

SERVICING INSTRUCTIONS - USER'S MANUAL

Uninterruptible power supply unit LESTAR of MDS series Line Interactive with AVR Auto-voltage Regulation

MD-400S / MD-600S / MD-800S



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

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1. USE OF THE UNINTERRUPTIBLE POWER SUPPLY UNIT

(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 cash registers and telephone exchanges. Use of the uninterruptible 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 uninterruptible 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°C0+25°C0.
 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 uninterruptible power supply unit should have its own source of power - internal accumulators. UPS should 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 lightning protector. Should a house or antenna be directly struck by a lightning, UPS might not protect your equipment.
 14. The uninterruptible 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 uninterruptible 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-1, 3,15A or 4A).

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 uninterruptible 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 and 3.47 mA for MD-600S and MD-800S.

5. DESCRIPTION OF OPERATION

Emergency uninterruptible 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 uninterruptible power supply unit eliminates 230V line interference. (over-voltages, current pulses, voltage decay) and ensures stable and dependable operation of computer systems.

During normal mode of operation when supplied from supply mains green diode is illuminated. The uninterruptible 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 uninterruptible power supply unit during a „fraction of second“ (~2ms) is being switched over to the work from a accumulator. This is being signalled 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 discharged and that after a moment the uninterruptible power supply unit can be disconnected. This is being signalled by extinguishing of the green diode. Emergency supply time is dependent upon the degree of charging of accumulator and the load connected to the uninterruptible power supply unit and amounts to 5 to 21 min. The uninterruptible 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 uninterruptible power supply unit.

6. FEEDING STRIPS

Frequently expressed opinions, that the uninterruptible 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 uninterruptible 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 uninterruptible power supply units have filtering systems and varistor attenuators of very low values of the absorbed energy. Some of them don't have them at all and so the existing level of protection is questionable. Hence, in the case of a strong impact and danger 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 surge strips and comparison of the data and technical parameters.

FIG. 1 DIAGRAM OF CONNECTION OF THE STRIP- UPS - COMPUTER SYSTEM



ANTI-INTERFERENCE
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 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 uninterruptible power supply unit will be switched over to operation with supply from an accumulator.

✓ COLD START

The uninterruptible 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 uninterruptible power supply unit will then operate in the emergency mode of operation and will take energy from the accumulator.

✓ TELEPHONE FILTER RAS

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 uninterruptible power supply unit protects the uninterruptible power supply unit against full discharging. Should condition close to full discharging be detected, then the uninterruptible 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 uninterruptible power supply unit in a short time is signalled 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 uninterruptible power supply unit is being automatically switched off in the case of overloading, or short circuit. This is being signalled by a long acoustic signal.

✓ PROTECTION AGAINST OVERVOLTAGE IN SUPPLY MAINS

The uninterruptible 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).

✓ 3 X OUTPUT SOCKETS (MD-400S, MD-600S), 4 X OUTPUT SOCKETS (MD-800S)

In order to be connected to a computer the uninterruptible power supply unit has been provided with three output sockets (MD-400S, MD 600S) or four output sockets (MD-800S). Active power expressed in Watts connected to the both sockets may not exceed 210W (for MD-400S), 360W (for MD-600S) and 480W (for MD-800S).

✓ SOFTWARE FOR COMMUNICATION PORT (option)

The uninterruptible 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 uninterruptible power supply unit.

8. DESIGN OF THE UNINTERRUPTIBLE POWER SUPPLY UNIT

AUDIBLE/VISUAL INDICATORS

LED Code Explain	Buzzer Code Explain
☼ Continuously Lit	▶▶▶● Continuously Bleep
----☼ 1 Flash every 4 sec.	----○ 1 Bleep every 4 sec.
--☼ 1 Flash every 2 sec.	--○ 1 Bleep every 2 sec.
☼ 1 Flash every 1 sec.	○ 1 Bleep every 1 sec.
☼☼ 2 Flash every 1 sec.	○○ 2 Bleep every 1 sec.
☼☼☼ 2 Flash every 0,5 sec.	●● 2 Bleep every 0,5 sec.
× OFF Status	● 1 Bleep every 0,5 sec.

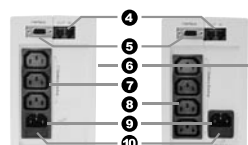
Green LED	Red LED	Buzzer	Operating status
☼	×	×	AC Normal
----☼	×	----○	Battery Mode
--☼	×	--○	AVR Mode
☼	×	○	Battery Low
☼	☼	○	Under Line Mode Load 105 ~ 140%
☼	☼☼	○○	Under Line Mode Load > 140%
☼	☼☼☼	○○	Under Battery Mode Load 105 ~ 140%
×	---	▶▶▶●	Under Battery Mode Load > 140%
☼	☼☼☼	×	Replace Battery
☼	×	×	UPS Fault
×	×	×	Green Mode Energy Saving

EXTERNAL ELEMENTS

FIG. 2 FRONT PANEL



REAR PANEL



1. On/Off Switch, 2. Optical signalling, 3. Model, 4. Telephone surge protection port, 5. RS 232 port, 6. Name plate, 7. Three Backup Power Outlets - MD 400S, MD 600S, 8. Four Backup Power Outlets - MD 800S, AC Power Inlet 230V, 10. Input Circuit Breaker or AC Fuse

9. TECHNICAL DATA

Model	UNINTERRUPTIBLE POWER SUPPLY UNITS OF OFFICE POWER AVR SERIES			
	MD-400S 400VA/210W	MD-600S 600VA/360W	MD-800S 800VA/480W	
Power	Rated input voltage	~230V		
	Rated input current	1,73A	2,6A	3,47A
	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		
Switching over time	Course form	Approximate sinusoid		
Accumulators	Type	Sealed lead-acid accumulator, service-less		
	Back-up time Pmax / P 0,5max	5 ± 14 min	5 ± 16 min	6 ± 21 min
	Charging time	4 hours to 90% of full capacity		
	Kind of accumulator	12V 3Ah x 1	12V 7Ah x 1	12V 7Ah x 1
Protections	Protection of accumulator	Auto-test and full accumulator charging protection		
	Auto-test	Auto-test - after every switching on		
Light indicator	Signaling diode	Continuous illumination of diode - normal operation		
		Slow flickering of green diode - emergency supply		
Electric protection	Protection against current surge	145 Joules		
	Protection against overload	Automatic electronic cutting off in the case of a short-circuit		
	Voltage filtration	Interference eliminator RFI/EMI		
Protection Modem/Supply mains		RJ 11 WE, WY		
	Interface	RS 232		
Communication with computer	Software	optional		
	Dimensions (mm) length x width x height	300x100x60		
Other	Weight	4,5 kg	6,3 kg	7,1 kg
	Working conditions	Temp. 0-40°C up to 90% humidity		
	Input sockets	Storage does not cause condensation!5°C to 45°C		
	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 uninterruptible power supply unit are not working.	<ol style="list-style-type: none"> 1. Check conductors uninterruptible power supply unit - receiver for proper connection. 2. Check the fuse at the uninterruptible 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	<ol style="list-style-type: none"> 1. The units connected to the uninterruptible power supply unit have an excessive power, check and if necessary reduce the load. 2. The uninterruptible power supply unit is damaged - switch off the uninterruptible power supply unit and contact with the service station.
The uninterruptible power supply unit operates being supplied from accumulator	<ol style="list-style-type: none"> 1. Check presence of voltage in this supply socket, to which the uninterruptible power supply unit has been connected. 2. Check and replace (exchange), if necessary, the input fuse in the uninterruptible power supply unit (spare fuse in a tool kit). 3. Check the supply cable.
Short working time when being supplied from accumulator	<ol style="list-style-type: none"> 1. Accumulator has not been fully charged - check or recharge. 2. Check whether the uninterruptible power supply unit is not overloaded. 3. Accumulator is damaged, get in contact with the service station.

11. PACKAGE CONTENT:

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

x 1
x 1 (MD-400S, MD-600S), x 2 (MD-800S)
x 1
x 1
x 1