

What is an oxygenator?

Introduction

A home medical oxygen concentrator is a machine that helps provide oxygen therapy to patients with various respiratory ailments such as COPD, asthma, or pneumonia. The concentrator filters the air in a room and removes nitrogen to provide pure oxygen concentration to the patient. The following guide will provide you with essential steps and tips to ensure safe and effective usage of a home oxygen concentrator.

A home oxygen generator is a device that can be used to obtain oxygen with a purity of more than 93%. The home oxygen generator does this by taking advantage of ambient air, cleaning dust and purifying it.

These devices do not need any other equipment or accessories and can meet the needs of any consumer just by using a power cable.

Before the production of home oxygen generators, home or even hospital use in individual dimensions was solved by using bulky, heavy and flammable capsules. It is clear that these capsules need to be refilled after consumption and the costs of recharging, moving and things like that would cause many problems and danger for patients, but using a home oxygen generator requires Any recharge is eliminated and patients can receive oxygen with a purity of over 93% through nasal masks or nasal cannula.

Khارد Gostar Tajhiz Medical Engineering Company, a manufacturer of home oxygen generators, has been able to meet the country's need for high quality home oxygen generators. Using the power of its research and development and scientific-engineering unit, this company has been able to produce a household oxygen generator at the level of international standards and obtain all national and international certificates to ensure the quality of the device.

The home oxygen generator of this company is produced in 5-liter home oxygen generator and 10-liter home oxygen generator models and is provided with a one-year warranty after installation and ten years of after-sales service.

Indications for Medical Oxygen Concentrator:

1. Chronic obstructive pulmonary disease (COPD)
2. Pneumonia
3. Asthma
4. Cystic fibrosis

5. Sleep apnea
6. Pulmonary fibrosis
7. Chronic bronchitis
8. Pulmonary hypertension
9. Lung cancer
10. Heart failure

Contraindications for Medical Oxygen Concentrator :

1. Not being prescribed oxygen therapy by a healthcare provider
2. Respiratory distress requiring immediate intervention such as mechanical ventilation
3. Patients who have unstable angina or have had a recent heart attack
4. Patients with a history of sulfur dioxide sensitivities
5. Patients with hyperventilation syndrome
6. Carbon monoxide poisoning

To see more information about home oxygen generators, we draw your attention to the following content:

●Home oxygen generators

Khord Gostar Tajhiz Medical Engineering Company has been able to use its scientific-engineering power to produce different types of oxygen generators and provide a quality product in accordance with international standards.

The oxygen generators of Khord Gostar tajhiz Medical Engineering Company are provided with a one-year warranty and are produced in two models of five-liter oxygen generators and ten-liter oxygen generators in the group of household models.

Components of a standard oxygen generator

- * Nebulizer (not available in all similar devices)
- * Moisturizer cup
- * Internal filter of the oxygen generator
- * External filter of the oxygen generator
- * Oxygen mask
- * Nasal oxygen tube in sizes of 2 meters and 15 meters
- * Persian manual
- * Device automatic operation timer
- * Oxygen analyzer
- * Flowmeter to measure the volume of outgoing oxygen

The oxygen generator is one of the most important and necessary home medical devices that continuously supplies the oxygen needed by patients whose blood level is low by condensing the ambient air into pure oxygen.

Nowadays, according to the increasing progress of knowledge, technology and new technologies, the use of oxygen capsules has gradually become obsolete. In addition to not having environmental destructive effects and all types of pollution, this device also has a higher added value from an economic point of view and has caused the comfort of the patient.

The air we breathe contains 78% nitrogen, 21% oxygen, and 1% other gases. By compressing the ambient air and sending it to the zeolite tanks, the oxygen generator separates the nitrogen contained in it under special conditions and produces pure oxygen. Medical provides over 93% to the patient.

Filters :

There are 2 types of oxygen generator inlet filters;

1-The first inlet filter is made of polyurethane or industrial cloud, which is responsible for absorbing the dust in the incoming air and is washable and should be washed and dried once a week with normal water without detergent

2-The second inlet filter or the HEPA 2 filter is made of paper, which has different sizes and shapes, depending on the brand of the oxygen generator, the replacement time is different

3-The output filter is an antibacterial filter that has the task of removing bacteria and micron particles so that the output oxygen is a healthy and medical oxygen for the patient to breathe

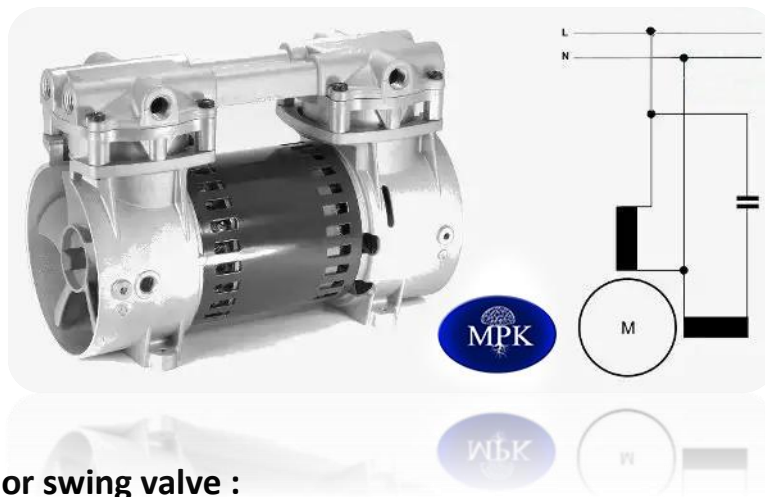


Air compressor ;

The function of the compressor is to suck the surrounding air into the device and compact or compress it.

Compressors of oxygen generators are often dry or (Oil free) type pistons. The air sucked into the device, after passing through the inlet filters, enters the compressor and is then directed into the zeolite cylinders under a certain pressure.

The highest amount of sound and vibration of oxygen generators is due to the operation of the compressor; For this reason, in the construction of devices, they often try to control the sound of the compressor, and they do this with methods such as putting the compressor inside the box or mounting it on a shock absorber, and the second method is superior to the first method. Is. Because placing the compressor inside the box over time leads to a decrease in its lifespan.



Solenoid valve or swing valve :

This valve is a four-way valve. On one side is the interface between the compressor and the zeolite cylinders and on the other side is the oxygen outlet.

It delivers the incoming air to the zeolite cylinders, on the other hand, it removes nitrogen and other gases from the cylinders and removes them from the device. Because it is constantly switching between two zeolite cylinders, we call it a rocking valve.

Zeolite cylinders :

In the oxygen generator, two cylinders filled with zeolite granules are responsible for purifying oxygen gas based on the method of surface absorption fluctuations, and their function is to absorb nitrogen gas and pass oxygen gas through their pores. They give.

After the granules are saturated with nitrogen gas, oxygen purification stops in this column and starts in another column, and the device starts to remove nitrogen gas from the column and goes to the regeneration phase, and the purification process starts again.

Zeolite is a mineral composed mainly of alum inosilicates and its major commercial application in industries is as a surface adsorbent

The word zeolite was originally coined in 1756 by Swedish mineralogist (Axel Fredrik Cronstedt). The name zeolite is composed of (Axel Fredrik Cronstedt) the combination of two Greek words meaning ζέω (zéo), stone and boil.

Oxygen tank :

After purifying the oxygen gas and removing it from the cylinders, the oxygen gas is stored in a tank called the oxygen tank, and here the oxygen pressure is adjusted by a regulator and directed to the outlet of the device.

Flowmeter :

The flowmeter is similar to a graduated ruler that is calibrated in liters per minute and is responsible for regulating the output oxygen gas in liters per minute (LPM). The flowmeter is located on the outside of the device and the user can adjust it easily by turning a valve.

It is very important to note that when the oxygen generator is working, the rotating valve of the flowmeter should not be opened so much that the ball inside it crosses the red line above the graduation.

Humidifier container :

At the outlet of the oxygen generator, there is a humidifying container through which the outgoing oxygen passes and becomes humid. The amount of water needed for the oxygen-generating humidifier container is marked on it, and you should not pour less or more water in the glass. The water used in the humidifier container should only be distilled water (or water obtained from a home water purifier) and once a week the holes of the hose nozzle inside the glass should be descaled (white vinegar) or by a needle, hole It will be returned.

Note: For optimal use of the oxygen-generating humidifier container and to maintain hygiene, the water in the glass must be completely changed every day or every two days completely.

How the oxygen generator works :

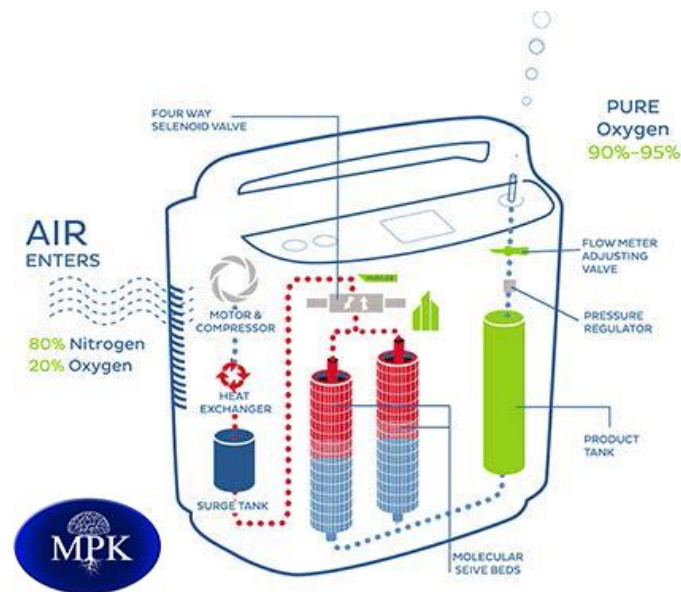
To learn more about the operation of this device, please pay attention to the following article;

The compressor compresses the incoming air from the environment and directs it to the zeolite tanks.

The air entering the zeolite tanks is decomposed by the zeolite granules in the order mentioned. Small molecules of oxygen gas pass through the pores and larger molecules of nitrogen and other gases are absorbed by the granules. The purified oxygen gas is directed to the oxygen

tank, and the absorbed excess gases return through the entrance of the zeolite column and are discharged and returned to the air.

In the oxygen tank, the output oxygen pressure is adjusted through pressure regulators and again passes through a filter and is directed to the oxygen purity sensor and the flow meter. After adjusting the flow by the user according to the dose prescribed by the doctor, the oxygen gas reached to the flow meter is directed to the outlet of the device and the humidifier container and then the oxygen tube and is breathed by the patient with the help of a mask.



When do we need an oxygenator?

In today's world, most people suffer from heart, lung, or other respiratory diseases, or in the recent outbreak, many people who were healthy were also infected with corona. A significant number of these patients can benefit from supplemental oxygen therapy for respiratory care at home, in the hospital, or in medical centers.

Oxygen is a gas that covers 21% of the air around us. The proper functioning of our body depends on this constant source of air. Because your body is not able to receive enough oxygen from the environment, your doctor prescribes supplemental oxygen therapy.

Patients with pulmonary insufficiency, including COPD patients, pneumonia, pulmonary edema, etc., and in general, it can be said that patients whose blood oxygen level (SPO2) is lower than normal, are in dire need of oxygen therapy to increase their blood oxygen.

Only the doctor determines the time of using the device and these hours can be between 1 and 24 hours a day.

tip:

After the doctor's prescription, a suitable oxygen device should be used quickly.

During sleep, people's breathing rate slows down. In this situation, people who are awake, the blood oxygen level is low

have, they will generally suffer from a lack of oxygen during sleep, which is called hypoxia.

On the other hand, people who do not need oxygen therapy while awake may need additional oxygen while sleeping.

In such a situation, it is necessary to examine the need for oxygen consumption and its amount after consulting a doctor. In this situation, by using a pulse oximeter device, the blood oxygen level is checked in different situations and the need for oxygen in wakefulness or sleep is determined.

Blood oxygen saturation is evaluated with a device called pulse oximeter, and the normal level of blood oxygen is the amount that

The normal activity and proper functioning of body organs should be sufficient and the decrease in normal blood oxygen level should be compensated with solutions that can be prescribed by the doctor. The normal blood oxygen level is generally in the range of 90 to 99% and it is clear that daily activities and living environment and lung activity conditions can affect the normal blood oxygen level.

One of the compensatory solutions to increase the normal level of blood oxygen, after the approval of the doctor, is to use oxygen. It should be noted that oxygen as a medicine should be used to compensate for the decrease in blood oxygen saturation.

The air we breathe contains about 21% oxygen, and after breathing, the oxygen in the environment is purified by the body's organs and reaches the normal level required by the body.

If, in any way, the vital organs are malfunctioning in this process, the normal blood oxygen level of the body may not reach the desired level, and in this case, the use of alternative treatment solutions can be prescribed with the expert opinion of the doctor.

Because oxygen is a sterile drug, it can have side effects for the patient after taking too much of the drug. The optimal amount of oxygen consumption is prescribed by the doctor. The exact amount of oxygen needed for a patient can be determined based on the blood gas measurement test and then by pulse oximetry under the doctor's supervision and the amount can be prescribed. When you need oxygen, the prescriber will guide you to adjust the amount and hours of its use.

If you receive more oxygen than you need, a message will be sent from the brain to reduce the breathing rate, and the lack of oxygen may deprive the brain or heart tissue of oxygen, resulting in memory loss or damage to the heart.

It is important to use only the amount that the doctor or nurse has prescribed for you; No more and no less.

The purpose of oxygen therapy is to maintain blood oxygen at a level that matches the body's needs; This value is usually above 89%. The oxygen generator has been designed and supplied for the convenience of consumers so that they can receive oxygen with a purity of 89% continuously from their device with the least difficulty.

Precautions:

Some points seem necessary when using an oxygen generator.

Do not light a fire or smoke next to the oxygen generator.

Keep your oxygen device vertically on the ground.

The help of handles and wheels built into the device is to help move.

It is essential to talk to your healthcare provider to determine the appropriate use of a medical oxygen concentrator and to discuss any potential contraindications. Your healthcare provider may also recommend the appropriate duration and frequency of use.