Pulsar Evolution

1500 /1500 Rack
1100 /1100 Rack
800 /800 Rack
500 Rack

Installation and user manual

NOTHING WILL STOP YOU NOW

MGE
UPS SYSTEMS

Introduction

Thank you for selecting an MGE UPS SYSTEMS product to protect your electrical equipment.

The **Pulsar Evolution** range has been designed with the utmost care. We recommend that you take the time to read this manual to take full advantage of the many features of your UPS.

MGE UPS SYSTEMS pays great attention to the environmental impact of its products. Measures that have made **Pulsar Evolution** a reference in environmental protection include:

- the eco-design approach used in product development,
- recycling of **Pulsar Evolution** at the end of its service life.

To discover the entire range of MGE UPS SYSTEMS products and the options available for the **Pulsar Evolution** range, we invite you to visit our web site at **www.mgeups.com** or contact your MGE UPS SYSTEMS representative.

Important: before installing and using the UPS, always read the safety instructions (document n° 3400722200).

Foreword

Using this document

Information may be found in two ways, using:
- the contents;
- the index.

Pictograms

Important instructions that must always be followed.

Information, advice, help.

Visual indication.

Action.

Audio indication.

In the illustrations on the following pages, the symbols below are used:

LED off.

LED on.

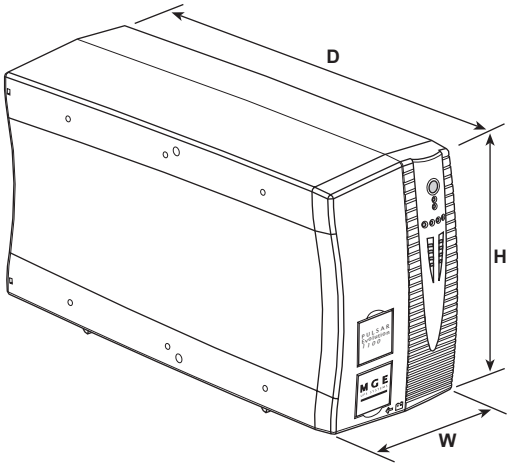
LED flashing.

Contents

Contents

1.1 Overall view

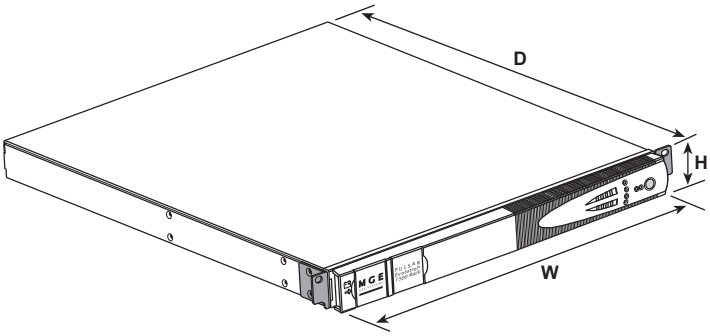
Tower models



	Dimensions in mm (W x H x D)
Evolution 800	150 x 237 x 415
Evolution 1100	150 x 237 x 415
Evolution 1500	150 x 237 x 483

	Weight in kg
Evolution 800	10.5
Evolution 1100	11.5
Evolution 1500	15

Rack models



	Dimensions in mm (W x H x D)
Evolution 500 Rack	438 x 43.5 x 353
Evolution 800 Rack	438 x 43.5 x 499
Evolution 1100 Rack	438 x 43.5 x 499
Evolution 1500 Rack	438 x 43.5 x 522 (19") (1U)

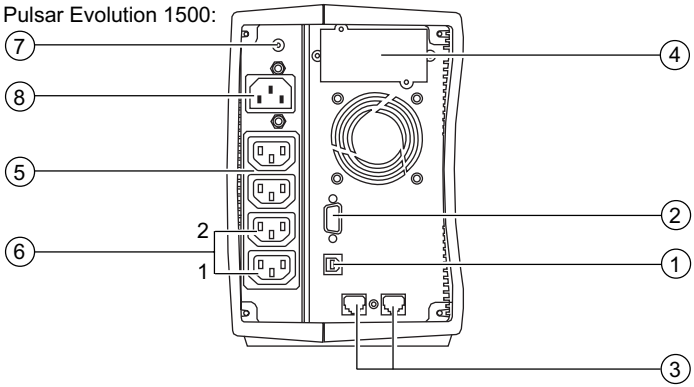
	Weight in kg
Evolution 500 Rack	9
Evolution 800 Rack	15.5
Evolution 1100 Rack	16
Evolution 1500 Rack	19

1. Presentation

1.2 Back

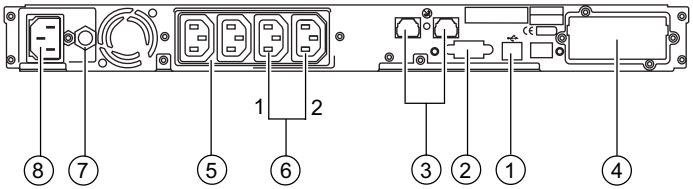
Pulsar Evolution 800 / 1100 / 1500

Pulsar Evolution 1500:

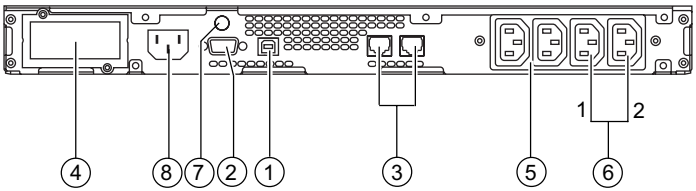


1. USB communications port.
2. RS232 communications port.
3. Data-line protection.
4. Slot for communications-card option.
5. Outlets for direct connection of protected equipment.
6. Programmable outlets (1 and 2).
7. Input circuit-breaker.
8. Socket for connection to AC-power source.

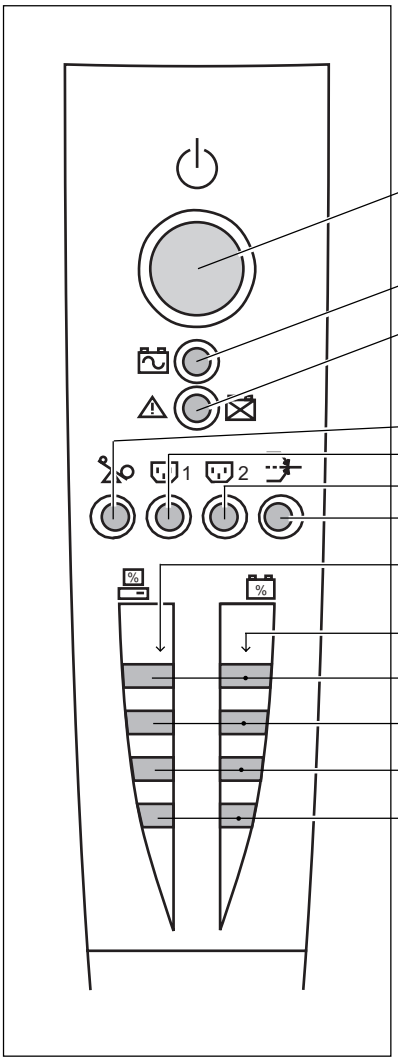
Pulsar Evolution 500 / 800 / 1100 Rack



Pulsar Evolution 1500 Rack



1.3 Control panel



(10) Illuminated ON/OFF button for the outlets.

(11) Operation on battery power.

(12) UPS fault.

Battery fault.

(13) Overload.

(14) Group 1 programmable outlets supplied with power.

(15) Group 2 programmable outlets supplied with power.

(16) Booster or fader mode.

(17) Bargraph indicating percent load at output.

(18) Bargraph indicating the battery charge level.

76 to 100%.

51 to 75%.

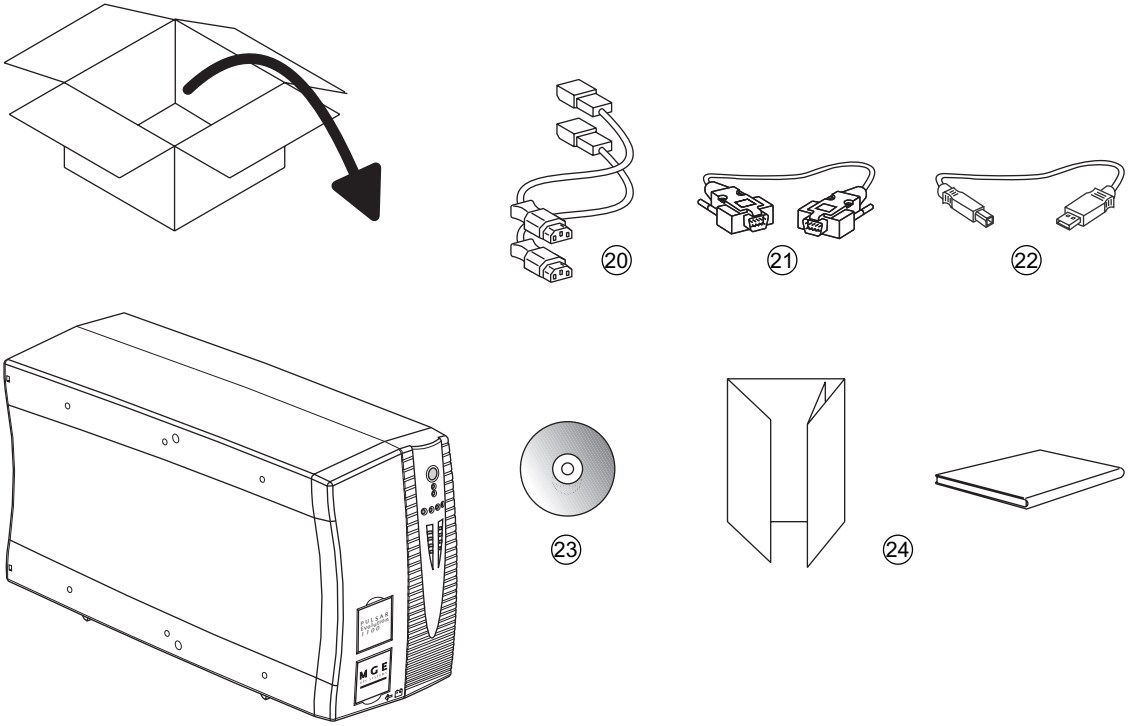
26 to 50%.

0 to 25%.

2. Installation

2.1 Unpacking and parts check

Tower models



⑳ Two cords for connection of the protected equipment.

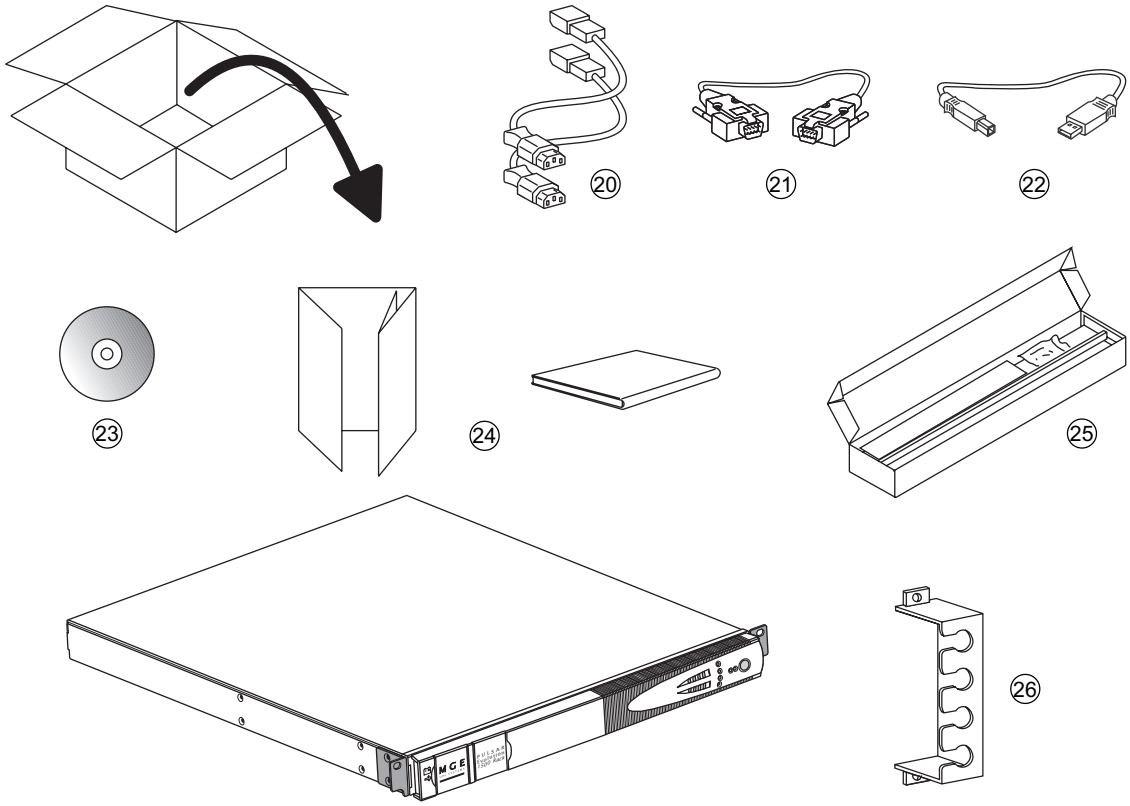
㉑ RS232 communications cable.

㉒ USB communications cable.

㉓ CD-ROM with the Solution-Pac and UPS Driver software.

㉔ Product documentation.

Rack models



20 Two cords for connection of the protected equipment.

21 RS232 communications cable.

22 USB communications cable.

23 CD-ROM with the Solution-Pac and UPS Driver software.

24 Product documentation.

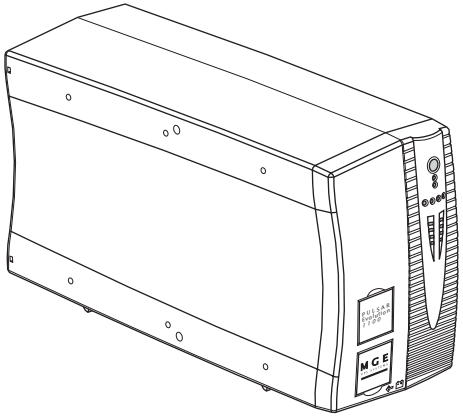
25 Telescopic rails for mounting in 19" bay with mounting hardware.

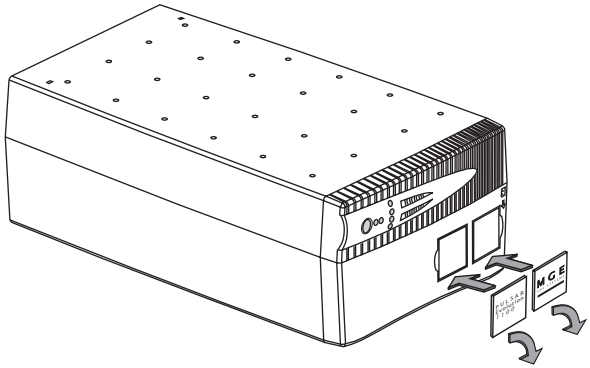
26 Securing system for equipment power cords.

2. Installation

2.2 Installation

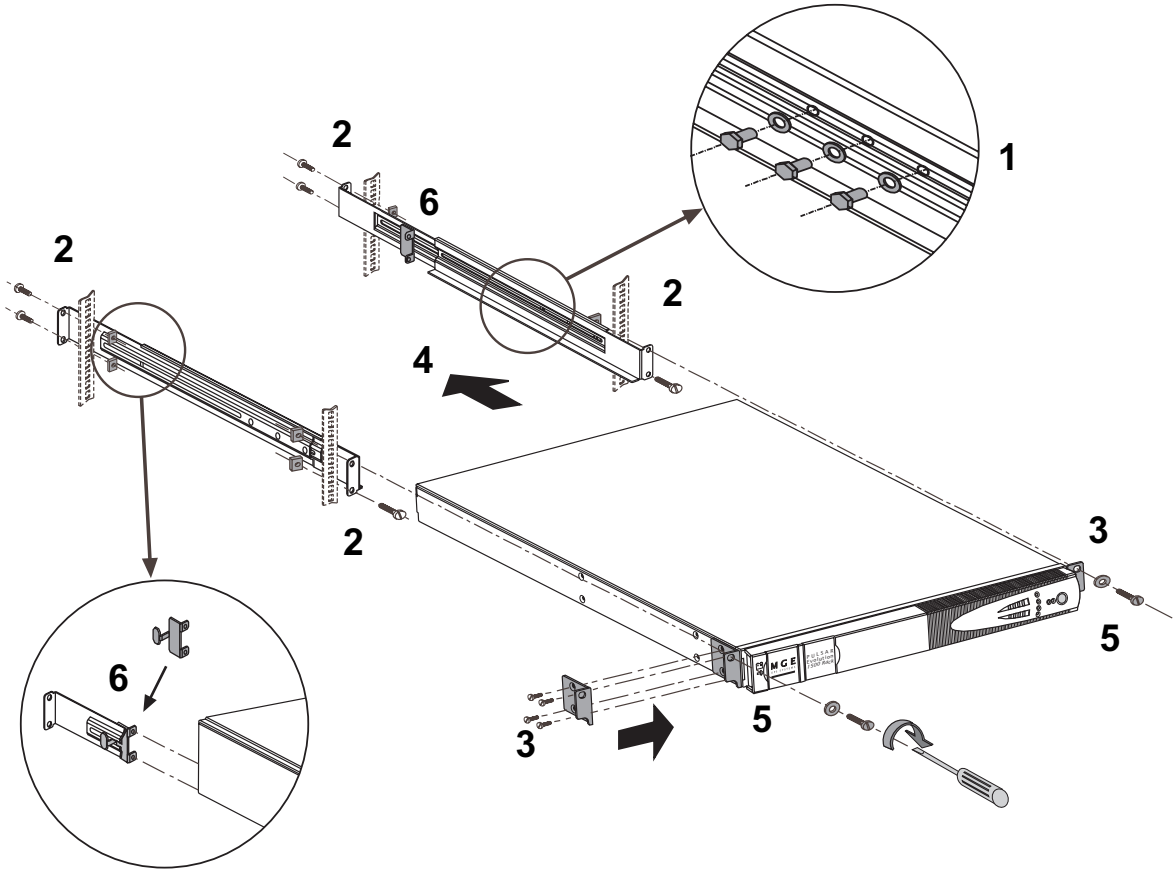
Tower models





800/1100/1500 Rack models

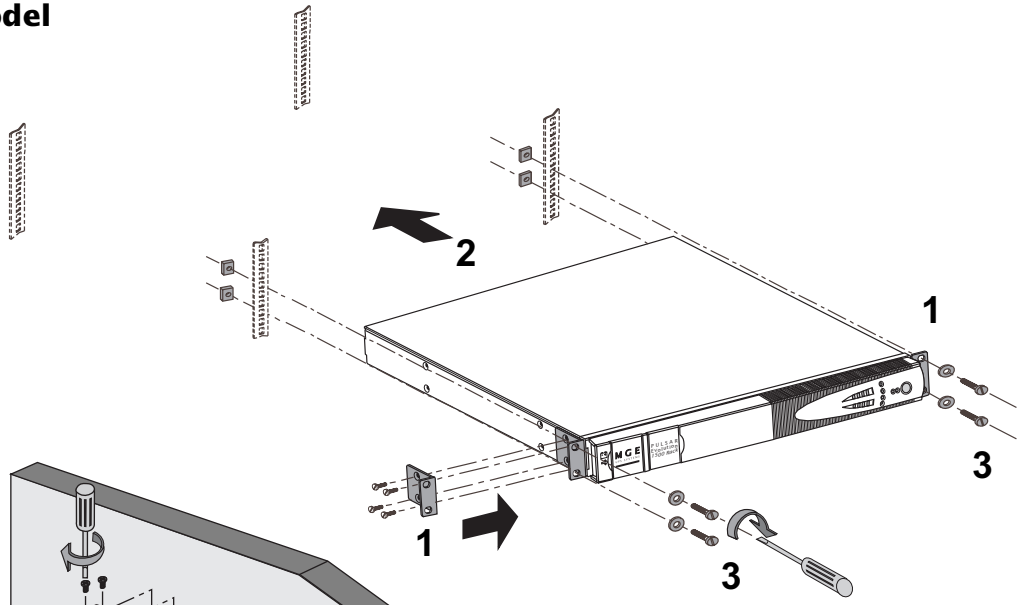
Follow steps 1 to 6 for rack mounting of the UPS on the rails.

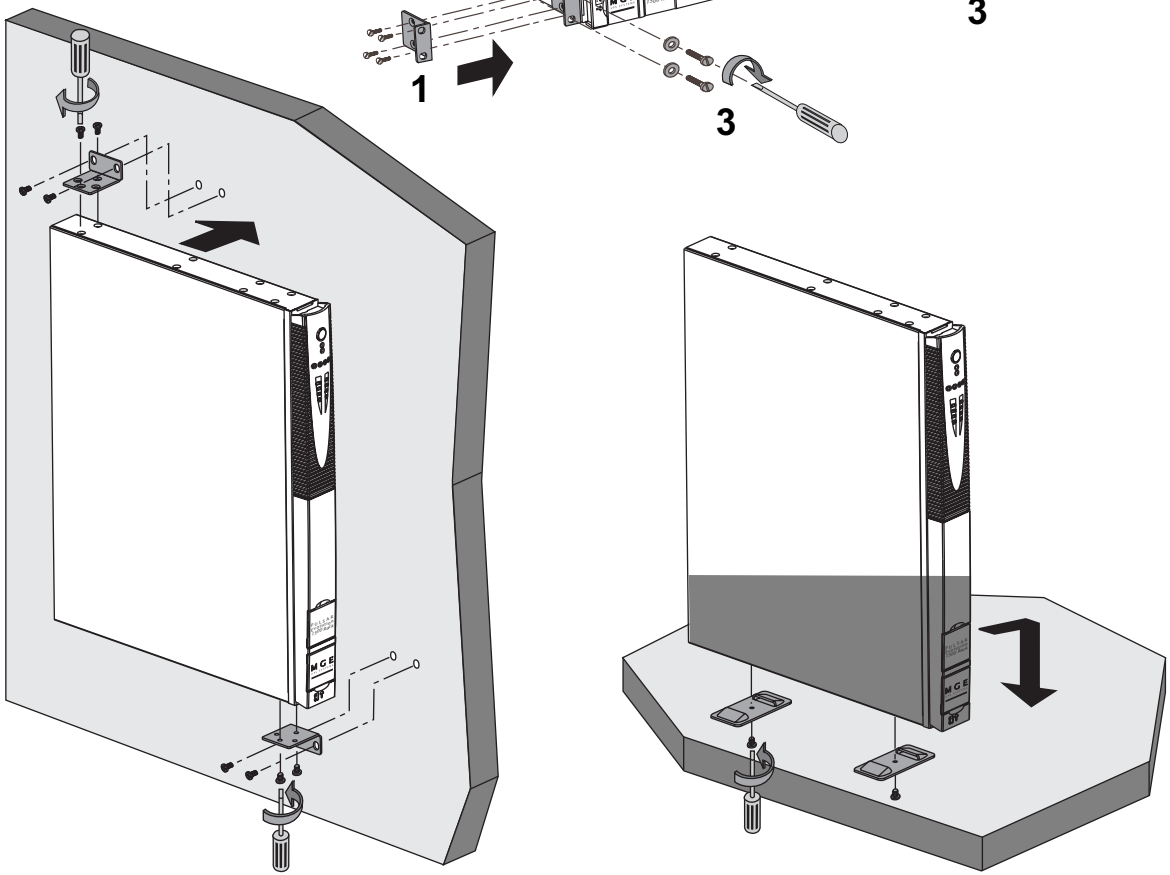


The rails and the necessary mounting hardware are supplied by MGE UPS SYSTEMS.

2. Installation

500 Rack model

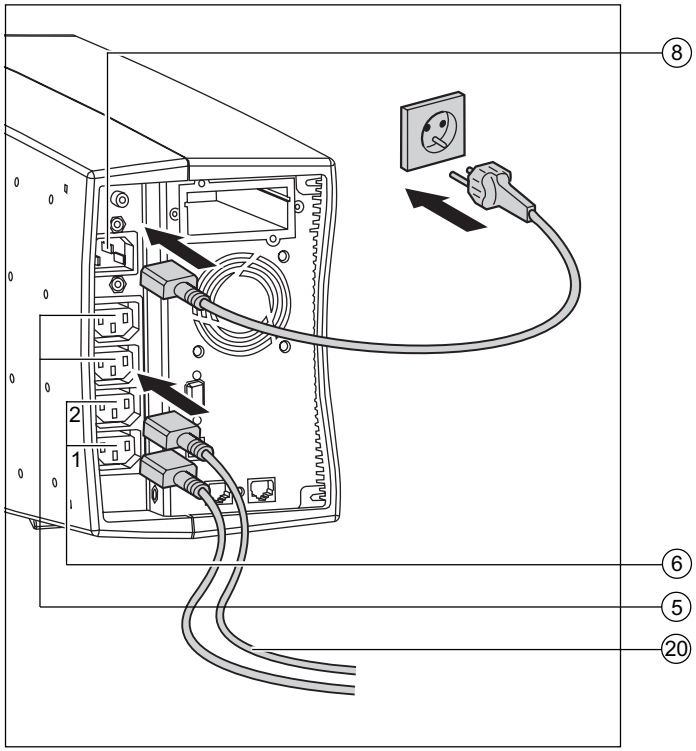




2.3 Connecting the protected equipment

A **Pulsar Evolution 1500 tower** UPS has been used below to illustrate the instructions. The principle is the same for all the other tower and rack models.

Check that the indications on the rating plate on the back of the UPS correspond to your AC-power system and to the actual electrical consumption of all the equipment to be connected to the UPS.



1 - Remove the power cord supplying the equipment to be protected.

2 - Connect the power cord (1) just removed from the equipment to the AC-power socket (8), and then to the AC-power wall outlet.

3 - Connect the protected equipment to the UPS using the two cords (20).
Connect priority loads to the two standard outlets (5) and any non-priority loads to the two programmable outlets (6) (1 and 2).

If the UPS is connected to a computer running MGE communications software, it is possible to program the interruption of power to the programmable outlets (6) during operation on battery power, thus reserving backup power for the priority loads.

4 - Lock the connections using the securing system (26) (for rack models only).

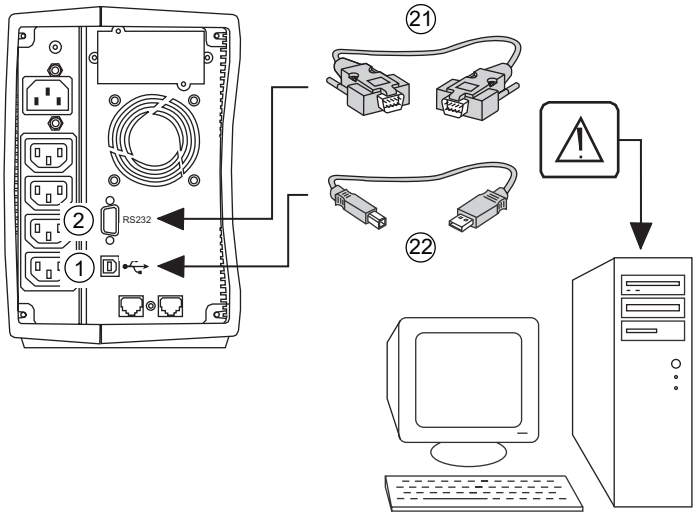
As soon as the UPS is energised, the battery begins charging. Eight hours are required to charge to the full rated backup time.

(1) Make sure the cord has the following characteristics: 250 V, 10 A, cross-sectional area 1 mm^2, type HO5.

2. Installation

A **Pulsar Evolution 1500 tower** UPS has been used below to illustrate the instructions. The principle is the same for all the other tower and rack models.

2.4 Connection to the RS232 or USB communications port (optional)



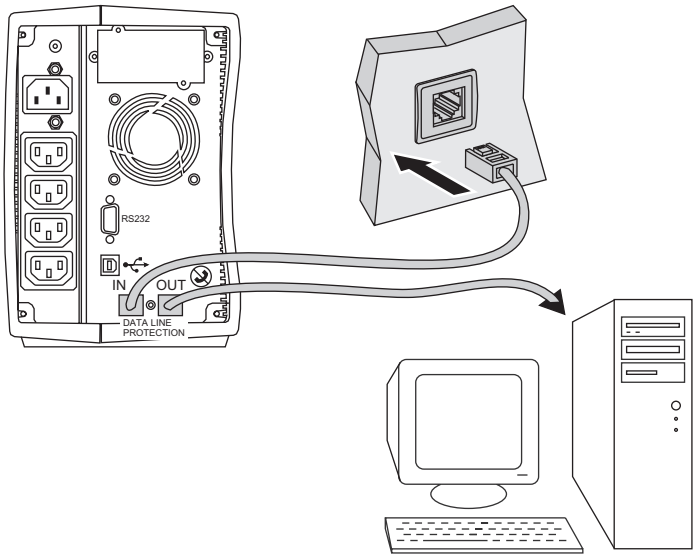
The RS232 and USB communications ports cannot operate simultaneously.

1 - Connect the RS232 (21) or USB (22) communications cable to the serial port or the USB port on the computer.

2 - Connect the other end of the communications cable (21) or (22) to the RS232 (2) or USB (1) communications port on the UPS.

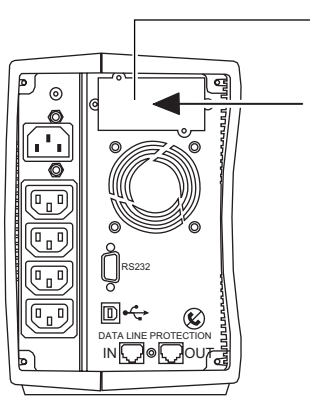
The UPS can now communicate with all MGE UPS SYSTEMS supervision, set-up or safety software.

2.5 Connection to the data-line protection port (optional)



The data-line protection function on the UPS eliminates overvoltages flowing on the computer-network lines.
Simply connect the line to be protected to the UPS using the data-line protection connectors (IN and OUT) as indicated opposite (RJ45 cables not supplied).

2.6 Installation of the communications-card option



1 - Remove the slot cover (4) secured by two screws.

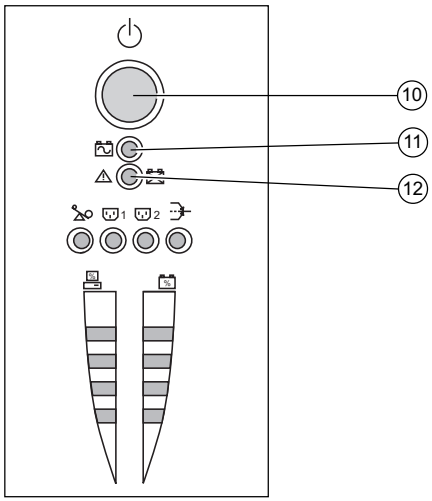
2 - Insert the card in the slot.

3 - Secure the cover with the two screws.

It is not necessary to shut down the UPS to install the communications card.
This operation must be carried out by qualified personnel.

3. Operation

3.1 Start-up

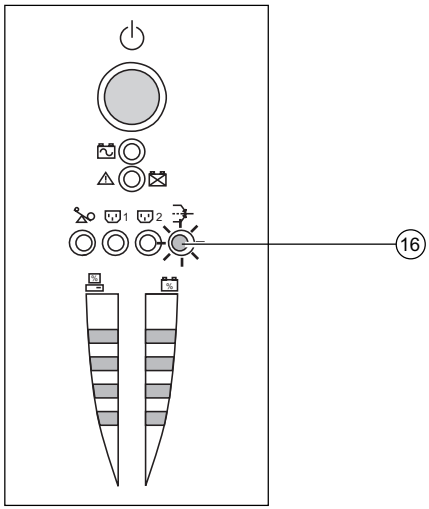


Press the ON / OFF button (10).
The buzzer beeps and all the LEDs come ON.
The buzzer beeps twice during the self-test, then button (10) remains ON, indicating that the outlets are supplied with power.
- **AC power is present**: Only button (10) is ON. The protected equipment is supplied by the AC-power source.
- **AC power is absent**: Button (10) and LED (11) are ON. The protected equipment is supplied by the UPS, operating on battery power.

All the connected equipment is supplied with power.

If button (10) or LED (11) are not ON or if LED (12) is ON, there is a fault (see section 4.1).
Note: The battery is charged as soon as the UPS is connected to the AC-power source, even if button (10) is in the OFF position.

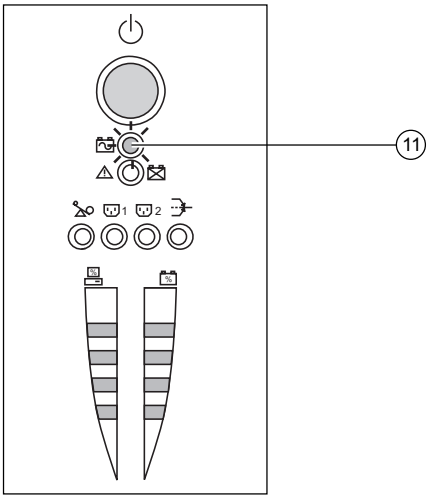
3.2 Shift to booster or fader mode
(during voltage variations in the AC-input power)



The booster and fader functions maintain the output voltage supplied by the UPS within close tolerances around the rated value even if significant voltage variations occur in the AC-input power. This avoids calling on battery power.
The values defining the voltage range may be set using the UPS Driver software.
During operation in booster or fader mode, LED (16) is ON, signalling a significant voltage variation in the AC-input power.

3.3 Operation on battery power (following failure of AC-input power)

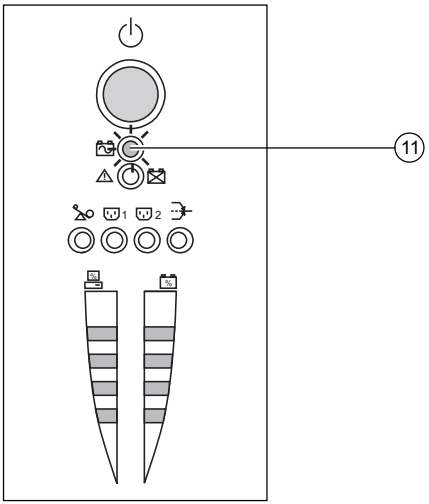
Transfer to battery power



The AC-input power is out of tolerances, LED (11) goes ON.
During operation on battery power, the buzzer beeps every ten seconds.

The equipment connected to the UPS is supplied by the battery.

Threshold for the low-battery warning



When the threshold is reached, the buzzer beeps every three seconds.
The low-battery warning threshold can be set by the user, with the “UPS Driver” software.

There is very little remaining battery backup time. Close all applications because UPS automatic shutdown is imminent.

When the battery reaches the end of its backup time, the UPS shuts down and all the LEDs go OFF.

The equipment is no longer supplied with power.

The UPS automatically restarts when power returns.
If the UPS does not restart, check that the “automatic restart when power returns” function has not been disabled (see section 3.4 Personalisation).

3. Operation

3.4 Personalisation (optional)

Function

Personalisation parameters can be set and modified using the UPS Driver software installed on a computer that is connected to the UPS (see section 2.4 Connection to the RS232 communications port).

Check that the RS232 (21) communications cable is connected.

UPS Driver installation:

1 - Insert the Solution-Pac CD-ROM containing the UPS Driver software in the drive of a PC running Windows.
2 - Open the Windows File manager or Explorer and select the CD-ROM drive.
3 - Double-click "\Emb\Evolutio\Config\upsdriv.exe".

Once UPS Driver has been installed, UPS parameters can be modified in a window containing a number of tabs, each presenting a set of parameters :

ON / OFF conditions tab

Configurable function	Default setting	Options
Automatic restart	Enabled	Disabled
Cold start	Enabled	Disabled
Forced reboot	Enabled	Disabled
Energy saving	Disabled	Enabled
UPS ON / OFF via software	Enabled	Disabled

Battery tab

Configurable function	Default setting	Options
Interval between automatic battery tests	Once a week	Every day Once a month No test
Low-battery warning threshold	20% of the remaining battery backup time	10 to 40% of the remaining battery backup time
Protection against deep discharges	Enabled	Disabled

Voltage-thresholds tab

Configurable function	Default setting	Options
Output voltage on battery power	230 V	200 V - 220 V - 240 V
Upper threshold for transfer to battery power	294 V	271 to 294 V
Fader-mode cut-in threshold	265 V	244 to 265 V
Booster-mode cut-in threshold	184 V	184 to 207 V
Lower threshold for transfer to battery power	160 V	160 to 180 V
Maximum input-voltage range	Disabled	Enabled (1)

(1) Lower threshold for transfer to battery power = 150 V

Sensitivity tab

Configurable function	Default setting	Options
UPS sensitivity level	Normal	High or low

For more informations about these settings, refer to the Help function of the "UPS Driver" software.

4. Maintenance

4.1 Trouble-shooting

Troubleshooting not requiring MGE UPS SYSTEMS after-sales support (all versions)

Indication	Signification	Correction
LED (13) flashes and the buzzer beeps once.	UPS overload. The power drawn by the connected equipment exceeds UPS capacity.	Check the power drawn by the equipment and disconnect any non-priority devices.
LED (12) flashes.	A battery fault was detected during the automatic battery test.	Replace the battery module (see section 4.2).

Troubleshooting requiring MGE UPS SYSTEMS after-sales support

Indication	Signification	Correction
LED (12) goes ON and the buzzer sounds continuously.	UPS electronics have detected a UPS fault. ◗ The connected equipment is no longer supplied. ? The equipment connected to the UPS is no longer protected.	Call the after-sales support department.

4.2 Replacement of the battery module

Safety rules

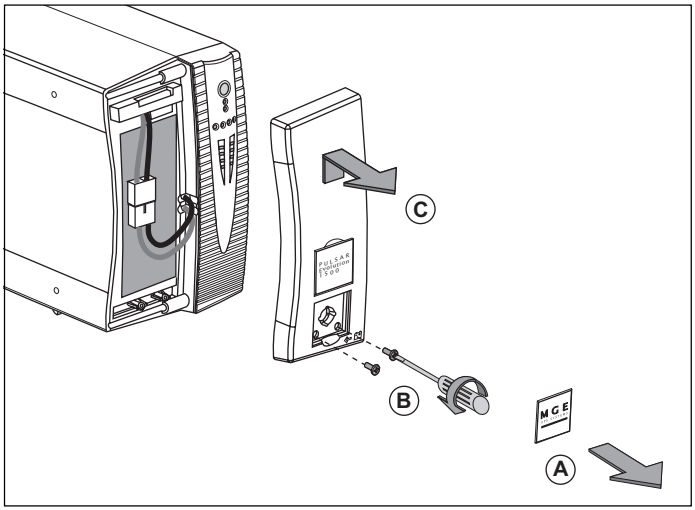
Batteries constitute a danger (electrical shock, burns). The short-circuit current may be very high. Precautions must be taken for all handling:

- **remove all watches, rings, bracelets and any other metal objects;**
- **use tools with insulated handles.**

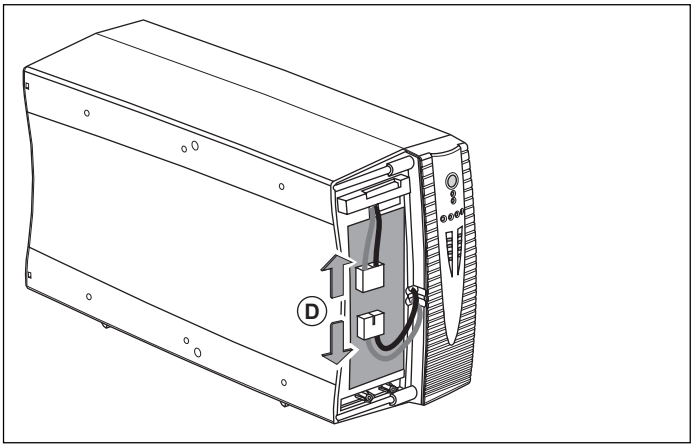
Tower models

Removal of the battery module

This operation may be carried out with the UPS supplying power to the load.

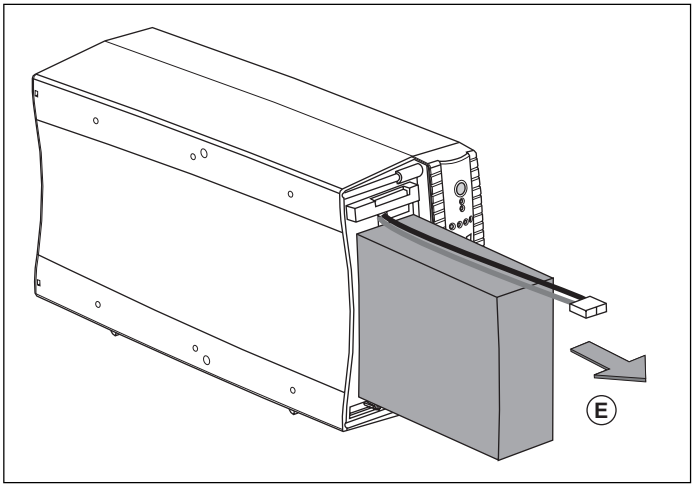


(A) - Unclip the small plate with the MGE logo on the front panel of the UPS.
(B) - Remove the two screws.
(C) - Remove the left-hand side of the front panel by pulling it slightly up and then forward.



(D) - Disconnect the battery module by pulling apart the connectors (never pull on the cables).

4. Maintenance



Ⓔ - Remove the battery module by pulling on the plastic tab and proceed with replacement.

Installation of the new battery module

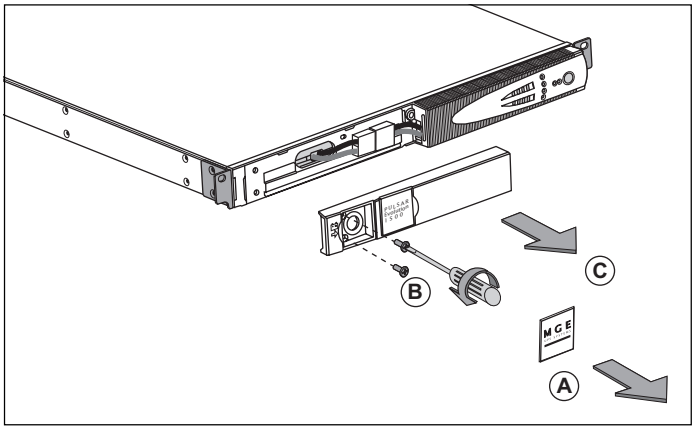
Carry out the above operation in reverse order.

- **Caution: risk of electric arc when connecting the battery.**
- **To maintain an identical level of performance and safety, use a battery module identical to that previously mounted in the UPS.**
- **Press the two parts of the battery connector tightly together to ensure proper connection.**

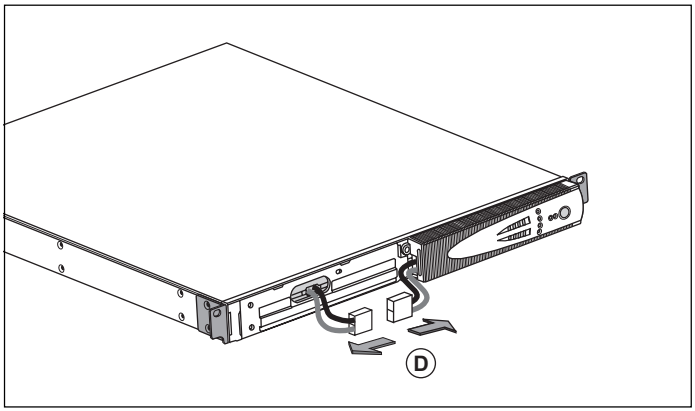
Rack models

Removal of the battery module

This operation may be carried out with the UPS supplying power to the load.

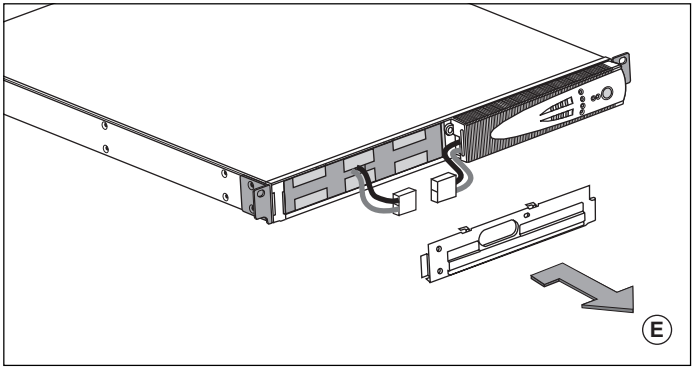


Ⓐ - Unclip the small plate with the MGE logo on the front panel of the UPS.
Ⓑ - Remove the two screws.
Ⓒ - Remove the left-hand side of the front panel by pulling it forward.

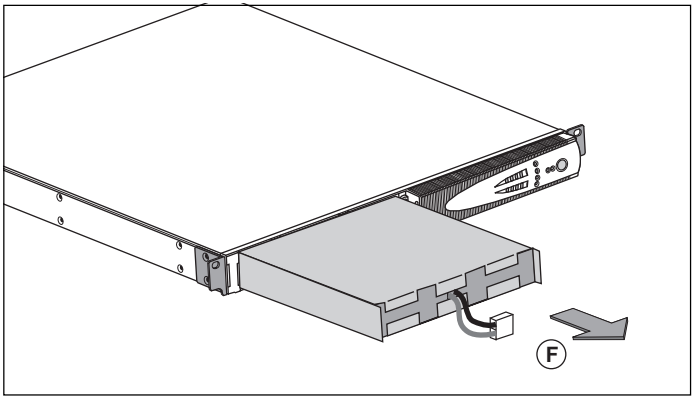


Ⓓ - Disconnect the battery module by pulling apart the connectors (never pull on the cables).

4. Maintenance



Ⓔ - Remove the cover.



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- **To maintain an identical level of performance and safety, use a battery module identical to that previously mounted in the UPS.**
- **Press the two parts of the battery connector tightly together to ensure proper connection.**

5. Environment

This product has been designed to respect the environment:

It does not contain CFCs or HCFCs.

UPS recycling at the end of service life:

MGE UPS SYSTEMS undertakes to recycle, by certified companies and in compliance with all applicable regulations, all UPS products recovered at the end of their service life (contact your MGE branch office).

Packing:

UPS packing materials must be recycled in compliance with all applicable regulations.

Warning:

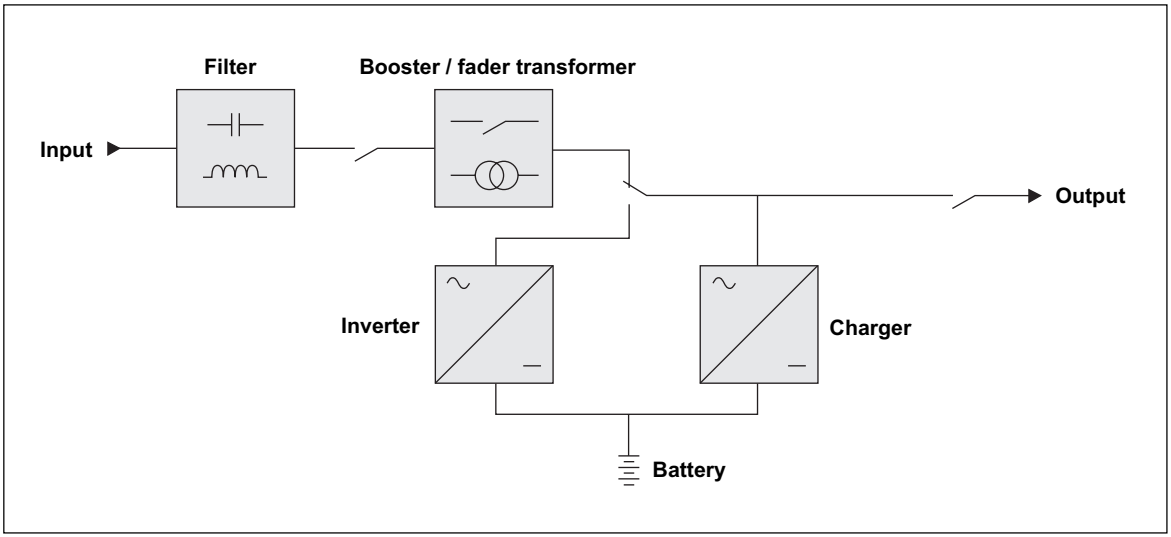
This product contains lead-acid batteries. Lead is a dangerous substance for the environment if it is not properly recycled by specialised companies.

Web site: www.mgeups.com

6. Appendices

6.1 Technical data

Simplified diagram



Technical characteristics

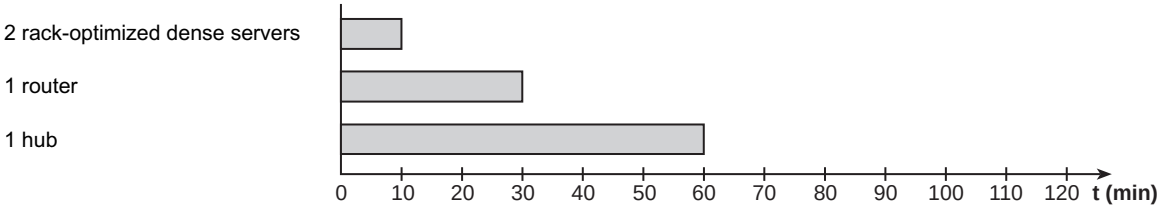
Pulsar Evolution	500	800 / 800 rack	1100 / 1100 rack	1500 / 1500 rack
Output rating	500 VA / 350 W	800 VA / 560 W	1100 VA / 700 W	1500 VA / 1000 W
AC-input power ◗ Voltage ◗ Frequency	Single-phase, 160 V to 294 V (1) , 230V nominal. 47 Hz to 70 Hz (50 Hz system) or 56.5 Hz to 70 Hz (2) (60 Hz system)			
Output power (operation on battery power) ◗ Voltage ◗ Frequency	Single-phase, 230 V (3) (+ 6% / - 10%) 50/60 Hz +/- 0.1 Hz			
Battery (sealed lead-acid, maintenance free) ◗ Tower models ◗ Rack models	2 x 6 V - 9 Ah,	2 x 12 V - 7.2 Ah, 4 x 6 V - 7.2 Ah	2 x 12 V - 9 Ah, 4 x 6 V - 9 Ah	3 x 12 V - 9 Ah, 6 x 6 V - 9 Ah
Environment ◗ Noise level (operation on AC-input power) ◗ Operating temperature ◗ Relative humidity (without condensation)	<40 dBA 0 to 35° C 20 to 90%			<40 dBA 0 to 40° C 20 to 90%

(1) The upper and lower thresholds may be set using the UPS Driver software.
(2) Or 40 Hz in low-sensitivity mode (may be set using the UPS Driver software).
(3) Adjustable from 200 to 240 V using the UPS Driver software.

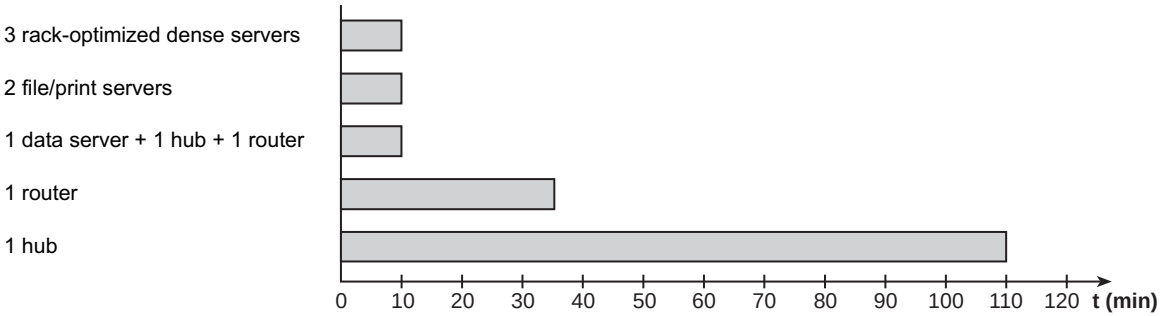
6. Appendices

Examples of battery backup times

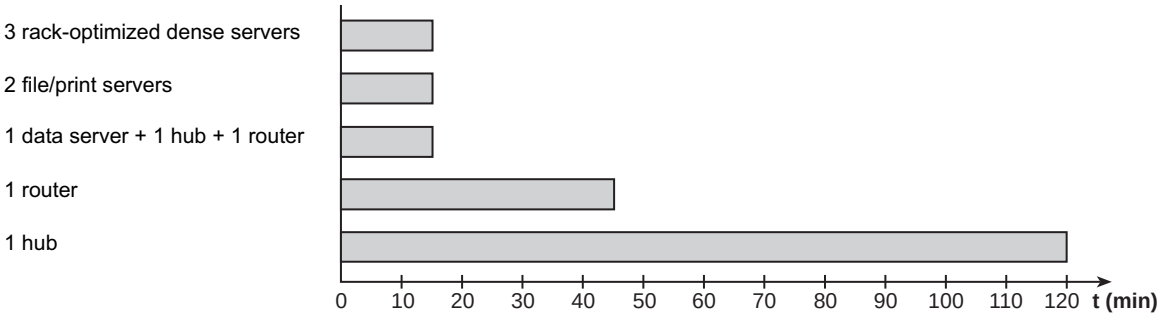
Pulsar Evolution 500



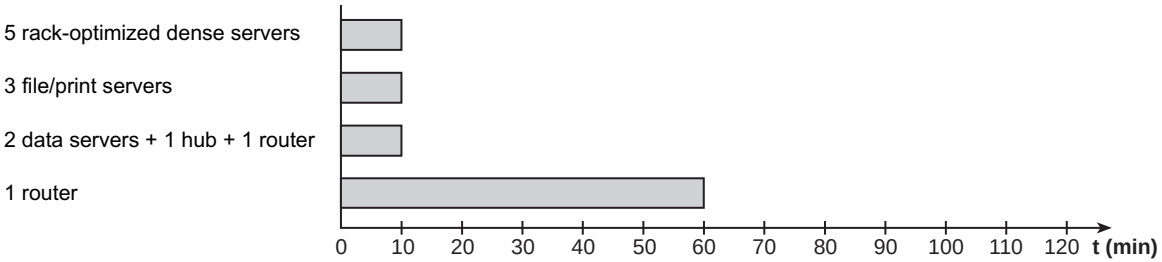
Pulsar Evolution 800



Pulsar Evolution 1100



Pulsar Evolution 1500



6.2 Glossary

Backup time	Time that the connected equipment can operate on battery power if AC-input power fails.
Bargraph	Device on the front panel indicating the percent remaining backup time or the percent load.
Booster mode	Automatic UPS operating mode whereby the input-power voltage is increased if it drops below a value set in the personalisation parameters, thus avoiding a battery discharge.
De-energised	The UPS must be physically disconnected from the AC-input power.
Equipment	Devices and systems connected to the UPS output.
Fader mode	Automatic UPS operating mode whereby the input-power voltage is decreased if it rises above a value set in the personalisation parameters, thus avoiding a battery discharge.
Input circuit breaker	Circuit breaker protecting the upstream distribution system against UPS faults.
Outlets	**Pulsar Evolution** has a group of four non-programmable outlets.
Personalisation	The parameters for a number of UPS functions may be modified using the UPS Driver software to adapt UPS operation to user needs.
Programmable outlets	**Pulsar Evolution** has two groups of two programmable outlets. They may be used for sequential start-up of protected equipment, shedding of non-priority loads during operation on battery power or management of operating priorities to provide the most critical devices with more backup time before battery power runs out. These outlets may be programmed using the Solution-Pac software on the CD-ROM supplied with the UPS.
RS232 communications port	For UPS connection to a computer via the serial port.
Solution-Pac	MGE UPS SYSTEMS safety, set-up and supervision software suite on the CD-ROM supplied with the UPS.
UPS	Uninterruptible Power Supply.
UPS Driver	Communications software on the CD-ROM supplied with the UPS. It may be used to personalise the default settings.
USB communications port	For UPS connection to a computer via the USB port.

6. Appendices

6.3 Index