

Arrow Springs

Oxygen Concentrator/Generator Usage

Oxygen concentrators, also known as oxygen generators, for lampworking, are often originally in service for medical use. Having been taken out of medical service, reconditioned and enhanced for higher output as an oxygen source for lampworking, they are not appropriate for nor can they be used as a medical device.

This paper lists a general recommended procedure for the operation of all brands of oxygen concentrators. It is not intended as a replacement of the oxygen concentrator manufacturer's original manual, or the torch manufacturer's original manual that should contain specific information to your equipment, including specific safety precautions and maintenance procedures.

There is a specific procedure to the operation of oxygen concentrators. Failure to adhere to this procedure can lead to their damage and/or a drop in oxygen purity. The following information will guide you through the usage procedure that will assure your machine performs well throughout its life.

The important points of operation are:

1. Never allow the oxygen flow to stop for more than a few moments at a time while the machine is turned on and running. Doing so causes an excess build up of pressure within the machine that can cause internal damage.
2. Avoid exceeding 80% of the range of the flow gauge, or a mark indicating a maximum setting level. This is only recommended to maintain a high percentage of oxygen.
3. Always keep air filters clean.
4. Operate machine in a well ventilated, room temperature, and low humidity environment. Multiple machines should be kept several feet apart so as not to pick up the oxygen deficient exhaust of the other. Do not use in an enclosed area, such as a closet.
5. When the machine is first turned on, oxygen purity is very low. It can take up to 10 minutes of flowing, and probably will, before the oxygen purity reaches its maximum of about 95%.

Before turning on the oxygen concentrator, do the following:

1. Connect the torch to the concentrator's output connection.
2. Fully open the concentrator's flow valve by turning it counterclockwise.
3. Open the torch's oxygen valve more than one full turn by turning it counterclockwise.
4. Close the torch's fuel gas valve securely.

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Turning on the machine and setting the flow rate:

Turn on the machine and check to see that oxygen is flowing by observing that the small ball within the flow gauge tube is not resting at the bottom. If it is at the bottom, oxygen is not flowing. Check hoses for kinks, and that the torch oxygen valve and machine flow valve are open.

After about one minute of running, slowly close the machine's flow valve, by turning it clockwise, until the bottom of the ball aligns to the mark on the flow gauge that indicates 80% of the range of the flow gauge. If the range of the gauge 0 to 5, 4 is 80%. If the range is 0 to 10, 8 is 80%. If the range is 12, 9 is 80%. Your machine's flow gauge may have a mark other than at 80% that indicates its recommended maximum flow rate setting. Generally, 80% is the maximum flow rate that produces the maximum percentage of oxygen possible, about 95%. Flow rates greater than 80% will cause the machine to produce oxygen at a lower percentage of purity, which will affect flame quality and also lowers the oxygen pressure.

This step sets the maximum flow your torch will be able to receive, no matter how far the torch oxygen valve is opened. If you adjust the torch flame to a small setting, you will likely see a lower flow rate, as that is all you are asking of the machine. Avoid letting the flow rate to drop to zero for more than a few moments, as this can cause excessive pressure to build within the machine and will lead to internal damage. Once the maximum flow rate has been set, you should not have to do it again, unless the setting has been changed.

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To light the torch, you can turn off the torch's oxygen valve for a few moments to turn on fuel gas valve and light the flame. Be sure to turn on the oxygen as soon as the flame is ready for it. If you find that after turning on the oxygen the flame is pushed away from the face of the torch, it may be that the oxygen has not reached a high enough purity yet.

To turn off the torch, it is okay to turn off the oxygen valve before you turn off the fuel gas valve, but as soon as the flame is extinguished, open the oxygen valve to let the oxygen flow. You can leave the machine running with the fuel gas valve closed as long as the oxygen valve is open and oxygen is flowing.

Turn off the machine when you are finished and allow the oxygen pressure to bleed away.

It is always recommended that you extinguish the flame by turning off the oxygen first, then the fuel gas, for premix design torches. The turn off order is not critical for surface mix torches. Most glassworking torches are surface mix design.