



Eaton 5E

Advanced User Guide



5E700UI-EA

5E900UI-EA

5E1200UI-EA

5E1600UI-EA

5E2200UI-EA

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DSD-5E2206

English

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1 Special symbols

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



DANGER: Dangerous voltage levels are present within the UPS. The UPS has its own internal power source (the battery). Consequently, the power outlets may be energized even if the UPS is disconnected from the AC power source.



Important instructions that must always be followed.

CAUTION: Batteries present a risk of energy or electrical shock or burn from high short circuit current. Observe proper precaution. Batteries may contain HIGH VOLTAGE and CORROSIVE, TOXIC and EXPLOSIVE substances.



Information, advice, help.



Read the documentation provided.



Disconnect input plug.



Before maintenance, first shut down the UPS then disconnect the AC power source, internal and external batteries then discharge capacitors by pressing the ON button and wait 5 minutes.



This equipment should only be used in a dry indoor environment.



Operating range of temperature.



Operating range of humidity.



The UPS and their batteries must be kept in a ventilated place.

2 Introduction

Thank you for selecting an Eaton 5E product to protect your electrical equipment. The Eaton 5E range has been designed with the utmost care. We recommend that you take the time to read this advanced user guide to take full advantage of the many features of your UPS (Uninterruptible Power System).

Before installing your Eaton 5E, please read the information and safety instructions provided. Follow the instructions in the quick start guide and if necessary, refer to this advance user guide.

To discover the entire range of Eaton products, we invite you to visit our web site at eaton.com or contact your Eaton local representative.

2.1 Environmental protection

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

2.1.1 Substances


This product does not contain CFC and HCFC. This product does not contain asbestos. This product is compliant with regulations on the restriction of the use of substances in electrical and electronic equipment.

2.1.2 Packaging

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

- The cardboard we use comprises over 50% of recycled cardboard.
- Plastic 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.

2.1.3 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.

2.1.4 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. eaton.com/recycling

2.1.5 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.

2.2 Benefits

The Eaton 5E uninterruptible power system (UPS) protects your sensitive electronic equipment from the most common power problems, including power outages, voltage sags, impulsive transients, line noise, and long-term under and over voltage conditions.

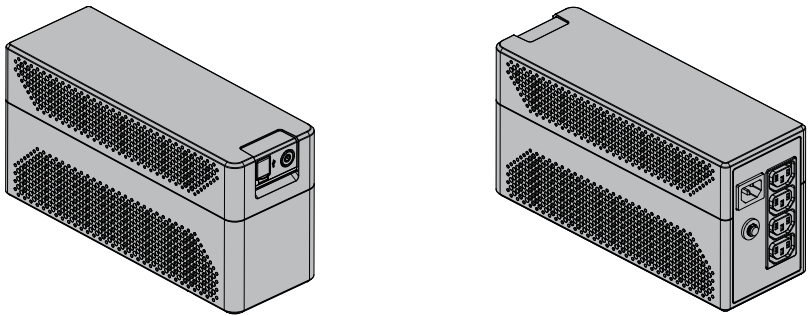
Power outages can occur when you least expect it and power quality can be erratic. These power problems have the potential to corrupt critical data, destroy unsaved work sessions, and damage hardware - causing hours of lost productivity and expensive repairs.

With the Eaton 5E, you can safely eliminate the effects of power disturbances and guard the integrity of your equipment. Providing outstanding performance and reliability, the Eaton 5E's unique benefits include:

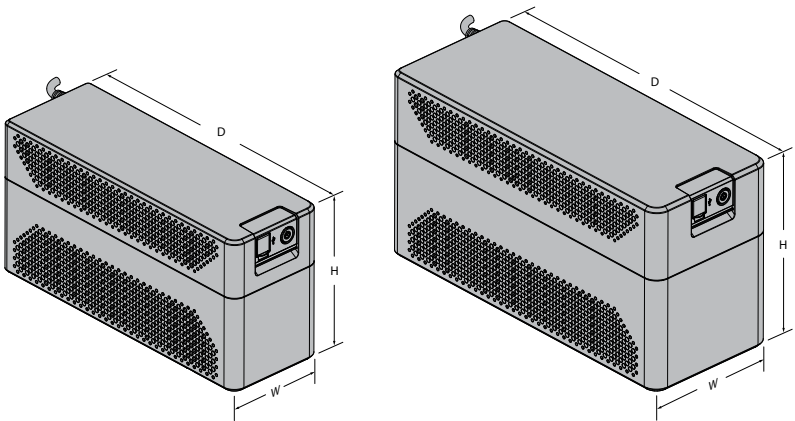
- Standard communication: one USB communication port.
- Backed by worldwide agency approvals.

3 Presentation

3.1 Standard installation

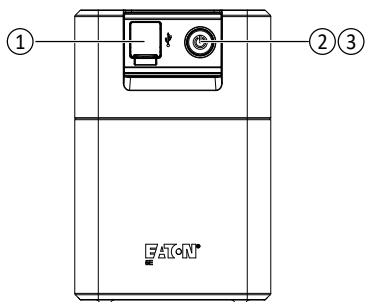


3.1.1 Weights and dimensions



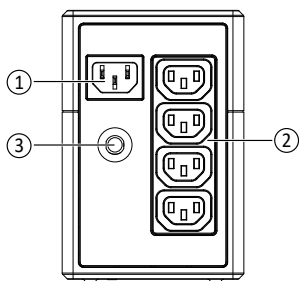
Description (UPS)	Weights (kg / lbs)	Dimentions (mm / inch) D x W x H
5E700UI-EA	4.2 / 9.3	288 x 100 x 148 / 11.5 x 3.9 x 5.8
5E900UI-EA	5.2 / 11.4	288 x 100 x 148 / 11.5 x 3.9 x 5.8
5E1200UI-EA	8.2 / 18.2	330 x 133 x 180 / 13.0 x 5.2 x 7.1
5E1600UI-EA	8.9 / 19.6	330 x 133 x 180 / 13.0 x 5.2 x 7.1
5E2200UI-EA	10.0 / 22.0	330x 133 x 180 /13.0 x 5.2 x 7.1

3.2 Front panel

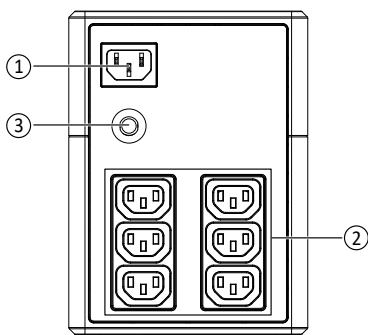


- 1. USB communication port
- 2. ON/OFF Button
- 3. UPS status LED

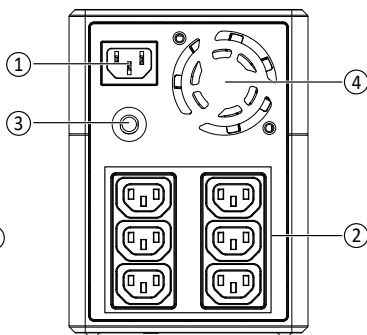
3.3 Rear panel



5E700UI-EA / 5E900UI-EA



5E1200UI-EA



5E1600UI-EA / 5E2200UI-EA

- | | |
|-------------|-----------|
| 1 AC Input | 3 Breaker |
| 2 AC Output | 4 Fan |

4 Installation

4.1 Inspecting the equipment

If any equipment has been damaged during shipment, keep the shipping cartons and packing materials for the carrier or place of purchase and file a claim for shipping damage. If you discover damage after acceptance, file a claim for concealed damage.

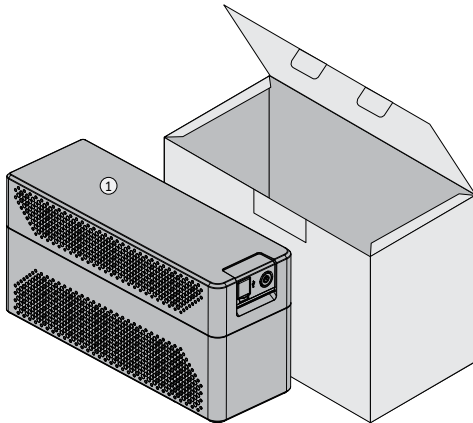
To file a claim for shipping damage or concealed damage:

1. File with the carrier within 15 days of receipt of the equipment;
2. Send a copy of the damage claim within 15 days to your service representative.



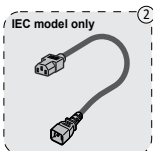
Check the battery recharge date on the shipping carton label. If the date has passed and the batteries were never recharged, do not use the UPS. Contact your service representative.

4.1.1 Package content



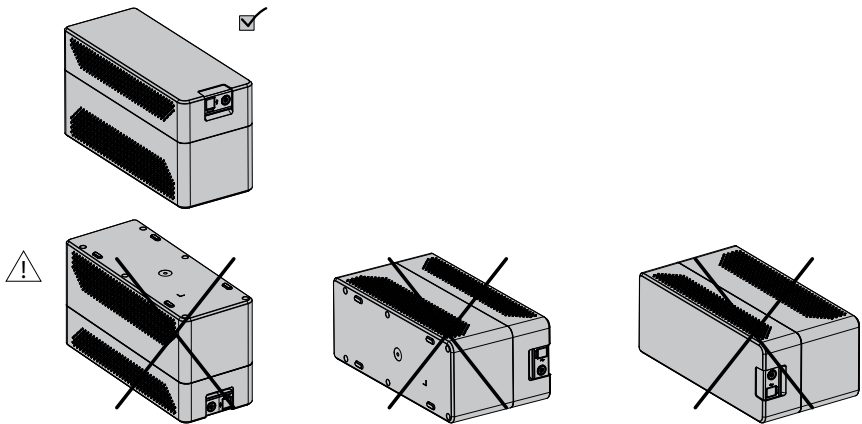
Verify that the following additional items are included with the UPS:

1. UPS
2. Connection cables
3. Instructions and Safety Information
4. Quick start



4.2 Recommended positions

Place the Eaton 5E on a flat, stable surface in its final location. Always keep 6" or 150 mm of free space near UPS openings for ventilation.



Installation in tower position

4.3 UPS connection

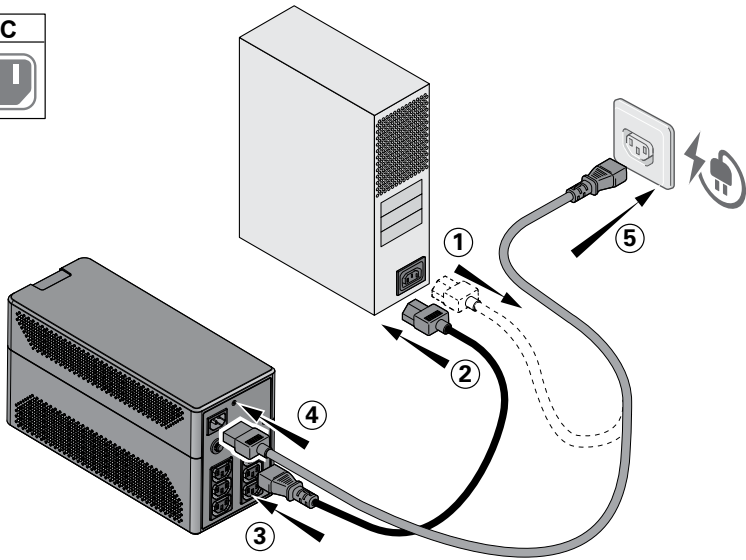
4.3.1 Power supply connection



Check that the indications on the name plate located on the back of the UPS correspond to the AC-power source and the true electrical consumption of the total load.

Connect the UPS to the AC-power source with cable through a wall outlet equipped with an earth connector, using your equipment cord.

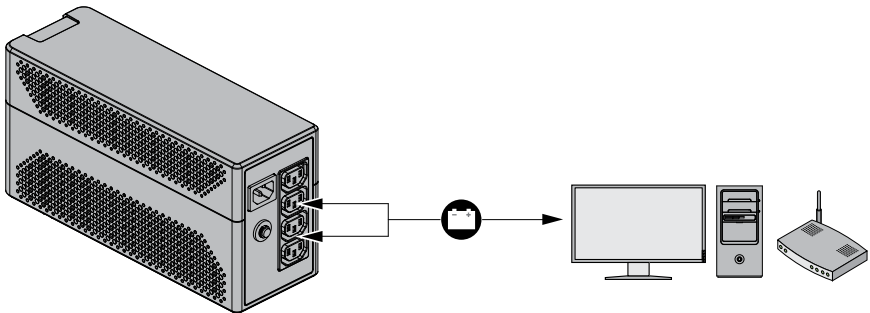
1. Disconnect the protected equipment, keep the power cable
2. Connect IEC cable on protected equipment side.
3. Connect IEC cable provided on UPS AC output side
4. Connect the power cable to UPS AC inlet
5. Connect the power cable to wall outlet



4.3.2 Protected outlets / Backup & Protected outlets

Plug critical equipment (computer, monitor, modem, etc.) to the backup & protected outlets providing battery backup power, taking care not to exceed the rated current indicated in amperes.

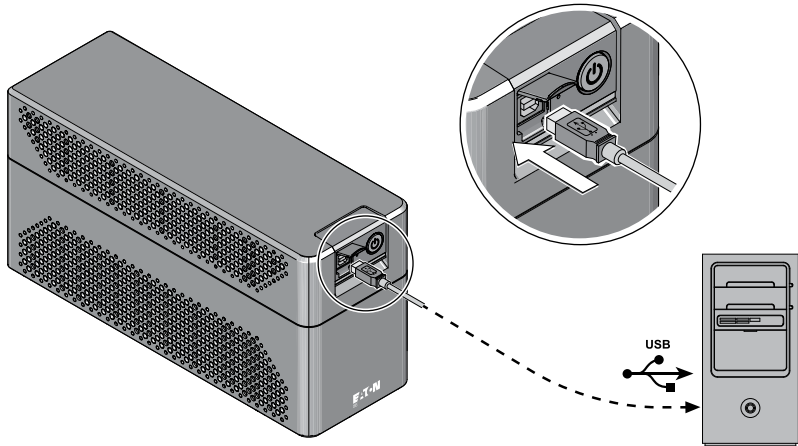
Equipment connected to these outlets is supplied as soon as the AC cord is plugged in. These are not affected by ON/OFF button.



4.4 USB COM port

Connect the UPS to the computer using the USB cable.

Enhance your purchase by downloading the monitoring software “Eaton UPS Companion” using URL : eaton.com/downloads



5 Operation

5.1 Start-up and normal operation



Check that the indications on the name plate located on the back of the UPS meets to the AC power source and the true electrical consumption of the total load.

5.1.1 Battery charge

The UPS charges the battery as soon as it is connected to the AC outlet, whether the ON/OFF button is pressed or not. It is recommended that the UPS be permanently connected to the AC power supply to ensure the best possible autonomy.

Button function:

1. Buzzer mute:

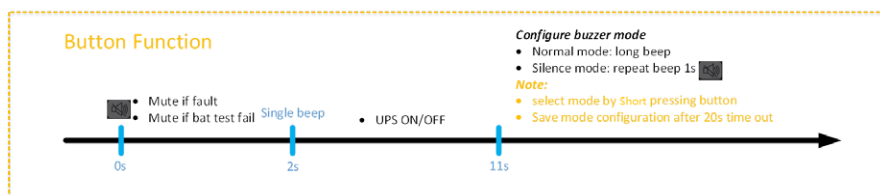
Push the button for <2s to mute the buzzer temporarily when there is a fault occur or battery test fail.

2. UPS on/off:


Push the button for >2s, then to power on/off the UPS.


3. Silence mode:



Let UPS working in the standby mode, then to push the button for >11s to enter the configuration mode.

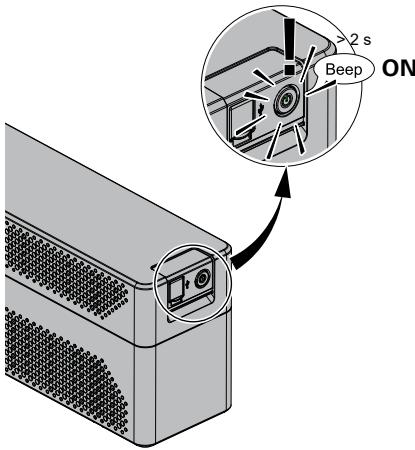


To start the UPS:

1. Verify that the UPS power cord is plugged in.
2. There is a single buzzer indication.
3. Press the  button on the UPS front panel for few seconds.



Check the UPS front panel display for active alarms or notices. Resolve any active alarms before continuing; if the  indicator illuminates in red, do not proceed until all alarms are clear (see “Troubleshooting” section). Check the UPS status from the front panel to view the active alarms. Correct the alarms and restart if necessary.

4. Verify that the  indicator illuminates in green, indicating that the UPS is operating normally and any loads are powered and protected. The UPS should be in Normal mode.
5. The UPS will make a first battery test, the  will blink for few seconds, this behavior is normal




5.2 Starting the UPS on battery

To start the UPS on battery:

1. When the UPS is disconnected from the AC power source, press the  button on the UPS front panel. The UPS transfers from Standby mode to Battery mode. The  indicator blinking and the buzzer snooze. The UPS supplies power to your equipment.
2. Check the UPS front panel display for active alarms or notices besides the “Battery mode” and related notifications that indicates missing utility power. Resolve any active alarms before continuing. See “Troubleshooting”. Check the UPS status from the front panel to view the active alarms. Correct the alarms and restart if necessary.

5.3 UPS shutdown


To shut down the UPS:

Press the  button on the front panel for two seconds. UPS starts to beep and indicator is blinking. The UPS then transfers to Standby mode, and the indicator turns off.


5.4 Operating modes

The Eaton 5E front panel indicates the UPS status through the UPS LED indicator.

5.4.1 Normal mode

When the symbol  is illuminated in green, the UPS is providing protected AC power output. The UPS charges the batteries and provides power protection to your equipment.

5.4.2 Battery mode

 When the UPS is operating during a power outage, the alarm beeps once every five seconds and the indicator illuminates blinking.


The necessary energy is provided by the battery.

When the utility power returns, the UPS transfers to Normal mode operation while the battery recharges. If battery capacity becomes low while in Battery mode, the audible alarm beeps faster.

This warning is approximate, and the actual time to shutdown may vary significantly; gracefully shutdown all applications on connected equipment due to imminent UPS shutdown.

When utility power is restored after the UPS shuts down, the UPS automatically restarts.

5.4.3 Low-battery warning

- The  indicator blinking quickly.
- The audio alarm beeps every 1.5 seconds.

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

5.4.4 End of battery backup time

- All the LEDs go OFF.
- The audible alarm stops.

5.5 Return of AC input power

Following an outage, the UPS restarts automatically when AC input power returns (unless the UPS is not shut-down by backup end) and the load is supplied again.

6 UPS maintenance

6.1 Equipment care

For the best preventive maintenance, keep the area around the equipment clean and dust free. If the atmosphere is very dusty, clean the outside of the system with a vacuum cleaner.

For full battery life, keep the equipment at an ambient temperature of 25 °C (77 °F). The batteries are rated for a 3-5 year service life. The length of service life varies, depending on the frequency of usage and ambient temperature (life divided by 2 each 10 °C above 25 °C).

If the UPS requires any type of transportation, verify that the UPS is turned off.

Batteries used beyond expected service life will often have severely reduced run-times. Replace batteries at least every 4 years to keep units running at peak performance.

Batteries runtime will be reduced at low temperature (below 10 °C).

6.2 Storing the equipment

If you store the equipment for a long period, recharge the battery every 6 months by connecting the UPS to utility power. The internal batteries charge to 90% capacity in less than 3 hours. However, Eaton recommends that the batteries charge for 48 hours after long-term storage.

Check the battery recharge date on the shipping carton label. If the date has passed and the batteries were never recharged, do not use them. Contact your service representative.

6.3 Recycling the used equipment

Contact your local recycling or hazardous waste center for information on proper disposal of the used equipment. eaton.com/recycling



Do not dispose the battery or batteries in a fire. Batteries may explode. Proper disposal of batteries is required. Refer to your local codes for disposal requirements.



Do not open or mutilate the battery or batteries. Released electrolyte is harmful to the skin and eyes. It may be toxic. Do not discard the UPS or

the UPS batteries in the trash. This product contains sealed, lead acid batteries and must be disposed of properly. For more information, contact your local recycling/reuse or hazardous waste center.



Do not discard waste electrical or electronic equipment (WEEE) in the trash. For proper disposal, contact your local recycling/reuse or hazardous waste center.

7 Troubleshooting

The Eaton 5E is designed for reliable, autonomous operation while providing you with notifications and alerts whenever a potential operational or performance issue occurs.

Usually the alarms shown by the control panel do not mean that the output power is affected. Instead, they are preventive alarms intended to alert the user.

- Events are silent status information that are recorded into the Event log. Example = “AC freq in range”.
- Alarms are recorded into the Event log and displayed on the LCD status screen with the logo blinking. Some alarms may be announced by a beep every 3 seconds. Example = “Battery low”.
- Faults are announced by a continuous beep and red LED, recorded into the Fault log and displayed on the LCD with a specific message box. Example = Out. short circuit.

Use the following troubleshooting chart to determine the UPS alarm condition.

Conditions	Possible cause	Action
The UPS outlets are not supplied with power or the UPS cannot be turn on after pressing the button	The ON/OFF Button is not pressed or the ON/OFF button is pressed too briefly.	Press the button continuously for more than 2 seconds and check that LED turns to green.
The connected devices are not supplied when AC power fails.	The devices are not connected good to the UPS outlets .	Check the cables and reconnect the devices to the UPS outlets.
Green LED flashes every 1 second and audio alarm beeps every 5 seconds.	The UPS frequently operates on battery power because the AC power source is of poor quality.	Have the electrical installation checked by a professional or use another wall outlet.
Green LED flashes every 1 second and audio alarm beeps every 1.5 second.	UPS operates on battery power with a low battery	The actual time to shutdown may vary significantly, prepare your equipment for shutdown.
Battery discharging time diminishes	Battery not yet been fully charged or overloaded	Keep UPS connected to utility power persistently for more than 6 hours to recharge the batteries. Or remove some noncritical loads.

Green/Red LED alternative flashes every 0.5 second and audio alarm beeps every 1.5 second.	The connected loads are exceed the UPS capacity or Battery fault	The connected loads are exceed the UPS capacity, remove some noncritical loads or check if some loads are failed.
Red LED is on and the audio alarm beeps continuous.	A fan fault has occurred on the UPS. The UPS outlets are no longer supplied.	Check if the fan is stopped, if no, please contact your service representative.
Red LED is on and the audio alarm beeps continuous.	An internal fault has occurred on the UPS. The UPS outlets are no longer supplied.	Contact your service representative.
USB communication fails.	Cable connection may be defective.	Re-connect the USB cable, if still not available. Contact your service representative.

7.1 Service and support

If you have any question or problem with the UPS, call Eaton or your local service representative in your country / region. Please have the following information ready when you call for service:

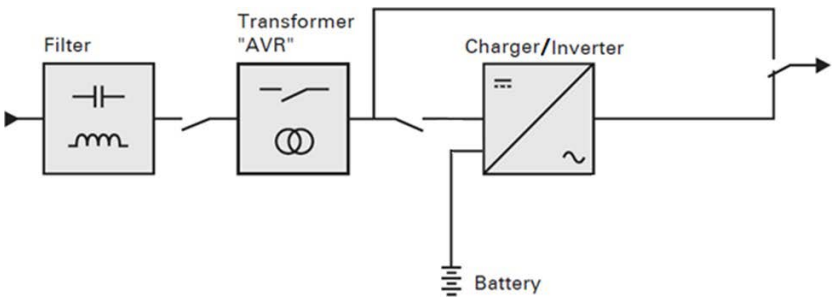
- Model number
- Serial number
- Firmware version number
- Date of failure or problem
- Symptoms of failure or problem
- Customer return address and contact information

If repair is required, you will be given a Returned Material Authorization (RMA) number. This number must appear on the outside of the package and on the Bill Of Lading (if applicable). Use the original packaging or request packaging from the Help Desk or distributor. Units damaged in shipment as a result of improper packaging are not covered under warranty. A replacement or repair unit will be shipped freight prepaid for all warranted units.



For critical applications, immediate replacement may be available. Call the Help Desk for the dealer or distributor nearest you.

8 Specification and technical characteristics



8.1 Electrical input

Catalog Number	Nominal Current	Nominal Voltages	Voltage Windows
5E700UI-EA	3.8A	220-240V; 50/60Hz	140-300V; 46-65Hz
5E900UI-EA	4.8A		
5E1200UI-EA	6.0A		
5E1600UI-EA	8.6A		
5E2200UI-EA	10A		

8.2 Electrical output

All models	Normal mode	Battery mode
Voltage regulation	Boost1 : $V_{in} \times 1.2$ Boost2 : $V_{in} \times 1.4$ Buck : $V_{in} \times 0.857$	+10/-15%
Efficiency	>95%	>60%
Frequency regulation	Same as input	+/- 1 Hz
Nominal output	220/230/240V	
Frequency	Follows input frequency	50/60Hz
Output overload	[110%,120%] 5min >120% 1s	Go to fault mode immediately

Short circuit current limitation in battery mode	Depend on the external fuse or breaker in the upstream of UPS	700VA: 5A 900VA: 6A 1200VA: 16A 1600VA/2200VA: 23A
Short Time withstand current		50ms
Transfer time	10ms for on-line to battery mode	

8.3 Battery

Internal batteries	
Specifications	700VA: 12Vdc – 1 x 12V, 7Ah 900VA: 12Vdc – 1 x 12V, 9Ah 1200VA: 24Vdc – 2 x 12V, 7Ah 1600VA: 24Vdc – 2 x 12V, 7Ah 2200VA: 24Vdc – 2 x 12V, 9Ah Brand & Reference : LEOCH/DJW12-XX or equivalent
Type	Valve Regulated Lead-Acid (VRLA) Sealed, maintenance-free, minimum 3-5 year float service life at 25°C (77°F)
Monitoring	Advanced monitoring for earlier failure detection by indicators

8.4 Environmental and safety

Standards	IEC/EN 62040-1 Safety IEC/EN 62040-2 Electromagnetic Compatibility EMC IEC/EN 62040-3 Performance
EMC (Emissions)	CISPR32 Class A IEC/EN 61000-3-2 Flickers IEC/EN 61000-3-3 Harmonics This is a category C2 (Class A) UPS product. In a residential environment, this product may cause radio interference, in which case the user may be required to take addition measures.
EMC (Immunity)	IEC 61000-4-2, (ESD): 4 kV Contact Discharge / 8 kV Air Discharge IEC 61000-4-3, (Radiated field): 10 V/m IEC 61000-4-4, (EFT): 4 kV IEC 61000-4-5, (Surges): 1 kV Differential Mode / 2 kV Common Mode IEC 61000-4-6, (Electromagnetic field): 10 V IEC 61000-4-8, (Conducted magnetic field): 30 A/m
Agency markings	CE;
Protection degree	IP20

Earthing system	This UPS can be connected to TN, TT, IT electrical supply system, same system is supplied to the load.
Protective Class	Class I
Operating temperature	0 to 40 °C (32 to 104 °F)
Storage temperature	0 to 40 °C (32 to 104 °F) with battery -25 to 55 °C (-13 to 131 °F) without battery
Relative humidity	Storage: 0-93 % non-condensing Operation: 0-85 % non-condensing
Operating altitude	2000 m
Transit altitude	Up to 10,000 meters (32,808 ft) above sea level
Audible noise	700VA/900VA/1200VA: <25dBA 1600VA/2200VA: <25dBA (Line Mode), <40dBA (Battery or AVR mode)

9 Glossary

Backup time	Time during which the load can be supplied by the UPS operating on battery power.
Low-battery warning	This is a battery-voltage level indicating that battery power is low and that the user must take action before the UPS shuts down.
Load	Devices or equipment connected to the UPS output.
Normal mode	The normal UPS operating mode in which the AC source supplies the UPS which, in turn, provides AC power to the connected loads.
Normal AC source	Normal source of power for the UPS.
OVL	Overload. When the load exceeds 100% of the maximum load of the UPS.
UPS	Uninterruptible Power System.
AVR	The Automatic Voltage Regulation maintains a constant voltage level for electrical equipment loads when the voltage falls outside the voltage tolerance range.

