

ENG ULTRASONIC NEBULIZER LD. Instruction Manual.

POL INHALATOR ULTRADZIĘWKOWY LD. Instrukcja obsługi.

HUN ULTRAHANGOS LD INHALÁTOR. Használati utasítás.

ROU INHALATOR CU ULTRASUNETE LD. Manual de instrucțiuni.

BGР УЛТРАЗВУКОВ ИНХАЛАТОР LD. Ръководство за експлоатация.

fig.1 rys. 1 1. ábra imaginea 1 фіг.1  
 PARTS AND COMPONENTS DENUMIREA PĂRȚILOR Sİ COMPOENENTELOR НАЗВАНИЯ НА ЧАСТИ И КОМПОНЕНТЫ  
 PODSTOVAE CZESCI I KOMPONENTY ALKATRÉZEK MEGNEVÉZÉSE

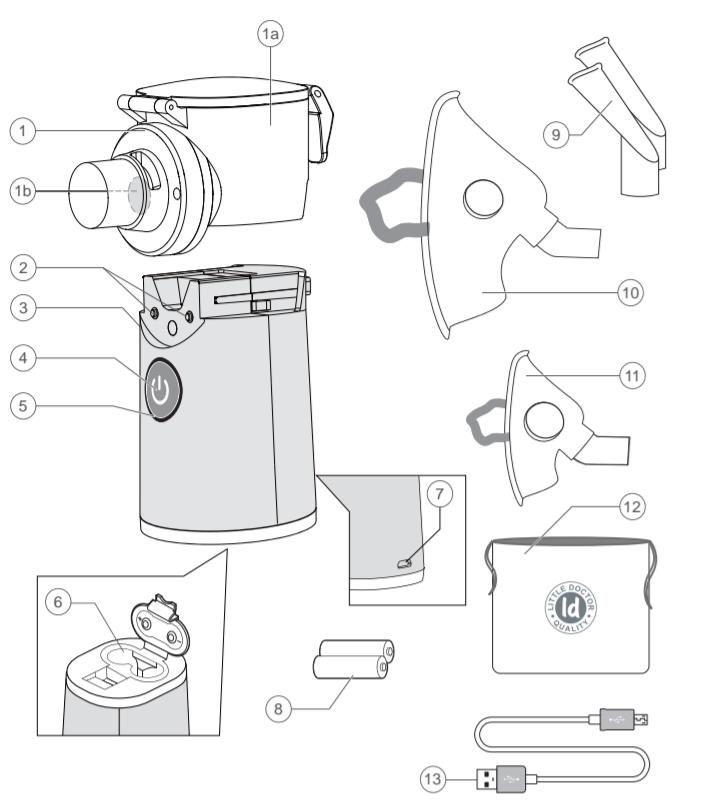


fig. 2, 3 rys. 2, 3 2. ábra imaginea 2, 3 фіг. 2, 3  
 POWER SUPPLY OF THE DEVICE ZASILANIE ELEKTRYCZNE URZĄDZENIA AZ ELEMÉK BEHELYEZÉSE SURSA DE ALIMENTARE A DISPOZITIVULUI ELEKTRIČECKO ZAPRAVBAHE NA USTROJSTVOTO

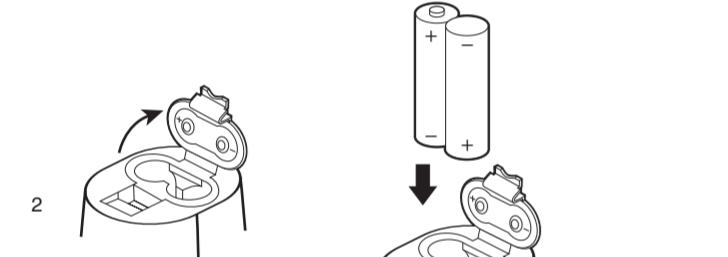


fig. 4-7 rys. 4-7 4.-ábra imaginea 4-7 фіг. 4-7  
 OPERATING PROCEDURES INSTRUKCJA UŻYTKOWANIA AZ ESZKÖZ HASZNÁLATA

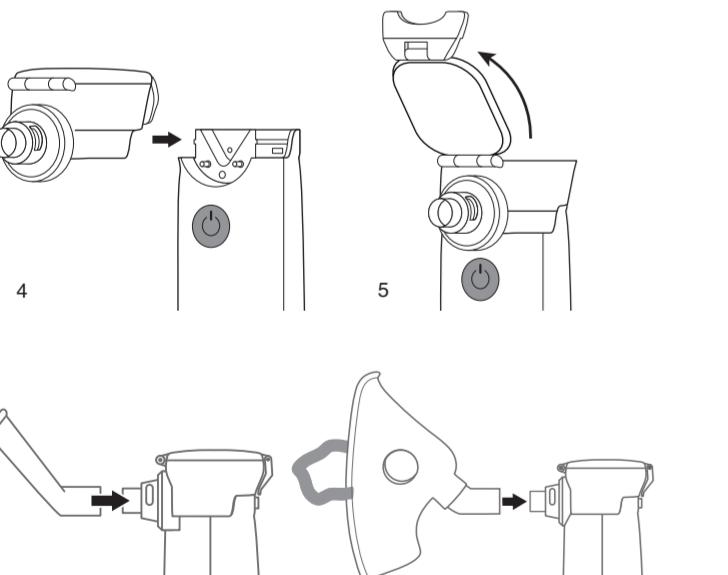
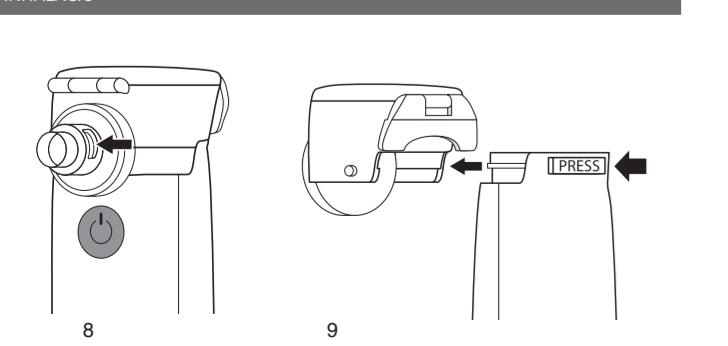


fig. 9, 8 rys. 9, 8 9. ábra imaginea 9, 8 фіг. 9, 8  
 INHALATION INHALÁTOR IHALACIJA INHALÁCIA



## ENG

## PARTS AND COMPONENTS (fig.1)

- ① Nebulization chamber
- ② Medication cup
- ③ Mesh membrane
- ④ Electrodes
- ⑤ Main unit
- ⑥ Button
- ⑦ Indicator
- ⑧ Battery compartment
- ⑨ Electric power socket
- ⑩ Batteries
- ⑪ Mouthpiece
- ⑫ Mask for adults
- ⑬ Mask for children
- ⑭ Carrying bag
- ⑮ Power cord

## 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 save expensive drugs;
- the device can work from either a USB-adapter (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 even better efficiency of delivery of medicine to the lower respiratory tract

## 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 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 indicator located on 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 any 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 drain 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 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".

1. Insert the inhalation chamber into the slots in the upper part of the main unit until it clicks (fig. 4).

**Attention!** Keep the electrodes of the device and nebulizer chamber clean. Prevent water or 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).

2. Open the top of the nebulization chamber by lifting the latch (fig. 5). Pour the medication into the medication cup. 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 inhalation, which allows the child to breathe more calmly, evenly and deeply.

**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).

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-use patient of mouthpiece and/or mask is recommended. Take a comfortable position and begin the inhalation procedure. Breathing should be steady, evenly 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 of 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 operating 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 pushing the PRESS button, 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 off state, press and hold the button for about 5 seconds until the green indicator lights up. Release the button.

3. After about 3 to 5 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

For more information please visit [www.littledoctor.sg](http://www.littledoctor.sg)

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 (napkins, 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 use 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 contamination.

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 (special 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, dB	40*
Power source	3V (2xAA) or DC 5V/0.5A
Electric power socket	micro-USB
Degree of patient contact	II
Electrical safety	1.9V ± 0.2V
Low battery indication	about 90
Operation from a single alkaline battery, 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, 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 in the serial number in the form of «YYMM81XXXX», where YY is the year and MM is the month of production.

## SYMBOL EXPLANATION:

CE 020 Compliance with the Directive 93/42/EEC	Manufacturer
Important: Read the instruction	Keep from moisture
Representative in the EU	Protection class II
	IP22 IP protection class
	IP22 IP protection class

Production of the devices is certified according to the international standard ISO 13485.

The device complies with European Directive MDD 93/42/EEC.

The revision date of this Operation manual is indicated at the last page in the EXXX/YYMM/NN format, where YY is the year, MM – 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.

## TROUBLESHOOTING ALGORITHM AND METHODS

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

