

**MX**  
5000 RT — UPS  
EXB RT — Extended  
Battery  
Transformer 5000

**Installation and User Manual**



**Pulsar Series**



**MX**  
5000 RT — UPS  
EXB RT — Extended  
Battery  
Transformer 5000

**Installation and User Manual**

**Revision History**

*MX Installation and User Manual, 86-87050-00*

*Revision: A00    ECN#: 004747    04/2006*

*Revision: A01    ECN#: 004773    05/2006*

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Thank you for selecting an EATON product to protect your electrical equipment.

The 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.

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

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

To discover the entire range of EATON products and the options available for the MX range, we invite you to visit our web site at [www.eaton.com](http://www.eaton.com) or contact your EATON representative.

## Environmental Protection

EATON 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

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

EATON 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, please visit our website: [www.eaton.com](http://www.eaton.com).

# IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS. This manual contains important instructions that should be followed during installation and maintenance of the UPS and batteries.

The MX models that are covered in this manual are intended for installation in an environment within 0° to 40°C, free of conductive contaminant.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

## Certification Standards

- ▶ IEEE 587-1980/ANSI C62.41 1980 Standards for Surge Withstand Ability
- ▶ FCC rules and regulations of Part 15, Subpart J, Class A
- ▶ UL listed under 1778, Standards for Uninterruptible Power Supply Equipment
- ▶ IEC 61000-4-2 (ESD): level 4
- ▶ IEC 61000-4-3 (Radiated field): level 3
- ▶ IEC 61000-4-4 (EFT): level 4
- ▶ IEC 61000-4-5 (Fast transients): level 4
- ▶ IEEE-C6241 Category B (ring wave)
- ▶ IEC 61000-4-6 (electromagnetic field)
- ▶ IEC 61000-4-8 (conducted magnetic field)

## Safety of Persons

- ▶ The system has its own power source (the battery). Consequently, the power outlets may be energized even if the systems is disconnected from the AC power source.
- ▶ Dangerous voltage levels are present within the system. It should be opened exclusively by qualified service personnel.
- ▶ The system must be properly grounded.
- ▶ The battery supplied with the system contains small amounts of toxic materials. To avoid accidents, the directives listed below must be observed:
  - Never burn the battery (risk of explosion).
  - Do not attempt to open the battery (the electrolyte is dangerous for the eyes and skin).
  - Comply with all applicable regulations for the disposal of the battery.
  - Batteries constitute a danger (electrical shock, burns). The short-circuit current may be very high. Precautions must be taken for all handling: remove watches, rings, bracelets and any other metal objects, use tools with insulated handles.
  - Do not lay tools or metal parts on top of batteries.

## Product Safety

- ▶ The UPS connection instructions and operation described in the manual must be followed in the indicated order.
- ▶ A protection circuit breaker must be installed upstream and be easily accessible. The system can be disconnected from the AC power source by opening this circuit breaker.
- ▶ Check that the indications on the rating plate correspond to your AC powered system and to the actual electrical consumption of all the equipment to be connected to the system.
- ▶ The socket-outlet shall be installed near the equipment and shall be easily accessible.
- ▶ Never install the system near liquids or in an excessively damp environment.
- ▶ Never let a foreign body penetrate inside the system.
- ▶ Never block the ventilation grates of the system.
- ▶ Never expose the system to direct sunlight or source of heat.
- ▶ If the system must be stored prior to installation, storage must be in a dry place.
- ▶ The admissible storage temperature range is -20°C to +40°C.

## Special Precautions

- ▶ All handling operations will require at least two people (unpacking, installation in rack system).
- ▶ Before and after the installation, if the UPS remains de-energized for a long period, the UPS must be energized for a period of 24 hours, at least once every 6 months (for a normal storage temperature less than 25°C). This charges the battery, thus avoiding possible irreversible damage.
- ▶ During the replacement of the Battery Module, it is imperative to use the same type and number of element as the original Battery Module provided with the UPS to maintain an identical level of performance and safety. In case of doubt, don't hesitate to contact your EATON representative.

## Environment

- ▶ **This product has been designed to respect the environment:**
  - It does not contain any Chlorofluorocarbon (CFC) or Hydrochlorofluorocarbon (HCFC).
- ▶ **UPS recycling at the end of service life:**
  - EATON 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 EATON 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 specialized companies.**



# Symbol Usage



Important instructions that must always be followed.



Information, advice, help.



Visual indication.



Action.



Audible signal.



LED off.



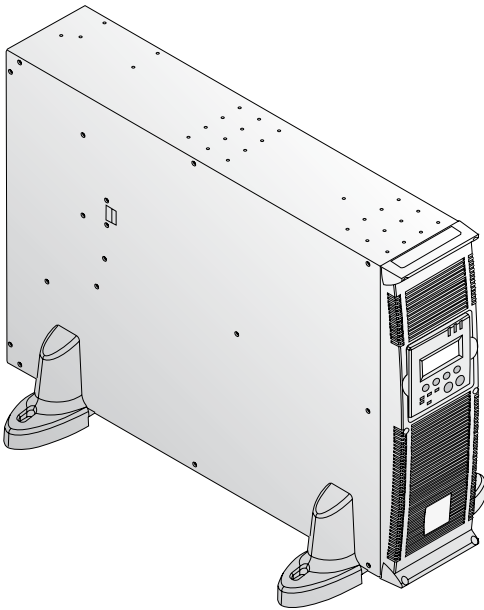
LED on.

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# 1. Presentation

## 1.1 Standard Positions

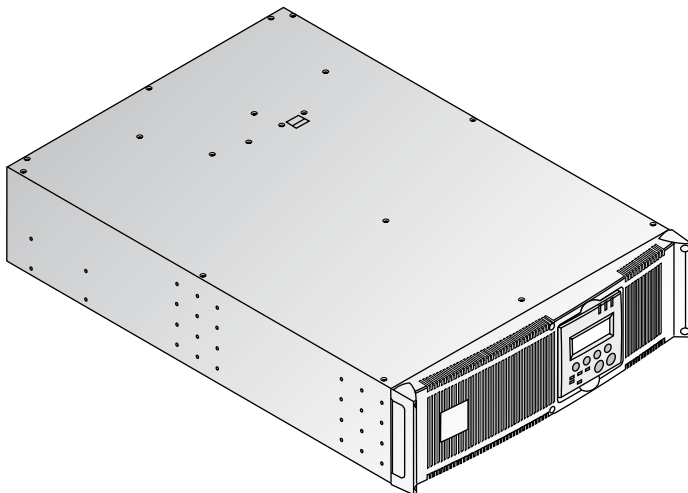
### Tower Position



Dimensions (H x W x D) in inches/mm	
MX 5000 RT	17.5 x 5.16 x 29.2/ 444.5 x 131 x 741.4
MX EXB RT	17.5 x 5.16 x 25.6/ 444.5 x 131 x 650
Transformer 5000	17.5 x 3.5 x 25.6/ 444.5 x 88.9 x 650

Weights in lbs/kg	
MX 5000 RT	125/57
MX EXB RT	154/70
Transformer 5000	84/38

### Rack Position



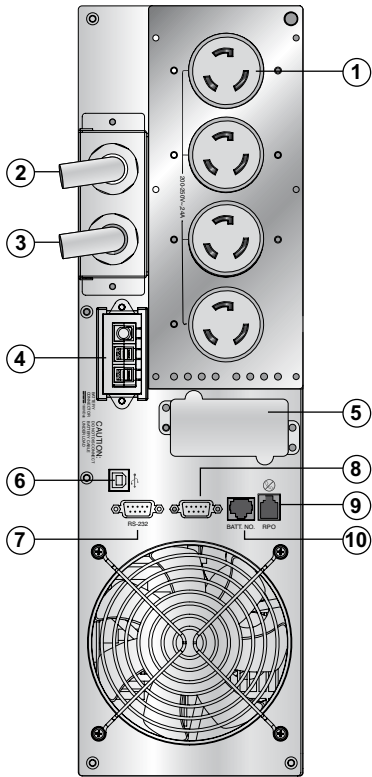
Dimensions (H x W x D) in inches/mm	
MX 5000 RT	5.16 x 17.5 x 29.2/ 131 x 444.5 x 741.4
MX EXB RT	5.16 x 17.5 x 25.6/ 131 x 444.5 x 650
Transformer 5000	3.5 x 17.5 x 25.6/ 88.9 x 444.5 x 650

Weights in lbs/kg	
MX 5000 RT	125/57
MX EXB RT	154/70
Transformer 5000	84/38

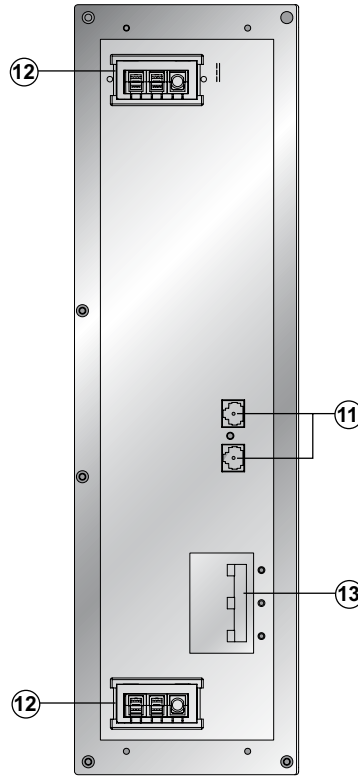
# 1. Presentation

## 1.2 Rear Panels

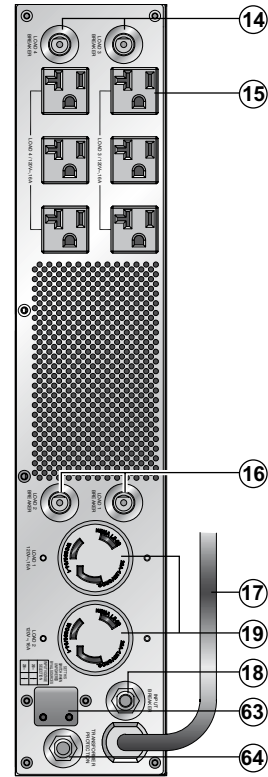
**MX 5000 RT**



**MX EXB RT**



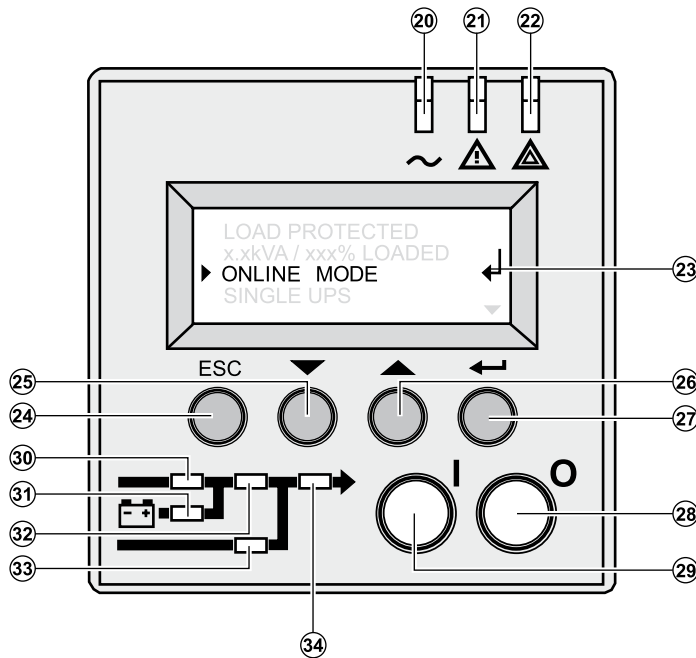
**Transformer 5000**



- (1) One group of 4 L6-30R outlets for connection of equipment
- (2) Output terminal block
- (3) Normal AC source input cable with L6-30P
- (4) Connector for additional battery module
- (5) Slot for optional communication card
- (6) USB communication port
- (7) RS232 communication port
- (8) Communication port by relay
- (9) Connector for Remote Power Off control
- (10) Connector for automatic detection of battery module(s)
- (11) Connectors for automatic detection of battery module(s)
- (12) Connectors for battery modules (to the UPS or to the other battery modules)
- (13) DC Battery circuit breaker
- (14) Resettable 20Amp circuit breakers for NEMA 5-15/20 receptacle
- (15) 6 NEMA 15/20 receptacle
- (16) Resettable 20Amp circuit breakers to protect each L5-20R receptacle
- (17) Input cable with L6-30P plug
- (18) Input resettable CB
- (19) 2 NEMA L5-20R receptacle
- (63) Input voltage selecting (240V/208)
- (64) Transformer protection CB

# 1. Presentation

## 1.3 Display and Control Panel

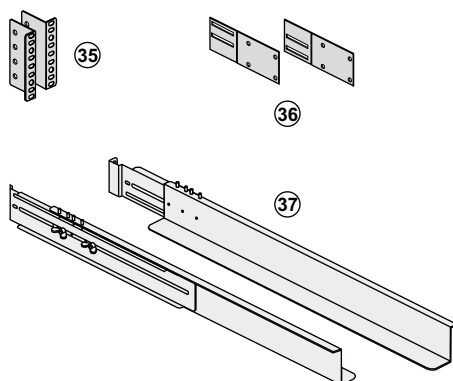


- (20) Load protected LED
- (21) Downgraded operation LED
- (22) Load not protected LED
- (23) Alphanumeric display
- (24) Escape (cancel) button
- (25) Function buttons (scroll down)
- (26) Function buttons (scroll up)
- (27) Enter (confirm) button
- (28) UPS OFF button
- (29) UPS ON button
- (30) Rectifier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

## 1.4 Accessories for Rack Mount

### Rack Mounting Kit

Telescopic rails for MX RT mounting in 19" enclosure with mounting hardware



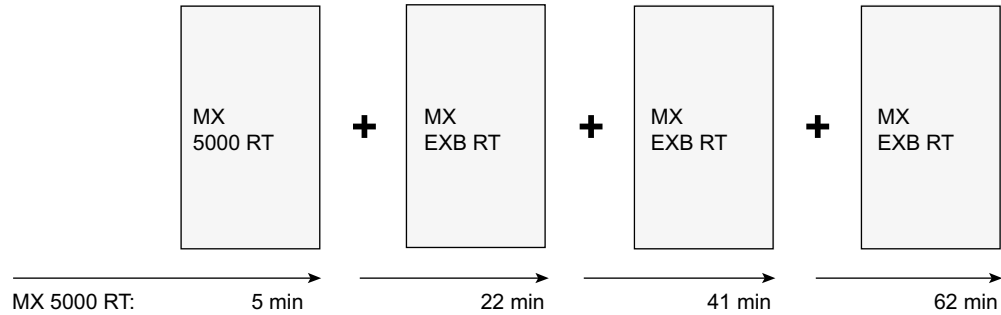
- (35) Front mounting bracket
- (36) Rear support bracket
- (37) Telescopic rails, 639 mm to 1005 mm length (27.36" to 39.96")

# 1. Presentation

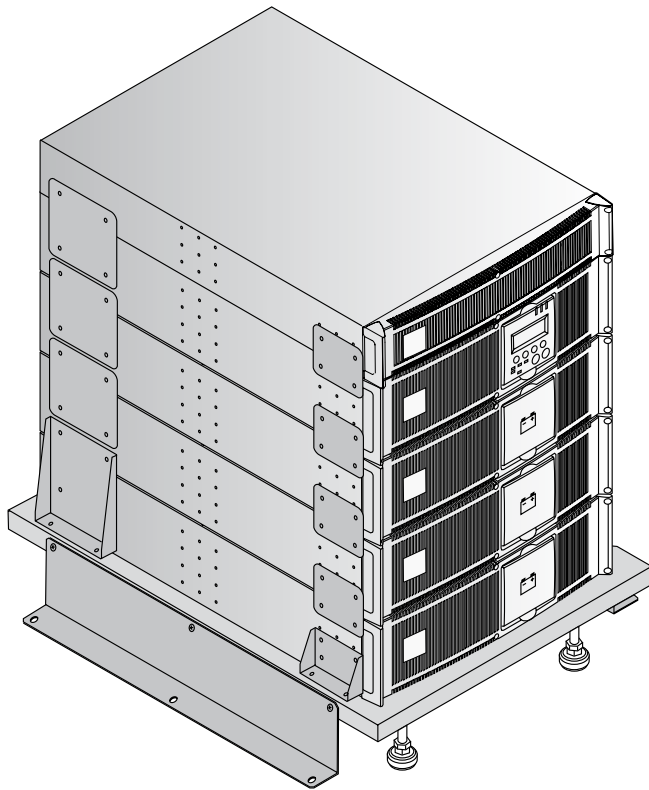
## 1.5 Extended Battery (EXB)

MX RT offers a standard backup time of 5 minutes at full load. To increase backup time, it is possible to connect MX EXB RT modules to the UPSs for backup times up to 62 minutes (at full load).

### Battery extensions for MX RT



### Battery Integration System Kit with Casters (86005)



The Battery Integration System is intended for extended backup time configurations to conveniently stack and secure up to 5 modules on the same cart (swivel wheels with brakes, leveling feet, seismic side panels, plates to lock modules, and screws included).

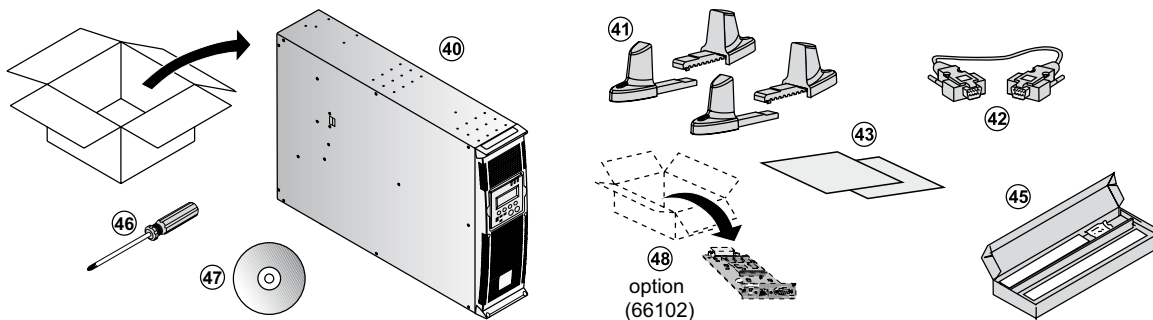
### Optional battery extension cable (6 ft/1.8 m)

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).

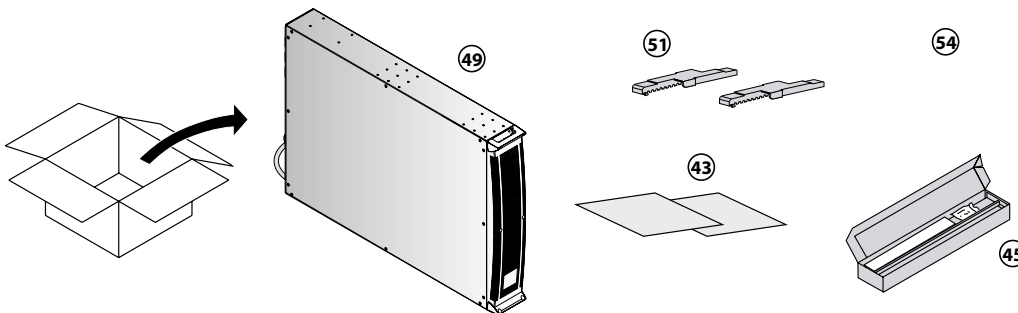
## 2. Installation

### 2.1 Unpacking and Contents Check

#### UPS Module Contents (87050)

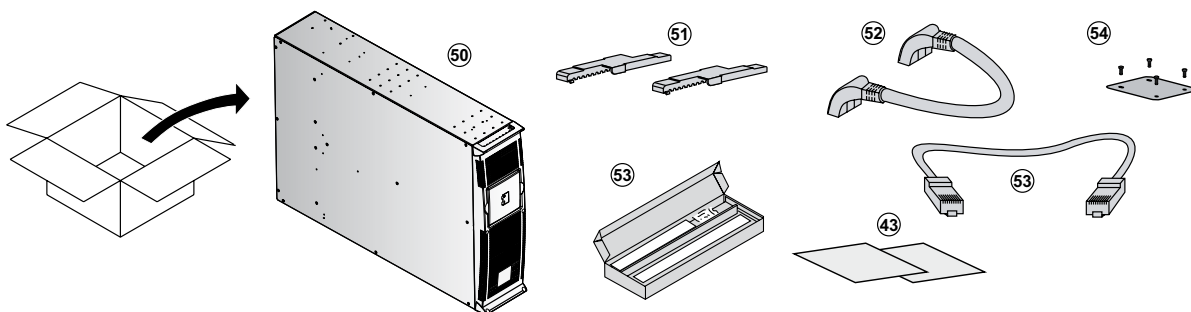


#### Optional Transformer Module Contents (87102)



Step down transformer is designed to provide isolated 120 volts AC outlets.

#### Optional Battery Module Contents (87103)



- |   |   |
|---|---|
| (40) MX 5000 UPS  | (48) Network Management card (optional)     |
| (41) Two sets of tower stands                                   | (49) Transformer 5000                       |
| (42) RS232 communications cable                                 | (50) MX EXB RT battery module               |
| (43) Product documentation                                      | (51) Tower stand expanders                  |
| (45) Telescopic rails for rack enclosure with mounting hardware | (52) Battery cable                          |
| (46) Screw driver   | (53) Battery communication cable            |
| (47) Solution-Pac power management suite CD-ROM                 | (54) Stabilizer bracket (4 screws included) |

Please see the appropriate manual for packing contents of the optional battery module and transformer module.



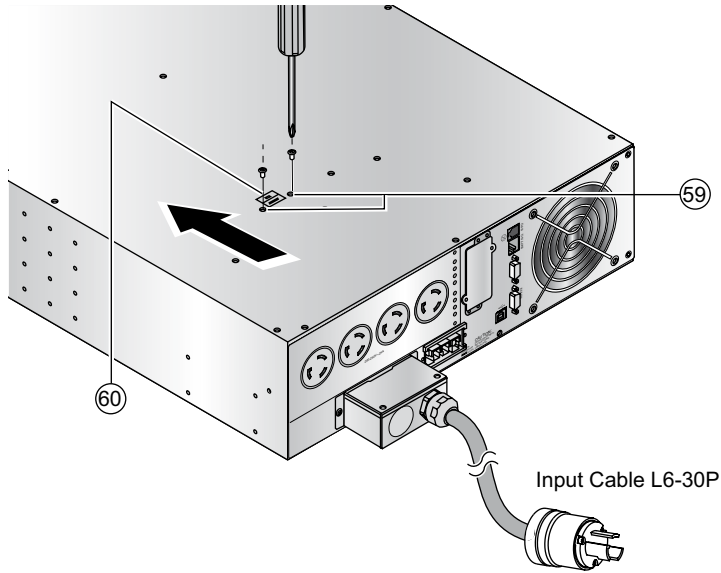
Packaging must be destroyed according to waste management standards. Recycling icons are displayed for easy selection.



**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 personnel.**

## 2. Installation

### 2.2 Internal Battery Connection (Battery Start-up)

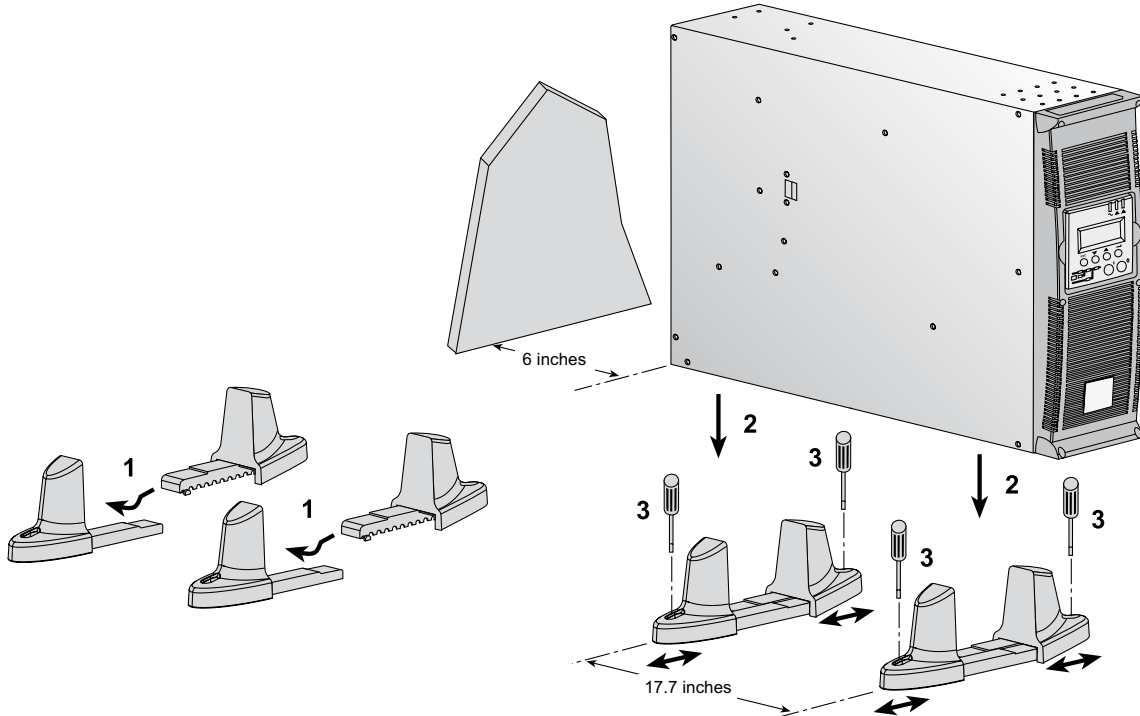


1. Remove the two mounting screws (59) to free the battery disconnect switch (60).
2. Push the battery disconnect switch so that you can read "Connected".
3. Secure the two mounting screws (59).

### 2.3 Installation in Tower Position



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

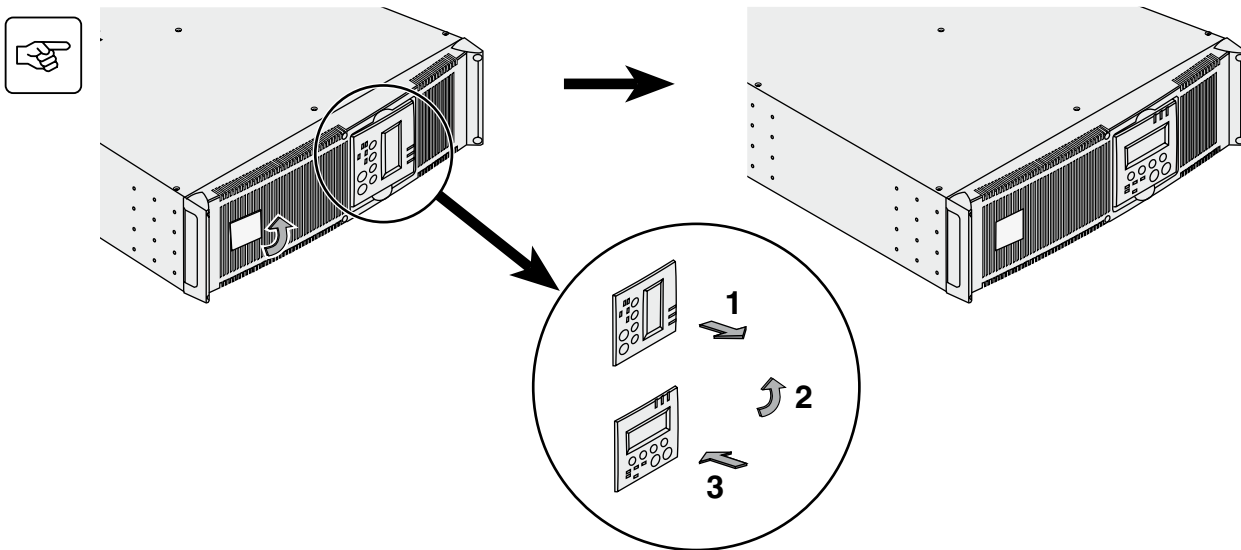


Always keep 6 inches free space behind the UPS rear panel. The distance between the tower stands should be 17.7 inches.



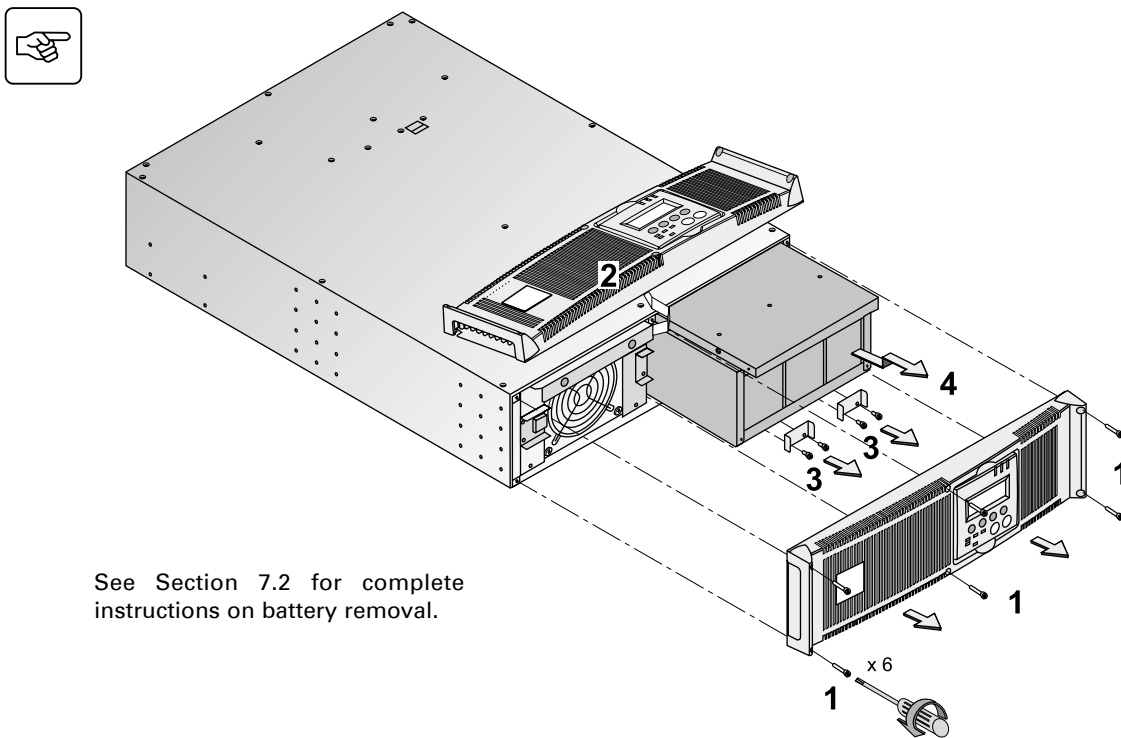
### 2.4 Installation in Rack Position

#### Adjustment of the orientation of the logo and control panel



#### UPS module rack mounting

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



See Section 7.2 for complete instructions on battery removal.

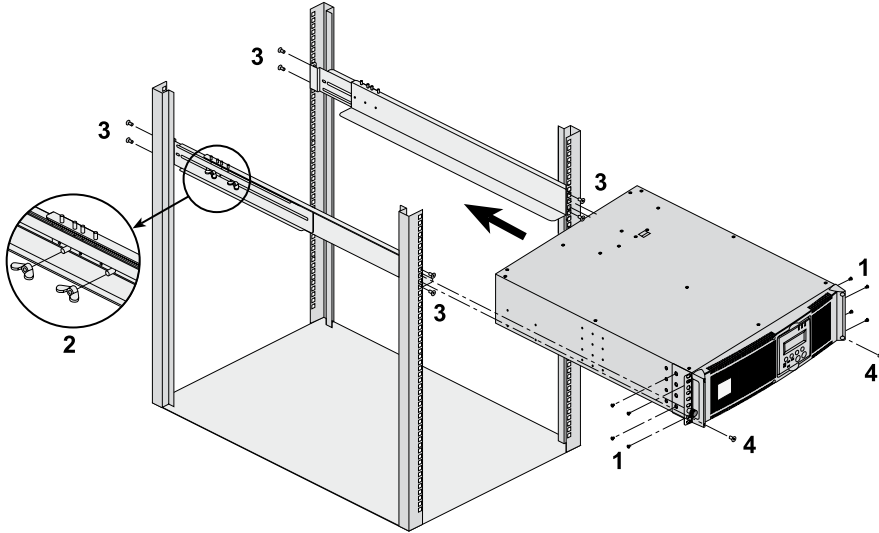
## 2. Installation



Do not install the UPS or battery module in hermetic closed environments without any exchange of air.



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



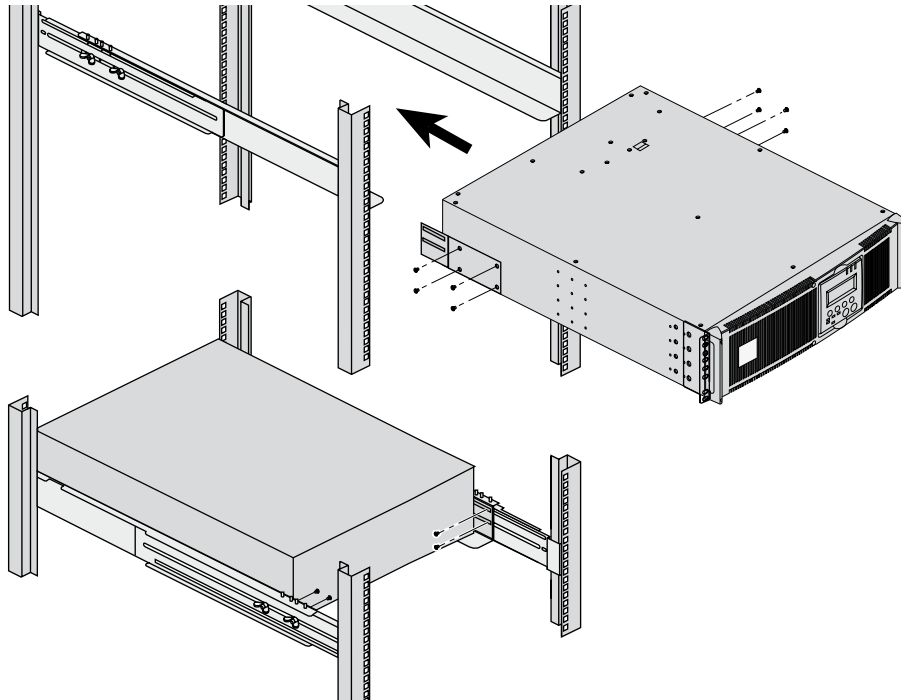
The rails and the necessary mounting hardware are supplied by EATON.



**Note for step 1:** It is possible to adjust the position of both front mounting brackets.

### Rear bracket system (included with rail kits)

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



### 2.5 Communication Ports

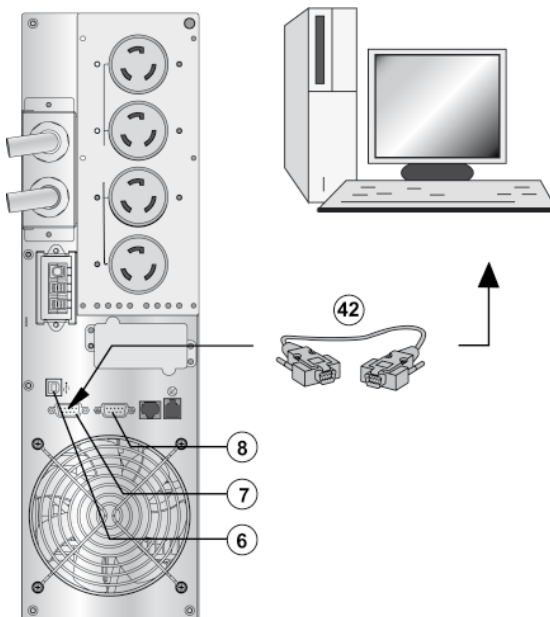
**MX RT** provides 4 communication methods.

1. The RS232 port provides communications using EATON Serial HID UPS transfer (SHUT) protocol. The SHUT protocol is compatible with the power management applications available on the enclosed Solution-Pac 2 CD-Rom.
2. The Output contacts port is used for basic signaling or for protection of IT systems like IBM iSeries (formerly AS400) and more.
3. The USB port is compatible with the power management applications available on the enclosed Solution-Pac 2 CD-Rom.
4. The slot is compatible with the optional 66102 — Network Management Card (NMC) 2006 Edition and the 66103-Status Card.



**Note** All communications options can be used simultaneously except for the SHUT RS232 and USB port. If both the USB and SHUT ports are connected then the USB takes control.

#### Connection to the RS232 or USB communication port (42)

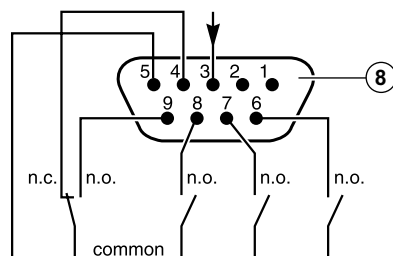


1. Connect the RS232 (42) or USB (44) communication cable to the serial or USB port on the computer equipment.
2. Connect the other end of the RS232 cable (42) to the RS232 (7) communication port or the USB cable (not included) to the USB port (6) on the UPS.

The UPS can now communicate with various EATON power management application software.

Please note that Personal Solution-Pac can be used to configure (personalize) the UPS parameters such as voltage, frequency, battery test, etc. See section 4.6 for more details.

#### Connection to the communication port by relays (8)



- ▶ Pin 1, 2: not used,
  - ▶ Pin 3: Remote Power Off signal (5 to 27 V DC, 10 m A 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<sub>max</sub>=625 mA

## 2. Installation

### Remote Power Off communication port (9)

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

In order to fully de-energize MX RT with the RPO port, it is necessary to use a two-position switch (Normally Open or Closed contact). Once switch is energized/de-energized, the UPS shuts off the display and the output of the UPS.

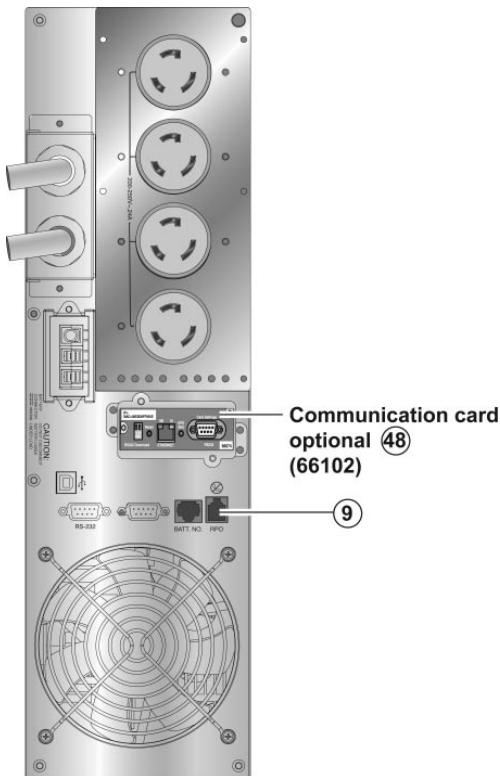
- ▶ The output devices can be powered again through auto bypass when the two-position switch is released (open or closed).
- ▶ The output devices will remain powered < 1 sec. after RPO activation.

Push the start button to return to normal operation.

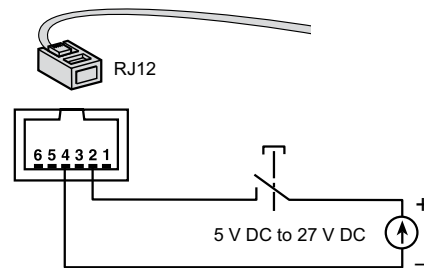
Note: The internal batteries will remain connected to the power sub-module after RPO activation.

The cable is not included.

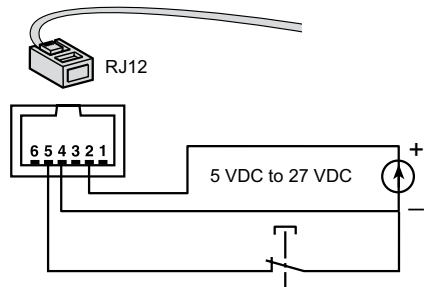
### Installation of optional communication card (66102)



### Remote power off contact normally open (9)



### Remote power off contact normally closed (9)

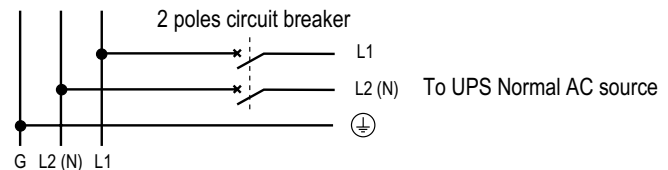


- ▶ Signal: activation voltage: 5 V DC to 27 V DC, current: 10 mA max.

## 2.6 Required Protective Devices and Cable Cross-Sections

### Recommended upstream protection

UPS Power Rating	Upstream Circuit Breaker
5000 RT	D curve - 35A



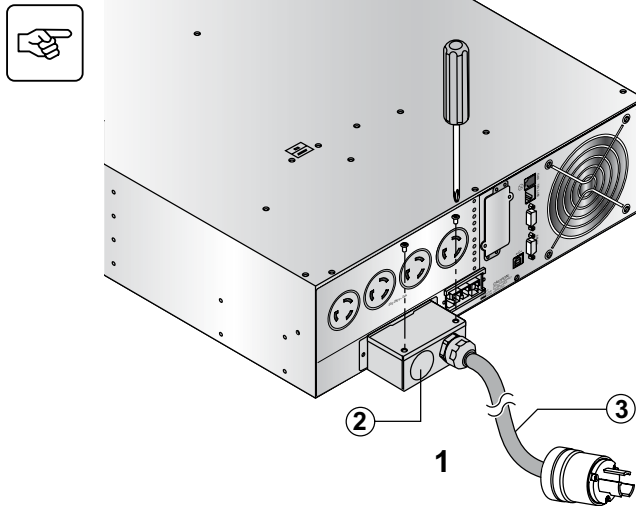
### Required cable cross-sections

- ▶ Terminal-block cable capacity: 6 mm<sup>2</sup>, solid or stranded wire (maximum AWG 10).
- ▶ Capacity for earthing conductor: 6 mm<sup>2</sup>, solid or stranded wire (maximum AWG 10).

## 2. Installation

### 2.7 Hardwire Connection of Output Power Cable to UPS

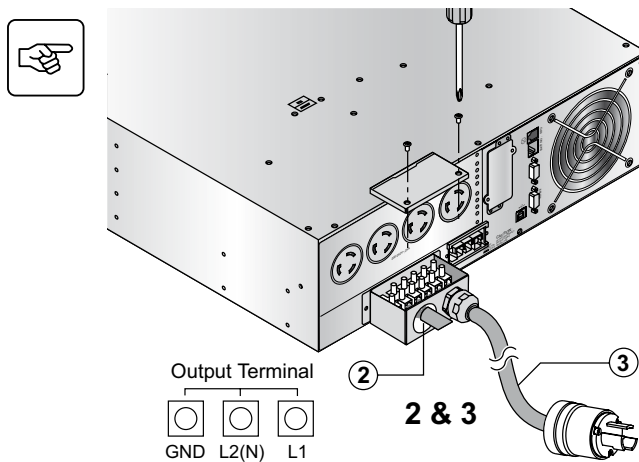
- ▶ This type of connection must be carried out by qualified electrical personnel.
- ▶ Before carrying out any connection, check that the battery circuit breaker and the upstream protection device (Normal AC source) is open «0» (off).



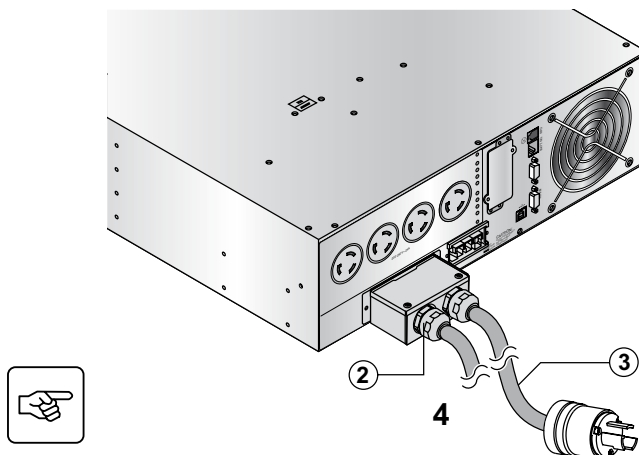
1. Remove the top of the terminal box cover (2 screws) with the included screwdriver.
2. Insert the output cable/conduit (provided by others) through the cable knockout (2).
3. Connect the outlet cable to the output terminal block.
4. Tighten the cable/conduit flange and refit the terminal box cover by means of the 2 screws.



Always connect the ground wire first.

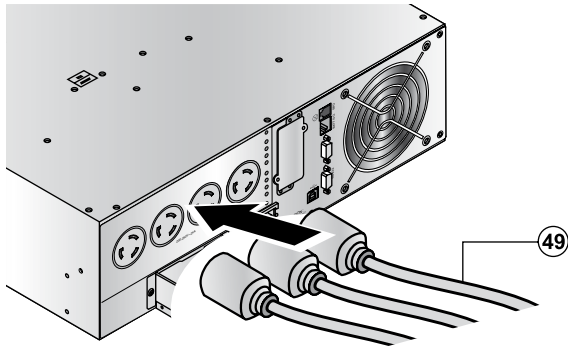


**Note:** 10' Input cable with L6-30P (3) comes attached by EATON. Output cable/conduit (2) is not included (provided by others).



## 2. Installation

### 2.8 Connection to Output Receptacles

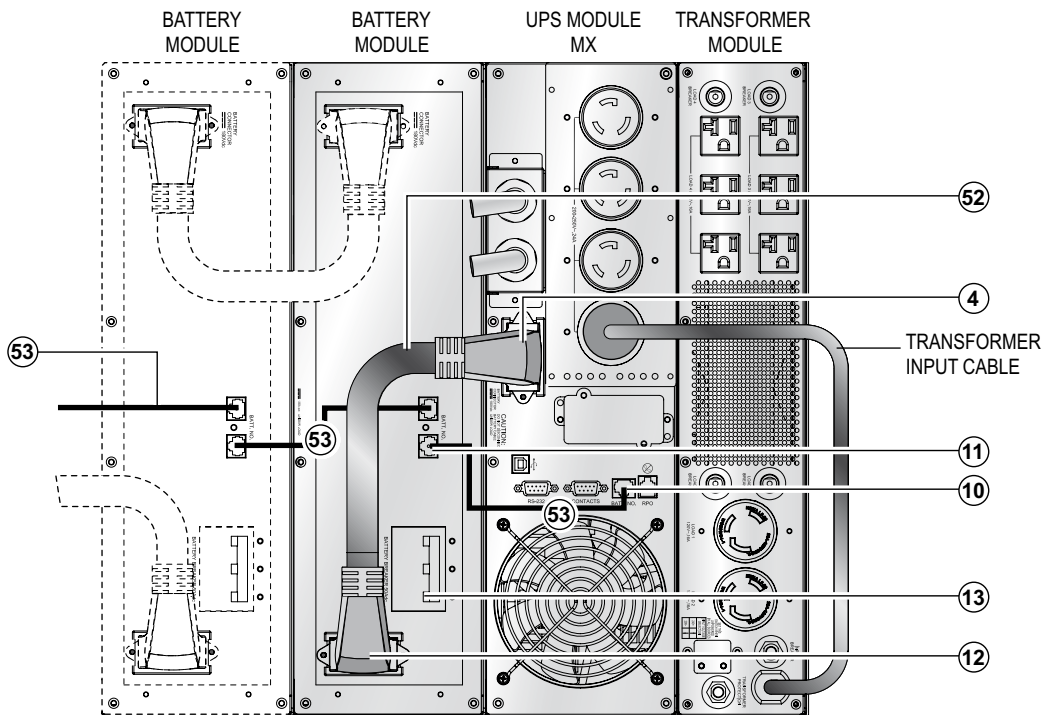


1. Connect the equipment to the UPS 4 NEMA L6-30R.



If more than one load is connected to the UPS, the total capacity of the loads should not exceed 30 Amps.

### 2.9 Connection of Extended Battery Module, UPS, and Transformer



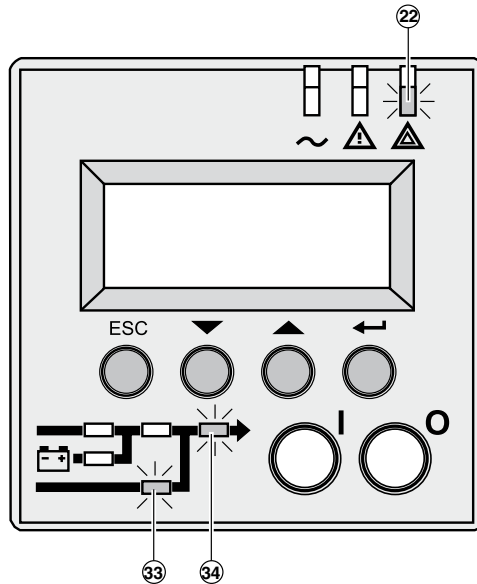
1. Check that the battery circuit breaker(s) (13) is OFF («0» position).
2. Connect the battery power cable (52) to the connector (4) of the power module and to the connector (12) of the battery module.
3. Connect the battery detection cable (53) to the connector (10) of the power module and to the connector (11) of the battery module.
4. Switch on the battery circuit-breaker(s) (13).

# 3. Operation

## 3.1 Initial Start-Up



To ensure that your system is configured in complete accordance with safety regulations and to benefit from the manufacturer's warranty, please contact Technical Support at [www.eaton.com](http://www.eaton.com) or call (800) 279-7776.



1. Check that the battery disconnect switch (60) on top cover is connected (see section 2.2 Internal Battery Connection).
2. Set the upstream circuit breaker (not included) to the on position.

**The equipment is 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.

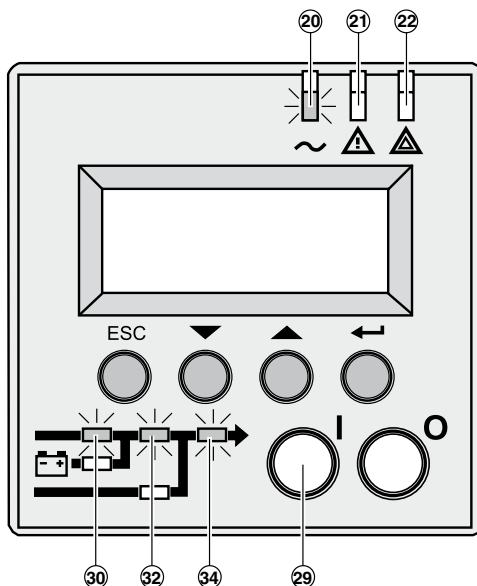
LED (22) is ON, LEDs (33) and (34) are green.

### UPS Set-Up



If UPS personalization is desired, it is advised to enter the personalization mode at this time (see the 4.4 «Personalization» section).

## 3.2 Final Start-Up Sequence



3. Press and hold the «I» (on) button (29) for 3 seconds.

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

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

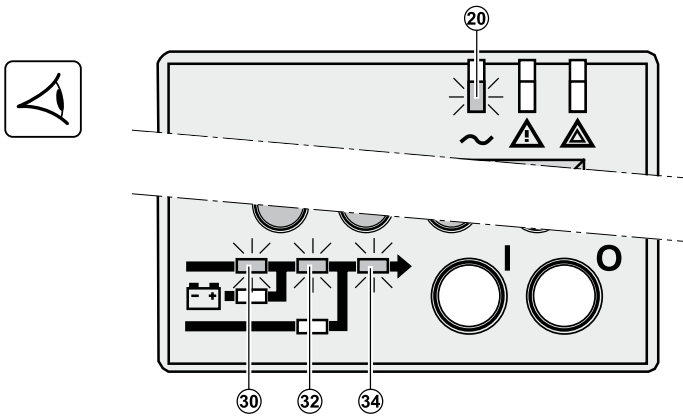
**The equipment is protected by the UPS.**

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

# 3. Operation

## 3.3 Operating Modes

### Normal mode



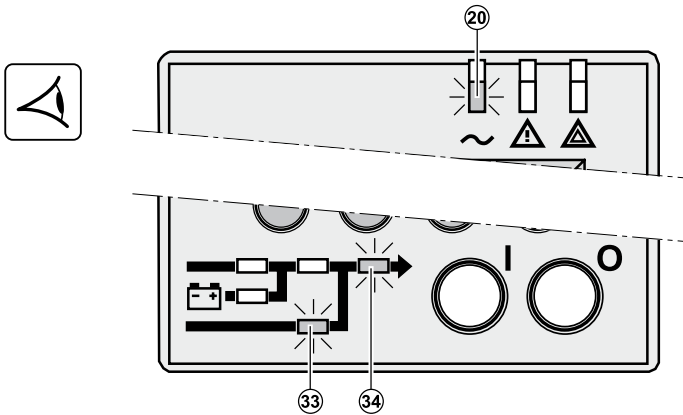
This is the standard operating mode, set by default in the factory.

Under normal condition (Normal AC source available):

LED (20) is ON.  
LEDs (30), (32), (34) are green.

**The equipment is protected by the UPS.**

### ECO mode



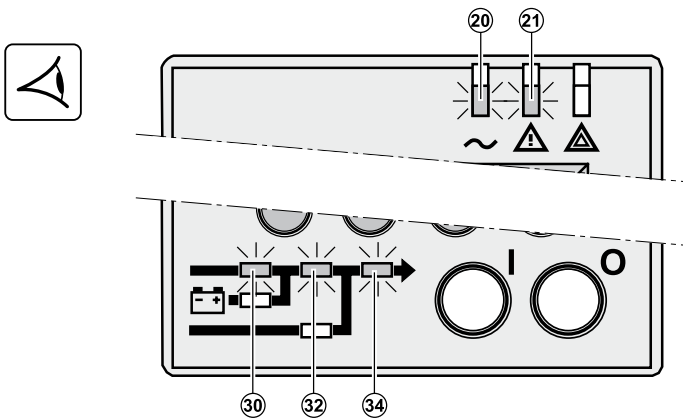
The main advantage of the Eco mode (see glossary) is that it reduces the consumption of electrical power.

Under normal condition (Normal AC source available):

LED (20) is ON.  
LEDs (33), (34) are green.

**The equipment is supplied in ECO mode.**

### AC out of tolerance



If normal AC source is out of tolerance:

LEDs (20), (21) are ON.  
LEDs (30), (32), (34) are green.

**The equipment is protected by the UPS.**

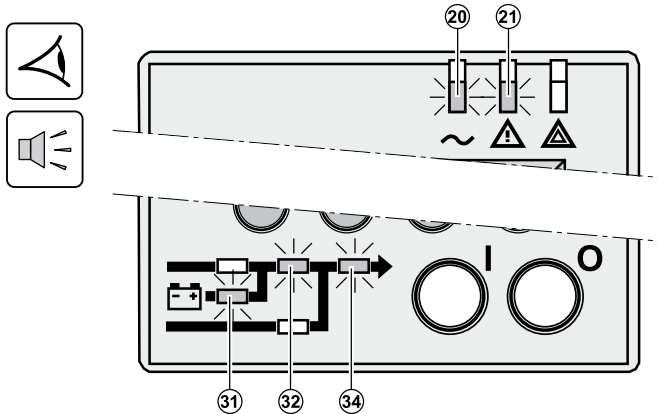


# 3. Operation

## 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



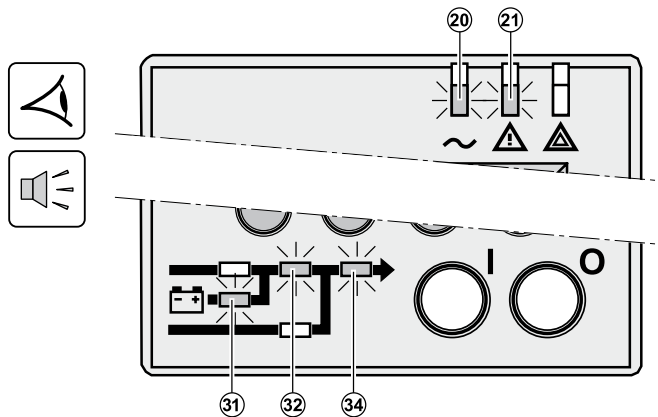
LEDs (20), (21) are ON.  
LEDs (31), (32), (34) are green.

The audible alarm beeps every 10 seconds.

**The equipment is protected by the UPS and supplied by the battery.**

The display indicates the battery remaining backup time.

### Low battery warning



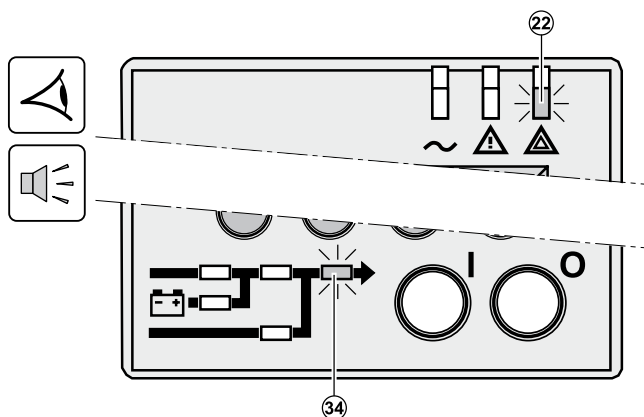
LEDs (20), (21) are ON.  
LEDs (31), (32), (34) are green.

The audible 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 audible alarm beeps continuously.

**The equipment is not powered.**

The UPS displays «End of backup time Battery low».

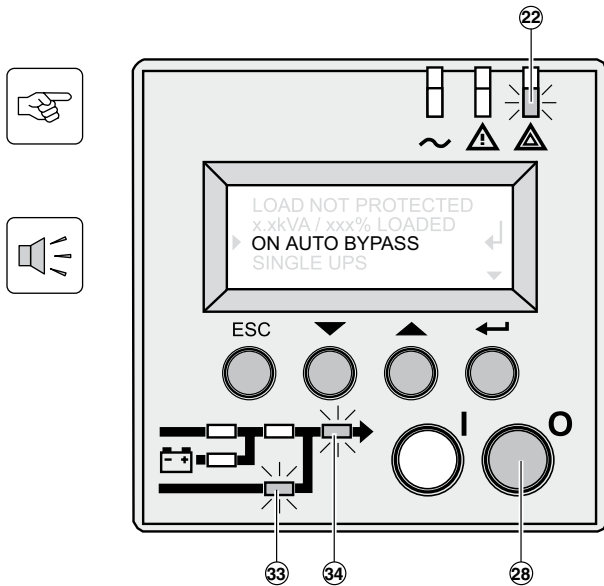
## 3. Operation

### 3.5 Return to Normal AC Source

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

### 3.6 UPS Shutdown When AC Present

Before shutdown, please read ALL instructions below:



1. Press and hold the «0» (off) button (28) for 3 seconds. The buzzer beeps once.

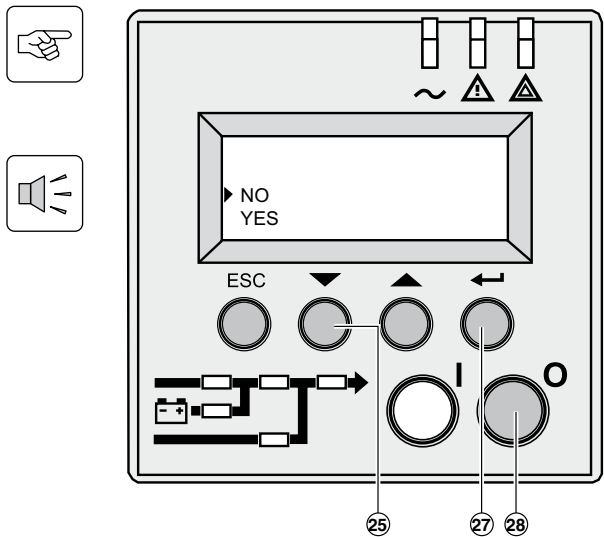
**The load is no longer protected by the UPS.** It is powered via the Normal AC source (bypass). **If the UPS is set in frequency converter mode, the equipment will not be powered.** If the Normal AC source is out of tolerance, the UPS will generate a 10ms output calibrated break.

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

For a full shutdown of UPS and connected load, the upstream circuit breaker (not included) should be set to the off position or remove the Normal AC source.

### 3.7 UPS Shutdown When on Battery

Before shutdown, please read ALL instructions below:

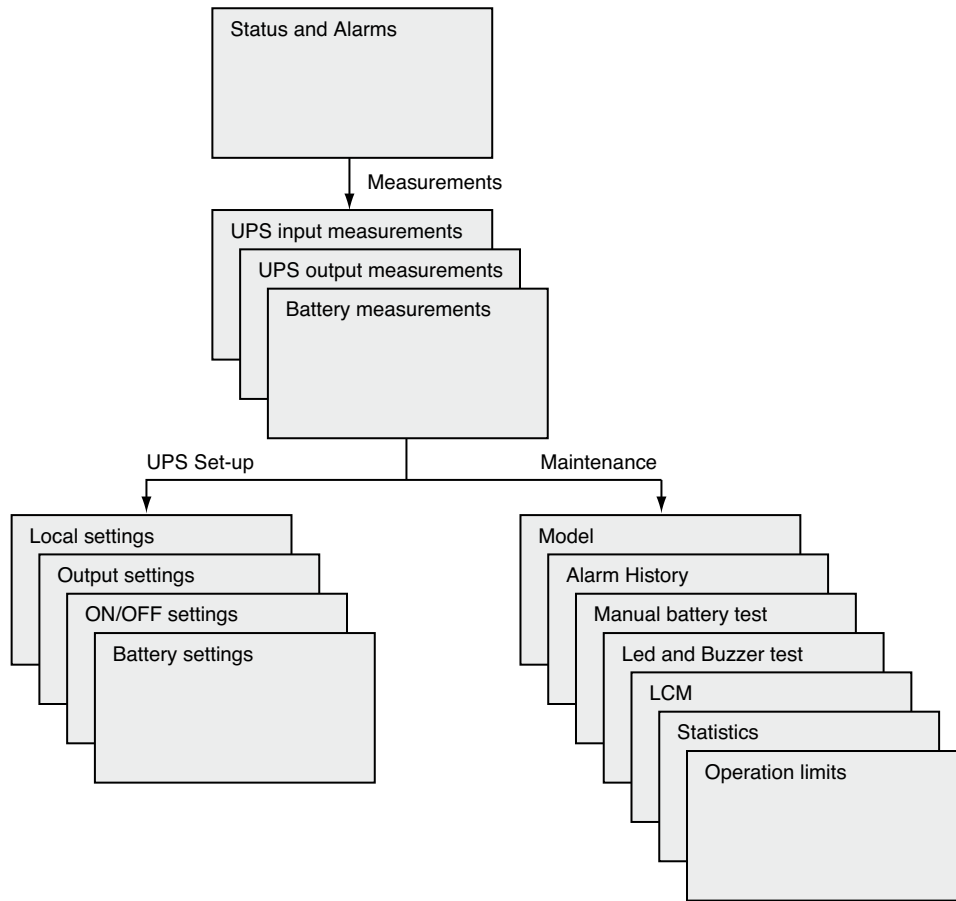


1. Press and hold the «0» (off) button (28) for 3 seconds. The buzzer beeps once.
2. The display asks for confirmation.
3. Press the scroll button (25) to select yes.
4. Press confirm button (27).

The UPS is now fully shut down.

# 4. Access to Maintenance and Personalization Data

## 4.1 Display Organization

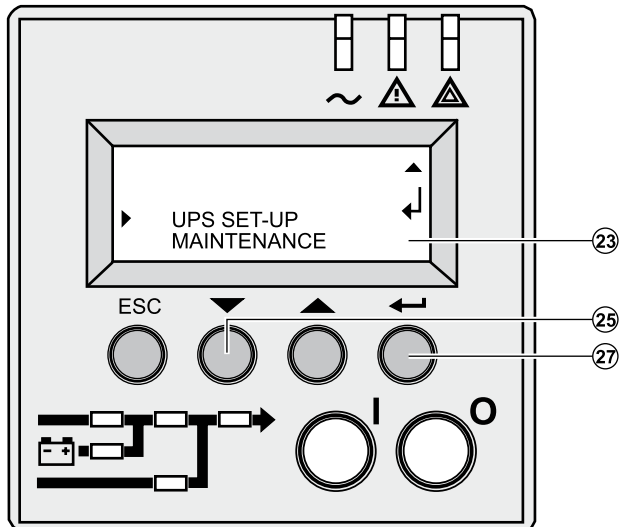


## 4.2 Access to Measurements



Press the scroll button (25) 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 to the UPS set-up or Maintenance menu.
- ▶ Press the "Enter" button (27) to get access.

## 4. Access to Maintenance and Personalization Data

### 4.4 UPS Set-Up

#### Local Settings

Function	Factory Setting	Options
Language	English	French, German, Italian, Portuguese, Spanish
Date/Time Format	International format (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	208V	200V / 230V / 220V /240V / 250V	
Freq Converter	Disabled	Enabled	
Output Frequency	60 Hz	50 Hz	User selectable under frequency-converter mode
Eco Mode	Disabled	Enabled	
Slew rate	1 Hz/sec.	0.5 Hz/sec.	
Bypass Transfer	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

#### ON/OFF Settings

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

## 4. Access to Maintenance and Personalization Data

### Battery Personalization

Function	Factory Setting	Options	Comments
Battery test	Every week	No test / daily test / monthly	
Low Batt warning	20%	0 to 100%	1% increment
User Battery Settings	UPS reads number of battery modules connected	From 0 to 40 Ah	5 Ah increment
Deep DischargeProtect	Yes	No	Protection against deep discharge. If disable, EATON warranty will be void

### 4.5 Maintenance

Function	Sub-Function	Options/Display	Comments
Model	Power Module	SN: xxxxxxxxx SOFT: xxx NT: xxx	Serial number Soft version Technical level
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	
	Custom Statistics	Reset Date: No, Yes Statistics	
Operation Limits	Operation Limits		Automatic alarms displayed when UPS is operating near the limits

### 4.6 UPS Set-Up Using External Software



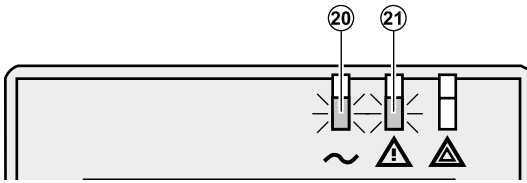
- ▶ Insert the Solution-Pac CD-ROM in the drive.
- ▶ On the first navigation screen, select «Point to Point solution» and follow the instructions on how to install the Personal Solution-Pac software.
- ▶ Then select «Settings», «Advanced settings» and «UPS settings».

**Note** This feature is only supported through Windows and the RS232 communication.

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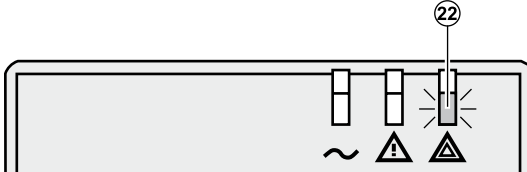
# 5. Troubleshooting

## 5.1 Troubleshooting LEDS (21) and (22)



If LED (21) is ON:

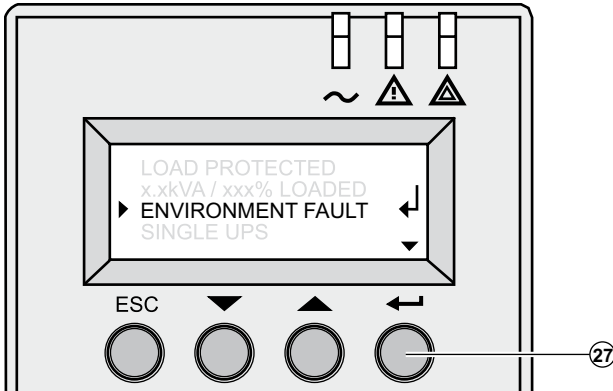
The equipment is protected by the UPS but the operation is downgraded.



If LED (22) is ON:

The equipment is no longer protected by the UPS.

## 5.2 Troubleshooting Not Requiring EATON After-Sales Support



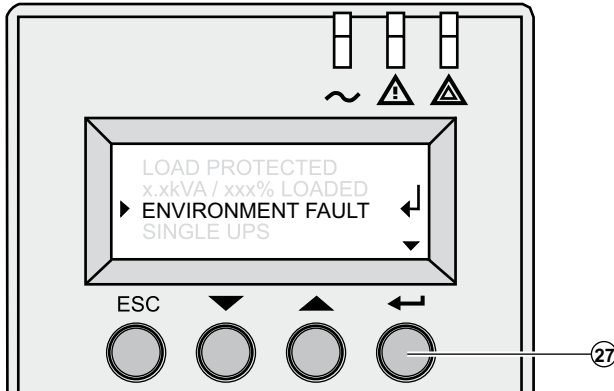
Press the "Enter" button (27) to display the details below:



Displayed details	Signification	Correction
NO BATTERY	The battery is incorrectly connected	Check battery connections (see section 2.9)
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 EATON After-Sales Support



Displayed	Signification	Correction
POWER MODULE FAULT	The battery is incorrectly connected. Internal power sub-module fault detected. Use "Enter" button (27) to display details.	See after-sales support at <a href="http://www.eaton.com">www.eaton.com</a> . Follow the power sub-module replacement procedure (see sections 7.1 and 7.2)
BATT MODULE FAULT	Battery fault detected during the battery test. Use "Enter" button (27) to display details.	See after-sales support at <a href="http://www.eaton.com">www.eaton.com</a> . 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.	See after-sales support at <a href="http://www.eaton.com">www.eaton.com</a> . Follow the frame replacement procedure (see sections 7.1 and 7.2)



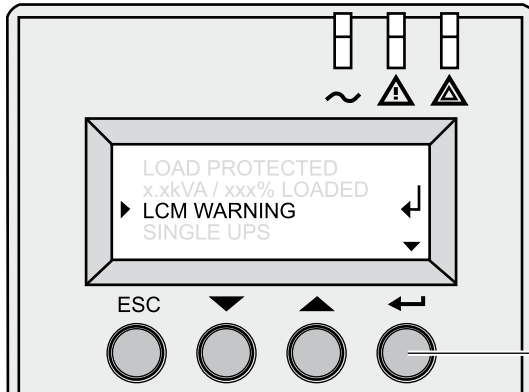
**Note:** In case of multiple fault, press the "Enter" button (27) and the scroll button (25) to get access to further details.



## 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.

### Secure your installation power continuity

Anticipate needed maintenance actions thanks to automatically displayed warnings:

LCM warning details	Signification
BATTERYCHECK RECOMMENDED CONTACT <a href="http://www.eaton.com">www.eaton.com</a>	Battery is approaching its reliability end of life. Risk of dramatically reduced backup time

### Reset or disable LCM

In case of any LCM messages displayed:

- For temporary reset: Press ESC for more than 3 seconds in the Status and Alarm screen, to temporarily cancel the alarm status. The alert will be repeated twice in 30 days.
- For permanent reset: Press ENT for more than 3 seconds in the LCM warning screen, to permanently cancel this LCM event.

At any time:

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



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

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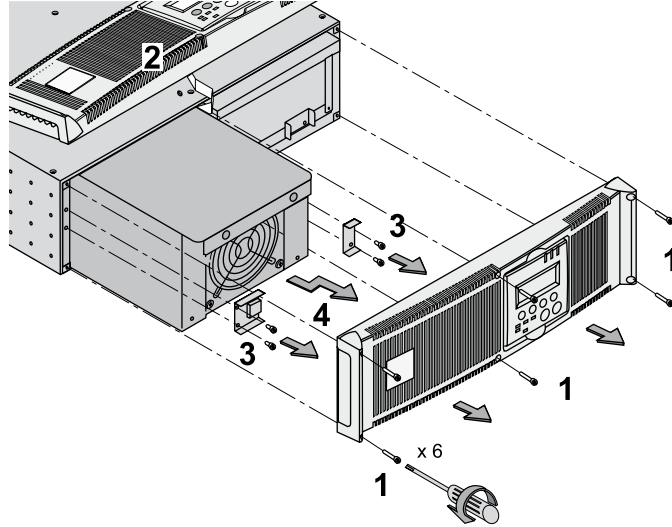
# 7. Maintenance

## 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 equipment.

### Disconnecting the power sub-module (87100):



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

**Note:** There is a safety pin at the rear of the module. Lift the sub-module slightly and the sub-module will slide out (follow the arrow in the diagram).

When reconnecting the sub-module, carry out the above instructions in reverse order. A red button will be depressed behind plate 3, reestablishing connection.

### 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 (MX 5000).

## 7.2 Hot Swapping the Battery Sub-Module



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

The battery can cause electrocution and high short-circuit currents. The following safety cautions are required before servicing the battery components:

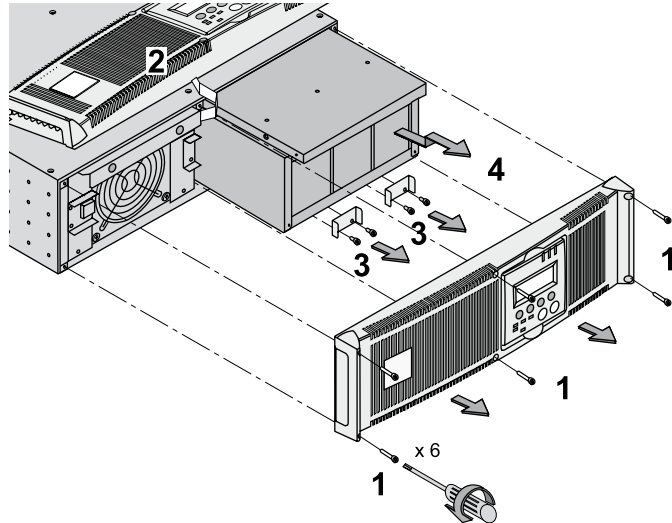
- ▶ Remove watches, rings, bracelets and all other metal objects from the hands and arms,
- ▶ Use tools with an insulated handle.

This operation can be performed without interrupting the equipments.



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

### Disconnecting the battery sub-module (87101):



1. Remove the 6 mounting screws to free the main front panel bezel.
2. Place the front panel above the UPS.
3. Remove the 4 mounting screws on the sides of the battery sub-module.
4. Withdraw the battery sub-module.

### Reconnecting the battery sub-module:

Carry out the above instructions in reverse order.

To ensure safety and high performance, use only batteries supplied by EATON.



**Caution!** The battery is heavy (approx. 60 lbs.).



### 8.1 Technical specifications

	MX 5000	MX EXB
<b>Output power</b>	5000 VA <sup>(1)</sup> / 4500 W <sup>(2)</sup>	
<b>Electrical supply network</b> <ul style="list-style-type: none"> <li>▶ Rated input voltage</li> <li>▶ Input voltage range</li> <li>▶ Frequency</li> <li>▶ Power factor</li> <li>▶ Leakage current</li> </ul>	Single phase 208 V 120/156 V to 280 V <sup>(3)</sup> 50/60 Hz (autoselect) > 0.99 7 mA	
<b>Load output</b> <ul style="list-style-type: none"> <li>▶ Voltage</li> <li>▶ Frequency</li> <li>▶ Harmonic distortion</li> <li>▶ Overload capacity</li> </ul>	Single phase 208 V ±3% <sup>(4)</sup> 50/60 Hz ±0,5% <sup>(5)</sup> < 3% 105% continuous, 110% 2min, 125% 1min, > 150% 0.5s	
<b>Battery</b>	15 x 12V - 5 Ah, sealed lead acid, maintenance free	Two 15 x 12 V - 5 Ah strings, sealed lead acid, maintenance free
<b>Environment</b> <ul style="list-style-type: none"> <li>▶ Operating temperature range</li> <li>▶ Relative humidity</li> <li>▶ Storage temperature range</li> <li>▶ Altitude</li> </ul>	0°C to 40°C 20% to 90% (non-condensing) -25°C to 40°C 1000 m	
Noise level	< 45 dBA	

(1) If the output voltage is 200V – 250V, the output power is 5000VA / 4500W.

(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 **Personal Solution-Pac** software.

(5) Frequency-converter mode is programmable using the **Personal Solution-Pac** software.

(6) Step-down transformer is available for 120V output.



### EATON Customer Care Center

#### Technical Support and Product Services



Technical questions? If you encounter a problem while following the instructions in this manual, or have questions about the operation, repair, or servicing of your equipment, please visit our web site [www.eaton.com](http://www.eaton.com) for complete service information.

To insure that your questions are correctly answered, please obtain the part number, assembly number, and serial number of the unit and include them in any discussions or correspondence.

Part Number: \_\_\_\_\_

Assembly Number: \_\_\_\_\_

Serial number: \_\_\_\_\_

#### Who To Contact

For Technical Support, Customer Care Center, Customer FAQ please visit our website: [www.eaton.com](http://www.eaton.com)

#### Scheduling Field Service Engineer Support

Scheduling of the EATON Field Service Engineers typically should be done 7 to 10 days before they are required on-site. If the startup of the UPS is critical to maintaining your schedule, please contact EATON to insure a safe installation and start-up that will maintain the EATON warranty and insure smooth performance.

#### Return Policy for Single Phase Products (RMA)

Should you require factory service for your equipment, contact EATON Customer Care Center and obtain a Return Materials Authorization (RMA) prior to shipping your unit. Never ship equipment to EATON without first obtaining an RMA number.

For further details please visit our website: [www.eaton.com](http://www.eaton.com)

Date: \_\_\_\_\_

RMA Number: \_\_\_\_\_

Contact Name: \_\_\_\_\_





### 8.2 Glossary

<b>Backup time</b>	Time that the connected equipment can operate on battery power.
<b>Bypass AC source</b>	Source supplying the bypass line. The equipment can be transferred to the bypass line if an overload occurs on the UPS output, for maintenance or in the event of a malfunction.
<b>ECO mode</b>	Operating mode by which the equipment is supplied directly by the AC source if it is within the tolerances defined by the user. This mode reduces the consumption of electrical power.
<b>Equipment</b>	Devices or systems connected to the UPS output.
<b>Normal (double conversion) mode</b>	The normal UPS operating mode in which the AC source supplies the UPS which in turn supplies the connected equipment (after electronic double conversion).
<b>Frequency converter</b>	Operating mode used to convert the AC-power frequency between the UPS input and output (50 Hz -> 60 Hz or 60 Hz -> 50 Hz).
<b>Normal AC source</b>	Normal source of power for the UPS.
<b>Low-battery warning</b>	This is a battery-voltage level indicating that battery power is low and that the user must take action to prevent the imminent break in the supply of power to the load.
<b>Relay contacts</b>	Contacts supplying information to the user in form of signals.
<b>Personalization</b>	It is possible to modify certain UPS parameters set at the factory. Certain UPS functions can also be modified by the EATON power management products to better suit user needs.
<b>UPS</b>	Uninterruptible Power System.

# Notes





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