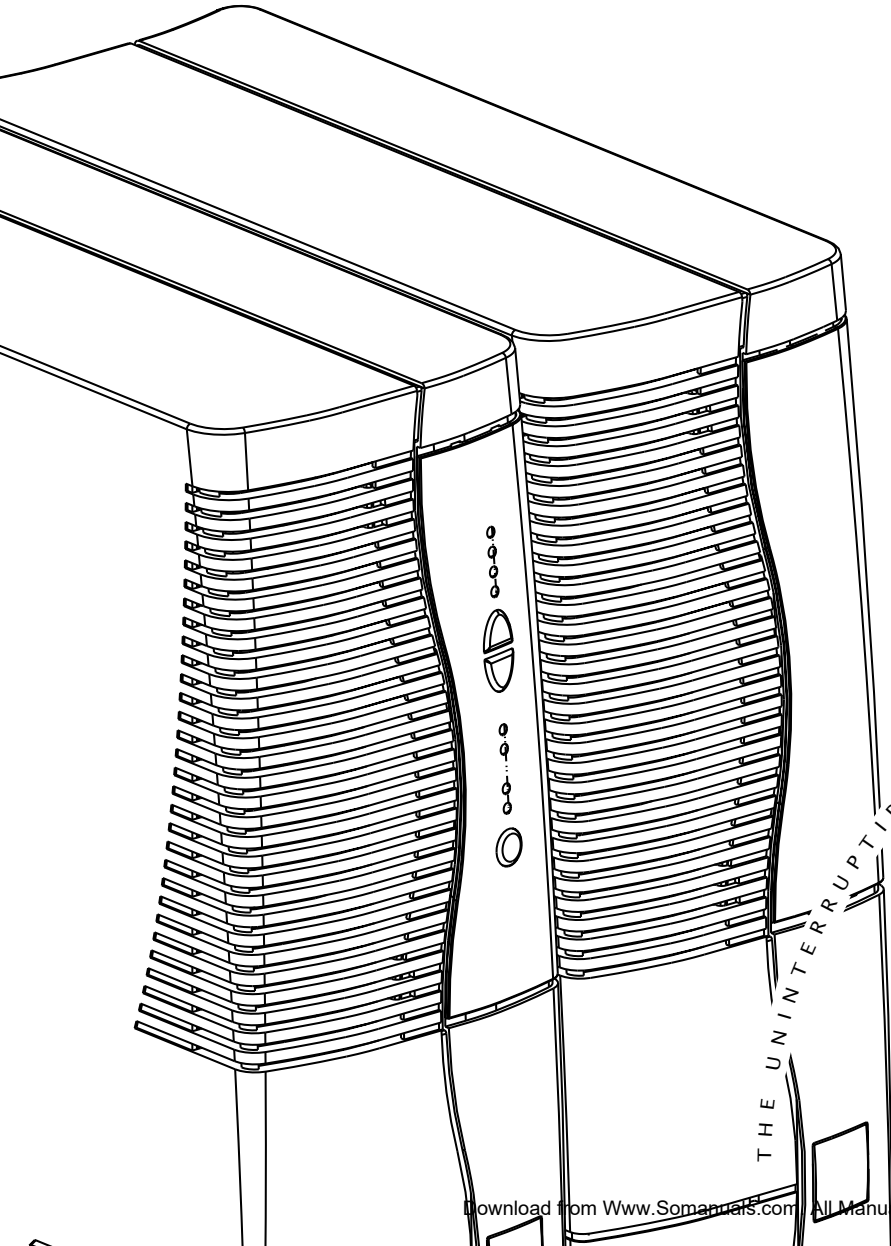


Comet Extreme

4.5/6/9/12 kVA

Installation and user manual



THE UNINTERRUPTIBLE POWER PROVIDER

MGE
UPS SYSTEMS

Introduction

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

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

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

- ▶ Production in an ISO 14001 certified factory;
- ▶ Recycling of **Comet Extreme** at the end of its service life.

To discover the entire range of MGE UPS SYSTEMS products and the options available for the **Comet Extreme** range:

- ▶ We invite you to visit our Web site at **www.mgeups.com**
(page: www.mgeups.com/products/pdt230/smallups/extreme/extrem10.htm),
- ▶ Or contact your MGE UPS SYSTEMS representative.

Using this document

Information may be found primarily by consulting:

- ▶ the contents,
- ▶ the index.

Pictograms



Important instructions that must always be followed.



Information, advice, help.



Visual indication.



Action.



Audio indication.

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



LED off.



LED on.



LED flashing.

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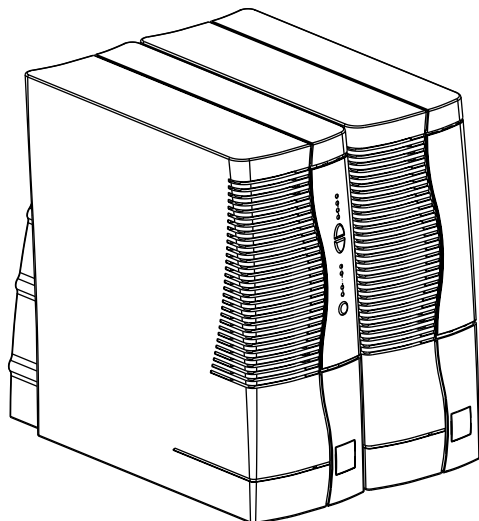
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1. Presentation

1.1 Comet *EXtreme* range

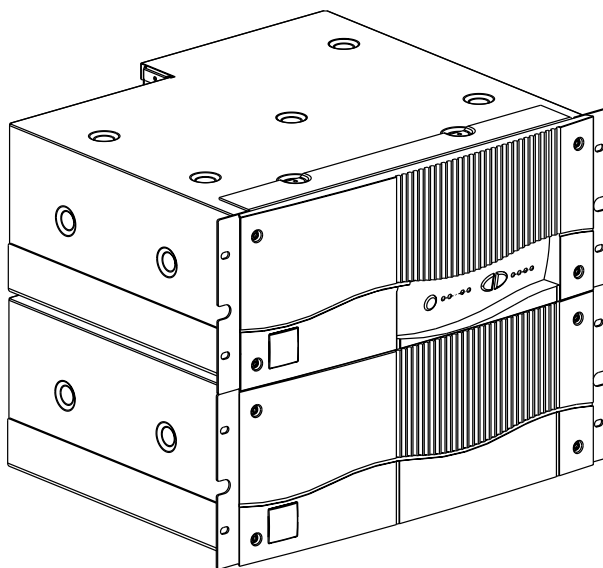
4.5 and 6 kVA tower models



	Dimensions in mm (H x W x D)
Electronic module	443 x 173 x 465
Battery module	443 x 173 x 465

	Weight in kg
Electronic module	14
Battery module	48

4.5 and 6 kVA rack models

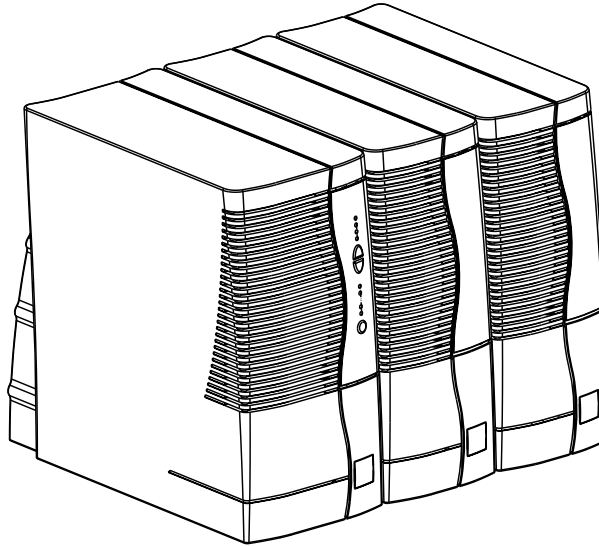


	Dimensions in mm (H x W x D)
Electronic module	177 (4U) x 483 x 462
Battery module	177 (4U) x 483 x 462

	Weight in kg
Electronic module	18
Battery module	51

1. Presentation

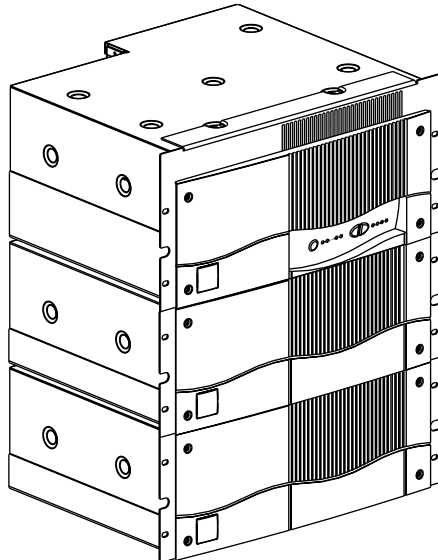
9 and 12 kVA tower models



	Dimensions in mm (H x W x D)
Electronic module	443 x 216 x 465
Battery module	443 x 173 x 465

	Weight in kg
Electronic module	22
Battery module	48

9 and 12 kVA rack models



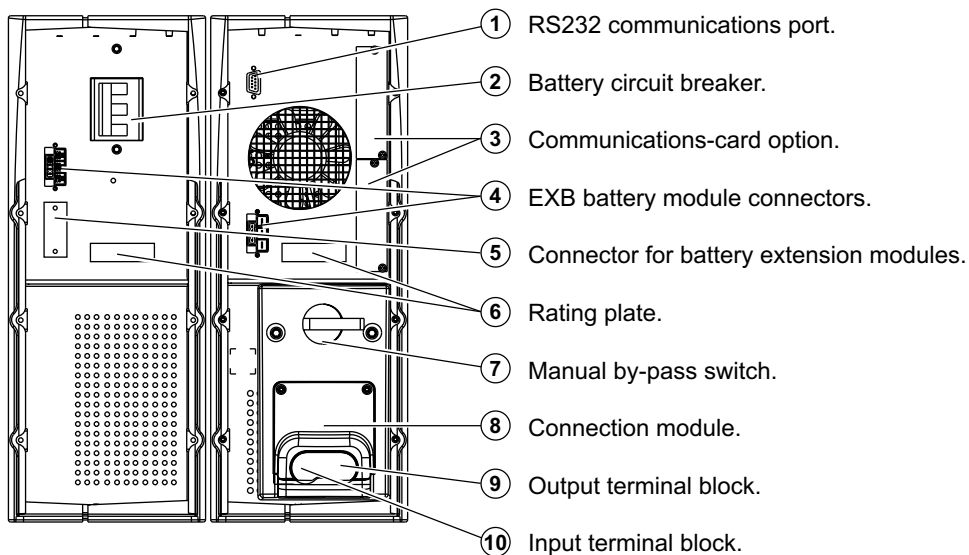
	Dimensions in mm (H x W x D)
Electronic module	221 (5U) x 483 x 462
Battery module	177 (4U) x 483 x 462

	Weight in kg
Electronic module	27
Battery module	51

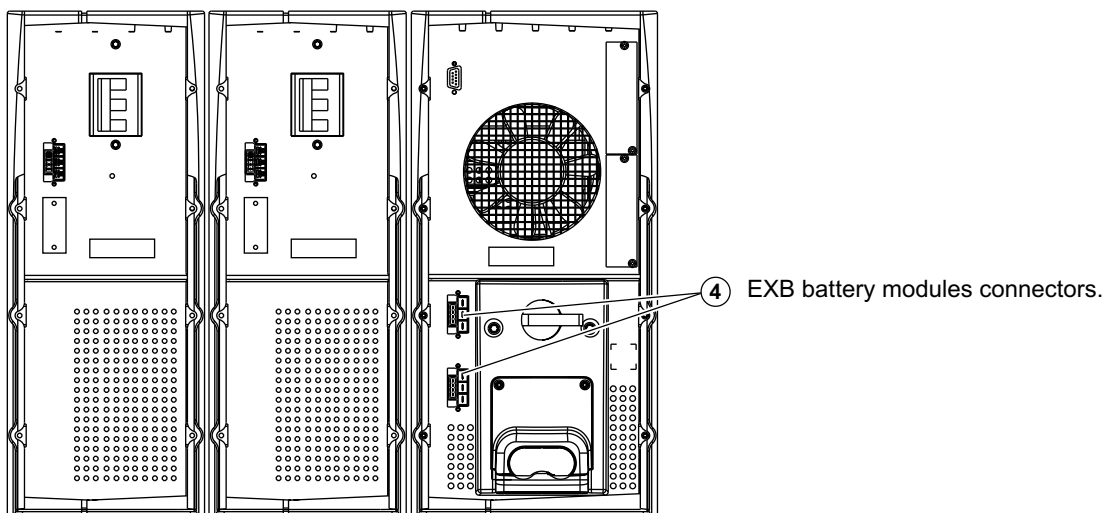
1. Presentation

1.2 Back

Comet *EXtreme* 4.5 and 6 kVA



Comet *EXtreme* 9 and 12 kVA



1. Presentation

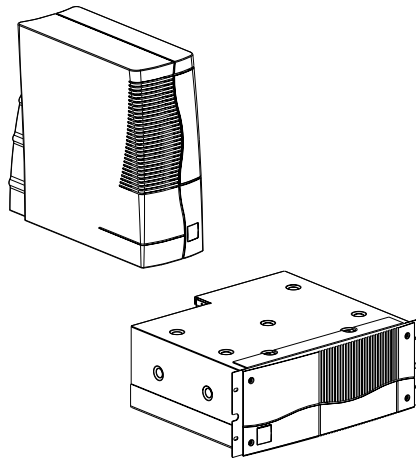
1.3 Options

EPO (Emergency Power Off)

Available for both tower and rack versions of **UPSs** with standard backup times and for the battery extensions, the EPO (Emergency Power Off) option lets you simultaneously switch off the **UPS** battery circuit breaker and the upstream circuit breaker of your installation by connecting both of them to a single emergency off button (not supplied).

For more details, visit our Web site: www.mgeups.com/products/pdt230/smallups/extreme/epo.htm

Transformer for galvanic isolation or earthing arrangement change

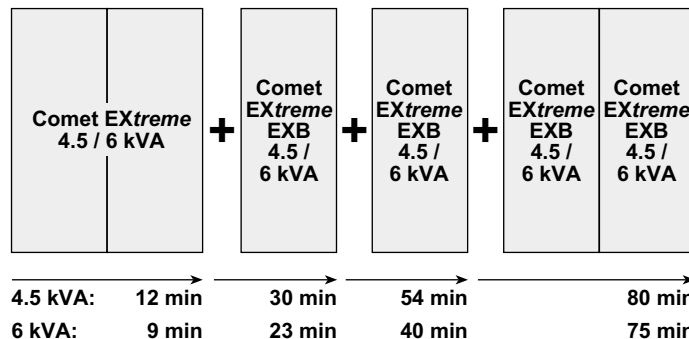


	Comet EXtreme Transfo 4.5 - 6 kVA	Comet EXtreme Transfo 9 - 12 kVA
Nominal power	6 kVA	12 kVA
Nominal current	32 A	63 A
Input voltage	230V (+15%, -20%)	230V (+15%, -20%)
Voltage drop	2.2%	1.7%
Frequency	50/60 Hz (+/-10%)	50/60 Hz (+/-10%)
Isolation (EN 61558-1-2-4)	3.75 kV / 5 M ohms	3.75 kV / 5 M ohms
Operating temperature	From 0° to +40°C	From 0° to +40°C
Max. operating rel. humidity	95%	95%
Derating / altitude	Pn-10% > 1000 m	Pn-10% > 1000 m
Natural ventilation	IP20 ANAN	IP20 ANAN
Dimensions HxWxD (tower)	443 x 173 x 465 mm	443 x 216 x 465 mm
Dimensions HxWxD (rack 4U)	177 x 483 x 462 mm	177 x 483 x 462 mm
Weight (tower)	44 kg	62 kg
Weight (rack)	48 kg	67 kg

Important: to simplify installation, connect the **Comet EXtreme Transformer** downstream of the **UPSs**.
Visit our Web site: www.mgeups.com/products/pdt230/smallups/extreme/transfo.htm

Battery extensions for UPS backup times of 80 minutes

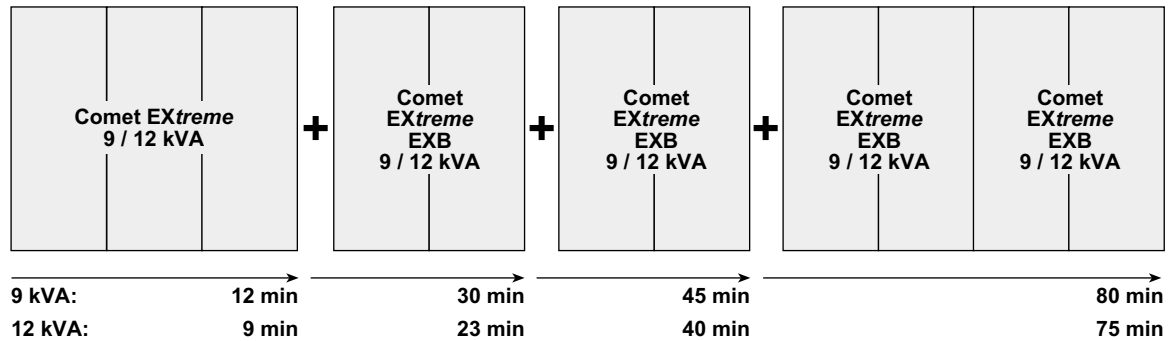
Battery extensions for 4.5 or 6 kVA Comet EXtreme:



Comet EXtreme offers a standard backup time of 9/12 minutes. To increase backup time, it is possible to connect **Comet EXtreme EXB** modules to the **UPSs**.
Visit our Web site: www.mgeups.com/products/pdt230/smallups/extreme/guide.htm.

1. Presentation

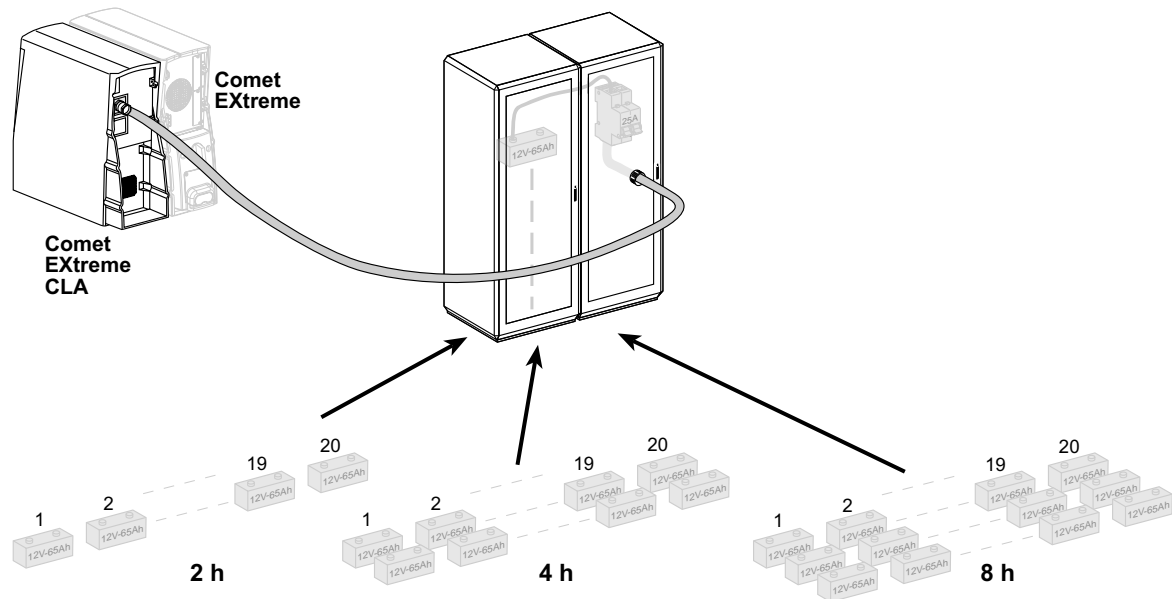
Battery extensions for 9 or 12 kVA Comet *EXtreme*:



The **Comet *EXtreme* EXB** modules are available in "tower" and in "rack" models.
The **Comet *EXtreme* EXB** modules come with their connection cables.

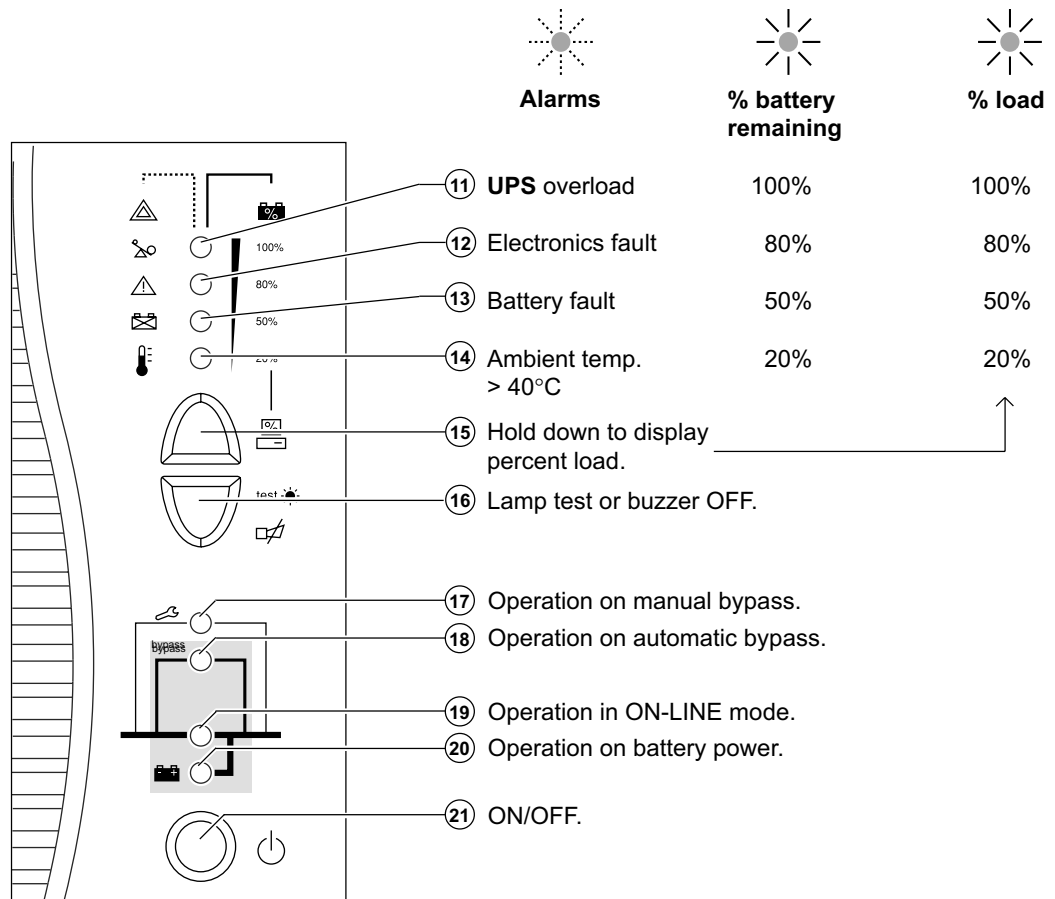
CLA module (Long backup time charger) for backup times of 2 to 8 hours

Very long backup times, from 2 to 8 hours at full load, require a **Comet *EXtreme* CLA** module.
Visit our Web site: www.mgeups.com/products/pdt230/smallups/extreme/cla/cla2.htm.



1. Presentation

1.4 Control panel

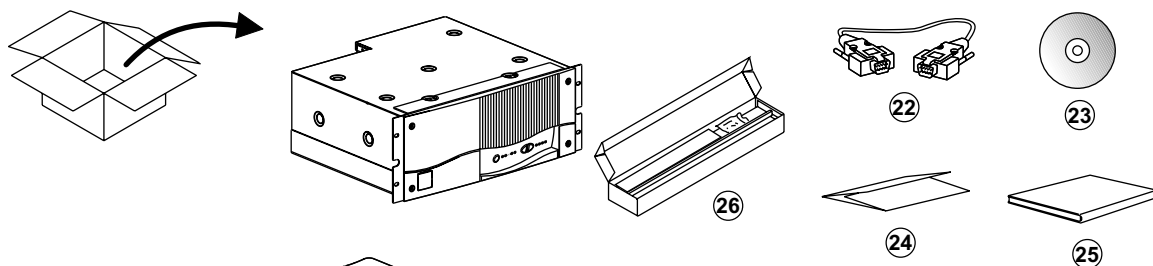
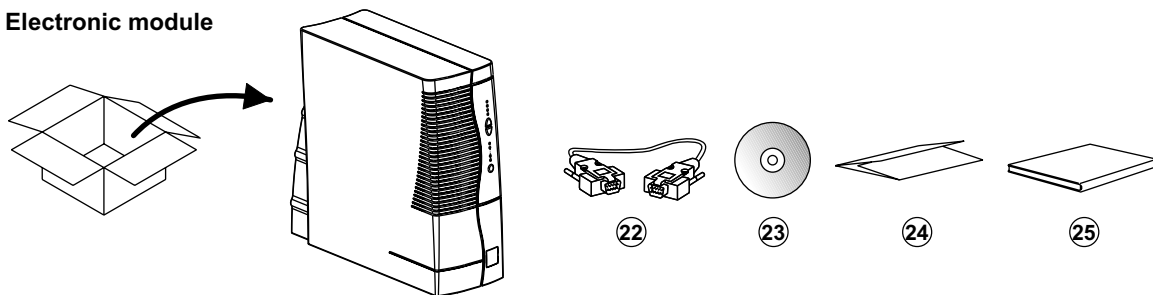


2. Installation

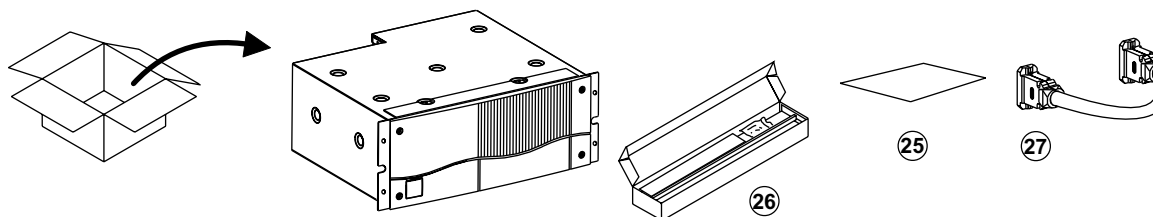
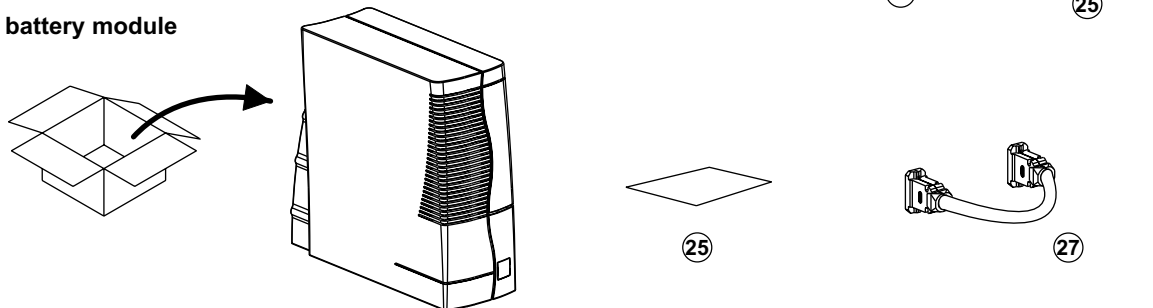
2.1 Unpacking and checks

Comet EXtreme 4.5 and 6 kVA

Electronic module



battery module



②② RS 232 communications cable.

②③ CD ROM with "**Solution Pac**" and "**UPS Driver**" softwares.

②④ Quick Start documentation.

②⑤ Installation and user manual.

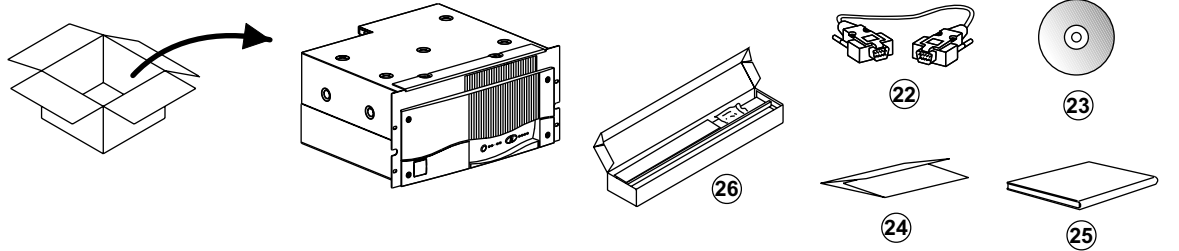
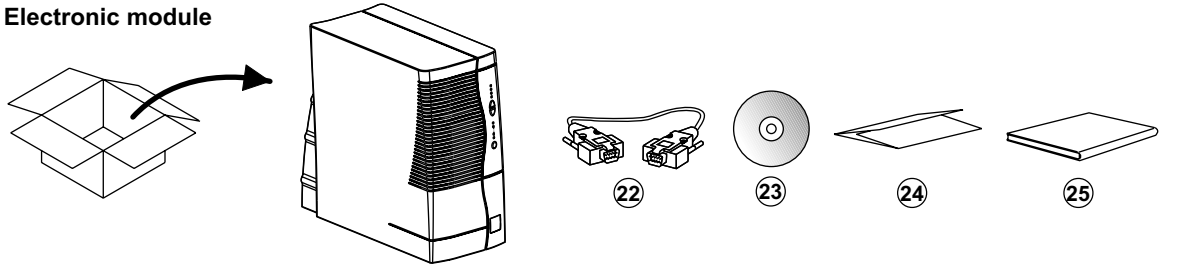
②⑥ Telescopic rails for mounting in 19" bay with mounting hardware.

②⑦ Cable for connection to battery module.

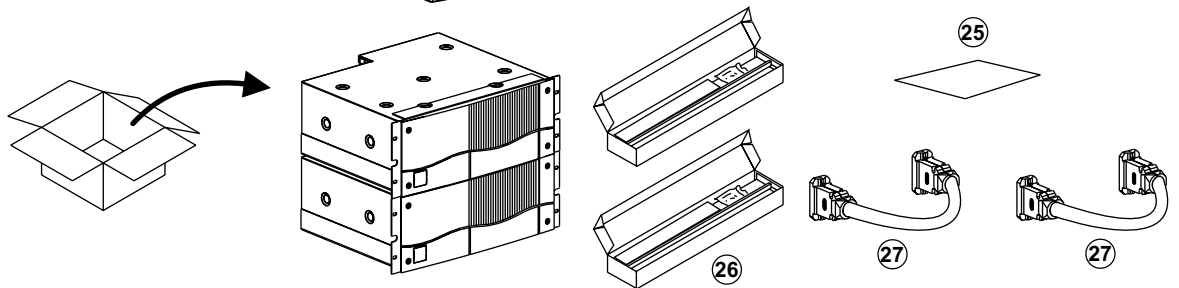
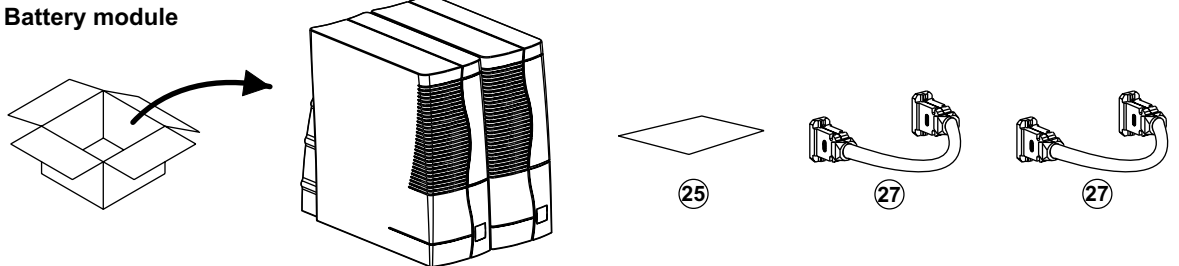
2. Installation

Comet EXtreme 9 and 12 kVA

Electronic module



Battery module



②② RS 232 communications cable.

②③ CD ROM with "Solution Pac" and "UPS Driver" softwares.

②④ Quick Start documentation.

②⑤ Installation and user manual.

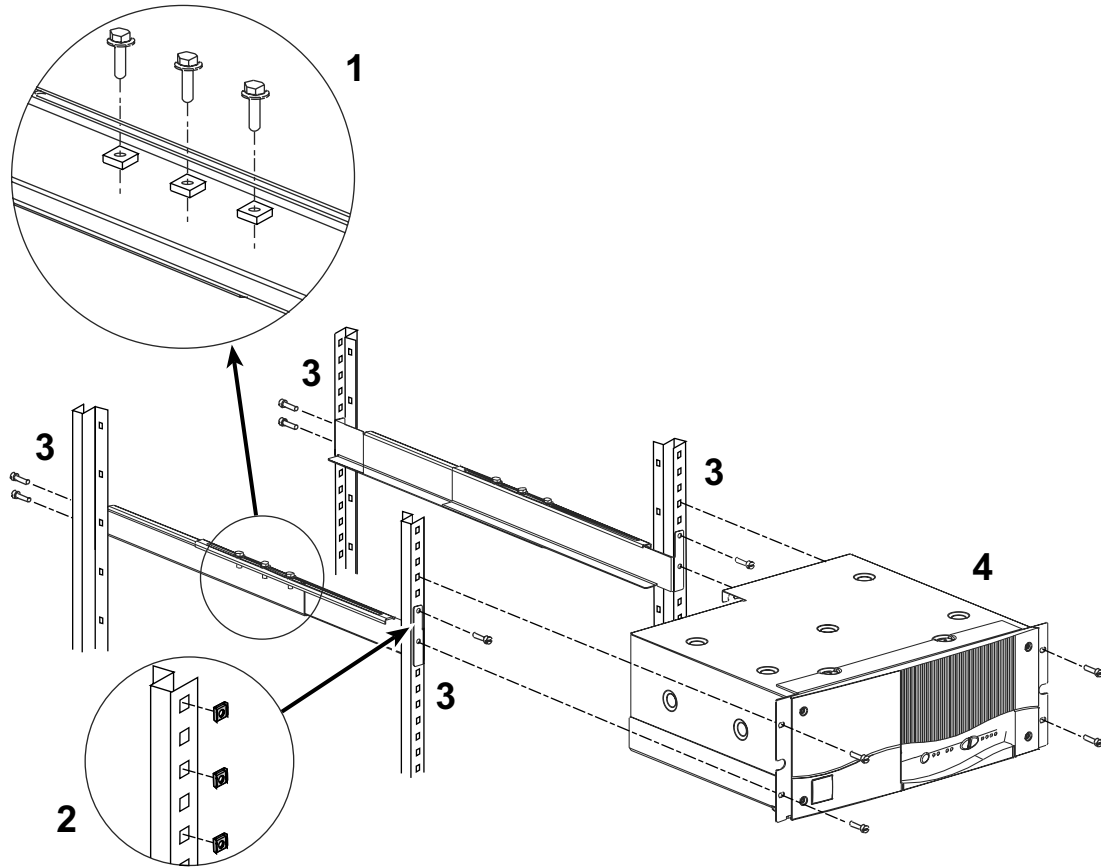
②⑥ Telescopic rails for mounting in 19" bay with mounting hardware.

②⑦ Cable for connection to battery module.

2. Installation

2.2 Installation of the rack version

Rack mounting diagram with rails



The rails and the necessary mounting hardware are supplied with the **UPS** in the package.

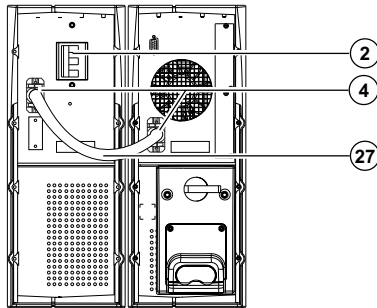
2. Installation

2.3 Battery-module connections

Comet *EXtreme* 4.5 and 6 kVA



Check that the battery circuit breaker ② is OFF.

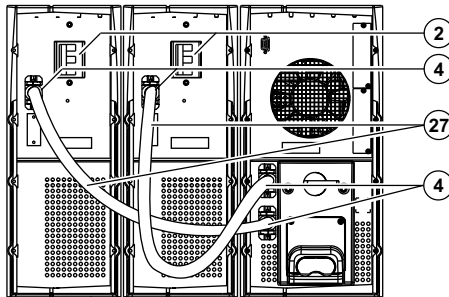


Connect cable ②⑦ to the connectors ④ of the electronic and battery modules.

Comet *EXtreme* 9 and 12 kVA



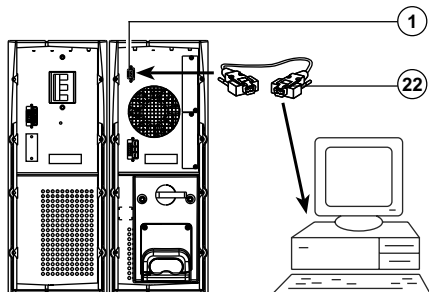
Check that the battery circuit breaker ② is OFF.



Connect cable ②⑦ to the connectors ④ of the electronic and battery modules.

2. Installation

2.4 Connection to the RS 232 communications port (optional)

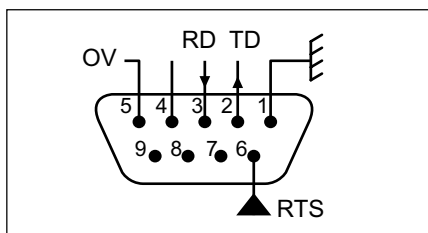


1. Connect the RS 232 communications cable (22) to the serial port on the computer.

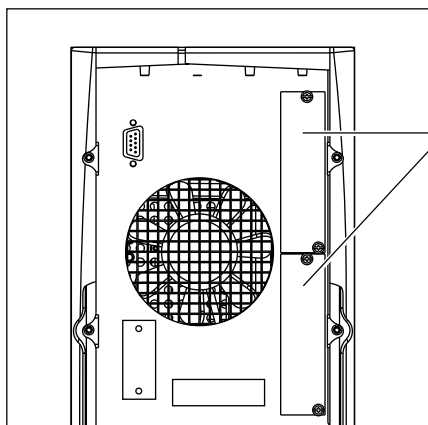
2. Connect the RS 232 communications cable (22) to the RS 232 communications port (1) on the UPS.

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

Pin-out diagram for the RS 232 communications port (1) on the UPS.



2.5 Installation of the communications-card option



3 Slots for communications card.

It is not necessary to shut down the UPS to install the communications card:

1. Remove the slot cover (3).

2. Insert the card in the slot.

3. Secure the card with the two screws.

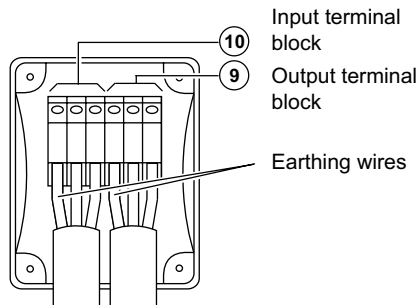
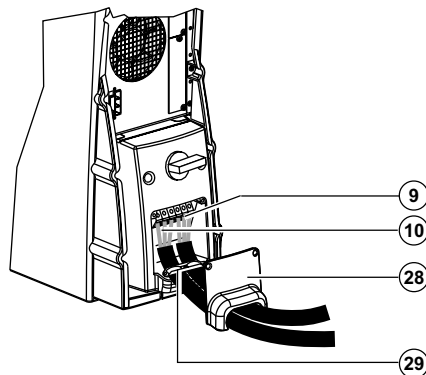
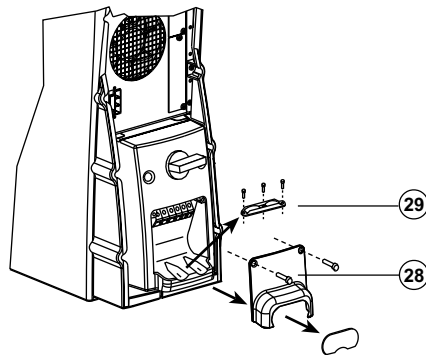
2. Installation

2.6 Connection to the connection modules

This type of connection must be carried out by qualified electrical personnel.



Before carrying out any connections, check that the battery circuit breaker (2) is OFF and that the upstream protection devices (AC-power source) are open (OFF).



The overall cable diameter and the cross-sectional area of the three wires depends on the **UPS** rating.

	Comet EXtreme 4,5 to 6 kVA	Comet EXtreme 9 to 12 kVA
Cable diameter	15 to 25.5 mm	15 to 25.5 mm
Cross-sectional area of each wire		
▶ Flexible wire	4 to 10 mm ²	10 mm ²
▶ Rigid wire	4 to 16 mm ²	10 to 16 mm ²
Recommended upstream circuit breaker		
▶ Nominal rating (47 to 63Hz, 230V)	C60N 32A 2P (maximum line current = 26A)	C60N 63A 2P (maximum line current = 52A)
▶ Maximum rating (47 to 63Hz, 187V)	C60N 40A 2P (maximum line current = 32A)	C60N 80A 2P (maximum line current = 64A)

1. Remove the terminal-block cover (28).
2. Remove the cable entry knockouts from the cover.
3. Loosen the cable clamp (29).
4. Insert the cable supplying the equipment and the power cable through the terminal-block cover (28).

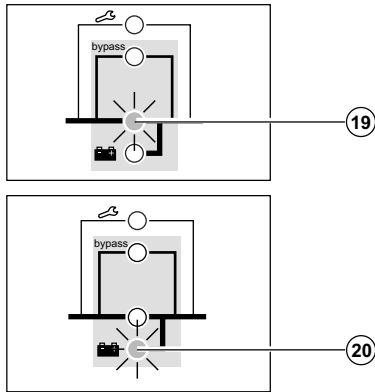


Always connect the earthing wire first.

5. Connect the three wires of the equipment cable to the output terminal block (9).
6. Connect the three wires of the power cable to the input terminal block (10).
7. Tighten the cable clamp (29).
8. Refit and secure the terminal-block cover (28).

3. Operation

3.1 ON-LINE operating mode



This is the normal operating mode for the UPS.

Two possible cases:

LED ①⑨ is ON: AC input power is available. Power is drawn from the AC-power source and supplied to the protected equipment via the **UPS**.

LED ②⑩ is ON: AC input power is not available. Power is drawn from the battery and supplied to the protected equipment.

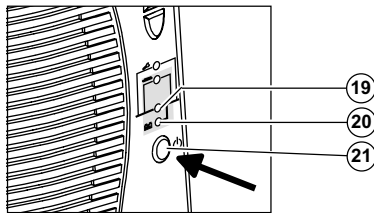
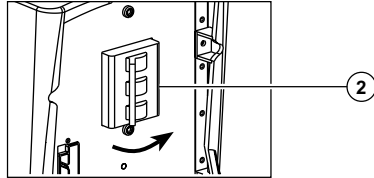
3. Operation

3.2 Start-up



Prior to initial start-up, check the **UPS** voltage settings.

The frequency of the output voltage (50 or 60 Hz) is automatically set to that of the input source.



1. Close the upstream device (ON position) controlling the supply of AC power to the **UPS**.

2. Set the battery circuit breaker(s) (2) to ON.

The buzzer beeps three times.

If the supply frequency is different than the default value set on the **UPS**, the new value is set and the buzzer beeps 4 times.

3. Press the ON / OFF button (21).

All the equipment connected to the **UPS** is now energised, however it takes another 30 seconds before the **UPS** is fully operational.

After this time, the equipment connected to the UPS is protected.

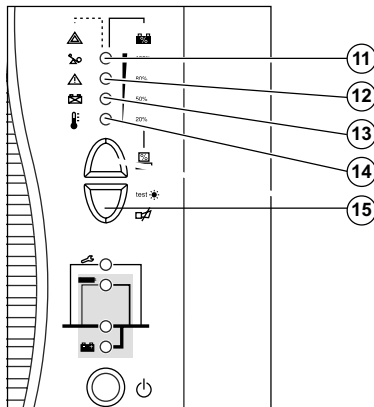


► If LED (19) or (20) do not go ON or if one of LED (11), (12), (13) or (14) flash, there is a fault (see section 4.1).

► In order to detect any wiring errors, it is essential that the AC-power source be present at the first switch-on. Subsequently, the device may be switched-on without the presence of the AC-power source.

3.3 Bargraph indications

LEDs (11) to (14) provide three different indications.



1. Remaining backup time in percent (in ON-LINE mode).

2. Percent load drawn by the protected equipment, when button (15) is pressed.

3. Operating faults (flashing LED and beeps):

(11) Overload.

(12) **UPS** fault.

(13) Battery fault.

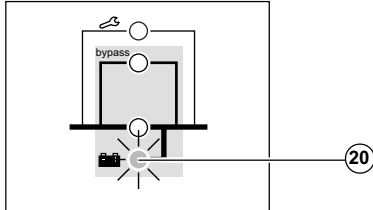
(14) Excessive ambient temperature.

3. Operation

3.4 Failure of AC input power and operation on battery power

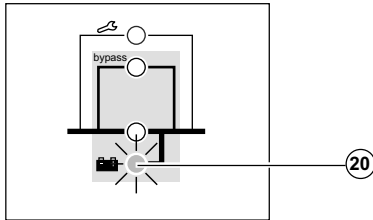
AC input power is not available, the battery steps in to supply the protected equipment.

Transfer to battery power



When AC-power source goes outside tolerances or fails completely, LED (20) goes ON and the buzzer beeps three times.

Threshold for the low-battery shutdown warning

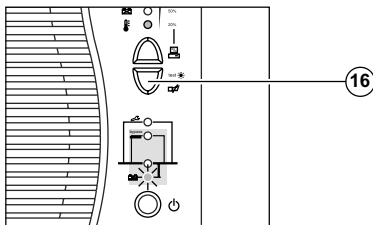


The low-battery shutdown warning threshold can be set by the user, with the "UPS Driver" software (default setting equal to 20% of full backup time). LED (20) flashes when the setted level is reached. The buzzer beeps every three seconds when less than 10% of backup time remains.



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

End of backup time



The buzzer sounds continuously. Press button (16) to turn the buzzer OFF.



The equipment is no longer supplied with power.

Sleep mode

This operating mode may be personalized using the "UPS Driver" software (see section 3.5). It saves battery power when no equipment is connected to the UPS. Shutdown occurs after 5 minutes. The UPS automatically restarts when the AC-power source returns to within tolerances.

Return of AC input power

If, in spite of the return of AC input power, the UPS does not restart, check that the automatic-restart function (activated by return of AC input power) has not been disabled (see section 3.5).

3.5 Personalization

Function



Personalization parameters can be set and modified using the **"UPS Driver"** software installed on a computer that is connected to the **UPS** (see section 2.3 Connection to the RS 232 communications port).

Check that the RS 232 cable (22) is correctly connected and that the battery circuit breaker (2) is closed.

"UPS Driver" installation:



1 - Insert the **Solution-Pac** CD-ROM containing the **UPS Driver** software in the drive of a PC running Windows.

2 - Open the Windows File manager or Explorer and select the CD-ROM drive.

3 - Double-click "\\Emb\Index.htm", then **"UPS Driver"**.

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

"ON / OFF conditions" tab

Personalizable function	Default setting
Automatic start	Enabled
Cold start (battery power)	Enabled
Forced shutdown	Enabled
Sleep mode	Disabled
UPS ON / OFF via software	Enabled

3. Operation

"Battery" tab

Personalizable function	Default setting	Options
"Battery test" intervals	Every day	Once a week Once a month No test
"Low-battery shutdown warning" threshold	20% remaining battery backup time	40% remaining battery backup time
Charger	Standard	CLA (2, 4 or 8 hours)

"Output" tab

Rated AC-power source voltage (see figure 1)	230 V	200 V-208 V-220 V-240 V
Rated AC-power source frequency	50 Hz	60 Hz
Tolerance for AC-power source frequency	± 5%	± 1% to ± 10% , in 1% steps
Alarm threshold for overload	100%	0 to 100%, in 10% steps
Restart inverter after short circuit	Disabled	Enabled (click to add check)

"By-pass" tab

Authorized voltage range for transfer to bypass if fault or overload	187 V to 265 V (for 230 V rated voltage)	187 V to 265 V, in 1V steps
Authorized frequency range for transfer to bypass if fault or overload	± 10%	± 1% to ± 10%, in 1% steps
Transfer to bypass if overload	Enabled	Disabled (click to remove check)
Transfer to bypass following a fault, whatever the conditions on the AC-power source	Disabled	Enabled (click to add check)



The value selected for the rated **UPS** voltage impacts on the power available at **UPS** output (see the diagram below).

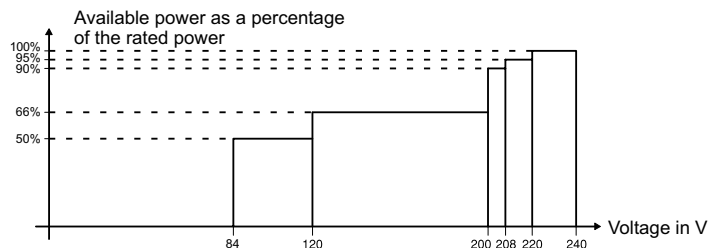
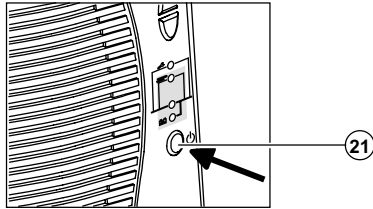


Fig. 1

3.6 Shutdown

Shutdown of connected equipment



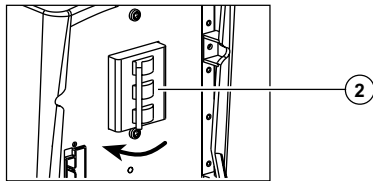
1. Press button 21 (return to the OFF position).

The connected equipment is no longer supplied with power, but the battery is maintained charged if AC-power source is present.



If the AC source fails, even though the connected equipment is no longer supplied, the **UPS** operates on battery power and therefore reduces the available backup time.

Complete shutdown of the UPS



1. Press button 21 (return to the OFF position).

The connected equipment is no longer supplied with power.

2. Open the upstream device (OFF position) controlling the supply of AC power to the **UPS**.
3. Switch the battery circuit breaker(s) 2 to OFF position.



The UPS is now de-energised and the batteries are no longer recharged.

Warning: if the upstream source is not switched off, the **UPS** remains in operation.

4. Maintenance


4.1 Troubleshooting



If one or more LEDs (11), (12), (13) or (14) flash, there is a operating anomaly or an alarm.

If a LED flashes, the bargraph data is no longer displayed.

Troubleshooting not requiring MGE after-sales support

Indication	Signification	Correction
LEDs (11), (12), (13), (14) flash and the buzzer beeps.	The UPS has detected a problem concerning the wiring of the connection module input.	Shut down the UPS and check that the input power cable is properly connected to the input terminal block and the load to the output terminal block (see p. 17). After correcting any wiring errors, restart the UPS as indicated on page 19. If the problem persists, call MGE after-sales support.
LED (11) flashes and the buzzer beeps.	UPS overload. Overload is too long or too high. The UPS cuts the supply of power to the connected equipment and the buzzer beeps continuously.	Check the power drawn by the equipment and disconnect any non-priority devices.
LED (14) flashes.	The ambient temperature is higher than 40° C.  The UPS is not designed to operate more than eight hours under these conditions.	Install the UPS in a room where the ambient temperature is not greater than 40° C.
LED (17) is ON.	The UPS is in maintenance mode (manual bypass)	See point 5 to 7 of in the "Reconnecting the connection module" part of section 4.2.

To allow you to use MGE UPS SYSTEMS products effectively and carry out basic maintenance, we offer a complete range of technical training courses in English and French.

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4. Maintenance

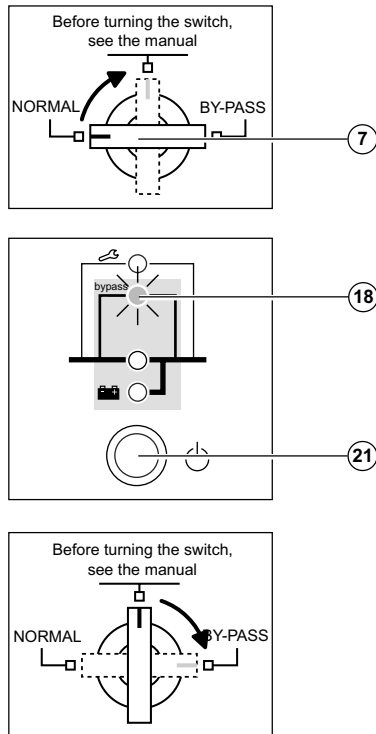
Troubleshooting requiring MGE after-sales support

Indication	Signification	Correction
LED ⑫ flashes and the buzzer beeps.	<p>UPS electronics have detected a UPS fault.</p> <p>Depending on the UPS personalization parameters (see section 3.5), there are two possibilities:</p> <ul style="list-style-type: none">▶ the equipment connected to the UPS continues to be supplied, but directly from the AC-power source via the automatic bypass for a maximum of 8 hours (LED ⑬ ON);▶ the connected equipment is no longer supplied. <p> The equipment connected to the UPS is no longer protected.</p>	<p>Follow the UPS replacement procedure (see section 4.2).</p> <p>Call the after-sales support department.</p>
LED ⑬ flashes.	A battery fault was detected during the battery test.	Call the after-sales support department because the batteries need replacing.

4. Maintenance

4.2 Replacement of the electronic module

Disconnecting the connection module



1. Turn the manual bypass switch (7), located behind the **UPS** (see section 1.2), from the **NORMAL** to the intermediate position.
2. Check that LED (18) is **ON** before continuing to the **BYPASS** position.



If LED (18) is not ON, do not switch to the BYPASS position and call the after-sales support department.

3. Turn the manual bypass switch (7) from the intermediate position to the **BYPASS** position.



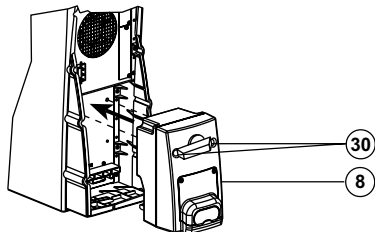
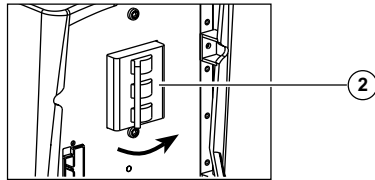
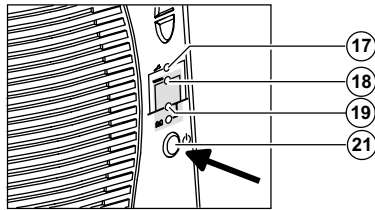
The connected equipment is supplied by the AC-power source, via the manual bypass.

4. Shut down the **UPS** by pressing button (21) (return to the **OFF** position).
5. Switch the battery circuit breaker(s) (2) to the **OFF** position.
6. Remove the two fixing screws (30) to free the connection module (8) (see next page).
7. Remove the connection cable(s) from the battery module(s).

The UPS can be replaced. The connected equipment is supplied by the AC-power source.

4. Maintenance

Reconnecting the connection module



1. Secure the connection module (8) using the two screws (30).
2. Reconnect the connection cable(s) to the battery module(s).
3. Switch the battery circuit breaker(s) (2) to the ON position and check that LED (17) is ON.



Check that UPS personalization settings still correspond to the equipment to be supplied (see section 3.5).

4. Press button (21) and wait 20 seconds.
5. Check that LED (18) is ON.



If LED (18) is not ON, do not switch the manual bypass to the intermediate position and call the after-sales support department.

6. Turn the manual bypass switch (7) from the BYPASS position to the intermediate position and check that LED (17) is OFF.
7. Turn the manual bypass switch (7) from the intermediate position to the NORMAL position. LED (17) goes OFF and LED (19) goes ON.

The connected equipment is again protected by the UPS.

5. Environment

This product has been designed to respect the environment:

It does not contain CFCs or HCFCs.
It was manufactured in a factory certified ISO 14001.

UPS recycling at the end of service life:

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

Web site : www.mgeups.com

6.1 Glossary

Authorized voltage range for transfer to bypass if fault or overload	Upper and lower voltage thresholds within which the UPS can operate on the automatic bypass in the event of a UPS fault or overload.
Automatic bypass	Automatic switch controlled by the UPS , used to connect the equipment directly to the AC-power source.
Automatic start following return of AC input power	When AC input power returns following shutdown at the end of the battery backup time, UPS automatic start can be enabled or disabled.
Backup time	Time that the connected equipment can operate on battery power.
Bargraph	Device on the front panel indicating the percent remaining backup time or the percent load.
Battery test	Internal UPS test on battery status.
Cold start	See "Start on battery power".
Connection module	Unit grouping the receptacles for connection to the AC-power source and the equipment.
Dialog box	A window in a computer program displayed for selection by the user of various options and parameter settings.
Double conversion	The power supplied to the connected equipment is completely regenerated by continuous double conversion, i.e. the AC power from the AC-power source is rectified (AC - DC), then converted back (DC - AC) to AC power.
Equipment	Devices or systems connected to the UPS output.
Forced shutdown	Allows a "clean" of computer operating systems depending on the low battery threshold setting. If the input source is restored during the time period between the shutdown order and actual system shutdown, it causes a voluntary interruption of the supply of power to the connected equipment (lasting 10 seconds) after system shutdown.
Manual bypass	Rotary switch controlled by the user, used to connect the equipment directly to the AC-power source. Transfer of the load to the manual bypass enables UPS maintenance or replacement, without interrupting the supply of power to the connected equipment.
ON-LINE mode	The normal UPS operating mode, by which the AC-power source supplies the UPS , which in turn, following double conversion of the AC power, supplies the connected equipment.

6. Appendices

Out of tolerance	The AC input source is either absent or its voltage or frequency is outside the set limits.
Percent load	Ratio between the power drawn by the connected equipment and the total power that the UPS can supply.
Personalization	A number of UPS functions can be modified using the " UPS Driver " software to better meet the user's needs.
Sleep mode	This function shuts down the UPS after 5 minutes when it operates on battery power and no load is detected on the UPS output. The UPS restarts automatically as soon as the AC input source is restored.
Start on battery power	This function makes it possible to energize the connected equipment even when AC input power is not available (operation exclusively on battery power).
Tolerance for AC-power source frequency	The range of frequency supplied by the AC-power source within which the UPS can operate in ON-LINE mode (double conversion).
UPS	Uninterruptible Power Supply.
UPS ON / OFF via software	It is possible to enable or disable use of UPS ON / OFF controls by the computer-system protection software.

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