 Keor SPE 750	3 110 61 Keor SPE 1000	3 110 62 Keor SPE 1500	3 110 63 Keor SPE 2000	3 110 64 Keor SPE 3000
Operating temperature (°C)	0 ÷ +40 (+20 ÷ +25 recommended for longer battery life)				
Relative humidity during operation	< 95% non-condensing				
Storage temperature (°C)	-20 ÷ +70 (+20 ÷ +25 recommended to preserve battery life)				
Noise level at 1 meter (dBA)	< 45				
Protection Index (IEC 529)	IP 20				
Operating height	up to 1000 metres above sea level without derating				
Pollution degree	PD2				
Environmental category (EN 6021-3-3)	3K2				
Mechanical category (EN 6021-3-3)	3M1				

REFERENCE DIRECTIVES AND STANDARDS

Marks	CE, EAC, CMIM
Safety	2014/35/EU Directive EN 62040-1
EMC	2014/30/EU Directive EN 62040-2

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