

Pulsar MX

4000 RT
5000 RT

Installation and user
manual



THE UNINTERRUPTIBLE POWER PROVIDER

MGE
UPS SYSTEMS

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

The **Pulsar MX** 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 (Uninterruptible Power System)**

Warning: this is a class A UPS product. In a domestic environment, this product may cause radio interference, in which case, the user may be required to take additional measures.

Output cables should not be longer than 10 meters.

If the device must be installed in overvoltage category III or IV environments, additional upstream overvoltage protection must be provided for.

Before installing **Pulsar MX**, please read the booklet on the required safety instructions. Then follow the indications in this manual.

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

Environmental protection

MGE UPS SYSTEMS has implemented an environmental-protection policy.

Products are developed according to an eco-design approach.

Substances

This product does not contain CFCs, HCFCs or asbestos.

Packing

To improve waste treatment and facilitate recycling, separate the various packing components.

- ▶ The cardboard we use comprises over 50% of recycled cardboard.
- ▶ Sacks and bags are made of polyethylene.
- ▶ Packing materials are recyclable and bear the appropriate identification symbol



Material	Abbreviation	Symbol number	
Polyethylene terephthalate	PET	01	
High-density polyethylene	HDPE	02	
Polyvinyl chloride	PVC	03	
Low-density polyethylene	LDPE	04	
Polypropylene	PP	05	
Polystyrene	PS	06	

Follow all local regulations for the disposal of packing materials.

End of life

MGE UPS SYSTEMS will process products at the end of their service life in compliance with local regulations.

MGE UPS SYSTEMS works with companies in charge of collecting and eliminating our products at the end of their service life.

▶ Product

The product is made up of recyclable materials.

Dismantling and destruction must take place in compliance with all local regulations concerning waste.

At the end of its service life, the product must be transported to a processing centre for electrical and electronic waste.

▶ Battery

The product contains lead-acid batteries that must be processed according to applicable local regulations concerning batteries.

The battery may be removed to comply with regulations and in view of correct disposal.

The "Material Safety Data Sheets" (MSDS) for the batteries are available on our web site*.

(*) For more information or to contact the Product Environmental manager, use the "Environmental Form" on the site: www.mgeups.com -> About us -> Environment.

Introduction

Pictograms



Important instructions that must always be followed.



Information, advice, help.



Visual indication.



Action.



Audio signal.

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



LED off



LED on

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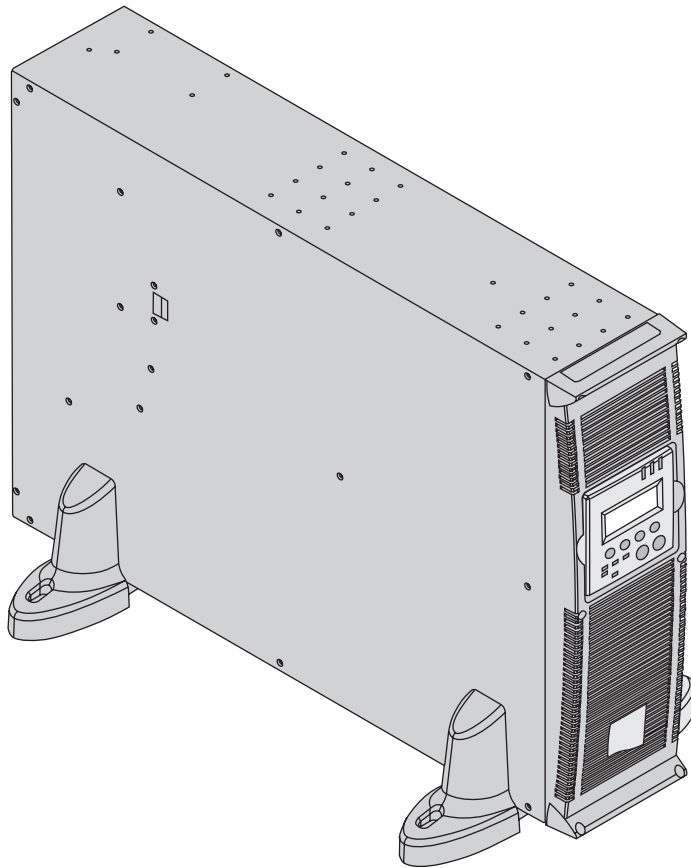
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1. Presentation

1.1 Standard positions

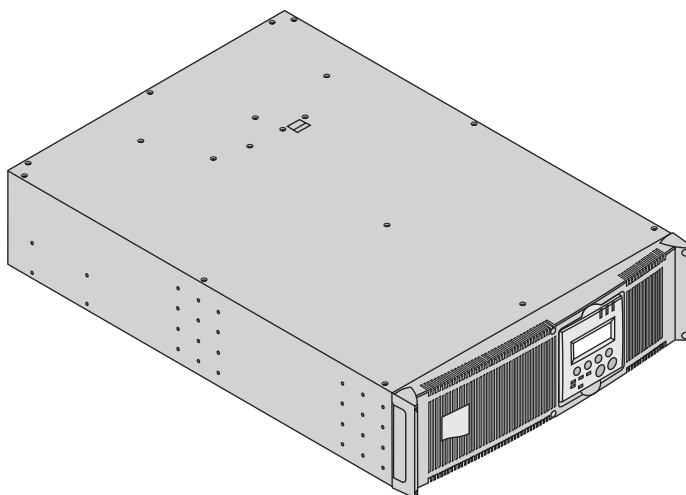
Tower position



Dimensions (H x W x D) in mm / Inches	
Pulsar MX 4000 RT	444.5 x 131 x 700 / 17.5 x 5.16 x 27.56
Pulsar MX 5000 RT	444.5 x 131 x 700 / 17.5 x 5.16 x 27.56
Pulsar MX EXB RT	444.5 x 131 x 650 / 17.5 x 5.16 x 25.6

Weights in kg / lbs	
Pulsar MX 4000 RT	57 / 125
Pulsar MX 5000 RT	57 / 125
Pulsar MX EXB RT	70 / 154

Rack position



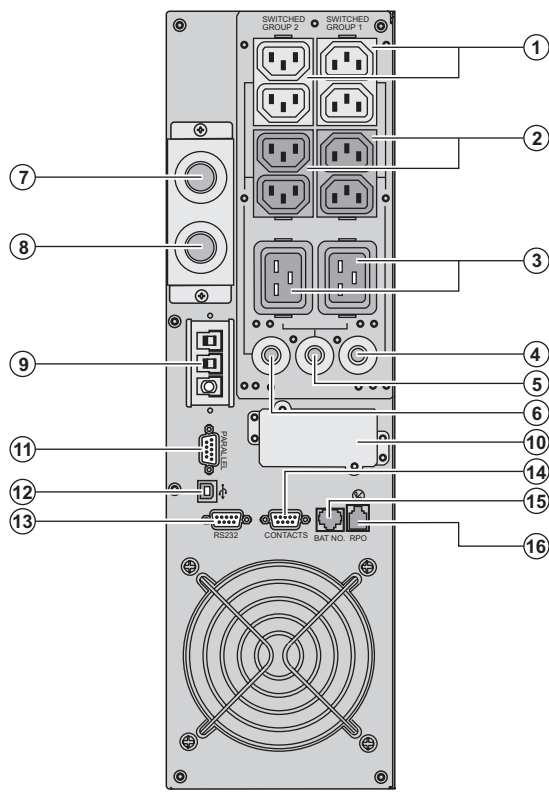
Dimensions (H x W x D) in mm / Inches	
Pulsar MX 4000 RT	131 x 444.5 x 700 / 5.16 x 17.5 x 27.56
Pulsar MX 5000 RT	131 x 444.5 x 700 / 5.16 x 17.5 x 27.56
Pulsar MX EXB RT	131 x 444.5 x 650 / 5.16 x 17.5 x 25.6

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Pulsar MX 4000 RT	57 / 125
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Pulsar MX EXB RT	70 / 154

1. Presentation

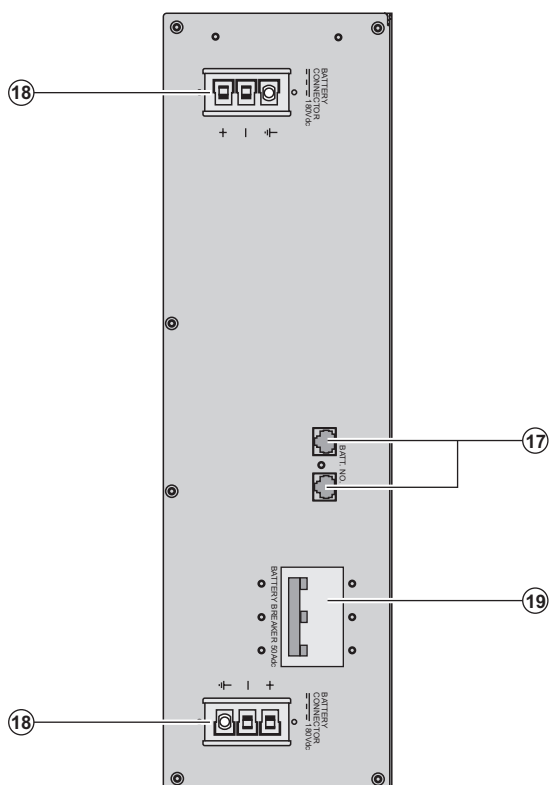
1.2 Rear panels

Pulsar MX 4000 RT / 5000 RT



- (1) Two groups of 2 programmable (10A) outlets for connection of equipment
- (2) Groups of 4 (10A) outlets for connection of equipment
- (3) Groups of 2 (16A) outlets for connection of equipment
- (4) 12A thermal switch
- (5) 20A thermal switch
- (6) 12A thermal switch
- (7) Output terminal block
- (8) Normal AC source terminal block
- (9) Connector for additional battery module
- (10) Slot for optional communication card
- (11) Connector for parallel operation
- (12) USB communication port
- (13) RS232 communication port
- (14) Communication port by relay
- (15) Connector for automatic detection of battery module(s)
- (16) Connector for Remote Power Off control (RPO)

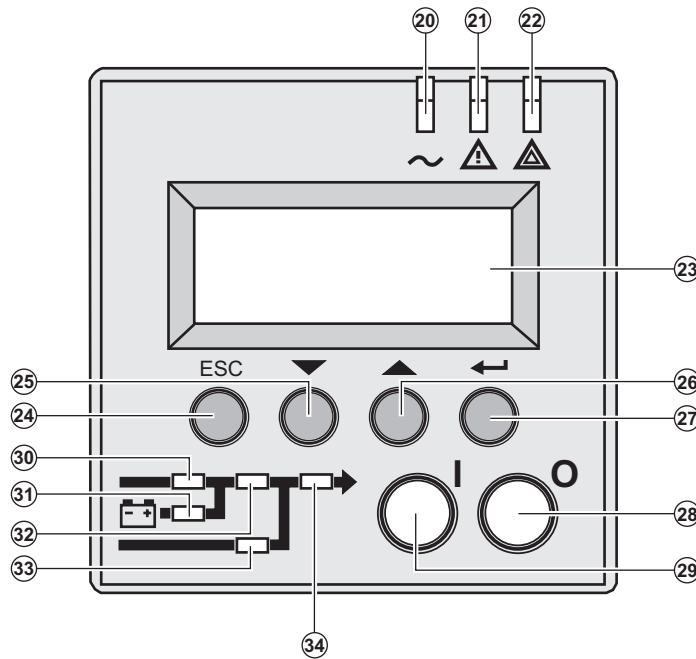
Pulsar MX EXB RT (optional battery module)



- (17) Connectors for automatic detection of battery module(s)
- (18) Connectors for battery modules (to the UPS or to the other battery modules)
- (19) Battery circuit breaker

1. Presentation

1.3 Display and control panel

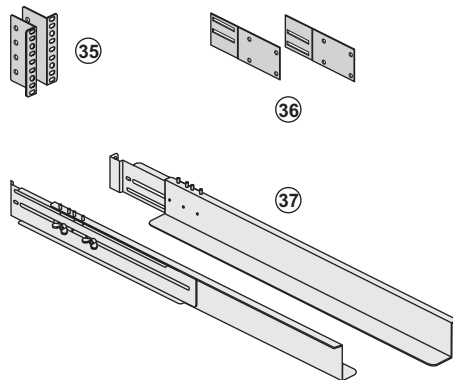


- (20) Load protected LED
- (21) Downgraded operation LED
- (22) Load not protected LED
- (23) Alphanumeric display
- (24) Escape (cancel) button
- (25) (26) Function buttons (scroll down / scroll up)
- (27) Enter (confirm) button
- (28) UPS OFF button
- (29) UPS ON button
- (30) Rectifier LED
- (31) Battery LED
- (32) Inverter LED
- (33) Bypass LED
- (34) Load powered LED

1.4 Options

Rack mounting kit

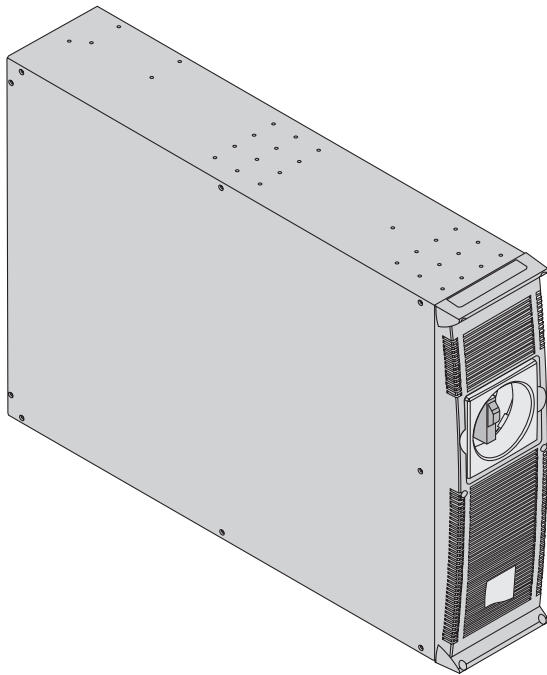
Telescopic rails for Pulsar MX RT mounting in 19" enclosure with mounting hardware (part number 68002)



- (35) Ear hangup
- (36) Rear bracket system for transportation
- (37) Telescopic rails, 639 mm to 1005 mm length (27.36" to 39.96")

1. Presentation

ModularEasy

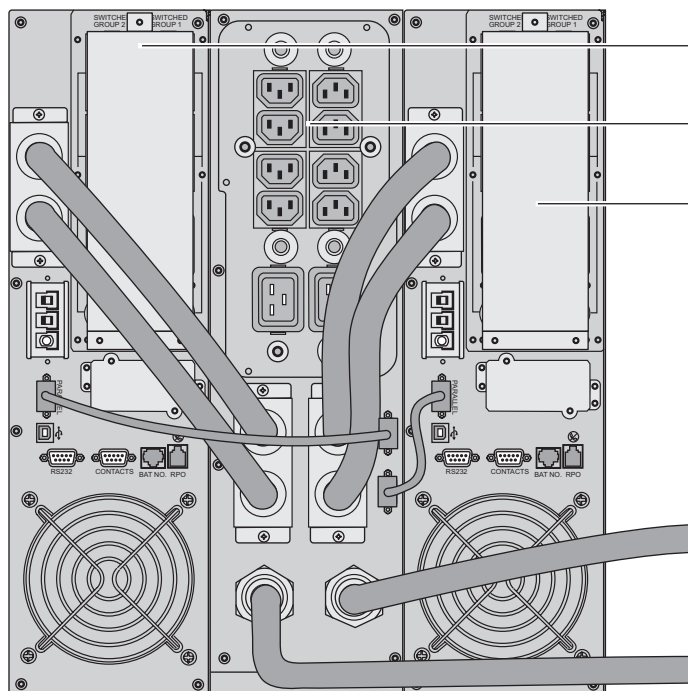


Pulsar MX ModularEasy enables parallel operation when combining two **Pulsar MX** UPSs. Consequently you can enhance the availability level of your equipment (N+1 redundancy). You can also double your secured power capacity according to your needs (migration, network extension...). In the unlikely event a major fault would occur, the manual maintenance bypass of **Pulsar MX ModularEasy** would allow the UPS maintenance without interrupting your connected equipment.

In single unit mode, **Pulsar MX ModularEasy** combined with one **Pulsar MX** UPS adds a second level of availability to your installation.

The manual bypass mode allows the replacement of the UPS without any interruption to the connected equipment in case of a major fault that would not be related to the most critical components of the UPS (i-e front-accessible, hot-swappable Battery and Power Sub-Modules).

Example of Pulsar MX ModularEasy connected with two UPSs in parallel operation



UPS 1
(Pulsar MX RT)

Pulsar MX RT ModularEasy

UPS 2
(Pulsar MX RT)

UPS output to load

AC Normal input

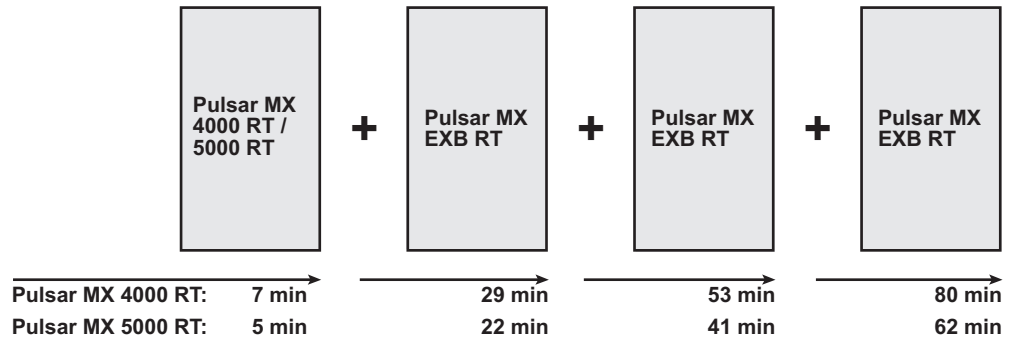
1. Presentation

Battery extensions for UPS backup times up to 80 minutes (at full load)

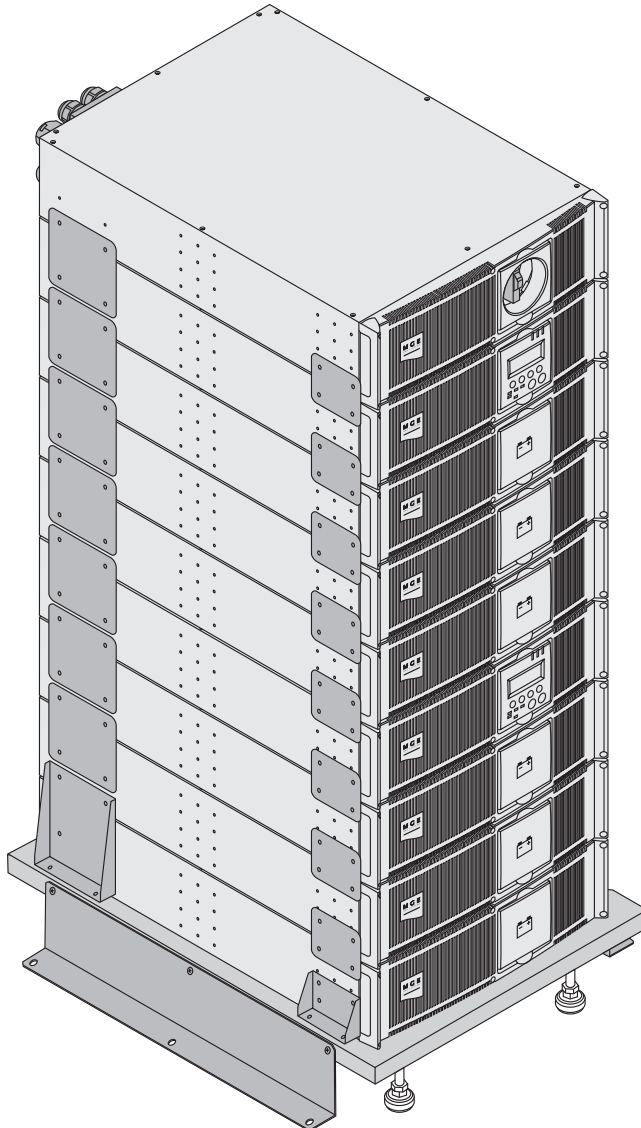
Pulsar MX RT offers a standard backup time of 5/7 minutes at full load.

To increase backup time, it is possible to connect Pulsar MX EXB RT modules to the UPSs.

Battery extensions for Pulsar MX RT



Battery Integration System



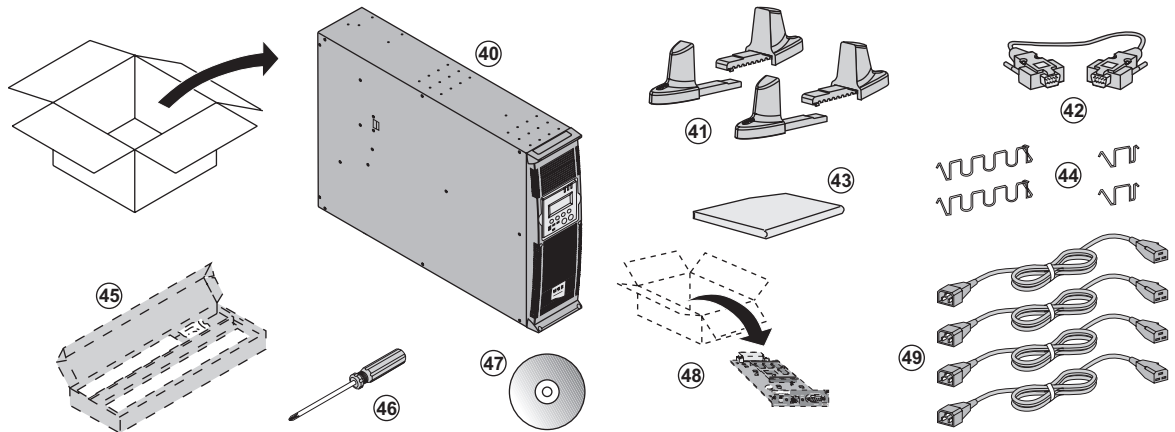
The Battery Integration System is intended for extended backup time configurations to conveniently stack and secure up to 9 modules on the same cart (swivel wheels with brakes, leveling feet, seismic side panels, plates to lock modules and screws included).

Battery extension cable (1,8 m / 6 ft)

This extended battery cable will be used instead of the standard battery cable when battery modules are distant from each other (located in two different enclosures, for instance).

2. Installation

2.1 Unpacking and contents check



(40) Pulsar MX 4000 or 5000 UPS.

(41) Two sets of tower stands.

(42) RS232 communications cable

(43) Product documentation.

(44) 4 cable lockers.

(45) Telescopic rails for rack enclosure with mounting hardware (optional, or standard with **NetPack** version).

(46) Screw driver.

(47) **Solution-Pac** power management suite CD-ROM.

(48) Network Management card (optional, or standard in **NetPack** version).

(49) 4 IEC 10A output cables.

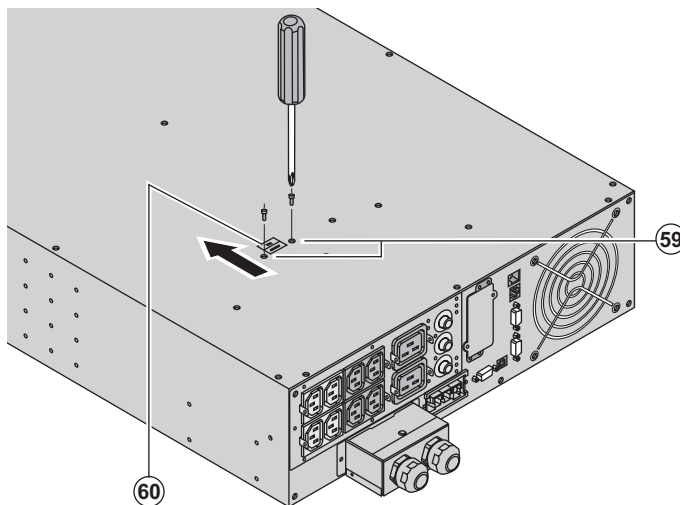


Packaging must be destroyed according to waste management standards. Recycling icons are displayed for easy selection.



A dangerous voltage is present inside the power module and the battery module. Any operations to be carried out on these modules must be done so by qualified staff.

2.2 Internal battery connection (Battery start-up)



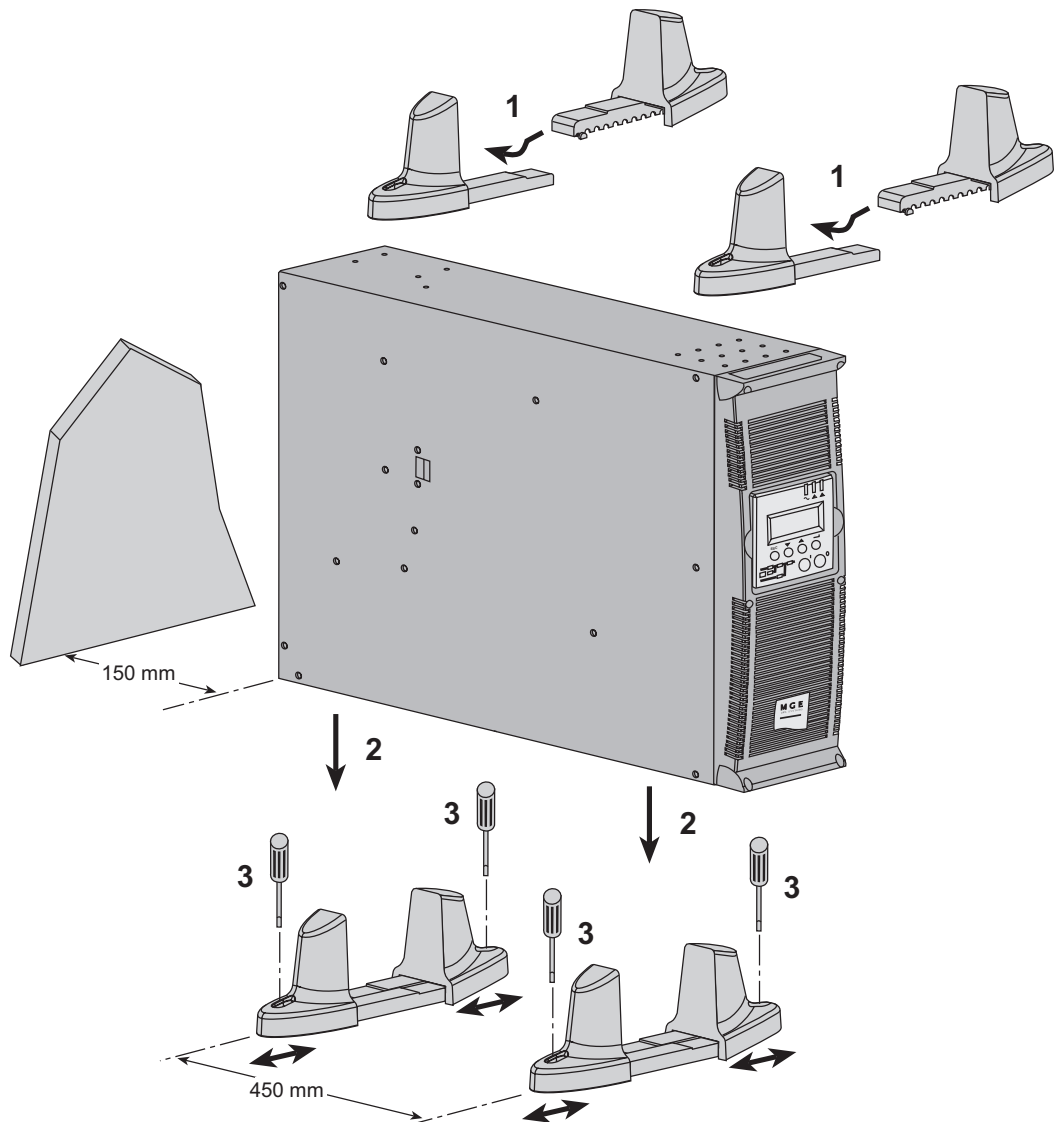
1 - Remove the two fixing screws (59) to free the battery connector.

2 - Push the battery connector so that you can read "Connected".

3 - Secure the two fixing screws (59).

2.3 Installation in tower position

Follow steps 1 to 3 to adjust the tower stands for the upright position.

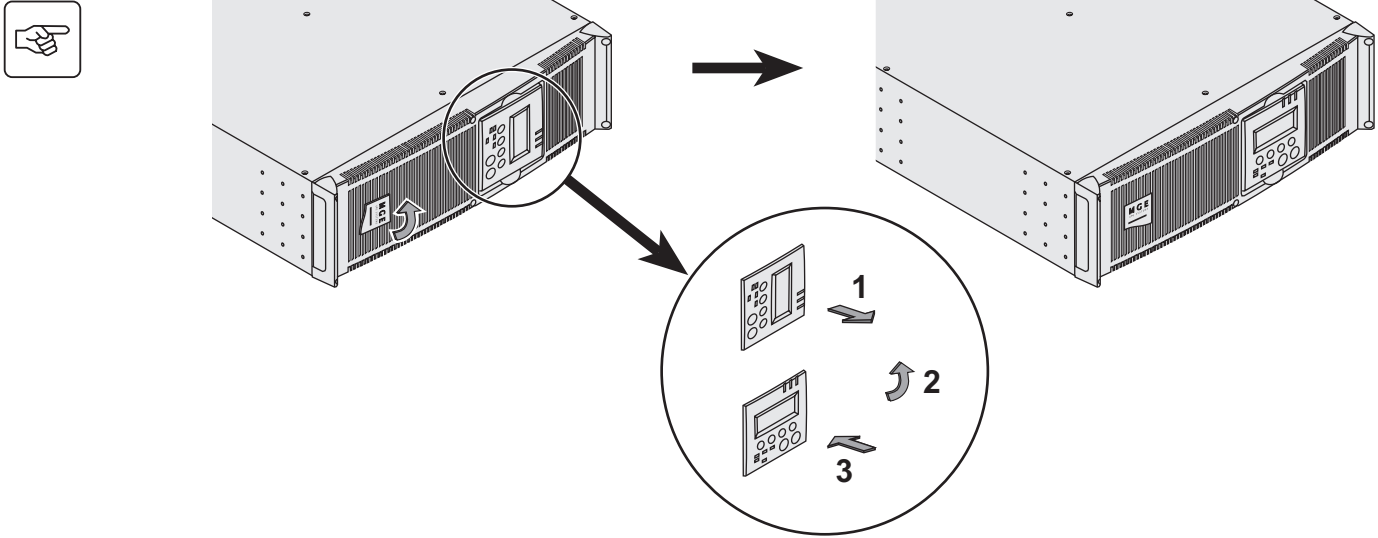


**Always keep 150 mm free space behind the UPS rear panel.
The distance between the tower stands should be 450 mm.**

2. Installation

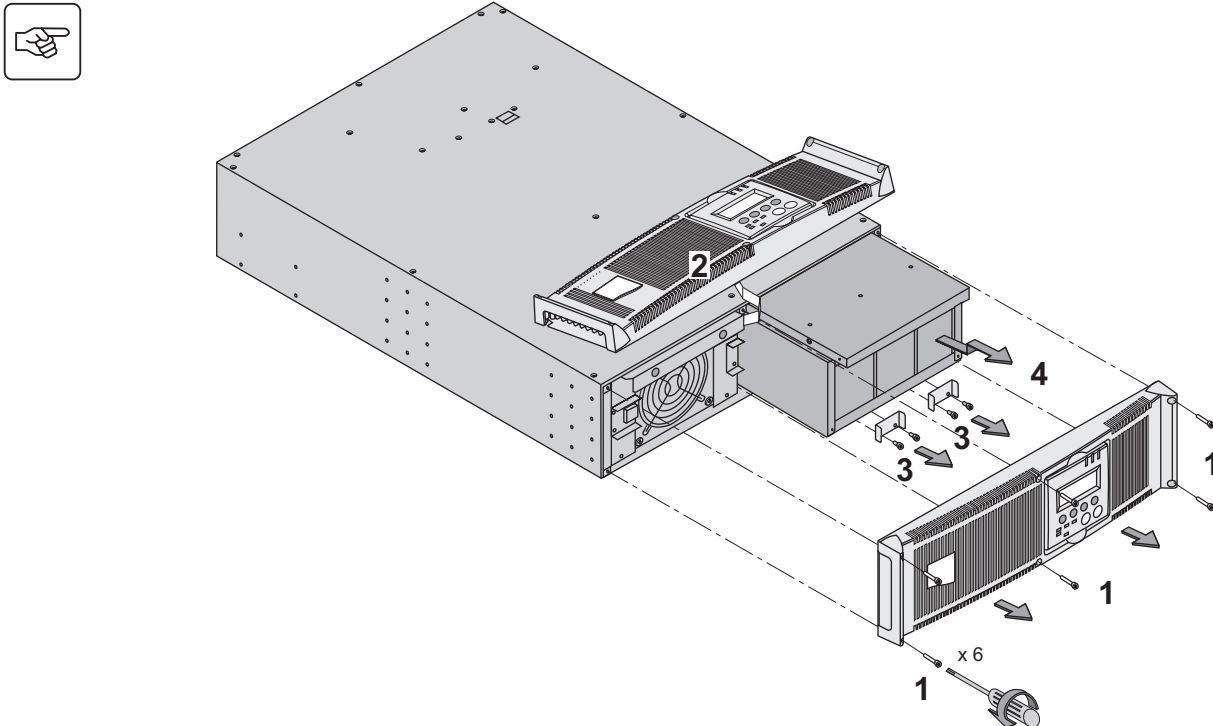
2.4 Installation in rack position

Adjustment of the orientation of the logo and control panel



UPS module rack mounting (optional rails required)

i Pulsar MX RT is very heavy. To ease its rack integration, we strongly recommend to remove the battery tray as shown below:



- 1 - Remove the 6 fixing screws to free the main front panel bezel.
- 2 - Place the front panel above the UPS.
- 3 - Remove the 4 fixing screws on the right side to free the battery sub-module.
- 4 - Pull the battery sub-module slightly, then lift it to extract it.

2. Installation

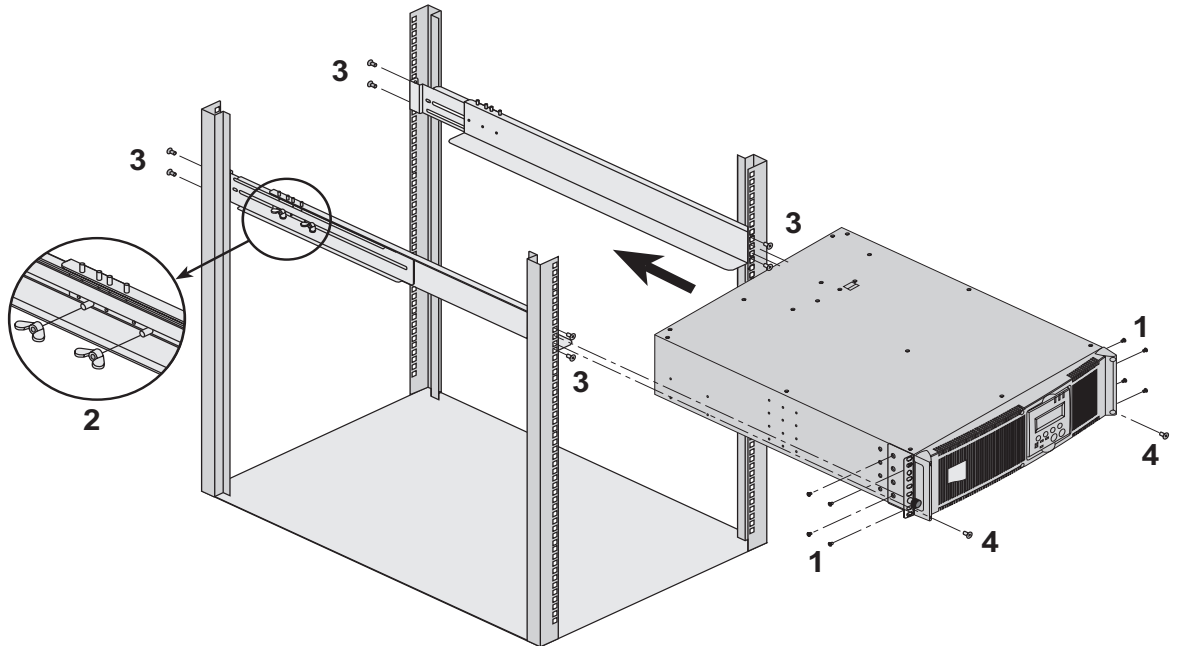
UPS or battery module rack mounting (optional rails required)



It is not allowed to install the UPS or battery module in a hermetically closed environment without any exchange of air.



Follow steps 1 to 4 for rack mounting the UPS onto the rails.

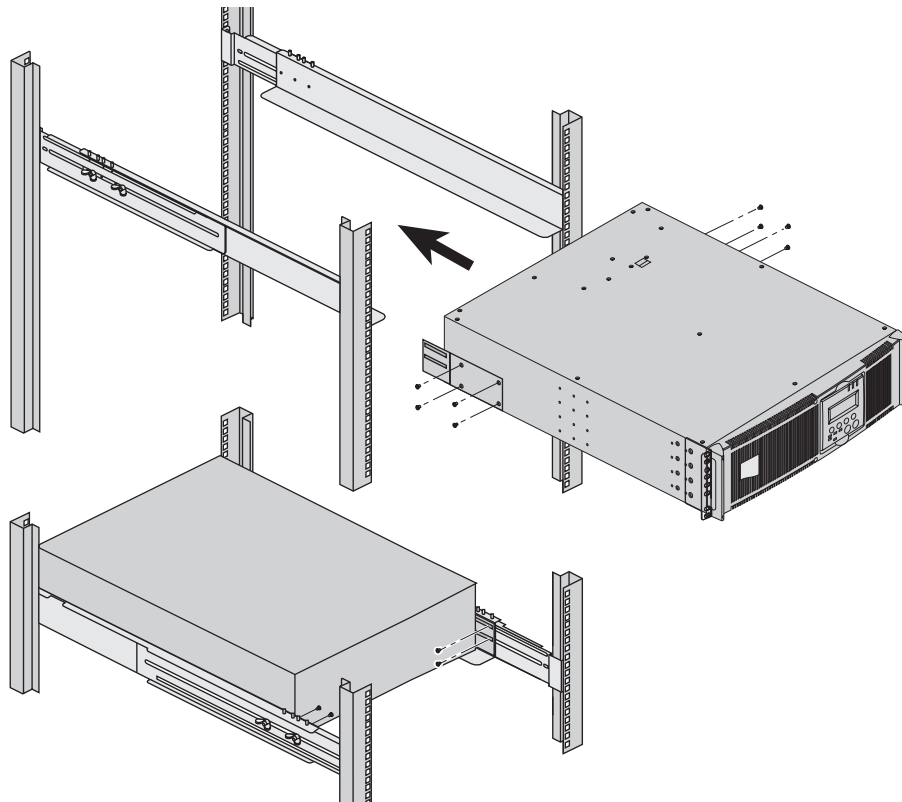


The rails and the necessary mounting hardware are supplied by MGE UPS SYSTEMS.

Note for step 1: it is possible to adjust the position of both front mounting ears.

Rear bracket system (included with rail kits)

To be used if you need to move the rack enclosure with UPS already rack-mounted inside.



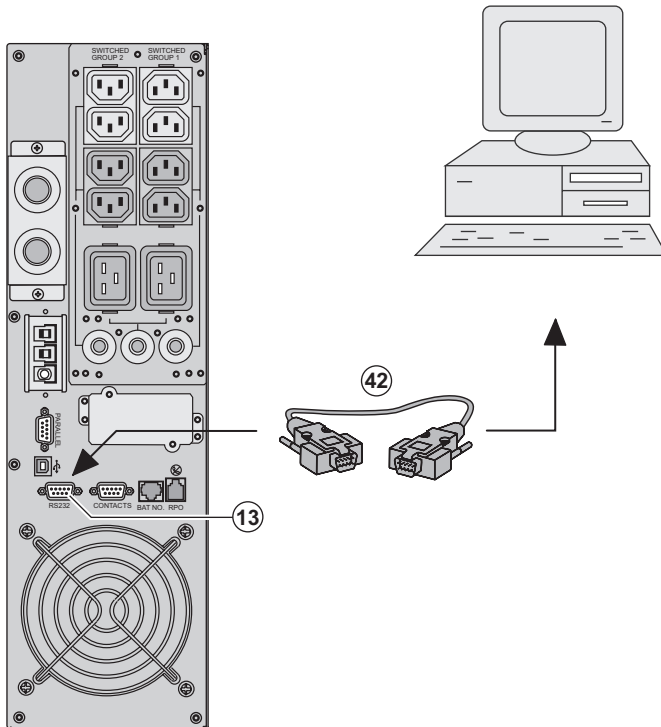
2. Installation

2.5 Communication ports

Pulsar MX RT provides 3 communication methods that can be used simultaneously:

- ▶ 2 COM ports provide RS232 or USB communications using MGE UPS SYSTEMS SHUT protocol. Compatible with most power management software applications available into the enclosed **Solution Pac** CD-Rom. Please, note that both ports cannot be used at the same time.
- ▶ The output contact port is used for basic signaling or for protection of IT systems like IBM iSeries (formerly AS400) and more.
- ▶ The slot is compatible with any MGE UPS SYSTEMS communication card (check www.mgeups.com web site for the complete list of compatible cards).

Connection to the RS 232 communication port



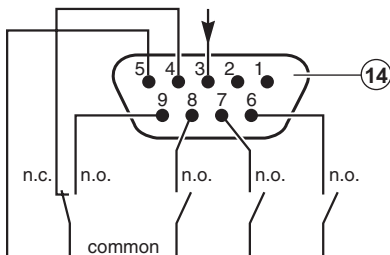
1 - Connect the RS232 (**42**) communications cable to the serial port on the computer equipment.

2 - Connect the other end of the communication cable (**42**) to the RS232 (**13**) communications port on the UPS.

The **UPS** can now communicate with various MGE UPS SYSTEMS power management application software. Please note that the configuration software is included with **Personal Solution Pac** for Windows.

Connection to the communication port by relays (14)

(see page 8)



- ▶ Pin 1, 2: not used,
 - ▶ Pin 3: remote Power Off signal (5 to 27 V DC, 10 mA max),
 - ▶ Pin 4: operation on mains (not on battery),
 - ▶ Pin 5: user common,
 - ▶ Pin 6: operation on automatic by-pass,
 - ▶ Pin 7: low battery,
 - ▶ Pin 8: load protected,
 - ▶ Pin 9: operation on battery.
- n.o.: contact normally open.
n.c.: contact normally closed.

When the status is active, the contact between the common (Pin 5) and the relevant information pin is closed.

Output relays specifications

- ▶ Voltage: 48 V DC max,
 - ▶ Current: 2 A max,
 - ▶ Power: 62,5 VA, 30 W.
- Example: for 48 V DC, I_{max}=625 mA

Remote Power Off communication port (16)

(see page 8)

Installation of a Remote Power Off function must be carried out in compliance with applicable regulations.

In order to fully de-energize devices and **Pulsar MX RT** with the RPO port, it is necessary:

- ▶ to use a two-position switch (Normally Open or Closed contact should be held more than 1 second to be taken into account).
- ▶ to connect to this RPO switch a device that allows to trip all breaker(s) located upstream⁽¹⁾ and downstream⁽²⁾ Pulsar MX RT. This can be achieved by means of a shunt trip.

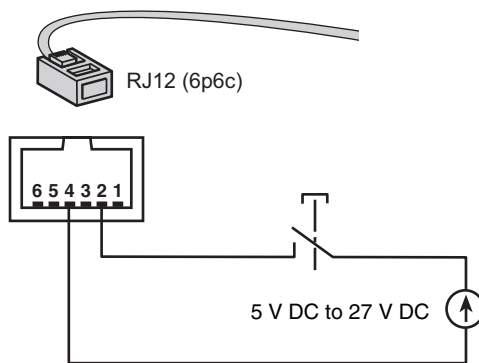
(1) : If not, the output devices could be powered again through static switch when the two-position switch is released.

(2) : If not, the output devices will remain powered several seconds after the RPO activation.

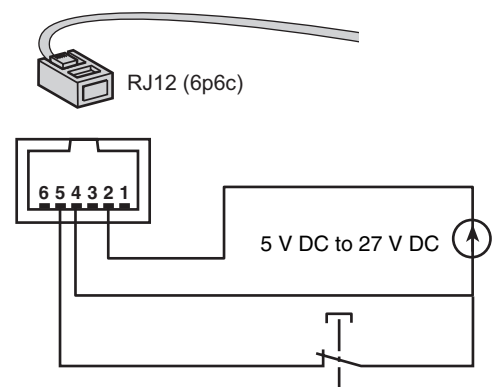
Please, notice that the internal batteries will remain connected to the power sub-module after RPO activation.

The cable is not included.

Remote power off contact normally open



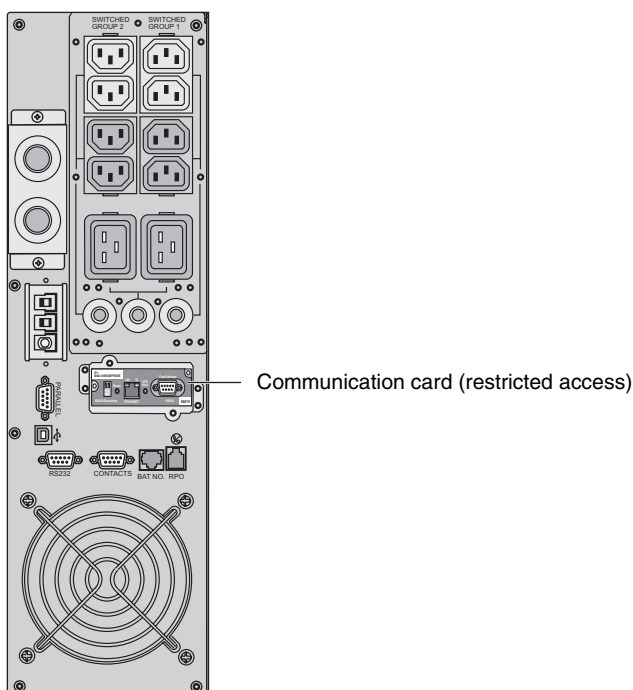
Remote power off contact normally closed



▶ Signal:

- activation voltage: 5 V DC to 27 V DC.
- current: 10 mA max.

Installation of communication cards (optional, standard with the NetPack version)



It is not necessary to shutdown the UPS before installing a communications card.

- 1 - Remove the slot cover secured by two screws.
- 2 - Insert the communications card in the slot.
- 3 - Secure the card with both screws.

2. Installation

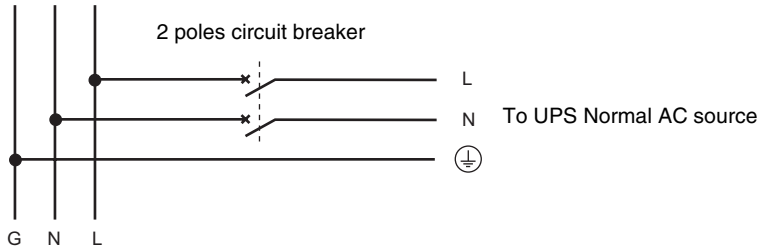
2.6 Required protective devices and cable cross-sections

Recommended upstream protection

UPS power rating	Upstream circuit breaker
4000 RT	D curve - 32A
5000 RT	D curve - 32A

The indicated protection ensures discrimination for each output circuit downstream of the UPS.

If these recommendations are not followed, protection discrimination is not achieved and may result in a potential power interruption to the connected devices.



Recommended downstream protection

UPS power rating	Downstream circuit breaker
4000 RT	Z curve - 10A
	C curve - 4A
5000 RT	Z curve - 10A
	C curve - 6A

The indicated protection ensures discrimination for each output circuit downstream of the UPS.

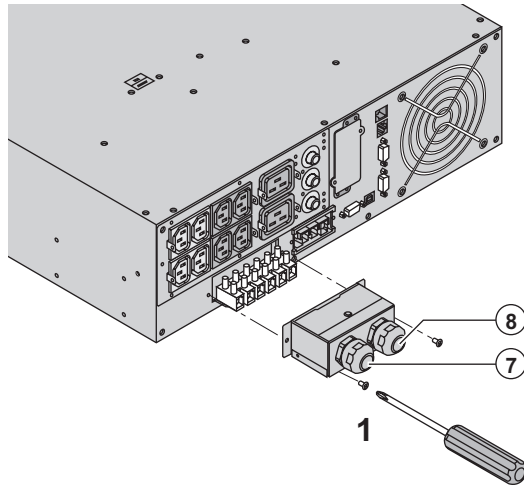
If these recommendations are not followed, protection discrimination is not achieved and may result in a potential power interruption to the connected devices.

Required cable cross-sections

- Terminal-block cable capacity: 6 mm², solid or stranded wire (maximum 8 mm² or AWG 8).
- Capacity for earthing conductor: 6 mm², solid or stranded wire (maximum 8 mm² or AWG 8).

2.7 Connection of input/output power cables on UPS terminals

- ▶ This type of connection must be carried out by qualified electrical personnel.
- ▶ Before carrying out any connection, check that the battery circuit breaker (19) (see page 8) and that the upstream protection device (Normal AC source) is open ("0").
- ▶ Use included insulated ferrules with stranded wires.

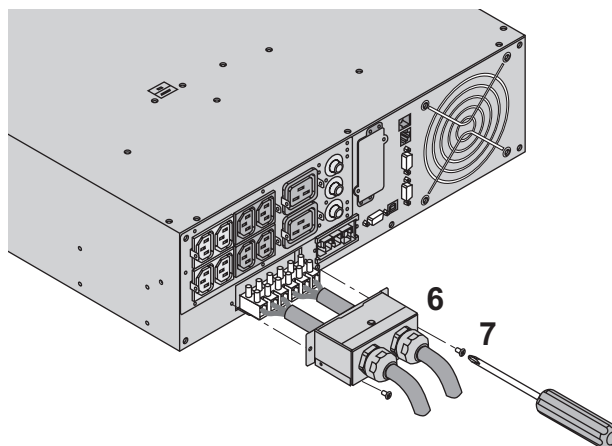
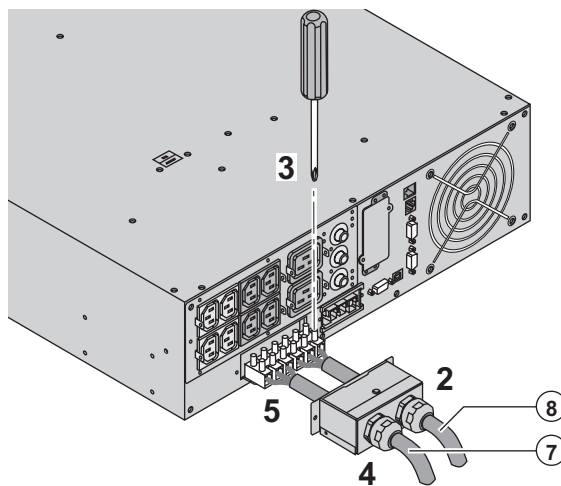


- 1 - Remove the terminal block cover (2 screws) with the included screwdriver.
- 2 - Insert the Normal AC cable through the cable gland (8).
- 3 - Connect the 3 wires to the Normal AC terminal block.



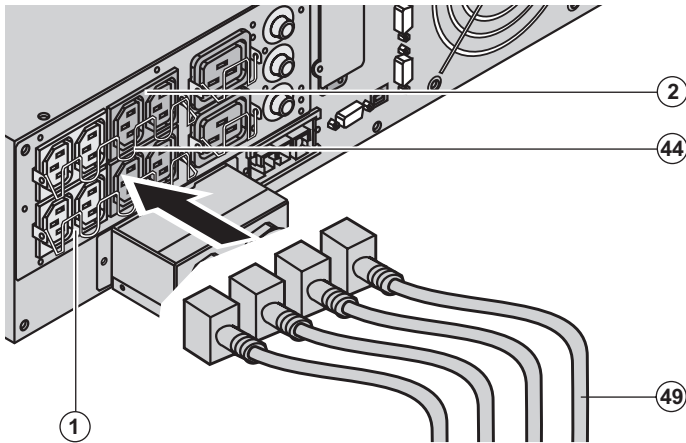
Always connect first the earthing wire.

- 4 - Insert the output cable through the cable gland (7).
- 5 - Connect the 3 wires to the output terminal block.
- 6 - Refit the terminal block cover and tighten the cable glands.
- 7 - Secure the terminal block cover by means of 2 screws.



2. Installation

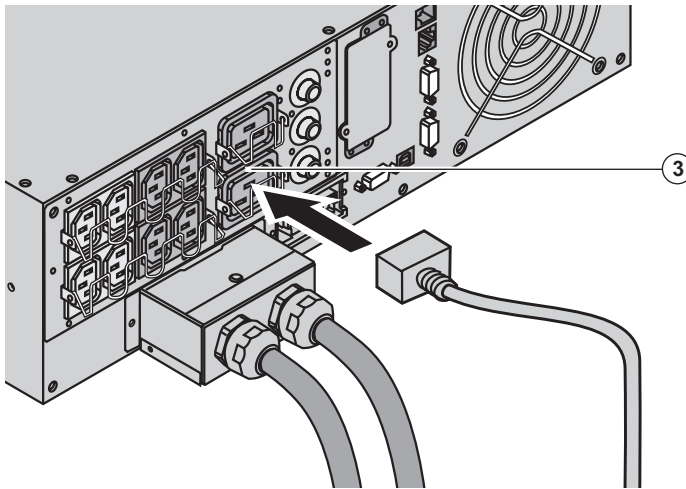
2.8 Connection of IEC cables to output receptacles



1 - Connect the equipments to the UPS using the cables (49).

It is preferable to connect the priority equipments to the four outlets (2) and the non priority equipments to the four outlets (1) that can be programmed in pairs (1 and 2). Connect any high-power devices to the 16 A outlet (3)

To program shutdown of outlets (2) during operation on battery power and thus optimise the available backup time, the MGE UPS SYSTEMS communication software is required.

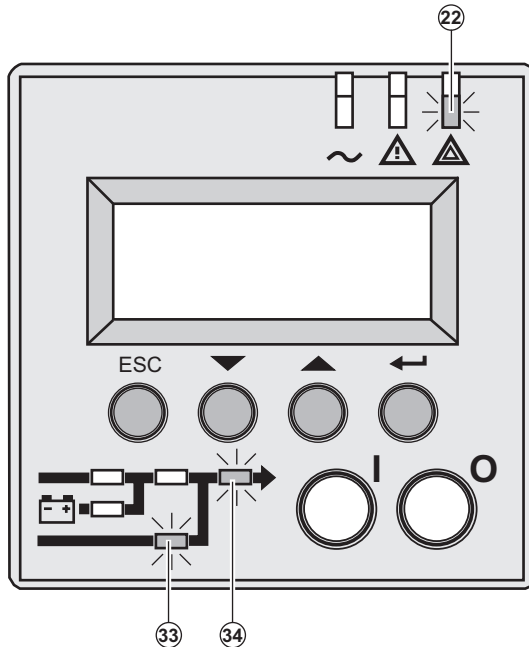


2 - Fit the connection securing system (44) that prevents the plugs from being pulled out accidentally.

3.1 Initial start-up



It is essential to contact our Customer Service to ensure that your system is commissioned in complete safety and to benefit from the manufacturer's guarantee.



1 - Check that the battery switch (60) (see section 2.2, page 12) on top cover is connected.

2 - Set the upstream circuit breaker (not included) to the "I" position (ON).

The equipments are powered via the Normal AC source, but not protected by the UPS.

Batteries are recharging, an 8 hour recharge period is necessary to get full backup time.

LEDs (22) is ON, LEDs (33) and (34) are green.

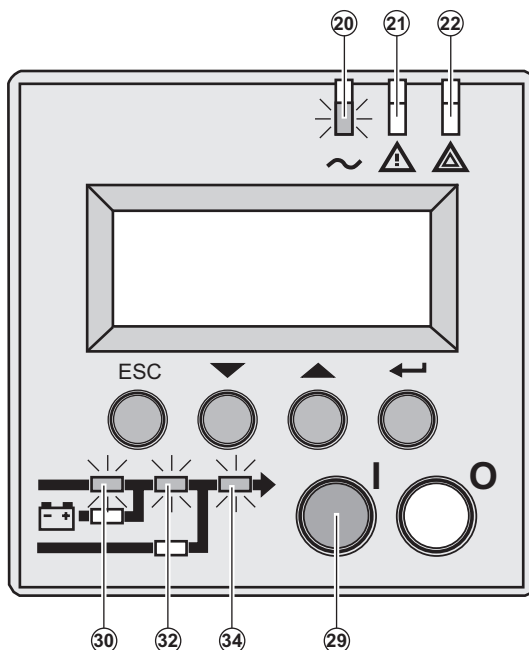


UPS personalisation



If UPS personalisation is desired, it is advised to enter the personalisation mode at this time (see the 4.4 "Personalisation" section).

3.2 Final start-up sequence



3- Press the "I" button (29) more than 3s.

The buzzer beeps once, and after UPS internal test sequence, the LED (20) is ON.

LEDs (30), (32), (34) are green.

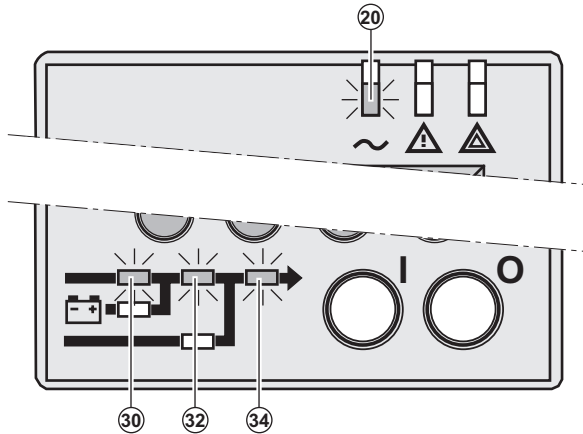
The equipments are protected by the UPS.

If LED (21) or (22) is ON, an alarm has occurred (see the "troubleshooting" section).

3. Operation

3.3 Operating modes

Normal mode

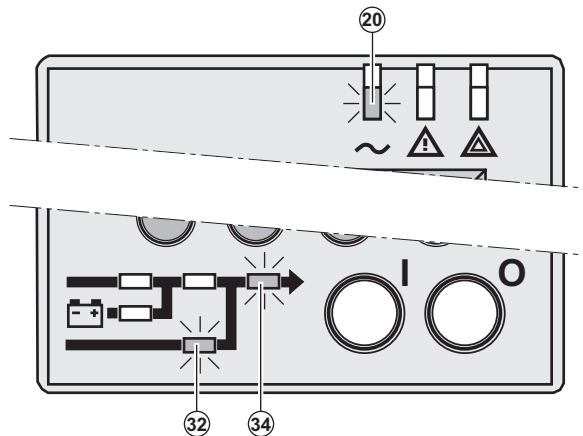


This is the standard operating mode, set by default in the factory.

Under normal condition (Normal AC source available):
LED (20) is ON.
LEDs (30), (32), (34) are green.

The equipments are protected by the UPS.

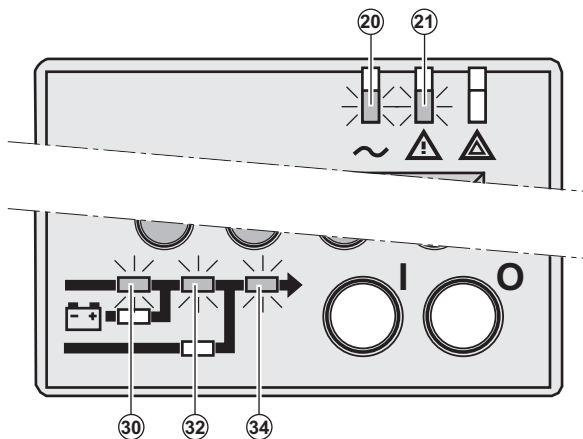
Eco mode



The main advantage of the Eco mode (see glossary) is that it reduces the consumption of electrical power.

Under normal condition (Normal AC source available):
LED (20) is ON.
LEDs (32), (34) are green.

The equipments are supplied in ECO mode.



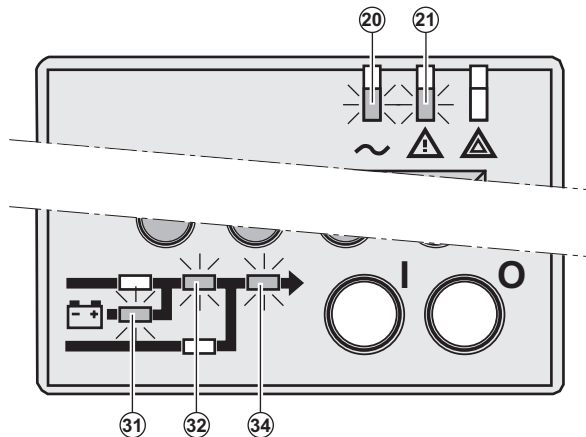
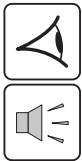
If normal AC source is out of tolerance:
LEDs (20), (21) are ON.
LEDs (30), (32), (34) are green.

The equipments are protected by the UPS.

3.4 Operation on battery power

When the Normal AC source is not available, the load continues to be protected by the UPS.
Power is supplied by the battery.

Transfer to battery power



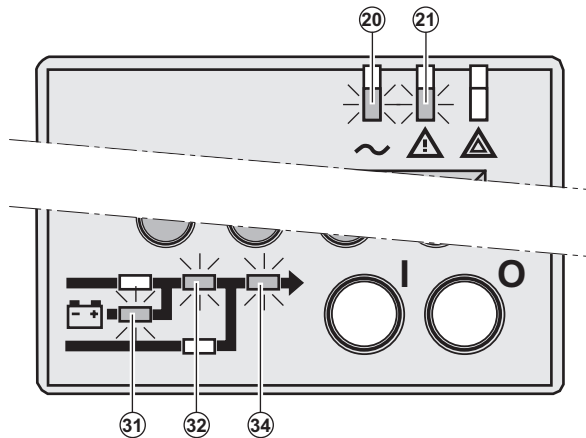
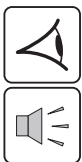
LEDs (20), (21) are ON.
LEDs (31), (32), (34) are green.

The audio alarm beeps every 10 seconds.

The equipments are protected by the UPS and supplied by the battery.

The display indicates the battery remaining backup time.

Low battery warning



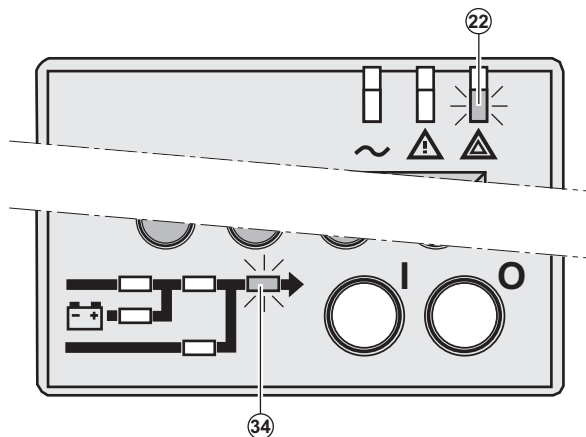
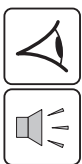
LEDs (20), (21) are ON.
LEDs (31), (32), (34) are green.

The audio alarm beeps every 3 seconds.

The remaining battery power is low.

Shut down all applications on the connected equipment because automatic UPS shutdown is imminent.

End of backup time



LED (22) is ON.
LED (34) is red.

The audio alarm beeps continuously.

The equipments are not powered.

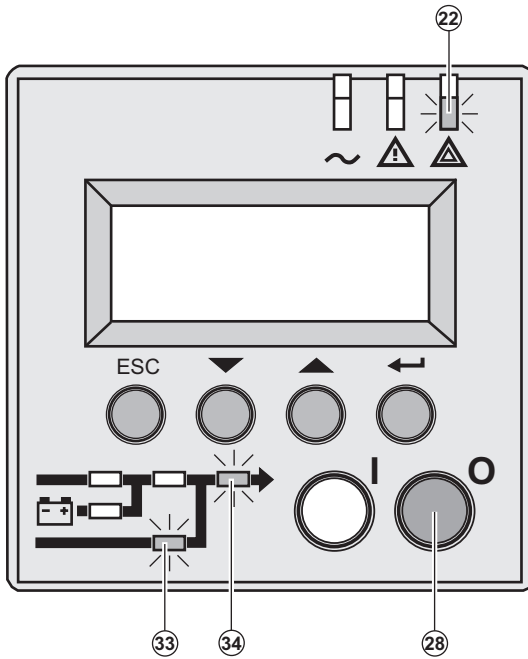
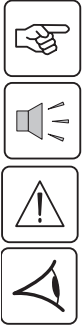
The UPS displays "End of backup time Battery low".

3.5 Return on Normal AC source

After an outage, the UPS restarts automatically when Normal AC source is restored (unless this function has been disabled via UPS personalisation) and the load is supplied again.

3. Operation

3.6 UPS shutdown



1 - Press the "0" button (28) more than 3s.

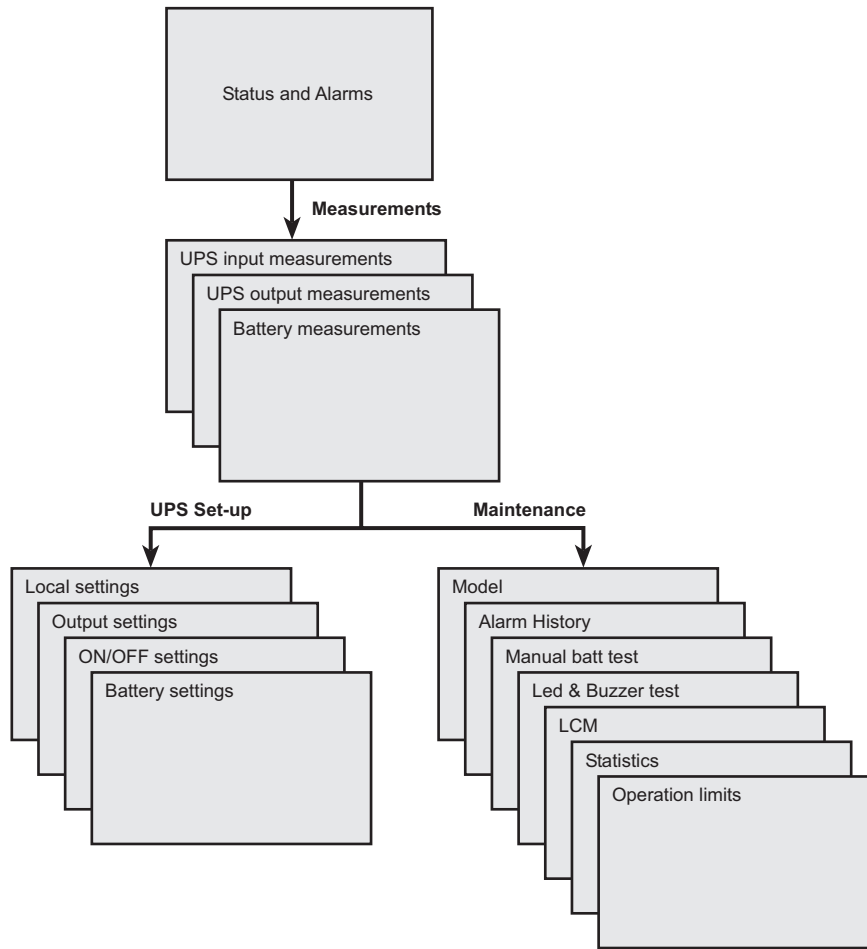
The buzzer beeps once, and the load is no longer protected by the UPS. It is powered via the Normal AC source. If the UPS is set in frequency converter mode, the equipments will not be powered.

If the Normal AC source is out of tolerance, the UPS will generate a 10ms output calibrated break.

2 - For a full shutdown of UPS and connected load, the upstream circuit breaker (not included) should be set to the "0" position.

4. Access to measurements and personalisation data

4.1 Display organisation

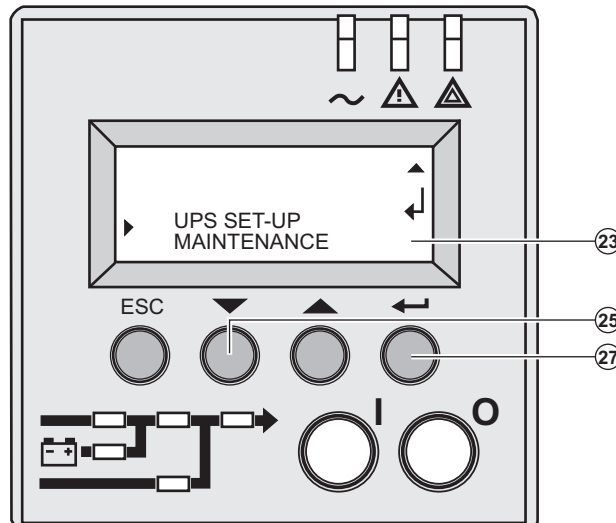


4.2 Access to measurements



Press the scroll button (24) (see section 1.3, page 9) to access measurements for voltage, current, frequency, power output and battery capacity.

4.3 Access to UPS set-up and maintenance using the control panel (23)



- ▶ Press the scroll button (25) a number of times to point the **UPS set-up** or **Maintenance** menu
- ▶ Press the Enter button (27) to get access.

4. Access to measurements and personalisation data

4.4 UPS set-up

Local settings

Function	Factory setting	Options
Language	English	French, German, Italian, Portuguese, Spanish
Date / Time Format	International (DD-MM-YYYY/HH :MM)	US (MM-DD-YYYY/HH:MM AM/PM)
Date / Time Change	GMT + 1 (Continental Europe)	MM-DD-YYYY/HH :MM adjustable
Audible Alarm	Yes	No

Output settings

Function	Factory setting	Options	Comments
Output Voltage	230 V	200 V / 208 V / 220 V / 240 V / 250 V	
Freq Converter	Disable	Enable	
Output Frequency	50 Hz	60 Hz	User selectable under frequency- converter mode
Eco Mode	Disable	Enable	See glossary
Slew Rate	1 Hz / sec.	0.5 Hz / sec.	
Bypass Transfer If bypass Ac nok?	Yes	No	Transfer to bypass if Normal AC source is out of tolerance
Interrupt Time	10 ms	20 ms, , 200 ms	Break time calibration during load transfer on Normal AC source out of tolerance
Overload Prealarm	105 %	40 %, 50 %, 70 %	Alarm if threshold is overrun
Redundancy Mode	No	Yes	On parallel sequence : Alarm if redundancy loss

ON/OFF settings

Function	Factory setting	Options	Comments
Cold Start	Disable	Enable	Start on battery
Forced Reboot	Enable	Disable	Enables automatic restart of the system even if Normal AC source is restored before the end of the shutdown sequence
Auto Restart	Enable	Disable	UPS restarts automatically when Normal AC source is restored
Energy Saving	Disable	Enable	Automatic shutdown on battery if output load level < 10 %
Sleep Mode	Enable	Disable	
Remote Command	Enable	Disable	Enables consideration of shutdown or restart orders from software to be authorised

4. Access to measurements and personalisation data

Battery settings

Function	Factory setting	Options	Comments
Auto Battery Test	Everyweek	No test / everyday / everyweek /everymonth	
Low Batt Warning	20%	0 to 100%	1% increment
User Batt Settings	UPS reads number of battery modules connected	From 0 to 40 Ah	5 Ah increment
Deep Disch Protect	Yes	No	Protection against deep discharge. If disable, MGE UPS SYSTEMS warranty will be void

4.5 Maintenance

Function	Sub-Function	Option / Display	Comments
Model	Power Module	SN: xxxxxxxxx SOFT: xxx NT: xxx	Serial number Soft version Technical level
	Frame		
Alarm History	Read	Description Date Hour Alarm xxx	10 alarms can be stored automatically
	Erase	No / Yes	
Manual Batt Test	Manual Battery Test	No / Yes	
Led & Buzzer Test	Led & Buzzer Test	No / Yes	
Life Cycle Monitoring	LCM	Enable / Disable	Life cycling monitoring alarms
Statistics	Auto Statistics	Statistics	You need to register at www.mgeups.com/lcm to get the code and get access to free statistics
	Custom Statistics	Reset Date ? Are you sure ?	
Operation Limits	Operation Limits		Automatic alarms displayed when UPS is operating near the limits

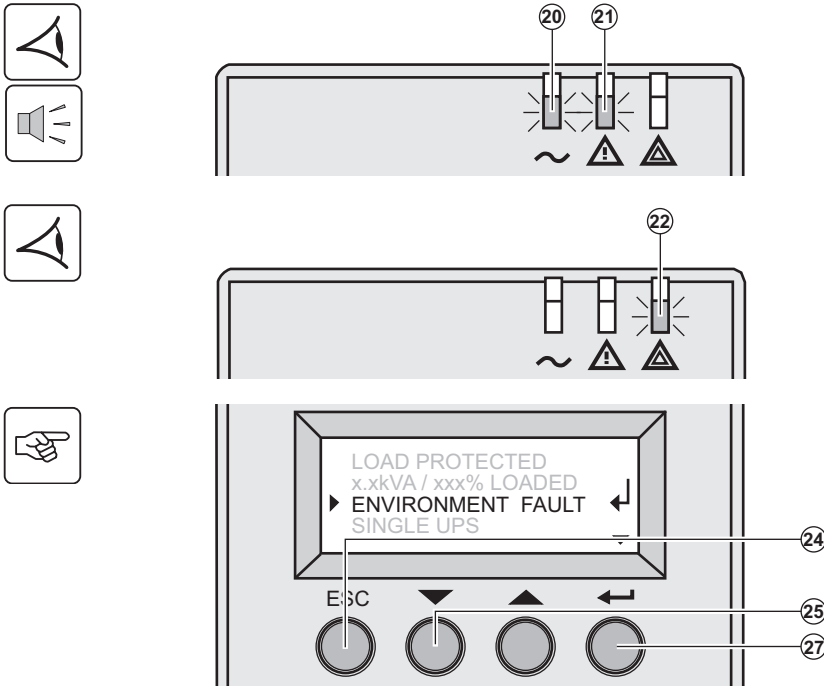
4.6 Personalisation using external software



- ▶ Insert the **Solution-Pac** CD-ROM in the drive.
 - ▶ On the first navigation screen, select "Point to Point solution" and follow the instructions on how to install the **Personal Solution-Pac** software.
 - ▶ Then select "Settings", "Advanced settings" and "UPS settings".
- Note that only the Windows versions of the **Personal Solution-Pac** software offer this possibility.

5. Troubleshooting

5.1 Troubleshooting LEDS (21) and (22)



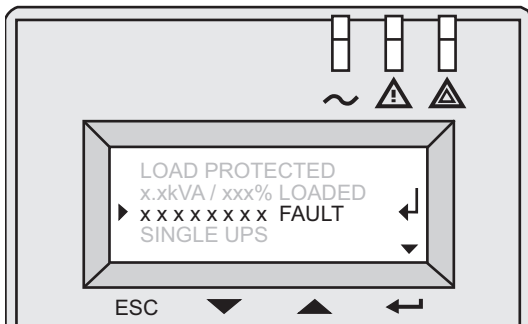
If LED (21) is ON:
the equipments are protected by the UPS but the operation is downgraded.

If LED (22) is ON:
the equipments are no longer protected by the UPS.

Press the escape button (24) to stop the audible alarm.

Note :
 In case of "MULTIPLE FAULT", press the "Enter" button (27) and the scroll button (25) to get access to further details.
 In case of "LCM WARNING", refer to LCM section (see section 6).

5.2 Troubleshooting not requiring MGE UPS SYSTEMS after-sales support

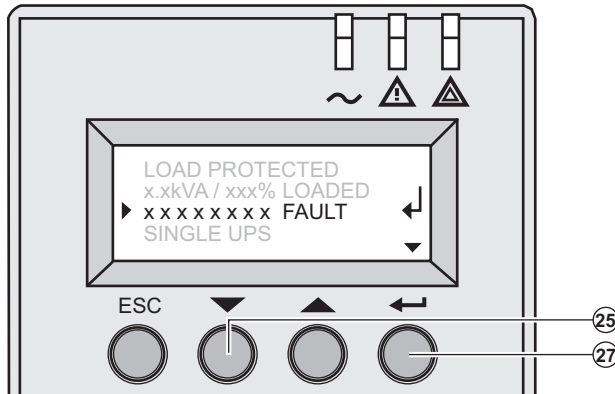


Press the "Enter" button (27) to display the details below :

Displayed details	Signification	Correction
NO BATTERY	The battery is incorrectly connected	Check battery connections
I/O BAD CONNECTION	AC source is not connected to the correct terminals	Check AC wiring
NO POWER MODULE	The power sub-module is not inserted	Check power sub-module connections (see section 7.1)
NO BATTERY MODULE	The battery sub-module is incorrectly connected	Check battery connections (see section 7.2)
INV THERM OVERLOAD	The UPS shuts down automatically because of a major overload.	Check the power drawn by the connected devices and disconnect any non-priority devices.
INVERT LIMITATION	Short circuit conditions on output devices	Check the installation at the UPS output (wiring, fault equipment)

5. Troubleshooting

5.3 Troubleshooting requiring MGE UPS SYSTEMS after-sales support



Display	Signification	Correction
POWER MODULE FAULT	Internal power sub-module fault detected. Use "Enter" button (27) to display details.	Call the after-sales support department. Follow the power sub-module replacement procedure (see section 7.1)
BATT MODULE FAULT	Battery fault detected during the battery test. Use "Enter" button (27) to display details.	Call the after-sales support department. Follow the battery sub-module and battery module replacement procedure (see section 7.2)
FRAME FAULT	Internal chassis fault detected. Use "Enter" button (27) to display details.	Call the after-sales support department. Follow the frame replacement procedure (see section 7.1, 7.2)



Note: In case of multiple fault, press the "Enter" button (27) and the scroll button (25) to get access to further details.

Troubleshooting one UPS (or two UPS in parallel) with ModularEasy module:

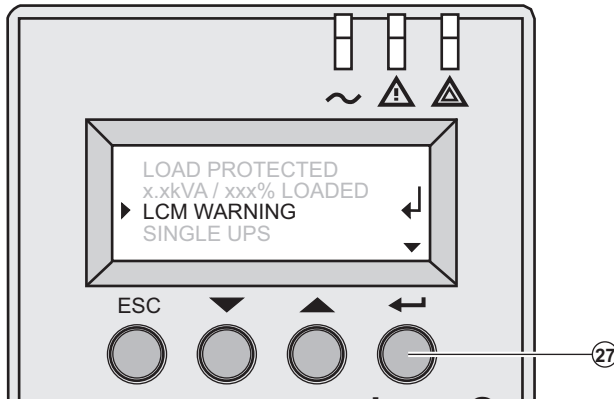


Indication	Diagnostic	Correction
The equipments are no longer supplied when the manual bypass on the ModularEasy module is set on the Bypass position.	The equipments are connected to the UPS output instead of the ModularEasy module output.	Check the wiring(s) between the UPS and the ModularEasy module (see ModularEasy install manual).
The equipments are no longer supplied when the manual bypass on the ModularEasy module is set on the Normal position.	The wiring(s) between the UPS and the ModularEasy module is not correct.	Check the wiring(s) between the UPS and the ModularEasy module (see ModularEasy install manual).
The equipments are no longer supplied if Normal AC source fails	The manual bypass on the ModularEasy module is set on the Bypass position. The wiring(s) between the UPS and the ModularEasy module is not correct.	Set the manual bypass on the ModularEasy module to the Normal position. Check the wiring(s) between the UPS and the ModularEasy module (see ModularEasy install manual).

6. Life Cycle Monitoring (LCM)

6.1 Description

This function, embedded in the UPS, displays messages, on screen and communication channels, at every important stage of the UPS's life, allowing you to:



Press the "Enter" button (27) to display LCM warning details.

Get free offers



LCM warning details	Signification
3 MONTHS FREE WARRANTY EXTENSION FOR PRODUCT REGISTRATION CONTACT MGE AT www.mgeups.com/lcm	Get free offer after registration at: www.mgeups.com/lcm
FREE STATISTIC FEATURE FOR PRODUCT WEB REGISTRATION CONTACT MGE AT www.mgeups.com/lcm	Get free offer after registration at: www.mgeups.com/lcm These statistics will allow you to have an accurate follow-up (on the display) of the major environmental parameters of your installation: <ul style="list-style-type: none"> Autonomy, time with mains 2 out of tolerance, overloads number, load level in %, Battery ambient temperature, time on inverter, time on mains 2

Secure your installation power continuity

Anticipate maintenance actions thanks to automatically displayed warnings while displaying automatic warnings when maintenance actions need to be planned :



LCM warning details	Signification
FOR A SECURED START-UP CALL MGE CONTACT MGE AT www.mgeups.com/lcm	Entrust your product commissioning to MGE UPS SYSTEMS: MGE UPS SYSTEMS will check the installation according to local regulations, in respect of the state of the art.
END OF WARRANTY SOON CONTACT MGE AT www.mgeups.com/lcm	Get your product warranty extension, contacting MGE UPS SYSTEMS at: www.mgeups.com/lcm
BATTERY CHECK RECOMMENDED CONTACT MGE AT www.mgeups.com/lcm	Battery is approaching its reliability end of life. Risk to reduce dramatically backup time
TECHNICAL CHECK RECOMMENDED CONTACT MGE AT www.mgeups.com/lcm	Wearing parts of your product must be checked
ALARM OPERATION LIMITS XXX CONTACT MGE AT www.mgeups.com/lcm	One of the following parameters is close to the limit of your product: Autonomy, time with mains 2 out of tolerance, overloads load level in %, battery environment temperature

6. Life Cycle Monitoring (LCM)

Reset or disable LCM



In case of any LCM messages displayed:

► For temporary reset: press the escape button (**24**) more than 3 seconds, into Status and Alarm screen, to cancel temporary the alarm status.

The alert will be repeated twice each 30 days.

► For permanent reset: press the enter button (**27**) more than 3 seconds, into LCM warning screen, to cancel permanently this LCM event.

At any time:

To Disable all LCM messages select "disable all" ,into LCM menu with LCD navigation.

Be careful: you will not be aware of any LCM events that can happen on the UPS if you disable all LCM messages.

7. Maintenance

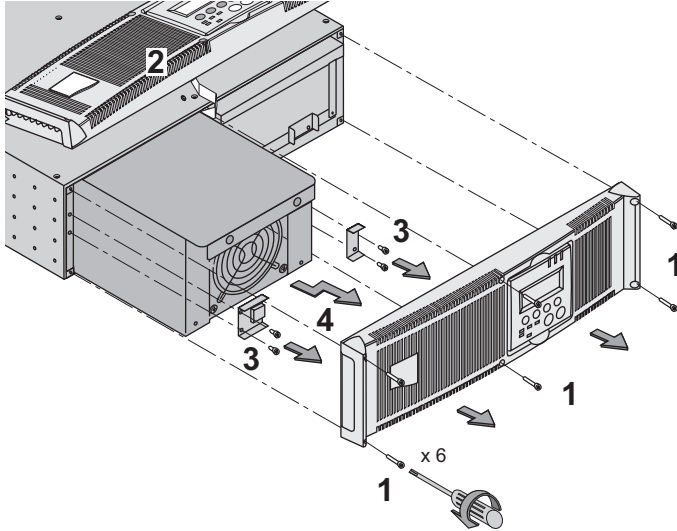
7.1 Hot swapping the power sub-module



This operation must be carried out by qualified electrical personnel only.

This operation can be performed without interrupting the equipments.

Disconnecting the power sub-module :



- 1 - Remove the 6 fixing screws to free the main front panel bezel.
- 2 - Place the front panel above the UPS.
- 3 - Remove the 4 fixing screws on the left side to free the power sub-module.
- 4 - Withdraw the power sub-module.

Reconnecting the power sub-module :



► Carry out the above instructions in reverse order.

► Replace the faulty power sub-module by another one with same power rating (**Pulsar MX 4000** or **Pulsar MX 5000**).

7.2 Hot swapping the battery sub-module



► **Caution:** a battery can cause electrocution and high short circuit currents.

► Servicing of batteries should be performed or supervised by personel knowledgeable of batteries and the required precautions. Keep unauthorized personel away from batteries.

► Remove watches, rings, bracelets and all other metal objects from the hands and arms,

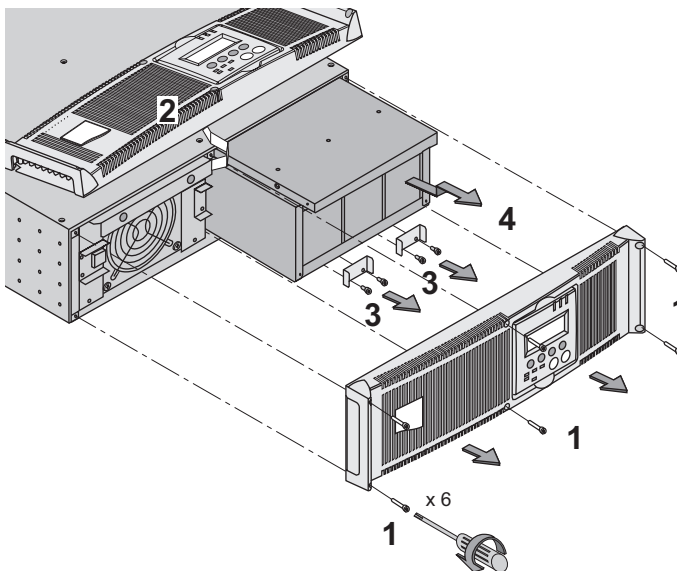
► Use tools with an insulated handle.

► When replacing batteries, replace with the same number of the BB/HR5.5-12 batteries.



This operation can be performed without interrupting the equipments.

Disconnecting the battery sub-module :



- 1 - Remove the 6 fixing screws to free the main front panel bezel.
- 2 - Place the front panel above the UPS.
- 3 - Remove the 4 fixing screws on the right side to free the battery sub-module.
- 4 - Pull the battery sub-module slightly, then lift it to extract it.

Reconnecting the battery sub-module :



Carry out the above instructions in reverse order.

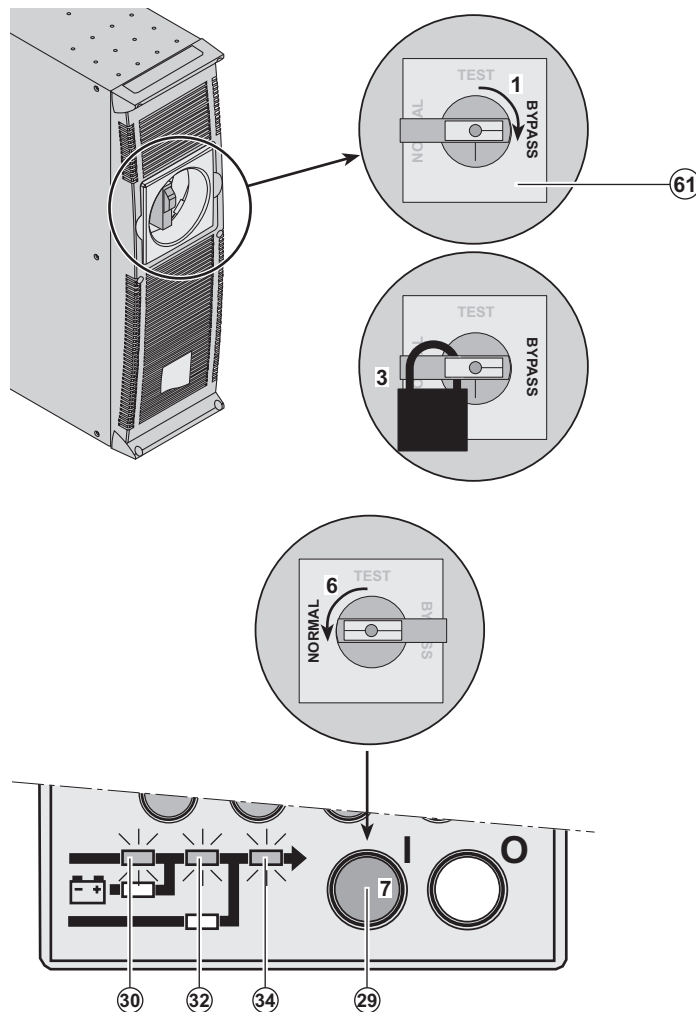
► To ensure safety and high performance, use only batteries supplied by MGE UPS SYSTEMS.

7.3 Maintenance on a UPS equipped with the ModularEasy MX module



Before any action on the manual bypass (61) located on the ModularEasy module front panel, always check that the inverter is stopped (press the "0" button more than 3 seconds).

The equipments should be powered via the Normal AC source, and not protected by the UPS.



The **ModularEasy** module makes possible to service or even replace the UPS without affecting the connected equipments (HotSwap function).

Maintenance:

1 - Set the manual bypass (61) to the Bypass position.

The equipments are supplied directly with Normal AC source.

2 - Check the UPS main bezel and wait the LCD stops (30 seconds).

3 - Padlock the manual bypass (61) on bypass position.

4 - The UPS can now be disconnected and replaced.

Return to normal operation:

5 - Properly wire the UPS (see section 2), and connect internal batteries.

6 - Set the manual bypass (61) to the Test position then to Normal position : the equipments are powered via the Normal AC source, but not protected by the UPS..

7 - Push the "I" button (29) till the buzzer beeps. LED (20) is ON, and LEDs (30), (32) and (34) (see page 9) are green: the equipments are protected by the UPS.

Test position:

It is also possible to fully test the UPS before the manual bypass (61) is set on Normal position.

To check the UPS, after step 5, follow this operating method:

6bis - Set the manual bypass (61) to the test position.

7bis - Push the "I" button (29) till the buzzer beeps. After UPS Internal test, LED's (30), (32) and (22) should be ON: no failure has been detected.

To return to normal operation:

► Push the "0" button (28) more than 3 seconds.

► Then follow the operating method from step 6.

7. Maintenance

7.4 Training centre



To fully master operation of your MGE UPS SYSTEMS product and carry out level 1 servicing, see our complete range of technical training courses, available in both French and English.

50 Hz training centre

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140 avenue Jean-Kuntzmann
Zirst - Montbonnot St-Martin
38334 St-Ismier Cedex FRANCE

Tel. +33 (0)4 76 18 34 14
Fax +33 (0)4 76 18 45 21
training@mgeups.com
www.mgepowerlearning.com
(Catalogue and registration available on line)

60 Hz training centre

MGE UPS SYSTEMS
1660 Scenic Avenue
Costa Mesa CA 92626 USA

Tel. +1 714 557 1637
Fax +1 714 437 9072
technical.training@mgeups.com
www.mgepowerlearning.com
(Catalogue and registration available on line)

8.1 Technical specifications

	Pulsar MX 4000	Pulsar MX 5000	Pulsar MX EXB
Output power	4000 VA / 3600 W	5000 VA ⁽¹⁾ / 4500 W ⁽²⁾	
Electrical supply network <ul style="list-style-type: none"> ▶ Rated input voltage ▶ Input voltage range ▶ Frequency ▶ Power factor ▶ Leakage current 	Single phase 230 V 120 / 156 V to 280 V ⁽³⁾ 50/60 Hz (autoselection) > 0.99 7 mA max.		
Load output <ul style="list-style-type: none"> ▶ Voltage ▶ Frequency ▶ Harmonic distortion ▶ Overload capacity 	Single phase 230 V ±3% ⁽⁴⁾ 50/60 Hz ±0,5% ⁽⁵⁾ < 3% 105% continuous, 110% 2min, 125% 1min, > 150% 0.5s		
Battery	15 x 12V - 5 Ah, sealed lead acid, maintenance free	15 x 12V - 5 Ah, sealed lead acid, maintenance free	Two 15 x 12 V - 5 Ah strings, sealed lead acid, maintenance free
Environment <ul style="list-style-type: none"> ▶ Operating temperature range ▶ Relative humidity ▶ Storage temperature range ▶ Altitude ▶ Noise level 	0°C to 40°C 20% to 90% (non-condensing) -25°C to 40°C 0 to 1000 m without derating		
	< 45 dBA		

(1) If the output voltage is 200V - 250V, the output power is 4500VA / 4000W.

(2) With one **EXB** module or more, the standard output power is 5000VA / 4000W.

(3) Values for 70% / 100% of UPS output.

(4) Programmable: 200V / 208V / 220V / **230V** / 240V / 250V using the **UPS Config** software.

(5) Frequency-converter mode is programmable using the **UPS Config** software.

8.2 Glossary

Backup time	Time that the connected equipments can operate on battery power.
Bypass AC source	Source supplying the bypass line. The equipments can be transferred to the bypass line if an overload occurs on the UPS output, for maintenance or in the event of a malfunction.
ECO mode	Operating mode by which the equipments are supplied directly by the AC source if it is within the tolerances defined by the user. This mode reduces the consumption of electrical power.
Equipments	Devices or systems connected to the UPS output.
Frequency converter	Operating mode used to convert the AC-power frequency between the UPS input and output (50 Hz -> 60 Hz or 60 Hz -> 50 Hz).
Low-battery warning	This is a battery-voltage level indicating that battery power is low and that the user must take action in light of the imminent break in the supply of power to the load.
Manual bypass	Rotary switch controlled by the user, used to connect the equipments directly to the AC source. Transfer of the equipments to the manual bypass enables UPS maintenance without interrupting the supply of power to the connected equipments.
Normal AC source	Normal source of power for the UPS.
Normal (double conversion) mode	The normal UPS operating mode in which the AC source supplies the UPS which in turn supplies the connected equipments (after electronic double conversion).
Personalisation	It is possible to modify certain UPS parameters set in the factory. Certain UPS functions can also be modified by the MGE UPS SYSTEMS power management products to better suit user needs.
Programmable outlets	These outlets can be automatically shut down during operation on battery power (shutdown time delays can be programmed with the MGE UPS SYSTEMS power management products). The UPS has two sets of two programmable outlets.
Relay contacts	Contacts supplying information to the user in forme of signals.
UPS	Uninterruptible Power System.

MGE UPS SYSTEMS

THE UNINTERRUPTIBLE POWER PROVIDER

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