SERVICING INSTRUCTIONS
- USER'S MANUAL

Uninterruptable power supply unit
LESTAR of MD series
Line Interactive
with AVR Auto-voltage Regulation

MD-450E / MD-625E / MD-800E CE

Prior to switching on the uninterruptable power supply unit please read carefully these instructions and warranty conditions!

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1. USE OF THE Uninterruptable POWER SUPPLY UNIT

UPS (Uninterruptable power supply unit) is designed for work with the equipment of information systems, such as: computers, networks, servers, modems, as well as other electronic equipment, such as revenue cash registers and telephone exchanges. Use of the uninterruptable power supply unit with electric appliances, such as refrigerators, electric water kettles, mechanical household appliances AGD, and other electric motors is unallowable. LESTAR will not bear any responsibility for damages caused as a result of improper connection of the afore mentioned equipment.

2. SAFETY INSTRUCTIONS

ATTENTION!

1. UPS is equipment designed for high voltage operation. Inside the unit there are live parts dangerous for human life!
2. Please don't open yourself the casing, don't make repairs, etc. since this brings about hazard of electric shock. If you have some questions, please come into contact with our company, or the salesman.
3. The device is not recommended for protection of life saving equipment!
4. Please don't spill liquids on the UPS casing, or inside it.
5. The uninterruptable power supply unit should be stored in dry rooms. Avoid location of UPS in the neighborhood of environment of considerable humidity, or in the vicinity of liquids, such as chemical water solutions.
6. Avoid location of UPS in a place, where it will be exposed to the action of sun rays , or other heat sources, as well as in the places of low temperature. Recommended temperature range is 15°C÷25°C.
7. Please don't plug ventilating holes making possible escape of heat from the interior of UPS.
8. For connecting UPS please use grounded supply cable; connecting plug of UPS should be plugged-in to a socket having grounding circuit.
9. Under normal working conditions when supplied from „supply mains" UPS is protected by a fuse against overloading, or short circuit.
10. Supply socket, to which UPS has been connected, should be located close to the device and should be easily accessible.
11. The uninterruptable power supply unit should have its own source of power - internal accumulators. UPS output can be under tension even, if it has been disconnected from supply mains ! Full disconnection of UPS from the source of power will take place after removal of the clamp from the accumulator. Such operation may be performed by an authorized serviceman only !
12. In order to exchange the battery please contact with the service station indicated by LESTAR.
13. This device is not a lighting protector. Should a house or antenna be directly struck by a lighting, UPS might not protect your equipment.
14. The uninterruptable power supply unit should be connected to a socket, whose phase wire has been protected by a fuse of rated value not greater than 16A. This is in conformity with the regulations IEC 950 (EN 69950-2000) as far as user's safety is concerned. To this aim oblige the installer of the device to check the electric system of the building (room), where the uninterruptable power supply unit will operate.

3. EXCHANGE OF FUSE

In the case of connection of a unit, whose power consumption exceeds considerably the rated value, or in the case of a short circuit in the mains socket, the fuse can be blown out. The fuse, as well as the spare fuse, are located in a holder in the rear panel of the device. In order to exchange the fuse, switch off the UPS by means of the power switch and then pull out the supply cable from the socket, pull out the fuse holder and exchange the fuse (delay fuse WTA-T: 4A MD-450E, 6A MD-625E, 8A MD-800E).

4. INSTALLATION, CONNECTION AND INSTALLING REMARKS

1. Unpack UPS in order to check, whether the product has not been damaged. Should any damages be detected, contact with the salesman.
2. Connect the AC supply cable to UPS socket.
3. Depress and hold back the power switch (15sec.); LED will illuminate, which means that UPS is supplied with alternating current.
4. Connect the computer supply cable, or the supply cable of other peripheral equipment (IEC 320) to output sockets of UPS. Then switch on the computer and disconnect UPS supply cable in order to check the unit for proper operation. Supply cable is to be disconnected by removing the plug with a grounding pin from the mains socket.
5. Prior to proceeding to operation of the unit switch on UPS and charge it for 8 hours. This will enable to charge the accumulator. Should operation of the unit begin before a full charging of the accumulator, then the time of emergency operation will be shorter than the full capacity of the accumulator.
6. UPS is switched off by depression and hold back of the power switch, which is accompanied by extinguishing of LED
7. Don't use UPS with laser printers, electric motors and mechanized appliances because of a high starting current.
8. Don't connect the uninterruptable power supply unit to an electric system cooperating with a power generating set.
9. If you don't anticipate the use of UPS for a longer period of time, please charge the accumulator for minimum 12 hours every 3 months.
10. Full discharging of accumulator can lead to a considerable shortening of its service life. After discharging it should be charged again as soon as possible. If the device has been fully discharged for a period of time longer than 3 days, it could be irreversibly damaged!
11. Accumulator will re-gain its full operating capacity after about 1 month of mains operation.
12. Permissible value of current leakage to the earth must not exceed 3,45 mA for MD-450E and 3,47 mA for MD-625E and MD-800E.

5. DESCRIPTION OF OPERATION

Emergency uninterruptable power supply units of OfficePower AVR series are up-to-date source of power for various electronic equipment, mainly for computer systems to be used for professional purposes and in households. The application of a uninterruptable power supply unit eliminates 230V line interference. (over-voltages, current pulses, voltage decays) and ensures stable and dependable operation of computer systems.
During normal mode of operation when supplied from supply mains green diode is illuminated. The uninterruptable power supply unit will filter the existing voltage thus eliminating line interference and in the case of a drop, or growth of voltage the AVR system (automatic voltage regulation) is being stabilized on the 230 V level.
In the case of mains voltage decay, the uninterruptable power supply unit during a „fraction of second" (6 ms) is being switched over to the work from a accumulator. This is being signaled by a slow flickering of the green diode and a sound signal synchronized with it (every approx. 4 sec). Quick flickering of diode and the same sound signal (every approx. 1 sec.) means that the accumulator has been almost fully discharges and that after a moment the uninterruptable power supply unit can be disconnected. This is being signaled by extinguishing of the red diode. Emergency supply time is dependent upon the degree of charging of the accumulator and the load connected to the uninterruptable power supply unit and amounts to 4 to 21 min. The uninterruptable power supply unit is provided with a function, owing to which it may be switched on without an external supply (so called cold start). This has been described in the chapter devoted to the properties and functions of the uninterruptable power supply unit.

6. FEEDING STRIPS

Frequently expressed opinions, that the uninterruptable power supply units perform also the function of anti-interference strips, is erroneous. Extended LESTAR strips (of POWER MULTIPROTECTOR, POWER MASTER HIGH series) have incomparably greater possibilities of attenuation and adsorption of energy than UPS units available on the market. As a result, their application ensures far greater efficiency and better protection of your valuable equipment.
In order to better understand the level of protection, compare the data given below with the data of the uninterruptable power supply units:

	Absorption of pulse energy	Max. current	Attenuation
POWER MULTIPROTECTOR	1176 Joules	19,500A	70 dB
POWER MASTER HIGH	480 Joules	15,500A	60 dB

Most uninterruptable power supply units have filtering systems and varistor attenuators of very low values of the adsorbed energy. Some of them don't have them at all and so the existing level of protection is questionable.
Hvence, in the case of a strong impact and damaged varistor attenuator also the application of an anti-interference strip before the UPS being connected also brings about a considerable financial advantage, because the possible cost of service and repair of the strip is considerably lower than of each UPS separately.
We do recommend the use of LESTAR supply strips and comparison of the data and technical parameters.

ANTI-INTEFRENECE LESTAR STRIP ***UPS LESTAR*** ***COMPUTER SYSTEM***

7. PROPERTIES AND FUNCTIONS

✓ **FULL AVR FUNCTION**
Operation with AVR function consists in regulation of output voltage on a level of 230 V (+/-10%). In spite of fluctuations of the input voltage within the limits from 172 V up to 278 V, the output voltage is constant. Voltage regulation is effected without drawing energy from an accumulator.

✓ **LINEAR INTERACTIVE SUPPLY OF UPS OUTPUT**
AVR function is combined with switching over to operation with supply from accumulator, when the threshold of operation of AVR system has been exceeded. Within the range of voltage from 172 V up to 278 V regulation of output voltage takes place by means of AVR function. Should voltage drop below 172V, or raise above 278V, then the uninterruptable power supply unit will be switched over to operation with supply from an accumulator.

✓ **COLD START**
The uninterruptable power supply unit can be started when not supplied from the supply mains. This function is possible only for a standard set consisting from a computer and 15" monitor and is activated by switching on the power switch. The uninterruptable power supply unit will then operate in the emergency mode of operation and will take energy from the accumulator.

✓ **TELEPHONE FILTER RJ45**
UPS offers the possibility of connection of a modem, or telephone. Telephone line is protected against over-voltage and interference, which can occur in the telephone network.

✓ **PROTECTION OF ACCUMULATOR FULL DISCHARGING**
Microprocessor automatic system for testing and control of operation of the emergency uninterruptable power supply unit protects the uninterruptable power supply unit against full discharging. Should condition close to full discharging be detected, then the uninterruptable power supply unit will be completely disconnected.

✓ **SOUND SIGNAL OF OVERLOADING, OR FULL DISCHARGING OF ACCUMULATOR**
Full discharging of accumulator and switching off of the uninterruptable power supply unit in a short time is signaled by a quick flickering of the green diode and a single sound signal lasting 1 second.

✓ **AUTOMATIC SWITCHING OFF IN THE CASE OF A SHORT CIRCUIT OR OVERLOADING**
The uninterruptable power supply unit is being automatically switched off in the case of overloading, or short circuit. This is being signaled by a long acoustic signal.

✓ **PROTECTION AGAINST OVER-VOLTAGE IN SUPPLY MAINS**
The uninterruptable power supply unit protects the equipment connected to it against over-voltage and current pulses, which can appear in supply mains. This is effected by rapid varistors characterized by a big energy absorption (145 Joules).

✓ **OUTPUT SOCKETS (MD-450E, MD-625E x2; MD-800E x3)**
In order to be connected to a computer the uninterruptable power supply unit has been provided with three output sockets (MD-450E, MD-625E) or four output sockets (MD-800E). Active power expressed in Watts connected to the both sockets may not exceed 270W (for MD-450E), 375W (for MD-625E) and 480W (for MD-800E).

✓ **SOFTWARE FOR COMMUNICATION PORT** (option)
The uninterruptable power supply unit is provided with a communication port RS 232. After having been connected to the computer, it together with the software renders possible control of operation of emergency uninterruptable power supply unit.

8. DESIGN OF THE UNINTERRUPTABLE POWER SUPPLY UNIT

ALARMS AND SIGNALING

OPERATING STATUS	VISUAL INDICATORS	AUDIO INDICATORS
AC normal	Continously green LED light	——
BACKUP mode	1 flash green LED every 3 sek.	1 beep every 3 sek.
Battery low	1 flash red LED every 0,5 sek.	1 beep every 0,5 sek.
Overload	Continously red LED light	Continously beep
UPS OFF	——	——

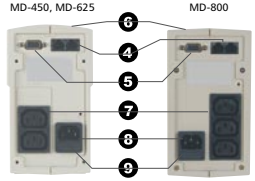
EXTERNAL ELEMENTS

FIG. 2 FRONT PANEL

MD-450, MD-625 MD-800

RYS. 3 REAR PANEL

MD-450, MD-625 MD-800



1. On/Off Switch, 2. Optical signalling, 3. Model, 4. Telephone surge protection port, 5. RS 232 port 6. Name plate, 7. Backup Power Outlets (MD-450E, MD-625E x2; MD-800E x3), 8. AC Power Inlet 230V. 9. Input Circuit Breker or AC Fuse

9. TECHNCAL DATA

Model		UNINTERRUPTABLE POWER SUPPLY UNITS OF OFFICE POWER AVR SERIES MD-450E	MD-625E	MD-800E
Power		450VA/270W	625VA/375W	800VA/480W
Input	Rated input voltage	~230V		
	Rated input current	1,95A	2,70A	3,50A
	Switching over threshold supply mains-UPS	~172V ÷ ~278V		
	Input frequency	50 Hz +/- 5%		
Output	Output voltage range (AVR)	230V +/- 10%		
	Voltage control	230V +/- 3%		
	Output frequency of accumulator	50 Hz +/- 1%		
	Frequency regulation	+/- 1Hz		
	Course form	Approximate sinusoid		
Switching over time		6 ms		
Accumulators	Type	Sealed lead-acid accumulator, service-less		
	Back-up time P_{max} / $P\ 0{,}5_{max}$	4÷15 min	5÷16 min	6÷16 min
	Charging time	4 hours to 90% of full capacity		
	Kind of accumulator	12V 7Ah x 1	12V 7Ah x 1	12V 9Ah x 1
Protections	Protection of accumulator	Auto-test and full accumulator charging protection		
Light indicator	Signaling diode	Continuous illumination of diode - normal operation		
		Slow flickering of green diode - emergency supply		
		Quick flickering of green diode - battery al/most fully discharged, readiness to be switched off		
		Lack of diode illumination - UPS switched off		
Electric protection	Protection against current surge	145 Joules		
	Protection against overload	Automatic electronic cutting off in the case of a short-circuit		
		1 x fuse WTA-T 4A	1 x fuse WTA-T 6A	1 x fuse WTA-T 8A
	Voltage filtration	Interference eliminator RFI/EMI		
Protection Modem/Supply mains		RJ45		
Communication with computer	Interface	RS 232		
	Software	optional		
Other	Dimensions (mm) length x width x height	354x95x168		354x95x171
	Weight	5 kg	6 kg	7 kg
	Working conditions	Temp. 0-40ºC up to 90% humidity Storage does not cause condensation15°C to 45ºC		
	Input sockets	2 output sockets		3 output sockets
	Noise level	Up to 30 dB from a distance of 1 meter		

Right of modifications without separate notification reserved by the manufacturer.

10. MALFUNCTIONS AND REMEDIES

Problem	Check - correct
Units connected to an emergency uninterruptable power supply unit are not working.	1. Check conductors uninterruptable power supply unit - receiver for proper connection. 2. Check the fuse at the uninterruptable power supply unit inlet, if blown out replace (spare fuse in tool set). 3. Check and, if necessary reduce the value of the load of the connected units.
Alarm - switched on sound signal, flickering of diode	1. The units connected to the uninterruptable power supply unit have an excessive power, check and if necessary reduce the load. 2. The uninterruptable power supply unit is damaged - switch off the uninterruptable power supply unit and contact with the service station.
The uninterruptable power supply unit operates being supplied from accumulator	1. Check presence of voltage in ths supply socket, to which the uninterruptable power supply unit has been connected. 2. Check and replace (exchange), if necessary, the input fuse in the uninterruptable power supply unit (spare fuse in a tool kit). 3. Check the supply cable.
Short working time when being supplied from accumulator	1. Accumulator has not been fully charged - check, or recharge. 2. Check whether the uninterruptable power supply unit is not overloaded. 3. Accumulator is damaged, get in contact with the service station.

11. PACKAGE CONTENT:

1. LESTAR uninterruptable power supply unit x 1
2. Cable IEC 320 - for the unit being supplied x 1
3. Spare fuse in supply socket x 1
4. Servicing instructions + warranty card x 1
5. Cable + software (option) x 1

Data zgłoszenia/ Application date/ Дата заявки/ Datum ohlášení	Opis naprawy/ Repair description/ Описание работ по ремонту/ Popis opravy	Data wykonania/ Execution date/ Дата выполнения Datum vykonání/	Podpis i pieczęć serwisu/ Signature and stamp of service/ Подпись и печать сервиса/ Podpis a razítko servisu

12. WARRANTY. PLEASE CONTACT YOUR REGIONAL DEALER FOR DETAILS.