HIGH VOLUME OXYGEN

Owner's Manual for Torch Users

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****** If you purchased Respironics M10 Oxygen Concentrators from High Volume Oxygen, remove the 9-volt batteries prior to use ******

M10s Battery Removal*: Open the door in the back of the M10 using a flat screwdriver, remove the filter (gently wiggle it upwards), feel around behind where the filter was. The battery is on long wires and you can pull it out of where it's located so you can see it. Remove the battery, tuck the wires back in place, and replace the filter and door.*

Patent No. 9372488

1. Pre-Setup Conditions

PSA oxygen generators require specific conditions. Follow all the required operating conditions and guidelines that come with your PSA oxygen generators from your specific manufacturer.

Electrical Requirements: The High Volume Oxygen System (HVO System) requires a dedicated single phase electrical supply, 120 VAC/5 amps at a frequency of 50/60 Hz. For CE, the required electrical supply is 220 VAC/12 amps at a frequency of 50 Hz. In addition, every relay box and bank of 3 oxygen generators will require its own 120 VAC, 50/60 Hz, 20 amp supply or for CE 220 VAC, 50 Hz, 12 amp. Only use supplied power cords. Ensure that the equipment is properly grounded through the power cord. Do not install in locations without an earth ground connection. Only oxygen compressors rated with a 5A input or less should be used with the relay box. The total current rating of all three oxygen compressors should not exceed 15A.

Location of Machine: The HVO System must be operated indoors, within temperatures of 45 F to 100 F; protected from dust, solvents, grease and hydro-carbons; and in accordance with CGA guidelines for pressurized gas cylinders (see below). Ensure that the equipment is installed so that the power cable is easily accessible in case any hazards from function should occur.

Positioning: The HVO machine must be operated in an upright position only, with no obstruction blocking the cooling fan on the machine.

2. Safety Precautions and Safe Operating Guidelines

The HVO tank should never be used for storing anything other than oxygen generated by PSA oxygen machines. Maintain PSA oxygen generating machines according to manufacturer's guidelines.

Although oxygen is not combustible, it can be very dangerous as it greatly accelerates the flammability of combustible materials.

Ensure the equipment is installed in a well-ventilated location.

Ensure the equipment is installed in a location that makes it easy to disconnect the power cord in case of emergency.

Do not operate the equipment for any other purpose or in any other manner than what is specified in this manual.

Only use the supplied manifold lines or green oxygen rated hose.

HVO Systems are pre sealed and leak tested before shipment. However, in the case of a leak, immediately contact High Volume Oxygen. Never use any product to seal a leak except for an oxygen rated sealant. Contact High Volume Oxygen for information.

Never use or apply solvents (paints, denatured alcohol, acetone, WD-40, etc.) of any kind on or near the oxygen machines. Solvents are highly combustible when combined with oxygen.

If your machines need cleaning, clean machine and parts with soap and water only. Compressed air can be used to blow out dust and hair from the head unit box.

Do not locate the HVO System near open flame; do not smoke near the HVO System; and make sure all connections and hoses are without leaks, are kept clean and are free of grease or other combustible materials.

Bubble test (mixture of soap and water) all connections upon installation and annually. Failure to maintain leak-free oxygen lines from the PSA machines to the HVO System can result in low oxygen purity.

Do not attempt to remove fittings from pressurized tank. Always de-pressurize tank first.

Make sure your PSA oxygen machines are located in a well-ventilated room. Small rooms or closets without sufficient air flow can result in a dangerous build-up of nitrogen. (see instructions from your PSA machine manufacturer)

When emptying a tank or bleeding a line, make sure you do not let the oxygen blow into hair or clothing as a spark or flame could cause instantaneous and violent combustion of clothing and hair.

<u>Do not change the settings on the controller. This can lead to mechanical failure and will void the warranty.</u>

CGA GUIDELINES: Standard Safety Guidelines for Handling of Compressed Oxygen Cylinders (by the Compressed Gas Association, which complies with OSHA standards):

- Always ensure that compressed gas cylinders are securely strapped or chained in place to prevent tipping or falling. Do not store near elevators, stairs, or passageways.

- If visual inspection indicates obvious damage, the cylinder should be returned to the supplier without any attempt at using the machine.

- Cylinders should not be dropped or permitted to strike each other or any other surface. Do not drag or slide cylinders; use a suitable hand truck, fork truck, roll platform or similar device, firmly securing the cylinders for transporting.

- Do not store oxygen cylinders with flammable gas cylinders. Stored oxygen and fuel gas cylinders should be at least 20 feet apart; preferably separated by a fire resistant partition.

3. Set-up and Operating Instructions

Unpack all the items from the boxes or crates. You should have:

The HVO System

Relay box

Power cords

Coaxial cable(s)

Oxygen manifold lines

Oxygen machines

Regulator (you may need to supply your own)

TOOL FREE INSTALLATION – HAND TIGHTEN ONLY (except for regulator, which requires wrench tightening)

1. Attach one end of the coaxial cable onto the back of the HVO System by screwing it onto the threaded coaxial connector in the center of the rear of the head unit. Plug one of the supplied power cords into the power cord receptacle in the back of the head unit.

2. Place the relay box near the oxygen machines*. Don't place the relay box on the oxygen machines or on the HVO System, as over time the vibration could cause it to fall.* Attach the other end of the coaxial cable to the relay box by screwing it onto either threaded coaxial. Make sure the nut on the coaxial cable is fully tightened onto the coaxial connector.

There are 3 power cord outlets on the front of the relay box. Depending on your number of oxygen machines, you may be using either 2 or 3 of these outlets. Plug the oxygen machine power cords into the outlets on the front of the relay box. Plug the remaining supplied power cord into the power cord receptacle on the lower left corner of the relay box.

For use with 4 to 6 oxygen machines, an additional relay box or a 5-outlet 30-amp relay box is required. Do not attempt to plug more than 3 oxygen machines into one relay box. Link additional relay boxes with a coaxial cable line from the first relay box to the second. Each additional 3-outlet relay box requires its own dedicated 20 amp circuit.

3. Custom-built oxygen supply lines are included with your HVO System. Carefully hand tighten the oxygen connectors onto the oxygen outlet on each of the oxygen machines. Be sure to gently screw them on straight and avoid stripping the connectors. Attach the remaining end of the oxygen connector onto the oxygen inlet fitting on the rear of the HVO system. Make sure the push connect is snug by tugging gently after pushing it in.

4. Attach an oxygen regulator to the oxygen regulator fitting. Tighten with a crescent wrench. If your system doesn't come with a regulator, you will need to supply one. Always attach an oxygen regulator back-flow or

oxygen check valve to your regulator. This is especially important for use with pre-mix torches. Attach your torch's oxygen line to the regulator check valve. For multiple torches, attach an oxygen splitter to your 2-stage regulator check valve. For manifold, patch-ins, advanced and custom installation, call High Volume Oxygen for multiple torch set-up information.

5. Plug the HVO machine into a dedicated 20 amp circuit. Plug each relay box into a separate dedicated 20 amp circuit.

6. On the HVO System main unit, turn the switch above the power cord to the "On" position.

7. Immediately turn all the oxygen machines to "On" and adjust the flow valves to slightly below the highest liter per minute setting. Adjusting to slightly below the maximum setting will result in higher oxygen purity. From here on, do not change the settings or turn the oxygen machines off. They will be automatically controlled by the HVO System.

8. The system will turn off when tank pressure reaches its maximum setting for your specific model.

9. During initial setup, the oxygen being created will be mixed with atmosphere in the tank. Let the HVO System run for a few minutes with the regulator open before turning the regulator off. It's best to vent the HVO System through your unlit torches on the bench with the ventilation system on. After a few minutes, close the regulator and let the HVO System fill until it turns off. The oxygen regulator is now your source for oxygen.

When the pressure reaches the maximum setting, the oxygen machines will shut off. The controller will remain on and will continue to read tank pressure. As the oxygen is being used and the pressure goes down to the low pressure setting for your HVO System, the oxygen machines will automatically turn on. They will remain on until the tank is re-pressurized to its maximum setting.

You will experience increasing flame quality through the first two cycles of usage as oxygen purity increases, after which the oxygen purity will remain at optimum usage level.

10. Once the system is set up and running, do a bubble test to make sure there are no leaks. Leaks in the lines will cause lower oxygen purity. Also bubble test the regulator and tank fittings to make sure nothing came loose during shipping.

11. Turn the HVO System's power switch to "off" when the HVO System will not be in use for extended periods. It is okay to leave it on; however, it is more economical to close the shut off valve when the HVO System is not in use.

4. General Information

1. You will need to supply:
- A minimum of two dedicated 20 amp breakers (or one 30 amp breaker with a 5-outlet relay box).
- 2-stage oxygen regulator
(call for additional information on oxygen regulators and specifications as some do not provide sufficient flow)

2. During normal operation, the tank will be adequately pressurized but the PSA machines will continue running to keep up with your usage. The HVO System will turn off when your oxygen usage at the torch is lower than the oxygen being generated by the PSA machines, at which point the tank pressure will eventually reach its maximum setting and will shut off. As you continue to work, the machines will turn back on at the lower pressure setting. If your torch usage exceeds the generating capacity of your PSA machines, then you may need to add additional machines to meet the lpm requirements of your torch/torches. If this is the case, you may also need an additional relay box. Each relay box can accommodate 3 PSA machines. After 45 lpm of oxygen (higher for the MAX) generating capacity, the oxygen compression limits of the original system are exceeded. At this point, you will need an HVO Drone in order to add more oxygen machines. Contact High Volume Oxygen for information.

3. For shutting down at night, turn off the main switch on the back of the HVO machine only (this is optional; you may also just leave the HVO System on). Turn off the shut off valve on the HVO machine. Always leave the switches in the "on" position and flow meters open on the PSA machines and Drones.

4. Once the HVO System is running, be sure to periodically test for leaks and make sure all connections are sealed. Leaks in the oxygen input lines can cause low oxygen purity.

As with all equipment, safe operation is the responsibility of the user. Failure to monitor, maintain, or properly operate equipment could lead to injury or loss of life.

5. Manufacturer's Contact Information

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