

Installation and user manual

5SX 1250VA Rack 2U

5SX 1750VA Rack 2U

5SX 3000VA Rack 2U

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5SX 1-3 KVA EU_EN

Certification Standards

Uninterruptible power systems (UPS) directives:

- IEC 62040-1: General and safety requirements for UPS
- IEC 62040-2: Electromagnetic compatibility (EMC) requirements
- IEC 62040-3: Method of specifying the performance and test requirements
- IEC 62040-4: Environmental aspects - Requirements and reporting

CE mark

CE compliance contact : Eaton I.F. - 110 rue Blaise Pascal - 38330 Montbonnot Saint Martin - France

The EC Declaration of Conformity is available upon request for products with a CE mark.

For copies of the EC Declaration of Conformity, contact Eaton Power Quality or check Eaton website:

www.powerquality.eaton.com

Class B emission level CISPR 22(EN 55022)

Harmonics emission: IEC 61000-3-2

Flickers emission: IEC 61000-3-3

Special symbols

The following are examples of symbols used on the UPS or accessories to alert you to important information:



RISK OF ELECTRIC SHOCK - Observe the warning associated with the risk of electric shock symbol.



Important instructions that must always be followed.



Do not discard the UPS or the UPS batteries in the trash.

This product contains sealed lead acid batteries and must be disposed as it's explain in this manual.

For more information, contact your local recycling/reuse or hazardous waste center.



This symbol indicates that you should not discard waste electrical or electronic equipment (WEEE) in the trash. For proper disposal, contact your local recycling/reuse or hazardous waste center.



Information, advice, help.

Safety of Persons

- The system has its own power source (the battery). Consequently, the power outlets may be energized even if the system is disconnected from the AC power source.
- Dangerous voltage levels are present within the system. It should be opened exclusively by qualified service personnel.
- The system must be connected to an earthed outlet.
- The battery supplied with the system contains small amounts of toxic materials.

To avoid accidents, the directives listed below must be observed:

- servicing of batteries should be performed or supervised by personnel knowledgeable about batteries and the required precautions.
- when replacing batteries, replace with the same type and number of batteries or battery packs.
- do not dispose of batteries in a fire. The batteries may explode.
- batteries constitute a danger (electrical shock, burns). The short-circuit current may be very high.

Precautions must be taken for all handling:

- Wear rubber gloves and boots.
- Do not lay tools or metal parts on top of batteries.
- Disconnect charging source prior to connecting or disconnecting battery terminals.

Product Safety

- The UPS connection instructions and operation described in the manual must be followed in the indicated order.
- A protection circuit breaker must be installed upstream and be easily accessible. The system can be disconnected from the AC power source by opening this circuit breaker or unplugging the input cable.
- Check that the indications on the rating plate correspond to your AC powered system and to the actual electrical consumption of all the equipment to be connected to the system.
- For PLUGGABLE EQUIPMENT, the socket-outlet shall be installed near the equipment and shall be easily accessible
- Never install the system near liquids or in an excessively damp environment.
- Never let a foreign body penetrate inside the system.
- Never block the ventilation grates of the system.
- Never expose the system to direct sunlight or source of heat.
- If the system must be stored prior to installation, storage must be in a dry place.
- The admissible storage temperature range is -15 to +50 °C / 5 to 122 °F.
- The system is not for use in a computer room.

Special Precautions

- **All handling operations will require at least two people (unpacking, installation in rack system).**
- Before and after the installation, if the UPS remains de-energized for a long period, the UPS must be energized for a period of 24 hours, at least once every 6 months (for a normal storage temperature less than 25 °C / 77 °F). This charges the battery, thus avoiding possible irreversible damage.
- During the replacement of the Battery Module, it is imperative to use the same type and number of element as the original Battery Module provided with the UPS to maintain an identical level of performance and safety. In case of doubt, don't hesitate to contact your EATON representative.

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1. Introduction

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

The 5SC range has been designed with the utmost care.

We recommend that you take the time to read this manual to take full advantage of the many features of your UPS (Uninterruptible Power System).

Before installing your 5SC, please read the booklet presenting the safety instructions. Then follow the indications in this manual.

To discover the entire range of EATON products and the options available for the 5SC range, we invite you to visit our web site at www.eaton.com/powerquality or contact your EATON representative.

1.1 Environmental protection


EATON has implemented an environmental-protection policy. Products are developed according to an eco-design approach.


Substances

This product does not contain CFCs, HCFCs or asbestos.

Packing

To improve waste treatment and facilitate recycling, separate the various packing components.

- The cardboard we use comprises over 50% of recycled cardboard.
- Sacks and bags are made of polyethylene.
- Packing materials are recyclable and bear the appropriate identification symbol 

Materials	Abbreviations	Number in the symbols 
Polyethylene terephthalate	PET	01
High-density polyethylene	HDPE	02
Polyvinyl chloride	PVC	03
Low-density polyethylene	LDPE	04
Polypropylene	PP	05
Polystyrene	PS	06

Follow all local regulations for the disposal of packing materials.

End of life

EATON will process products at the end of their service life in compliance with local regulations. EATON works with companies in charge of collecting and eliminating our products at the end of their service life.

Product

The product is made up of recyclable materials.

Dismantling and destruction must take place in compliance with all local regulations concerning waste. At the end of its service life, the product must be transported to a processing center for electrical and electronic waste.

Battery

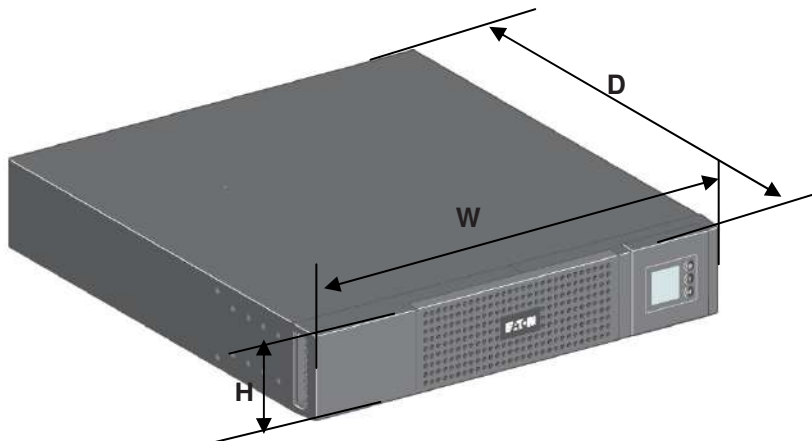
The product contains lead-acid batteries that must be processed according to applicable local regulations concerning batteries.

The battery may be removed to comply with regulations and in view of correct disposal

2. Presentation

2.1 Standard installations

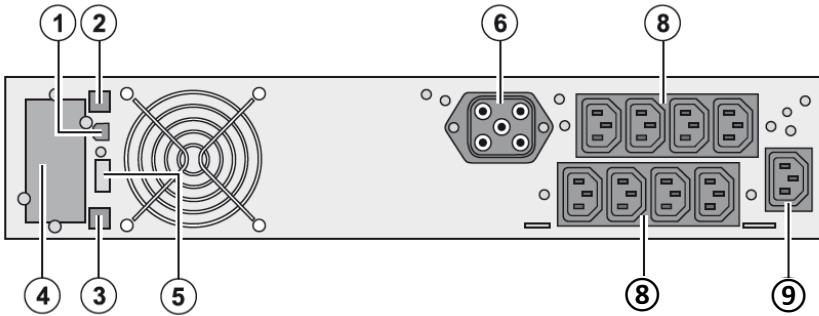
Rack installation



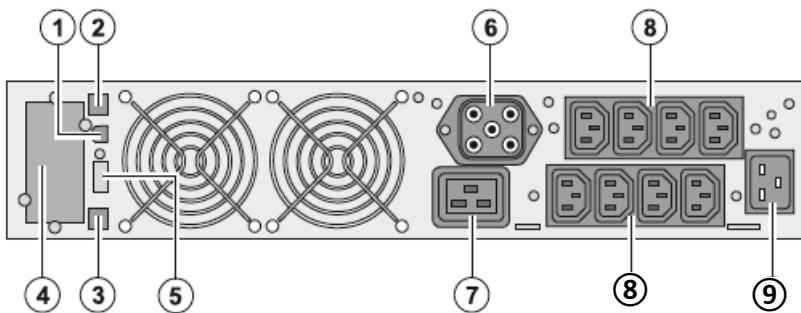
Description	Weights (kg/lb)	Dimensions W*H*D (mm/inch)
5SX 1250VA Rack 2U	24.9/54.7	441.2*86.2*522 / 17.4*3.4*20.5
5SX 1750VA Rack 2U	26.4/58.7	441.2*86.2*522 / 17.4*3.4*20.5
5SX 3000VA Rack 2U	34.5/75.9	441.2*86.2*647 / 17.4*3.4*25.5
5SX EBM 48V 2U	30.3/66.4	441.2*86.2*522 / 17.4*3.4*20.5
5SX EBM 72V 2U	43.6/95.9	441.2*86.2*647 / 17.4*3.4*25.5

2.2 Rear panels

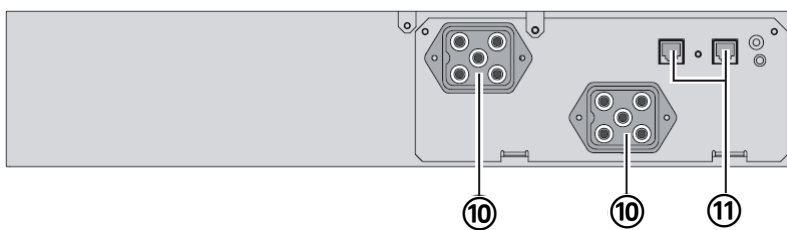
5SX 1250VA Rack2U & 5SX 1750VA Rack2U



5SX 3000VA RT2U



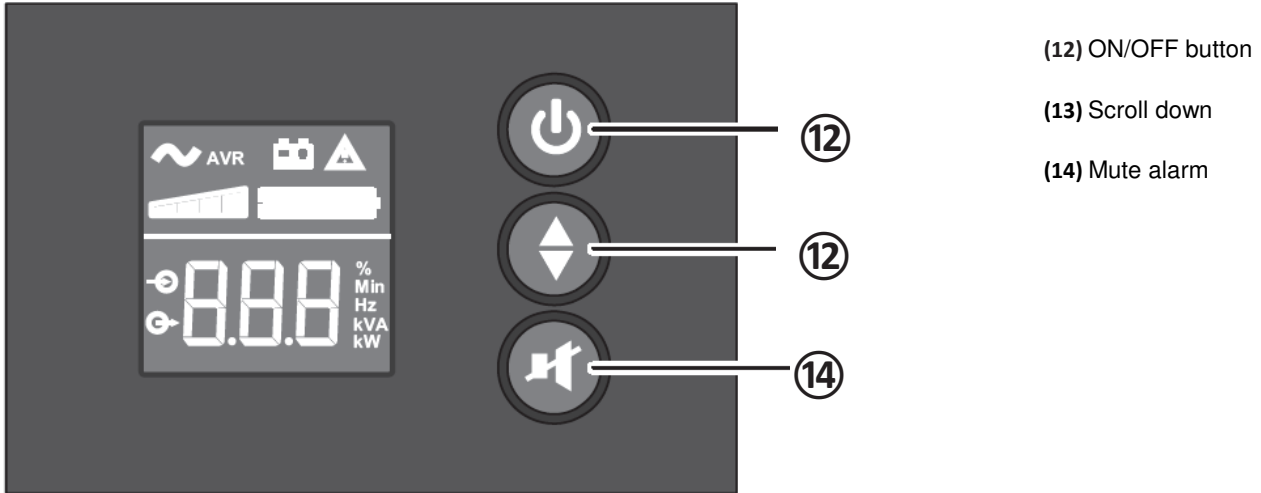
5SX EBM 48V 2U & 5SX EBM 72V 2U



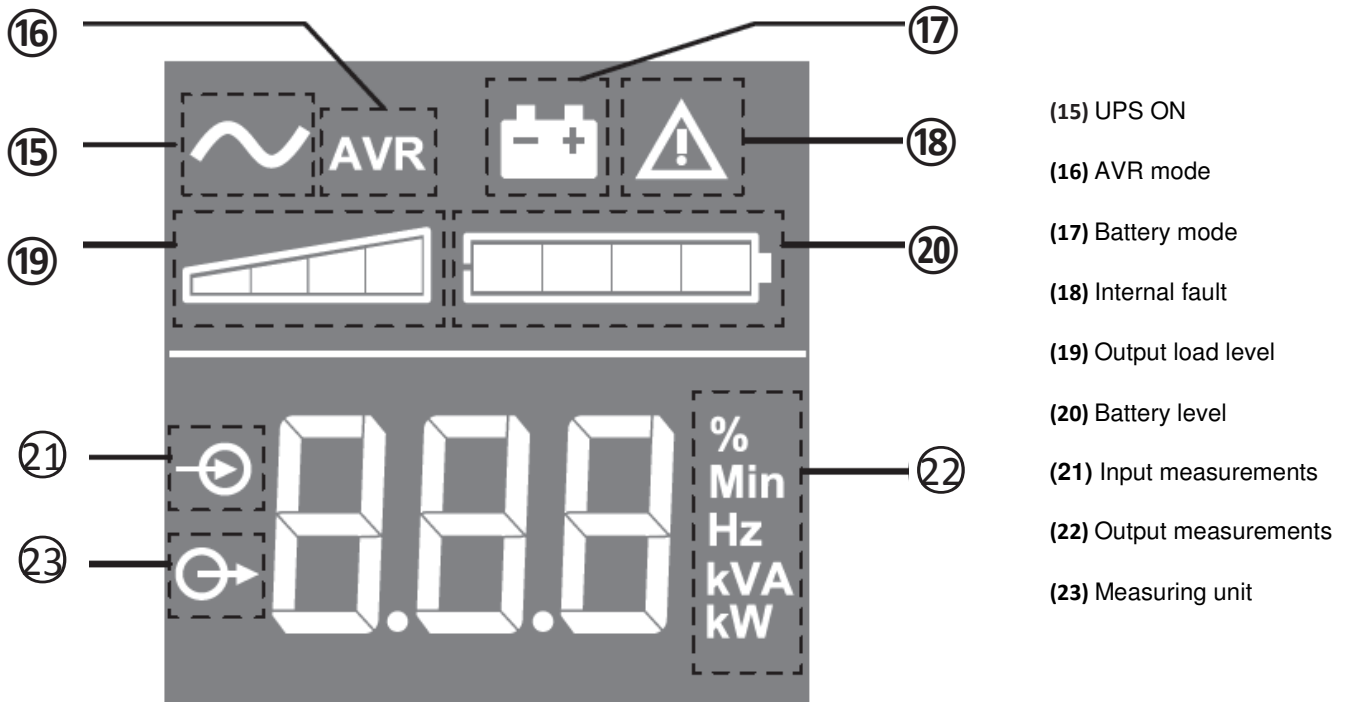
- (1) USB communication port
- (2) RS232 communication port
- (3) Connector for automatic recognition of optional battery modules
- (4) Slot for optional communication card
- (5) Connector for ROO (remote ON/OFF) or RPO (Remote Power Off) control
- (6) Connector for optional battery modules
- (7) 16 A outlet for connection of equipment (Primary group)
- (8) outlets for connection of equipment
- (9) Socket for connection to AC-power source
- (10) Connectors for battery modules(to the UPS or to the other battery modules)
- (11) Connectors for automatic recognition of battery modules

2.3 Control panel

The UPS has a three-button LCD. It provides useful information about the UPS itself, load status, events, measurements and settings.

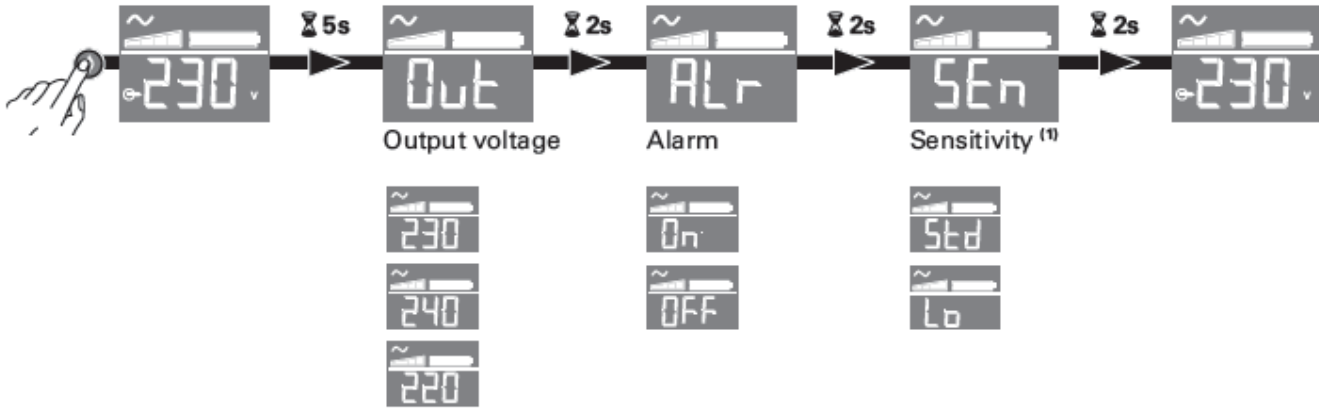


2.4 LCD description



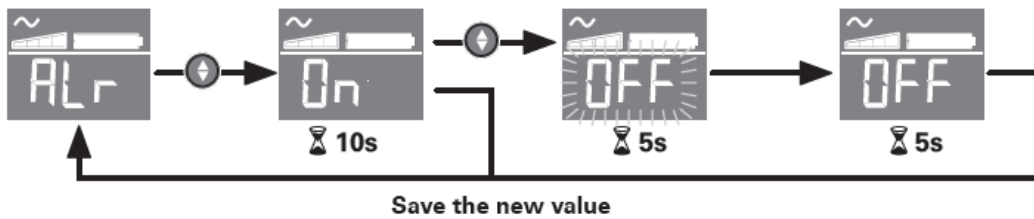
2.5 UPS setting through the LCD

Release scroll down button to select menu



- (1) In low sensitivity mode (Lo) UPS will tolerate more fluctuations in power and will go on battery power less often. If the connected load is sensitive to power disturbances, keep the sensitivity as Standard (Std).

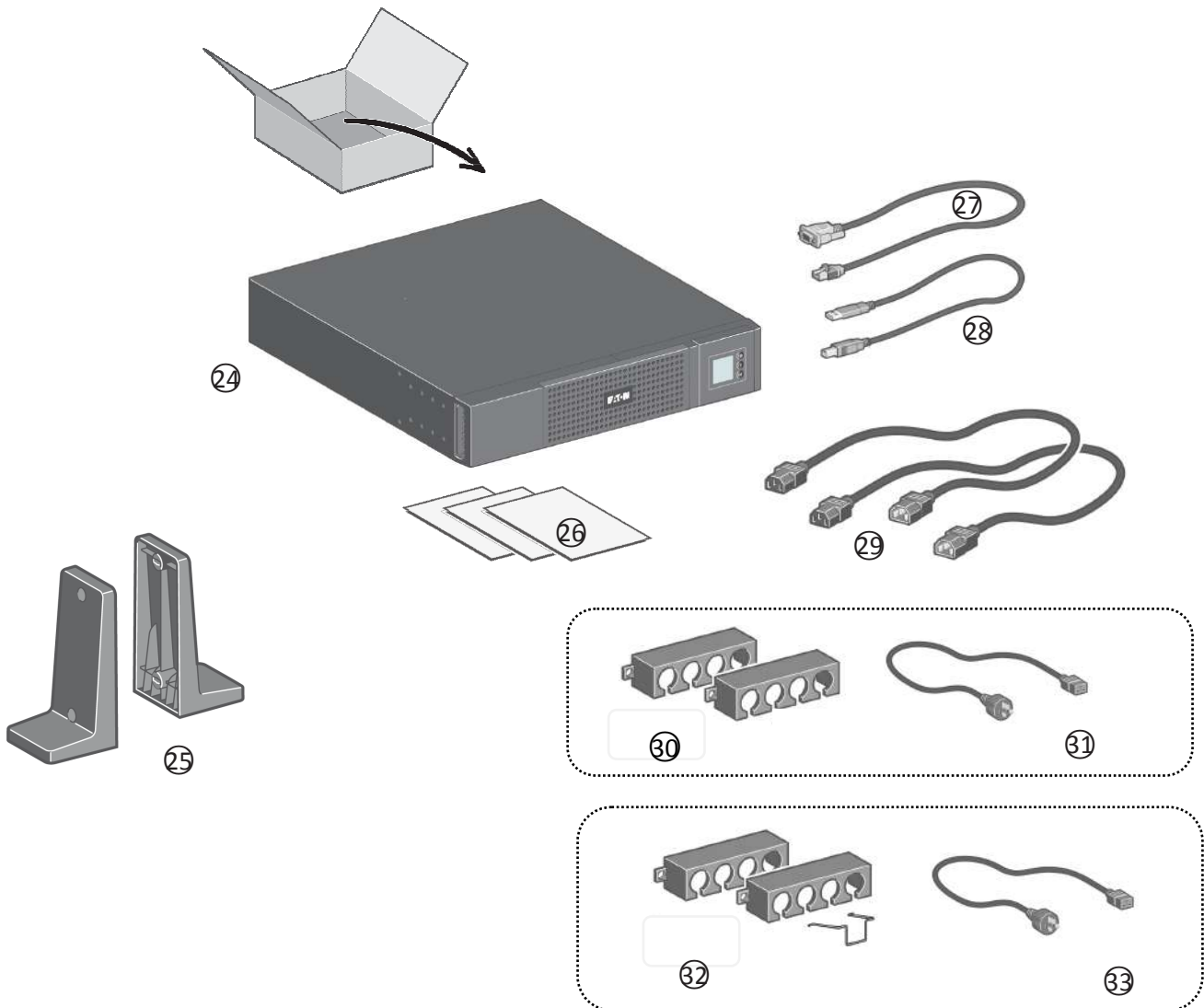
Example of setting



- LCD shut off if no activity for 3 minutes.

3. Installation

3.1 Unpacking and contents check



(24) 5SX UPS

(25) 2 supports for tower position

(26) Quick start, safety instructions and environmental document

(27) RS232 communication cable

(28) USB communication cable

(29) 2 connection cables for the protected equipment

(30) Cable locking systems

(5SX 1250VA Rack 2U and 5SX 1750VA Rack 2U models only)

(31) Connection cable to AC-power source

(5SX 1250VA Rack 2U and 5SX 1750VA Rack 2U models only)

(32) Cable locking systems

(5SX 3000VA Rack 2U models only)

(33) Connection cable to AC-power source

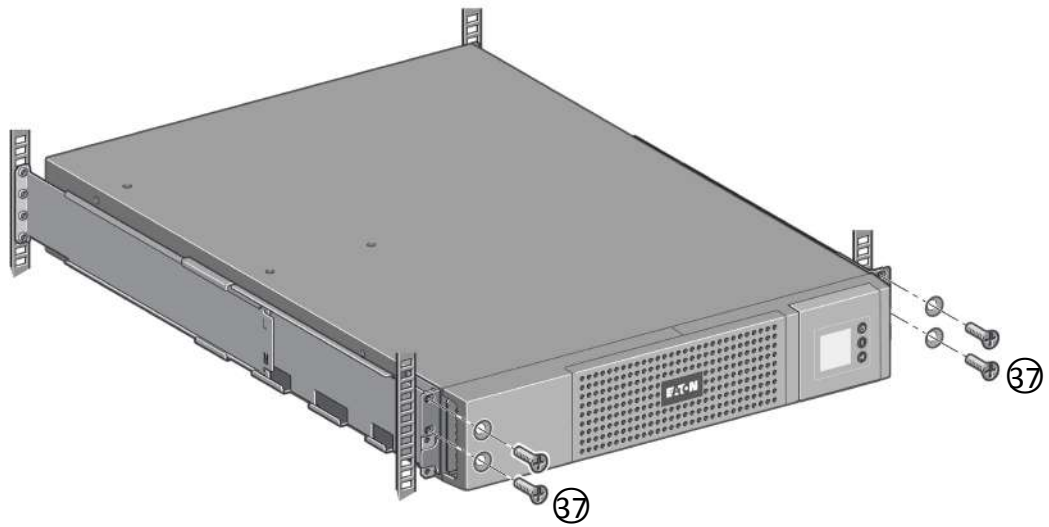
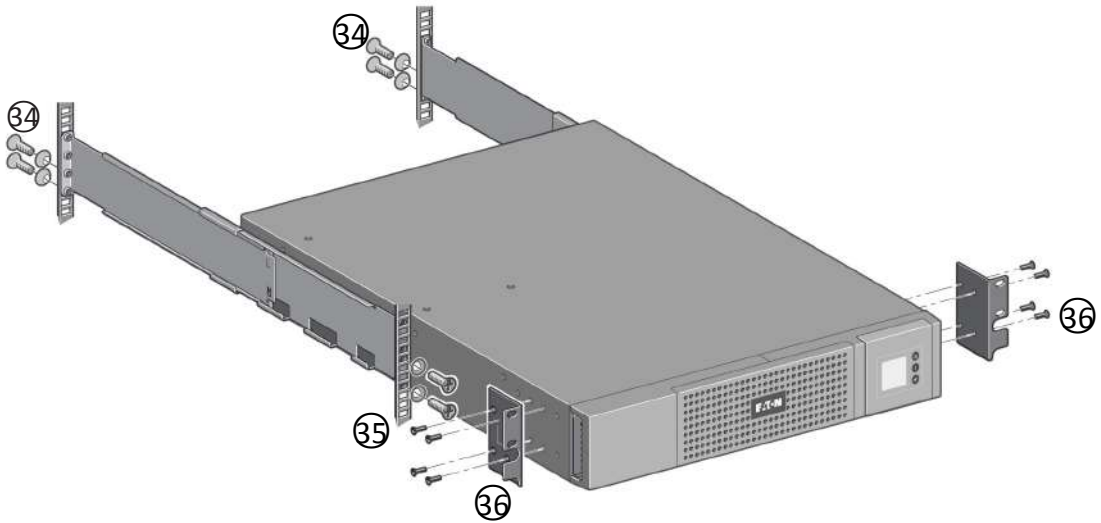
(5SX 3000i RT2U models only)



Packing materials must be disposed of in compliance with all local regulations concerning waste. Recycling symbols are printed on the packing materials to facilitate sorting.

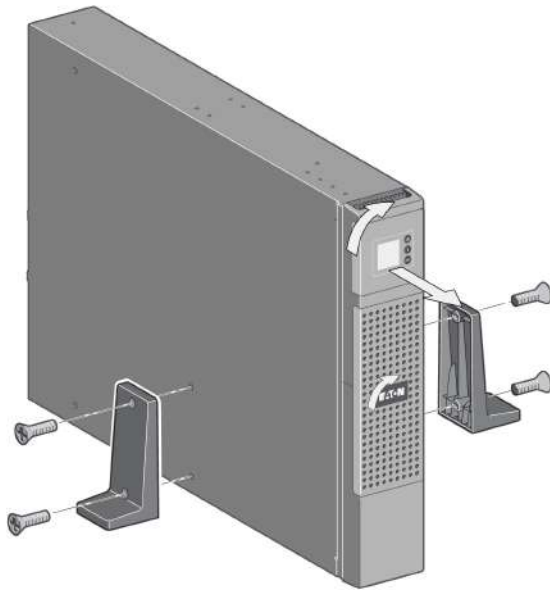
3.2 Installation of rack models

Follow steps 34 to 37 for model mounting on the rails.
Use provided screws on step 36 of installation. Using a longer screw could present a safety risk.



The rails and necessary hardware are supplied by EATON.

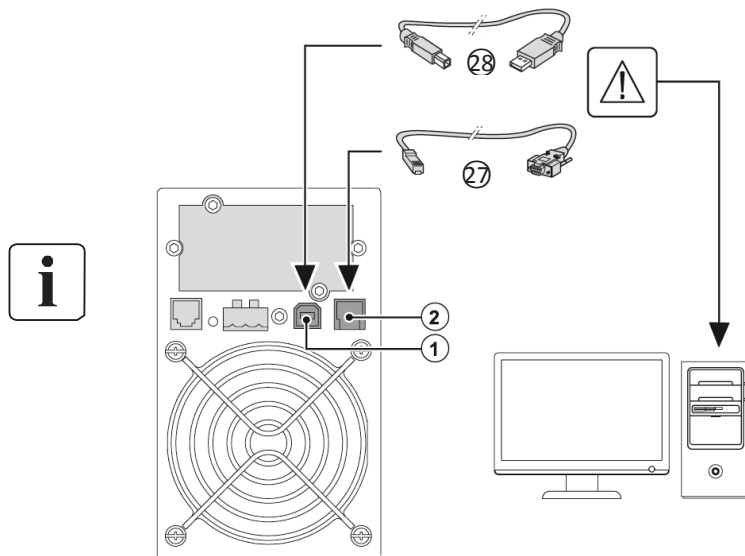
3.3 Installation of tower models



3.4 Communication ports

Connection of RS232 or USB communication port

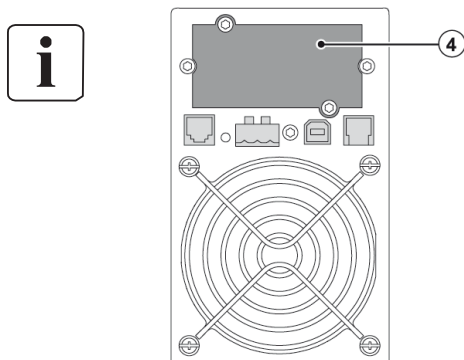
The RS232 and USB communication ports can operate simultaneously.



1. Connect the RS232 (27) or USB (28) communication cable to the serial or USB port on the computer equipment.
2. Connect the other end of the communication cable (27) or (28) to the USB (1) or RJ45 (2) communication port on the UPS.

The UPS can now communicate with EATON power management software.

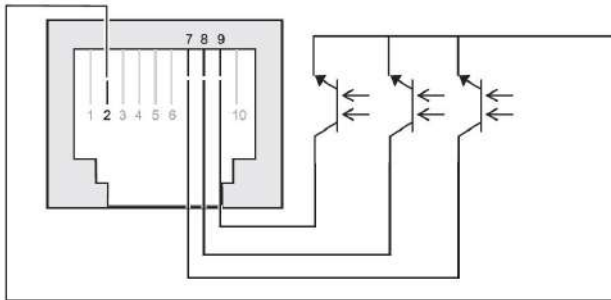
Installation of the communication cards (optional)



It is not necessary to shut down the UPS before installing a communication card

1. Remove the slot cover (2) secured by screws;
2. Insert the communication card in the slot
3. Secure the card cover with the 2 screws.

Characteristics of the contact RS232 communication port



- Pins 1, 3, 4, 5, 6, 10: not used
- Pin 2: common (user)
- Pin 7: low battery
- Pin 8: operation on battery power
- Pin 9: UPS ON, equipment supplied
- n.o.: normally open contact

When a signal is activated, the contact is closed between the common (pin 2) and the pin for the corresponding signal.


Contact characteristics (optocoupler)

- Voltage: 48 V DC max
- Current: 25 mA max
- Power: 1.2

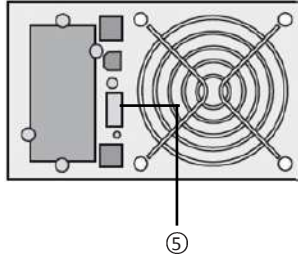
3.5 UPS remote control functions

The 5P offers a choice between two remote control functions.

- **RPO**: Remote Power Off allows a remote contact to be used to disconnect all the equipment connected to the UPS. Restarting the UPS requires manual intervention.

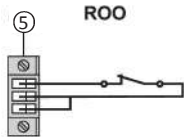
- **ROO**: Remote ON/OFF allows remote action of  button to shut down the UPS.

These functions are obtained by opening a contact connected between the appropriate pins of connector (6) on the rear panel of the UPS (see figures below).



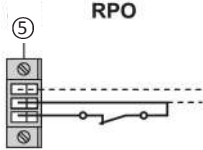
Remote control connection and test



1. Check that the UPS is OFF and disconnected from the AC input source.
2. Remove connector (5) after unscrewing the screws.
3. Connect a normally closed volt-free contact (60 V DC / 30 V AC max., 20 mA max., 0.75 mm² cable cross-section) between the two pins of connector (5) (see diagram).



Contact open: UPS shutdown
Contact closed: UPS start-up (UPS connected to AC power and AC power is available)

Note. The local ON/OFF control using button  overrides the remote-control function.



Contact open: UPS shutdown, LED  goes ON.
To return to normal operation, deactivate the remote external contact and restart the UPS by pressing button .

4. Plug connector (6) into the back of the UPS.
5. Connect and restart the UPS following the previously described procedures.
6. Activate the external remote shutdown contact to test the function.





Warning. This connector must only be connected to SELV (Safety Extra-Low Voltage) circuits.

4. Operation


4.1 Start-up and Normal operation

To start the UPS:

1. Verify that the UPS power cord is plugged in.
2. Press the  button on the UPS front panel for at least 2 seconds.
3. Check the UPS front panel display for active alarms.

If the  indicator is on, do not proceed until all alarms are cleared.

Correct the alarms and restart if necessary.

4. Verify that the  indicator illuminates solid, indicating that the UPS is operating normally and any loads are powered and protected.

4.2 Starting the UPS on Battery



Before using this feature, the UPS must have been powered by utility power with output enabled at least once.

To start the UPS on battery:

1. Press the  button on the UPS front panel until the UPS front panel display illuminates.


The UPS cycles through Standby mode to Battery mode. The  indicator illuminates solid.


The UPS supplies power to your equipment.

2. Check the UPS front panel display for active alarms. Resolve any active alarms before continuing. See "Troubleshooting" in section 5.1.

4.3 UPS Shutdown


To shut down the UPS:

Press the  button on the front panel for three seconds.

The UPS starts to beep. The UPS then transfers to Standby mode, and the  indicator turns off.

4.4 Operation on Battery Power


Transfer to battery power

- The connected devices continue to be supplied by the UPS when AC input power is no longer available. The necessary energy is provided by the battery.
- The  indicator illuminates solid.
- The audio alarm beeps every ten seconds.



The connected devices are supplied by the battery.

Low-battery warning

- The  indicator illuminates solid.
- The audio alarm beeps every three seconds.



The remaining battery power is low. Shut down all applications on the connected equipment because automatic UPS shutdown is imminent.

End of battery backup time






- The audio alarms stops.

4.5 Return of AC Input Power

Following an outage, the UPS restarts automatically when AC input power returns (unless the restart function has been disabled) and the load is supplied again.

5. Maintenance

5.1 Troubleshooting

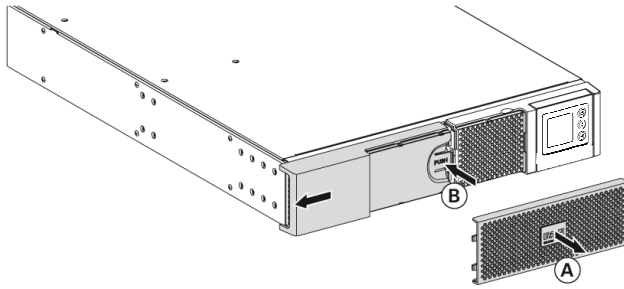
Operation status	Possible cause	Action
Overload 	Power requirement exceeds the UPS capacity (greater than 105 % of nominal).	Remove some of the equipment from the UPS. The UPS continues to operate, but may shutdown if the load increases. The alarm resets when the condition becomes inactive.
Short-circuit fault 	A short-circuit occurred.	Check device connection or integrity. If error persists, note the alarm message and the UPS serial number, and then contact your service representative.
Battery fault 	The batteries in the UPS are disconnected.	Verify that all batteries are properly connected. If error persists, note the alarm message and the UPS serial number, and then contact your service representative.
	The end of battery life is reached.	Contact your service representative for battery replacement.
Fan fault 	The UPS has a fan fault.	Check that no object is blocking the fan. If error persists, note the alarm message and the UPS serial number, and then contact your service representative.
Charger fault 	The UPS has a charger fault.	The UPS does not charge the battery anymore. Note the alarm message and the UPS serial number, and then contact your service representative.

5.2 Battery-module replacement

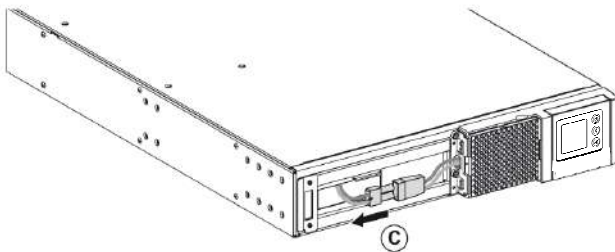
Safety recommendations

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

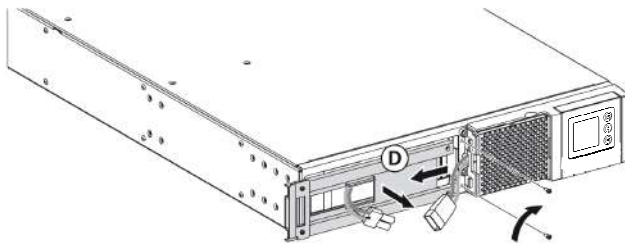
- remove watches, rings, bracelets and all other metal objects from the hands and arms,
- use tools with an insulated handle.



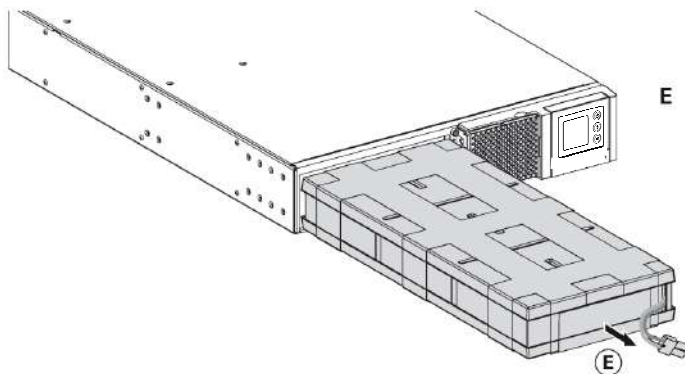
- A.** Remove the center panel
- B.** Remove the left-hand side of the front panel by pushing the button and then by sliding the part



- C.** Disconnect the battery module by separating the two connectors



- D.** Remove the metal protection cover in front of the battery (one screw)



- E.** Pull the plastic tab to remove the battery module and replace it

Mounting the new battery module

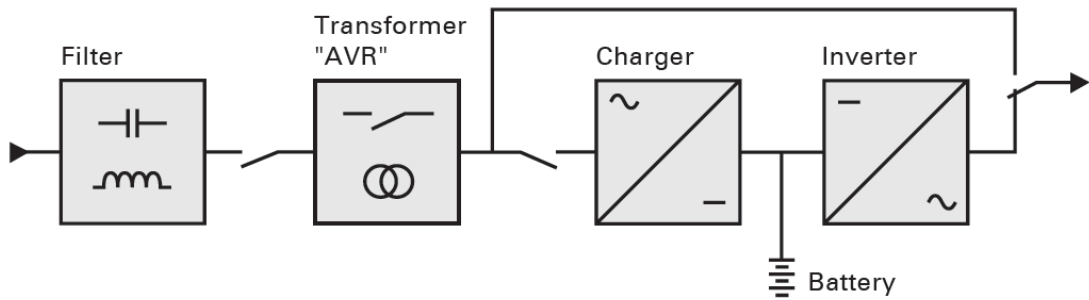


Carry out the above instructions in reverse order.

- To ensure safety and high performance, use only batteries supplied by EATON.
- Take care to firmly press together the two parts of the connector during remounting.

6. Appendices

6.1 Technical specifications



	5SX 1250VA Rack 2U	5SX 1750VA Rack 2U	5SX 3000VA Rack 2U
Output Power @ 240 V	1250 VA 1125 W	1750 VA 1575 W	3000 VA 2700 W
AC Input power			
Rated input voltage	Single phase 220-240 V		
Input voltage range	184 to 276 V		
Input frequency range	47 to 57 Hz (50 Hz system), 57.5 to 70 Hz (60 Hz system)		
Output on battery power			
Voltage	220/230/240 V (-10/+6 %) (1)		
Frequency	50/60 Hz ±0.1 Hz		
Battery (sealed lead acid, maintenance free)	3 x 12 V 7 Ah	3 x 12 V 9 Ah	4x 12 V 9 Ah
Environment			
Operating temperature range	0 to 40 °C		
Storage temperature range	-15 to +50 °C		
Relative humidity	20 to 90 % (without condensation)		
Noise level	<45dB		

1) Adjustable to 220/230/240 V, must be set to the identical AC power source value.

This product is designed for IT power distribution system.

6.2 Glossary

Backup time	Time during which the load can be supplied by the UPS operating on battery power.
Battery test	Internal UPS test to check battery status.
Cold start	The devices connected to the UPS can be started even if AC input power is not available. The UPS operates on battery power alone.
Deep discharge	Battery discharge beyond the permissible limit, resulting in irreversible damage to the battery.
Load	Devices or equipment connected to the UPS output.
Low-battery warning	This is a battery-voltage level indicating that battery power is low and that the user must take action in light of the imminent break in the supply of power to the load.
Normal AC input	The AC-power line supplying the UPS under normal conditions.
Percent load	Ratio of the power effectively drawn by the load to the maximum output of the UPS.
Personalisation	It is possible to modify certain UPS parameters set in the factory. Certain UPS functions can also be modified by the software to better suit user needs.
UPS	Uninterruptible Power System.
UPS ON/OFF controlled by software	This function enables or disables initiation of UPS ON/OFF control sequences by computer power-management software