

**Pulsar™**

**ESV 8+Rack / 11+Rack  
14+Rack / 22+Rack**

**user manual**

**M G E**  
UPS SYSTEMS  

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[www.mgeups.com](http://www.mgeups.com)

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Dear Customer,

Thank you for your purchase of the **Pulsar UPS**. It has been designed for many years of trouble-free operation.

Please review this manual which has been prepared to provide you with information concerning the proper installation and operation of your **Pulsar ESV 8+Rack / 11+Rack /14+Rack /22+Rack**.

Please feel free to call us at our toll-free number on the last page should you require assistance.

Yours truly,

**MGE UPS SYSTEMS**

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### **Federal Communications Commission (FCC) Statement**

Note: this equipment has been tested and found to comply with Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when equipment is operated in a residential 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. Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits.

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## safety rules

- this equipment can be operated by any individual, with no previous training;
- **the UPS contains voltages which are potentially hazardous. ALL REPAIRS SHOULD BE PERFORMED BY QUALIFIED SERVICE PERSONNEL;**
- **attention:** risk of electric shock, even with unit disconnected from utility power. Hazardous voltages are present even when operating on battery.
- **do not attempt to power the UPS from any receptacle other than a 2-pole 3-wire grounded receptacle;**
- do not place **Pulsar** near water or in environment of excessive humidity;
- do not allow liquids or any foreign objects to get inside **Pulsar**;
- do not block air vents in front, in the back or on the sides of **Pulsar**;
- do not plug household appliances such as hair dryers into **Pulsar** receptacles;

- do not place **Pulsar** in direct sunlight or close to heat-emitting sources;
- the utility power outlet shall be near the equipment and easily accessible. To isolate **Pulsar** from AC input, turn unit off and remove the plug from the utility power outlet;
- if **Pulsar** is to be stored for a long time, it is recommended to recharge the batteries (by connecting the utility power to **Pulsar**, switch "ON" or "OFF"), once a month for 24 hours to avoid a full battery discharge;
- **Pulsar** contains batteries that should be disposed of or recycled in accordance with applicable laws;
- prior to installation, store **Pulsar** in a dry location;
- storage temperatures must be between: -4°F and +113°F (-20°C and +45°C);
- when replacing the batteries, use the same number and the following type of batteries: 6V/12Ah, 12V/7.2Ah;
- do not incinerate batteries, they may explode;
- do not open or mutilate the battery or batteries,

- released electrolyte is harmful to the skin and eyes;
- a battery can present a risk of electric shock and high short circuit current.
- The following precautions should be observed when working with batteries:
- remove watches, rings or other metal objects,
  - use tools with insulated handles;
  - please dispose of the packaging in accordance with applicable laws.



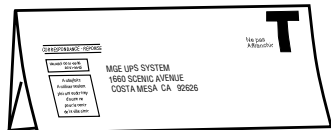
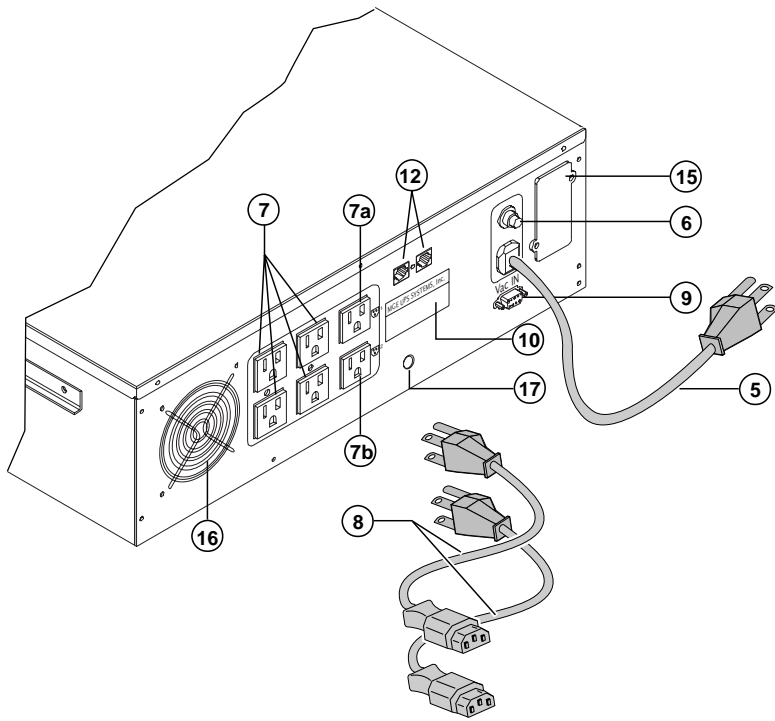
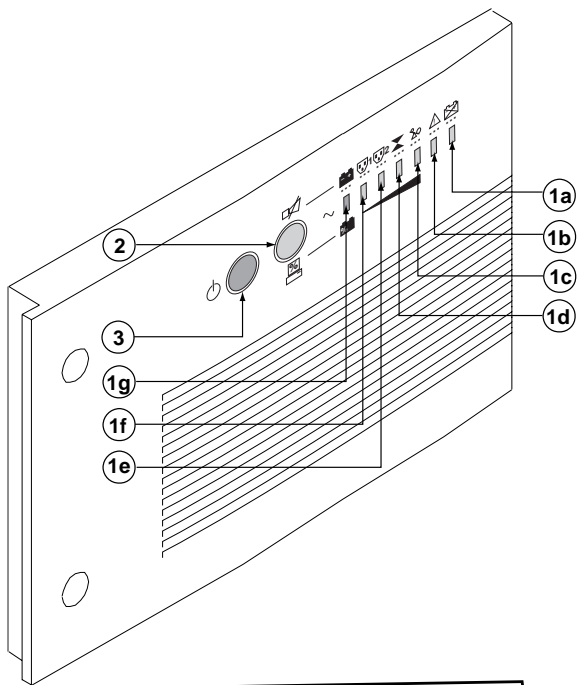
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# general contents

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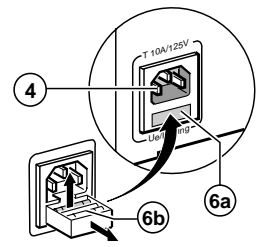
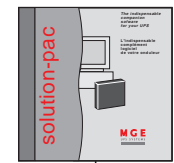
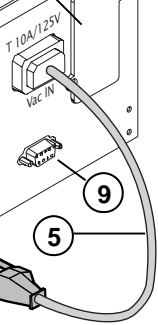
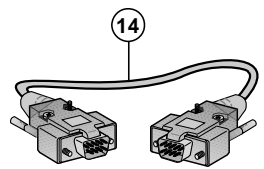
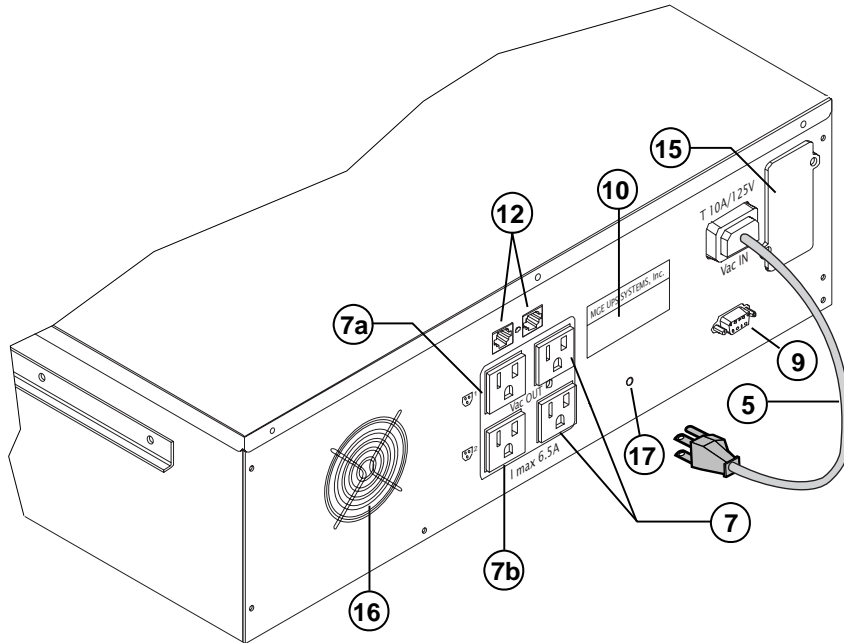
**discover Pulsar** ..... **6**  
illustrations and features key diagram

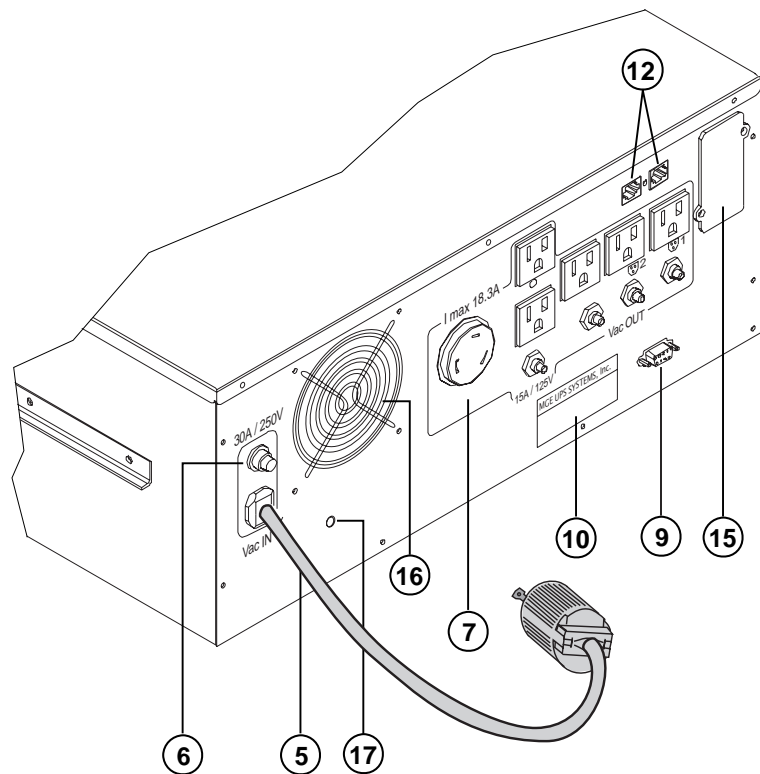
introduction / getting started/ operation ..... **11**



11

# rear view of ESV8+Rack





- 1a yellow indicator light flashing quickly only: battery fault,
- 1b yellow indicator light flashing quickly only: device fault,
- 1c yellow indicator light flashing quickly only: overload,
- 1d yellow indicator light flashing quickly only: operating on "booster" or "fader" mode,
- 1e yellow indicator light flashing quickly only: plug 2 not powered,
- 1f yellow indicator light flashing quickly only: plug 1 not powered,
- 1g green indicator light on continuously: operating on utility,  
green indicator light flashing: battery back-up time,



## key to diagrams page 6 to 8

- ② "function" button: switches off audio warning device or measures load charge percentage (with utility power),
- ③ "ON/OFF" switch,
- ④ utility input receptacle,
- ⑤ utility power connection (**use computer cord only for ESV 8+Rack**),
- ⑥ 15A, circuit protector for **Pulsar ESV 11+Rack**  
20A, circuit protector for **Pulsar ESV 14+Rack**  
30A, circuit protector for **Pulsar ESV 22+Rack**
- ⑥a 10A, delayed fuse for **Pulsar ESV 8+Rack**,
- ⑥b fuse holder,
- ⑦ output receptacles for connection of computer equipments to **Pulsar ESV+Rack** (2 for ESV 8+) with output switchable receptacles ⑦a and ⑦b by Solution-Pac,
- ⑧ power cords for connection of computer equipment to **Pulsar ESV+Rack (not included)**,
- ⑨ SUB-D 9 pins connectors communication port,
- ⑩ identification plate,
- ⑪ warranty card,
- ⑫ network protection, RJ45 connector,
- ⑬ Solution-Pac CD-ROM,
- ⑭ serial cable for communication with a PC,
- ⑮ cover for optional communication cards,

- ⑮ Fan
- ⑰ Site wiring fault

### NB:

Indicator lights ①c à ①f indicate the charge level of the battery (if utility power present) or the remaining battery backup time (without utility power).

By pressing the button marked "function" ② when utility power is present, they indicate the level of load charge.

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## software supplied with Pulsar ESV+Rack

To meet the different operating environments of your UPS, **Pulsar ESV+Rack** includes 2 MGE UPS SYSTEMS software programs:

- **ESV-Driver** software for Windows;
- **Network based Solution-Pac™** power management software.

### ESV-Driver for Windows

ESV-Driver for Windows provides communication with the UPS from a simple Windows workstation. ESV-Driver is compatible with Windows 3.1x and Windows 95/98, for communication with the UPS via a serial connection for various needs:

- **personalization of the UPS operating mode:** the ESV-Tuner utility, can be used to change certain UPS operating parameters if the standard factory settings are not ideal for the operating conditions. It is possible to modify the output voltage, battery-test frequency, startup and shutdown sequences, etc.;

## Solution-Pac™ for networks and multi-server systems

Protection by UPS is only complete and effective if combined with powerful software functions which warn users and the operator of any power supply problem, automate system shutdown, supervise and remotely control the UPSs. MGE UPS SYSTEMS created Solution-Pac™ for this purpose. Solution-Pac™ combines all these functions in a single CD-ROM, usable in local or remote mode (TCP/IP and SNMP), and covering the main network environments.

Solution-Pac™ is the ideal solution for protecting networks and multiserver systems.

Solution-Pac™ on a single CD-ROM contains everything needed to safeguard one or more systems and to supervise one or more UPSs from a local or remote station. Solution-Pac™ includes SNMP proxy agents, system shutdown software, and supervision software.

Solution-Pac™ is a powerful and upgradable software tool which provides all the supervision, control and safety functions associated with a UPS:

- graphic display of the UPS,
- remote control of the UPS and output receptacles,
- user alarm of problems,
- recording of events in log files,
- automatic system shutdown and restart,
- local or remote supervision of UPSs and ancillary devices,
- transmission of UPS information and alarms to any SNMP supervisor.
- paging / e-mail capabilities
- multiple server shutdown in heterogeneous environment.

### Platforms supported:

Windows 3.1, 95, 98, NT, Novelle Netware, OS/2, Linux, Mac/OS, Sun Solaris, HP/UX, IBM AIX, Dec Unix and Open VMS, Silicon Graphics, IRIX.

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# contents

<b>introduction</b> .....	<b>12</b>
benefits .....	12
options.....	12
<b>getting started</b> .....	<b>13</b>
installation .....	13
preliminary checks .....	13
connections .....	13
■ power connections .....	13
■ serial connections .....	13
■ computer network protection.....	13
communication .....	14
<b>operation</b> .....	<b>15</b>
starting up with utility power .....	15
starting up without utility power.....	16
normal operation .....	17
operation with battery backup time .....	18
overload.....	19
operating anomalies .....	19
battery replacement .....	20
technical data .....	21

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# introduction of Pulsar UPS

## benefits

Network servers and data are very sensitive to electrical disturbances of all types including outages, brownout, voltage sags, interference, etc. The origins of disturbances also vary, ranging from atmospheric phenomena such as lightning or frost, to near-by devices generating interference such as elevators, copiers and machine-tools, not to mention human errors such as the accidental pulling out of power cords or tripping of circuit breakers. The consequences of disturbances on computer systems range from damage to hardware (power supplies, hard disks) to the loss of data.

**Pulsar ESV+Rack** has been specially designed to protect network servers and all other connected devices that are sensitive to electrical disturbances. **Pulsar ESV+Rack** adds fault-tolerance to the power source supplying your server.

**Pulsar ESV+Rack** is designed as a compact unit that silently protects your electrical devices.

Because of its backup battery, **Pulsar ESV+Rack** protects your system for several minutes (see the "characteristics" section) in the event of a power failure. A built-in filtering system protects connected devices from line interference. Finally, to counter voltage sags or spikes, **Pulsar ESV+Rack** uses voltage compensation circuits ("booster" and "fader" modes) to guarantee a stable supply of clean power.

As standard, **Pulsar ESV+Rack** offers the PowerShare function that was previously available only on large UPSs. Power outputs may be remotely controlled, thus making possible sequential start-ups of various devices, selective load shedding in the event of an overload and priority management near the end of battery power to protect the most sensitive load.

**Pulsar ESV+Rack** offers a number of functions and characteristics intended to simplify power management:

- automatic battery test carried out periodically. In the event of a fault, a LED provides enough advance warning for battery replacement;
- LEDs on the front signalling all types of faults and alarms;
- bar graph continuously indicating the battery charge level or the computer-application load level;
- environment friendly: all components are recyclable and an electronic power-saver device reduces consumption if the UPS is not active for a period exceeding five minutes;
- Pulsar ESV+Rack** includes user-replaceable batteries, no need to power off connected equipments to replace them;
- ESV Driver software is part of our CD-ROM (\*). It lets you edit the default parameters of **Pulsar** to ideally match your requirements;
- Pulsar ESV+Rack** is Plug and Play: its installation on Windows 95/98 is fully automatic;
- advanced operation and monitoring of **Pulsar** are achieved by means of the Solution-Pac CD-ROM included in your package. To learn more about all the advanced features offered (system shutdown, remote monitoring, SNMP administration,...) please view the navigator tool of the CD-ROM;
- network protection is built-in to ensure safe data transmission.

## options

**UM Sensor environment measurement unit:** compatible with SNMP or Solution Pac™, this unit measures the temperature and the relative humidity in the room where the **Pulsar** is installed. Eight relay contacts are provided to transmit signals to an administration platform, in the form of voltage free contacts to enable monitoring of (fire alarm, climate control fault, intrusion, etc.);

additional communications options:

**SNMP administration:** MGE has the most complete offering for the administration of a group of UPSs using the SNMP protocol with different network-connection modules (SNMP card or proxy software), supervision modules (application for NMS platforms such as HP OpenView or C.A. UNICENTER TNG) and a file-closing module (UM Client).

**SNMP card:** this card, inserted into your UPS, can establish a direct Ethernet network connection for your UPS. It can then be temporarily managed using SNMP or the various software modules of Solution-Pac. The MGE UPS SYSTEMS offering complies with RFC 1628 specifications (IETF) and was certified by the InterWorking Labs during the Test Summit in June 1994;

**status information card:** this option provides you with 3 data elements on voltage-free contacts: operating on battery, low battery warning, operating on utility power. This card can be used with the UPS driver of IBM AS/400.

Contact your reseller for further information on these options.

(\*) CD-ROM : EMB/ESVPLUS/CONFIG

# getting started

## installation

■ observe the safety rules indicated at the beginning of this document.

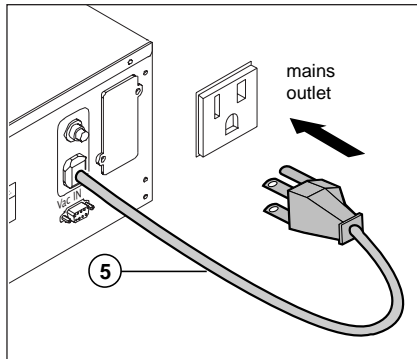
## preliminary checks

- check that button ③ " I " on the front is not pushed in;
- check that rating shown on identification plate ⑩ corresponds to the input voltage specification and power requirement of the load.

## connections

### ■ power connections:

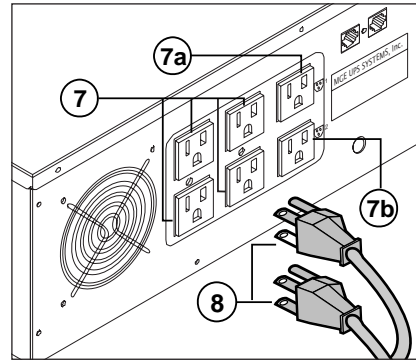
- use the UPS input cord to supply input power to **Pulsar** as shown.



Connect the UPS input cord ⑤ to a nearby power outlet.

For the **ESV8+Rack**, the input cord is not attached to the UPS. Connect the input cord to the UPS input receptacle ④, as shown on page 7, and to a nearby power outlet.

- use included IEC cords ⑧ to connect the computer loads to output sockets ⑦, ⑦a and ⑦b.



### Note 1:

Following connection, the battery automatically charges, regardless of the position of the ON/OFF button ③ " I ".

### Note 2:

The batteries will provide full back-up time after approximately 8 hours of recharge time.

### Note 3:

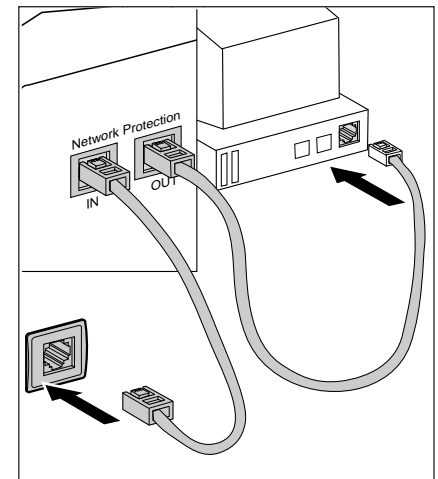
The rating of the input power cord must not be less than the nominal input rating of **Pulsar**.

### ■ serial connections:

If you wish to use the functions of the CD-ROM supplied with your **Pulsar**, connect one end of the supplied serial cable ⑭ to the communication port ⑨. Connect the other end to a serial port of a computer system.

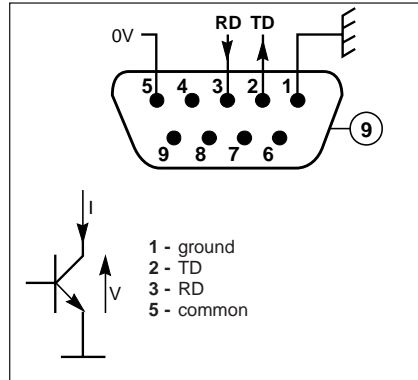
### ■ computer network protection:

If you wish to use the network line filtering functions (Ethernet for example), use a cable of the RJ45 type. Connect the "IN" output to the network and use another cable to connect the "OUT" output to the protected computer system.



## communication

The communication port (9), at the rear of **Pulsar**, delivers information in the form of an RS232 serial link supported by the communication protocol exclusive to MGE UPS SYSTEMS. The Solution-Pac programs use the data made available by this protocol.



With the ESV Driver software program you can set up **Pulsar ESV+Rack** to suit your user conditions (ESV Tuner). To install ESV Driver, connect the serial cable supplied to COM1 to COM4 (set up by ESV Tuner) serial port of your computer equipped with Windows 3.1 or 95/98 on the one end, and to the serial **Pulsar ESV+Rack** connector on the other end.

ESV Driver software (included in the CD-ROM: EMB/ESVPLUS/CONFIG) lets you edit the default parameter of **Pulsar**:

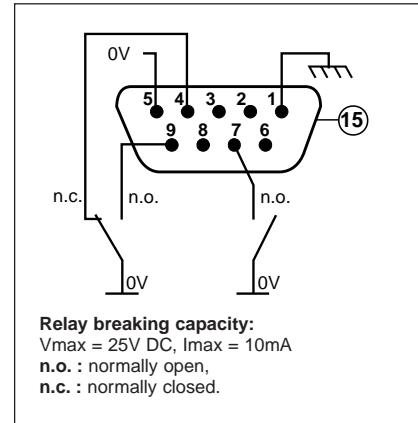
- battery test frequency (default: every week);
- nominal output voltage (default: 120 Volts);
- high/low voltage thresholds (default: 138/92 Volts);

- Fader/Booster activation thresholds (default : 102/128 Volts);
- on/off conditions:
  - automatic restart,
  - forced reboot,
  - energy saving,
  - cold start.

## option 1

■ **status information card**: after the card is installed in the rear of the **Pulsar**, communication port (15) transmits status information on a SUB-D 9-pin female connector using the following pinouts:

- 1 - ground,
- 4 - normal operation,
- 5 - common,
- 7 - low battery warning,
- 9 - operation on battery.

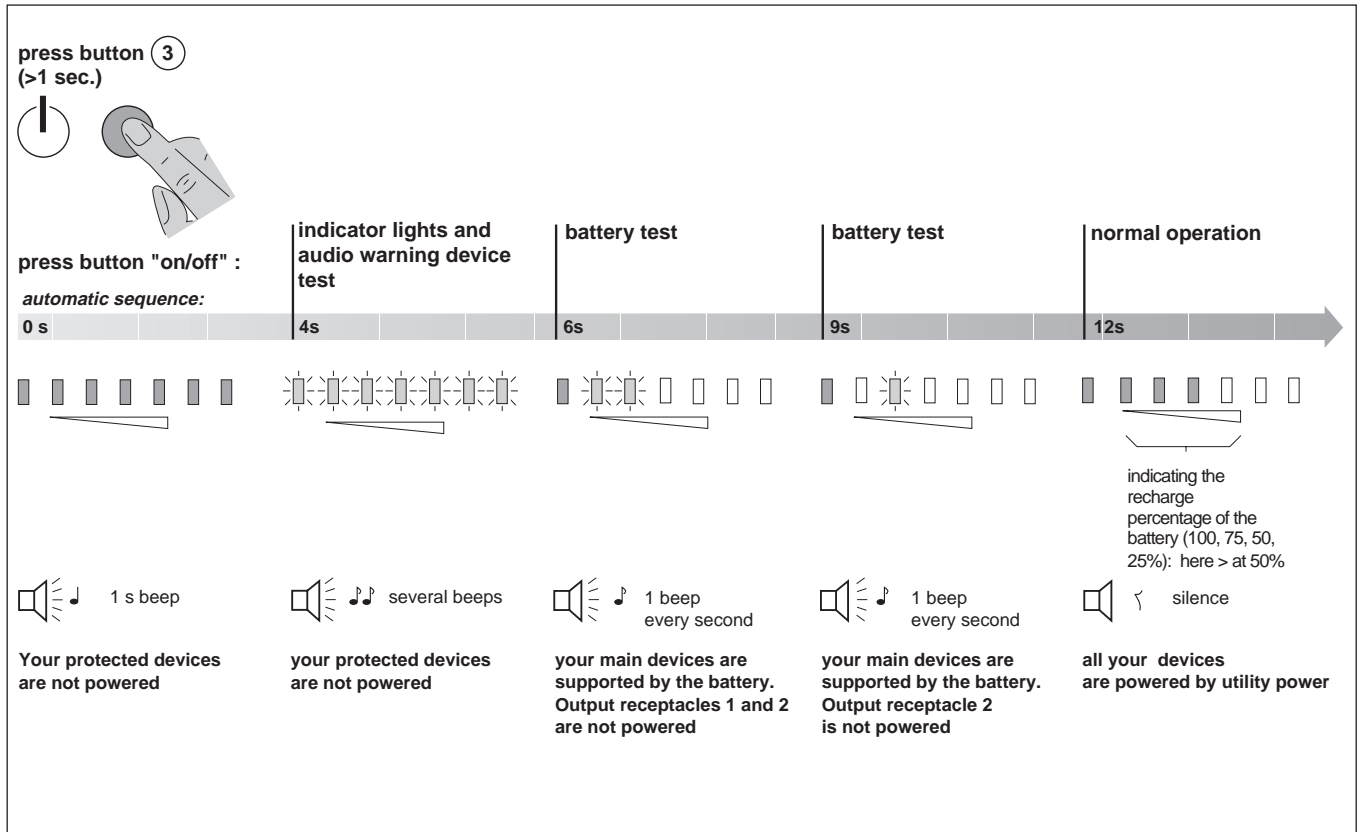


## option 2

■ **SNMP card**: after the card is installed in the rear of the **Pulsar**, communication port (15) transmits information supported by the TCP/IP and SNMP protocols on an RJ45 connector to any ethernet network. Contact your sales agent for further details.

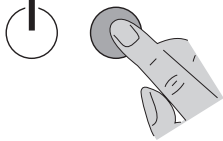
# operation

## starting up with utility power present



# starting up without utility power

press button ③  
(>1 sec.)

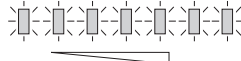


automatic sequence:



indicator lights and audio warning device test

4s



1 s beep

Your protected devices are not powered

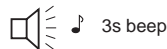
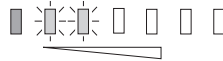


several beeps

your protected devices are not powered

battery test

6s

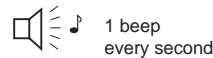
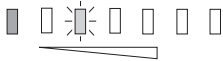


3s beep

your main devices are supported by the battery. Output receptacles 1 and 2 are not powered

battery test

9s



1 beep every second

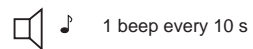
your main devices and output receptacle 1 are supported by the battery. Output receptacle 2 is not powered

normal operation with battery autonomy

12s



indicating the remaining autonomy percentage (<100, 75, 50, 25%): here < 50%

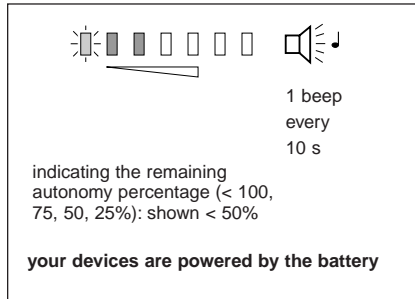


1 beep every 10 s

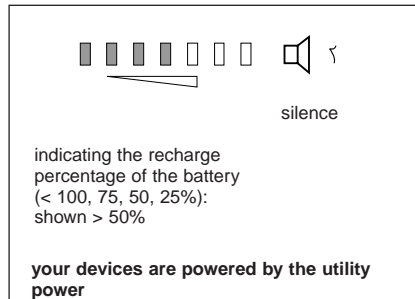
all your devices are powered by the battery



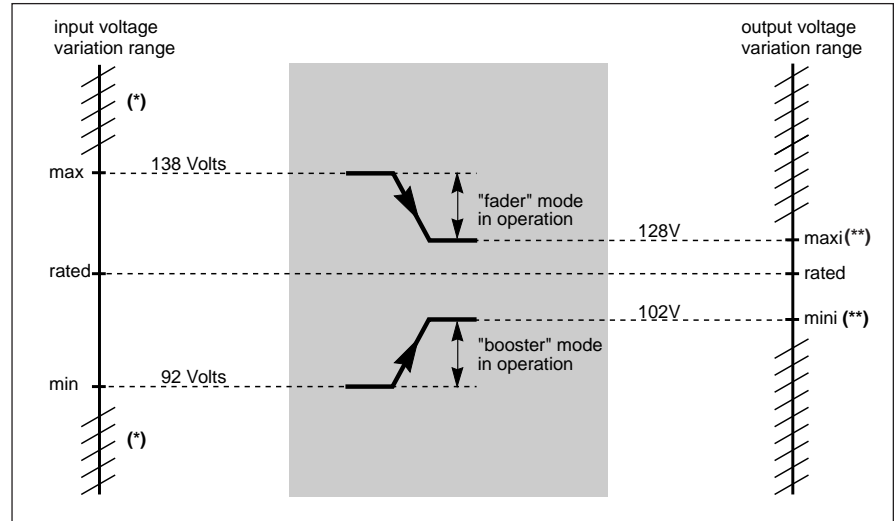
## normal operation without utility power



## with utility power

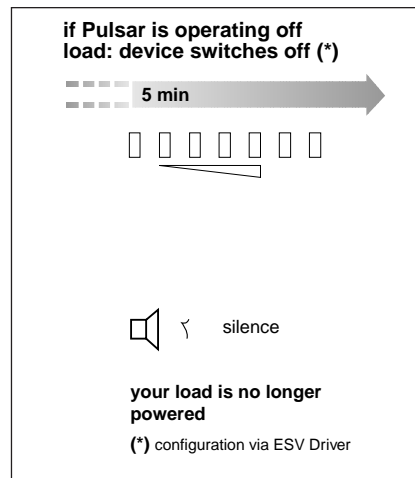
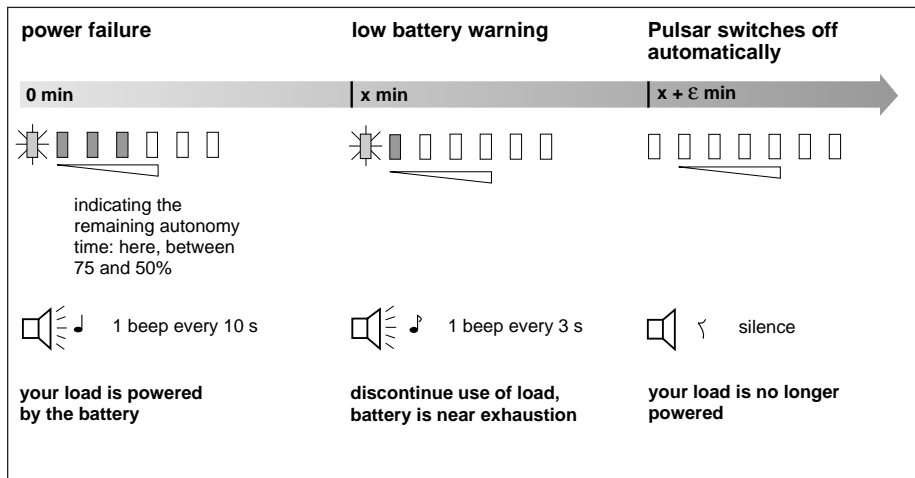


- the "fader" and "booster" functions are used to keep the output voltage range ( $U_{max}$ - $U_{min}$ ) compatible with the supply operating range of your application;
- this operating range can be configured via the "ESV Driver" software (included in your CD-ROM);
- on operation in the "fader" or "booster" range, the indicator light **(1d)** begins flashing.

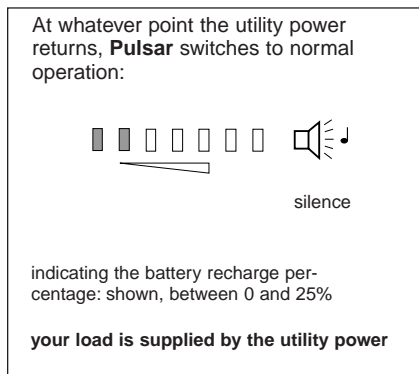


(\*) outside the min.-max. range indicated, **Pulsar** runs in battery backup  
 (\*\*) standard setting

## operation with battery back up time no utility power



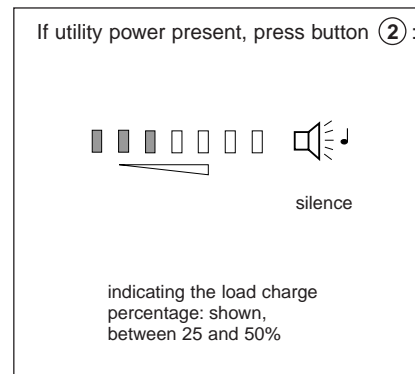
## return of utility power



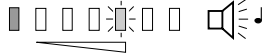
### Note:

Button ② is to disable or activate the audible alarm device when operating on battery.

## load charge percentage




## overload utility power present



1 beep  
every  
second

**Pulsar switches off automatically after operating in overload for approximately 5 min.**

## no utility power present




1 beep  
every  
second

**Pulsar switches off automatically after a length of time which depends on the level of overload.**

### NOTE:

Overload occurs if the electricity consumption of the load connected is greater than the rated power of **Pulsar**. To acknowledge the fault, push button (3), temporarily disconnected **Pulsar** from the wall socket (5), disconnect non-priority loads and re-start **Pulsar**.


## operating anomalies device fault



1 beep  
every  
second

- switch off **Pulsar** (push button (3)), disconnect from the wall socket (flex (5)), and check that **Pulsar** has not short-circuited (disconnect all applications),
- check the input fuse (6b) and replace it with a fuse of the same rating or reset thermal breaker (6),
- re-start **Pulsar**.

## utility power outside limits

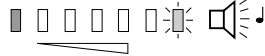


continuous  
beep

after the start-up sequence, if the audio warning device sounds continuously, **check the voltage and frequency of your utility power** (see the § entitled "characteristics") **and/or recharge your battery for 8 hours.**

## battery fault

A battery test is carried out while **Pulsar**, is in start-up phase, then automatically every 7 days (overhaul times adjustable using ESV Driver). If a battery fault is detected, the following occurs:



1 beep  
every  
second

**recharge your battery for 8 hours. If battery fault persists, see next page.**

## Start/Stop control on output receptacles 1 and 2 (PowerShare)

You can use the applications included on the CD-ROM to remote control the Start/Stop sequences on output receptacles (7a) (or (7b)). If (7a) (or (7b)) is disabled through software, front panel led (1f) (or (1e)) flashes, with 1 beep every second. Beep can be deactivated by "function" button (2).

### NOTE:

If the previous symptoms persist, contact our after sales department.

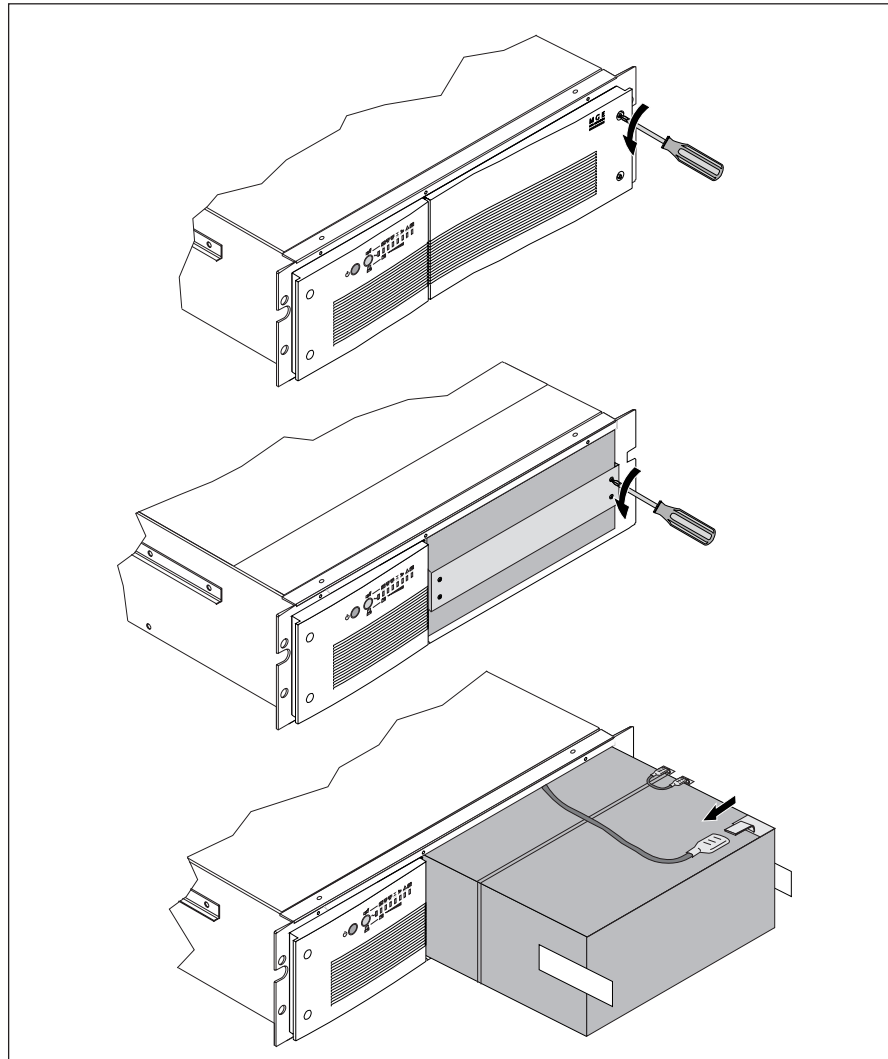
## battery replacement

### ESV8+Rack / 11+Rack / 14+Rack /22+Rack

- see important battery safety rules (see page i);
- batteries can be replaced without risk, but don't hesitate to contact our after sales department to confirm battery failure, and to give you further information;
- battery replacement can be performed with UPS on utility power, but we recommend you to switch off the unit in order to avoid any data loss;
- use a screwdriver to remove the cover on the right side of the UPS **ESV+Rack**;
- use a screwdriver to remove horizontal metal plate holding the batteries.

For **ESV22+Rack** remove terminal **before** removing the battery.

- pull out battery block using tapes on the sides;
- disconnect battery wires red (+) and black (-) from the UPS on battery terminals;
- replace all batteries with new batteries, same voltage and same rating (Volts, Ah), then connect battery wires again (sparks may occur during connection);
- push battery block back in, screw metal front panel on, then click plastic front panel into place and secure the plastic plate with screws.



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# technical data

---

## ■ output power:

- |  |             |  |              |
|--|-------------|--|--------------|
| <input type="checkbox"/> Pulsar <b>ESV 8+Rack</b> :  | 780VA/490W  | <input type="checkbox"/> Pulsar <b>ESV 14+Rack</b> : | 1400VA/980W  |
| <input type="checkbox"/> Pulsar <b>ESV 11+Rack</b> : | 1080VA/700W | <input type="checkbox"/> Pulsar <b>ESV 22+Rack</b> : | 2200VA/1540W |
- 

## ■ utility power source:

- |   |  |
|---|--|
| <input type="checkbox"/> voltage (V):   | 92V to 138V single phase (*)                       |
| <input type="checkbox"/> frequency (F): | 47Hz to 53Hz or 57Hz to 63Hz                       |
| ■ <b>battery:</b>                       | <b>Pulsar <i>ESV 8+Rack</i></b> : 2 x 12V - 7.2Ah  |
| <input type="checkbox"/> type:          | <b>Pulsar <i>ESV 11+Rack</i></b> : 3 x 12V - 7.2Ah |
|   | <b>Pulsar <i>ESV 14+Rack</i></b> : 4 x 12V - 7.2Ah |
|   | <b>Pulsar <i>ESV 22+Rack</i></b> : 8 x 6V - 12Ah   |

maintenance free sealed lead-acid

**caution: battery life (4 or 5 years) is halved every 10°C above 25°C**

---

## ■ output specifications with load on battery:

- |   |                                 |
|---|---------------------------------|
| <input type="checkbox"/> voltage (V):   | single phase 120V ±5% (**)      |
| <input type="checkbox"/> frequency (F): | 50Hz/60Hz ± .1Hz auto selection |

## ■ output specifications with load on utility power:

- |   |   |
|---|---|
| <input type="checkbox"/> voltage (V):   | see "normal operation with utility power present" |
| <input type="checkbox"/> frequency (F): | 47Hz to 53Hz or 57Hz to 63Hz                      |
- 

## ■ environment:

- |   |  |
|---|--|
| <input type="checkbox"/> noise level:           | ≤ 40dBA for operation on utility power |
|   | ≤ 45dBA for battery backup time        |
| <input type="checkbox"/> operating temperature: | 0 to 35°C                              |
| <input type="checkbox"/> relative humidity:     | 0 to 90% non condensing                |
- 

## ■ dimensions and weights:

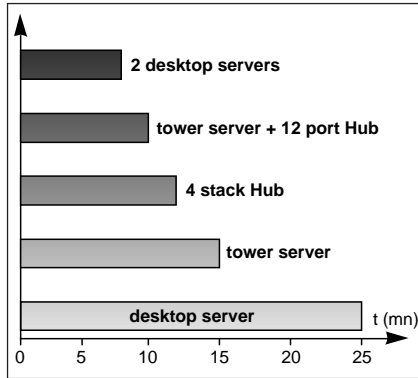
- |  | <b>Pulsar <i>ESV 8+Rack / 11+Rack / 14+Rack</i></b> | <b>Pulsar <i>ESV 22+Rack</i></b> |
|--|---|----------------------------------|
| <input type="checkbox"/> height H (mm/inch): | 133.35/5.25   | 177.8/7                          |
| <input type="checkbox"/> width W (mm/inch):  | 482.6/19  | 482.6/19                         |
| <input type="checkbox"/> depth D (mm/inch):  | 457.2/18  | 457.2/18                         |
| <input type="checkbox"/> weight (kg/lb) :    | 25/29/31 (kg) 55/64/68 (lbs)                        | 44/97                            |

(\*): adjustable high and low thresholds using ESV Driver (CD-ROM: EMB/ESVPLUS/CONFIG)

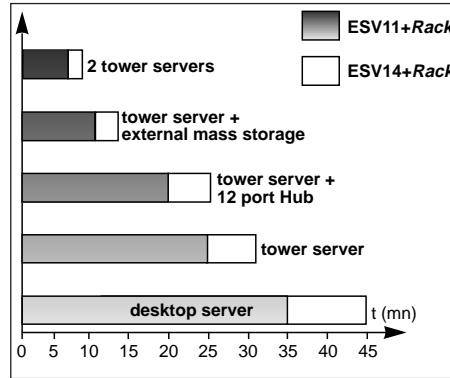
(\*\*): can be adjusted from 100 to 127V using ESV Driver (CD-ROM: EMB/ESVPLUS/CONFIG)

## technical data (continued)

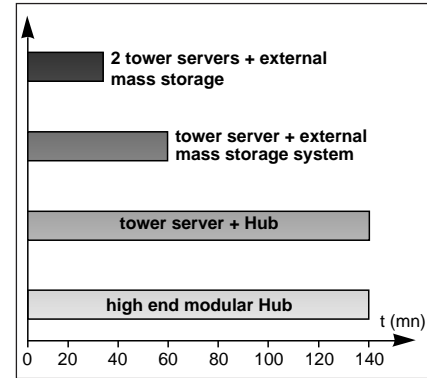
Pulsar ESV 8+Rack battery back-up time



Pulsar ESV 11+Rack /14+Rack battery back-up time



Pulsar ESV 22+Rack battery back-up time



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## North American warranty

MGE UPS Systems warrants that products furnished hereunder shall be free of defects in material and workmanship for a period of two (2) years from date of purchase. Upon notice of any such defect, MGE UPS Systems shall, at its option, repair or replace the defective product at no cost to the buyer.

Proven defective units will be replaced with new or re-certified units, at MGE's sole option. Replacement units will be reshipped within five working days of receipt of defective units at MGE's Costa Mesa facility. Replacement units will carry the balance of

original two (2) year warranty, or 90 days, whichever is greater.

Customer must first obtain a Return Material Authorization number (RMA#) from MGE's Sales Administration department. The RMA# must be clearly printed on the outside of each box when returned. The RMA# and serial number(s) of the returned units must appear on the return shipping documents. Call MGE for shipping boxes if necessary.

Freight: All products returned shall be shipped to MGE UPS Systems, Costa Mesa facility, freight and shipping charges prepaid.

This warranty constitutes the sole and exclusive remedy of any buyer of MGE UPS Systems equipment and the sole and exclusive liability of MGE in connection with the products and is in lieu of all other warranties, expressed, implied or statutory, including but not limited to, any implied warranty of merchantability of fitness.

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