Uninterruptible Power Supply

SPW 5000 NP - SPW 6000 NP

SPT 6500 NP - SPT 8000 NP - SPT 10000 NP

Manuale d'installazione ed uso

Installation and user manual

Installations- und Bedienungsanleitung

Manuel d'installation et d'utilisation

Manual de instalación y uso

INTRODUCTION

Thank you for choosing our product.

The manufacturers are highly specialized in the development and production of uninterruptible power systems (UPS). The UPSs of this series are high quality products, designed and manufactured to ensure optimum performance.

This device can be used by anyone, provided that they **READ THIS MANUAL CAREFULLY AND THOROUGHLY BEFOREHAND**.

This manual contains detailed instructions for the use and installation of the UPS.
For information on use and in order to get the most out of this device, this manual should be kept close to the UPS and CONSULTED BEFORE CARRYING OUT ANY OPERATIONS ON IT.

ENVIRONMENTAL PROTECTION

During the development of its products, the company uses extensive resources with regards to all environmental aspects.

All our products pursue the objective defined in the environmental management system developed by the company in compliance with standards in force.

No hazardous materials such as CFC, HCFC or asbestos are used in this product.

When evaluating packaging, the choice of material has been made favouring recyclable materials.
For correct disposal, please separate and identify the type of material of which the packaging is made in the table below. Dispose of all material in compliance with standards in force in the country in which the product is used.

Description	***Material***
Pallet	Heat-treated pine
Packaging corner	Stratocell/cardboard
Box	Cardboard
Adhesive pad	Stratocell
Protective bag	HD Polyethylene

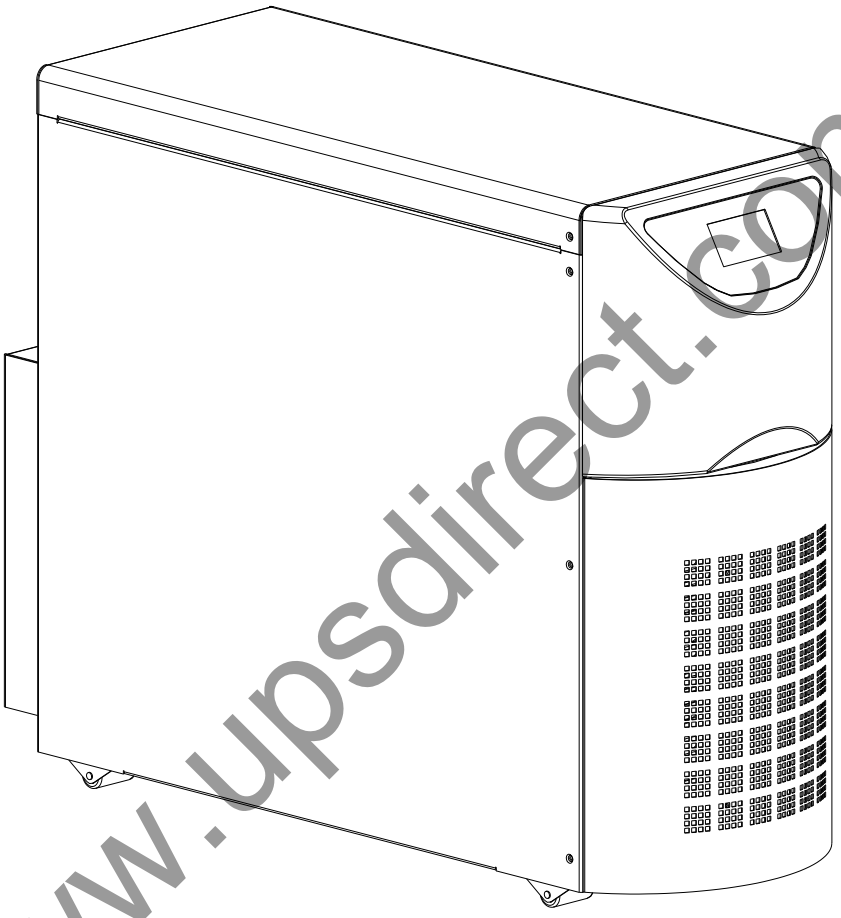
DISPOSING OF THE PRODUCT

The UPS contains internal material that (in case of dismiss / disposal) are considered TOXIC and HAZARDOUS WASTE, such as electronic circuit boards and batteries. Treat these materials according to the laws applicable referring to qualified service personnel. Their proper disposal contributes to respect the environment and human health.

CONTENTS

PRESENTATION

The ***SPW-SPT*** UPS range has been designed using the state-of-the-art in technology available today, so as to guarantee the user maximum performance levels. The use of multiprocessors combined with high-frequency IGBT technology, grants optimum performance in terms of distortion and efficiency.
Thanks to its modern design, use of a wide graphic display and highly versatile setting possibilities, the ***SPW-SPT*** range represents a reference in the universe of three-phase/single-phase and single-phase/single-phase UPS's.

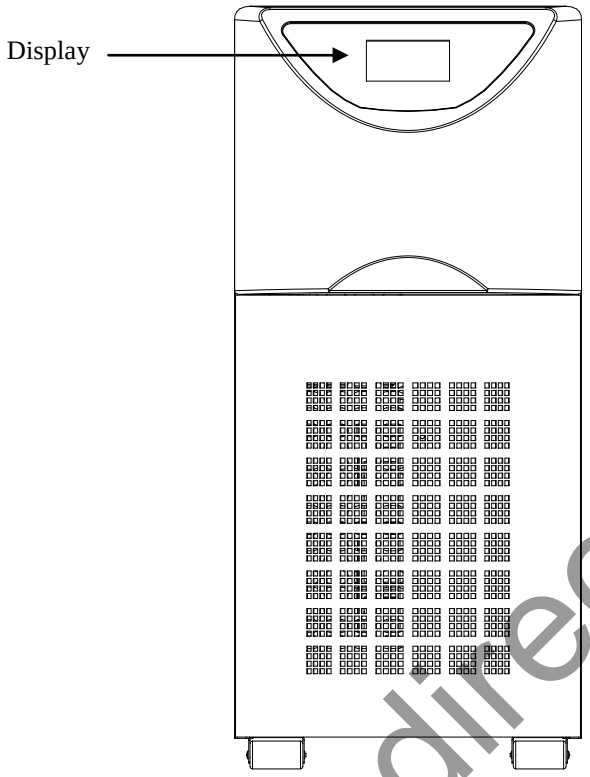


		SPW 5000 NP	SPW 6000 NP	SPT 6500 NP	SPT 8000 NP	SPT 10000 NP
Nominal power	[VA]	5000	6000	6500	8000	10000
Nominal voltage	[Vac]	220/230/240				
Dimensions H x L x D	[mm]	[615 x 282 x 785] (1)				
Weight	[Kg]	89	90	91	94	95

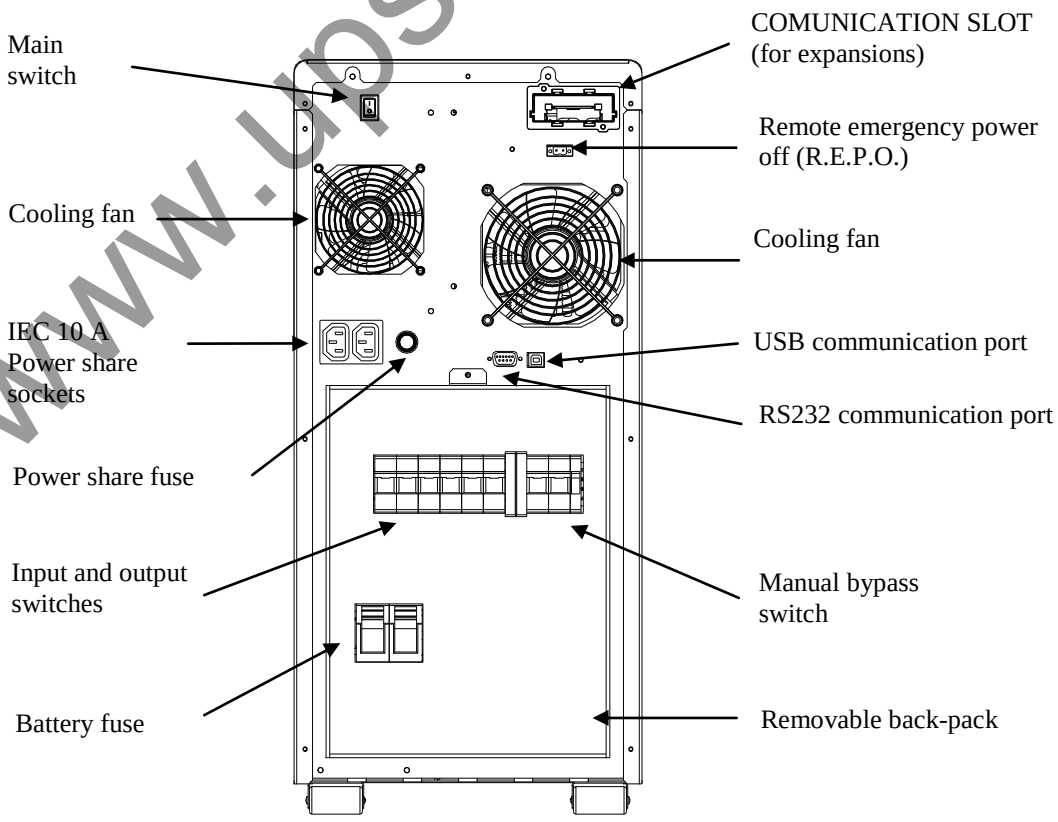
(1) *The dimensions are for a UPS including back-pack module*

PRESENTATION

UPS VIEWS

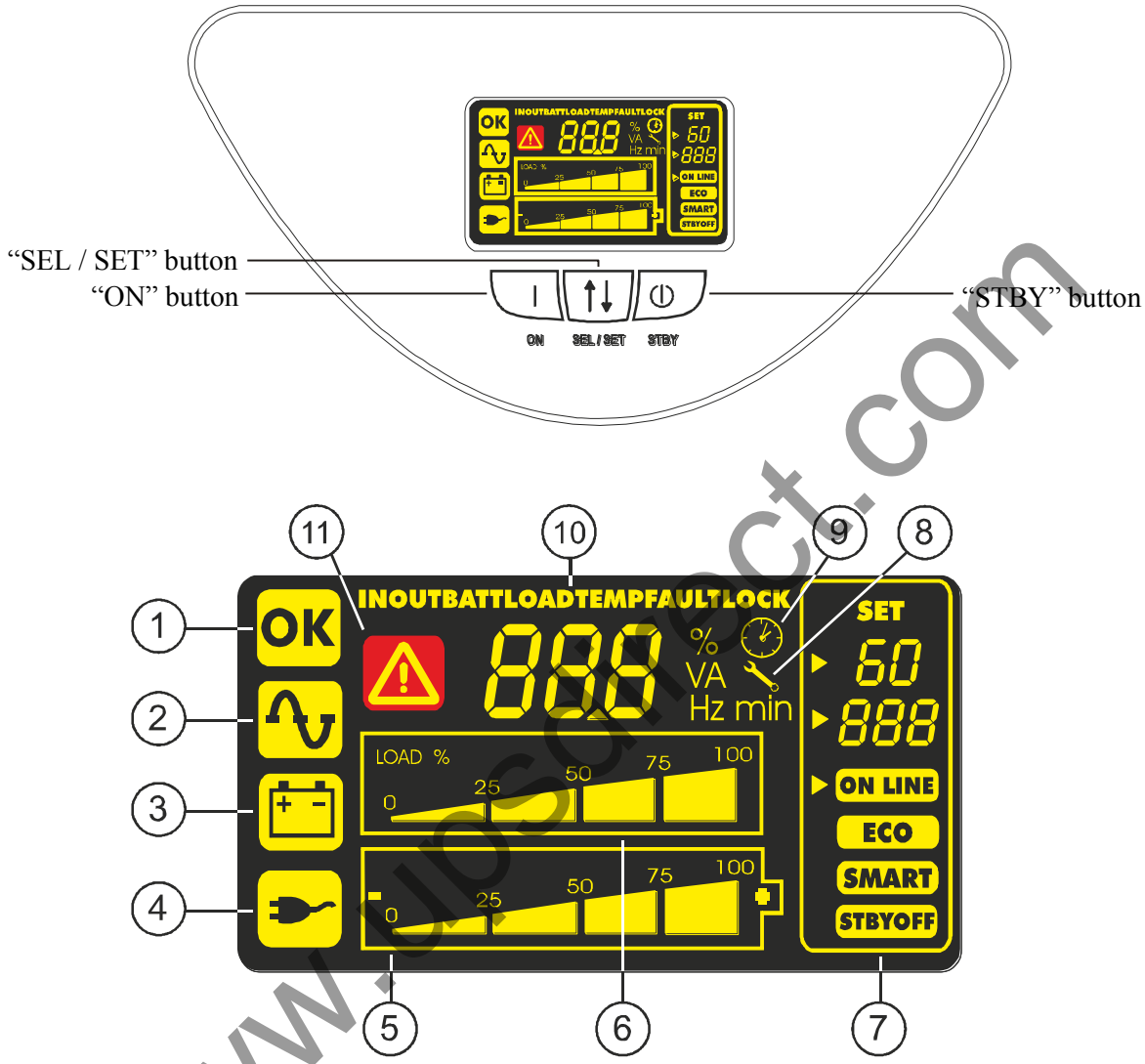


Front view



Rear view

DISPLAY MASK VIEW



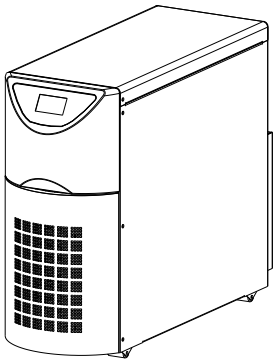
①	Normal operation	⑦	Configuration area
②	Operation from mains	⑧	Maintenance request
③	Operation from battery	⑨	Timer
④	Load powered by the bypass	⑩	Measurement display area
⑤	Battery back up time indicator	⑪	Stand-by/alarm
⑥	Load level indicator		

INSTALLATION

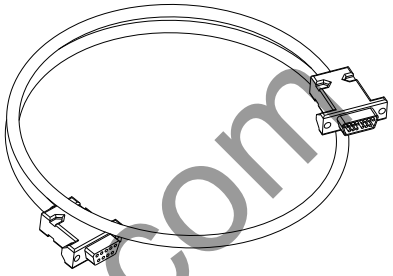
OPENING THE PACKAGING AND CHECKING ITS CONTENTS

After opening the pack, make a check of the contents first of all.
The pack should contain:

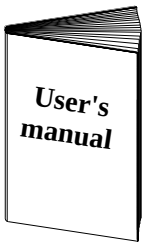
UPS

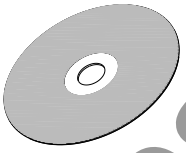


RS232 serial cable

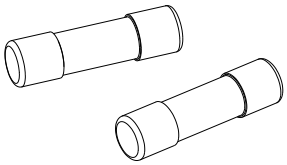


User manual + CD-ROM with software

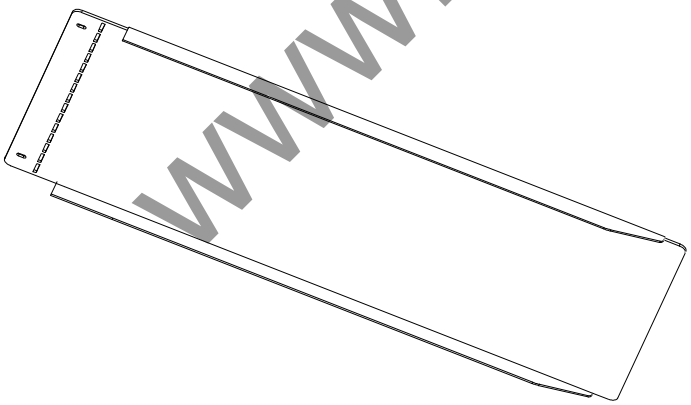




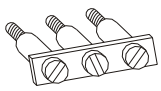
2 Battery fuses - 14x51 mm, 50A, 400V



Slide



Jumper (only into 3phases–1phase versions)



WARNING: this UPS product conforms to the current electromagnetic compatibility (EMC) regulations (C2 class). It may cause radio interference in the home environment. The user may have to adopt supplementary measures.

The manufacturers cannot accept liability for damage caused by wrong connections or by operations other than those described in this manual.

INSTALLATION PROCEDURES

Before connecting the UPS to the Battery box, ensure compliance with the following points:

- Install the UPS and the Battery box on a flat, stable surface.
- Avoid placing in positions exposed to direct sunlight or hot air
- Maintain room temperature between 0°C and 40°C
  N.B.: the UPS can operate with an ambient temperature of between 0°C and 40°C. The optimal operating temperature for the batteries inside the UPS is between 20 and 25°C. If the operational lifetime of the batteries is an average of 4 years with an ambient temperature of 20°C, this will be halved if the temperature goes up to 30°C.
- The ambient humidity rate must not exceed 90%.
- Avoid dusty environments.
- Ensure that the UPS and the Battery box are placed with the front and the rear at least 10 cm away from walls. Do not place objects on top of the ventilation holes in order to allow adequate ventilation.

USE

CONNECTIONS

INSTALLATION MUST ONLY BE PERFORMED BY QUALIFIED PERSONNEL.

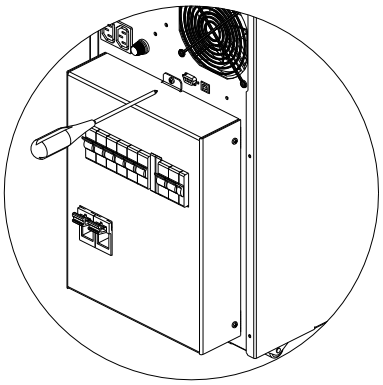
THE FIRST CONNECTION TO BE MADE IS THAT OF THE PROTECTION CONDUCTOR (EARTH CABLE), TO THE TERMINAL MARKED ⏚.

THE UPS MUST NEVER BE MADE OPERATE WITHOUT A CONNECTION TO THE EARTHING SYSTEM.

Warning: *providing it complies with the neutral (N) and phase (F) indications for plugs and sockets, the UPS, when inserted in an installation, does not alter the existing neutral arrangements. The resistance on the neutral connection must be less than 0.1 ohm.*
A differential switch upstream will also be triggered for a fault occurring downstream of the UPS. In calculating reactivity of this switch, account must be taken of the leakage current of the UPS (approx. 2 mA) plus that of the load which come together on the UPS's earth conductor.
The neutral arrangements are altered only if there is also an isolating transformer or when the UPS operates with a neutral that is disconnected upstream.
In any case avoid connecting the output neutral with the input neutral or to the earth as this could damage the UPS.

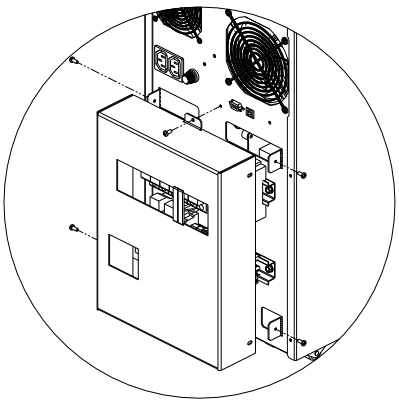
To make the mains power and load connections, follow the instructions below:

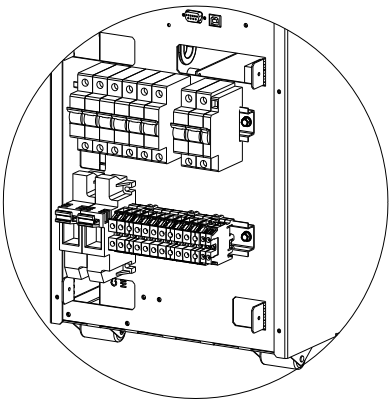
1. Install a 63A magneto-thermal switch with intervention curve B or C upstream of the machine (4 poles for three-phase versions, 2 poles for single-phase versions).



2. The terminals to be used for connection of the input and output connections are located on the inside of the back-pack. Next unscrew the back-pack fastening screws (two each side) on the sides of and above the back-pack (see figure to the side).

3. Lift the back-pack off (see figure to the side). WARNING: the back-pack is connected to the back of the UPS by way of an earth cable which prevents it from being taken away completely. Do not try to separate the back-pack from the UPS.





SINGLE-PHASE VERSION

1. ***(SINGLE-PHASE CONNECTION 5-6kVA):*** **use 3 cables with cross-section 6 mm^2 (EARTH, N and L) for the input, and 3 cables with cross-section 6 mm^2 for the output (EARTH, N and L).**

2. Connect the wires to the relative terminals, following exactly the instructions given below:

   Input line

   a - Make sure that the magneto-thermal switch upstream is open.

   b - Connect the earth wire to terminal B.

   c - Connect the neutral wire to terminal 4.

   d - Connect the live wire to terminal 3.

   Output line

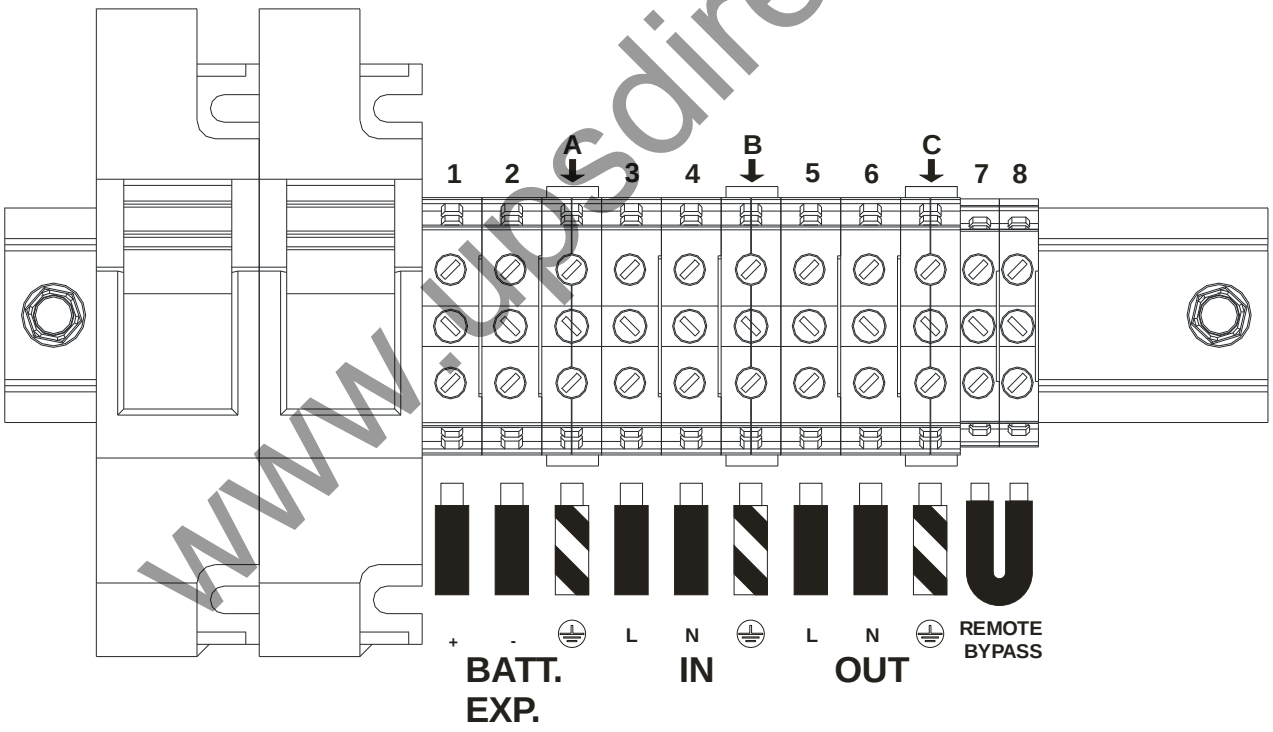
   a - Connect the earth wire to terminal C.

   b - Connect the neutral wire to terminal 6.

   c - Connect the live wire to terminal 5.

   By-pass line

   a - Make sure that a jumper is connected between terminals 7 and 8, needed for proper operation of the UPS.



3. Tighten the terminals well, close the back-pack and secure it with the screws taken out earlier.

USE

THREE-PHASE VERSION

Single-phase connection

1. ***(SINGLE-PHASE CONNECTION 8-10kVA):*** **use 3 cables of cross-section 10 mm^2 (EARTH, N and L) for the input, and 3 cables of cross-section 10 mm^2 for the output(EARTH, N and L).**

   (SINGLE-PHASE CONNECTION 6.5kVA): **use 3 cables of cross-section 6 mm^2 (EARTH, N and L) for the input, and 3 cables of cross-section 6 mm^2 for the output(EARTH, N and L).**

2. Short-circuit the input terminals (3, 4 and 5) with the jumper provided in the accessories kit. Connect the wires to the respective terminals, following exactly the instructions below:

   Input line

   a - Ensure that the upstream magneto-thermal switch is open.

   b - Connect the earth wire to terminal B.

   c - Connect the neutral wire to terminal 6.

   d - Connect the live wire to terminal 4.

   Output line

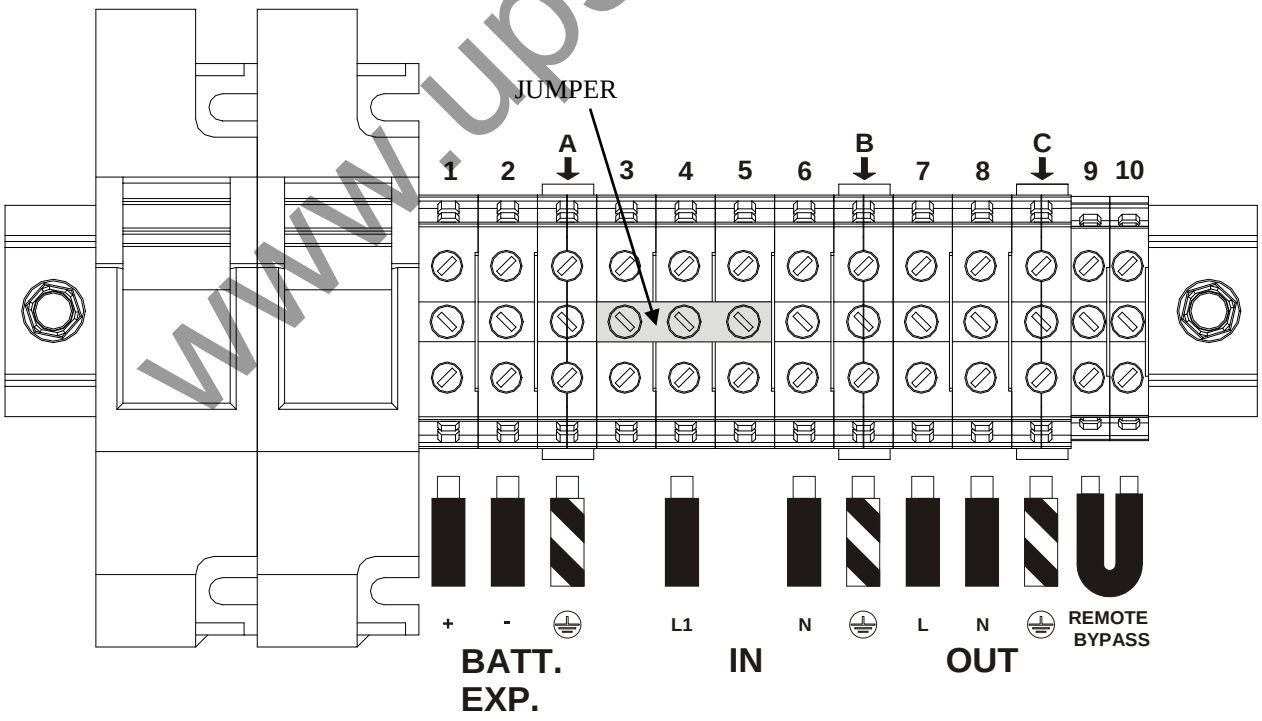
   a - Connect the earth wire to terminal C.

   b - Connect the neutral wire to terminal 8.

   c - Connect the live wire to terminal 7.

   By-pass line

   a - Ensure that a jumper is connected on terminals 9 and 10, this is necessary for correct operation of the UPS.



3. Tighten the terminals well, close the back-pack and secure it with the screws taken out earlier.
4. Configure the single-phase configuration using the configuration software (see paragraph **Configuration software**).

Three-phase connection

1. ***(THREE-PHASE CONNECTION 8-10kVA):*** **Use 3 cables of cross-section 6 mm^2 (EARTH, L2 and L3) and 2 with cross-section 10 mm^2 (N, L1) for the input (N.B.: L1 and N are of greater cross-section because in bypass operation they have to carry all of the input current). For the output use 3 cables of cross-section 10 mm^2 (EARTH, N and L).**
   (THREE-PHASE CONNECTION 6.5kVA): **Use 3 cables of cross-section 4 mm^2 (EARTH, L2 and L3) and 2 of cross-section 6 mm^2 (N, L1) for the input (N.B.: L1 and N are of greater cross-section because in bypass operation they have to carry all of the input current). For the output use 3 cables of cross-section 6 mm^2 (EARTH, N and L).**

2. Connect the wires to the respective terminals, following exactly the instructions below:

   Input line

   a - Ensure that the upstream magneto-thermal switch is open.

   b - Connect the earth wire to terminal B.

   c - Connect the neutral wire to terminal 6.

   d - Connect the wires of the phases to terminals 3, 4 and 5 (for L1 use red wire).

   Output line

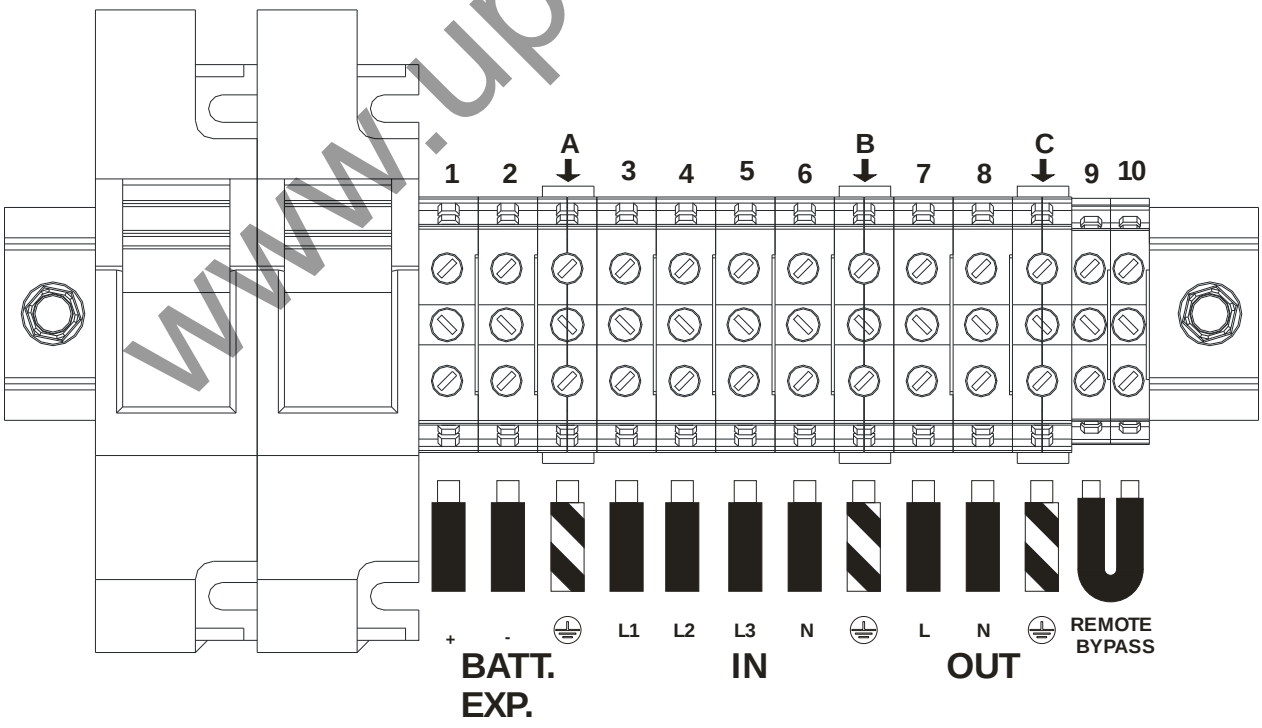
   a - Connect the earth wire to terminal C.

   b - Connect the neutral wire to terminal 8.

   c - Connect the live wire to terminal 7.

   By-pass line

   a - Ensure that a jumper is connected on terminals 9 and 10, this is necessary for correct operation of the UPS.



3. Tighten the terminals well, close the back-pack and secure it with the screws taken out earlier.

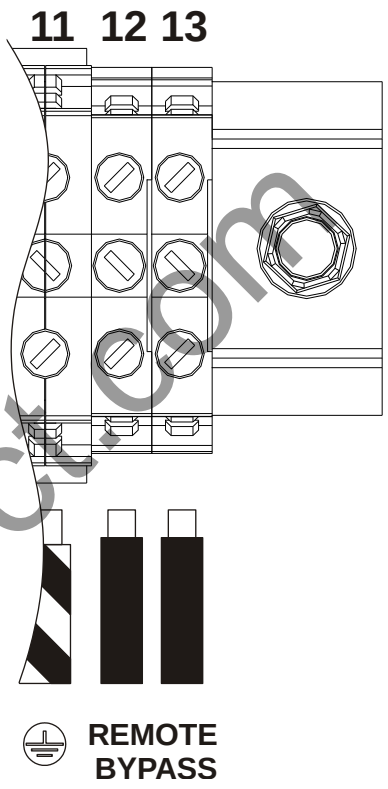
Version with external remote By-pass command

To be able to control the remote maintenance By-Pass externally, follow points 1, 2 and 3 described above. Then proceed as follows:

1. **Follow the instructions given above for the connection, number and cross-section of the cables to use for the power connections. For the connection with the remote By-pass terminals use a 2x0.75 mm^2 cable.**

2. Connect the wires to the respective terminals following the instructions described above. The By-pass line can be connected either with the UPS in a single-phase connection or a three-phase connection. Connect the wires of the By-pass lines as follows:

   By-pass line
   Connect the two cable leads to terminals 12 and 13 to properly control the remote By-pass externally.



3. Tighten the terminals well, close the back-pack and secure it with the screws taken out earlier.

A WARNING LABEL MUST BE PUT ON ALL MAINS POWER DISCONNECTING SWITCHES INSTALLED REMOTE FROM THE AREA OF THE UPS, IN ORDER TO ALERT ALL SERVICE OPERATORS THAT THE CIRCUIT IS CONNECTED TO A UPS. THE LABEL MUST BEAR THE FOLLOWING WORDING:

ISOLATE THE UPS
BEFORE WORKING ON THIS CIRCUIT

FIRST SWITCHING-ON

1) Ensure that all the steps described in the previous paragraph *"Connections"* have been carried out correctly.
2) Close the magneto-thermal switch located upstream of the UPS.
3) Close the input and output switches and insert the battery fuses on the rear of the back-pack on the UPS. Close the main switch located on the rear.
4) After a short time, the UPS comes on, the display comes on, a beep will be heard and the icon starts blinking.
5) The UPS will be in stand-by: this means that the UPS is in a minimum consumption condition. The microcontroller is powered and performs the supervision and self-test tasks; the batteries are charging; everything is ready for activation of the UPS. The UPS is also in Stand-by status when operating on battery power provided that the timer has been activated.
6) Check the default settings shown on the display (see paragraph: ***Configuration area***)

SWITCHING-ON WITH MAINS POWER

1) Press the "ON" button. After this, all the icons on the display will come on for 1 second and the UPS beeps once.
2) Switch on the machine connected to the UPS.

On first switching-on only: after about 30 sec., check that the UPS is working properly:

1. Simulate a black-out by opening the switch located upstream of the UPS.
2. The load should remain powered, the icon on the display should come on, and a beep should be heard every 4 seconds.
3. When the switch upstream is closed again, the UPS should return to working on mains power.

SWITCHING-ON WITH BATTERY POWER

1) Press the main switch on the rear of the UPS.
2) Hold the "ON" button down for at least 5 seconds. All the icons on the display come on for 1 second and the UPS beeps once.
3) Switch on the items connected to the UPS.

SWITCHING OFF THE UPS

To switch the UPS off, hold the "STBY" button down for at least 1.5 seconds. The UPS goes back into stand-by state and the icon starts blinking:

a. If the mains is present, to switch the UPS off completely, press the main switch so as to bring the switch back into "0" position .
b. If the UPS is working off battery power and the timer has not been set, it will switch off completely and automatically after 5 seconds. If on the other hand the timer has been set, to switch the UPS off, the "STBY" button must be held down for at least 5 seconds. If you want the UPS to remain switched off completely when the mains returns, press the main switch (see point a.).

WARNING: the UPS is provided with a redundant emergency power supply which, in the event of a UPS failure, will cut in thereby avoiding the load being switched off by switching it to the bypass.

If you switch the UPS off by pressing the main switch directly (without first putting it in stand-by as explained in the manual), the load remains powered by the bypass.

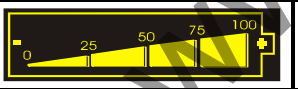
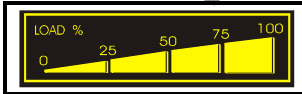
USE

DISPLAY PANEL INDICATIONS

This section describes in detail all the information that can be shown on the LCD display.
In order to make it clearer, all the information displayed can be divided into three main groups:

- UPS status indicators
- Measurements display area
- Configuration area

UPS status indicators

ICON	STATUS	DESCRIPTION
	Constant	Indicates a fault
	Flashing	The UPS is in stand-by state
	Constant	Indicates regular operation
	Constant	The UPS is operating from the mains
	Flashing	The UPS is operating from the mains, but the output voltage is not synchronized with the mains voltage
	Constant	The UPS is operating from the battery. When it is in this state the UPS emits an acoustic signal (beep) at regular intervals of 4 sec.
	Flashing	End of discharge prealarm. Indicates that the battery back up time is coming to an end. In this condition the UPS emits a beep at regular intervals of 1 sec.
	Constant	Indicates that the loads connected to the UPS are powered from the bypass
	Dynamic	Indicates the estimated percentage of back-up time
	Dynamic	Indicates the % of load applied to the UPS with respect to the nominal value
	Flashing	A maintenance operation is required
	Constant	Indicates that the timer is activated (programmed start-up or shutdown). The timer can be activated/deactivated via the software provided
	Flashing	1 minute to go before the UPS starts up or 3 minutes before it shuts down

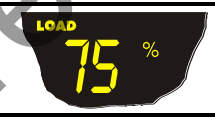
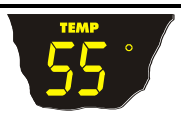
Measurements display area

The most important measurements regarding the UPS may be posted on the display in sequence.
When the UPS is switched on, the display shows a reading of the mains voltage value.
To change to a different display, press the “SEL / SET” button repeatedly until the desired quantity appears.
If there is a failure / alarm (FAULT) or a block (LOCK), the display will automatically show the type and code of the corresponding alarm.

Single-phase connection

Some examples are shown below:

GRAPHIC EXAMPLE[1]	DESCRIPTION
	Mains voltage
	Mains frequency
	Voltage output from the UPS
	Output voltage frequency
	Residual battery back up time
	Percentage of battery charge

GRAPHIC EXAMPLE[1]	DESCRIPTION
	Total battery voltage
	Percentage of the applied load
	Current absorbed by the load
	Temperature of the cooling system for the UPS internal electronics
	Fault/Alarm [2]: the corresponding code is displayed
	Lock [2]: the corresponding code is displayed

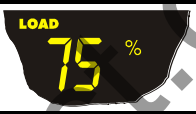
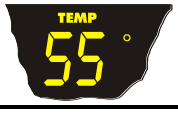
[1] The values shown in the images in the table are purely indicative.

[2] The FAULT/LOCK codes can only be displayed if they are active (i.e., if there is a fault/alarm or a lock).

Three-phase connection

Some examples are shown below:

GRAPHIC EXAMPLE [1]	DESCRIPTION
 	Voltage phase 1 [2]
 	Voltage phase 2 [2]
 	Voltage phase 3 [2]
	Output voltage frequency
	Residual battery back up time

GRAPHIC EXAMPLE [1]	DESCRIPTION
	Percentage of battery charge
	Total battery voltage
	Percentage of the applied load
	Current absorbed by the load
	Temperature of the cooling system for the UPS internal electronics
	Fault/Alarm [3]: the corresponding code is displayed
	Lock [3]: the corresponding code is displayed

[1] The values shown in the images in the table are purely indicative.

[2] Alternative indication Phase No./Voltage.

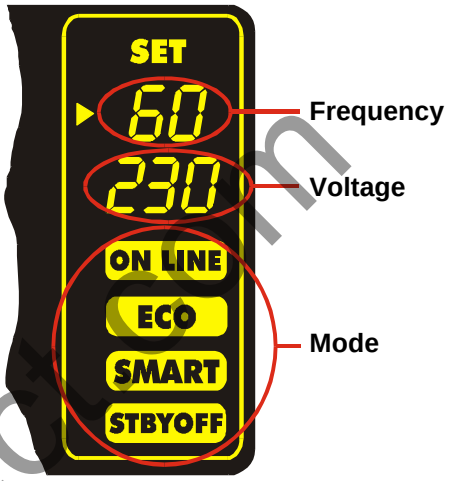
[3] The FAULT/LOCK codes can only be displayed if they are active (i.e., if there is a fault/alarm or a lock).

Configuration area

The configuration area groups together the main UPS operating parameters and displays its current status. The parameters contained in this area can be changed directly from the display panel.

SETTABLE PARAMETERS:

- **Frequency:** Output voltage frequency
- **Voltage:** Output voltage
- **Mode:** UPS operating mode



The image at the side shows the display zone for the settings (configuration area) showing the three settable parameters.

How to change the settings:

- To access the configuration area, hold the "SEL/SET" button down for at least 2 sec.
- The word "SET" will light up and an arrow (▶) will appear to the left of *Frequency*.
- The arrow shows the selected setting. To select a different parameter press the "SEL/SET" button.
- To change the selected item, press the "ON" button.
- To exit from the configuration area, hold the "SEL/SET" button down for at least 2 sec.

POSSIBLE SETTINGS

Frequency:	□ **50 Hz**	□ **60 Hz**	□ **Off** (frequency auto-sensing)	
Voltage:	□ **220 V**	□ **230 V**	□ **240 V**	
Mode:	□ **ON LINE**	□ **ECO**	□ **SMART**	□ **STBYOFF**

NOTE: Changes in the output frequency configuration will only become effective when the UPS has been completely shut down and restarted (via the general switch).

THE *OUTPUT FREQUENCY* AND *VOLTAGE* PARAMETERS MUST BE COMPATIBLE WITH THE PARAMETERS OF THE LOAD POWERED BY THE UPS

USE

OPERATING MODES

The mode that ensures maximum protection to the load is ON LINE mode (default), where the energy for the load undergoes a double conversion and is reconstructed fully sinusoidal in output with frequency and voltage set by accurate digital microprocessor control independently of the input (V.F.I.). *****
The following modes can be set in addition to the conventional ON LINE double conversion operating mode:

- ECO (LINE INTERACTIVE)
- SMART (SMART ACTIVE)
- STBYOFF (STAND-BY OFF)

The load is normally powered from the bypass in ECO mode, in order to optimize efficiency. If the mains goes out of the admitted tolerances, the UPS switches to normal ON LINE double conversion operation. About five minutes after the mains returns within tolerance, the load is once again switched onto the bypass.

If the user cannot decide which operating mode is the most suitable (ON LINE or ECO), this decision can be left to SMART ACTIVE mode. In this mode, the UPS decides autonomously which mode to configure on the basis of statistics collected on the quality of the mains power supply.

STAND-BY OFF mode is used for operation as a back-up unit:
when the mains is present, the load is unpowered while if a blackout occurs, the load is powered from the inverter via the batteries.

R.E.P.O.

This isolated input is used to remotely switch off the UPS in an emergency. Any "Remote Emergency Power Off" (R.E.P.O.) switch that is normally closed must be connected to the connector located at the back of the UPS.
The UPS is supplied ex-works with the R.E.P.O. terminals short circuited: remove the short circuit if this contact is connected to the auxiliary of a remote emergency switch.

The R.E.P.O. circuit is self-powered with SELV type circuits. No external power supply voltage is therefore required. When it is closed (normal condition) there is a current of 10mA max.

PROGRAMMABLE AUXILIARY SOCKET (POWER SHARE)

The UPS is provided with an output socket that allows the automatic disconnection of the load applied to it under certain operating conditions. The events that determine the automatic cut-out of the Power share socket can be user-selected by means of the configuration software (see paragraphs **Configuration software** and **UPS Configuration**).
It is possible for example to select cut-out after a certain time of operation from battery, or on reaching the end of the battery discharging prealarm threshold, or in the event of an overload.

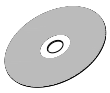
***** The rms value of the output voltage is fixed by accurate microprocessor control independently of the input voltage while the frequency of the output voltage is synchronized (within a user-selectable tolerance) with that of the input to enable use of the bypass. The UPS will desynchronize outside of this tolerance, returning to nominal frequency, and the bypass can no longer be used (free running mode).

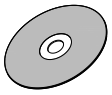
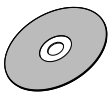
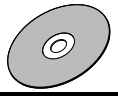
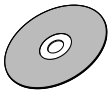
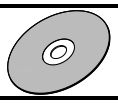
UPS CONFIGURATION

The following table shows all the possible configurations available to adapt the UPS to the user's requirements.

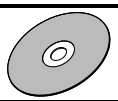
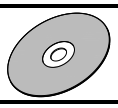
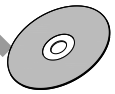
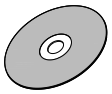
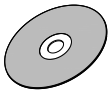
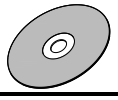
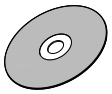
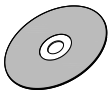
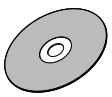
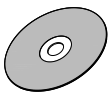
KEY:

 = Indicates that the configuration can be changed from the display panel as well as by means of the configuration software.

 = Indicates that the configuration can only be changed via the configuration software.

FUNCTION	DESCRIPTION	PREDEFINED	POSSIBLE CONFIGURATIONS	MODE
Output frequency	To select the nominal output frequency	Auto	• 50 Hz • 60 Hz • Auto: automatic sensing from the input frequency	
Output voltage	To select the nominal output voltage	230V	• 220V • 230V • 240V • 220 ÷ 240 in 1V steps (only via software)	
Operating mode	To select one of the 4 different operating modes	ON LINE	• ON LINE • ECO • SMART ACTIVE • STAND-BY OFF	
Start-up delay	Delay before automatic restart after the mains returns	5 sec.	• Disabled • 1 ÷ 255 in 1 sec. steps	
Shutdown due to minimum load	Automatic shutdown of the UPS in operation from the battery if the load is less than 5%	Disabled	• Enabled • Disabled	
Back up time limit	Maximum time of operation from the battery	Disabled	• Disabled (full battery discharge) • 1 ÷ 65000 in 1 sec. steps	
End of discharge alert	Estimated remaining back up time for the end of discharge alert	3 min.	1 ÷ 255 in 1 min. steps	
Battery test	Time interval for the automatic battery test	40 hours	• Disabled • 1 ÷ 1000 in 1 hour steps	

USE

FUNCTION	DESCRIPTION	PREDEFINED	POSSIBLE CONFIGURATIONS	MODE
Alarm threshold for maximum load	Selects the user overload limit	Disabled	• Disabled • 0 ÷ 103 in 1% steps	
Display brightness	Selects the level of brightness of the LCD display	Maximum	Minimum ÷ Maximum in 20 steps	
Acoustic alarm	Selects the operating mode of the acoustic alarm	Low	• Normal • Low: does not sound for momentary bypass intervention	
Auxiliary socket (power share)	Selects the operating mode of the auxiliary socket	Always connected	• Always connected • Disconnection after *n* seconds of operation from battery • Disconnection after *n* seconds from the end of discharge prealarm signal • ... (see configuration software manual)	
		ADVANCED SETTINGS		
Input frequency tolerance	Selects the allowed input frequency range for the passage onto bypass and for synchronization of the output	± 5%	• ± 0.25% • ± 0.5% • ± 0.75% • ± 1÷ ±10 in 1% steps	
Bypass voltage thresholds	Selects the allowed voltage range for the passage onto bypass	Low: 180V High: 264V	Low: 180 ÷ 200 in 1V steps High: 250 ÷ 264 in 1V steps	
Bypass voltage thresholds for ECO	Selects the allowed voltage range for operation in ECO mode	Low: 200V High: 253V	Low: 180 ÷ 220 in 1V steps High: 240 ÷ 264 in 1V steps	
Sensitivity of intervention for ECO	Selects the sensitivity of intervention during operation in ECO mode	Normal	• Low • Normal • High	
Power supply of the load in stand-by	Power supply of the load on bypass with UPS switched off (stand-by state)	Disabled (load NOT powered)	• Disabled (not powered) • Enabled (powered)	
Bypass operation	Selects the mode of use of the bypass line	Enabled / High sensitivity	• Enabled/High sensitivity • Enabled/Low sensitivity • Disabled with input/output synchronization • Disabled without input/output synchronization	

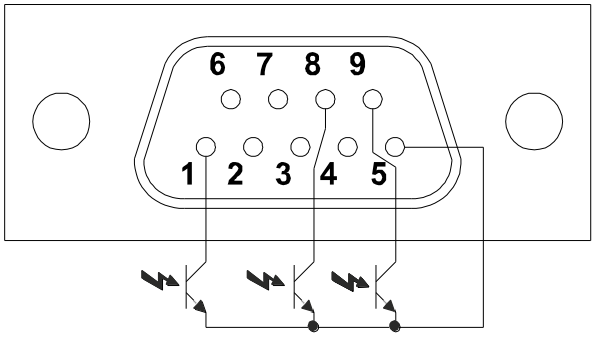
COMMUNICATION PORTS

The following communication ports are located at the back of the UPS (see *UPS Views*):

- Serial port, available with RS232 connector and USB connector.
  NOTE: use of one connector automatically excludes the other.
- Expansion slots for additional COMMUNICATION SLOT interface cards.

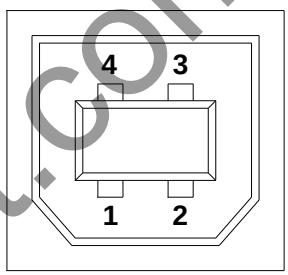
RS232 and USB connectors

RS232 CONNECTOR



PIN #	SIGNAL
1	Contact closed: UPS locked *
2	TXD
3	RXD
4	
5	GND
6	
7	Interface power supply input +12Vdc
8	Contact closed: end of discharge prealarm *
9	Contact closed: operation from battery *

USB CONNECTOR



PIN #	SIGNAL
1	VBUS
2	D-
3	D+
4	GND

***** Optoisolated contact max. +30Vdc/10mA

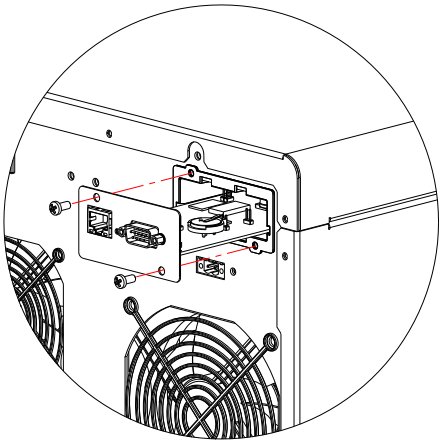
Communication Slot

The UPS is provided with an expansion slot for optional communication cards (see figure at the side) which enable the device to dialog using the main communication standards.

Some examples:

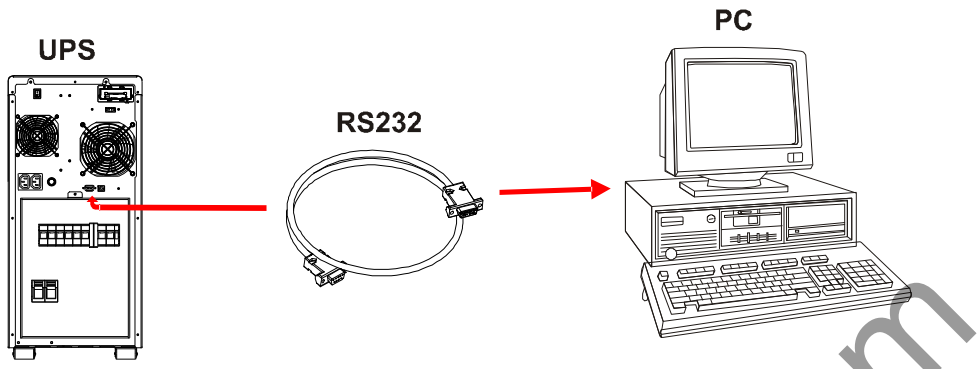
- Second RS232 port
- Serial duplexer
- Ethernet network agent with TCP/IP, HTTP and SNMP protocol
- RS232 port + RS485 with JBUS/MODBUS protocol
- Signalling relay card

Refer to the manufacturer's website for more information on the accessories that are available.



USE

SOFTWARE



Monitoring and control software

The **UPSmon** software provides effective and intuitive management of the UPS, displaying all the most important information, such as input voltage, load applied, and battery capacity.
It is also able to automatically effect operations such as shutdown, transmission of e-mails, SMS and network messages when particular events that can be selected by the user occur.

Installation procedure:

- Connect the UPS's RS232 communication port to a COM communication port on the PC by means of the serial cable provided***** or connect the USB port on the UPS to a USB port on the PC using a USB standard cable*****.
- Download the software from **www.ups-technet.com**, selecting the desired operating system.
- Follow the installation program instructions.
- For more detailed information about installation and use, refer to the software manual which can be downloaded from our website **www.ups-technet.com**.

Configuration software

The **UPStools** software allows the configuration and full display of the status of the UPS via USB or RS232.
For a list of possible configurations available to the user, refer to the **UPS Configuration** paragraph.

INSTALLATION OPERATIONS

1) Connect one of the UPS's communication ports to one of the PC's communication ports using the cable supplied.
2) Follow the installation instructions shown within the software manual which can be located in the UPSTools directory or downloaded from the web site **www.ups-technet.com**.

CAUTION:
If the RS232 communication port is used, it is not possible to communicate with the USB port and vice versa.It is advisable to use a cable which is shorter than 3 metres for communication with the UPS.
To obtain additional communication ports with different functions, independent from the standard USB and RS232 ports on the UPS, various accessories are available which can be inserted into the communication card slot.

To check the availability of new, more updated software versions and for more information about the accessories available, consult the website **www.ups-technet.com**.

* It is recommended to use a cable with a max. length of 3 metres.

TROUBLESHOOTING

Irregular functioning of the UPS is most often not an indication of a fault but due simply to trivial problems, minor difficulties or carelessness.
We therefore recommend that you refer to the table below which gives a summary of useful information to solve the most common problems.

PROBLEM	POSSIBLE CAUSE	SOLUTION
DISPLAY DOESN'T COME ON	MAIN SWITCH NOT CLOSED	Ensure that the main switch located on the rear panel is in position "I".
	BATTERY FUSE-HOLDER DISCONNECTING SWITCHES ARE OPEN	Check the battery fuses and close the disconnecting switches.
	NO CONNECTION TO THE MAINS LINE	Check the connection to the mains power.
	MAINS VOLTAGE DOWN (BLACK-OUT)	Check that there is a mains voltage present.
	UPSTREAM PROTECTION TRIGGERED	Reset the protection. WARNING: Check that there is not an overload on the UPS output.
DISPLAY IS ON BUT THE LOAD IS NOT POWERED	UPS IS IN STAND-BY	Press the "ON" button on the front panel so as to power the loads.
	STAND-BY OFF MODE HAS BEEN SELECTED	The mode has to be changed. In STAND-BY OFF (emergency) mode, the loads are only powered in the event of a black-out.
	NO CONNECTION TO THE LOAD	Check the connection to the load and close the output disconnecting switch.
THE UPS IS OPERATING FROM BATTERY EVEN THOUGH THE MAINS VOLTAGE IS PRESENT	UPSTREAM PROTECTION TRIGGERED	Reset the protection. WARNING: Check that there is no overload in output to the UPS.
	THE INPUT VOLTAGE IS OUTSIDE THE ALLOWED TOLERANCE FOR OPERATION FROM MAINS	Problem dependent on the mains. Wait for the input mains to return within tolerance. The UPS will automatically go back to operation from mains.
THE UPS DOES NOT SWITCH ON AND THE DISPLAY SHOWS ONE OF THESE CODES: **A06, A08**	THE TEMPERATURE OF THE UPS IS LOWER THAN 0°C	Check the temperature of the environment where the UPS is located; if it is too low, bring it to above the minimum threshold (0°C).
THE DISPLAY SHOWS THE CODE: **A11**	INPUT RELAY BLOCKED	The fault does not cause any particular malfunctions. If the problem should occur again on a subsequent start-up, contact the support service centre.

TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	SOLUTION
THE BUZZER SOUNDS CONTINUOUSLY AND THE DISPLAY SHOWS ONE OF THESE CODES: **A54, F50, F51, F52, F55, L50, L51, L52**	THE LOAD APPLIED TO THE UPS IS TOO HIGH	Reduce the load to within the threshold of 100% (or user threshold in the case of code **A54**).
DISPLAY SHOWS CODE: **A61**	BATTERIES NEED REPLACING	Replace the batteries or the battery box.
THE DISPLAY SHOWS THE CODE: **A62**	BATTERY BOX NOT PRESENT OR NOT CONNECTED	Check that the battery box is inserted and connected correctly.
THE DISPLAY SHOWS THE CODE: **A63**	THE BATTERIES ARE DISCHARGED; THE UPS IS WAITING FOR THE VOLTAGE OF THE BATTERIES TO GO OVER THE SET THRESHOLD	Wait for the batteries to recharge or force start-up manually by keeping the "ON" key pressed for at least 2 sec.
THE BUZZER SOUNDS CONTINUOUSLY AND THE DISPLAY SHOWS ONE OF THESE CODES: **F03, F05, F07, F10, F13, F21, F40, F41, F42, F43**	A MALFUNCTION OF THE UPS HAS BEEN VERIFIED; PROBABLY ABOUT TO STOP	If power can be removed from the load, switch the UPS off and then on again; if the problem should occur again, contact the support service centre.
THE BUZZER SOUNDS CONTINUOUSLY AND THE DISPLAY SHOWS ONE OF THESE CODES: **F04, L04**	THE TEMPERATURE OF THE DISSIPATORS INSIDE THE UPS IS TOO HIGH	Check that the temperature of the environment where the UPS is located does not exceed 40°C.
THE BUZZER SOUNDS CONTINUOUSLY AND THE DISPLAY SHOWS ONE OF THESE CODES: **F53, L53**	A FAULT HAS BEEN DETECTED ON ONE OR MORE APPLICATIONS POWERED BY THE UPS	Disconnect all the applications and reconnect them one by one to identify the faulty one.
THE BUZZER SOUNDS CONTINUOUSLY AND THE DISPLAY SHOWS ONE OF THESE CODES: **F60, L03, L05, L07, L10, L13, L20, L21, L40, L41, L42, L43**	A UPS MALFUNCTION HAS BEEN VERIFIED	If power can be removed from the load, switch the UPS off and then on again; if the problem should occur again, contact the support service centre.
THE DISPLAY SHOWS ONE OF THESE CODES: **C01, C02, C03**	A REMOTE CONTROL HAS BEEN ACTIVATED	If this is not required, check the position of the manual bypass switch or the status of the control inputs of any optional contacts card. Check the closing of the R.E.P.O. contact at the back of the UPS.

ALARM CODES

Using a sophisticated self check system, the UPS can verify and indicate on the display panel any faults and/or malfunctions that may occur during the normal operation of the device. In the event of a problem, the UPS indicates this by displaying the code and the type of alarm (FAULT and/or LOCK).

FAULT

FAULT signals can be subdivided into three categories.

1. **Faults:** these are "minor" problems that do not stop the UPS but reduce performance or prevent the use of some of its functions.

CODE	DESCRIPTION
A06	Sensor1 temperature less than 0°C
A08	Sensor2 temperature less than 0°C
A11	Input relay locked (does not open)
A54	Load > preset user threshold
A61	Batteries to be replaced
A62	No Battery box or not connected
A63	Waiting to recharge batteries

2. **Alarms:** these are more critical problems than faults since if they persist, even for a very short time, they may cause the UPS to stop.

CODE	DESCRIPTION
F03	Auxiliary power supply not correct
F04	Dissipators overtemperature
F05	Temperature sensor1 faulty
F07	Temperature sensor2 faulty
F10	Input fuse broken or input relay locked (does not close)
F13	Condenser precharge failed
F21	Condenser bank overvoltage
F40	Inverter overvoltage
F41	Direct voltage in output
F42	Inverter voltage not correct
F43	Inverter undervoltage
F50	Overload: load > 103%
F51	Overload: load > 125%
F52	Overload: load > 150%
F53	Short circuit
F55	Waiting for reduction of load to return onto inverter
F60	Batteries overvoltage

TROUBLESHOOTING

3. **Active controls:** indicate the presence of an active remote control.

CODE	DESCRIPTION
C01	Shutdown remote control
C02	Load on bypass remote control
C03	Startup remote control
C04	Battery test underway

LOCK

LOCK signals are usually preceded by an alarm signal and, due to their significance, cause the inverter to shut down and the load to be powered via the bypass line (this procedure does not include locks from strong and persistent overloads or locks due to short circuits).

CODE	DESCRIPTION
L03	Auxiliary power supply not correct
L04	Dissipators overtemperature
L05	Temperature sensor1 faulty
L06	Temperature sensor3 faulty
L07	Temperature sensor2 faulty
L10	Input fuse broken or input relay locked (does not close)
L13	Condenser precharge failed
L20	Condenser bank undervoltage
L21	Condenser bank overvoltage
L31	Bypass fault
L40	Inverter overvoltage
L41	Direct voltage in output
L42	Inverter voltage not correct
L43	Inverter undervoltage
L50	Overload: load > 103%
L51	Overload: load > 125%
L52	Overload: load > 150%
L53	Short circuit

UPS TECHNICAL DATA TABLE

MODELS	SPW 5000 NP	SPW 6000 NP
INPUT (1 Ø + N star configuration voltages)		
Nominal voltage	220 – 230 – 240 Vac single-phase	
Acceptable range	0 - 280 Vac	
Voltage range for which no battery intervention	Maximum voltage 276Vac Minimum voltage: from 184 to 138Vac between 100% and 50% of load in linear mode Return to mains operation at 190Vac	
Nominal frequency	50 - 60 Hz ±5 Hz	
Maximum current (1)	30A	36A
Nominal current (2)	24A	28,5A
Power factor	≥ 0.95	
Current distortion @ maximum load	≤ 6%	
BYPASS (on L1)		
Voltage range accepted for switching	180 - 264 Vac	
Frequency range accepted for switching	Frequency selected ±5%	
Switching time	0.1ms	
BATTERY		
Recharge time (8)	6-8 h	
OUTPUT		
Nominal voltage	220 / 230 / 240 Vac selectable ±1.5%	
Static variation (3)	1.5% (7)	
Dynamic variation (4)	≤ 5% in 20 ms	
Waveform	Sinusoidal	
Voltage distortion @ linear load	≤ 3%	
Voltage distortion @ distorting load	≤ 6%	
Frequency (5)	50 or 60 Hz selectable	
Current peak factor	≥ 3 : 1	
Nominal power in VA	5000	6000
Nominal power in W	4000	4800
Short circuit current	1.5 x In per t=0.5sec	
VARIOUS		
Leakage current (to ground)	≤ 10mA	
AC/AC yield	92 %	
Ambient temperature (6)	0 – 40 °C	
Relative humidity	< 90 % non-condensing	
Protections	Excessive battery discharge – overcurrent – short-circuit – overvoltage – undervoltage –thermal	
Hold-up time	≥ 40msec	
Noise level	< 45 dB(A) at 1 m	
Dimension H x L x D (mm)	615mm x 282mm x 785mm	
Weight in Kg (estimate)	89 Kg	90 Kg

TECHNICAL DATA TABLE

MODELS	SPT 6500 NP	SPT 8000 NP	SPT 10000 NP
INPUT (3 Ø + N star-configured voltages)			
Nominal voltage	220 – 230 – 240 Vac single-phase / 380 – 400 – 415 Vac three-phase with neutral		
Accepted range	0 - 280 Vac		
Voltage range for non-intervention of battery	Maximum voltage 276Vac Minimum voltage: from 184 to 138 Vac from 100% to 50% of the linear load Return of operation from mains at 190Vac		
Nominal frequency	50 - 60 Hz ±5Hz		
Maximum current (1)	12	14	17
Nominal current (2)	8	10	12
Power factor	≥ 0.95		
Current distortion @ max load	≤ 6% single-phase / ≤ 26% three-phase		
BYPASS (on L1)			
Voltage range accepted for switching	180 - 264 Vac		
Frequency range accepted for switching	Frequency selected ±5%		
Switching time	0.1ms		
BATTERY			
Recharge time (8)	6-8 h		
OUTPUT			
Nominal voltage	220/230/240 Vac selectable ±1.5%		
Static variation (3)	1.5% (7)		
Dynamic variation (4)	≤ 5% in 20ms		
Waveform	Sinusoidal		
Voltage distortion @ linear load	≤ 3%		
Voltage distortion @ distorting load	≤ 6%		
Frequency (5)	50 o 60 Hz selectable		
Current crest factor	≥ 3 : 1		
Nominal power (VA)	6500	8000	10000
Nominal power (W)	5200	6400	8000
Short circuit current	1.5 x In for t= 0.5sec		
SUNDRY			
Leakage current to earth	≤ 10mA		
AC/AC performance	92%		
Ambient temperature (6)	0 – 40 °C		
Humidity	< 90% non condensing		
Protections	excessive battery discharge - overcurrent - short circuit - overvoltage - undervoltage - thermal		
Hold-up time	≥ 40msec		
Noise	< 45 dB(A) at 1mt.		
Dimensions H x L x D (mm)	615mm x 282mm x 785mm		
Weight in Kg (estimated)	91 Kg	94 Kg	95 Kg

(1) @ nominal load, minimum voltage of 180Vac, battery charging
(2) @ nominal load, nominal voltage of 230Vac, battery charging
(3) Mains/Battery @ load 0% -100%
(4) @ Mains/battery/mains @ resistive load 0%/100%/0%
(5) If the mains frequency is within ±5% (user definable) of the selected value, the UPS is synchronized with the mains. If the frequency is out of tolerance or in operation from battery, the frequency is the selected value ±0.1%
(6) 20 - 25 °C for extended battery life
(7) Recalibration may be necessary after a long period of operation, in order to maintain the output voltage within the indicated range.
(8) Time needed to reach 90% of charge (after a full discharge at load ≥80%)

TABLE OF OVERLOAD TIMES

OVERLOAD TIMES	OPERATION FROM	
	BYPASS	INVERTER
100% < Load ≤ 125%	Activates bypass after 2 sec Shutdown after 120 sec	Shutdown after 60 sec
125% < Load ≤ 150%	Activates bypass after 2 sec Shutdown after 4 sec	Shutdown after 4 sec
Load > 150%	Activates bypass instantaneously Shutdown after 1 sec	Shutdown after 0.5 sec