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USER MANULA

"AQUARIUS PLUS"

Da 1KVA a 3KVA

Cosphi 0,9

1. DOCUMENT CHECK SECTION

Drawing

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Control

Control by	Role	Date
Alessandri David	Technical Staff	29-03-17

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Revision

Rev.	Author	Description	Date
B			
C			
D			
E			
F			
G			
H			
I			
L			

References

Ref.	Author	Title	Revision

1. Preface

Thank you for purchasing our UPS, it is safe and reliable, little maintenance is required.

Read this manual carefully and completely. It includes safety and operating installation instructions. It will help your UPS get a longer service life. This manual explains the principle of internal operation, and the related protection functions.

This manual also contains information on the use of the equipment.

Please respect the instructions and all the warnings indicated in the manual or on the machine. Do not use the machine before completing the safety reading and the operating instructions.

Note: due to continuous improvements, our products may differ from the contents included in this manual. You can contact the local office to get information when needed.

General index

1 Description

UPS (Uninterruptible Power Supply) is a device that allows continuity in the supply of loads in alternating current, but also has protection and monitoring functions. The UPS plays a very important role in the supply of computers and the computer network to which the computer is possibly connected. The fields of application of UPS are numerous: communication, finance, electricity, transport, national defense, universities, scientific research institutes and so on.

The Aquarius series from 1KVA to 3kVA, are products designed with the advanced ON-LINE UPS technology, which provide the user with multiple functions and good performance.

1.1 Functions and features

1. The latest generations of IGBTs have been used in our UPSs to provide reliability and high performance. In general, the electronic components we have used are able to work normally for more than 300,000 hours.
2. Using digital technology associated with reliable algorithms, we have been able to create a powerful and easy-to-use product.
3. The self-test at the start-up of the apparatus, allows to find in advance, potential problems of the UPS in order to be able to intervene and resolve the problem promptly.
4. The on-line double conversion topology means that in the UPS output there is a sine wave with constant voltage and frequency, low noise and without any type of interruption of energy supplied to the load. All this guarantees the correct functioning of the equipment powered by our UPSs.
5. The transfer time between the main source and the emergency source at the UPS exit is zero, when the main power supply fails it is immediately replaced by the emergency power supply
6. With the bypass function incorporated in the UPS, the energy is transferred to the loads without any interruption. This feature is very useful when you need to perform maintenance on the UPS.
7. Advanced voltage compensation technology leads to having the input voltage range from 115V to 295V, which reduces battery usage and improves the ability to adapt to changing network conditions.
8. The AC input frequency is 50Hz / 60Hz. When the output frequency is 50Hz, the AC input frequency range is 45Hz-55Hz, when the output frequency is 60Hz, the AC input frequency range is 55Hz-65Hz. The UPS has good compatibility with generators. It is suitable for different types of single-phase generators.
9. The advanced PFC (Power Factor Correction), a technology that leads to a power factor higher than 0.98 of the UPS, increasing its energy efficiency and removing harmonic distortion.
10. The UPS starts up in battery mode, to be able to power the loads even in the absence of the mains. When the battery voltage is low, the UPS protects itself and turns off automatically. When the main power is restored, the UPS will detect its presence, checking that the voltage and frequency are in the ranges. Once the input voltage is considered good, the UPS will automatically turn on to supply loads; if the network is not considered good, the UPS will still start the charger to recharge the

battery. In this case the group does not switch on to supply loads until the voltage and frequency of the main source fall within the allowed ranges.

11. When there is no power supply, the UPS can be started by battery. This feature is called cold start and is used to supply loads in emergencies. This feature can also be activated at full load.
12. The UPS intervenes to protect the load when the following events occur: When the main input or output power is too high or too low, in case of overload, short circuit, high inverter stage temperature, minimum voltage and battery overload.
13. The UPS can be installed in a Rack or Tower version. The viewing angle of the display can be easily changed by pressing two buttons on the control panel of the apparatus. The content displayed on the interface is rich in measurements. Alarms and statuses are easily controlled from the operator panel.
14. It is possible to connect the UPS to a computer, through an RS232 serial port. A software must be installed on the PC that allows the intelligent management of most of the functionalities of the device.
15. If you want to connect the UPS to a computer network, you must have a kit called "SNMP adapter". The connection can be internal or external to the UPS. Through these cards it is possible to monitor the UPS from the internet or by evicting the various network protocols made available to the kit.
16. A further possibility to monitor the UPS is the USB port, present on the UPS. Also, in this case it will be necessary to load a software on the PC to which the group is connected.
17. The ECO function saves electricity. When the input voltage is in an acceptable range, the load is fed directly from the mains. In this case the inverter remains in stand-by. When the input voltage comes out of the ranges, the load is powered by the inverter, which returns the output voltage in the allowed ranges.

2 Safety Instructions

This chapter mainly introduces safety marks and notes on the 1KVA-3KVA online UPS series. Read this chapter carefully before using the equipment.

2.2 Safety

There are dangerous voltages and high temperatures inside the UPS. During the installation and maintenance operation, please follow the safety instructions in the interior and the relevant laws, otherwise personal injury or damage to the equipment may occur. Safety instructions in this text are like an additional manual for internal safety instructions. Our company does not assume the responsibility caused by non-compliance with safety instructions. Please note the following:

1. Do not use the UPS when the actual load exceeds the nominal load.
2. There are high-capacity batteries in standard-type UPSs. Do not open the cover. There is a danger of electric shock. In case of maintenance or replacement of the internal battery, please send it to the nearest UPS service center.
3. A short circuit inside the UPS causes electric shock or possible fire. Therefore, do not place containers with liquid on top of the UPS so as not to cause danger of electric shock.
4. Do not put the UPS in a place with high temperature or humidity, as well as corrosive gases and a lot of dust.
5. Maintain good air circulation on the front panel and rear panel.
6. In case of smoke coming out of the UPS, please remove the power as soon as possible and contact the assistance service.

2.3 Indication symbols

The safety symbols mentioned in this manual are shown in the following table. They are used to inform the user of safety problems that must be respected during installation, operation and maintenance.

Indication symbols	Indication
	Attention
	Sensitive to electrostatic discharge
	Electrocution

There are three levels of security: Dangerous, warning and attention. The meaning is to the right of the safety symbol, the description is below, as shown below:

Dangerous:

Indicates the risk of serious injury or death or serious damage to the equipment

Attention:

Indicates the risk of serious injury or damage to the equipment.

Warning:

Indicates risk of injury or equipment damage.

3 Product presentation

3.1 Product appearance

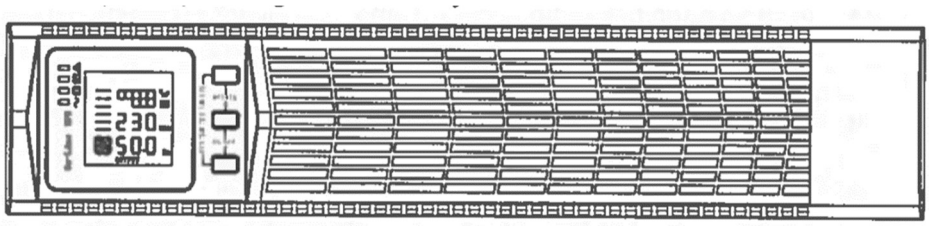


Illustration 1: front panel

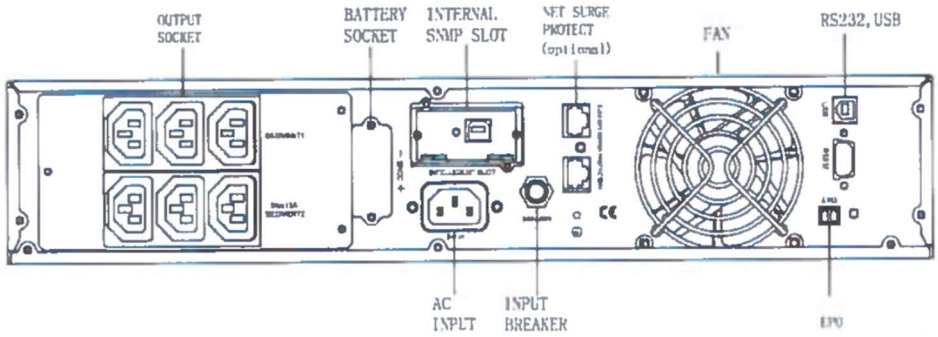


FIG.28 .

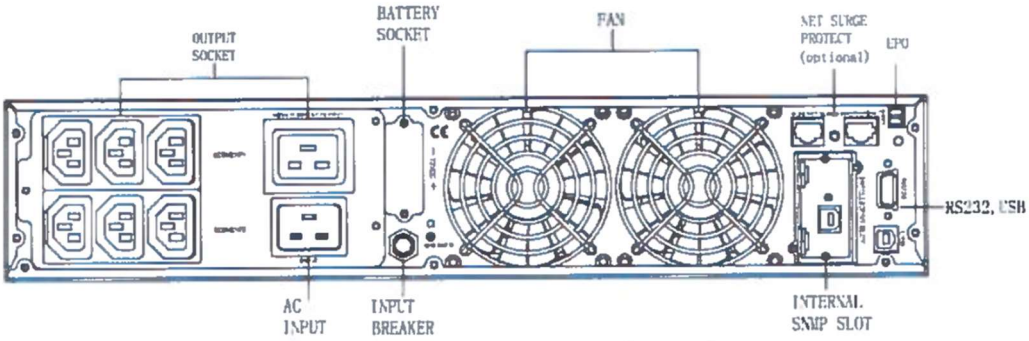


Illustration 2: Rear panel

3.2 The principle of the product

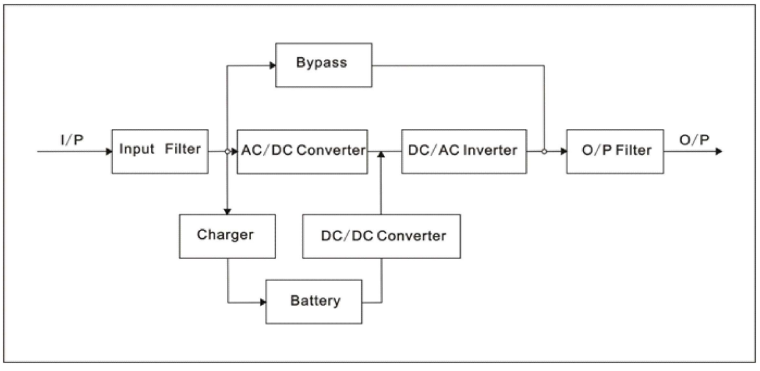


Illustration 3: Principle outline

1. Input filter: filters the AC mains input supply to supply clean energy for the UPS.

2. AC / DC converter: Converts the filtered mains voltage (AC) into DC voltage and elevates it for the DC / AC inverter.

3. DC / DC booster: When the UPS is operating in battery mode, this circuit increases the DC voltage for the inverter.

4. DC / AC inverter: Converts the direct voltage (DC) to a stable alternating voltage (AC) output.

5. Bypass: When an overload or failure of the inverter occurs, the UPS goes into bypass mode to supply loads.

6. Charger: the standard unit provides 1A, while the long-life charger provides 4A.

7. Battery: sealed lead acid batteries.

8. Output Filter: Completely filters the UPS output to provide clean energy for the loads.

3.3 Modell

UPS type	MODEL NO	Remark
Standard unit	1KVAS	Internal battery charger 1A,2 batterie PCS 7AH
	2KVAS	Internal battery charger 1A,4 batterie PCS 7AH
	3KVAS	Internal battery charger 1A,6 batterie PCS 7AH

Table 1: Aquarius model

To request an expansion battery box, for long term backup contact the Braga Moro sales office, or write to the following E-Mail address: sales@bragamoro.com

4 Installation

4.1 Unpacking and inspection

1. Unpack the UPS and check that there is no damage caused during transport. If any parts are damaged or missing, do not start the appliance and inform the carrier and report it to the service center.
2. Check the attachment (please refer to the Appendix 1 table).

4.2 Note

1. Please place the UPS in a clean environment and avoid vibration, dust, moisture, flammable and corrosive gases and liquids.
2. The ambient temperature must be in a range between 0 ° C ~ 40 ° C. If the ambient temperature exceeds 40 ° C, the nominal power decreases by 12% as the ambient temperature increases.
3. The maximum working temperature cannot be higher than 50 ° C.
4. The UPS must be placed in a sufficiently ventilated place.

4.3 Mounting the brackets for the Tower-mounted installation

The plastic brackets must be mounted as shown in illustration 5 and 6

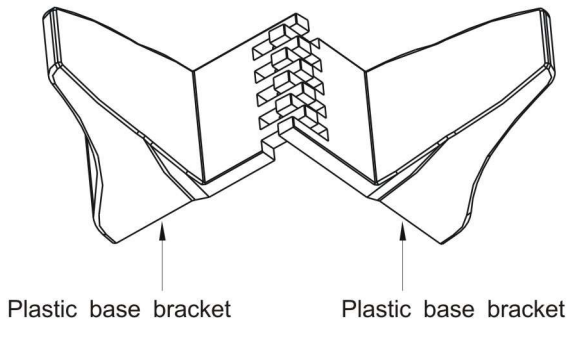


Illustration 4: mounting brackets-1

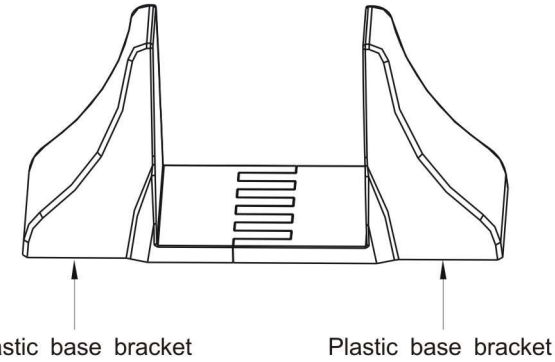


Illustration 5: mounting brackets-2

As for the mounting of the brackets for the different UPS models, it is necessary to know that the 1KVA unit needs a space of 1 unit, so it is sufficient to follow the illustrations 5 and 6. For the other models the space between the brackets it is 2 units and for a correct assembly the other illustrations in this paragraph must also be considered.

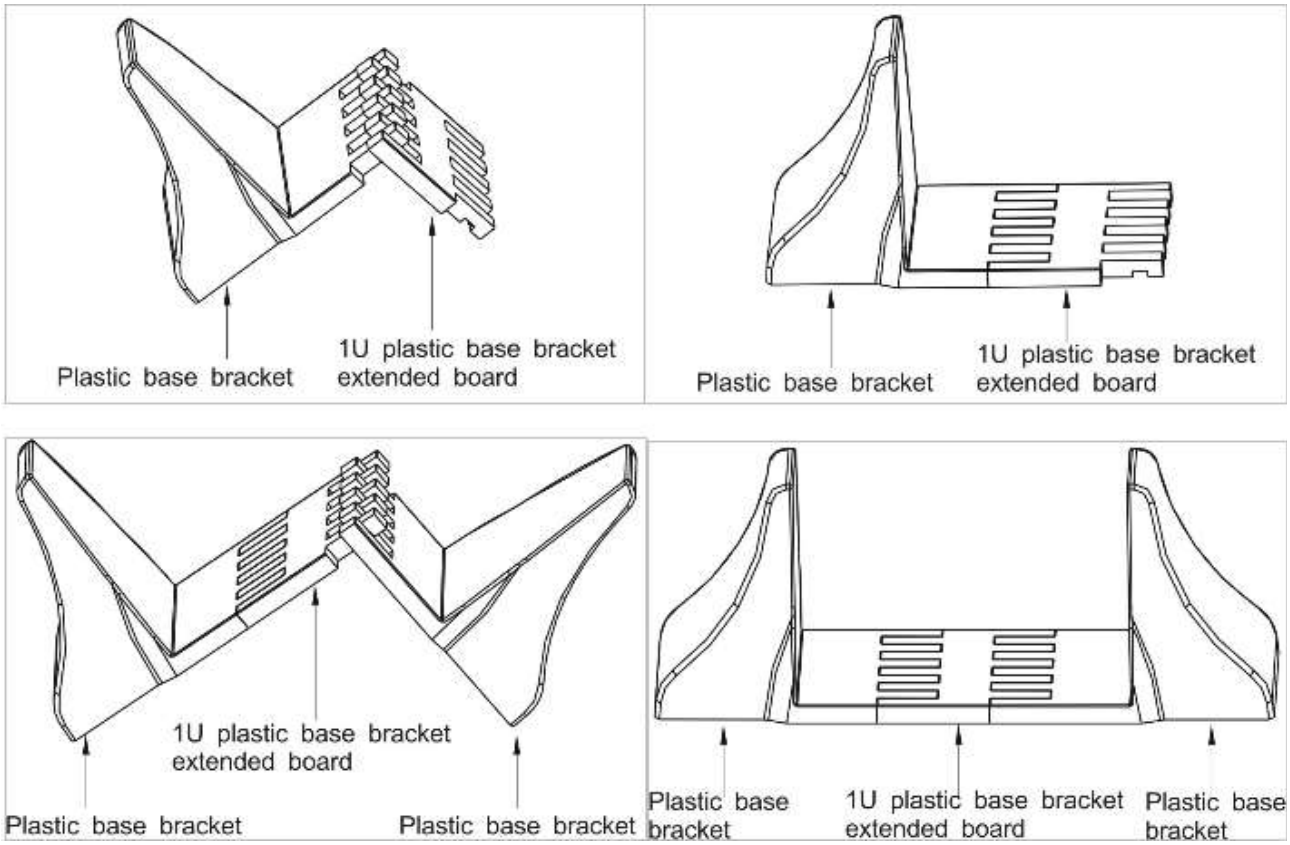
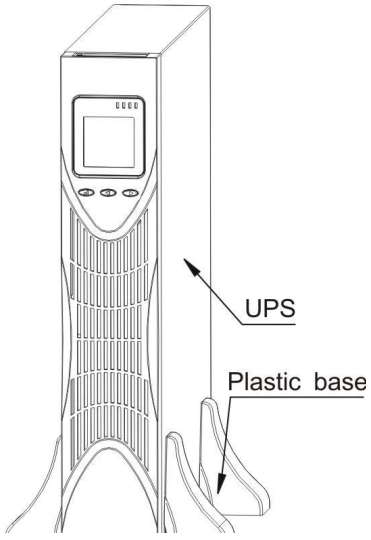


Illustration 6: mounting brackets for 2/3KVA



4.4 Mounting of rack mounting brackets

The following illustrations show how to fix the brackets on the groups, to perform a rack mount.
The screws (SCREW A and B) shown in illustration 9 are from M4.
The fixing of the brackets must be carried out on both sides of the UPS.

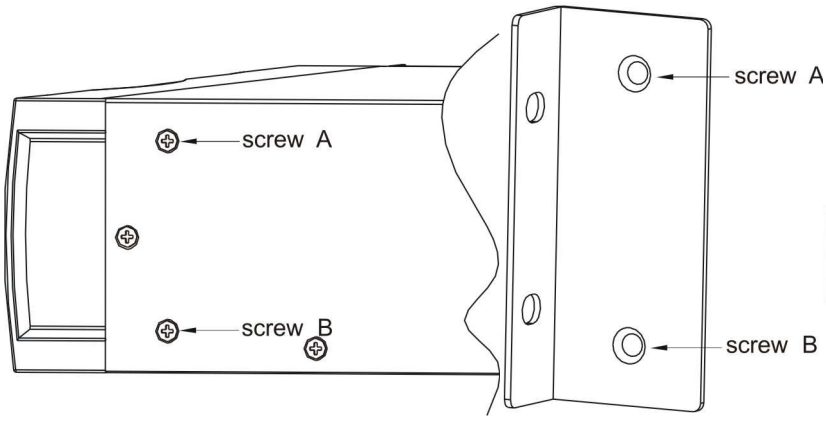


Illustration 3: Fixing brackets for rack mounting

Illustration 4: Fixing bracket

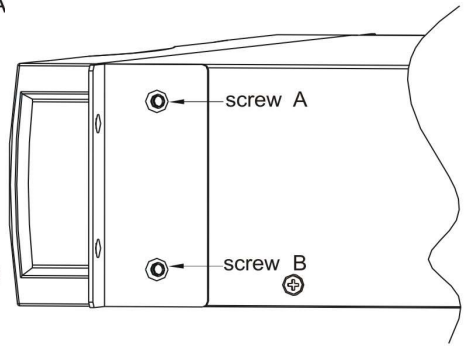


Illustration 5: Fixing bracket on UPS

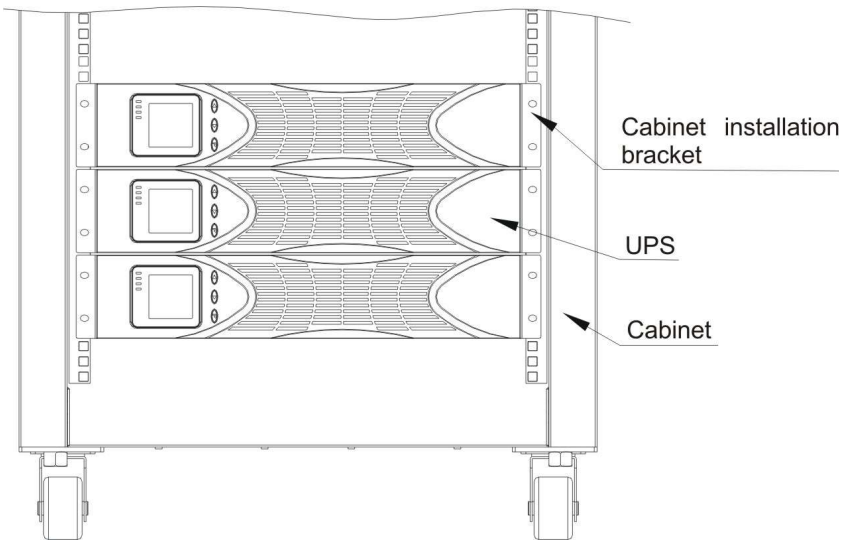
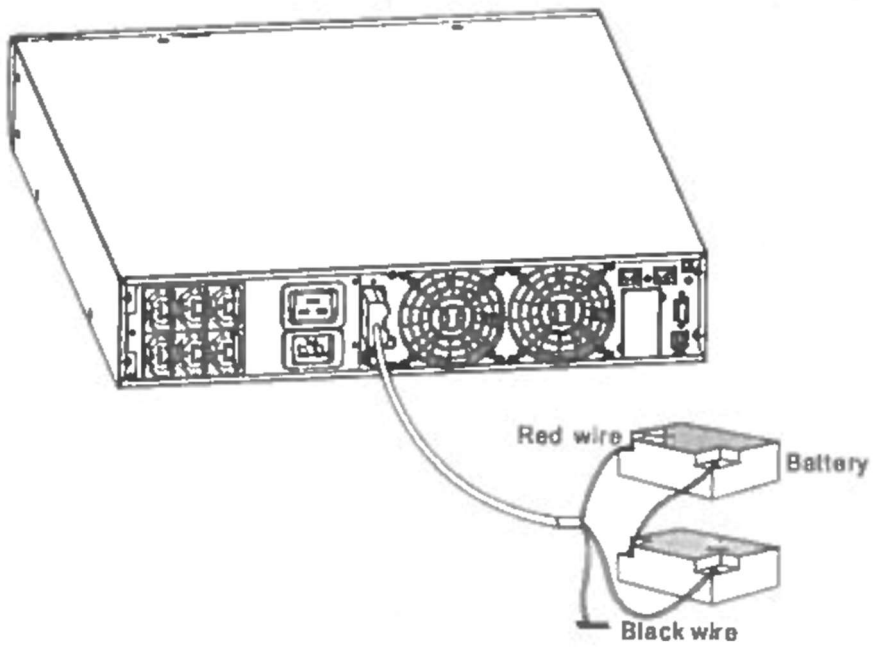


Illustration 6: Rack mounting

4.5 UPS output input connection

the UPS to the mains and to the loads with the supplied power cable.

4.6 Connection to the high autonomy battery box



Attention:

- Before installing the battery, make sure the UPS is turned off and its switch is open. Use all the precautions dictated by the safety rules at work, in order to avoid accidents.
- Pay attention to the battery polarity. The red cable connects it with the positive of the battery "+" and black cable connect it with the negative "-".
- Please use insulated tools that comply with the occupational safety directives. Do not place instruments or metal objects on the battery.

Note:

- Before connecting the loads to the UPS, open the relevant switches, then connect the cable to power supply and finally turn on the loads one at a time.
- To avoid damage, it is strictly forbidden to connect inductive loads such as motors, fluorescent lamps and photocopiers to the UPS.
- Connect the UPS to a device with overcurrent protection. The socket used must have a ground connection.

- The UPS can supply output voltage regardless of whether the power cord is connected to the power outlet. If you want the UPS not to supply output voltage, first open the circuit-breaker and then detach the network.
- When connecting the laser printer, select the pickup capacity at the UPS start according to the UPS model in order to have more power at start-up.

5 Display operation and management

Operation is simple. operators must only read the manual and follow the operating instructions contained in this without any special training.

5.1 Button operation:

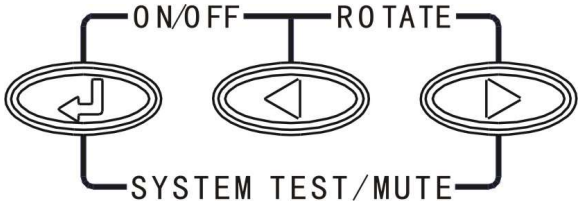


Illustration 7: front buttons

Buttons ON (+)

Press these two buttons for more than half a second to turn on the UPS.

Buttons OFF (+)
Press these two buttons for more than half a second to turn off the UPS.

TEST/MUTE buttons (+)

Press the keys for more than 1 second in line mode or in economic mode: the UPS will perform the auto test function.
Press the keys for more than 1 second in battery mode: the UPS performs the mute function.

Search keys o

Consultation method:
Press the keys for more than half a second (less than 2 seconds): list in order of the items of the LCD display.
Press and hold these keys for more than 2 seconds: the display rotates 90 ° displays the items every 2 seconds, keeping the keys pressed for the same amount of time, turn back to the initial position.
Mode setting function:
Press and hold the button for more than half a second (less than 2 seconds):
Select the option to be set.

Key setting function

Consultation mode:
Press and hold this key for more than 2 seconds: interface setting function.
Mode setting function:
Press the button for more than half a second (less than 2 seconds): Confirms the set option.
Press the button for more than 2 seconds to exit this interface with the setting function.

5.2 Function of the LED indicators

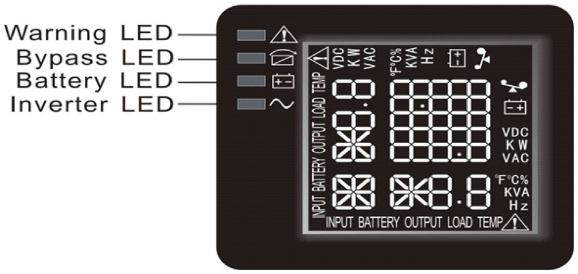


Illustration 8: Display

Warning Red LED is on: UPS is faulty. For example: overload beyond the allowed time, inverter failure, BUS failure, high temperature, etc.

Bypass Yellow LED on: UPS is in alarm. For example: active bypass, etc.

Battery Yellow LED on: UPS is in alarm. For example: battery inverter power supply mode.

Inverter Green LED on: UPS is normally powered from the mains or in ECO mode or in battery mode.

When the UPS starts up, the four LEDs light up and go off one at a time. This sequence repeats several times until the UPS has finally started up.

NOTE: Regarding the indication of the LEDs in different modes, please refer to the LED display panel and the warning table.

5.3 Functions of the LCD display

The LCD display appears as shown in the figure:

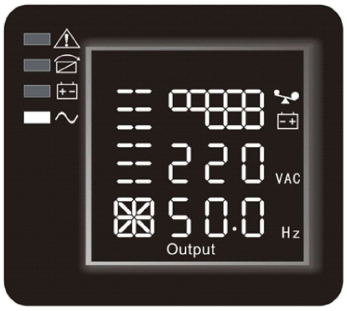


Illustration 9: Example screen

LCD display includes a section with numerical values, a graphic section of the power supplied, a graphic section of the fan status and a graphic section of the battery status.

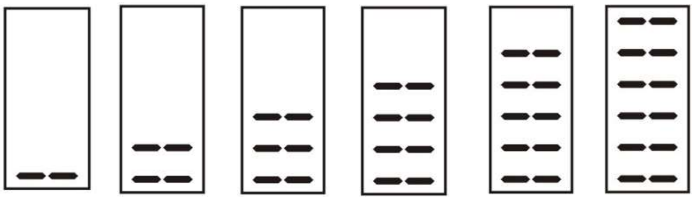
The numerical values section displays: the input voltage and frequency, the output voltage and frequency, the output powers, the temperature, the voltage and the percentage of battery charge, for example, as shown in the figure above, the output voltage is 220V, the output frequency is 50Hz.

Graphic section of battery capacity and load: each box represents 20% of capacity.

As shown in the figure above, the battery capacity is between 80% and 100% (5 panels), the load is between 40% and 60% (3 panels). When the UPS is overloaded, the icon will flash, when the battery capacity is too low or disconnected, the icon will flash.

Fan – Defines the fan status. In case the fan is working properly, the graph simulates the rotation of a propeller. In the event of an anomaly, the fan symbol will begin to flash.

Charger – When the charger is working properly, its symbol will follow a pattern like that shown in the following figure.



In the event of a malfunction, the symbol will start to flash. When the UPS is in battery mode, the number of charging status icons will vary depending on the battery capacity. For example: if there are five boxes (as in the figure below), the corresponding number of lines is five lines (like the following image on the left).

5.4 operation

5.4.1 UPS start-up

Starting the UPS, the Line Mode.

Once the mains supply is connected, the UPS charges the batteries. The display will show that the output voltage is 0, which means that UPS cannot yet power the load. If you plan to use the bypass, you can set the bps "ON" from the LCD settings menu.

To start the UPS, hold down the ON button for more than half a second. When the time expires the inverter will start up.

Once started, the UPS will perform a self-test. The LEDs will turn on and off in a circular and orderly manner. At the end of the initial test the device will be active and the Line Mode, with the relative LED lit.

Starting the UPS in battery mode.

To start the UPS even in the absence of mains, keep the ON key pressed for more than half a second. When the time expires, the inverter will start up.

The start-up of the group is identical to the Line Mode, at the end of the self-test the Battery Mode LED will light up.

5.4.2 Turn off the UPS

To turn off the UPS, press and hold the OFF button for more than half a second. When the time expires, the UPS and inverter will shut down.
After switching off the inverter there will be no output voltage left. In this situation it is possible to activate the by-pass (bps on) function to equally power the load.
The same shutdown procedure, it is possible to use it even when the group is in absence of network in battery mode.

5.4.3 Self-test/Mute modality

By pressing the self-test / mute button for more than one second, the group will start the self-checking sequence. The LEDs will turn on and off in sequence. During this phase the UPS will check the quality of its circuits. At the end of the test it will automatically return to the pre-test mode.
In case of pressure of the self-test / Mute for more than one second, when the group is in Battery Mode, the acoustic signal will be silenced.

5.5 Parameter setting

The UPS allows the modification of some parameters. The changes can be implemented in any operating mode. The application of the changes made to the group parameters will be checked by the software of the device before being saved

5.5.1 Change UPS parameters.

To access the modification of the UPS configuration parameters, keep the key pressed for two seconds  . Once the mode is activated, the word ECO will flash on the display.

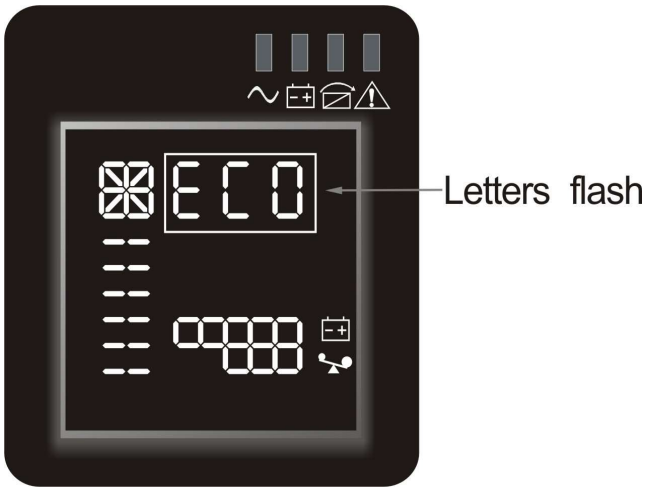


Illustration 10: Display- ECO

To activate ECO mode, the key must be kept pressed  for more than half a second (but not beyond two seconds). When the time expires you will see ON flashing (see next illustration).

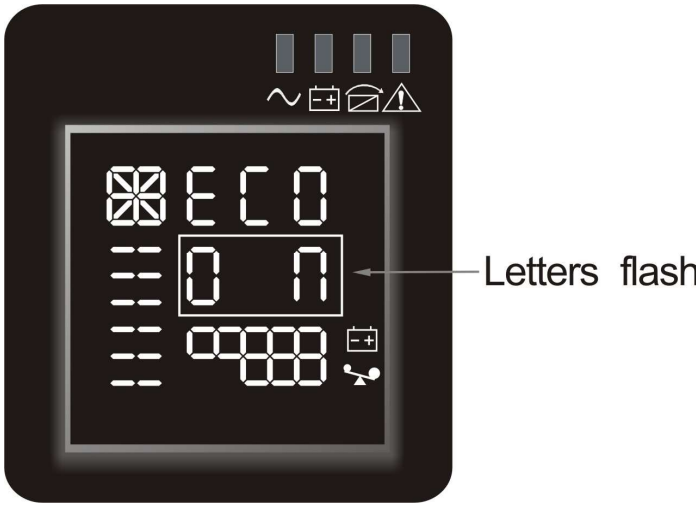


Illustration 11: ECO ON

Press the button to choose which ECO function to activate. The activated functions have the word ON, while the non-active functions the word OFF. To activate or deactivate the features, press the button for two seconds. After confirming the message ON or OFF will stop flashing.

To exit parameter modification, keep the button pressed for at least two seconds .

5.5.2 Bypass configuration

Entering the parameter modification mode as described in the previous paragraph. Select the function with the key , the Bypass message will flash after selection.

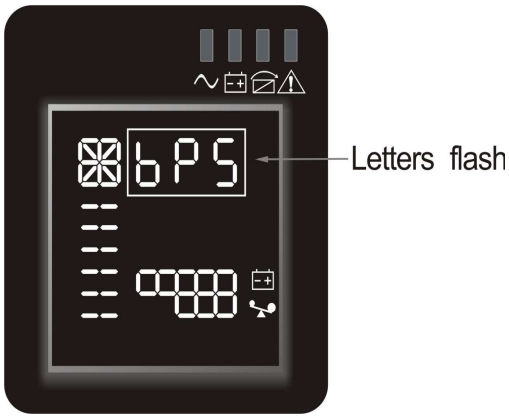


Illustration 12: Bypass

To activate or deactivate the Bypass function by keeping the button pressed for at least half a second  . The display will begin to flash.

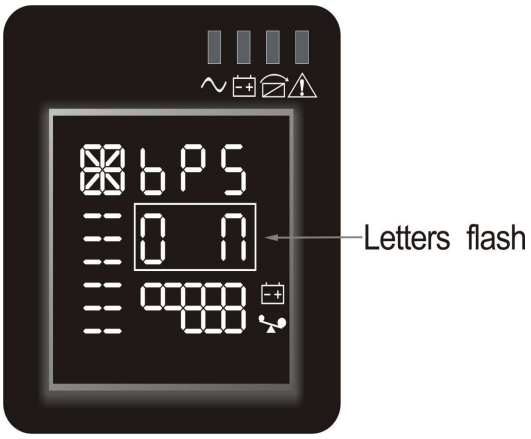


Illustration 13: Bypass ON

To confirm the selection, keep the key pressed  , for at least 2 seconds. The word ON or OFF will stop flashing. Pressing the button  for another two seconds you return to the main menu.

5.5.3 Output voltage setting (optional)

 NOTE:

Before changing the output voltage, it is advisable to disconnect the load.

Entering the parameter modification mode as described in the previous paragraph. Press the button for half a second  and select the OPU option.

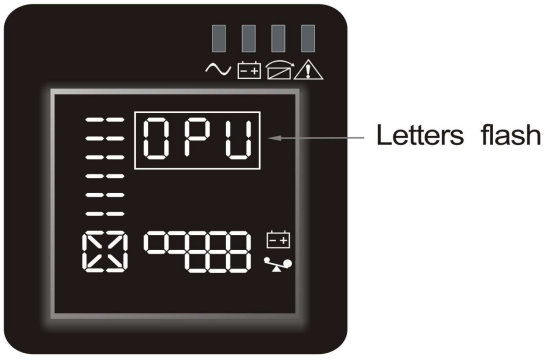


Illustration 14: OPU

Press the button again for half a second . Numerical values will appear under the word OPU. With the key choose the desired output voltage value. The selectable values are: 208V, 220V, 230V and 240V.

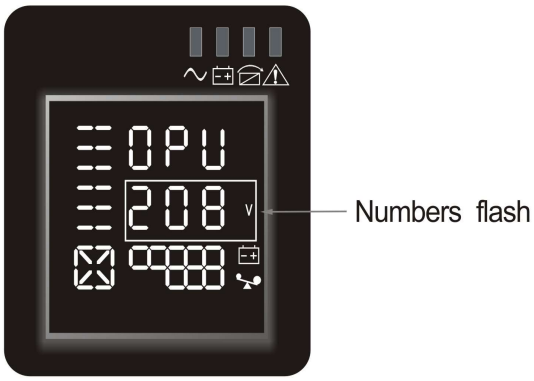


Illustration 15: OPU- Vout

to confirm the choice, press the key for two seconds . The numerical value of the voltage will stop flashing. To return to the main menu press the key for two seconds .

5.6 Display of the parameters

To view the UPS parameters, simply press the key or for half a second. The parameters related to the input, output, battery and temperature will appear on the display.
Regarding the input and the output, it will be possible to see the input voltage and frequency.

Illustration 16: Input

As far as the load measurements are concerned, the active and apparent power can be displayed

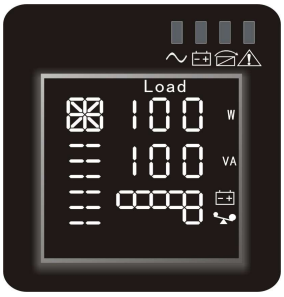


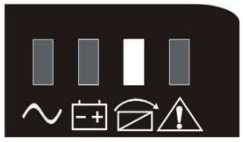
Illustrazione 17:
Potenza

Finally, the measurement relating to the internal temperature of the group and those relating to the battery will be available: available voltage and capacity.

5.7 Run mode

5.7.1 Bypass mode

The visual indications in Bypass mode are as follows:



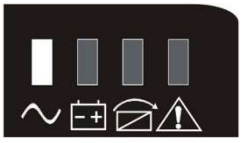
The yellow LED on indicates that the UPS is in Bypass, the sound signal emits a sound every two minutes, even the red LED that signals an attention situation is on. The display shows the measurements related to the load and the battery capacity.
Bypass mode is activated in the following conditions:

- When the UPS is in line mode and the network fails.
- When the UPS is overloaded.

Attention: When the UPS operates in Bypass mode it is not possible to use the batteries as a backup.

5.7.2 Line mode

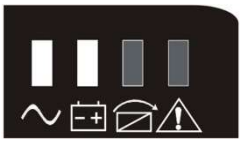
The visual signals in Line mode are as follows:



The green LED of the inverter is on. This condition remains if the input voltage is present and remains in the allowed ranges.

5.7.3 Battery mode

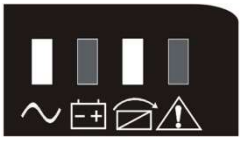
The visual signals in Battery mode are as follows:



The green LED of the inverter, the yellow LED of the battery and the red warning LED are on. The buzzer emits an acoustic signal every 4 seconds.
The Battery mode status remains until the input voltage is absent or out of limits.

5.7.4 ECO mode

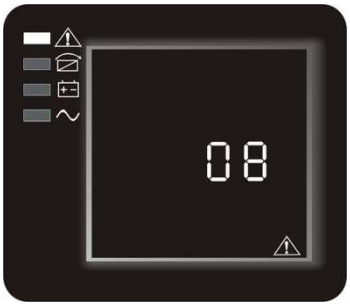
The visual indications in ECO mode are as follows



The green inverter LED and the yellow bypass LED are on.
The ECO mode status must first be activated, secondly it remains until the input voltage remains in the ranges allowed by this mode. If the input voltage exceeds the range allowed by the ECO mode, the load is automatically powered by the inverter.

5.7.5 Alarm condition

The following visual alarms are indicated:



The red LED is on and the UPS emits an acoustic signal. The display shows an alarm code. In some fault situations it may happen that the group no longer feeds the load.

The buzzer can be silenced by pressing the MUTE button, or the UPS can be turned off by pressing the OFF button.

NOTE: THE ALARM CODES ARE INCLUDED IN THE APPENDICES OF THIS MANUAL.

INFORMATION:

- This procedure must be carried out when a UPS with a generator (GE) is powered:
- Turns on the GE, after it has started up and its output is stable in both frequency and voltage, turn on the UPS.
- After the UPS has turned on, connect the loads one at a time.
- The power of the GE must be twice the power of the UPS.
- Do not activate the ECO mode function if the GE output is not very stable.

6 Maintenance

Minimal maintenance is required for this series of UPSs. Battery batteries are hermetically sealed, and only need to be charged properly in order to maintain the expected life. To charge the batteries, simply connect the UPS to the network. The device will take care of protecting the batteries in case of excessive charge, and in case of deep discharge.

6.1 Battery maintenance

1. It is a good rule to perform a deep discharge and relative recharge, every three or four months.
2. If the batteries are placed in environments where high temperatures are present, the discharge and recharge should be done every two months.
3. On average, the expected life of sealed lead batteries varies from three to five years. During periodic discharges / recharges, check the discharge / recharging times, should the batteries shorten dramatically, they must be replaced as soon as possible by specialized personnel.
4. It is advisable to replace all the batteries at once.
5. **ATTENTION: ALL MAINTENANCE ACTIVITIES MUST BE DONE BY SPECIALIZED PERSONNEL AND FOLLOWING SAFETY REGULATIONS.**

7 TROUBLESHOOTING

This chapter will describe the alarm codes that the user might encounter in the event of a UPS failure. Read the manual carefully before performing any operations on the UPS.

ATTENTION: DANGEROUS VOLTAGES ARE PRESENT INSIDE THE APPARATUS. WHICH MAY CAUSE SERIOUS DAMAGES TO THINGS OR PEOPLE.

To understand the operating status of the device it is necessary to know the following information:

1. When the red LED on the front panel is lit, there is a potential problem.
2. If the acoustic signal is active, a critical state is present.
3. In the presence of one of the situations it is advisable to contact the Braga Moro customer service by sending an E-mail to: assistenza@bragamoro.com. Specifying the following data:
    - Code and serial number of the device
    - Date of production
    - Date of failure
    - Code and description of the fault
    - Status of visual and acoustic signals

7.1 Alarm codes and related visual signals

Appendix 1 Error codes

Description	Code
Bus KO	00-19
Inverter KO	20-39
overtemperature	40-44
Short-circuit	45-49
Overload	50-54
KO output relay	55-59
Input NTC KO	60-64
KO aux power supply	65-69
KO input fuses KO	70-74
Other	99

Appendices 2 Signalizing di state

N°	Status	Notifications				Acoustic warnings	Comments
		Nor	Bat	Bps	Fau		
1	**Line mode**						
	Voltage within the limits	●				Nobody	
	Voltage out of bounds UPS in Battery mode	●	●		★	Every 4 seconds	
2	**Battery mode**						
	Voltage within the limits	●	●		★	Every 4 seconds	
	Battery voltage out of limits	●	★		★	Every second	
3	**Bypass mode**						
	Voltage within the limits			●	★	Every 2 minutes	Delete after starting UPS
	Voltage above the limits				★	Every 4 seconds	
	Voltage below the limits				★	Every second	
4	**Battery disconnection alarm**						
	Bypass mode			●	★	Every 4 seconds	Check if the battery switch is closed.
	Inverter mode	●			★	Every 4 seconds	Check if the battery switch is closed.
	Power on					Six times	Check if the battery switch is closed.
5	**Overload protection**						
	Overload (warning) in Line mode	●			★	2 per second	Disconnect less important loads
	Protection for overload in Line mode			●	●	Long sound	Disconnect less important loads
	Overload (warning) in Battery mode	●	●		★	2 per second	Disconnect less important loads
	Overload protection in battery mode	●	●		●	Long sound	Disconnect less important loads
6	Overload (warning) in Bypass mode			●	★	Every 2 seconds	Disconnect less important loads
7	Fan alarm (icon flashes)	▲	▲	▲	★	Every 2 seconds	Check the fan status
8	Failure				●	Long sound	If the alarm code is displayed, contact the service center.

● _indicator lights for a long time

★ _indicator flashes

▲ _the status of indicator depends on other conditions

7.2 Troubleshooting

Fault	Cause	Solution
The word "INPUT" flashes on the display	Neutral and phase reversed or Input voltage out of range.	Connect the cables correctly.
Battery capacity flashes.	Minimum battery voltage or battery disconnection	Check the connections or battery status
Input voltage present, but no output voltage	Open disconnector	Press the disconnector to reactivate it
Insufficient backup time	Battery not fully charged	Connect the UPS to the mains for at least 8 hours.
	UPS in overload	Check the loads and remove the least significant ones.
	Dated battery	Contact the Braga Moro service center for battery replacement.
After pressing the ON buttons the UPS does not start.	The keys were not pressed correctly	Press the ON buttons simultaneously
	There is a problem with the battery or there are too many loads connected	Check the battery connection, if the battery voltage is low, turn off the UPS and remove loads and then start the UPS.
	Fault in the UPS	Contact the Braga Moro service center.
The charger icon flashes on the display and the buzzer makes a sound every second	The charger is not working properly, or the battery is dated	Contact the Braga Moro service center.

8 Reference standards

The Braga Moro uninterruptible power supplies have been manufactured according to the regulations listed in the table in this paragraph and have obtained the CE mark in compliance with European standards.

EMC standards	Safety standards
IEC62040-2	IEC62040-1
IEC61000-4-2	GB4943-5
IEC61000-4-3	
IEC61000-4-4	
IEC61000-4-5	

9 Electrical characteristics

Model			1KVAS	1KVAH	2KVAS	2KVAH	3KVAS	3KVAH
Nominal capacity			900W/1000VA		1800W/2000VA		2700W/3000VA	
Input	Input type		Single-phase + earth					
	Voltage range		115±5VAC-295±5VAC					
	Frequency range		45Hz-55Hz@50HZ/55Hz-65Hz@60HZ					
	Power factor		≥0.98					
	ECO range		Output voltage variation ± 20VAC					
	Range Bypass		186VAC-252VAC					
	Harmonic current		≤7% (100% nonlinear load)					
Output	Output type		Single-phase + earth					
	Nominal voltages		208/220/230/240VAC					
	Power factor		0.9					
	Voltage accuracy		±2%					
	Frequency Exit	Line mode	1) When the input frequency is within the limits, the output frequency is the same as the input frequency. 2) When the input frequency is not within the limits, the frequency is (50/60 ± 0.2) Hz.					
		Battery mode	(50/60±0.2) Hz					
	Crest factor		3-1					
	Transfer time		Network ← → battery = 0ms					
			Network←→ bypass =4ms					
	Capacity overload	Battery mode	108%±5%<load≤150%±5% ＞30s cut off output and warn, 150%±5%<load<200%±5% ＞ 300ms cut off output and warn					
		Line mode	108%±5%<load≤150%±5% ＞ 30s transfer. al bypass e notice 150%±5%<load<200%±5% ＞300ms transfer. al bypass e notice					

	performance	Line mode	Full load≥86% Full load≥88%					
		Battery mode	Full load≥84%					
		ECO	Full load≥94%					
	Output Voltage Distortion		≤3% (100% linear load)					
			≤5% (100% non-linear load)					
Battery	Battery voltage		24VDC	24VDC	48VDC	48VDC	72VDC	72VDC
	Battery number		2		4		6	
	Tipo batterie		12V/7AH airtight lead (for standard UPS only)					
	Autonomy		Full load 4 minutes. For standard UPS only.					
	Charge current (A)		1	4	1	4	1	4

10 Environmental conditions

Template	1KVA-3KVA
Temperature	0℃～40℃
Humidity	0-95% without condensation
Altitude	1500 m
Storage temperature	-25℃ - 55℃

11 Mechanical specifications Rack mounting 19"

Model	Dimension W*D*H (mm)	Net / Gross Weight (kg)
1KVAS	440*430*86,5	15,7
1KVAH		
2KVAS	440*572*86,5	26,3
2KVAH		
3KVAS	440*736*86,5	33
3KVAH		

12 Communication ports

12.1 RS232

On the UPS there is a RS232 DB9 connector. To connect the unit to a PC it is necessary to have a standard serial cable. The following table shows how to wire the serial cable:

PIN 1（hole）to computer serial port	PIN 2（needle）to UPS serial port
2	2
3	3
5	5

To acquire data from the group's serial port, the UPSILON2000 software must be installed on the computer.

12.2 Smart Slot

The following smart cards can be installed in the UPS intelligent slot: USB intelligent card, SNMP card and relay card. All these cards are hot plug and play.

USB intelligent card: Useful to monitor the UPS and its parameters through the computer's USB port, it is necessary to load the UPSILON2000 software on the PC to use this option.

WARNING: If both the RS232 and the USB are installed on an UPS, it is not possible to use the two communication ports at the same time.

SNMP Card: This option allows you to connect the UPS to a computer network, with the consequent possibility to monitor the UPS through the internet and the SNMP protocol.
Relay Card: Provides the status of the UPS through the clean relay contacts.