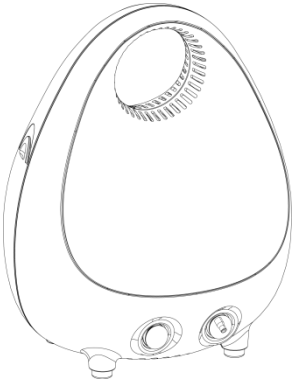
Read this manual carefully before use.
Manufacture date: see the label
Product life: 5 years

Air Compressing Nebulizer

Model: 608D

User's manual



Jiangsu Konsung Bio-Medical Science and Technology Co., Ltd

Statement

Thank you for purchasing 608D air compressing nebulizer (hereinafter referred to as "**nebulizer**") from Jiangsu Konsung Bio-Medical Science and Technology Co., Ltd. (hereinafter referred to as "**Konsung**).

This manual will help you understand the operation and maintenance of the product better. It is reminded that the product shall be used strictly complying with this manual. User's operation failing to comply with this manual may result in malfunction or accident for which **Konsung** cannot be held liable.

All illustrations in this manual serve as examples only. They may not necessarily reflect the setup or data displayed on your equipment.

Responsibility of the Manufacturer

Konsung only considers itself responsible for any effect on safety, reliability and performance of the equipment if: Assembly operations, extensions, re-adjustments, modifications or repairs are carried out by persons authorized by **Konsung**, and The electrical installation of the relevant room complies with national standards, and The instrument is used in accordance with the instructions for use.

Upon request, **Konsung** may provide, with compensation, necessary circuit diagrams, and other information to help qualified technician to maintain and repair some parts, which **Konsung** may define as user serviceable. Contents of this manual are subject to changes without prior notice.

Conventions

Warning: Indicates a potential hazard or unsafe practice that, if not avoided, could result in death or serious injury.

Caution: Indicates a potential hazard or unsafe practice that, if not avoided, could result in minor personal injury or product/property damage.

Note: Provides application tips or other useful information to ensure that you get the most from your product.

Table of Contents

1 Product Introduction

1.1 Intended use and Contraindication

Intended use: The 608D air compressor nebulizer is intended to aerosolize medications for inhalation by the patient for respiratory disorders.

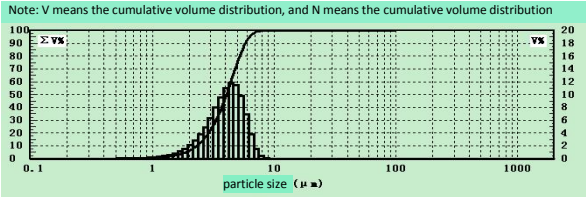
Contraindications: This nebulizer cannot be used for respiratory anesthesia and ventilator systems.

Theory of operation: the respiratory system is an open system, the liquid medicine is atomized into particles, the patient inhalation of these drug mists, the drug mist can be directly absorbed in the patient's mouth, throat, trachea, bronchi, alveoli, etc. Mucosal absorption and achieve the purpose of treatment.

1.2 Product specification

1. Maximum nebulization rate ≥0.2mL/min
2. Residual volume ≤1.3mL
3. Median particle size of 4μm, error ±25%
4. Maximum pressure of compression pump: ≥0.15MPa
5. Free flow of compression pump: ≥10L/min
6. Degree of protection against ingress of liquid: IPX0
7. Net weight: about 1.5kg (main unit only)
8. Size: about 158mmX133mmX194mm (LXWXH)
9. Power supply: Input AC220V, 50Hz
10. Pressure range of nebulizer: 60kPa to 150kPa under normal working conditions. When an abnormality occurs, the maximum pressure range is 150kPa to 400kPa, and no tube rupture occurs.

11. Equivalent volume particle size distribution curve (measured when the solution composition is pure water, the ambient temperature is 23°C±2°C, relative humidity ≤80%)



12. Noise ≤58dB(A)
13. Fuse: RF1ϕ5×20/1.0A
14. Input power: ≤175VA
15. Electrical safety type: Class II, type B applied part
16. Safety caution: do not use this unit in environment where combustible anesthetic gases are mixed with air, oxygen or nitro-monoxide
17. Working mode: Continuous
18. Normal working conditions:
    Environmental temperature: 5°C~35°C
    Relative humidity: ≤80%
    Atmospheric pressure for storage: 86kPa~106kPa
19. Restrictions on transportation and storage:
    Environmental temperature: -40°C~+55°C
    Relative humidity: ≤93%(non-condensing)
    Atmospheric pressure: 50kPa~106kPa

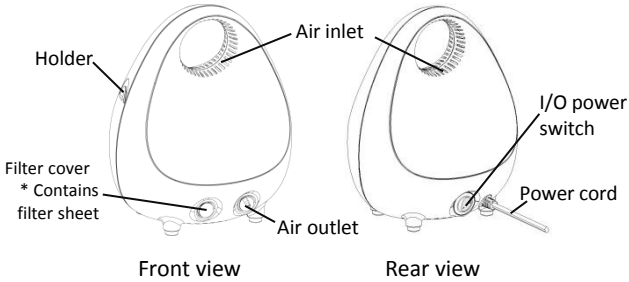
NOTE:

1. **Avoid violent vibration, collision and fall in transportation. Keep the unit up, and avoid rain and gently transport.**
2. **Store this product in a well-ventilated and non-corrosive gas room.**
3. **If the storage temperature is below 5°C, apply the device only when the temperature meets normal operating conditions.**

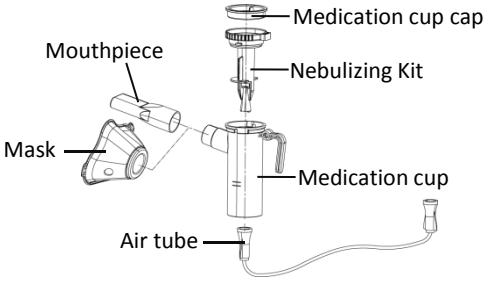
1.3 Structure and working principle

Air compressing nebulizer is composed by compressor, housing and nebulizing kit (without mask and mouthpiece). Users can purchase masks or mouthpieces manufactured by qualified manufacturers.

Main unit



Nebulizing assembly

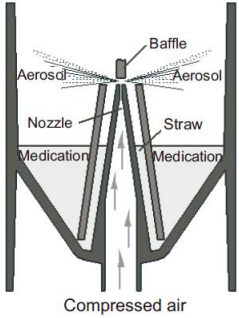


Key components:

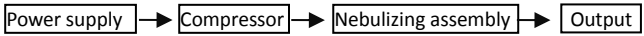
Main Structure	Material
Filter system	Felt
Compressor	Cast aluminum alloys
Electrical system	Power cord, switch, fuse
Nebulizing system	Polypropylene
Housing	ABS resin

Working principle

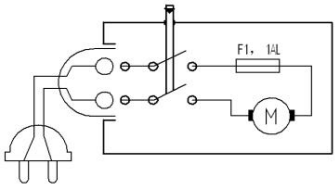
The compressed air generated with the pump inside the main unit, when pumping out from the nozzle, can suck up the medication with the negative pressure between the nozzle and the air tube. The pumped-up medication when impacting on the top of the septum can turn into very fine aerosol before ejecting to the outside.



Working principle block diagram:



Electrical schematic:



Electrical maintenance should be operated by professionals.

1.4 Product features

1. In normal use, the atomized air flow is 3L/min to 9L/min (flow rate is not adjustable). The corresponding pressure is 60kPa to 150kPa.
2. The atomization volume is 2mL to 8mL, and the theoretical atomization rate is greater than 0.2mL/min. The corresponding pressure range is 60kPa to 150kPa.

3. It is recommended that the user should use a minimum solution carrying capacity of 2mL. The maximum solution carrying capacity should not exceed the maximum scale of medication cup to avoid overflow. In the case of the maximum solution carrying capacity, the maximum temperature in the medication cup is 50°C during normal use.
4. There is no special requirement for the type of solution. The medication has been prescribed by the physician. Some high concentration solutions or suspensions may affect the nebulization rate or they are difficult to atomize.
5. The output air pressure and flow rate is 0 under the most unfavorable conditions.
6. Main advantages of inhalation therapy:
   - ℓ Inhaled medication can reach the patient respiratory tract and lungs and deposit, this therapy is more effective than oral drugs. Inhalation therapy is effective and rapid in relieving bronchial asthma and is superior to other treatments; even can save patients life in crisis time.
   - ℓ As the medication reaches the respiratory tract directly, its dosage and the toxic and side effects are significantly reduced, ensuring the principle of economical, affordable, effective, and safe medication.
   - ℓ Dilution of mucus and sputum can be used for a variety of respiratory diseases.
   - ℓ Inhalation therapy can significantly reduce symptoms and shorten the treatment course.

1.5 Equipment symbol and description

Symbol	Description	Symbol	Description
	Note! Consult the accompanying documents		Do not expose to open flames
	Caution Against Wet		Fragile-handle with care
	This side up		Class II equipment
	ON (power switched on)		Alternating current
	OFF(power switched off)		Date of manufacture
	Type B applied part	SN	Serial number
	Consult instructions for use	P/N	Part Number
	Stacking limit by number		

2 Safety Precautions

WARNING

1. **Inspect the device and parts before using them each time, and check that there are no problems.**
2. **Turn off the nebulizer if not use it. Unplug the plug cord from the power outlet if long time no use of nebulizer. Do not pull out the power cord when removing the plug.**
3. **Do not plug or unplug the AC adapter into the electrical outlet with wet hands.**
4. **Do not use power outlets or wiring equipment that not specified in this manual.**
5. **For type, dose, and regime of medication follow the instructions of your physician or respiratory therapist. Failure to do may cause symptoms to deteriorate.**
6. **Do not use only water in the nebulizer for inhaling purposes.**
7. **Do not use the device where it may be exposed to flammable gas.**
8. **Do not use or store the device in humid locations, such as a bathroom.**
9. **Dispose of any remaining medication in the medication cup after each use. Use fresh medication each time you use the device.**
10. **After cleaning or disinfecting, all attachments must be dried and then stored in a clean place. Do not store the air tube when there is moisture or medication residue inside.**
11. **Do not immerse the nebulizer or power cord in water or other liquids. Do not spill liquids on the equipment. When spilling medication liquid, clean it immediately with gauze.**
12. **Do not dissemble the main unit or attempt to repair, modify the equipment.**

13 **Only use the accessories specified by Konsung. Do not use damaged nebulizer.**
14 **This device is approved for human use only.**
15 **Operate the device only as intended. Do not use the device for any other purposes.**
16 **Do not use the device at temperatures greater than +40°C.**
17 **Do not cover the compressor with a blanket, towel, or any other type of cover during use. This could result in the compressor overheating or malfunctioning**
18 **Do not use or store the device where it may be exposed to noxious fumes or volatile substances.**
19 **Do not leave the device or its parts where it will be exposed to extreme high or low temperature, or where it will be exposed to humidity or direct sunlight.**
20 **Provide close supervision when this device is used by, on, or near infants, children or invalids.**
21 **Do not put fingers or any other objects into the device. Doing so may cause electric shock, malfunction, or injury.**
22 **Dispose of the device, components and optional accessories according to applicable local regulations. Unlawful disposal may cause environmental pollution.**

NOTE:

1 **Consult with physicians when purchasing or using this device.**
2 **The device uses disposable filter sheet. Do not reuse the filter sheet. Replace the dusted filter sheet according to the using environment (recommended to check or replace the filter sheet every 500 hours).**
3 **The provided nebulizing kit is disposable test sample. The nebulizing kit should be used by one person to prevent cross-infection. It is recommended to purchase and use**

qualified nebulizing kit manufactured by qualified manufacturers.

4 **Keep the device out of the reach of unsupervised infants, children or mental patient.**

5 **Do not carry or leave the nebulizing kit with medication in the medication cup.**

6 **Turn off the nebulizer and unplug the AC adapter from the electrical outlet after using the device or before cleaning.**

7 **The nebulizer uses oxygen gas with a concentration higher than 23% as the driving gas, and the gas flow rate is 3 to 9L/min (flow rate is fixed). When using oxygen as the driving gas, pay attention to:**

- **Do not use the device near the heat resource or fire.**
- **Do not use the device near flammable materials as grease oil, detergent ect. Neither use such materials and their analogue to the device.**
- **Do not use the device in a confined space, Operate the device at least 15cm away from the obstacles such as the walls and windows that prevent the air circulation.**

8 **Too high or too low voltage may damage the power supply. Do not use the device in a vehicle.**

9 **Do not use this product near the places with strong electromagnetic interference sources, such as walkie-talkies, CT, MRI and other equipment.**

10 **When using the device, the main unit may become hot. When using this device, there will be some noise and vibration caused by the pump in the compressor. There will also be some noise caused by the emission of compressed air from the nebulizing kit. This is normal and does not indicate a malfunction.**

11 **Do not use a microwave oven, dish dryer or hair dryer to dry the device or parts.**

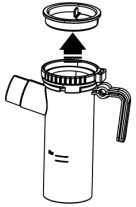
3 Operating and Maintenance

3.1 Unpacking and Inspection

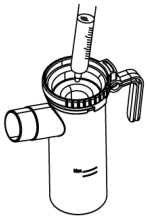
Users, before installing and commissioning, shall first check whether the appearance of the product is good, and whether the variety and number of attachments is in line with the list of accessories attached to the specifications. If there is any defect, please contact the supplier or manufacturer timely.

3.2 Preparations

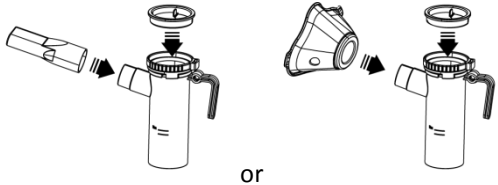
1. Open the cap.



2. Add the correct amount of prescribed medication to the medication cup.

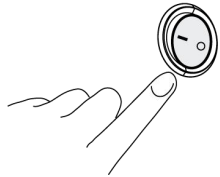


3. Cover the cap and connect the mouthpiece or mask.



or

4. Turn the power switch to the off (**O**) position.



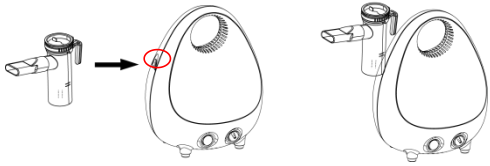
5. Plug the AC power supply to power outlet.

NOTE:

1 **Cannot use suspension liquid or high concentration medication. For type, dose, and regime of medication follow the instructions of your physician**
2 **Pour the correct amount of prescribed medication into the medication cup and do not exceed the maximum mark.**
3 **The scale on the medication cup is for reference only. Use the scale on your syringe or vial for accurate measurement of medication.**
4 **After the medication is added to the medication cup, please properly place the cup and avoid the dumping of the cup and the medication flowing outside.**
5 **There is no special requirement for the type of medication. The medication must be prepared under the guidance of physician. Do not add medication to the medication cup more than the maximum mark to avoid liquid spillage.**

Using holder

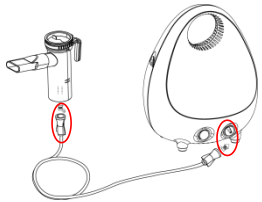
Use the holder when temporarily placing medication cup.



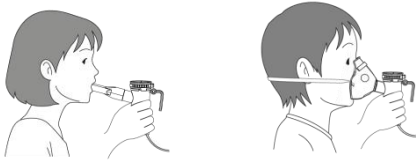
3.3 Nebulizing

1. Turn the power switch to the on (—) position.

2. As the main unit starts, connect the air tube to the connector of the main unit and the medication cup respectively.



3. Hold the nebulizing kit for treatment.



Inhaling with the mouthpiece or mask

4. After treatment, turn the power switch to the off (**O**) position.
5. Disconnect the nebulizing kit from the air tube.
6. Check the air tube. No condensation or moisture should remain in the air tube.
7. Disconnect the air tube.
8. Unplug the adapter from the power outlet.

NOTE:

1 In nebulization, keep the mouthpiece in mouth and close your mouth.

2 Do not tilt the nebulizing kit so the angle of the kit is greater than 45 degrees. Medication may flow into the mouth and the spraying may be ineffective.

3 If there is anything unusual in using, please stop using it immediately.

4 In nebulization, check whether there is visible aerosol discharging from the medication cup. In the event of irregular spray, please immediately stop the treatment.

5 Be sure to wipe the face after using nebulizer mask, and do not let the medication left in the face.

¤ Adjust aerosol quantity

Rotating the cap can properly adjust aerosol quantity.

3.4 Maintenance after use

The provided nebulizing kit is single use accessory, do not re-use. It does not require cleaning, disinfection and sterilization before use.

Users can purchase masks or mouthpieces manufactured by qualified manufacturers. User can perform corresponding cleaning according to the instructions of the user's manual.

Clean the main unit

Clean the casing of the main unit frequently by using a clean and soft cloth moistened with water or mild detergent (such as cleanser essence, laundry detergent etc.). Wipe the casing softly to remove the dirty or oil and avoid the liquid into main unit during cleaning.

The nebulizer should be dust-proof and moisture-proof during deactivation. It is best cleaned every three months.

NOTE:

1. **Dispose of the device and components according to applicable local regulations. Unlawful disposal may cause environmental pollution.**
2. **Do not use volatile oils, thinners to clean the main unit.**
3. **Keep the device out of the reach of unsupervised infants and children. The device may contain small parts that can be swallowed.**
4. **Unplug the AC adapter from the electrical outlet before cleaning the device.**
5. **Do not let the main unit, nebulizing kit drop or subjected to strong shocks.**
6. **Do not apply force to the nebulizing kit to deform.**
7. **Do not poke nebulizing kit with needles or sharp objects.**

Disinfect the main unit

Disinfection may cause damage to the nebulizer. We recommend that you disinfect the nebulizer only when necessary.

Clean the nebulizer before disinfecting it.

Recommended disinfectants are Ethanol 75%, isopropanol 70%.

WARNING

ℓ **Never use EtO or formaldehyde for disinfection.**

Replace filter sheet

If the air filter sheet has changed color or has been used on average for more than 500 hours, replace it with a new one.

1. Remove filter cover from the front side of nebulizer.
2. Remove the dirty filter sheet.
3. Insert a new filter sheet.
4. Put the filter cover back on the nebulizer.

NOTE:

1 **Use specified filter sheet, and do not use nebulizer without filter sheet.**

2 **Do not attempt to wash or clean the filter sheet. Damp filter sheet can cause blockages. Do not substitute cotton or any other material for the filter sheet.**

3 **Before inserting the new filter sheet, make sure the filter sheet is clean and free of dust.**

4 Troubleshooting Guide

Symptoms	Causes	Solutions
The main unit is not operating when the power switch is on.	The AC adapter is not plugged into an electrical outlet.	Turn the power switch off. Plug the AC adapter into an electrical outlet. Turn the device on.
	Damaged power fuse or switch	Replace the power fuse or switch. Please contact maintenance personnel for replacement
No nebulization when the main unit is operating.	No medication in the medication cup	Add the correct amount of prescribed medication to the medication cup.
	The nebulizing kit has been deformed in disinfection.	Replace the nebulizing kit
	The nebulizing kit has been blocked or deformed.	
	The air tube is blocked or folded.	Make sure the air tube is not folded, kinked or bent.
There is leakage outside the medication cup	The cup cap is not tightened.	Tighten the cap
	The medication cup is not stable	Place the cup steadily
There are water droplets in air tube.	Excess atomization medicine.	After the air tube is connected to the main unit, repeatedly open and closes the outlet of the air tube
	In nebulization, there is	

	condensation inside the air tube.	with a finger to get rid of water.
Excessive noise	Filter sheet is not installed	Install a filter sheet.
If there are any other questions, please contact the manufacturer or supplier, or turn to professionals for maintenance. Non-professional maintenance personnel or personnel who have not been trained and authorized by our company are strictly forbidden to disassemble the nebulizer compressor for maintenance.		

5 Warranty and Service

5.1 Warranty

Our company is responsible for return and replacement of the product which does not meet product standards.
In the normal condition of usual use and storage, the company is responsible for free repair and replacement if the device cannot be used within a week after sold (within 12 months of commercial storage). The user can take the device to the company following service department or agency or distributor for free repair with the invoice and warranty card if the equipment cannot be used within 12 month after sold. More than 12 month, the company provides the parts to repair with reasonable charge if it could not be used.

The following conditions are not covered by the warranty:

- Damage or deformation of the device caused by collision;

- Water into the unit or unit get wet;
- The device cannot work properly because of self-disassemble caused by user.
- Assembly is removable, stretching and re-commissioning;
- Equipment repair or alterations by non-authorized personnel of Konsung;
- Damage caused by non-normal use beyond the prescribed conditions;
- Original serial number tag or manufacturer logo is removed or replaced;
- Improper use of the product.
  If you have any questions, please contact us.

NOTE:

1. **Please take care of the purchase invoice and maintenance card for service.**
2. **The non-controllable factor or the artificial damage is not applicable to maintenance scope.**
3. **The service term is subject to Konsung.**

5.2 Contact information

If any questions in equipment operation, please contact the manufacturer or local agency.

Jiangsu Konsung Bio-Medical Science and Technology Co., Ltd.
Add: No. 8, Shengchang West Road, Danyang Development Zone, Jiangsu Province, P.R.China
Tel: +86-511-86375968
E-mail: info@konsung.com

6 EMC

This product has passed the electromagnetic compatibility test conducted by testing center. Please install and use this product according to the following electromagnetic compatibility information. Portable and mobile radio frequency communication equipment may affect the medical electrical equipment. Do not use this product near the places with strong electromagnetic interference sources, such as walkie-talkies, CT, MRI and other equipment.
This product uses the ordinary power line RVV 2x0.75, its maximum length is 1.5 meter.

WARNING

1. **Use of cables and transducers other than those specified, with the exception of cables and transducers sold by the manufacturer of the medical electrical equipment as replacement parts for internal components, may result in increased emissions of decreased immunity of the device.**
2. **The device should not be used adjacent to or stacked with other equipment. If adjacent or stacked use is unavoidable, the device should be observed to verify normal operation.**

6.1 Electromagnetic emissions

The device is intended for use in the electromagnetic environment specified below. The customer or the user of the device should assure that it is used in such an environment.

Emission test	Compliance	Electromagnetic environment
RF emissions CISPR 11	Group 1	The nebulizer uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions CISPR 11	Class B	The nebulizer is suitable for use in all establishments, including domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emissions IEC 61000-3-2	Class A	
Voltage fluctuations/ flicker emissions IEC 61000-3-3	Compliance	

6.2 Electromagnetic immunity

The device is intended for use in the electromagnetic environment specified below. The customer or the user of the device should assure that it is used in such an environment.

Immunity test	IEC60601 TEST LEVEL	Compliance level	Electromagnetic environment
Electrostatic discharge (ESD) IEC 61000-4-2	±6kV contact ±8kV air	±6kV contact ±8kV air	Floors should be wood, concrete or ceramic tile. If floor are covered with synthetic material, the relative humidity should be at least 30%.

Electrical fast transient/burst	±2kV for power supply lines ±1 kV for input/output lines	±2kV for power supply lines ±1 kV for input/output lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	±1kV for line to line ±2kV for line to ground	±1kV for line to line ±2kV for line to ground	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	<5% U_T, for 0.5 cycle (>95% dip in U_T) 40% U_T, for 5 cycles (60% dip in U_T) 70% U_T, for 25 cycles (30% dip in U_T) <5% U_T, for 5s (>95% dip in U_T)	<5% U_T, for 0.5 cycle (>95% dip in U_T) 40% U_T, for 5 cycles (60% dip in U_T) 70% U_T, for 25 cycles (30% dip in U_T) <5% U_T, for 5s (>95% dip in U_T)	Mains power quality should be that of a typical commercial or hospital environment.
Power frequency magnetic field 50Hz IEC 61000-4-8	3A/m	3A/m	Power frequency magnetic fields should be at levels characteristic of a

			typical location in a typical commercial or hospital environment.
Note 1: U_T is the AC mains voltage prior to application of the test level.			

6.3 Electromagnetic Immunity: For non-life support equipment and systems

The device is intended for use in the electromagnetic environment specified below. The customer or the user of the device can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the device as recommended below, according to the maximum output power of the communications equipment.

The device is intended for use in the electromagnetic environment specified below. The customer or the user of the device should assure that it is used in such an environment.			
Immunity test	**IEC60601 Test level**	**Compliance level**	**Electromagnetic environment-guidance**
Conducted RF IEC 61000-4-6	3V effective value 150kH-80MHz	3V effective value	Portable and mobile RF communications equipment should be used no closer to any part of the device including cables, than the recommended separation distance calculated from the equation applicable
Radiated	3V/m	3V/m	to the frequency of the

RF IEC 61000-4-3	80MHz-2.5GHz		transmitter. Recommended Separation Distances $d=1.2\sqrt{P}$ $d=1.2\sqrt{P}$ 80MHz-800MHz $d=2.3\sqrt{P}$ 800MHz-2.5GHz Where: P—is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey[a] should be less than the compliance level in each frequency range.[b] Interference may occur in the vicinity of equipment marked with the following symbol:
Note 1: From 80MHz to 800MHz, the higher frequency range applies. Note 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and			

reflection from structures, objects and people.
* Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the device is used exceeds the applicable RF compliance level above, the device should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the device. * Over the frequency range 150kHz to 80MHz, field strengths should be less than 3V/m.

6.4 Recommended Separation Distances

Recommended separation distances between portable and mobile RF communications equipment and the device.

Output power of transmitter in Watt(W)	**Separation distance according to frequency of transmitter(m)**		
	150kHz-80MHz $d=1.2\sqrt{P}$	80MHz-800MHz $d=1.2\sqrt{P}$	800MHz-2.5GHz $d=2.3\sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.38	0.38	0.73
1	1.2	1.2	2.3
10	3.8	3.8	7.3
100	12	12	23
For transmitters rated at a maximum output power not listed above, the recommended separation distance d in meters (m) can be estimated using the equation applicable to the frequency of			

the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

Note 1: From 80MHz to 800MHz, the higher frequency range applies.

Note 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

7 Parts list

Nebulizer main unit	1
Nebulizing kit	1
User's manual	1
Warranty card	1
Qualified certificate	1

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