

Little Doctor

LD-812U

ENG ULTRASONIC NEBULIZER LD. Instruction Manual.

POL INHALATOR ULTRAŁDŹWIĘKOWY LD. Instrukcja obsługi.

FIN ULTRAHANGOS LD INHALÄTOR. Használati útastís.

RUS INHALATOR CU ULTRAZVUKOV LD. Manual de instrucci3n.

ROM УПТРАЗВУКОВ ИУХАЛАТОР LD. Ръководство за експлоатация.

fig. 1	rys. 1	1. ábra	imaginea 1	фиг. 1
PARTS AND COMPONENTS	DENUMIREA PÁRÞILOR ŞI COMPONENTELOR			
PODSTAWOWE CZĘŚCI I KOMPONENTY	НАЗВАНИЯ НА ЧАСТИ И КОМПОНЕНТИ			
ALKATREŠEK MEGNEVEZÉSE				

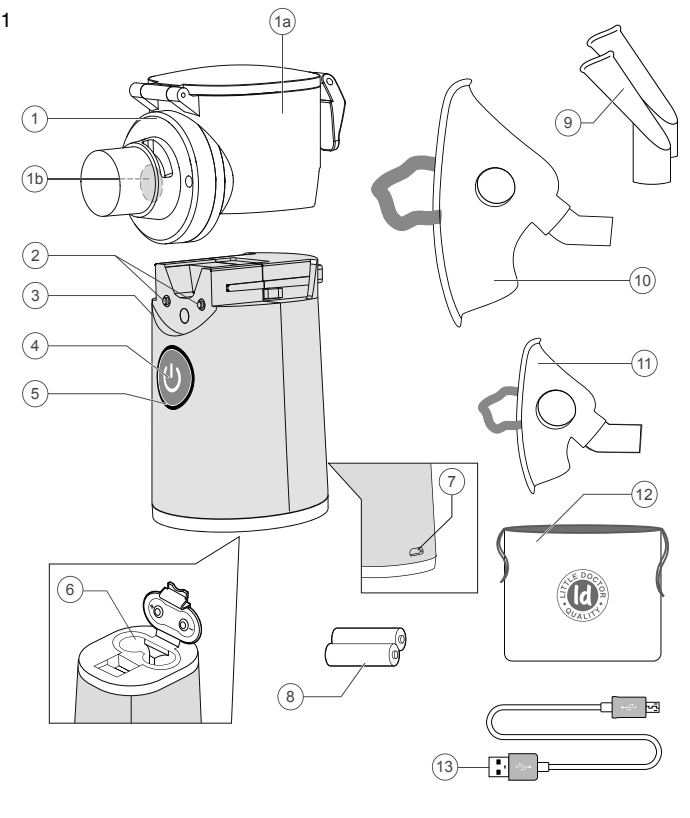


fig. 2, 3 rys. 2, 3 2. ábra imaginea 2, 3 фиг. 2, 3

PARTS AND COMPONENTS

PODSTAWOWE CZĘŚCI I KOMPONENTY

ALKATREŠEK MEGNEVEZÉSE

SURSA DE ALIMENTARE A DISPOZITIVULUI

ЭЛЕКТРИЧЕСКО ЗАХРАНЯВАНЕ НА УСТРОЙСТВОТО



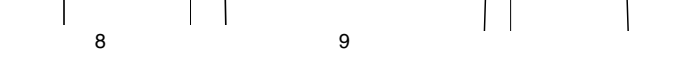
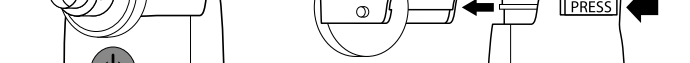
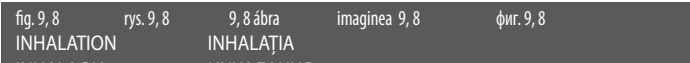
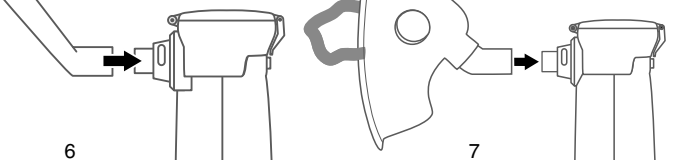
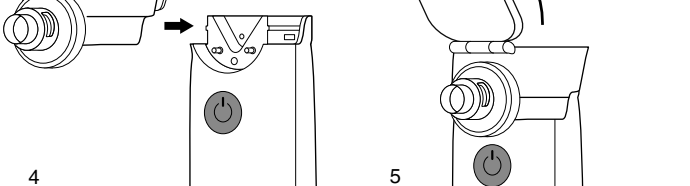
fig. 4, 7 rys. 4, 7 4. ábra imaginea 4, 7 фиг. 4, 7

OPERATING PROCEDURES

INSTRUKCIJA UZYTAKOWANIA

ПОСЛЕДОВАТЕЛЬНОСТЬ НА УПОТРЕБА

AZ ESZKÖZ HASZNÁLATA



ENG	
PARTS AND COMPONENTS (fig.1)	
● Nebulization chamber	● Electric power socket
● Medication cup	● Batteries
● Mesh membrane	● Mouthpiece
● Electrodes	● Mask for adults
● Main unit	● Mask for children
● Button	● Carrying bag
● Indicator	● Power cord
● Battery compartment	

MESH TECHNOLOGY OF AEROSOL GENERATION

LD-812U is a nebulizer that uses a new mesh technology of aerosol generation. Compared to conventional ultrasonic nebulizers, the use of the mesh technology gives a number of advantages:

- super compact size of the device
- use of a wide range of drugs, including antibiotics, antiseptics and mineral water as inhalation solutions;
- remaining volume of the inhalation solution is reduced to almost zero, which helps expensive drugs;
- the device can work from either a USB-adaptor (not included) or 2 AA batteries;
- device operation is virtually silent and inhalation therapy can be administered even to sleeping children;
- you can tilt the device during inhalation up to 45° from the vertical axis;
- self-cleaning membrane significantly extends the service life of the nebulization chamber
- small particle size provides for more efficient delivery of medication to the lower respiratory tract
- two masks (adult mask and children mask) and two mouthpieces are in package.

OVERVIEW

The purpose of LD Ultrasonic Nebulizer is to treat and prevent respiratory and lung disorders using aerosols of AQUEOUS solutions of drugs in hospitals and at home. This manual will help the user to operate LD Ultrasonic Nebulizer safely and efficiently. Use the device shall be in accordance with the rules in this manual and do not use it for purposes other than those described herein. Make sure you read and understand the entire manual. Functionally, the device consists of an aerosol formation chamber with a mesh membrane and a main unit with a battery compartment. There is a button and a light indication around the button on the case of the device.

SAFETY WARNINGS

Caution! Never use inhalation solutions containing ether, oils or suspended particles (suspensions), including decoctions and infusions of herbs. We recommend to use only types of standard liquid inhalation solutions designed for nebulizer therapy produced by pharmaceutical companies, and natural mineral waters.

Caution! To avoid damage, do not touch the mesh membrane with your hands, do not clean it with any objects, alcohol or solvents.

Inhalation solutions should be prepared under sterile conditions based on 0.9% sodium chloride as a solvent. Do not use tap or even boiled water as an inhalation agent. Disinfect the vessel where the solution is to be prepared by boiling.

Type of inhalation (through the mouth, using a mouthpiece, or through the nose using a mask), the duration (usually no more than 10–15 minutes) and frequency, as well as the inhalation solutions used should be determined by YOUR DOCTOR.

- Children shall use the device under adult supervision.
- If you do not use the device for a long time, remove the batteries.
- Do not place the device in water, under flowing water stream or in the shower. Do not use it when bathing.
- If the device does not work, see the "TROUBLESHOOTING ALGORITHM AND METHODS" section.
- Only use accessories that are intended for LD-812U and are described in this manual.
- Do not insert foreign objects into the holes of the main unit.

Device is not suitable for anesthesia or lung ventilation.

BATTERY INSTALLATION

The package of nebulizer has two AA batteries. The included batteries are designed to test the performance of the device, and their service life may be shorter than that of new batteries. To install batteries, open the battery compartment by pressing the cover latch with your finger (fig. 2). Insert the batteries, observing the polarity (fig. 3). Close the battery compartment cover by pressing your finger until it clicks. New batteries, depending on the type and capacity, can ensure the operation of the nebulizer for an average of 6 days (when the nebulizer is working for 15 minutes a day). If the indicator is constantly lit in orange it means that the battery is low and inhalator will stop working. Replace the batteries with new ones.

- Do not leave used batteries inside the device.
- We recommend to use alkaline AA batteries to power the device.
- Zinc-carbon batteries are not recommended.

THE USE OF THE DEVICE WITH A POWER SUPPLY

Use a power supply (not included) with the following specifications.

Output voltage: 5V ± 5%

Load current: at least 500 mA

Plug: micro-USB

Find the power supply socket on the back case of the device. Connect the power cord to the main unit, plug the power cord into electrical wall outlet and press the button. After measurement, switch the device off by pressing the button, disconnect the power source from the electrical wall outlet and disconnect the power cord from the device.

OPERATING PROCEDURES

Important! Before using the device for the first time, clean it as described in paragraph 1 of section "Care, storage, repair and disposal". An inconvenient posture and uneven breathing may lead to blocking a part of the lungs and some parts of the respiratory tract.

Attention! Keep the electrodes of the device and nebulizer chamber clean. Prevent water and drugs from getting on them! Otherwise, malfunction of the inhaler is possible.

Important! The nebulization chamber with a mesh membrane are consumable materials. The service life of the nebulization chamber varies depending on the usage environment and the composition of the inhalation solutions used. Under proper operation conditions and provided that the device is used to nebulize a saline solution 3 times a day for 10 minutes at a room temperature (23 °C) the service life of the nebulization chamber is one year (amount 180 hours). The maximum capacity of the medication for one inhalation is 8 ml (see the scale on the nebulization chamber), the minimum is 0.5 ml. Close the cover of the nebulization chamber by lowering the latch. Do not use excessive force for opening and closing the latch (thus you will increase the service life of the nebulizer chamber). Ensure that the cover is tightly closed and the inhalation solution does not spill out of the nebulizer chamber.

3. Insert the mouthpiece (fig. 6) or mask (fig. 7)

Attention, parents! While using of the mask during inhalation the child can breathe simultaneously through the mouth and through the nose. The design of the mask prevents the formation of excessive pressure of the aerosol during the inhale, which allows the child to breathe more calmly, evenly and deeply.

4. For the beginning of the procedure press the button. The indicator lights up with green color.

Attention! If the nebulizer chamber is empty when the power is on, the indicator light will glow green for one second, and then the device will switch off automatically. The nebulizer may spray the inhalation solution for one second after the power is on, and then pause for 0.5 seconds. This is normal operation of the device. After a pause, the device should spray the inhalation solution continuously.

INHALATION

For effective inhalation, calm down, relax, and sit up. If you inhale in bed, place a pillow under your back so that your back is as straight as possible. An inconvenient posture and uneven breathing may lead to blocking a part of the lungs and some parts of the respiratory tract.

Important! A single-patient use of mouthpiece and/or mask is recommended. Take a comfortable position and begin the inhalation procedure. Breathing should be even, breathe slowly and deeply so that the aerosol penetrates deeply into the respiratory tract.

Attention! During inhalation, do not close the openings (fig. 8). This will reduce the efficiency of the device. If you want to stop the procedure, press the button to turn off the power. The indicator goes out. If the inhalation solution is fully used, the device will automatically switch off.

Attention! If during the inhalation the device does not switch off automatically after the entire inhalation solution has been used, turn off the power by pressing the button. During the procedure, you can tilt the inhaler (at an angle no more than 45° relative to the vertical axis). However, make sure that the inhalation solution is in contact with the mesh membrane. The inhaler may operate normally for some time after changing the angle of inclination of the device. If the angle of inclination of the inhaler is such that the inhalation solution is not in contact with the mesh membrane, it will work normally for about 10 seconds and then switch off (the operation time depends on the type of inhalation solution used). When a small amount of the inhalation solution is left, tilt the device towards you. Thus you will use the remaining inhalation solution completely. Do not shake the inhaler during use. It may automatically switch it off. After inhalation, switch off the device by pressing the button, the indicator will go out. Remove the inhalation chamber from the device by pressing the PRESS button on the back of the case and pushing the nebulization chamber forward (fig. 9). Clean the device as described in paragraph 1 of section "Care, storage, repair and disposal".

MEMBRANE CLEANING MODE

The membrane cleaning mode is designed for automatic cleaning of the membrane from residues of drugs and other deposits. To enable the membrane cleaning mode:

1. Pour 8 ml of distilled water into the medication cup.
2. In the state of press and hold the button for about 5 seconds until the green indicator lights up. Release the button.
3. After about 3 seconds, the indicator goes out and the membrane cleaning procedure begins.
4. The device will switch off automatically after 10 minutes. For the forced shutdown of the membrane cleaning mode briefly press the button. Forced shutdown is possible after 3 seconds after switching on. We recommend to clean the membrane at least 1 time per month with a daily use of the device or in cases where the aerosol performance has decreased or is completely absent.

CARE, STORAGE, REPAIR AND DISPOSAL

1. After an inhalation procedure with any medicinal solution, it is recommended to spray pure water for 1–2 minutes in order to clean the mesh membrane from drug residues. DO NOT clean the membrane with any objects (nagpans, rags, cotton swabs, etc.).
2. Clean the device and accessories regularly. It is recommended to wipe all accessories of the device with a 3% solution of hydrogen peroxide with the addition of a 0.5% solution of detergent (for example, laundry detergent). Then wash the nebulization chamber and medication cup under running water. Mouthpieces can be boiled for 10 minutes or autoclaved at a temperatures up to 150°C. After processing, wipe all parts of the device with a soft cloth. Attention! After cleaning, do not install the nebulization chamber with residual water on the main unit — this may lead to oxidation of the contacts. Wait until the camera is completely dry.
3. Protect the device from direct sunlight and strong shocks.
4. Do not store or use the device in the immediate vicinity of heaters and open flame.
5. Protect the instrument from contact with contaminants.
6. Do not allow the device to come in contact with aggressive solutions.
7. If necessary, carry out repairs only in specialized organizations.
8. This device has a service life of 5 years from the moment of its transfer to the consumer. For consumables - 1 year

from the date of transfer to the consumer. At the end of the specified service life, periodically contact specialists (specialized repair organizations) to check the technical condition of the device and, if necessary, to carry out its disposal in accordance with the rules of disposal applicable in your region. No special conditions for disposal by the manufacturer are established.

POWER INDICATOR LIGHT

Green light	power on
Orange light	low battery
Flashing green light	membrane cleaning mode is on

BASIC SPECIFICATIONS

Model	LD-812U
Type	ultrasonic
Power consumption, not more, W	3
Nebulization rate, not less, ml/min (Aerosol Output Rate)	0.2*
Median mass aerodynamic diameter (MMAD), not more, µm	5*
Capacity nebulization chamber, ml	8
Remaining capacity of the inhalation solution, not more, ml	0.5
Ultrasonic frequency, kHz	110
Noise level, no more than, dB	40*
Power source	3V (2xAA) or DC 5V/0.5A
Electric power socket	micro-USB
Degree of patient contact	type BF
Electrical safety	II
Low battery indicator	1.9V ± 0.2V
Operation from one set of alkaline batteries, min	about 90
Operation conditions: temperature, °C	10 to 40
relative humidity, % Rh	15 to 85
Storage and handling conditions: temperature, °C	minus 20 to 40
relative humidity, % Rh	15 to 85
Weight (the main unit and nebulization chamber), no more than, g	90
Dimensions of the main unit with nebulization chamber, mm	(73 ± 2) × (99 ± 2) × (45 ± 2)

Year and month of production

Indicated on the device case in the serial number in the form of «YYMM812XXXX», where YY is the year and MM is the month of production.

SYMBOL EXPLANATION:

- CE: Conforms with the Directive MDR (EU) 2017/745
- IP22: IP protection class
- Authorized Representative in the EU
- Manufacturer
- Serial number
- MD: Medical Device
- Import

Production of the devices is certified according to the international standard ISO 13485. The device complies with European Directive MDR (EU) 2017/745. The revision date of this Operation manual is indicated at the last page in the XX-XXXX-YYMM-NN format, where YY is the year, MM is the month, and NN is the revision number. Technical specifications are subject to change without prior notice in order to improve operational properties and quality of the product. Any serious incident that has occurred in relation to the device should be reported to the manufacturer and the competent authority of the Member State in which the user and/or patient is established.

TROUBLESHOOTING ALGORITHM AND METHODS

If any trouble occurs when using the device, refer to the table below for possible causes of failure.

Problem	Cause	Recommended actions
The intensity of aerosol formation is very low.	There is no contact between the aerosol solution and the mesh membrane for more than 10 seconds.	Change the tilt angle of the nebulizer so that the aerosol solution is in contact with the mesh membrane.
	Mesh membrane inhalation chamber is clogged.	Clean the membrane as described in the MEMBRANE CLEANING MODE section. If after cleaning the problem persists, replace the inhalation chamber with a new one.
	Use of not recommended high viscosity drugs.	Use only recommended low viscosity drugs.
	Electrodes of the nebulizer and inhalation chamber are contaminated.	Wipe away any contamination and turn the power on again.
	The indicator is orange, the battery level is insufficient.	Replace all batteries with new ones and turn on the power again.
	After power on, the indicator is lit in orange and then turns off.	Try a different power adapter / power cord
	There is no contact between the inhalation solution and the mesh membrane.	Adjust the tilt angle of the nebulizer so that the inhalation solution is in contact with the mesh membrane.
	Electrodes of the nebulizer and inhalation chamber are contaminated.	Wipe away any contamination and turn the power back on.
	The indicator does not light, and the spraying of the drug does not occur.	Incorrectly installed batteries.
	Low battery charge.	Replace all batteries with new ones and turn on the power again.
	The indicator lights up but no spraying occurs.	Replace all batteries with new ones and turn on the power again.
	Disruption of the mesh membrane nebulizer chamber.	Replace the inhalation chamber with a new one.
	Electrodes of the nebulizer and inhalation chamber are contaminated.	Wipe away any contamination and re-power on.
	The mesh membrane of the inhalation chamber is heavily clogged.	Clean the inhalation chamber as described in the "Care, storage, repair and disposal" section. If after cleaning the problem persists, replace the inhalation chamber with a new one.
	Nebulizer turns off during operation.	Out of inhalation solution.
	There is no contact between the zolu podla sleduho, or pocvala na spokoju, rovný i gleboke oddech.	Change the tilt angle of the nebulizer so that the inhalation solution is in contact with the mesh membrane.
	Nebulizer was shaken during use.	Hold the nebulizer in your hand steadily, do not shake it.
	Inhalation solution leaks from the nebulizer chamber.	Disruption of the mesh membrane of the inhalation chamber or aging of the seal of the inhalation chamber.
	Mesh membrane inhalation chamber is clogged.	Mesh membrane is clogged with drug residues and other deposits.

WARRANTY

The purchased device is warranted for 24 months from the date of sale. Faults detected during the warranty period will be repaired free of charge by a specialized service center within 2 business days from the date of device delivery to the service center. The costs for the defective device transportation are borne by Little Doctor Europe s.p. z o.o. (door-to-door service), except for faults that are not covered by the warranty. The party submitting the claim must properly prepare the device for shipment, protecting it from damage during transportation and endorse a completed warranty card (with the seller's stamp, date of sale and seller's signature) and proof of purchase (invoice or receipt). The warranty does not cover damages resulting from inadequate protection of the device from damage during transportation. The warranty period is extended for the time the device is under repair. Post-waranty repair of the device is performed at the user's expense. The warranty does not cover the following: consumables and accessories for individual use (tubes, nebulizers, masks, mouthpieces, etc.); products with mechanical, thermal or chemical damage, or damage caused by violations of the rules specified in the operating instructions; products with signs of modification, opening and/or repair by an unauthorized service center (by an individual); products that have been connected to unrecommended power supplies or used with unrecommended consumables; products that have been operated with non-recommended devices; products that are defective through no fault of the manufacturer, such as: actions of third parties, natural phenomena and natural disasters, animals, insects, foreign objects or liquids entering the device, etc.; internal and external contamination, scratches, cracks, scrapes and other mechanical damage to the equipment occurring during its operation; products with illegible or altered serial numbers or a damaged warranty seal; batteries, glass parts, light bulbs, as well as operations such as adjusting, cleaning and other maintenance of the product. The buyer has the right to replace the device with a replaceable one if an authorized service center finds a manufacturing defect that cannot be eliminated or after 3 successful repairs of the same malfunction.

INFORMATION ON THE MANUFACTURER AND DISTRIBUTORS

Manufactured under control and for Little Doctor International (S) Pte. Ltd. (7500A BEACH ROAD #11-313 THE PLAZA SINGAPORE 199571. Postal Address: Senjeng Central PO Box 960 Singapore 915411).

Manufacturer: Little Doctor Electronic (Nantong) Co. Ltd. (No. 8, Tongying Road Economic & Technical Development Area, 226010 Nantong, Jiangsu, People's Republic of China).

Little Doctor Europe s.p. z o.o. 576 Zawiła Street Kraków 30-390 Poland.

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Important information regarding electro-magnetic compatibility (EMC)

This device manufactured by Little Doctor Electronic (Nantong) Co. Ltd. conforms to EMC60601-1-2:2014 Electro Magnetic Compatibility (EMC) standard. Further documentation in accordance with this EMC standard is available at Representative in EU Little Doctor Europe s.p. z o.o. at the address mentioned in this instruction manual or at www.littledoctor.eu. Refer to the EMC information for Device on the website.

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POL

PODSTAWOWE CZĘŚCI I KOMPONENTY (rys. 1)

- Komora inhalacyjna
- Zbiornik na lek
- Membrana siateczkowa
- Elektrody
- Urządzenie główne
- Przycisk
- Dioda
- Komora baterii
- Gniazdo zasilania elektrycznego
- Baterie
- Usłnik
- Maski dla dorosłych
- Maski dla dzieci
- Worek
- Kable zasilające

MESH TECHNOLOGY WYTWARZANIA AEROSOLU

LD-812U jest inhalatorem z najnowszej technologii uzyskiwania aerozolu MESH, czyli za pomocą membrany siateczkowej. W porównaniu ze zwykłymi inhalatorami ultradźwiękowymi, zastosowanie technologii MESH daje szereg zalet:

- niewielki rozmiar urządzenia;
- możliwość stosowania środków leczniczych jako roztworów inhalacyjnych: preparatów mukolitycznych i chłuk-rozku; obiekty o nie nadających się do użycia resztek roztworu niemal do zera, co pomaga uniknąć marnowania drogich leków;
- możliwość pracy zarówno z adapterem USB (do kupienia osobno) jak i na dwóch bateriach AA;
- cicha praca urządzenia, pozwala na przeprowadzanie terapii inhalacyjnych nawet u śpiących dzieci;
- cicha praca urządzenia, pozwala na przeprowadzanie terapii inhalacyjnych nawet u śpiących dzieci;
- tryb czyszczenia automatycznego znacznie wydłuża czas pracy komory inhalacyjnej;
- niewielki rozmiar częściek pozwala na skuteczniejsze dotarcie leku do dolnych odcinków dróg oddechowych;
- dwie maski (dla dorosłych i dla dzieci) oraz dwa usłniki w zestawie.

DANE OGÓLNE

Inhalator ultradźwiękowy LD służy do leczenia i profilaktyki chorób dróg oddechowych oraz płuc za pomocą aerozolu z WODNYCH roztworów leczniczych w placówkach medycznych oraz w domu. Niniejsza instrukcja obsługi została sporządzona, aby pomóc w bezpiecznej i skutecznej terapii za pomocą inhalatora ultradźwiękowego LD. Z tego urządzenia należy korzystać w sposób zgodny ze wskazaniami zawartymi w niniejszej instrukcji obsługi. Nie należy stosować inhalatora do innych niż opisane tutaj celów. Ważne, aby użytkownik inhalatora przeczytał i zrozumiał treść instrukcji. Zasadniczo urządzenie składa się z komory wytwarzającej aerozol z membraną siateczkową oraz z urządzenia głównego z komorą na baterie. Na obudowie przyrządu znajduje się przycisk wyłączenia/wyłączenia z diodą dookoła przycisku.

SRODKI OSTROŻNOŚCI

Uwaga! Stosowanie roztworów inhalacyjnych będących zawiesinami (NP: NEBBUD, BERODUAL, PULMICOFT i ECOTODOS) SUBSTANCJI ZAWIERAJĄCYCH ETÉR, OLEJÓW, ALKOHOL jest niedopuszczalne. Zalecane jest użycie standardowych płynnych roztworów inhalacyjnych, przeznaczonych do nebulizacji i produkowanych przez firmy farmaceutyczne oraz naturalnych wód mineralnych. Należy stosować się do założeń lekarza lub farmaceuty co do wyboru odpowiedniego typu leku, możliwości jego stosowania w inhalatorach ultradźwiękowych oraz sposobu jego dawkowania. Lek, zawierający antybiotyki, glikokortykosteroidy, oraz niektóre leki mukolityczne mogą tracić swoje właściwości/ulegać zniszczeniu w środowisku ultradźwiękowym.

Uwaga! Dokniecie membrany siateczkowej może spowodować jej uszkodzenie, zatem prosimy o niedokonywanie jej rękami oraz o powstrzymanie się od czyszczenia jej jakimikolwiek przedmiotami, spirytusem czy rozpuszczalnikami. Zalecane jest użycie standardowych płynnych roztworów inhalacyjnych, przeznaczonych do nebulizacji i produkowanych przez firmy farmaceutyczne oraz naturalnych wód mineralnych. Należy stosować się do założeń lekarza lub farmaceuty co do wyboru odpowiedniego typu leku, możliwości jego stosowania w inhalatorach ultradźwiękowych oraz sposobu jego dawkowania. Lek, zawierający antybiotyki, glikokortykosteroidy, oraz niektóre leki mukolityczne mogą tracić swoje właściwości/ulegać zniszczeniu w środowisku ultradźwiękowym.

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