



# USER MANUAL

Lion+ Series

650 - 2000 VA

Line Interactive UPS



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Line Interactive UPS

UDD-SD-110

## About The Manual

This manual is prepared for the users of Lion+ Series 650-2000 VA.

### Companion Manuals

For further information about this device and its options, please visit [www.makelsan.com.tr](http://www.makelsan.com.tr)

### Updates

Please visit [www.makelsan.com.tr](http://www.makelsan.com.tr) for updates. Always use the latest manuals.

## Shipment

Carrying vehicles or handling accessories must have enough features and characteristics to carry UPS's weight.



**DO NOT LIFT HEAVY DUTY WEIGHT WITHOUT HELP**



<18 kg (<40 lb)



32–55 kg (70–120 lb)



18–32 kg (40–70 lb)



>55 kg (>120 lb)

Be more careful of sudden movements, especially when batteries are inside of cabinet.



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# 1 Important Safety Instruction

**CAUTION:**

This product is specially designed for PCs and it is not recommended for use in any medical equipment, life-supporting system and other specific important equipment.

**CAUTION:**

Do not plug the UPS into its own output.

**CAUTION:**

Do not attach a power strip or surge suppressor to the UPS.

**CAUTION:**

To reduce risk of overheating the UPS, do not cover the UPS' cooling vents and avoid exposing the unit to direct sunlight or installing the unit near heat emitting appliances such as space heaters or furnaces.

**CAUTION:**

This unit intended for installation in a controlled environment (temperature controlled, indoor area free of conductive contaminants). Avoid installing the UPS in locations where there is standing or running water or excessive humidity and do not use it in any of the following environments:

- Any area with combustible gas, corrosive substance or heavy dust.
- Any area with extraordinarily high or low temperature (above 40°C or below 0°C) and humidity of more than 90%.
- Any area exposed to direct sunshine or near any heating apparatus.
- Any area with serious vibrations.
- Outdoor.

**CAUTION:**

The utility power outlet shall be near the equipment and easily accessible.

**CAUTION:**

In the event of an emergency, press OFF button and disconnect the power cord from the AC power supply to properly disable the UPS.

**CAUTION:**

The internal short circuiting of the UPS will lead to dangers such as electric shock or fire; therefore do not allow liquids or any foreign object to enter the UPS. No water containers (such as a water glass) or any other liquid-containing vessels shall be placed on the top of the UPS so as to avoid such dangers as electric shock.

**CAUTION:**

Please do not use the UPS in excess of the rated load capacity.

**CAUTION:**

Unplug the UPS prior to cleaning and do not use liquid or spray detergent.

**CAUTION:**

Risk of electric shock, do not attempt to disassemble the unit. No user serviceable parts inside. Refer

servicing to qualified service personnel.

**CAUTION:**

If UPS is to be stored for a long time, it is recommended to recharge the batteries (by connecting the utility power to UPS, switch “ON”), once a month for 24 hours to avoid a full battery discharge.

**CAUTION:**

In case smoke is found coming out from the device, please cut off the power supply quickly and contact the distributor.

**CAUTION:**

The UPS contains one/two large-capacity batteries. So the shell shall not be opened, otherwise such dangers as electric shock will be caused. If any internal overhaul or replacement of the battery is required, please contact the distributor.

**CAUTION:**

Servicing of batteries should be performed or supervised by personnel knowledgeable of batteries and the required precautions. Keep unauthorized personnel away from batteries.

**CAUTION:**

A battery can present a risk of electrical shock and high short circuit current. The following precautions should be observed when working on batteries:

- Remove watches, rings, or other metal objects from the hand.
- Use tools with insulated handles and wear rubber gloves and boots.
- Do not lay tools or metal parts on top of batteries.
- Disconnect charging source prior connecting or disconnecting batteries terminals.

**CAUTION:**

When replacing batteries, replace with the same type and number of the sealed lead-acid batteries.

**CAUTION:**

The maximum ambient temperature rating is 40°C.

**CAUTION:**

Do not dispose of battery or batteries in a fire. The battery may explode.

**CAUTION:**

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

**CAUTION:**

Icon  $\Phi$  on the rating label stands for phase symbol.

**CAUTION:**

During the installation of this equipment it should be assured that the sum of the leakage currents of the UPS and the connected loads does not exceed 3.5mA.

**CAUTION:**

Attention, hazardous through electric shock. Also with disconnection of this unit from the mains, hazardous voltage still may be accessible through supply from battery. The battery supply should be therefore disconnected in the plus and minus pole of the battery when maintenance or service work inside the UPS is necessary.

**CAUTION:**

In the event that there is fire occurring in the vicinity, please use dry-power extinguishers. The use of liquid extinguishers may give rise to the danger of electric shock.

**NOTE: This product complies with the safety and environmental regulations in EU.**

If the time arises to throw away your product, please recycle all the components possible. Batteries and rechargeable batteries are not to be disposed in your domestic waste! Please recycle them at your local recycling point. Together we can help to protect the environment.

## 2 Package Contents

You should have received the following items inside of package:

- UPS unit
- User manual
- AC input power cord
- USB communication cable (Optional)

## 3 Introduction

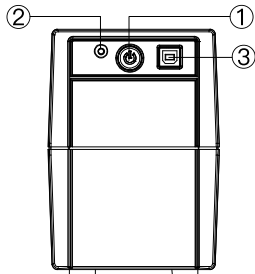
**Lion+ series** is an intelligent and compact line interactive UPS (Uninterruptable Power Supply) which is designed to protect your personal computer or sensitive electronic equipments from all forms of power interference, including complete power failures. It is equipped with many features that allow any attached equipment to operate longer and more reliability.

- Easy to use and install utilized microprocessor control to maximize the reliability and efficiency
- Equipped with built-in boost and buck AVR function
- DC Cold start function
- Green Power Function for energy saving
- Auto restart while AC recovery.
- Provides AC Overload protection
- RJ11/RJ45 (in/out) LAN/Modem/Phone line protection

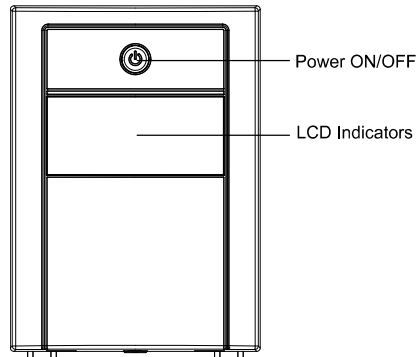


# 4 Product Overview

## 4.1 Front Panel

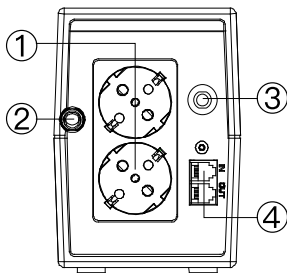


650-850VA

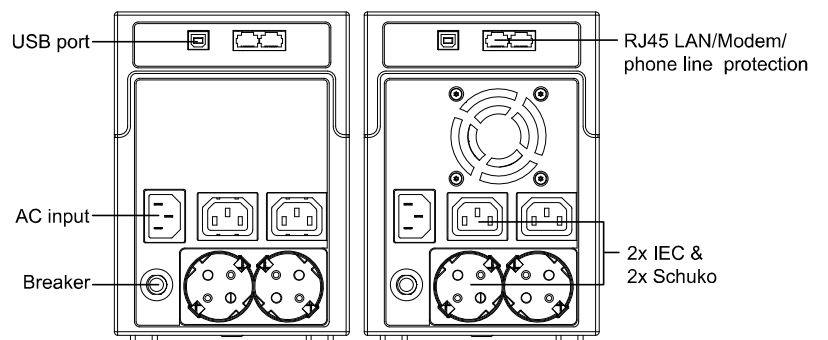


1000-1500-2000VA

## 4.2 Back Panel

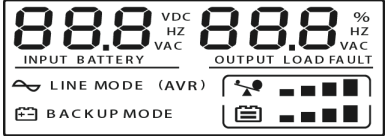






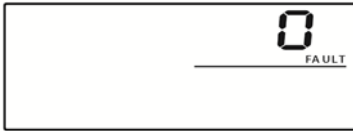


650-850VA







1000-1500-2000VA

### 4.3 Display





<p>When LCD starts to work, it will display all information for 3 seconds.</p> 	<p>When in normal mode, it will display as below.</p> 
<p>When in AVR mode, it will display as below. And mark  will flicker every 1 second.</p> 	<p>When in battery mode, it will display as below. And the mark  will flicker every 1 second.</p>  <p>Note: If I/P-V&lt;40V, input voltage will display “000”</p>
<p>When in off charging mode, it will display as below.</p>  <p>Note: The output voltage always is displayed as “000” in off charging mode.</p>	<p>When in fault mode, it will display as below. “FAULT” character and “0” character only.</p> 

### 4.4 Load Level Definition





Load level	Load bar indication
 ■	0%~25%
 ■■	25%~50%
 ■■■	50%~75%
 ■■■■	75%~100%

## 4.5 Battery Capacity Definition

1B model battery definition:

Battery level	Battery bar indication	
	Battery mode	Other mode
 ■	Battery voltage < 11V	Battery voltage < 12.7V
 ■ ■	11V ≤ battery voltage < 11.5V	12.7V ≤ battery voltage < 13.2V
 ■ ■ ■	11.5V ≤ battery voltage < 12.5V	13.2V ≤ battery voltage < 13.5V
 ■ ■ ■ ■	Battery voltage ≥ 12.5V	Battery voltage ≥ 13.5V

2B model battery definition:

Battery level	Battery bar indication	
	Battery mode	Other mode
 ■	Battery voltage < 22V	Battery voltage < 25.4V
 ■ ■	22V ≤ battery voltage < 23V	25.4V ≤ battery voltage < 26.4V
 ■ ■ ■	23V ≤ battery voltage < 25V	26.4V ≤ battery voltage < 27V
 ■ ■ ■ ■	Battery voltage ≥ 25V	Battery voltage ≥ 27V

## 4.6 Overload Definition

The mark will flicker every 1 second



## 4.7 Battery Low Definition

The mark will flicker every 1 second



## 5 Installation and Initial Startup

**NOTE:** Before installation, please inspect the unit. Be sure that nothing is damaged.

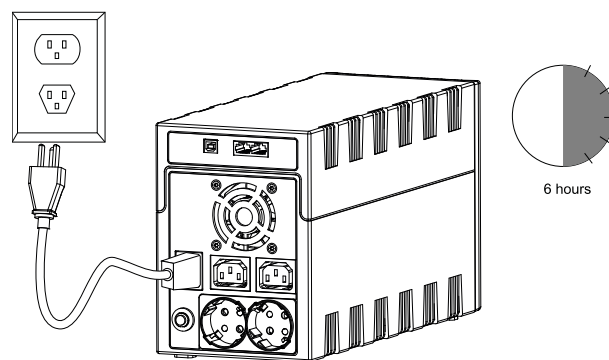
### 5.1 Placement and Storage Conditions

Install the UPS in a protected area that is free of excessive dust and has adequate air flow around the unit, and is free from excessive dust, corrosive fumes and conductive contaminants. Please place the UPS away from other units at least 20 cm to avoid interference. Do NOT operate the UPS where the temperature exceeds 0-40° C and the humidity is over 0-90 % RH.



### 5.2 Connect to Utility and Charge

Plug in the AC input cord to the 2-pole, 3-wire grounded wall outlet. For the best results, we suggest charging the battery at least 6 hours with no load (no electrical devices such as computers, monitors, rtc.) connected before initial use. The unit charges its battery while connecting to the utility.



### 5.3 Connect the Loads

Plug in the loads to output receptacles on the rear panel of the UPS. Simply turn on the power switch of UPS unit, and devices connected to the UPS will be protected by UPS unit

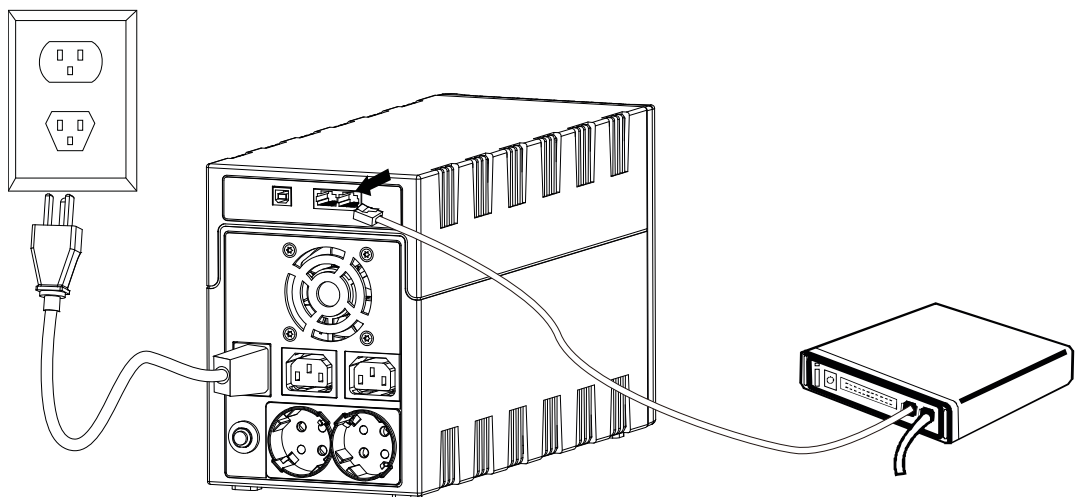
**CAUTION: Do not attach a power strip or surge suppressor to the UPS.**

**CAUTION: Never connect a laser printer or scanner to the UPS unit, because in-rush current generated by motor's devices may cause the damage of the unit.**



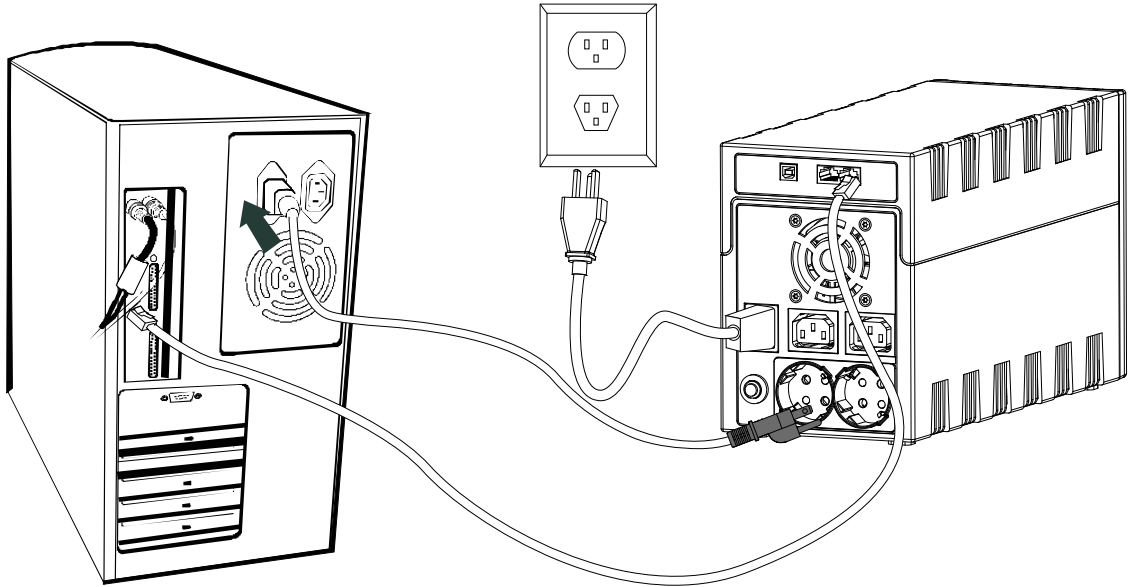
### 5.4 Connect LAN Cable, Modem or Phone Line for Surge Protection

Connect for example a single modem or phone line into surge-protected “IN” outlet on the back panel of the UPS unit. Connect from “OUT” outlet to the computer with another phone line cable.



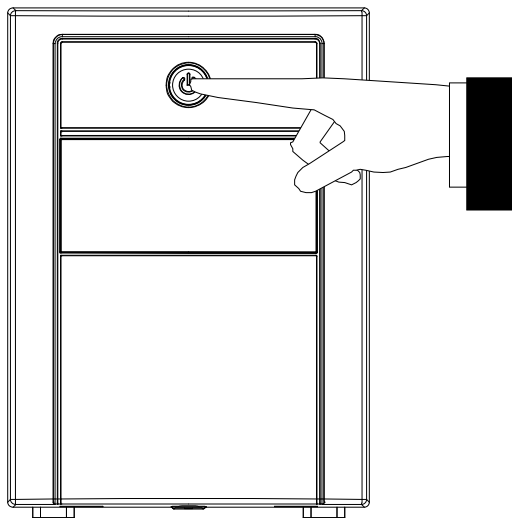
## 5.5 Connect USB Cable

To monitor the UPS status, such as unattended UPS shutdown and start-up, by using bundled software, please connect the UPS and PC with USB cable included.



## 5.6 Turn On / Off The Unit

Turn on the UPS unit by pressing the power switch. Turn off the UPS unit by pressing again the power switch



# 6 Functions and Operations

## 6.1 DC Start Function

DC Start Function enables UPS to be started up when AC utility power is not available and battery is fully charged. Just simply press the power switch to turn on the UPS.

## 6.2 Green Power Function

These series are equipped with Green Power Function for saving power and protecting battery. The feature of deep discharge protection is adopted on battery mode. If no load is connected to the UPS, it will automatically shut down after 5 minutes for energy saving while running on battery mode. The UPS will restart while AC recovery.

## 6.3 AVR (Automatic Voltage Regulation)

If the quality of the incoming mains is poor, the AVR boosts a low incoming voltage or reduces a high one. The load receives a voltage within the normal range.

## 6.4 Auto Restart While AC Recovery

## 6.5 Audio Indicator

<u>Audible Alarm</u>	<u>Situation</u>
Sounding every 10 seconds	Battery mode
Sounding every 1 seconds	Battery low
Sounding every 0.5 seconds	Overload
Continuous sounding	Faulty

## 7 Software Installation On Your PC

Connected by USB to a PC or notebook, the Software enables communication between the UPS and the computer. The UPS software monitors the status of the UPS, shuts down the system before the UPS is exhausted and can remotely observe the UPS via the Network (enabling users to manage their system more effectively). Upon AC failure or UPS battery low, UPS takes all necessary actions without intervention from the system administrator. In addition to automatic file saving and system shut-down functions, it can also send warning messages via pager, e-mail etc.

- Use the bundled CD and follow the on-screen instructions to install the software WinPower.
- Enter the following serial No. to install software: 511C1-01220-0100-478DF2A
- After the software is successfully installed, the communication with UPS has been established and a green icon will appear in the system tray.
- Double-click the icon to use the monitor software (as above).
- You can schedule UPS shutdown/start-up and monitor UPS status through PC.
- Detail instructions please refer to the e-manual in the software.



Check <http://www.ups-software-download.com/index.htm> from time to time to get the latest version of monitoring software.



# 8 Maintenance

## 8.1 General

The UPS is virtually maintenance free: take care of proper environmental conditions and keep air inlets-outlets free of dust.

## 8.2 Fuses

If the AC input fuse is defect, be sure it is replaced by a compatible fuse from the same make and type.

Never short circuit batteries. When working with batteries, remove watches, rings and other metal objects, and only use insulated tools.

## 8.3 Batteries

This series UPS only requires minimal maintenance. The battery used for standard models are value regulated sealed lead-acid maintenance free battery. These models require minimal repairs. The only requirement is to charge the UPS regularly in order to maximize the expected life of the battery. When being connected to the mains power, whether the UPS is turned on or not, the UPS keeps charging the batteries and also offers the protective function of overcharging and over-discharging.



Read all safety rules before replacing the battery.

## 9 Trouble Shooting

Symptom	Possible Cause	Remedy
No LED display on the front panel.	1. Battery weak.	1. Charge battery up to 8 hours.
	2. Battery defect.	2. Replace with the same type of battery.
	3. Power switch is not pressed.	3. Press the power switch again.
Alarm buzzer beeps continuously when AC supply in normal.	Overload of the UPS.	Verify that the load matches the UPS capability specified in the specs.
When power failure back-up time is shorten.	1. Overload of the UPS.	1. Remove some non-critical load.
	2. Battery voltage is too low.	2. Charge battery 8 hours or more.
	3. Battery defect due to high temperature operation environment, or improper operation to battery.	3. Replace with the same type of battery.
Mains normal but LED is flashing.	Power cord is loose.	Reconnect the power cord properly.

If any abnormal situation occur that are not listed above, please call service people immediately.

## 10 Specifications

<b>MODEL</b>					
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CAPACITY	650VA/390W	850VA/510W	1000VA/600W	1500VA/900W	2000VA/1200W
<b>INPUT</b>					
RATED VOLTAGE	220/230/240VAC				
VOLTAGE RANGE	162VAC-268VAC±%7				
FREQUENCY RANGE	50/60Hz ±%1				
<b>OUTPUT</b>					
RATED VOLTAGE	220/230/240VAC				
VOLTAGE PRECISION	±%10 (Battery mode)				
FREQUENCY (AC MODE)	same as mains				
FREQUENCY (BATTERY MODE)	50/60Hz ±%1Hz				
WAVEFORM	Modified sine wave				
CREST FACTOR	3:1				
TRANSFER TIME	2 ~ 6 ms, 10 ms Max.		4 ~ 8 ms, 10 ms Max.		
OVERLOAD	<p>line mode:  110%+20%/-10%; shutdown after 5 minutes and go to fault mode for all model.  120%+20%/-10%; shutdown immediately and go to fault mode for 1B model  120%+20%/-10%; shutdown after 8 sec and go to fault mode for 2B model</p> <p>battery mode:  110%+20%/-10%; shutdown after 5 seconds  120%+20%/-10%; shutdown immediately</p>				
<b>EFFICIENCY</b>					
INVERTER MODE	line mode: >95% AVR mode: >88%				
BATTERY MODE	>60%				
<b>BATTERY</b>					
BATTERY CONFIGURATION	12V/7AH*1	12V/9AH*1	12V/7AH*2	12V/9AH*2	12V/9AH*2
CHARGE CURRENT	About 1A at normal mode				
RECHARGE/CHARGING TIME	6 hours to 90% at normal mode after complete discharge (Load>50%)				
BACKUP TIME	~ 16 min.	~ 20 min.	~30 min.	~ 50 min.	~ 50 min.
<b>PROTECTION</b>					
FULL PROTECTION	Discharge, overcharge, overload protection		Discharge, overcharge, overload, short circuit protection		
<b>INDICATION</b>					
AC MODE	Green LED lighting		Green LED lighting		
BATTERY MODE	Green LED lighting		Yellow LED lighting		
FAULT	N/A		Red LED lighting		
<b>ALARM</b>					
BATTERY MODE	Sounding every 10 seconds				
BATTERY LOW	Sounding every 1 seconds				
OVERLOAD	Sounding every 0.5 seconds				
FAULT	Continuously sounding				
<b>PHYSICAL</b>					
DIMENSION (W*D*H)	278*100*143 mm		365*139*195 mm (for 1B and 2B model)		
PACKING (W*D*H)	332*142*225 mm		457 * 235 * 297 mm		

NET WEIGHT	4.35kg	5.15kg	9.07kg	10.74kg	10.74kg
GROSS WEIGHT	4.55kg	5.35kg	10.2kg	12kg	12kg
<b>OPERATING ENVIRONMENT</b>					
TEMPERATURE	0°C ~ 40°C				
STORAGE TEMPERATURE	-20°C ~ 55°C				
RELATIVE HUMIDITY	0 to 90%				
AUDIBLE NOISE (at 1m)	≤40 dB			≤45 dB	
<b>OTHER</b>					
COMMUNICATION PORT	USB				
SOFTWARE	Windows family/Linux/Mac				

## 11 GUARANTEE

### 11.1 Terms of Guarantee

- Our products are under a two-year guarantee starting from the date of delivery against malfunctions resulting from production, material and workmanship faults. Malfunctions due to

such type of faults will be removed without claiming any price of workmanship or spare parts to be replaced.

- Whether aforementioned malfunctions originate from usage faults or not are determined with a report to be issued by service stations, if there exists no service stations, by one of seller, dealer, agency, representative, importer or manufacturer or producer of those products respectively.
- Repair time of defective products is twenty business days at most. This period starts from the date when products are delivered to one of seller, dealer, agency, representative, importer or one of manufacturer or producer. Provided that products break down within the period of guarantee, the time passing during the repair process is added to the guarantee time. Provided that faults of products cannot be removed within ten business days, manufacturer-producer or importer is obliged to assign another product having similar features for the use of consumers until the faulty product has been repaired.
- Even though consumers exercise their repair rights, they can claim free replacement of products, refund or price discount at the rate of fault in the events;
  - That, besides, the product, as of the date when the product is delivered to the consumer, breaks down four times a year or six times within the guarantee period to be determined by the manufacturer-producer and/or importer at least, on the condition of being in guarantee period, such malfunctions perpetuate passing over;
  - That maximum time required for the repair of products is exceeded;
  - That repair of the malfunction is determined as impossible through a report to be issued by service station, if there exists no service station, one of seller, dealer, agency, representative, importer or manufacturer or producer of the company respectively.
- The consumer is, on demand, obliged to submit guarantee certificate in terms of repairs or replacements within the scope of guarantee.
- It is essential that you definitely perform damage control over external packaging before receiving the products to be sent through freight. In the event of any damage, delivery person must be made to prepare a “damage determination record”. (For example; during the delivery process, the product has been checked and seen that is damaged.)
- After the damage determination record has been issued, we request you to inform the MAKELSAN head office of the case. Products to be received from freight by signature means that products have been received completely and without no damage.
- Repairs of plug-and-play products in the places where no service point is around are performed in the factory of MAKELSAN or the nearest service point according to the direction to be made by the MAKELSAN head office. Defective product is delivered by hand to the nearest service point or to the contracted freight company in its original packaging to be sent to the factory of MAKELSAN according to the direction to be made by the MAKELSAN head office. For malfunctions in the scope of guarantee, shipment fees are under the

responsibility of MAKELSAN on the condition that products are delivered to the contracted freight company.

- The device must be sent as packed in its original packaging as long as it is not desired by the service. Original packaging of devices should be preserved in order to use them for shipment of devices in terms of repairs to occur. Otherwise, no responsibility is assumed with regards to any troubles to be experienced.
- All defective products to be delivered by hand or through freight are to meet the necessary shipment requirements. (Anti-static protective, bubble wrap or box etc.)It is essential that legible barcode serial number belonging to the product be on the product. Otherwise, it is not covered in the scope of the guarantee.
- It is essential that products to be sent through freight definitely be together with delivery note, and that serial/model/malfunction details be written on delivery note to be sent (for example, breakdown report form), and that packaging content match with the products specified in the delivery note. Otherwise, freight is not accepted.
- The use of the Guarantee Certificate, submitted together with products with MAKELSAN trademark, is permitted by the T.R. Ministry of Industry and Commerce and General Directorate of Protection of Competition with no..... in accordance with the law, with no. 4077, and the notification, with no. TRKGM-95/116-117, issued basing the aforementioned law. MAKELSAN acknowledges and undertakes to obey the liabilities determined by the laws and legislations.

## **11.2 Cases Not Covered by the Guarantee**

- Breakdowns resulting from the use of products contrary to the issues or the environment conditions (temperature, humidity etc.) specified in the user manual are not covered in the scope of guarantee.
- Damages and breakdowns resulting from the use of software, hardware, interface, accessories or consumables apart from those used together with products or recommended ones; changing place, wrong and insufficient maintenance, calibration or use; its operation contrary to environment specifications published for products; insufficiency of air installation; use of products in ambient having excessive humid or temperature; its operation in environment harmful for electrical circuits and abrasive; and accidents, impacts, electric, shipment, natural disasters, not limited to the ones listed above, are not covered in the scope of product guarantee.
- In the general examination performed during the breakdown acceptance process, certain troubles causing products not to be covered in the scope of guarantee might not be understood. Provided that such faults come up in the detailed examination to be performed via technical service equipment, products are returned to customers.
- Products not covered in the scope of guarantee can, on demand of customer, be treated in a fee-paying way within the bounds of possibilities of the authorized service. Products out of the scope of guarantee, repairs of which are not possible are returned to customers.

- Damages and breakdowns resulting from treatments, internally or externally tampering, efforts to repair and spare part replacement of products, without approval of MAKELSAN, and those resulting from treatment of unauthorized service/dealer/person/establishment, are not covered in the scope of guarantee. Breakdown, cracks, scratches and wear, corrosion and dust to occur in time and by use in the outer surfaces of products (cabinet, cover, and front panel) are not covered in the scope of guarantee.
- In the event that original serial numbers, guarantee labels and stamps on products are removed or distorted, products are not covered in the scope of guarantee. No guarantee is issued against the use of products for any other purpose, apart from those specified in introduction or manual of products.
- Shelf lives of VRLA batteries are 6 months under the ambient temperature of 15 °C and 3 months under the ambient temperature of 25 °C.
- It is compulsory that systems to be purchased be commissioned within 3 months.

## **12 CONTACT INFORMATION**

# MAKELSAN®

Uninterruptible Power Supplies

[www.makelsan.com.tr](http://www.makelsan.com.tr)

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