



## Index

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|  |           |
|--|-----------|
| <b>1 Introduction</b>                              | <b>24</b> |
| <b>2 Conditions of use</b>                         | <b>24</b> |
| <b>3 LCD Panel</b>                                 | <b>25</b> |
| <b>4 Installation</b>                              | <b>28</b> |
| <b>5 UPS communicator self-diagnostic software</b> | <b>37</b> |
| <b>6 Battery replacement</b>                       | <b>38</b> |
| <b>7 Possible malfunctioning</b>                   | <b>40</b> |
| <b>8 Technical features</b>                        | <b>41</b> |

## 1 Introduction

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This manual contains information for users of the Daker DK 1, 2, 3 kVA models.

You are advised to read this handbook carefully before installing your uninterruptible power supply, meticulously following the instructions given herein.

The UPS Daker DK is only been made for civil or industrial use; it is not in conformity with the standards for electro-medical equipment.

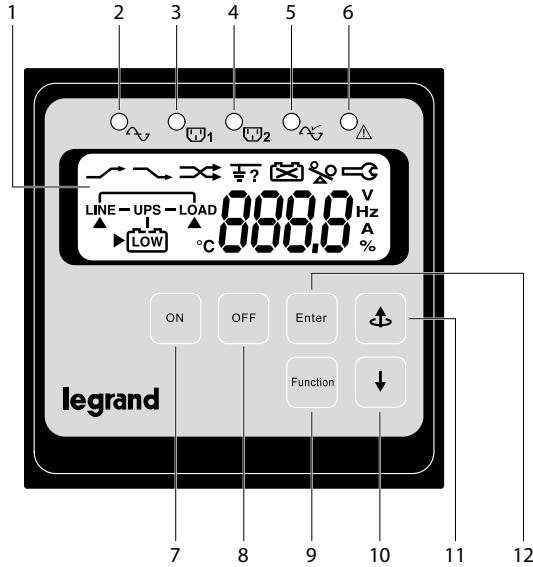
In case of problems with the UPS, please read this manual before contacting technical support; The “Troubleshooting” section can in fact help resolving most of the problems encountered while using the uninterruptible power supply.

## 2 Conditions of use

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

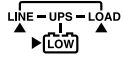


- The UPS has been designed for the power supply of the data processing equipment; The load applied must not exceed the one indicated on the rear label of your UPS.
- The ON/OFF button of your UPS does not electrically isolate the internal parts. To isolate your UPS unplug it from the mains power socket.
- Do not open the UPS container since there may be parts inside with dangerously high voltage even when the mains plug is disconnected; there are no parts inside that the user can repair.
- The front control panel is provided for manual operations; Do not press on the panel with sharp or pointed objects.
- The UPS Daker DK has been designed to work in closed, clean rooms where there are no inflammable liquids or corrosive substances and where it is not too damp.
- Do not place near equipments that generate strong electro-magnetic fields and/or near equipments that are sensible to electro-magnetic fields. (engines, floppy disks, speakers, adapters, monitors, video, etc...)
- Do not pour any liquid on the UPS or inside the UPS.
- Do not place the UPS in humid environment or near liquid, such as water, chemical solution...
- Do not expose the UPS to the direct sunlight or any heat sources.
- Keep the ventilation slits clean to dissipate the heat of the UPS.
- Use grounded power cable to connect the UPS to the mains supply.
- Do not plug laser printers into the UPS because of their high start-up current.
- Do not plug house electric equipments, such as hair dryer, air conditioner, and refrigerator into the UPS outlets.

## 3 LCD Panel

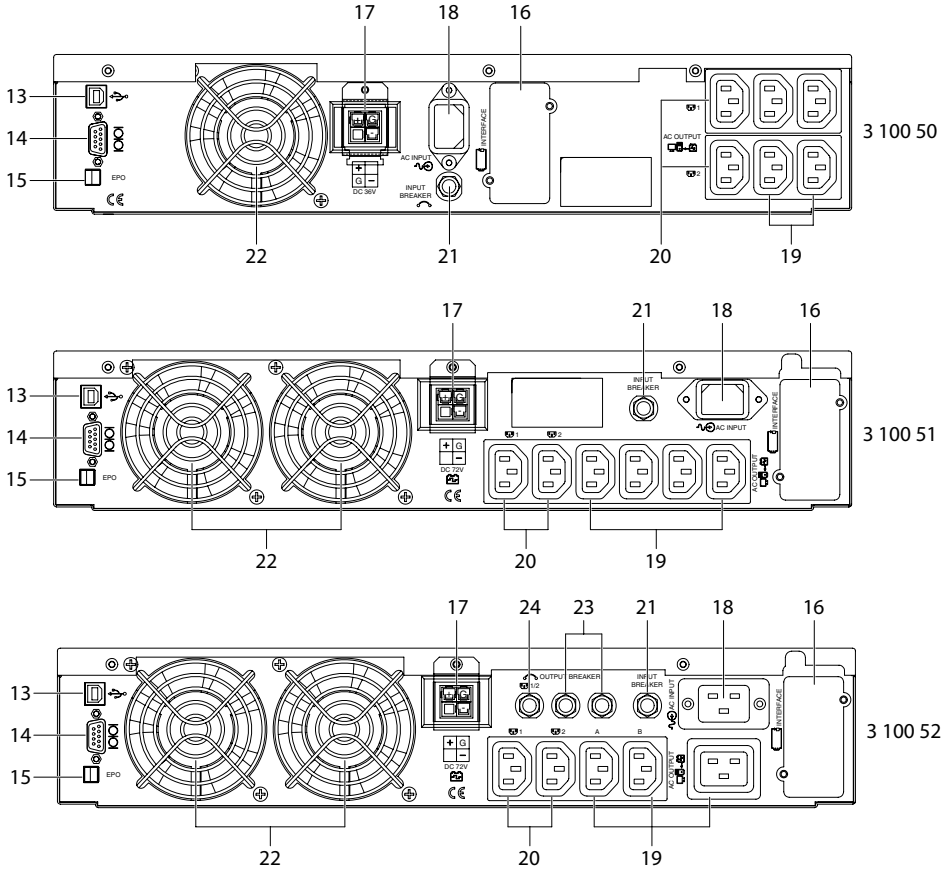


1. LCD Panel
2. The green LED on steady indicates that the power supply network is within the 160-288 Vac range.
- 3-4. The green LEDs indicate that the programmable Outlets 1 and 2 are present.
5. The orange LED indicates that the Bypass is active.
6. UPS alarm LED
7. UPS power on/buzzer silencing pushbutton
8. UPS power off pushbutton
9. Special functions access menu pushbutton, log in/out
10. Following screen selection pushbutton
11. Previous screen selection, or settings change pushbutton
12. Selection confirmation pushbutton

#### Display LCD symbols

| Item | Symbol  | Description                                    |
|------|---|--|
| 1    | <b>LINE</b>   | Line source                                    |
| 2    |    | Low battery level                              |
| 3    |    | Battery damaged                                |
| 4    |    | Overload                                       |
| 5    |    | Earth connection error                         |
| 6    |    | Service Mode operation                         |
| 7    | <b>OFF</b>  | UPS off  |
| 8    | <b>FAIL</b>   | UPS alarm                                      |
| 9    |    | UPS operation diagram                          |
| 10   |    | Measurements display                           |
| 11   |  | It indicates which parameter is being measured |
| 22   | <b>Er05</b>   | Battery insufficient or needing replacing      |
| 23   | <b>Er06</b>   | Short circuit on the output                    |
| 24   | <b>Er10</b>   | Excessive inverter current                     |
| 25   | <b>Er11</b>   | Overtemperature                                |
| 26   | <b>Er12</b>   | Overload on the output                         |
| 27   | <b>Er**</b>   | Other Alarms                                   |

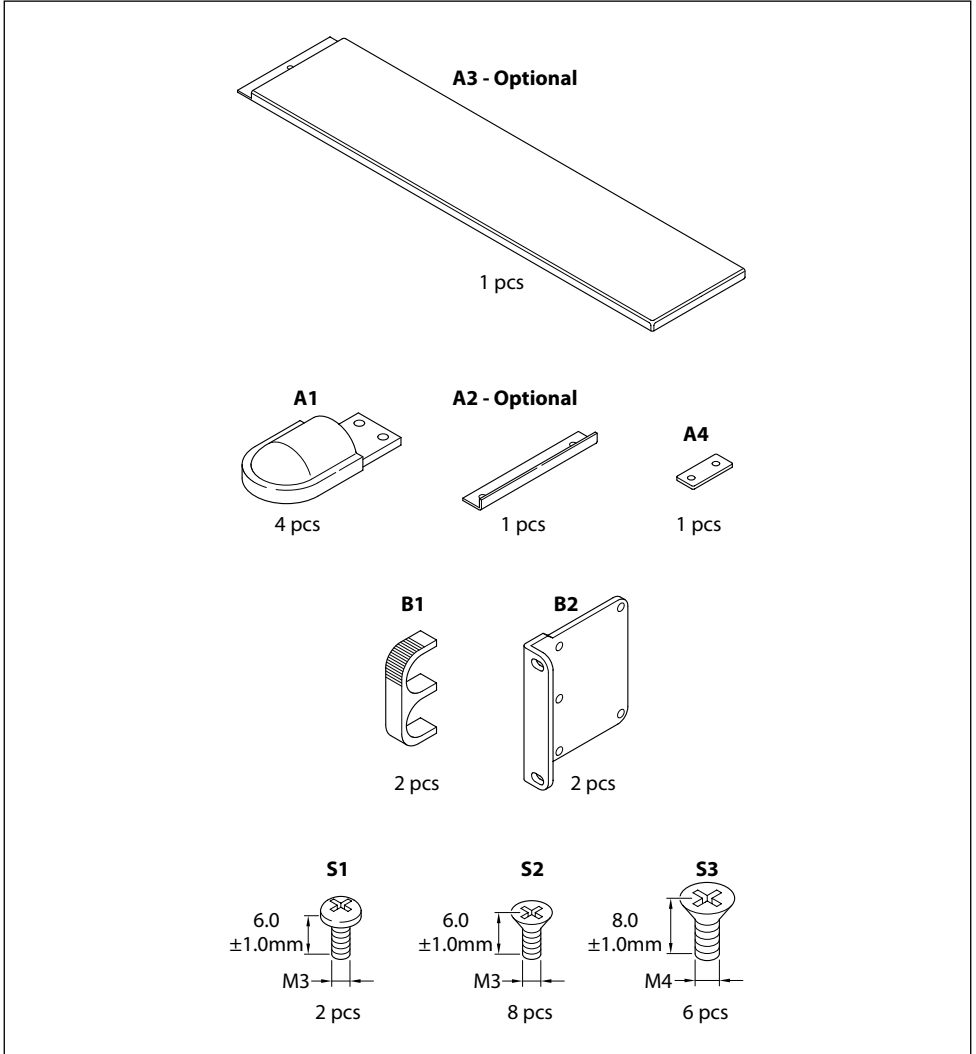
## Rear panel 230V



- |   |   |
|---|---|
| 13. USB Port  | 19. AC Outlets  |
| 14. RS-232 Port   | 20. Two programmable outlets                            |
| 15. Emergency Power Off (EPO) Dry Contact Signal inputs | 21. Utility Input circuit breaker                       |
| 16. Communication Card Options Slot                     | 22. Cooling Fans  |
| 17. External Battery Connector                          | 23. Output circuit breaker for two outlets              |
| 18. AC power connection socket                          | 24. Output circuit breaker for two programmable outlets |

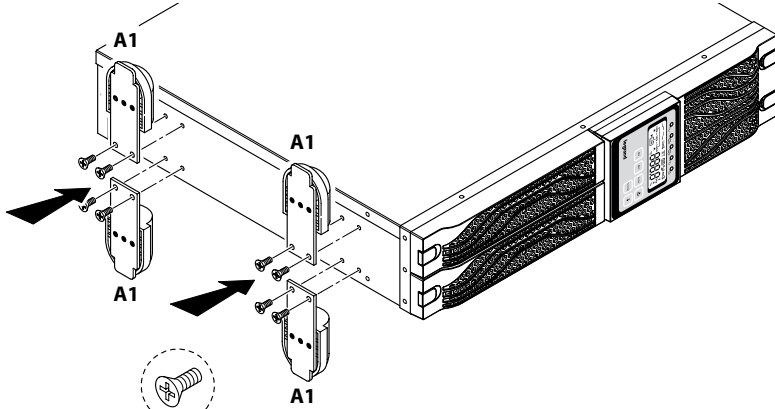
Check for the following standard package contents:

- User Manual
- 2 IEC output cables (for UPS with IEC sockets only)
- detached AC Input Power cable (for UPS with IEC sockets only)
- RS-232 communication cable
- USB communication cable
- Tower/Rack Accessories Kit as below:

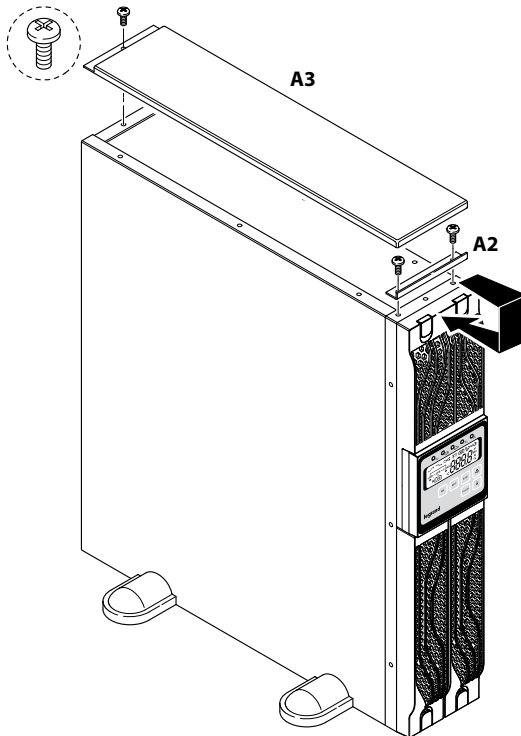


## Tower configuration setup

Step 1

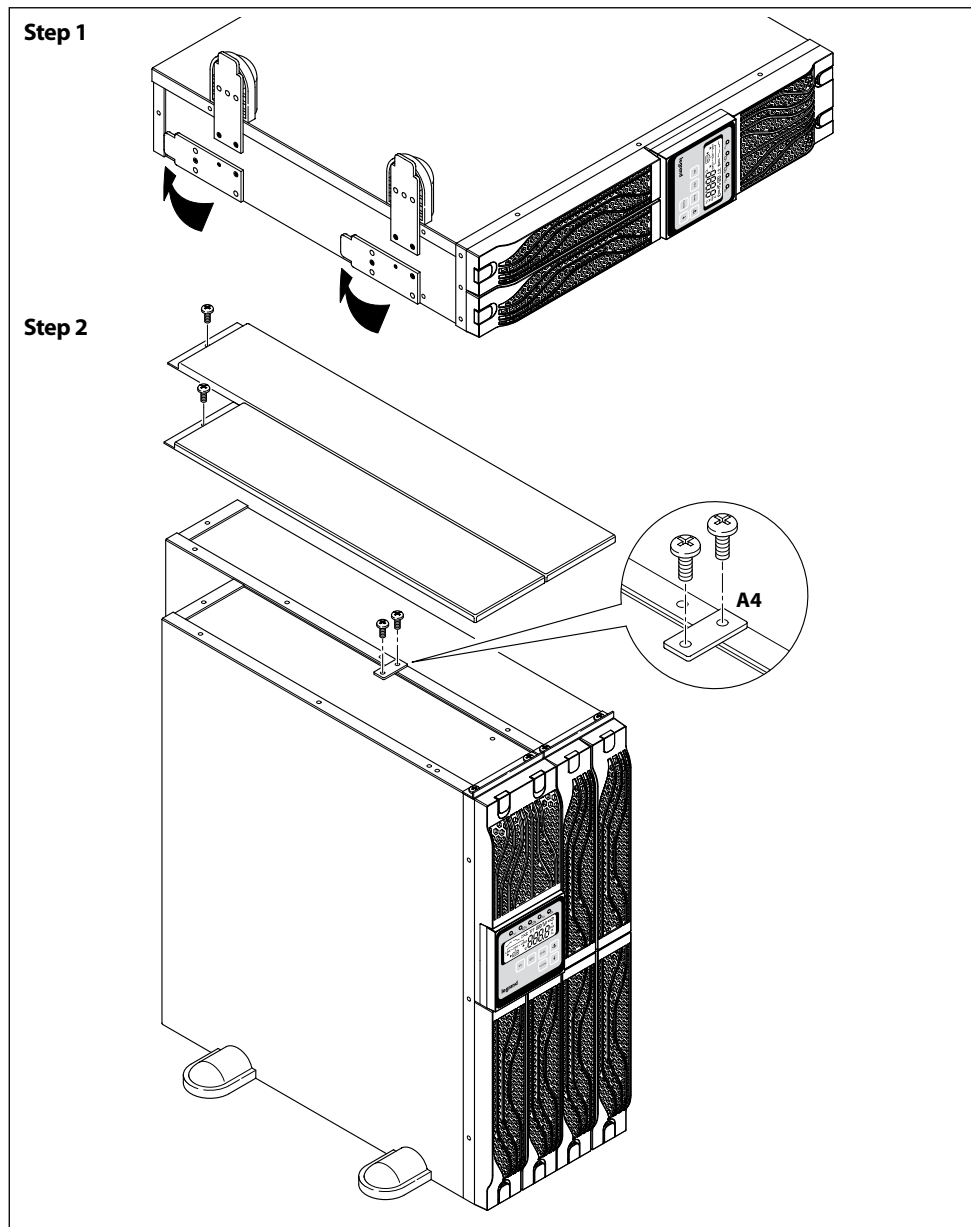


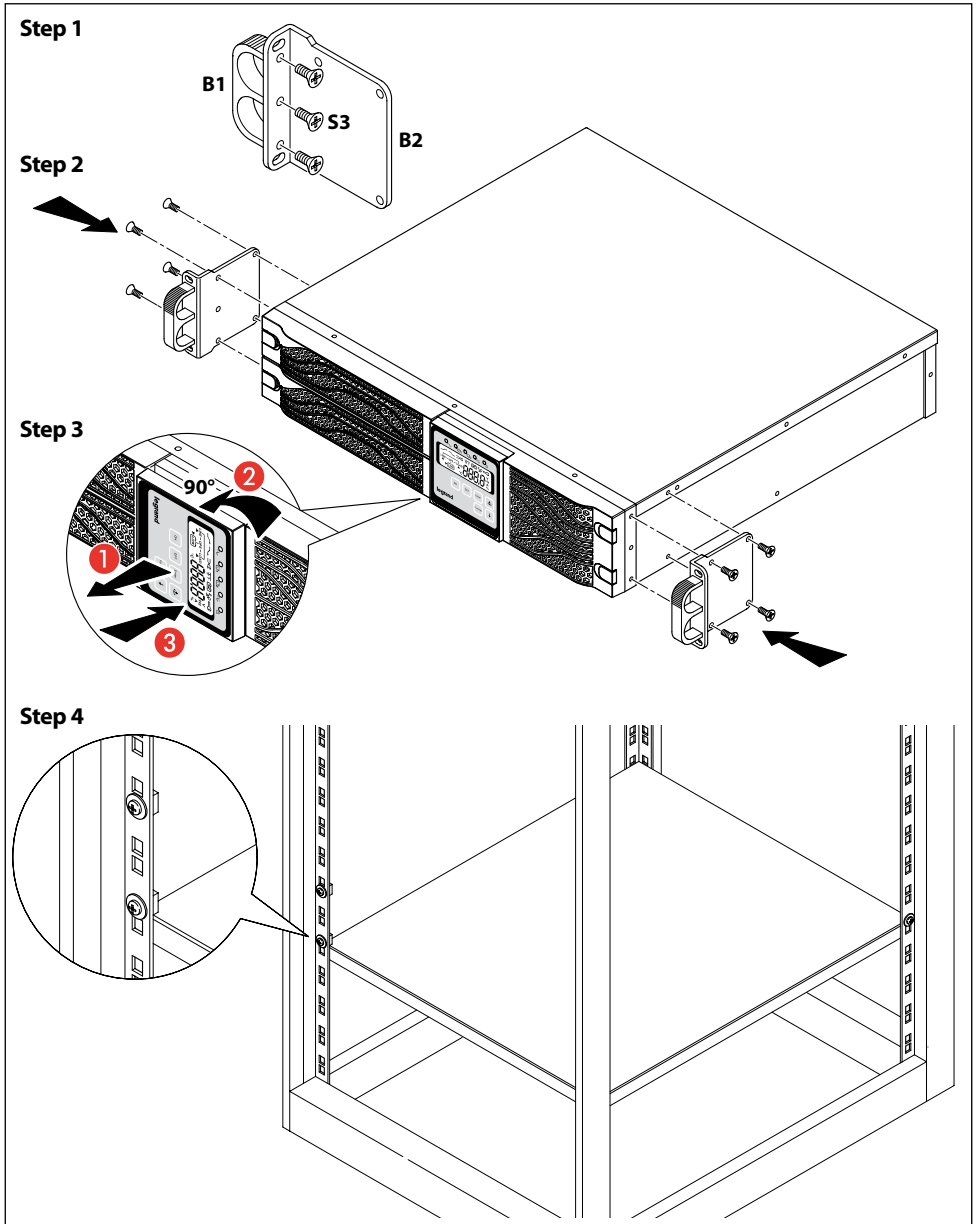
Step 2



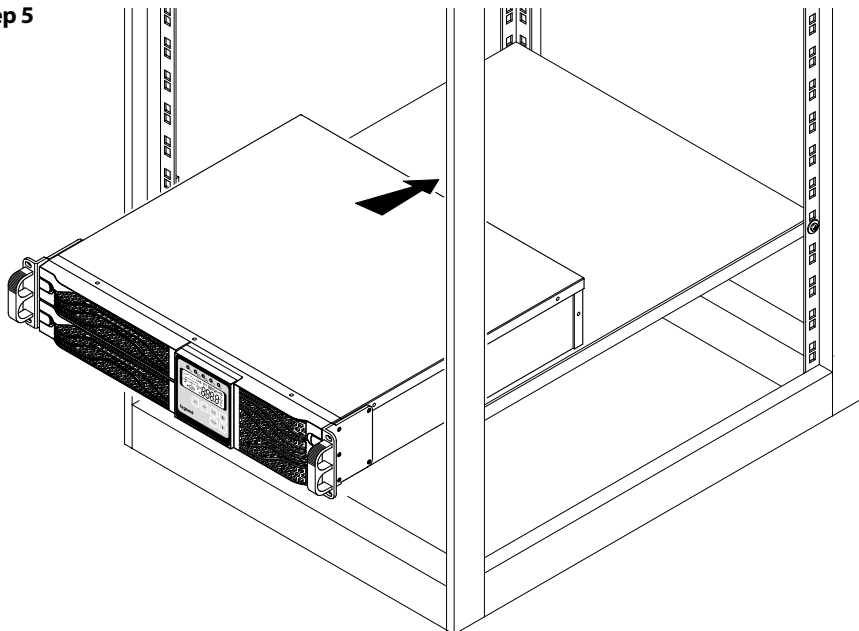


**UPS + battery cabinet (optional)**

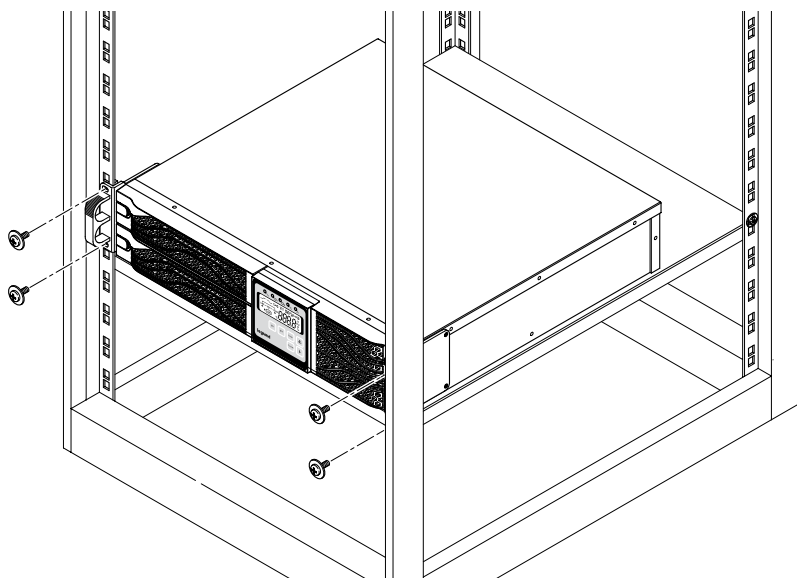




**Step 5**



**Step 6**



On the rear of the uninterruptible power supply are the following connections:

- Output sockets [19] input connector [18]: connect to these connectors the power cable and the output cables included.
- Socket for connecting computer serial interface RS232 (9 female pins) [14]: required when using the diagnostic and shutdown management software.
- Socket for USB interface connection [13]: to be used when connecting the UPS using a USB cable.
- Presetting for the connection of additional batteries [17].



## WARNING

For safety reasons it is advised not to modify the cables supplied; it is also necessary to make sure that the mains socket the uninterruptible power supply is connected to is fitted with a safe connection to the earth system, and appropriate protection in accordance with current regulations.




## WARNING

The mains supply socket, or the disconnection device, must be installed nearby the equipment, and must be easily accessible.


## Proceed to the installation as follows:

- 1) Position the uninterruptible power supply so that the vents are not obstructed.
- 2) Connect the input connector [18], the power cable, and the output cables to the appropriate connectors [19].
- 3) Connect the loads to the output cables, ensuring that the switches of the various users are off.
- 4) Connect the power supply plug to a power socket with suitable voltage and current.

## Start

- 1) Switch on the power breaker [ 21 ] of the distribution panel. Then the UPS will start up. Green LEDs  $\sim^1$ , and  $\sim^2$  and show that the Utility and Bypass inputs are normal. The LCD will display OFF after few seconds.
- 2) The UPS is in Bypass Mode now. It will proceed to self-test automatically. If no abnormal message appears then the pre-startup of the UPS was successful and the charger starts to charge the batteries.
- 3) Press the UPS On Switch  [ 7 ] for approximately three seconds. The Buzzer sounds twice and the LCD display changes from previous status to RUN mode.
- 4) The UPS is in self-test mode again. The LCD display will show TEST and the UPS will remain in battery mode for approximately four seconds.
- 5) If the self-test fails an error code or error status will appear on the screen.
- 6) Your start-up operation of the UPS is complete now. Make sure the UPS is plugged into the wall receptacle for charging at least 8 hours and the batteries are fully charged before connecting the device to be protected.

### Shutdown


- 7) Press the Off  [ 8 ] key for five seconds. The Inverter output will be turned off, and the output load will be supplied by the Bypass loop.
- 8) Turn Off the Input breakers.
- 9) The UPS is now turned off completely.

### Special functions

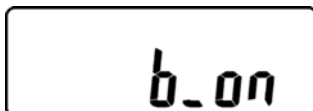
The UPS has two programmable outputs for the less critical loads. These sockets may be disabled or timed, during battery operation, to ensure quality power supply for the more critical loads.

To access both this and other functions download the “UPS Setting tool” free of charge from the [www.ups.legrand.com](http://www.ups.legrand.com) website.

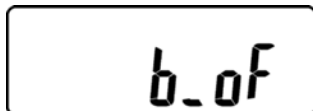
### UPS Default Data and Special Function Execution


- 1) After the UPS is turned on successfully press the Special Functions button  to change the LCD to figure **P1**.

P1

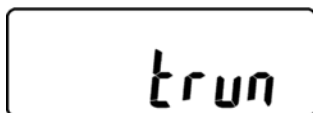


P2

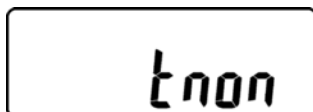


- 2) Press the  key to scroll through the UPS settings. The LCD will display in sequence: figure **P1** (buzzer) → figure **Q1** (self test) → figure **R1** (Bypass Voltage) → figure **S** (Output Frequency Synchronized Window) → figure **T** (Inverter Output Voltage) → figure **U1** (UPS Operation Mode) → figure **V** (Output Voltage Fine Tuning).

Q1



Q2



R1

5. Lo

R2

5. HI

S

51.03 Hz

T

0220 V

U1

norL

U2


cF50 Hz

U3

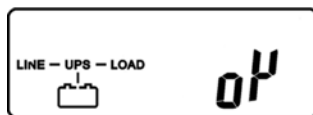
cF60 Hz

V







0A 0%

- 3) Press the scroll up  key to execute special functions. The functions include Buzzer ON (figure P1), Buzzer OFF (figure P2, Alarm silence for UPS warning), and self-test ON (figure Q1) or OFF (figure Q2). The UPS will execute the battery test for ten seconds. If the self-test is successful it will display figure W; otherwise it will display figure D and an error message at the same time.

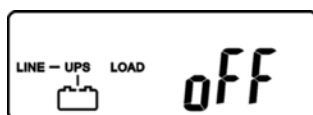
W



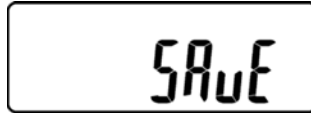
### UPS Default Settings and Their Alternatives

- 1) Make sure the UPS is not "ON", i.e., that it is not in Line Mode or Backup Mode. Press the  button and scroll down  button simultaneously for approximately three seconds. The buzzer will sound twice, and the LCD will display figure P1, indicating that the UPS is in setting mode.
- 2) To scroll through the options use the scroll up  and scroll down  buttons.
- 3) Except for Buzzer (figures P1 and P2) and Self-test (Q1 and Q2) all of the other default settings may be changed by pressing the scroll up key .
- 4) Figures R1 and R2 indicate the bypass input acceptable window. It can be 180-260 VAC for 220 VAC systems, 90-130 VAC for 110 VAC systems, 194-260 VAC for 220 VAC systems, or 97-130 VAC for 110 VAC systems.
- 5) Figure S indicates the bypass frequency window of the inverter output. The acceptable settings are  $\pm 3$  Hz and  $\pm 1$  Hz.
- 6) Figure T indicates the acceptable Inverter Output Voltage. Possible values are 200, 208, 220, 230, and 240 V for 220 VAC systems, and 100, 110, 115, 120, and 127 V for 110 VAC systems.
- 7) Figures U1, U2 and U3 indicate the operation modes of the UPS. Possible values are Online, fixed 50 Hz Output, and fixed 60 Hz Output.
- 8) Figure V indicates the adjustment of the Inverter Output, which may be set to 0%, +1%, -1%, +2%, -2%, +3%, or -3%.
- 9) After changing settings you must press the enter key  to save all the changes when the LCD displays figure X. The changes will be activated only after the UPS is powered off and then powered back on. The LCD screen will be back to the original screen before setting. After you cycle the power the LCD will display the original screen that was displayed before changing the settings (figure B).

B



X



- 10) Turn off the UPS and the utility input breaker.
- 11) Your setting changes are now complete.

## Connection

The UPS has standard RS232 and USB interfaces that provide access, through a processor, to a range of data for the operation and the history of the UPS.

This function can be accessed through a WINDOWS (\*) interfacing program, connecting a serial port of the PC to the interface sockets [indicate the reference number] that can be found on the back of the UPS using an RS232 or USB cable.

## 5 UPS communicator self-diagnostic software

From the website [www.ups.legrand.com](http://www.ups.legrand.com) it is possible to download free of charge a self-diagnostic software running on WINDOWS (16 e 32 bit) e Linux platforms.

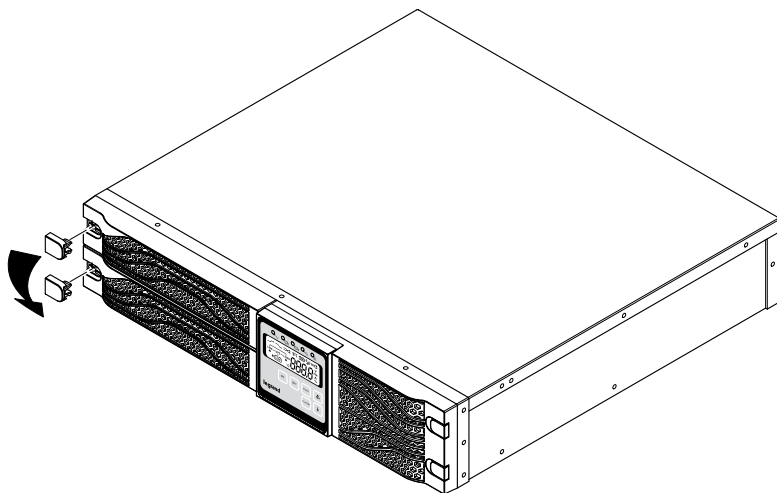
This software can be used for the following functions:

- Display of all the operation and diagnostic data in case of problems.
- Setup of special functions.
- Automatic shutdown of the local computer (Windows and Linux operating systems).

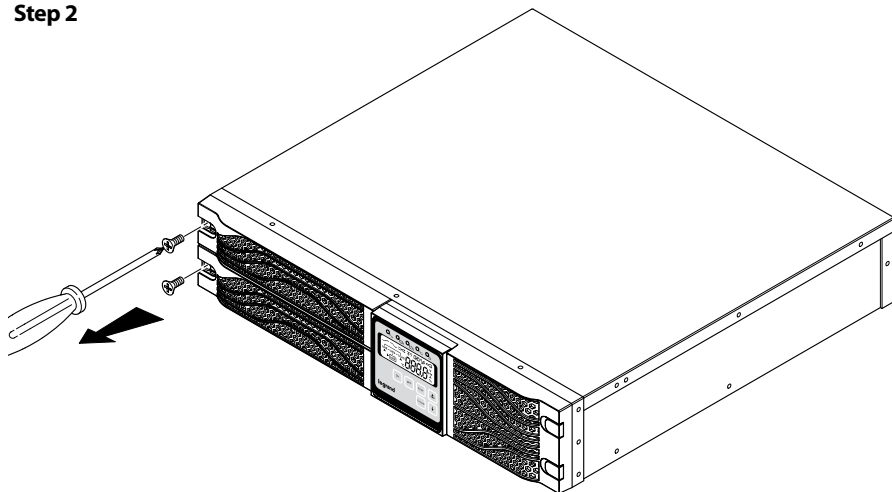
\* Windows is a registered trademark of Microsoft Corporation.



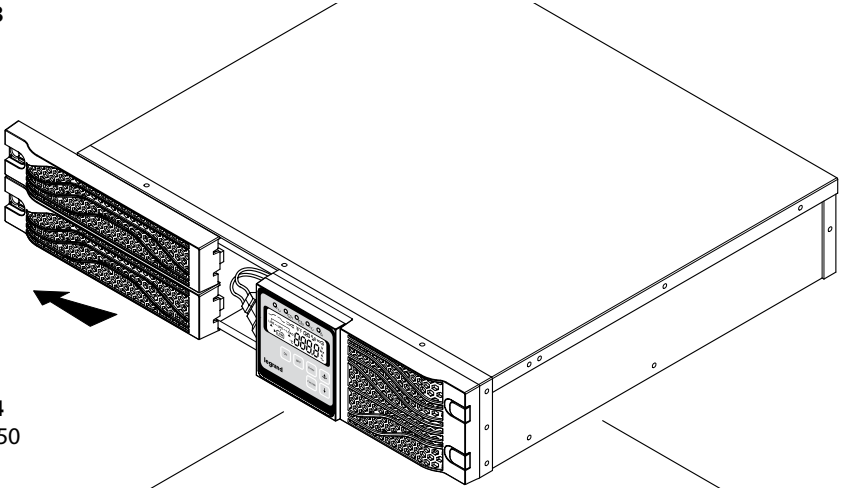
**Step 1**



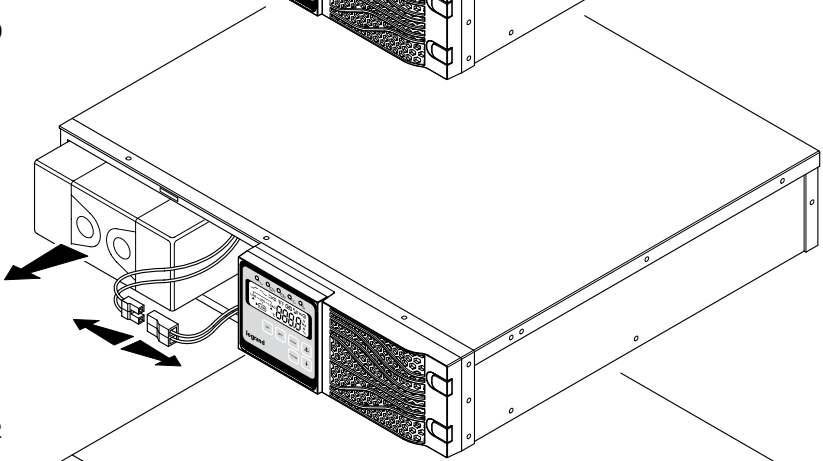
**Step 2**



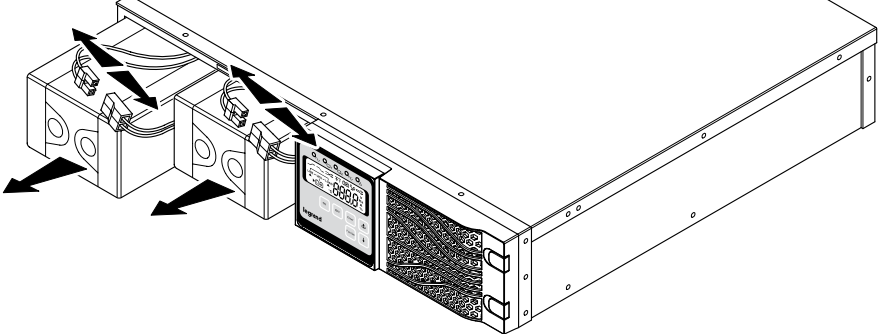
## Step 3



## Step 4 3 100 50



## Step 4 3 100 51 3 100 52



## 7 Possible malfunctioning

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The UPS always operates on batteries:

- There is no line voltage
- Line voltage is out of allowed UPS range
- The power supply cable is not correctly connected to mains socket.
- The input circuit breaker has to be reset
- The mains socket is defective

The UPS signals overloading:

- Additional loads to the ones normally connected have involuntarily been connected on the output line.
- Check all the loads connected to the output

The UPS doesn't 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 6 hours by connecting the uninterruptible power supply 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 uninterruptible power supply to the mains.
- The battery has run down due to being used frequently, to ambient conditions, or to having exceeded its average service life; it is necessary to change it.

The UPS doesn't deliver power to the output:

- Check that the loads are correctly connected to the output sockets

## 8 Technical features

| CONSTRUCTION SPECIFICATIONS                | 3 100 50  | 3 100 51       | 3 100 52       |
|--|---|----------------|----------------|
| Weights                                    | 16 Kg   | 29,5 Kg        | 30 Kg          |
| Dimensions L x H x P in mm                 | 440 x 88 x 405  | 440 x 88 x 650 | 440 x 88 x 650 |
| Protection                                 | Electronic protection against overloading and short-circuiting. Shutdown on reaching operating limit and overheating. Automatic shutdown due to protection triggering |                |                |
| <b>Ambient specifications</b>              |   |                |                |
| Operating temperature range                | from 0 to +40 °C  |                |                |
| Operating relative humidity range          | from 20 to 80% non-condensing   |                |                |
| Degree of protection as per IEC529         | IP20  |                |                |
| Noise level at 1 meter                     | < 50 dBA  |                |                |
| <b>Electrical input specifications</b>     |   |                |                |
| Rated input voltage                        | 230 V   |                |                |
| Range of input voltage                     | from 160 V to 288 V   |                |                |
| Rated input frequency                      | 50 or 60 Hz ± 5Hz   |                |                |
| Maximum input current                      | 5,2 Arms  | 10,4 Arms      | 15 Arms        |
| Number of input phases                     | Single phase  |                |                |
| <b>Waveform on output</b>                  |   |                |                |
| With battery operation                     | sinusoidal  |                |                |
| Type of operation                          | on line - double conversion   |                |                |
| <b>Electrical specifications on output</b> |   |                |                |
| Rated output voltage                       | 230 V ± 1%  |                |                |
| Active output capacity on nominal load     | 800W  | 1,6 kW         | 2,4 kW         |
| Apparent output capacity on nominal load   | 1kVA  | 2 KVA          | 3 KVA          |
| Overload capacity                          | 105% continuous<br>120% for 30 seconds<br>150% for 10 seconds   |                |                |
| Number of phases on output                 | Single phase  |                |                |

## 8 Technical features

| CONSTRUCTION SPECIFICATIONS                                       | 3 100 50  | 3 100 51  | 3 100 52   |
|---|---|---|--|
| <b>Electrical specifications on output with battery operation</b> |   |   |  |
| Rated output voltage  | 230 V $\pm$ 1%  |   |  |
| Output frequency  | 50/60 Hz $\pm$ 0.1%   |   |  |
| Active output capacity on non-linear load                         | 800W  | 1,6kW   | 2,4kW  |
| Apparent output capacity on non-linear load                       | 1kVA  | 2kVA  | 3kVA   |
| <b>Battery operation</b>  |   |   |  |
| Operating time  | 10 min.   | 10 min.   | 8 min.   |
| Charging time   | 4-6 hours at 80% of the charge                                      |   |  |
| Technical data and number of batteries                            | n°3<br>maintenance-free,<br>sealed, lead<br>battery<br>12V<br>7.2Ah | n°6<br>maintenance-free,<br>sealed, lead<br>battery<br>12V<br>7,2Ah | n°6<br>maintenance-free, sealed,<br>lead-acid<br>battery<br>12V<br>9Ah |
| <b>Standards</b>  |   |   |  |
| Electromagnetic compatibility<br>Emission - Immunity              | Conforms to EN 62040 - 2  |   |  |
| Safety  | Conforms to EN 62040 -1   |   |  |
| Performance and features  | Conforms to EN 62040 -3   |   |  |



### NOTICE

The batteries are considered hazardous waste and should be disposed of in accordance with current regulations.