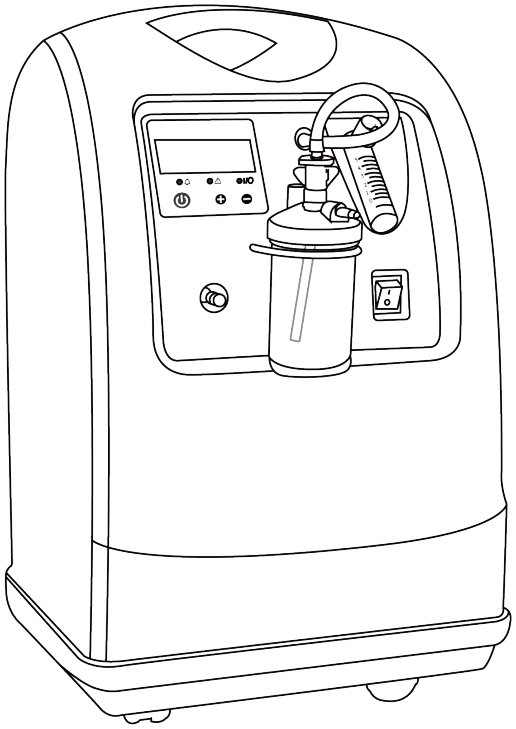
OXYGEN CONCENTRATOR

[KSOC SERIES]

MDA Reg : GB5179223-140100

USER'S MANUAL
Read carefully before use!



WFR Medical Supplies Sdn Bhd

About this Manual

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WFR Medical Supplies Sdn Bhd

Statement

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 WFR Medical Supplies Sdn Bhd (hereinafter called **WFR**) cannot be held liable.

WFR holds the rights to modify, update, and ultimately explain this manual.

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

Responsibility of the Manufacturer

WFR 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 WFR, 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, WFR may provide, with compensation, necessary circuit diagrams, and other information to help qualified technician to maintain and repair some parts, which WFR 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 Safety Guidance

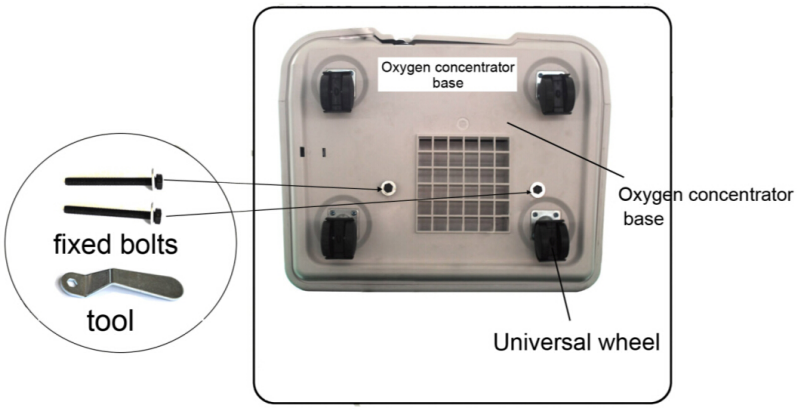
WARNING TIPS

1. For the first time use, remove the fixed bolts on the bottom of the oxygen concentrator with tool we offered before using the concentrator.

2. If do not remove the bolts on the bottom of the oxygen concentrator, the concentrator will not work well.

3. Keep the bolts for next transportation.

The picture of the fixed bolts on the bottom of oxygen concentrator and tool as bellow:



The picture is only for reference; please make the object as the standard.

1 Product Introduction

Oxygen Concentrator is composed of air compressor, air pretreatment, control valve, molecular sieve adsorption tower, control and alarm system, and production gas treatment system.
By providing oxygen to patients, with the treatment the oxygen concentrator can help recovery in the following cardiovascular and cerebrovascular, respiratory, chronic obstructive pneumonia and others diseases, and hypoxia. Oxygen concentrator is suitable for different levels of physiological hypoxia crowd such as the elderly, poor physique, pregnant women, college entrance examination students, and it also be used to eliminate fatigue and restore the body function after heavy physical or mental consumption.
Concentrator's safety life is five years.

1.1 Intended Use and Population

Intended Use: For medical institutions to prepare oxygen for patients with hypoxia.
Intended patient population: Adult and child;
Medical condition: medical institutions; institutions or healthcare facilities with health care capabilities.
Intended user: medical professional or trained patient;
Contraindications: patients with oxygen poisoning and oxygen allergy are forbidden.

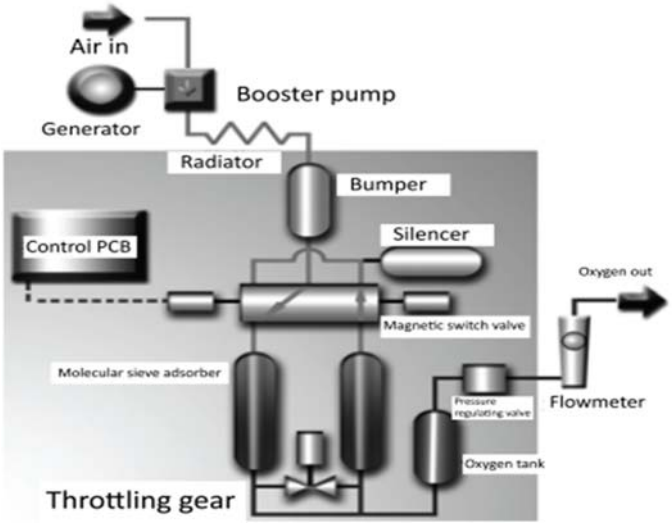
Oxygen concentrator mainly uses air as raw material and uses molecular sieve pressure swing adsorption process to produce oxygen with oxygen concentration ranging from 87% to 96%(V/V).For medical institutions and other production of oxygen for hypoxia patients to use oxygen.

Warning: The oxygen concentrator is not for life supporting use or unconscious patients.

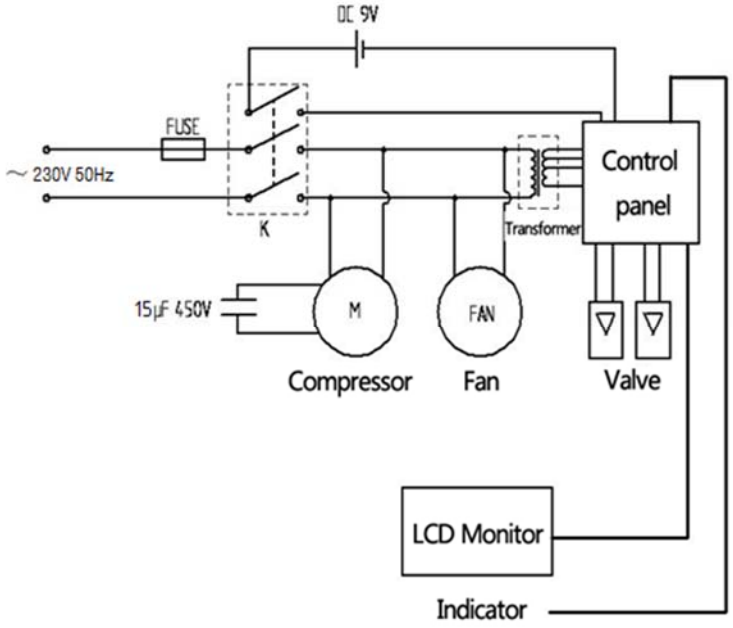
1.2 Operating Principle & Flowcharts

Operating principle: Oxygen concentrator uses the pressure swing adsorption (PSA) technology and through the molecular sieve to process air to produce high medical standard oxygen.

The following figure shows the process:



The following chart shows the electrical control process of concentrator:



1.3 Equipment Symbols

Some symbols may not appear on your equipment.

Symbol	Description	Symbol	Description
	General warning sign		No open flame: Fire, open ignition source and smoking prohibited
	Caution		No smoking
	Keep dry		Fragile-handle with care
	This side up		Increase or decrease (Knob)
	ON (power)		Class II equipment
	OFF (power)		Alternating current
	Type BF applied part		Date of manufacturer
	Refer to instruction manual/booklet		Manufacturer
	Consult instructions for use	SN	Serial number
IP21	Degree of protection provided by enclosure	LOT	Batch code
P/N	Part Number		Fuse
	Max. Stack Quantity		WEEE symbol
CE 1639	CE mark	EC REP	Authorized representative in the European community

2 Safety Guidance

⚠ Special Warning

- **To prevent possible failures or power shut down of oxygen concentrator, people in urgent need of oxygen and seriously ill patients must prepare other oxygen-supply devices for emergency use (etc : oxygen cylinders, oxygen bags).**
- **The concentrator is suitable for oxygen supplement, and it is not intended to be life supporting or life sustaining.**
- **This device must be used under the guidance of a physician.**
- **Personal and family use should be in accordance with the guidance of a physician when the concentration is higher than 93%.**

⚠ Safety Information

- **It uses the power of AC 220-240V 50Hz.**
- **If any object or liquid enters the unit, disconnect the power plugs immediately, and have them tested by the professional person before re-use.**
- **Unplug the plug cord from the power outlet if long time no use of concentrator. Do not pull out the power cord when removing the plug.**

2.1 Safety Tips for Oxygen Concentrator

WARNING

- **There is a risk of fire associated with oxygen enrichment during oxygen therapy. Do not use the oxygen concentrator or accessories near sparks or open flames.**
- **Use only water-based lotions or salves that are oxygen-compatible before and during oxygen therapy. Never use petroleum or oil-based lotions or salves to avoid the risk of fire and burns.**
- **Do not lubricate fittings, connections, nasal cannula, or other accessories of the oxygen concentrator to avoid the risk of fire and burns.**
- **Use only spare parts recommended by the manufacturer to ensure proper function and to avoid the risk of fire and burns.**
- **Use the oxygen concentrator at an altitude above 4000 m or outside a temperature of 5°C to 40°C or a relative humidity above 75% (non-condensing) is expected to adversely affect the flowrate and the percentage of oxygen and consequently the quality of the therapy.**
- **Oxygen makes it easier for a fire to start and spread. Do not leave the nasal cannula or mask on bed coverings or chair cushions, if the oxygen**

concentrator is turned on, but not in use; the oxygen will make the materials flammable. Turn the oxygen concentrator off when not in use to prevent oxygen enrichment.

- **If you feel discomfort or are experiencing a medical emergency while undergoing oxygen therapy, seek medical assistance immediately to avoid harm.**
- **Geriatric, paediatrics or any other patient unable to communicate discomfort can require additional monitoring and or a distributed alarm system to convey the information about the discomfort and or the medical urgency to the responsible care giver to avoid harm.**
- **Smoking during oxygen therapy is dangerous and is likely to result in facial burns or death. Do not allow smoking within the same room where the oxygen concentrator or any oxygen carrying accessories are located.**
- **Open flames during oxygen therapy are dangerous and is likely to result in fire or death. Do not allow open flames within 2 m of the oxygen concentrator or any oxygen carrying accessories.**
- **Do not use the equipment near flammable materials as grease oil, detergent etc. In a certain pressure, oil, grease or grease substances which contacted with oxygen will self-ignition and intense combustion. These substances must be kept away from oxygen concentrator, piping, connectors, and all other oxygen devices. Do not use any lubricant other than the manufacturer's recommendation.**
- **Do not place debris and water oil containers on the top of the oxygen concentrator.**
- **Do not place any debris place at the bottom of the oxygen concentrator, and it is forbidden to place the concentrator on a soft surface (such as bed or sofa) that can cause tilting or sinking. Do not allow either the air intake or the air outlet vents to become blocked. This can cause the concentrator to overheat and affect performance.**
- **Do not touch the cabinet or air outlet with your hands during the operation of the oxygen concentrator to avoid injury caused by overheat.**
- **The device has gotten through the electromagnetic compatibility test conducted by testing center for TUV product. The device will not produce harmful RF interference if used in residential area. But in order to keep normal use, please do not use the concentrator near high frequency disturbing equipment, such as speaker, MRI or CT etc.**
- **Do not place oxygen concentrator in parallel or in series with other concentrators or oxygen treatment equipment.**
- **Oxygen therapy is dangerous in some specific environment. The manufacturer recommends that the user consult the physician before using the oxygen concentrator.**
- **Avoid the production of any spark near the oxygen concentrator, including sparks due to various friction static electricity.**

- **Call the emergency hot line and seek the help of professional health care workers immediately if any discomfort is felt or accident happened while using the concentrator.**

2.2 Electrical Safety Requirement

CAUTION

- **Electrical shock hazard, do not disassemble the concentrator. Only a qualified service technician should remove the covers or service the unit.**
- **The concentrator should be kept away from explosive atmosphere.**
- **Oxygen is combustion-supporting gas. No smoking near the working oxygen concentrator.**
- **The oxygen concentrator should be kept away from matches, burning cigarettes and other objects of high temperature or fire Textiles and other normally non-combustible materials are easily ignited and boiled in oxygen-enriched air. Ignorance of this warning may result in serious fire, property damage, and personal injury or death.**
- **Oxygen concentrator cannot be placed and used in the following environment: near heat or bright and dark fire, wet, no shelter, smoke and pollution, too high or too low temperature.**
- **Do not use the equipment in a confined space or airflow obstruction environment. Oxygen concentrator should be placed in the indoor ventilation, and to avoid direct sunlight. 0.5m or more should be left between concentrator and the walls, windows, furniture and other similar objects.**
- **If the power cord or plug of the oxygen concentrator is damaged, or concentrator does not work properly, or the concentrator was dropped or damaged, please contact qualified maintenance personnel to check and repair.**
- **Keep the power cord away from heat or heated surfaces.**
- **Do not move the oxygen concentrator while the electricity is on.**
- **Do not tread, sit on or lie on the oxygen concentrator.**
- **Do not drop or insert anything at the concentrator intake or outtake port. If any object or liquid enters the unit, disconnect the power plugs immediately, and have them tested by the professional person before re-use.**
- **Ensure there is no humidification devices in the same room or within 2 meters around while using the concentrator.**
- **Turn off the equipment before accessing it for different power outlet.**
- **Please pay attention to electricity safety. Do not turn on the concentrator if the plug or power lines damaged. Ensure to cut off the power when cleaning the concentrator or cleaning and replacing the filters.**
- **Install the regulator device when the voltage is higher than the normal range or in fluctuation.**

- **To extend the life span of the machine, reboot 5 minutes after each shutdown to prevent the compressor to start under pressure.**
- **Do not open the cabinet and intake window of concentrator under any conditions.**
- **Oxygen concentrators are strictly prohibited for children to avoid accidents.**
- **Avoid unattended the concentrator after connected to the power supply.**
- **Turn off the concentrator after use. Unplug the plug cord from the power outlet if long time no use of concentrator. Do not pull out the power cord when removing the plug.**

2.3 Safety Tips for Oxygen Inhale

NOTES

- **No smoking while using the oxygen concentrator.**
- **Follow the physician's guidance for it is used for medical treatment.**
- **Oxygen poisoning, oxygen allergy patients are prohibited.**
- **The oxygen flow rate shouldn’t be too high, or upon the request of the physician. Contact the supplier or physician immediately and adjust the flow according to physician's instructions if you or service person suspects that the oxygen concentration is insufficient; patients with severe lung disease should consult professional physician for flow level.**
- **Operate the oxygen concentrator in the following environment: working temperature from +5°C to +40°C and relative humidity not higher than 75%.**
- **Keep the concentrator stable at work and avoid sloping or inverting.**
- **When using the concentrator, care shall be taken to prevent strangulation due to cables and hoses, particularly due to excessive length.**
- **Do not pump the equipment as oxygen bag when the bottle has water.**
- **The water in the bottle should not be too much in case of the overflow (please keep the water level between MAX and MIN), and change the water often.**
- **Different bottles may affect the performance of the oxygen concentrate, use the original bottle provided or certified by WFR.**
- **Clean and replace the filter in case of the block of the outlet and outlet of oxygen delivery and affect the life of oxygen concentrator.**
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- **Excessive oxygen inhalation can cause some damage, e.g. oxygen poisoning including CO2 retention, newborns blind due to excessive oxygen intake, irritating dry cough, nausea, vomiting and headache, nasal duct injury, nasal bleeding, please use the oxygen concentrator with caution.**

3 Installation and Operation

3.1 Open-case Inspection

NOTE:

- **Unless the oxygen machine is used immediately, the machine must retain the carton and store the packaging material before use.**

Firstly check the carton or other packaging is obvious damage. If any damage is detected, contact the carrier or us. Take out all bulk packaging from the carton. Carefully take out all components from the carton. Check whether there is any damage to concentrator surface such as notches, dents, scratches and so on. Check all components. Check whether the components are missing according to packing list.

3.2 Storage and Transportation

Do not place any objects on the top of the oxygen concentrator.
The unit should be stored in the environment without corrosive air and with good ventilation.
Be careful to transport or convey, don’t let it reversal or thwart, tilt angle not greater than 5°.

NOTE:

- **When the storage temperature is below 5°C, it cannot work at once. Please place the machine in a normal working temperature environment for four hours before using.**

3.3 Installation

The oxygen concentrator should be located so as to avoid pollutants or fumes. The air intake as well as the exhaust of the oxygen concentrator should be located in a well-ventilated area.

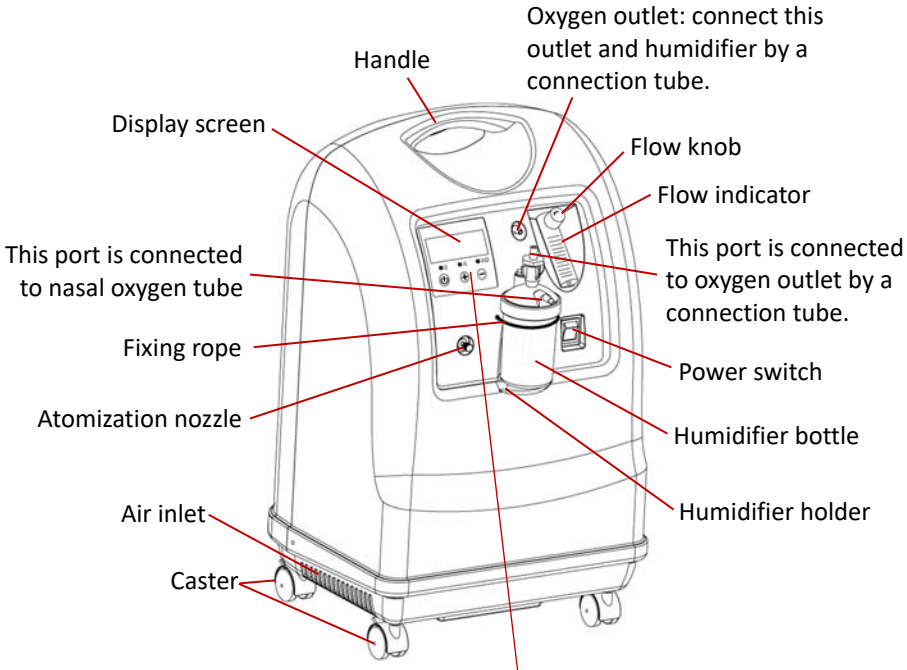
1. Open the package carton, take out the oxygen generator main unit and all accessories, and check the accessories against the packing list.
2. Put the oxygen concentrator in a convenient and safe place where there is air flow.
3. Take out the humidifier bottle, remove the top cover, and pour purified water (or distilled water) into bottle, ensure that the water level is between "Max" and "Min", and then cover the top cover.
4. Place the humidifier bottle to the fixing socket and fix it with the elastic rope.

5. Connect the humidification bottle to the oxygen outlet of the concentrator using a connecting tube, and the other port of the humidification bottle to the nasal oxygen tube.
6. Plug the power supply cord into a socket that meets the requirements.

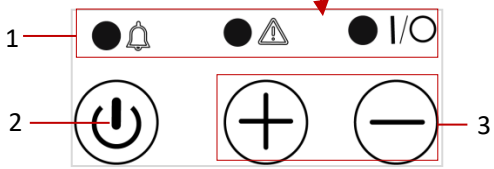
The proper placement and positioning of the prongs of the nasal cannula in the nose is critical to the amount of oxygen delivered to the respiratory system of the patient.

3.4 Parts and Function Introduction

Front view

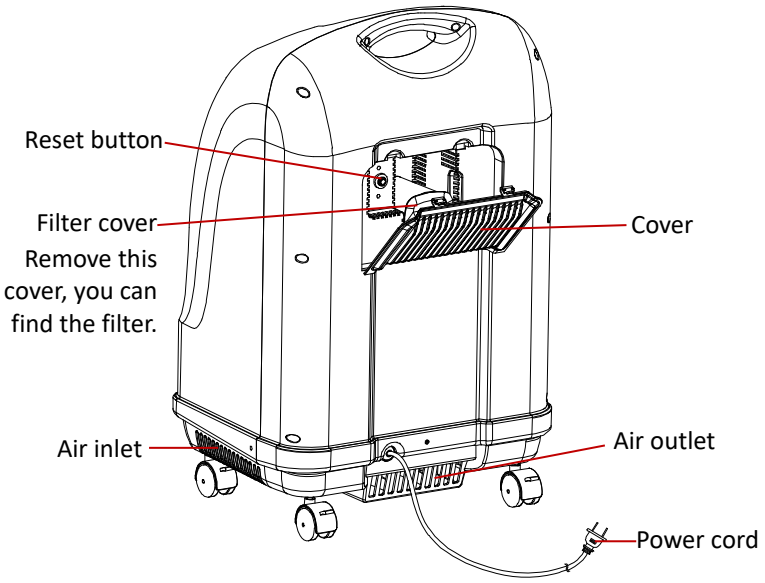


Indicators and buttons

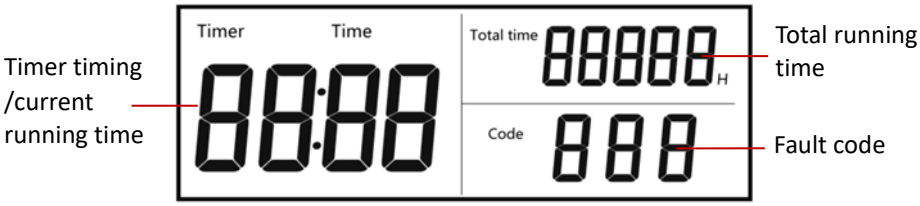


1. Indicator LED
   - ✧ ● I/O：Power indicator
     - ◆ This indicator lights green when the oxygen concentrator is connected to the main power supply.
   - ✧ ● ⚠：Air pressure /Concentration /Temperature /O_2 sensor /Low voltage indicator
     - ◆ This indicator lights yellow if the system air pressure is higher than 260kPa or lower than 20kPa. And the screen shows the corresponding error code. And the oxygen concentrator alerts with buzzer sound.
     - ◆ When the oxygen concentration is lower than 82%, the indicator lights up in yellow. And the oxygen concentrator alerts with buzzer sound.
     - ◆ When the temperature of the system exceeds the maximum allowable temperature limit (70°C), the oxygen generator stops working. The indicator lights yellow and the screen show the corresponding error code. And the oxygen concentrator alerts with buzzer sound.
     - ◆ After tuning on, the oxygen concentrator does not receive any information from the O_2 sensor. The indicator lights yellow and the screen show the corresponding error code. And the oxygen concentrator alerts with buzzer sound.
     - ◆ When the power supply voltage is lower than 85% of the standard voltage, the indicator lights yellow and the screen shows the corresponding error code. And the oxygen concentrator alerts with buzzer sound.
   - ✧ ● 🔔: Power failure alarm indicator
     - ◆ Accidental power off happened while operating the concentrator, this indicator lights red and flashes, and the oxygen concentrator alerts with buzzer sound. This can prompt the user to disconnect the power and check the power supply system.
2. Start/Stop oxygen button
3. Timer increase, decrease button
   - ◆ Adjust the timing, increase the value or decrease the value.

Back view



Display screen



No lubricants are to be used other than those recommended by the manufacturer. The following table shows the main structure and material of concentrator.

Main Structure	Material	Description
Air compressor	ZL102 cast alum, filling PTFE	Provides the air pressure necessary for adsorption and used to separate oxygen from air
Filter system	Foam filter, ABS resin, nonwovens	Used to provide gas cooling, water removal, filtration, etc.

Control valve	/	Control the compressed air treated by the air pretreatment system into the molecular sieve adsorption tower for periodic pressurization and exhaust
Molecular sieve adsorption tower	6063 aluminum alloy, molecular sieve	The molecular sieve is filled in a closed container. Oxygen in the air is separated by the characteristic of selective adsorption of gas by a molecular sieve.
Control and alarm system	PCB, silicon components	Automatic control and fault alarm according to preset working procedures
Producing gas treatment system	ABS resin, Polypropylene	Collecting, filtering, regulating and humidifying the oxygen generated by the oxygen concentrator.

3.5 Power ON/OFF

Put the oxygen concentrator in a convenient and safe place where there is air flow and make sure its back case is at least 15 cm away from the wall, window or any other things that are obstructing the airflow.

Power On: Press the **Power switch** to position "**I**" (**ON**). The oxygen concentrator is in working state. Then press the **Start/Stop oxygen** button to start oxygen supply.
In the three seconds before oxygen concentrator restarts, the system will be automatically on self-check during which time the buzz and LCD without light belongs to normal situation. Oxygen concentration can reach a stable status after the concentrator is running about 12 minutes.
Combination of the power-on-self-test routines and operator action that functionally check the alarm signals.

Power off: Press the **Start/Stop oxygen** button to stop the oxygen supply during operation. After use, press the **Start/Stop oxygen** button to stop the oxygen supply and then press the **Power switch** to position "**O**" (OFF). Unplug the power cord from the outlet socket. Disconnect the tube or connecting pipeline from the oxygen outlet.

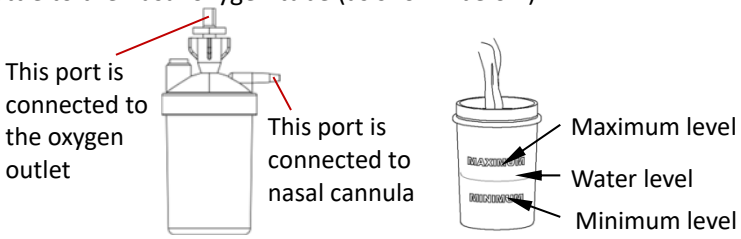
WARNING

- **Do not turn on and off the oxygen concentrator frequently. The time interval of shutting down and restart should be more than 5 minutes (that is, the gas must be discharged to prevent the air compressor with pressure to start and affect its life).**

3.6 Oxygen Inhale Operation

Put the oxygen concentrator in a convenient and safe place where there is air flow and make sure its back case is at least 15cm away from the wall, window or any other things that are obstructing the airflow.

1. Check the concentrator has been connected with power supply and make sure it in power off status.
2. Remove the top cover part of humidification bottle and fill pure water (or distilled water), make sure the water level is between the “MAX” and “MIN" mark of the bottle and then cover the top part.
3. Install the humidification bottle on the humidifier bottle holder of concentrator and secure it with band.
4. Press the **Power switch** to position “**I**”(**ON**). The power is plug in when the power indicator turns green. The oxygen concentrator is in working state.
5. Connect the humidification bottle to the oxygen outlet using a connecting tube and connect the other port of the humidification bottle to the nasal oxygen tube (as shown below).



6. Wear a nasal cannula.
7. Press the **Start/Stop oxygen** button on the front panel to start oxygen supply.
8. Adjust the nasal cannula to appropriate position for easy inhale of the pure oxygen and get maximum comfort. The oxygen density could be reached to 90% within 12 minutes.

9. Turn off the equipment after use. Pull out the power pin and take care of the nasal cannula for another use.

Every few seconds the concentrator issues "TAPOO" sound while operating, it is the normal ventilation sound.

WARNING

- **Choose safety-qualified socket and socket board with safety electrical certification.**
- **Do not remove the cabinet unless qualified technician, in case of damaging the machine, electric shock or other accident.**
- **Oxygen uptake time and oxygen flow adjustment should follow the physician's advice.**
- **Check that the nasal cannula or accessory is clogged, kinked or the humidifier is damaged if the flow value is lower than 0.5L/min.**
- **If no use of concentrator for a long-term, the water in humidifier bottle should be drained. Save the humidifier bottle after cleaned and dried.**

3.7 Other Operations

3.7.1 Timing Operation

During working the concentrator can be set timer length by using timer function.

1. Press the **Power Switch** to position "**I**" (ON), then press the **Start/Stop oxygen** to start the oxygen supply.
2. Press button, **Timing (+, -)** on front panel to set timer timing.
3. Using **Increase** (**+**) button to adjust the timing hours (maximum is 10 hours).
4. Then press **Power Switch** to confirm the setting.

When the shut hour is set, the system comes into count down time and the oxygen concentrator screen will show the remaining time. When remaining time becomes 0, the oxygen concentrator will go to standby state.

3.7.2 Adjust Flow

Rotate the knob on the front panel to adjust the flow. Rotate the knob to the left to increase the flow and to the right to decrease the flow.
The greater the flow value, the greater the air flow, oxygen purity will be reduced.

The recommended maximum flow rate is 10L/min; the recommended maximum concentration is 90%±3%.

3.7.3 View Total Running Time

The total running time is the sum of the working hours of the oxygen concentrator starting from the first use.

4 Troubleshooting

4.1 Oxygen Concentrator Alarm and Indicator System

Alarm system design aims at monitoring the working oxygen concentrator in case of such situations as power off, abnormal pressure or indicator of running condition of the equipment. **All alarms of this equipment are technical alarms.**

It includes an acoustic alarm system and a visual alarm system.
The list of alarm messages is as follows:

Alarm	Alarm reason	Audible	Visual	Priority	Measure
Power off	The network power is disconnected during operation	Triple + double + triple + double beep	The indicator quickly flashes red, frequency: 1.4～2.8Hz	High	Turn off the power immediately. If an alarm still exists after confirming that the power supply and connection are normal, please turn off the oxygen concentrator and contact local dealer or manufacturer.
Low concentration	Oxygen concentration is lower than 82%	Single beep	The indicator lights yellow	Low	Contact your local distributor or manufacturer. Spare oxygen should be prepared for those who are in urgent need of oxygen.
Abnormal air pressure	The internal pressure of the oxygen concentrator is higher than 260kPa or lower than 20kPa	Single beep	The indicator lights yellow and the screen displays code "E05" if the air pressure is high.	Low	Turn off the power immediately. Check and make sure the cleanness of outlet and inlet of air without any blocks. And then restart the equipment, please inform the distributor or manufacturer and shut down the concentrator if the alarm is still on.
			The indicator lights yellow and the screen displays	Low	

			code "E02" if the air pressure is low.		
High temperature	The oxygen concentrator system temperature is higher than the maximum allowable temperature limit.	Single beep	The indicator lights yellow and the screen displays code "E35".	Low	Turn off the power immediately. Check and make sure the cleanness of outlet and inlet of air without any blocks. And then restart the equipment, please inform the distributor or manufacturer and shut down the concentrator if the alarm is still on.
Oxygen sensor communicati on failure	The oxygen concentrator did not receive signal from the oxygen sensor.	Single beep	The indicator lights yellow and the screen displays code "E31".	Low	Contact your local distributor or manufacturer. Spare oxygen should be prepared for those who are in urgent need of oxygen.
Low Voltage	The supply voltage of the concentrator is 85% lower than the standard voltage.	Single beep	The indicator lights yellow and the screen displays code "E03".	Low	Turn off the concentrator immediately, and restart it after confirming that the voltage of the network power supply is normal.

4.2 Fault List

Symptoms	Possible Causes	Solutions
After turned on the switch, the light, alarm system and oxygen concentrator don't work.	1. The plug doesn't insert the switch firm. 2. No power. 3. Fuse is broken.	1. Insert the plug to the socket correctly. 2. Check the power supply. 3. Replace the fuse.
After turned on the switch,	1. Air compressor	1. If oxygen concentrator

the light works, but the oxygen concentrator doesn't work.	protection. 2. Inlet or outlet jammed. 3. Ambient temperature is lower than 5°C	shutdown after restarting of 45 minutes, please contact the vendor. 2. Clean the filter. Check if anything jammed intake. Check if objects blocking the cooling. 3. Rise the ambient temperature.
Cannot obtain the requested current capacity.	1. Nasal oxygen tube is blocked or damaged. 2. Mask jammed or damaged 3. Humidifier bottle is blocked or damaged. 4. Oxygen tube surpasses the stipulation or has the bend.	1. If the flow is normal, take down the nasal tube, clean, correct the dead bend or replace it. 2. If the flow is normal, take down the humidifier bottle, clean or replace it.

4.3 Fault Code

The description of fault code displayed on concentrator is as follows:

Code	Fault Description
E02	The pressure suddenly drops below the limit pressure (20kPa) during operation
E03	The supply voltage of the concentrator is lower than 85% of the standard voltage
E05	The pressure exceeds the limit pressure (260kPa) during operation
E31	Cannot receive data from oxygen sensor
E35	The temperature detected by the compressor control resistance exceeds the allowed range

If it's not in the above cases and there is still no oxygen output, please contact the distributor or the manufacturer.

Non-professional maintenance personnel or personnel without our authorization are strictly prohibited to open the concentrator cabinet for maintenance. If necessary, **WFR** may provide the circuit diagram, list of components of concentrator, the calibration rules or other required materials that help the qualified technicians who assist the user to repair the equipment.

5 Maintenance and Cleaning

Only the dealer or a trained person authorized by the manufacturer can perform pre-maintenance or performance commissioning of the oxygen concentrator.

Manufacturers recommend that the oxygen concentrator's running time is not less than 30 minutes each time. Do not turn on or off the oxygen concentrator frequently. Turn on the concentrator at least after 5 minutes after turning off to protect the compressor's life.

The replacement period is not fixed since the molecular sieve is greatly affected by the environment (temperature, humidity). The replacement period is mainly based on concentration change. If the concentration falls below 82% mentioned in ISO 80601-2-69, it can be understood that the oxygen concentration is unqualified, and the molecular sieve should be replaced.

The oxygen delivery settings of the oxygen concentrator should periodically reassessed for the effectiveness of the therapy.

WARNING

- **Disconnect the power cord from the electrical outlet before you perform maintenance to avoid electric shock.**
- **Person without training or authorization of manufacturer cannot open the cabinet.**
- **Do not operate the concentrator without the filters installed, or while the filters are wet. These actions could permanently damage the concentrator.**

5.1 Care and Cleaning of Cabinet

The outside of the cabinet is cleaned at least once a month.

Disconnect the power cord from the electrical outlet before you clean the cabinet.

You can wipe the cabinet surface with a clean soft cloth or towel, and then wipe the surface with dry cloth or towel. Do not pour the liquid into the cabinet gap. Concentrator cabinet cannot be washed with water.

The mild household neutral detergent can be used to clean the cabinet.

5.2 Care and Cleaning of Humidifier Bottle

Empty the humidifier bottle each time after using the concentrator.

Rinse the humidifier bottle with clean water and dry it. If there is any besmirch, you can use mild neutral detergent or solution of white vinegar

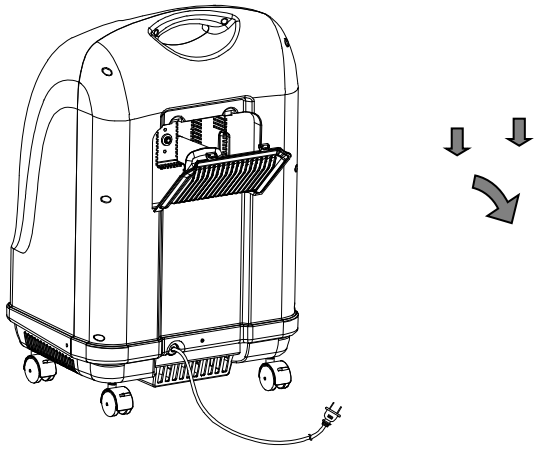
and hot water with proportion of 1:10 to wash it.
Check that the humidifier bottle cover is in good condition. And fill humidifier bottle up to the max line with distilled water before using.
The intended service life of the humidifier bottle is five years.

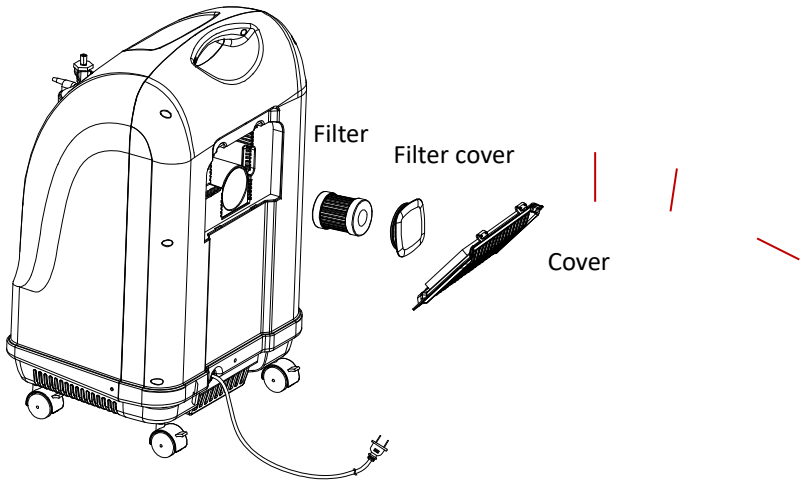
5.3 Clean or Replace Filter

The cleaning and replacement of the filter is important to protect and extend the service life of the compressor and molecular sieve.
Clean the filter with clean water. If the filter is too dirty, you can you can use mild soap or detergent, then rinse thoroughly and air dry it. The filter must be completely dry before it can be installed on the oxygen concentrator.
The intended service life of the filter is two years.
It is recommended to clean the filter every 100 hours, and the filter can be cleaned up to 5 times.
Replace the filter depending on the actual use and environmental impact of the concentrator.

Disassembly the filter

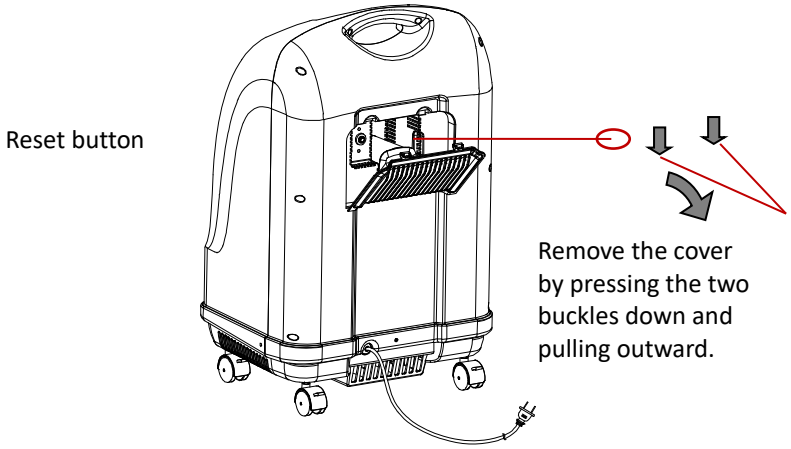
The filter is located on the back of the concentrator.
Remove the cover by pressing the two buckles down and pulling outward, then remove the filter cover, and pull out the filter.





5.4 Overload Protection

When you suspect or determine the overload protection (turn on the main unit when the power connection is normal, a power failure alarm occurs), you can remove the cover on the back of the concentrator and press the **Reset** button.



5.5 Disposal of waste

Dispose of the waste disposable nasal cannula, filter and oxygen concentrator should follow local laws and regulations in case of environmental pollution.

5.6 Check System Gas Leakage and Gas Flowrate

Connect the nasal cannula to the gas outlet connector of the oxygen concentrator or, if used, to the bubble humidifier outlet connector per the manufacturer's instructions.

With the oxygen concentrator turned on adjust the flowmeter to the desired flowrate. Gas should be flowing freely to the nasal cannula. You should be able to hear or feel the flow of gas to the prongs of the nasal cannula.

Wave your hand in front of the uprongs. If you do not feel the gas flowing, check the cannula connections for leaks.

Or place the end of the nasal cannula under the surface of a half full cup of water and look for the bubbles.

6 Accessories

You can order accessories from WFR supplies at www.wfr.com or consult your local WFR representative for details.

WARNING

- **Disposable accessories are designed for single-patient use only. Reuse of them may cause a risk of contamination and affect the measurement accuracy**
- **Use only WFR-approved accessories or listed in this chapter. Or else, the performance and electric shock protection cannot be guaranteed, and the patient may be injured.**
- **Check the accessories and their packages for any sign of damage. Do not use them if any damage is detected.**
- **The accessory material that contacts the user or other personnel has undertaken the bio-compatibility test and is verified to be in compliance with ISO 10993-1.**
- **Do not use parts, accessories, or adapters that are not approved by the manufacturer. Using other humidifier or other accessories not approved by manufacturer will reduce the performance of the concentrator.**

List of accessories

No.	Name	Specification	Unit	Qty.	Remarks
1	Humidifier bottle	RD-3A(250ml)	pcs	1	/
2	Nasal cannula	1.6 meter	pcs	1	Sample
3	Nasal cannula	6 meter	pcs	1	Sample
4	Filter	/	pcs	1	/

7 Product Specification

7.1 Main Unit

Electrical Safety classification	Class II, BF type applied part; non AP/APG equipment
Ingress of water or particulate matter into equipment	IP21
Operating mode	Continuous
Oxygen outlet pressure	30kPa -80kPa
Fuse	F8AL250V
Power supply	AC 220-240V 50Hz

7.2 Environmental Specifications

Operating environment	Temperature: 5°C - 40°C
	Relative humidity: ≤75% (non-condensing)
	Barometric pressure: 86kPa - 106kPa
Storage and transportation environment	Temperature: -40°C- +55°C
	Relative humidity: ≤93% (non-condensing)
	Barometric pressure: 50kPa - 106kPa

7.3 Concentrator Models and Technical Parameters

Below table shows main technical parameters of the concentrator.

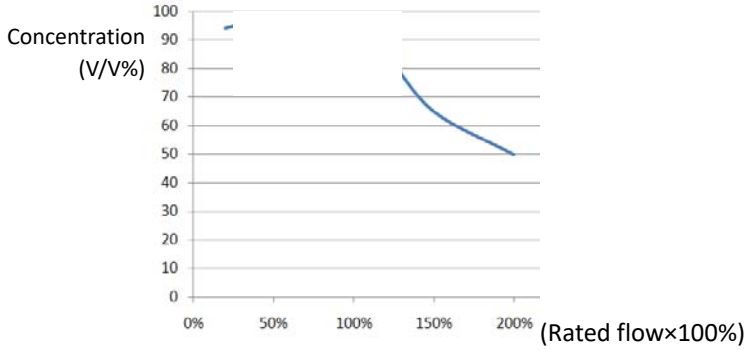
Model	Rated flow	O2 concentration (V/V)	Noise	Dimension (LxWxH)±20mm	Power consumption	Weight
KSOC-10	10L/min	90%±3%	≤60dBA	380x320x620mm	≤820VA	23±3kg

The effect of altitude on oxygen concentration delivered by oxygen concentrator:

Altitude(m)	≤800	800 - 1500	1500 - 3000	3000- 4000
Oxygen concentration	≥90%	≥80%	≥72%	≥63%

Impact of outlet pressure on output flow:
When the outlet nominal pressure is 0kPa, the specified control flow value is 10L/min;
When the outlet nominal pressure is 7kPa, the specified control flow value is 9.2L/min.

Function between Oxygen concentration of concentrator and rated flow (outlet nominal pressure is 0kPa)



Applicable condition for the indicator of oxygen concentrator:

- Temperature: 5- 40°C
- Relative humidity: ≤75% (non-condensing)
- Barometric pressure: 86kPa - 106kPa

8 Warranty and Service

8.1 Warranty
The manufacture date of can be found on the nameplate or label.
THIS WARRANTY IS EXCLUSIVE AND IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE. All faulty components can free repair or replace during the warranty period.
In the normal condition of usual use and storage, the company is responsible for free repair and replacement if the concentrator cannot be used within a week after sold (within 12 month of commercial storage). The user can take the oxygen concentrator 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 concentrator caused by collision;
- Water into the unit or unit get wet;
- The concentrator 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 WFR;
- 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.

NOTES:

- **Please take care of the purchase invoice and maintenance card for service.**
- **The non-controllable factor or the artificial damage is not applicable to maintenance scope.**
- **The service term is subject to WFR only.**
- **Figures in this manual are for reference only. Please take the real product you receive as standard. No notice will be made in case of any update.**

8.2 Contact Information

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

WFR Medical Supplies Sdn Bhd

E-30-3 Lorong Bayan Indah 2,
11900 Bayan Lepas, Pulau Pinang, Malaysia
Tel : +604-618 0809

9 EMC

Below cables information are provided for EMC reference.

Cable	Max. length	Shielded/unshielded	Qty.	Cable classification
AC Power Line	1.5m	shielded	1	AC Power

Important information regarding Electro Magnetic Compatibility (EMC)

Oxygen Concentrator needs special precautions regarding EMC and put into service according to the EMC information provided in the user manual;

Oxygen Concentrator conforms to this IEC 60601-1-2:2014 standard for both immunity and emissions. Nevertheless, special precautions need to be observed.

Oxygen Concentrator with no Essential Performance/Following Essential Performance is intended used in Professional healthcare facility environment.

Essential Performance: Noise≤60Db; O2 density (V/V): 90%±3%

When the AC input voltage is interrupted, the Oxygen Concentrator will shut down and if the power supply restored, it should be recovered by operator manually, this degradation could be accepted because it will not lead to unacceptable risks and it will not result in the loss of basic safety or essential performance.

WARNING

- **Use of this equipment adjacent to or stacked with other equipment should be avoided because it could result in improper operation. If such use is necessary, this equipment and the other equipment should be observed to verify that they are operating normally.**
- **Use of accessories, transducers and cables other than those specified or provided by the manufacturer of this equipment could result in increased electromagnetic emissions or decreased electromagnetic immunity of this equipment and result in improper operation.**
- **Portable RF communications equipment (including peripherals such as antenna cables and external antennas) should be used no closer than 30 cm (12 inches) to any part of the ME equipment, including cables specified by the manufacturer. Otherwise, degradation of the performance of this equipment could result.**

9.1 Table 1- Electromagnetic Emissions

Declaration - electromagnetic emission	
Emissions test	Compliance
RF emissions CISPR 11	Group 1
RF emissions CISPR 11	Class B
Harmonic emissions IEC 61000-3-2	Not applicable
Voltage fluctuations/flicker emissions IEC 61000-3-3	Not applicable

9.2 Table 2- Electromagnetic Immunity

Declaration - electromagnetic immunity		
Immunity test	IEC 60601 test level	Compliance level
Electrostatic discharge (ESD) IEC 61000-4-2	±8 kV contact ±2 kV, ±4 kV, ±8 kV, ±15 kV air	±8 kV contact ±2 kV, ±4 kV, ±8 kV, ±15 kV air
Electrical fast transient /burst IEC 61000-4-4	± 2 kV for power supply lines ± 1 kV for input/output lines	Not applicable
Surge IEC 61000-4-5	± 0.5kV, ± 1 kV line(s) to lines ± 0.5kV, ± 1 kV, ± 2 kV line(s) to earth	Not applicable
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	0 % U_T; 0.5 cycle At 0°, 45°, 90°, 135°, 180°, 225°, 270°and 315° 0 % U_T; 1 cycle and 70 % U_T; 25/30 cycles Single phase: at 0° 0 % U_T; 250/300 cycles	Not applicable
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	30 A/m	30 A/m
NOTE: U_T is the a.c. mains voltage prior to application of the test level.		

9.3 Table 3- Electromagnetic Immunity

Declaration - electromagnetic immunity		
Immunity test	IEC 60601 test level	Compliance level
Conducted RF IEC 61000-4-6	3 V 0.15 MHz to 80 MHz 6 V in ISM bands between 0.15 MHz and 80 MHz	3 V 0.15 MHz to 80 MHz 6 V in ISM bands between 0.15 MHz and 80 MHz
Radiated RF IEC 61000-4-3	10V/m 80 MHz to 2.7 GHz	10V/m

9.4 Table 4- IMMUNITY to Proximity Fields From RF Wireless Communications Equipment

Declaration - IMMUNITY to proximity fields from RF wireless communications equipment					
Immunity test	IEC60601 test level				Compliance level
	Test frequency	Modulation	Maximum power	Immunity level	
Radiated RF IEC 61000-4-3	385 MHz	**Pulse Modulation: 18Hz	1.8W	27 V/m	27 V/m
	450 MHz	*FM+ 5Hz deviation: 1kHz sine	2 W	28 V/m	28 V/m
	710 MHz 745 MHz 780 MHz	**Pulse Modulation: 217Hz	0.2 W	9 V/m	9 V/m
	810 MHz 870 MHz 930 MHz	**Pulse Modulation: 18Hz	2 W	28 V/m	28 V/m
	1720 MHz 1845 MHz 1970 MHz	**Pulse Modulation: 217Hz	2 W	28 V/m	28 V/m
	2450 MHz	**Pulse Modulation: 217Hz	2 W	28 V/m	28 V/m
	5240 MHz 5500 MHz 5785 MHz	**Pulse Modulation: 217Hz	0.2 W	9 V/m	9 V/m
Note* - As an alternative to FM modulation, 50 % pulse modulation at 18 Hz may be used because while it does not represent actual modulation, it would be worst case. Note** - The carrier shall be modulated using a 50 % duty cycle square wave signal.					

Authorized representative, Importer

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