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**D-Tiger** 

# 6000S USER MANUAL

Instructions and Safety Considerations of Ambulanc Transport Ventilator



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- The electrical installation of the relevant room complies with the applicable national and local requirements;
- The product is used in accordance with the instructions for use.



## Warning

- This equipment must be operated by skilled/trained clinical professionals.
- It is important for the hospital or organization that employs this equipment to carry out a reasonable service/maintenance plan. Neglect of this may result in machine breakdown or personal injury.



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- Others not caused by instrument or part itself.

## **Safety Information**



#### Danger

Indicate an imminent hazard that, if not avoided, will result in death or serious injury.



## Warning

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



## Caution

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

#### Note

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



## **Product Information**

#### Product Name: Transport Ventilator

#### Model: 6000S

#### Manufacturer: Ambulanc (Shenzhen) Tech. Co., Ltd.

Manufacturer address: 3rd Floor, Block C, Building #5, Skyworth Innovation Industry Park, Tang Tou 1st Road, Shiyan Town, Baoan District, Shenzhen 518108, China.



## Warning

This device is not intended for home using!

## **Company Contact**

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## Preface

#### **Manual Purpose**

This manual contains the instructions necessary to operate the product safely and in accordance with its function and intended use. Observance of this manual is a prerequisite for proper product performance and correct operation and ensures patient and operator safety.

This manual is based on the maximum configuration and therefore some contents may not apply to your product. If you have any question, please contact us.

This manual is an integral part of the product. It should always be kept close to the equipment so that it can be obtained conveniently when needed.

#### **Intended Audience**

This manual is geared for clinical professionals who are expected to have a working knowledge of medical procedures, practices and terminology as required for emergency rescue.

#### Illustrations

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



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# 1. Overview



# 1. Pressure monitoring hose connection

Connect with breather hose and monitoring of airway pressure.

#### 2. Connection for ventilation hose

Connecting with patient valve and breather hose

## 3. Safety valve

When the airway pressure overruns, it will automatically open the pressure safety valve.

#### 4. Air filter

Fresh air suction passage.

#### 5. Battery and maintenance interface

Built-in 3400 mAh high-capacity rechargeable battery, non-professional

couldn't replacement it; Maintenance interface can be used for the machine maintenance, non-professional couldn't use it.

#### 6. Speaker

Voice prompt and alarm speaker.

#### 7. O<sub>2</sub> inlet

Connect with oxygen cylinder.

#### 8. DC interface

Connect the power adapter, or DC power supply of an ambulance and rescue helicopter.

#### 9. Adapter

1.

To convert the 100-240 V alternating current (AC) for 12 V DC, provide power for breathing machine.



## **1.LED display**

Display respiration parameter

#### 2. Alarm panel

Display Alarm message type

#### 3. AC adapter indicators light

Whether it is switched on or off, the power converter are shown in green, do not display when no external power supply. Note: when breathing machine by an external power supply switch to the internal power, breathing machine still work normally.

#### 4. Battery indicators light

Instructs the battery status, Low battery will show red light, when the battery is being charged, Flash yellow light, indicator will be in green once the battery has been charged completely.

#### 5. Voice alarm mute key

This button could turn off the voice alarm function the alarm for a period of time (2 minutes), when the alarm mute indicator.

#### 6. Air Mix/No Air Mix switch

Switch between Air Mix/No Air Mix.

### 7. Minute volume regulator

Set up minute respiratory volume.

#### 8. Manual operation key

Presses the button continually, it will supply gas to the patients at constant velocity, until loosen Manual button to stop gas supply.

#### 9. ON/OFF switch assisted ventilation

Press the assisted mode; patient breath under assisted ventilation mode, Yellow light is bright.

#### 10. ON/OFF button

Press this button switch on, long press the power off after 3 S

#### **11. Regulator of Ventilation frequency**

Set the patients breathing rate

#### 12. Regulator of Max ventilation pressure

Set the airway pressure limit, if the airway pressure exceeds this value, will be sounded

#### 13. Color code

- infant (yellow, 10-30Kg)
- child (orange, 30—60Kg)
- Adult (blown, 60—110K)

## **Display of 6000S**



### 1. Battery status indicators

when battery is low display red to give a alarm, rolling green bar when

charging ,more than two compartment display green.

#### 2. Line operation indicators

Show red fork means no external power supply.

#### 3. Ventilation modes indicators

Indicate a real-time breathing pattern.

#### 4. Measurement parameters display

mage display the real-time airway

pressure, monitor the airway pressure within the set maximum pressure, Arc area filled with green, Paw and mbar letters show green, more than set the maximum pressure Arc area filling red, Paw and mbar letter turn to red to give an alarm.

#### 5. Mean airway pressure

Show the Mean airway pressure value of monitoring.

#### 6. Peak airway pressure

Show highest airway pressure value of monitoring.

Symbol	Meaning
*	Emergency ventilation mode — Infant
<b></b>	Emergency ventilation mode — Child
Ŵ	Emergency ventilation mode — Adult
	Battery status indicator

## Symbols used on the display



# 2. Description

## 2.1 Intended use

The 6000S is an automatic oxygen respiration device(short-term ventilator) with additional inhalation facility.6000S can control and assist Patient whose weight is more than 15Kg, as well as non-invasive and invasive mechanical ventilation.

6000S must only be operated when it is security installed or when it is on approved carrying platforms.



## Warning

6000S Should not be used on neonatal patients.

## 2.2 Applications

### You can use 6000S:

- To revive patients at the site of the emergency;
- For longer periods in more protracted emergencies, e.g. fire;
- For short-term O<sub>2</sub> inhalation using a respiration masks.

#### You can use 6000S while transporting patients:

- Between the various rooms and departments of a hospital;
- Between the hospital and other premises;
- In emergencies;
- When transport over considerable distances is planned.

#### 6000S:

- Is designed to provide controlled ventilation to persons of 15kg body weight or more;
- Is used to treat respiration arrest;
- Can be preset to parameters that ensure evenly balanced ventilation, provided that the selected Maximum ventilation pressure Pmax is not exceeded;
- Permits respiration-controlled oxygen inhalation in Demand mode.

## 2.3 Users qualification

6000S must only be used by persons who can verify that they have the following qualifications:

- A medical qualification and training in ventilation techniques.
- Training in the use of the 6000S by a person authorized by Ambulanc

Improper use may lead to serious physical injury.

## 2.4 Ventilation function

6000S operates within a pressure range of 2.7 to 6 bar and at a flow rate of not less than 70l/min  $O_2$ . It has a built-in power pack.

It uses high-pressure, medicinal-grade oxygen. An external pressure reducer brings this down to the required operating pressure. The oxygen supply is fed in at input valve.

The ventilation settings are infinitely variable. Both this and the inspiration/expiration ratio of 1:1.67 are regulated by internal electronic control mechanisms.

The gas for inspiration flows along the hose and through the patient valve and either the mask or the tracheal tube into the patient's airways. The patient valve is fitted with a lip membrane that enables expired gas to be conducted away through the expiration tube.

At the normal Air Mix setting atmospheric air is admixed to give an  $O_2$  concentration of between 55% and 85% at 10 mbar ventilation pressures (note "10.2  $O_2$  content when using Air Mix").

In certain indications and in cases where the surrounding atmosphere is contaminated, you can switch to No Air Mix and ventilate with pure oxygen.

The injector unit is switched off when switching from Air Mix to No Air Mix. This increases minute volume which can result in the set pressure limit being exceeded and a stenosis alarm (Stenosis) being triggered. In this case, set minute volume correspondingly lower.

In the opposite instance, in other words when switching from NO Air Mix to Air Mix, the injector unit is switch on. This reduces minute volume which can lead to the set pressure limit being undershot. In this case, set minute volume correspondingly higher.

# 2.5 Controlled ventilation (IPPV)

After being switched on, the 6000S is automatically in Controlled Ventilation mode. This administers mandatory ventilation strokes to the intubated patient according to the ventilation values set on the device.

# 2.6 Assisted ventilation (Assist)

In addition to Controlled Ventilation mode, the 6000S also has an Assisted Ventilation mode. After you have switched on Assisted Ventilation mode by pressing the Assist key, a flashing green LED indicates this mode.

The patient now has the option of triggering a triggered ventilation stroke within a time window of 40% of expiration. To do so, the patient must generate a flow of over 5 l/min by his own breathing efforts.

If the breathing efforts of the patient are not sufficient to trigger, the patient automatically receives a mandatory ventilation stroke at the end of the time window, so that the set minute volume is guaranteed.

With this function, the ventilation strokes of the device can be synchronized with the breathing in air from the surrounding atmosphere via the patient valve.

If the patient does not trigger the device, an alarm is triggered. The patient continues to receive controlled ventilation.

## 2.7 Manual operation mode

When 6000S in the IPPV ventilation mode, press the Manually ventilation button (M), 6000S would supply gas to the patients at constant velocity, until loosen manually ventilation button to stop gas supply. The constant flow rate is consistent with the parameters which set up under IPPV ventilation mode.

Loosen the button manually ventilation, If the controller did not press the M key within 3 s, it will automatically switch back to the breathing pattern

## 2.8 Patient ventilation Hose System

The ventilation gas is supplied to the patient via the Patient ventilation hose system, comprising the ventilation hose and all leads necessary for comprehensive ventilation and monitoring. It includes the ventilation hoses and patient valve.

- Ventilation hose component is designed to permit spontaneous respiration even if the 6000S malfunctions.
- Ventilation hose is available in two versions:
  - a) Reusable ventilation hose;
  - b) Disposable ventilation hose



# 3. Safety instructions

For your own safety and that of your patients, please observe the following points.

## 3.1 General

- Always carry out a functional check before using the unit. (See "7. Function check").
- Please read the directions for use carefully. They are an integral part of the ventilator and should be available for reference at all times.
- Before starting to work with 6000S, you must understand how to operate it.
- Please comply with section "5. Hygienic preparation" on page 30 to prevent infection or bacterial contamination.
- 6000S should be used only by medically qualified personnel who have had training in ventilation techniques. Incorrect use can cause severe physical injury.
- It is advisable for you to have servicing and repairs carried out only by the manufacturer Ambulanc, or by qualified technicians expressly authorized by Ambulanc.
- Malfunctions and a lack of biocompatibility may result if third-party articles are used. Please bear in mind that in these cases any warranty entitlement and liability shall lapse where the accessories recommended in the instructions for use or original spare parts are not utilized.
- 6000S should be used only for the purposes for which it is designed (note "2.1 Uses" on page4).
- 6000S is not designed for use under hyperbaric conditions (pressure chamber).
- 6000S should never be used with flammable anesthetics.
- In the case of use in poisoned or low-oxygen atmospheres, do not operate the 6000S with the "Air Mix" setting or in Assist mode.
- A back-up ventilator should always be available in case of technical failure.
- Risk of injury. Never leave the patient or the ventilator unattended during ventilation. Only then can you respond quickly if the patient's condition deteriorates or in the event of an alarm or malfunction. Delayed response on the part of medical personnel may lead to serious physical injury.
- Do not place a switched-on cellular phone or radio closer than 1m from the 6000S, as this could cause malfunctions.
- When operating the unit with the power supply unit, make sure that the power cord cannot cause anyone to trip or cause any obstruction.



## 3.2 Safe Using of Oxygen

Highly compressed oxygen can lead to spontaneous explosive reactions in combination with flammable substances (grease, oil, alcohol, disinfectants, etc,):



## Warning

- All screw connections and other components of the ventilator must be kept absolutely free of oil and grease.
- Always wash your hands before starting to work on the oxygen supply.
- Smoking and open flames are strictly prohibited in the vicinity of all fittings containing or transporting oxygen.
- During assembly and when changing the oxygen cylinder, only hand pressure should be used when tightening the screw connections to the cylinder and to the pressure reducer. Never use tools for this purpose. Excessive tighten damages the screw threads and seals and can cause leaks.
- Protect oxygen cylinders from accidental falls. If a cylinder falls, the pressure reducer or the valve may break off and cause a violent explosion.



## Caution

- Always open the valve of the oxygen cylinder slowly to prevent pressure damage to the other fittings.
- The oxygen cylinder should never be completely emptied as this may allow moisture-containing air to enter the cylinder and cause corrosion.
- Secure the oxygen cylinders so that they cannot fall over. If a cylinder falls on the pressure reducer or valve, these could break off, causing a violent explosion.

## 3.3 Ventilation/Operation

- Patient and transport ventilator must be kept under continuous observation during ventilation.
- Prolonged ventilation can lead to atrophy of the muscles (dependency of the patient on ventilation).
- Prolonged ventilation may lead to the airway drying out. Ensure adequate conditioning of the respiratory air.
- Only apply high ventilation pressures for short periods and only if medically indicated. Permanently applied high ventilation pressures can be injurious to the patient.



Make sure that the patient valve is not covered or its function impaired, e.g. by the patient's position. In the process of ventilation, it must be continuously observed patient and ventilator.

## 3.4 Patient Ventilation Hose System

## Warning

- Risk of injury. Only use the Patient Hose System if you are a qualified medical professional and have received training in respiration techniques. Improper use may lead to serious physical injury.
- The Patient Hose System must be subjected to a functional check and visual inspection by the user before use. For this, refer to the instruction manual for the Patient Hose System.
- When connecting the patient valve, check that the direction of flow of the respiratory gas is correct. Make sure that the expiration opening of the patient valve is not covered or prevented from functioning, e.g., by the patient's position.
- Only use the Patient Hose System for the purpose described. For this, refer to the instruction manual for the Patient Hose System.
- The Patient Hose System is not suitable for hyperbaric use (pressure chamber).
- Also refer to the instruction manual for the Patient Hose System.

## 3.5 Software

Risks due to software errors have been minimized by means of extensive qualification measures.

## 3.6 Accessories/spare parts



## Caution

- Protect silicone/rubber parts against UV light and prolonged direct exposure to sunlight to prevent them becoming brittle.
- We recommend that work such as inspections and repairs should be carried out by the manufacturer, Ambulanc, or by a technician expressly authorized by Ambulanc.
- Malfunctions and a lack of biocompatibility may result if products from other manufacturers are used. Please bear in mind that in these cases all warranty rights and liability shall become void if the accessories recommended in the instruction manual or original replacement parts are not used.



# 4. Installation

As a rule, 6000S only has to be installed for stationary use in rescue vehicles, helicopters or aircraft. In this case, fastening sets can be supplied as accessories.

If 6000S is supplied complete on a stretcher board, or mounted on an Ambulanc Emergency Bag, then the device is ready for operation and no further installation work is required.



## Warning

After installation, you must make function check to ensure reliable operation. (See "7. Function Check")

## 4.1 Connecting the oxygen cylinder



## Warning

- Risk of explosion! Wash your hands thoroughly before doing any work on the oxygen supply. Hydrocarbon compounds (e.g. oil, grease, cleaning alcohol, hand cream or adhesive plasters) can cause explosive reactions if they come into contact with highly compressed oxygen.
- Never use wrenches or other tools to tighten or loosen the screw connections.

# 4.2 Removing the empty cylinder

- 1. Close the valve on the oxygen cylinder.
- 2. Switch on 6000S at On/Off switch. This allows the remaining oxygen to escape and the unit is pressure-free. Wait until the pressure gauge on the pressure reducer shows an oxygen content of zero before undoing the screw connection by hand.
- 3. Switch off 6000S at On/Off switch.
- 4. Then loosen the screw connection to the cylinder by hand.

## 4.3 Connecting the new cylinder

- 1. First open the valve of the new oxygen cylinder, then shut it again quickly. This will blow away any particles matter.
- 2. Connect the pressure reducer to the valve on the oxygen cylinder. Tighten the connecting nut by hand.
- 3. Screw the pressure hose onto the outlet of the pressure reducer (if not already connected) using the 9/16"-18UNF union nut.
- 4. Screw the other end of the pressure hose to the compressed gas connection of the 6000S if this has not yet been done.





## Caution

- Make sure that the patient is not connected up to the 6000S when you are establishing the gas supply. Otherwise, the automatic self-test of machine will lead to incorrect results.
- When doing this, hold the valve opening away from your body in such a way that any flying particles cannot injure yourself or other people.

## 4.4 Ventilation Hose System

A reusable hose system is supplied with the 6000S. Optionally, a disposable hose system is also available. The procedure for connecting both systems is as follows:

- 1. Connect pressure-measurement tube onto the corresponding connection on the front of the unit. Make sure that the connected tubes are not kinked.
- 2. Connect the ventilation hose onto the corresponding connection on the front of the unit. Make sure that the connected hoses are not kinked.
- 3. Connect the patient valve with the ventilation hose and pressure measurement tube as below indicated drawing of patient valve.
- 4. If performing mask ventilation, attach the ventilation mask to the patient valve, or if the patient is incubated, attach the tube to the patient valve.



## Caution

Only grasp the ventilation hose by its ends. Otherwise the hose may be damaged.

## **Patient valve**



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1	Outlet	$\Phi$ 30mm Convex cone Interface
2	Intake	$\Phi$ 15mm/20mm Coaxial Interface
3	Patients connector ( Connect to mask / intubations )	$\Phi$ 15mm/20mm Coaxial Interface
4	Emergency air intake	Non-standard interfaces
5	Pressure measurement tube connecting point	$\Phi$ 5mm Non-standard cylindrical interfaces



## Warning

We strongly recommend to use the original Accessories supplied by Ambulanc only, malfunctions and a lack of biocompatibility may result if products from other manufacturers are used. Please bear in mind that in these cases all warranty rights and liability shall become void if the accessories recommended in the instruction manual or original replacement parts are not used.



# 5. Using the ventilator

## 5.1 Switching on/ self test



Error number:1

1. Open the valve of the oxygen cylinder slowly. The pressure gauge will now show the pressure in the cylinder.

2. Calculate the remaining operating time (please refer to "5.9 Calculation the oxygen level/operating time"). Always change the cylinder in good time, e.g. when the pressure falls below 50 bar, to ensure a sufficiently long operating time.

3. Select the desired settings for the ventilation (see "5.2 Selecting the ventilation settings").

4. Press the ON/OFF button to switch on 6000S, an automatic self-test runs. The screen will show the process percentage of self-test, after finishing self-test, the screen will change to the main interface with voice prompts "Open oxygen cylinder." "Check respiration and select mode, adjust settings."

If the self-test is unsuccessful, it will be shown in the screen as the left. You should hear the message "Device malfunction! Administer alternative ventilation" If this happens, 6000S must not be used for ventilation.

After the self-test, the ventilator repeatedly checks the oxygen cylinder pressure until adequate pressure is detected. Otherwise an alarm is sounded. The 6000S will then start to function with the selected ventilation settings.



## Warning

The automatic self-test is not a substitute for the functional check. Before using the unit, always carry out a functional check, as described in Section "7. Function check". That is the only way to ensure that the unit is fully functional.

- 5. When the screen switches into the main display interface, indicating that the unit is able to work promptly. All the settings will be the same at the time when you turn off the unit.
- 6. Connect to the patient after finish the setting.

7. During the ventilation, may need to adjust the respiratory parameters based on patient condition. Please refer to following contents of this chapter for details.



## 5.2 Selecting the ventilation settings

The settings can be selected either before or after the 6000S is switchen on. We recommend selection before switching on, to prevent unnecessary waste of oxgen.

#### Air Mix/No Air Mix

In the case of a given indication, it is possible to ventilate using pure oxygen or using mixed air.

1. For mixed air, set switch 6 to Air Mix.

The oxygen concentration administered will normally lie somewhere between 55% and 85% at a ventilation pressure of 10 mbar. You can read off the exact figure from relevant diagram (note "10.3  $O_2$  content when using Air Mix" on page 61)



## Warning

The No Air Mix setting should be used when the surrounding atmosphere is polluted or has a low oxygen content or when indication requires this.

2. Set Switch 4 to No Air Mix.

When the ventilator is switched from an air/oxygen mixture (Air Mix) to pure oxygen (No Air Mix), the minute volume will vary only within the set tolerances(note "10. Technical data: on page 58).

#### **Respiratory frequency**

The respiratory frequency can be set with regulator knob 11.

#### Minute volume

The minute volume can be set with regulator knob 7.

Recommended for breathing frequency and minute volume in the case of controlled ventilation:

Colour	Infant (Yellow)	Child (Orange)	Adult(Brown)
Body weight	10 ~ 30Kg	30 ~ 60Kg	60 ~ 110Kg
Respiratory frequency	25 ~ 40bpm	15 ~ 25bpm	8 ~ 15bpm
Minute volume	3 ~ 5L/min	5 ~ 7L/min	7 ~ 13L/min

The fingers shown in the table are only recommendations. Different settings may be required in cases of pulmonary damage or for special indications.

To see the relationship between the values, see diagram "11.3 Relationship between ventilation parameters".

#### Maximum ventilation pressure

Use the mask/tube switch 1 to set the maximum ventilation pressure. The LEDs light up in active mode.



#### **Recommended maximum ventilation pressure**

Mask ventilation	Intubations
20 mbar	45 mbar

The values given in the table are recommendations. Deviating values are possible for certain indications.

If the set level is reached, e.g. in cases where compliance is inadequate, 6000S sets off a stenosis alarm. (Note "Stenosis alarm" on page 25).

## 5.3 Selecting ventilation mode

### Ventilation in Controlled Ventilation mode

The 6000S is automatically in Controlled Ventilation mode when switched on. The Led in Key **9** does not come on.

The patient is supplied with air for breathing at an inspiration/expiration ratio of 1:1.67 according to the set ventilation parameters (note "5.2 Selecting the ventilation settings" on page 14).

## Example of a ventilation curve in Controlled

## Ventilation mode:



#### Ventilation in Assisted Ventilation mode

To switch on Assisted Ventilation Mode, please press key **9**, Assisted Ventilation mode is indicated by the green LED in key 9 flashing. During assisted ventilation, the patient likewise receives a controlled ventilation stroke in accordance with the ventilation frequency set.

In addition, the patient is given the option of triggering the device himself before a controlled ventilation stroke. This synchronises the controlled ventilation strokes with the breathing efforts of the patient.







The patient furthermore has the option of performing a spontaneous breath via the patient valve between triggered ventilation strokes. In this case, the patient draws air for breathing from the ambient air.

If the patient fails to trigger the device within the time window in two consecutive phases, i.e., is making no more breathing effort, the **NO Assist** alarm is triggered (note "4.9 Alarm signals" on page 25).

You end, Assisted Ventilation mode by pressing key **9**. The 6000S then continues working in Controlled Ventilation mode. The LED in key **9** goes out.



## Caution

When the trigger pressure is set incorrectly or the patient's spontaneous breathe is improved, this ventilation will result excessive ventilation on patient.

#### Manual operation mode

When 6000S in the IPPV ventilation mode, press the Manually ventilation button (M), 6000S would supply gas to the patients at constant velocity, until loosen manually ventilation button to stop gas supply. The constant flow rate is consistent with the parameters which set up under IPPV ventilation mode.

Loosen the button manually ventilation, If the controller did not press the M key within 3 s, it will automatically switch back to the breathing pattern

## 5.4 Performing ventilation

## Ventilation Mask

- 1. Attach the mask to the patient valve,.
- 2. Place the mask over the patient's mouth and nose.
- 3. Stretch the mask over the head and seal it hermetically.



## NOTE:

Use this model if patient can autonomous respiration.

## Intubations

The patient will normally be intubated before the patient value is connected to the tube.

- 1. Set appropriate ventilation mode and related respiratory parameters fit for patients.
- 2. Insert patient's ventilation valve to the trachea intubations connector.

3. During ventilation, please always observe the respiratory parameters on the screen. This ensures that your current set is suitable for patients.

#### NOTE:

Use this model when patient can't spontaneous breath, this mode is invasive breathing

#### NOTE:

Use this model when patient can't spontaneous breath, this model is invasive breathing.

## 5.5 Monitoring ventilation

#### General

During ventilation, you must monitor the patient continuously. You can follow the progress of ventilation on the display.

High airway resistances, e.g. due to obstructions of the airway or during external cardiac massage, may change the respiratory minute volume, depending on the ventilation mode.

If lung compliance decreases, the unit responds as follows. If it is more than the maximum pressure set twice during the inspiratory phase, check equipment and patient.



#### NOTE:

All the displayed measurements for flow, volume, or MV relate to ambient temperature and ambient air pressure.



## **Displayed measurements**



During ventilation, the following parameters are shown on the display as numbers:

◆ Image display the real-time airway pressure, monitor the airway pressure within the set maximum pressure, Arc area filled with green, Paw and mbar letters show green, more than set the maximum pressure Arc area filling red, Paw and mbar letter turn to red to give an alarm.

- ◆ The average airway pressure
- Digital display the high airway pressure.

## 5.6 Ending ventilation

 Please check the valve on the pressure gauge shows the pressure cylinder to know gas stock. If the pressure gauge instructions is below 5MPa (including 5MPa, about 725PSI), to be replaced with new oxygen cylinder.



- 2. Close the oxygen cylinder valve.
- 3. Long press "on / off key" for about three seconds, turn off the ventilator; it will have voice prompt "Close the oxygen cylinder."



## Caution

Never empty the oxygen cylinder completely. Always ensure that there is a certain residual pressure in the cylinder when you return it for filling, as this prevents moist ambient air from entering and causing corrosion.

## 5.7 Alarm signals

#### Alarm panel signals 2 the following alarms:

#### Stenosis

Stenosis, or a rise to maximal ventilation pressure  $P_{max}$  reached in two successive inspiration phases.

#### **Disconnection:**

Disconnect between 6000S and patient in two successive inspiration phases.

## <2.7 bar:

Π

Drop in oxygen pressure to below 2.7 bar.

: Low battery, battery failing or fuse defective.



NO Assist: In Assisted Ventilation mode, patient fails to trigger within the time window in two consecutive phases.

This equipment adopts the light alarm levels are high priority, once the alarm equipment handled in a timely manner.

alarm information	sound alarm	Sound alarm frequency	Light alarming	Light alarm frequency	Parameter alarm level
Stenosis	$\checkmark$	None	$\checkmark$	2Hz±0.2	high priority
Disconnection √ None		$\checkmark$	2Hz±0.2	high priority	
< 2.7 bar √ None		$\checkmark$	2Hz±0.2	high priority	
	$\checkmark$	None	$\checkmark$	2Hz±0.2	high priority

This equipment adopts the voice alarm in speech patterns, and auditory alarm is between 60-70 decibels.

Voice alarm means sound an alarm when the Instrument out of the question or parameters exceed the normal physiological indexes, At this time must work with sound and light alarm indication for alarm, If only the voice prompt, Just prompt the operator how to operate, not as an alarm management information please pay attention to distinguish

In addition, except visual alarm and sound alarm.

In addition to all the visual alarms, an acoustic alarm is triggered. Only in the case of No Assist alarm, is the acoustic alarm triggered with a delay of 1 minute.

If audio response is enabled you will hear the messeage "Device malfunction! Administer alternative ventilation."

In this case you must not to use the 6000S.

The patient valve is design to enable spontaneous breathing in the event of equipment failure.

## When is the alarm set off?

An alarm signal is given as soon as any one of the functional problems mentioned above occurs. The relevant Led starts flashing and an acoustic signal sounds. If audio response is enabled, the user also hears additional information about the individual alarm.

Simultaneous disconnection and drop in oxygen pressure will initially set off only the <2.7 bar alarm.

## Senosis alarm

Actual ventilation pressure exceeds the maximum ventilation pressure.

6000S briefly switches to expiration if the maximum ventilation pressure is exceeded, but the tries to continue inspiration in the same inspiration phase.

If the maximum ventilation pressure is exceeded for a second time during the same inspiration phase, the unit finally switches to expiration and vents the patient tube system completely. The next inspiration begins with the following ventilation stroke according to the frequency selected. This does not affect the set frequency.

The alarm is set off if airway resistance is exceeded in two successive inspiration phase. This is intended to prevent false alarms, e.g. due to coughing.

If audio response is enabled, the unit announces "Check airways and minute volume".

#### **Disconnection alarm**

As a rule this alarm is due to interruption of the breathing system. The alarm is set off when the rise in pressure fails to reach at least **3** mbar in two successive inspiration phases. If audio response is enabled, the unit announces "Check ventilation system and settings".

#### < 2.7 bar O2 alarm

Oxygen pressure at the pressure connection to the 6000S has dropped to less than 2.7 bar. The reason is usually an almost empty oxygen cylinder.

In this case 6000S can no longer function correctly because the operating parameters are no longer within the permissible limits.

If audio response is enabled, the ventilator announces: "Check pressure hose system and gas supply".

#### Alarm

The battery is failing. Failure of the automatic ventilation function must be expected. Immediate steps must therefore be taken to provide alternative ventilation (see "5.10 Alternative ventilation procedures").

If audio response is enabled, you will hear the message: "Device malfunction! Administer alternative ventilation".

The ventilator must be switched off before the battery can be changed (see "Changing the battery").

#### NO Assist Alarm

In Assisted Ventilation mode, patient fails to trigger within the time window in two consecutive phases.

The Led in alarm field 2 flashes and the acoustic alarm is triggered after a 1 minute delay.

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#### Canceling acoustic alarm

The acoustic alarm can be temporarily cancelled by pressing alarm acknowledgement 5:

Stenosis:	120 seconds
Disconnection:	120 seconds
< 2, 7 bar:	120 seconds
[ :	120 seconds
NO Assist:	120 seconds

Even if audio response is enabled, no messages will be output for the periods stated. The visual alarm will continue to flash.

If the cause of the alarm is not eliminated, the acoustic alarm will start to sound again after a short interval. Audio response will also resume automatically.

Both the visual and acoustic alarms are cancelled automatically as soon as the malfunction is eliminated.

#### Voice output

Alarm	Voice Prompt		
Battery Low	Low battery		
Supply pressure< 2.7 bar	Check pressure hose system and gas supply		
Airway pressure upper limit	Check airways and minute volume		
Minute volume upper limit	Check ventilation parameter setting		
Minute volume lower limit	Check ventilation parameter setting		
Apnea	Check situation of patient, choose other ventilation mode		
Disconnection	Check ventilation system and settings		

#### **Voice Alarm Mute**



When an alarm occurs, you can mute the audible alarm temporarily (120 seconds) by pressing the Alarm Mute button. For these 120 seconds. Press the button again to reactivate the acoustic alarm. The visual alarm remains active.

Visual and acoustic alarms are automatically reset as soon as the cause of the alarm has been rectified.



## 5.8 Selecting language for user guidance



6000 s did not shut down operation guide function. It meaning in any case, voice operation guide is opening. 6000 s did not shut down operation guide function. It meaning in any case, voice operation guide is opening. Voice guide with a variety of languages, please select the language as follows:

1. After starting system, at the same time, press the switch machine and "M" keys 2 seconds, can enter the voice interface.

2. Select the corresponding language, press the "OK" button to exit the voice selection interface, back to the system main interface.

If you press the "next" button, then the system will get into the calibration status. (Which detail please refer to the maintenance manual).

## 5.9 Audio response messages

The following is a list of the individual audio response messages with notes on what they mean:

Audio response	Meaning
"Turn on oxygen cylinder"	Open oxygen cylinder valve <b>slowly</b> .
"Check respiration and select mode"	Depending on whether or not the patient is breathing, set 6000S to one of the modes Demand Flow, mask ventilation or intubation.
"Adjust settings"	Depending on patient weight, set respiration frequency and minute volume.
"Connect patient"	Connect patient to ventilator via ventilation hose and patient valve using the patient mask or the connector of the tracheal tube.
"Check airways and minute volume"	6000S has measured excessive airway resistance. Check the airways or adjust respiratory frequency and minute volume settings to suit the patient.
"Device malfunction" "Administer alternative ventilation"	The device is faulty or the battery is failing. The device can no longer be used for ventilation. You must therefore use another ventilation method.
"Check pressure hose system and	6000Shas measured low pressure on the inlet

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gas supply"	side. Check whether the O2 cylinder still contains sufficient oxygen and that the oxygen hose is not leaking, kinked or jammed.
"Close oxygen cylinder"	After switching off the ventilator, turn off the O2 cylinder or the external O2 supply.
"Check ventilation system and settings"	Disconnection: a pressure rise of 3 mbar is not achieved during the inspiration phase under controlled ventilation. This is usually due to an interruption of the ventilation system or to a low minute volume setting. Check the connections or adjust the minute volume to suit the patient.

# 5.10 Calculation of oxygen content/remaining operating time

#### Oxygen content of cylinder

Oxygen volume = volume of cylinder x cylinder pressure.

	Cylinder volume	x cylinder pressure	= oxygen content
Example 1	10 L	x 200 bar	= 2000 L
Example 2	10 L	x 100 bar	= 1000 L

#### **Real ventilation time**

-	Oxygen content (L)
Real ventilation time (min) =	MV (L/min)

Example: O2 content = 1000 L; MV = 11 L/min.

This gives the following equation:

	1000 L	
Real ventilation time = -	11 L/min	= 91 min = 1 h 31 min

## 5.11 Battery management

6000S is equipped with a built-in rechargeable battery; the output is DC12-15V, in the standard mode of operation time is not less than 10 hours. Built-in rechargeable battery can't be charge separately, allowing only 6000S host for its power supply. Charging time is not less than 5 hours.



## **Battery Status indicators**

Battery status indicators displays in upper-right corner of the screen instructions to do all kinds of instructions are as follows:

Indicators	Instructions
	Battery full
	Battery not full
	The battery has been exhausted
	Lattice by small black arrows show the direction of non-stop flashing, indicating the battery is charging



# Attention!

- 1) In the use of emergency power it can't charge. Only in case of using an adapter it can charge.
- 2) In order to use batteries for a long-term normal use, it is recommended to charge and discharge once every 3 months.



# 6. Hygienic preparation

After every use the 6000S and any accessories used must undergo hygienic preparation.

Be sure to carry out a functional check after every hygienic preparation (see "7. Functional checks").

## 6.1 6000S

You can keep 6000S clean by simply wiping with disinfectant as described in section 6.6.



## Caution

Never immerse 6000S in disinfectants or other liquids. Otherwise damage may be caused to the unit, thus endangering users and patients.

## 6.2 Patient valve

- 1. Disconnect the patient valve from the hoses.
- 2. Always grasp the hoses by their ends. Otherwise you might damage or tear them.
- 3. Dismantle the patient valve. It is neither necessary nor permissible to remove the membrane in the emergency air intake for cleaning and disinfection.
- 4. Crinkled, misshapen and sticky valve membranes must be replaced.
- 5. Perform the hygienic preparation as described in section 6.6.
- 6. Reassemble the patient valve. When reassembling, make sure that the one-way valves membrane is correctly positioned.
- 7. Always perform a functional check before using the valve again (see "7.3 checking the patient valve")

## 6.3 Ventilation hose

1. Take the ventilation hose and the pressure gauge hose off both connection ports.



## Caution

Always grasp the hoses at the end, as shown in the drawing, otherwise the hoses may be damaged or torn off. Close both ends of the pressure gauge hose.

- 2. Perform the hygienic preparation as described in section 6.6.
- 2. For reassembling, see "4.2 Ventilation hose".



## 6.4 Pressure gauge tube

To disinfect the pressure gauge tube of the ventilation hose, proceed as follows:

- 1. Connect one end of the pressure gauge tube to a sterile disposable 20-ml syringe.
- 2. Immerse the other end in the dilute disinfectant solution.
- 3. Draw the disinfectant solution through the pressure gauge tube into the syringe until the latter is full. Do not flush through the pressure gauge tube in the opposite direction!
- 4. Detach the syringe from the pressure gauge tube and empty it out completely.
- 5. Repeat the procedure 5 more times.
- 6. After disinfection, the pressure gauge tube must be rinsed with distilled water at least 8 times using the same principle.

You can support the subsequent drying process with medical compressed air or medical oxygen.



## Caution

Allow the component to dry thoroughly. If any water is left in the pressure gauge tube of the ventilation hose, the unit may not function correctly.

## 6.5 Components and accessories

Masks, hoses and all rubber components should be cleaned in a disinfectant solution.

- 1. Make sure all internal and external surfaces are thoroughly wetted and free from bubbles. Wait for the full disinfection time to elapse.
- 2. After disinfection always rinse the components thoroughly with distilled water to prevent any adverse effects from disinfectant residues.
- 3. Always let the rubber components dry out in the air.
- 4. Carry out a visual check of the masks and hoses and replace any damaged components.

Silicone ventilation hoses, patient valves and ventilation masks can also be autoclaved.

## 6.6 Fittings

In cases where external cleaning of fittings (e.g., pressure reducer, valve) becomes absolutely essential, use only a clean cloth which should either be dry or moistened with clean water.



## Caution

1. Never immerse fittings in disinfectant or other fluids. Just wipe over with disinfectant. Fluids must not get into the pressure reducer. Otherwise explosions might occur.

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If in exceptional cases you have no alternative but to disinfect by wiping, take particular care to prevent any fluid getting into the pressure reducer.

2. In addition to the risk of explosion, there also the risk of disinfectant getting into the patient's respiratory tract with the oxygen and leading to injury.

## 6.7 Cleaning, disinfecting and sterilizing

Hygienic preparation of the 6000S and the accessories used should be performed as described in the following table.

Observe the instructions for the disinfectant used. You are recommended to wear suitable gloves (e.g. household or disposable gloves) during disinfection procedures.

Description of component	Cleaning	Disinfection	Rinsing in washing machine	Sterilization
6000S	With a dry or damp cloth	Wiping	Not permissible	Not permissible
Patient valve		Immerse in dilute solution, so that all		
Reusable respiratory mask Ventilation hose	In warm water with a mild household detergent	surfaces, inside and out, are thoroughly wetted without bubbles. Wait until the full exposure time has elapsed. After disinfection, rinse all parts thoroughly inside and out with distilled water and leave to dry	Rinsing programmed up to 93°C (thermal disinfection in automatic cleansing unit)	Sterilization with superheated steam at 134°C in units complying with EN285, residence time 5 minutes.
Oxygen fittings	With a dry or damp cloth	Wiping	Not permissible	Not permissible

#### To disinfect the pressure gauge hose of the ventilation hose, proceed as follows:

- 1. Connect one end of the pressure gauge hose to a sterile disposable 20-ml syringe.
- 2. Immerse the other end in the dilute disinfectant solution.
- 3. Draw the disinfectant solution through the pressure gauge hose into the syringe until the latter is full. Do not flush through the pressure gauge hose in the opposite direction!
- 4. Detach the syringe from the pressure gauge hose and empty it out completely. Repeat the procedure 5 more times.



- 5. After disinfection, the pressure gauge hose must be rinsed with distilled water at least 8 times using the same principle.
- 6. You can support the subsequent drying process with medical compressed air or medical oxygen.

# Caution

Then allow the components to dry thoroughly. If any water is left in the patient valve or the pressure gauge hose of the ventilation hose, the unit may not function correctly.



# 7. Functional checks

Before each use, after each dismantling and reassembly, and at the very least every 6 months, the user must carry out functional checks on the ventilator.

#### NOTE:

Before carrying out the functional check on 6000S, you must connect the ventilation hose and the patient valve.

6000S must not be used if the functional checks reveal defects or deviations from the specified parameters.

First try to correct the error with the help of the information provided in section "8. trouble shooting". If this is not possible, have the unit repaired by the manufacturer – Ambulanc – or by specialists explicitly authorized by Ambulanc.

#### A complete functional check includes:

- Visual inspection for mechanical damage;
- Visual inspection of the display
- "7.2 Checking for leaks in the system;
- "7.3 checking the patient valve";
- "7.4 Checking the alarm systems";

#### We recommend that you always hold reserve stocks of the following items:

- replacement washers for the connections;
- one-way valve membrane membranes for the patient valve.

## 7.1 Intervals

#### Before each use:

• Perform a functional check.

#### After each use or dismantling:

- Clean, disinfect or sterilize the ventilator and its components (see "6. Hygienic preparation");
- Check the one-way valve membrane in the patient valve (see "7.3 Checking the patient valve"). It must not be crinkled, sticky or misshapen.
- Perform a functional check.

#### At least every 6 months, if the ventilator has not been used in the meantime.

• Perform a functional check.



## 7.2 Checking for leaks in the system

1. Open the valve of the oxygen cylinder slowly. You can now read the pressure in the cylinder from the gauge on the pressure reducer. For example, a reading of 200 bars means that the cylinder is full, whereas 100 bars mean it is half full.

#### NOTE:

Always change the cylinder in good time, e.g. when the pressure is lower than 50 bar, to ensure that oxygen is available for an adequate period.

- 2. Close the cylinder valve again.
- 3. Watch the needle of the gauge on the pressure reducer for approx. 1 minute. If it stays in the same place, the system is free of leaks. If the needle drops steadily, there is a leak somewhere.

#### **Repairing leaks**

- 1. Prepare a soap/water solution using non-perfumed soap.
- 2. Wet all the screw and hose connections with the solution. Bubbles will form at the site of the leak.
- 3. Depressurize the system:

To do this, first close the oxygen cylinder. Switch on 6000S briefly until the pressure gauge on the O2 cylinder reads "0". Then switch off 6000S again.

- 4. If leaks are discovered, the defective components must be changed.
- 5. After changing, make a fresh check for leaks.
- 6. If it proves impossible to eliminate the leak, the ventilator will have to be repaired.

## Caution

The screwed unions of the oxygen lines must only be tightened by hand.

- 1. If there is a leak, change the defective parts.
- 2. Then check for leaks again.
- 3. If the leak cannot be rectified, the unit must be repaired.



## 7.3 Checking the patient valve



- 1. Disassemble the patient valve.
- Carry out a visual check of all components for cracks or other physical damage. The One-way valve membrane must be replaced if it is crinkled, sticky or misshapen. Never use torn, wavy, distorted or sticky diaphragms for ventilation. Otherwise considerable malfunctions are to be expected.
- 3. Reassemble the patient valve. When reassembling, make sure that the one-way valve membrane is correctly positioned.



#### Caution

When reassembling, make sure that the one-way valve membrane is correctly positioned.

## 7.4 Checking the alarm systems

# Warning

In the case of the stenosis alarm and the disconnection alarm, the alarm signal (or message) is only set off when the cause of the alarm is repeated in two successive inspiration phases. This prevents the alarm being triggered by a very short-lived dysfunction.



## Warning

In this test the rise in pressure is so strong that the pressure gauge needle may over into the red zone. There are technical reasons for this, and it does not indicate any malfunction.



#### Stenosis

- 1. Open the oxygen cylinder.
- 2. Remove the tube or the ventilation mask from the patient valve.
- 3. Switch on 6000S.
- 4. Switch the mask/tube switch 1 to mask ventilation mode.

5. Keep the ventilation connector on the patient valve closed with the flat of your hand during two successive inspiration phases. The stenosis alarm should be set off. If audio response is enabled, the ventilator announces "Check airways and minute volume".

#### Disconnection (interruption of breathing system)

- 1. First proceed as for the stenosis alarm.
- 2. Then remove your hand. The stenosis alarm should now cease (LED goes out, acoustic alarm stops sounding).

After two successive inspiration phases the disconnection alarm should be set off. If audio response is enabled, the ventilator announces "Check ventilation system and settings".

#### Drop in O2 pressure (<2.7 bar O2)

- 1. Open the valve of the oxygen cylinder slowly.
- 2. Switch on 6000S.

3. Close the valve on the oxygen cylinder. When the oxygen pressure in the system has fallen below 2.7 bar, the <2.7 bar O2 alarm should be set off.

If audio response is enabled, the ventilator announces "Check pressure hose system and gas supply".

#### Power supply (

The alarm that indicates a failing battery is checked automatically in the self test that runs when 6000S is switched on.

The power supply is in order if no alarm is set off when the valve on the oxygen cylinder is opened and 6000S is switched on and starts to function.

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# 8. Trouble shooting

Fault	Cause	Remedy	
	6000S defective.	Arrange for repair.	
		Replace battery in battery	
6000S will not switch		compartment.	
on	Pottory failing	If ventilator still refuses to switch	
	Dattery failing.	on, have internal auxiliary battery	
		replaced by manufacturer or	
		authorized specialists.	
	Airways obstructed.	Remove obstruction.	
Stenosis alarm	Kink or obstruction in	Remove kink or obstruction; if	
	ventilation hose/mask/tube.	necessary replace parts.	
resistance)	Tube incorrectly	Correct tube position	
	positioned.		
	6000S defective.	Arrange for repair.	
	Ventilation hose		
	leaking/slipped out.		
Disconnection alarm	Mask/tube incorrectly	Check connections	
(Breathing system	positioned.		
interrupted).	Pressure gauge hose		
	leaking/slipped out.		
	6000S defective.	Arrange for repair.	
	Oxygen cylinder nearly empty.	Change O2 cylinder.	
< 2.7 bar alarm	Oxygen valve closed.	Open oxygen valve.	
(oxygen pressure too low).	Pressure reducer defective.	Replace pressure reducer.	
	Kink or blockage in oxygen hose.	Take corrective action.	
[ Alarm.		Replace battery in battery	
		compartment.	
	Battery failing or fuse	If ventilator still refuses to switch	
	defective.	on, have internal auxiliary battery	
		replaced by manufacturer or	
		authorized specialists.	

	Patient does not trigger device within time window	Adapt ventilation frequency to suit patient
Alarm No Assist	Patient does not trigger device at all	Continue ventilation in Controlled Ventilation mode
	Valve membranes in spontaneous breathing arm detective or missing	Insert new valve membrane
Visual alarms flashing,		
but no acoustic alarm		
and no audio	Short-term electronic	
response.	problem or	
Acoustic alarm, but no	Defect in electronic	Switch off, then on again.
visual alarm flashing.	system.	If error recurs, arrange for repairs.
Acoustic alarm and all		
visual alarms flashing		-
Alarm: Device	Device defective.	
malfunctions.		
6000S will not switch off.	Operating error.	Keep button pressed for at least 3 seconds.
Unusually high oxygen consumption.	Leak in oxygen supply.	Find and eliminate leak
MV too low	Ventilation parameter(s) incorrectly set	Check ventilation parameter(s).
	6000S defective.	Arrange for repair.
6000S is functioning, but without any	Pressure gauge hose on 6000S or on patient valve slipped off.	Check pressure gauge hose.
aispiays.	KINK IN pressure gauge hose.	



# 9. Servicing

## 9.1 Intervals

## NOTE:

Always remember to carry out a technical safety check on the ventilator after every repair. 6000S must undergo a technical safety check and servicing at regular intervals.

### After each using:

Cleaning and disinfecting reusable ventilation hose and patient valve according to the instruction in Chapter VI.

### Every 1 year:

Every 1 year a technical safety check must be performed on the cleaned and disinfected unit according to Chapter 6, including ventilation hose and patient valve. At the same intervals, servicing is to be performed either by the manufacturer or by a specialist expressly authorized by the manufacturer.

#### Every 2 years:

Service the fittings in the oxygen supply system (e.g. pressure reducer) by the manufacturer or by a qualified specialist authorized by the manufacturer.

# 9.2 Performing technical safety check and servicing

We recommend that maintenance work such as inspections and repairs be performed only by the manufacturer, Ambulanc, or by qualified technicians expressly authorized by Ambulanc

# The following points are to be covered during technical safety check and servicing:

- Check equipment for completeness;
- Visual check;
- mechanical damage;
- labeling of controls;
- damage to all external hoses;
- Replace wear parts: battery, valve seals etc.;
- Check system components: carrying platforms, oxygen fittings, secretion suction system, hose connections etc.
- Check test bag;



## 9.3 Battery

#### 6000S is equipped with one battery:

The battery (Li-ion battery7.4 V) is designed for power supply. It can be changed by the operator.

In room temperature environment the full power battery's working time is up to 10 hours.

We recommend having the batteries changed only by the manufacturer –Ambulanc– or by qualified specialists expressly authorized by the manufacturer. Special precautions need to be taken during the change in order to protect the electronic system.

#### In an emergency, proceed as follows:

### Changing the battery

- 1. Make sure the ventilator is switched off.
- 2. Open the battery compartment on the side of the 6000S (e.g. with a coin).
- 3. Remove the empty battery.
- 4. Insert the full charged battery. Make sure it is inserted the right way round.
- 5. Close the battery compartment again.



## Warning

The 7.4V lithium battery is a special battery for this unit. Use only battery supplied by Ambulanc.

If the device is not using over 3 months, we strongly recommend conducting a charge – discharge every three months.

If the device is not using over 1 year, we recommend replacing a new battery before reusing.

## Note:

The adverse changes in the ambient temperature will affect battery working time.

## 9.4 Change Filter

# Warning

Must not be the case without filters operate ventilator. Otherwise, the machine's performance will be impaired, or the machine will be damaged.

1. Screw off for two screws on filter compartment cover, and remove the cover.

#### Note:

If the cover is not easy to remove, Please use the forceps grip the ventilation holes to

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#### remove.

- 2. To pull old filter out by forceps.
- 3. Wipe the filter cartridges with medical cotton ball (moistened with alcohol).
- 4. Use alcohol to clean and to disinfect the filter compartment cover and let it dry
- 5. Install the new filter into filter cartridges with forceps.
- 6. Refit the filter compartment cover and screw it tight.

#### **Emergency air intake**

- 1. Take the emergency air intake interface out of the patient valve. To do so, push the two locking lugs out of their seat, using a small screwdriver, for example.
- 2. Pull the defective valve membrane out of the emergency air intake interface using pointed tweezers.
- 3. Put in a new valve membrane.
- 4. Push the emergency air intake interface back into the patient valve.

#### Outlet

- 1. Use pointed tweezers to pull the defective valve membrane out of the outlet.
- 2. Insert a new valve membrane.

## 9.5 Storage

# If you do not intend to use 6000S for a long period, we recommend the following storage precautions:

- 1. Clean and disinfect the ventilator (see "6. Hygienic preparation").
- 2. Store 6000S in a dry place.
- 3. The battery can remain inside the unit even for lengthy periods.

# $\Lambda$

Warning

Remember that the ventilator still requires servicing at the specified intervals even when in storage; otherwise it cannot be used when removed from storage.

## 9.6 Disposal

To ensure proper disposal of the appliance, consult an approved electronic scrap recovery firm.



# **10. Product and accessories**

# **10.1 Standard product**

NO.	Parts	Parts No.	QTY(PCS)	Note
1.	6000S Main Unit	4.606.00001	1	
2.	Reusable Ventilation Hose	5.000.00235	1	
3.	Patient Valve	2.602.00019	1	
4.	Mask Hook	5.001.00033	1	
5.	Reusable Mask (4#)	5.001.00035	1	Adult, Middle
6.	Silicone Headgear (Adult)	5.001.00037	1	
7.	Power Adapter (12V)	1.119.00003	1	
8.	AC Power Cord	1.124.00001	1	
9.	6000S User Manual	1.601.00070	1	
10.	6000S Packing list	1.602.00043	1	
11.	Warranty Card	1.605.00002	1	

# **10.2 Optional Accessories**

NO.	Parts	Part No.	Note
1.	Ventilator Bag I	2.602.00025	See Chapter 10.3
2.	Gas Supply Connection	2.601.00021	3m, one end empty can be
3.	Gas supply Connection Pipe(DISS,9/16"-18 UNF)	1.703.00003	1.5m
4.	PEEP Valve	5.000.00027	5-20cmH2O
5.	Reusable Mask(Child,2#)	5.001.00046	Child, Large
6.	Reusable Mask(Adult,3#)	5.001.00034	Adult, Small
7.	Reusable Mask(Adult,4#)	5.001.00035	Adult, Middle
8.	Reusable Mask(Adult,5#)	5.001.00036	Adult, Large
9.	Disposable Oxygen Mask	5.000.00166	
10.	Mask Hook	5.001.00033	
11.	Silicone Headgear(Adult)	5.001.00037	
12.	Silicone Headgear(Child)	5.001.00038	
13.	Simulation Lung	5.000.00168	1.5L
14.	Rescue Bag	5.000.00087	

15.	Sputum Aspirator	4.109.00001	
16.	Transparent Tube for Sputum Suction	5.000.00164	
17.	Wall Bracket	2.601.00022	Fitted on the wall of Ambulance
18.	Intubation Tube Adult,7#)	5.001.00049	
19.	One-way Valve Membrane	1.402.00030	Fittings of Patient Valve
20.	One-way Valve Base	1.402.00054	Fittings of Patient Valve
21.	Filter	1.503.00029	Fittings of Main Unit
22.	Open Mouth tongs	5.001.00047	
23.	Nasopharyngeal Tube	5.001.00048	
24.	Gasket of Reducer	5.001.00050	Fittings of Reducer
25.	Power Adapter(12V)	1.119.00003	
26.	AC Power Cord	1.124.00001	
27.	Reducer	5.001.00051	CGA540 (3 port)
28.	T-shape Connector	2.601.00019	One end DISS 9/16-18 UNF,One end quick Connector

# 10.3 Parts List of Ventilator Bag I

NO.	Part	Part NO.	Note
1	Ventilator Bag I	260200025	
2	Oxygen Cylinder	500100011	2.5L
3	Oxygen Bridge	120500072	CGA540 to CGA870
4	Reducer	120500061	CGA870(3 port)
7	Gas supply Connection Pipe(DISS,9/16"-18 UNF)	260200020	0.4m



Caution

Specific configuration is subject to packing list.

# 11. Technical data

# **11.1 Specifications**

Type of Protection against	Class II	Equipment with Internal power supply			
Electric Shock					

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Degree of Protection against Electric Shock	BF
Degree of protection against Ingress of Liquids	IPX4
Degree of Protection against Hazards of Explosion	Ordinary equipment, without protection against explosion; not for use with flammable anesthetic
Mode of Operation:	Continuous running equipment
Dimensions $W \times H \times D$ in mm	$240 \times 120 \times 100$ mm include connectors
Weight	Approx. 1.3kg
Display	2.4" TFT color display resolution ratio: 320*240
Pressurized gas connection	External thread 9/16-18
Ventilation hose connection	External diameter 15mm/Internal diameter 20mm
Operating:	
Temperature range	-20℃ to +50℃
Humidity	15% to 95%
Air pressure	70 kPa to 110 kPa
Store/transport:	
Temperature range	40℃ to +50℃
Humidity	≪95%
Air pressure	70 kPa to 110 kPa
Power supply	AC: 100 to 240V; 1.5 to 4A; 50/ 60HZ
	DC : 12 V Adapter
Work current	I <sub>min</sub> =0.3A; I <sub>max</sub> =0.6A
Battery:	
Standard	Lithium battery 7.4V; 3400mAh ;
	operating time: more than 10 hour
Work temperature	-20℃ to +55℃
Charge temperature	0°℃ to 55°℃
Ventilation modes	IPPV; ASSIST; Manual
Operating pressure	2.7 to 6.0 bar
Required gas supply	
Standard gas supply:	

-Supply pressure	At least 2.7bar
-Drawn flow	At least 70 l/min Oxygen(ATPD)
Optimal gas supply:	
-Supply pressure	At least 4.5bar
-Drawn flow	At least 100 l/min Oxygen(ATPD)
Non-recommended gas supply:	
-Supply pressure	Less than 2.7bar
-Drawn flow	Less than 80 I/min Oxygen(ATPD)
Insp-exp. Ratio	Constant 1:1.67
Minute volume(MV)	Continuously variable from 3 to 20 l/min(ATPD)
Ventilation frequency	Continuously variable from 5to 40 min <sup>-1</sup>
O2 concentration	No Air Mix 100% and Air Mix (see page 42)
MV tolerances	±20%
Max. ventilation pressure	20 to 60 mbar
Safety airway pressure	$\leq$ 75 mbar
Pressure gauge accuracy	0 to 60 mbar Deviation ±5%
Trigger sensitivity	-2 mbar Deviation ±0.5mbar
Reusable ventilation hose	Spiral silicone
Patient valve resistance:	
Inspiration	<6 mbar at 30、60 l/min
Expiration	<6 mbar at 30、60 l/min
Emergency air intake	<6 mbar at 15、30 l/min
Respiratory compliance	100 ml/cmH₂O
Voice alarm mute time	≤ 120s
Voice prompt language	Support five languages, default Simplified Chinese

1 bar =100kPa

1 mbar=1 hPa



## 11.3 O<sub>2</sub> content when using Air Mix

The following diagram shows the oxygen concentration prevailing at various conuter-pressures and minute volumes when Air Mix is switched on.



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# 12. Warranty

- Ambulanc provides one year warranty from the date of purchasing and lifelong maintenance.
- Suggested Product's life : Three years.
- Claims against the warranty can be made only when accompanied by the sales receipt, which must show salesperson and date of purchase.
- We offer no warranty in the case of:
- -Disregard of usage instructions
- -Operating errors
- -Improper use or handling
- -Third-party intervention by non-authorized persons for the purpose of device repair
- -Acts of God, e.g., lightning strikes, etc
- -Transport damage as a result of improper packaging of returned items
- -Lack of maintenance
- Operational and normal wear and tear, which includes, for example, the following components :

Filter

Battery

Articles for one-time use,etc.

- -Failure to use original spare parts.
- Ambulanc is not liable for consequential harm caused by a defect if it is not based on intention or gross negligence. Ambualnc is also not liable for minor physical injury to life or limb resulting from negligence.
- Ambulanc is not responsible for the problems happened after the product end of life.
- Ambulanc reserves the right to decide whether to eliminate defects, to deliver a defect-free item or to reduce the purchase price by a reasonable amount.
- If Ambulanc rejects a claim against the warranty, it assumes no expense for transport between customer and manufacturer.
- Implied warranty claims remain unaffected by these changes.

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# 13. Storage and transportation

Packaged product can be transported by truck, air or railway. During the transportation, should avoid shock, severe vibration and moisture. Transport temperature is -40  $^{\circ}$ C ~ +50  $^{\circ}$ C, relative humidity should be less than 95%.



Storage temperature -40 - 50°C



Up



Stacking layers

Moisture protection

5





When the storage condition is beyond the required working environment, the device should be placed in a standard environment at least 8 hours before enter into standby state.



# 14. Electromagnetic Capability

### **GUIDANCE AND DECLARATION - ELECTROMAGNETIC EMISSION**

The 6000S 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.

EMISSIONS TEST	COMPLIANCE	ELECTROMAGNETIC ENVIRONMENT - GUIDANCE	
RF emissions CISPR 11	Group 1	The 6000S 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 emission CISPR 11	Class B	The 6000S is suitable for use is all	
Harmonic emissions IEC 61000-3-	Class A	establishments, including domestic establishments and those directly	
Voltage fluctuations/Flicker emissions IEC 61000-3-3	Complies	connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.	

## **GUIDANCE AND DECLARATION - ELECTROMAGNETIC IMMUNITY**

The 6000S 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	ELECTROMAGNETI C ENVIRONMENT - GUIDANCE
Electrostatic discharge (ESD) IEC 61000-4-2	± 6 kV contact ± 8 kV air	± 8 kV contact ± 15 kV 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 IEC 61000-4-4	±2 kV for power supply lines ±1 kV for input/output lines	±2 kV for power supply lines ±1 kV for input/output lines	Mains power quality should be that of a typical commercial or hospital

Surge IEC 61000-4-5	±1 kV differential mode ±2 kV common mode	±1 kV differential mode ±2 kV common mode	environment.
Power frequency (50Hz/60Hz) magnetic field IEC61000-4-8	3A/m	3A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
	<5% UT	<5% UT	
	(>95% dip in UT) for 0.5 cycle	(>95% dip in UT) for 0.5 cycle	Mains power quality should be that of
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	40% UT (60% dip in UT) for 5 cycles 70% UT(30% dip in UT) for 25 cycles <5% UT(>95% dip in UT) for 5	40% UT (60% dip in UT) for 5 cycles 70% UT(30% dip in UT) for 25 cycles <5% UT(>95% dip in UT) for 5	a typical commercial or hospital environment. If the user of the 6000S requires continued operation during power mains interruptions, it is recommended that the 6000S be powered from an uninterruptible power supply or a battery.
	sec	sec	



## **GUIDANCE AND DECLARATION - ELECTROMAGNETIC IMMUNITY**

The6000S transport ventilator 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	COMPLIA NCE LEVEL	ELECTROMAGNETIC ENVIRONMENT- GUIDANCE
Conducted RF	3 Vrms 150 kHz to 80 MHz outside ISM bands	3Vrms (V1)	Portable and mobile RF communications equipment should be used no closer to any part of the6000S transport ventilator, including cables, than the recommended separation distance calculated from the equation
IEC61000-4-6	10 Vrms 150 kHz to 80 MHz in ISM bands	10Vrms (V2)	applicable to the frequency of the transmitter. Recommended separation distance $d = \left[\frac{3.5}{4}\right]\sqrt{P}$
Radiated RF IEC61000-4-3	10V/m (80MHz∼ 2.5GHz)	30V/m (E1)	$\begin{bmatrix} V1 \end{bmatrix}$ $d = \begin{bmatrix} \frac{12}{V2} \end{bmatrix} \sqrt{P}$ $d = \begin{bmatrix} \frac{12}{E1} \end{bmatrix} \sqrt{P}  80 \text{ MHz} \sim 800 \text{ MHz}$ $d = \begin{bmatrix} \frac{23}{E1} \end{bmatrix} \sqrt{P}  800 \text{ MHz} \sim 2.5 \text{ GHz}$ Interference may occur in the vicinity of equipment marked with the following symbol:

NOTE 1: At 80 MHz and 800 MHz, 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.

a 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 the6000S transport ventilator is used exceeds the applicable RF compliance level above, the6000S transport ventilator should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating

the6000S transport ventilator

b Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/

Recommended separation distances between portable and mobile RF communications equipment and the6000S transport ventilator.

The6000S transport ventilator is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. 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 the6000S transport ventilator as recommended below, according to the maximum output power of the communications equipment.

Separation Power(V	V) distance (m)					
		0.01	0.1	1	10	100
Frequency(HZ)						
150KHz∼80MHz	Outside ISM bands	0.04	0 11	0 35	1 11	35
	$d = \left\lfloor \frac{S \cdot S}{V \cdot 1} \right\rfloor \sqrt{P}$	0.04	0.11	0.00	1.11	0.0
	ISM bands					
	$d = \left\lfloor \frac{12}{V2} \right\rfloor \sqrt{P}$	0.04	0.11	0.35	1.11	3.5
80MHz~800MHz	$d = \left[\frac{12}{E1}\right]\sqrt{P}$	0.04	0.11	0.35	1.11	3.5
800MHz~2.5GHz	$d = \left[\frac{23}{E1}\right]\sqrt{P}$	0.07	0.22	0.7	2.21	7.00

For transmitters rated at a maximum output power not listed above, the recommended separation distances 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: An additional factor of 10/3 is used in calculating the recommended separation distance for transmitters in the ISM frequency bands between 150 kHz and 80 MHz and in the frequency range 80 MHz to 2,5 GHz to decrease the likelihood that mobile/portable communications equipment could cause interference if it is inadvertently brought into patient areas.

NOTE 2: At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.

NOTE 3: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

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