
















**HUMIDIFLOW™ Installation Manual**  
**AirSep® NewLife® Intensity**  
**HMK-AI**



## Important Safety Notes

	<b>Warning:</b> Do not open the case of an oxygen concentrator if it is connected to a power supply. There is a serious risk of electric shock.
	<b>Warning:</b> Follow all safety warnings outlined in the documentation provided with each specific oxygen concentrator.
	<b>Warning:</b> The HUMIDIFLOW™ is only to be installed by a trained professional technician.
	<b>Warning:</b> The HUMIDIFLOW™ does not reduce the dangers associated with concentrated oxygen. Observe all necessary precautions when using an oxygen concentrator.
	<b>Caution:</b> Read through all documentation and instructions for each specific oxygen concentrator before installing a HUMIDIFLOW™.
	<b>Caution:</b> Do not attempt to service or open the HUMIDIFLOW™. It is designed to be maintenance-free.
	<b>Caution:</b> It is very important that the filters on the oxygen concentrator be changed with regularly scheduled maintenance. Reduced performance or damage may result from improper maintenance.
	<b>Caution:</b> Do not add water to the HUMIDIFLOW™.
	<b>Caution:</b> The HUMIDIFLOW™ components (i.e. tubing, etc.) should not come into contact with any moving parts (i.e. fans) inside of the concentrator.
	<b>Caution:</b> Do not touch or molest the fibers inside of the HUMIDIFLOW™ module in any way. Doing so could damage the HUMIDIFLOW™.
	<b>Note:</b> Do not modify or move any of the fittings attached to the HUMIDIFLOW™. Each model has been tested in a specific configuration, and modifying it may cause irregular performance.
	<b>Note:</b> The HUMIDIFLOW™ is designed to add water vapor to the outlet oxygen stream. This will cause the output oxygen concentration to read slightly lower or, with some meters, inaccurately. The results are similar to adding a bubble humidifier before measurement. To accurately measure the oxygen output from the concentrator, use Porous Media P/N ID-1406 (In-Line Dryer), or test the oxygen upstream of the HUMIDIFLOW™.
	<b>Note:</b> The output flow rate of the oxygen concentrator should be checked and adjusted as necessary, using a calibrated flow gauge, following HUMIDIFLOW™ installation.



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## Important Safety Notes



**Note:** Incorrect installation of the HUMIDIFLOW™ may invalidate its warranty or cause unsatisfactory results.



**Note:** The exact vertical and horizontal orientation of the HUMIDIFLOW™ module is unimportant and the module will work equally well in any orientation.



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## Installation Instructions

### AirSep® NewLife® Intensity (HMK-AI) Installation Instructions

#### Required tools:

- One #2 Phillips screwdriver
- One Flat head screwdriver
- One Utility knife or cable snips
- One Drill with  $\frac{3}{4}$  inch step drill bit or  $\frac{3}{4}$  inch hole saw.
- One Pliers

#### Included parts (See Picture A):

- One HUMIDIFLOW™ module (w/ appropriate fittings and tubing)
- One Piece detached  $\frac{1}{2}$  inch tubing with in-line intake filter
- One Piece detached  $\frac{1}{4}$  inch tubing with in-line bacteria filter
- Two Large cable ties
- Three Small cable ties
- Two Long cable ties

#### Installation Procedure:

1. Release the fasteners on either side of the unit by turning each 1/2 turn counterclockwise.
2. Remove both side covers and set aside. Remove the rear cover and set aside. Remove lower front panel and set aside.
3. From the back of the unit remove the 4 screws holding the top front cover on. Two of the screws are located in the top handle the other two screws are located in the middle cross piece directly above the fan.
4. Cut the 2 cable ties located on the back of the unit directly below the bottom two screws that were holding the front cover on previously removed in step 3. (See Picture B.)
5. Locate the flow meter and disconnect the tubing from the top port of the flow meter. (See Picture C.)
6. Locate the existing hole in the divider separating the compressor from the top compartment. If facing the front the hole will be on the right side.
7. Drill a  $\frac{3}{4}$  inch hole approximately 2 inches from the existing hole towards the center of the concentrator. It will be necessary to slightly pull the front section out to fit the drill into the correct position. We recommend using a step drill bit. (See Picture D.)
8. Using the step drill bit enlarge the original existing hole to  $\frac{3}{4}$  inch. (See Picture E.)
9. From the front of the concentrator remove the tubing between the compressor and the silencer (grey PVC tube) located inside the compressor chamber directly above the compressor. This section of tubing may be discarded. (See Picture F.)
10. Remove the silencer (grey PVC tube) by sliding it out to the right side when facing the front of the concentrator. The silencer may be discarded. (See Picture G.)
11. Slide the HUMIDIFLOW™ into the space where the silencer previously resided. Begin with the side of the module that has the 90°  $\frac{1}{4}$  inch fitting and slide this end in first from right to left when facing the front of the concentrator. (See Picture H.) Make sure the fittings and tubing on the HUMIDIFLOW™ module are facing the front of the machine. Tuck the tubing behind the black electrical wires. (See Picture I.)



## Installation Instructions

### Installation Procedure (continued):

12. Using 2 long cable ties secure the HUMIDIFLOW™ in place using the 3 holes located in the back of the machine. Slide the cable ties in through the bottom holes and reach inside the compressor compartment and bend the cable tie so it goes around the HUMIDIFLOW™ module and angles back towards the top hole. (See Picture J.) Make sure the HUMIDIFLOW™ is all the way to the right side of the chamber if facing front. Secure both cable ties tightly so the HUMIDIFLOW™ does not touch the compressor. (See Picture K.)
13. Connect the 3/8 inch tubing from the HUMIDIFLOW™ to the compressor inlet. Secure with a large cable tie. (Picture L.)
14. Slide the included detached piece of ½ inch tubing (with in-line intake filter) through the newly drilled hole in the compressor compartment divider and attach it to the open ½ inch fitting on the HUMIDIFLOW™. Isopropyl Alcohol (IPA) may be used as a lubricant to ease the connection of the ½ tubing to the ½ fitting. The tubing should fit snugly after making the 90 degree bend to connect to the fitting. Secure with a large cable tie. (See Picture M.)
15. Run the ¼ inch tubing that is connected to the HUMIDIFLOW™ across the top of the compressor compartment and feed it through the original hole in the compressor compartment divider and run it across the top of the unit over to the flow meter located on the opposite side. (See Picture N.) Attach this tube to the open fitting on the top of the flow meter. Secure with a small cable tie. (See Picture O.)
16. Attach the open end of the included in-line bacteria filter to the oxygen tubing that was previously connected to the top fitting of the flow meter. Secure with a small cable tie.
17. Run the ¼ inch tubing connected to the in-line bacteria filter down through the original hole in the compressor compartment divider along with the other ¼ inch tubing and connect it to the open port on the HUMIDIFLOW™. Secure with small cable tie. (See Picture P.)
18. **Double check to ensure that none of the lines are pinched or kinked.**
19. Reattach top front cover using the 4 screws.
20. Replace cover for compressor chamber.
21. Replace the back and side panels secure by turning the 2 screws on the side panels ½ turn clockwise.
22. **Test the system for leaks by running the concentrator at its maximum rated flow. Once the maximum flow rate is achieved, briefly and completely block the output oxygen. If the flow gauge drops to zero, there are no leaks in the oxygen tubing.**

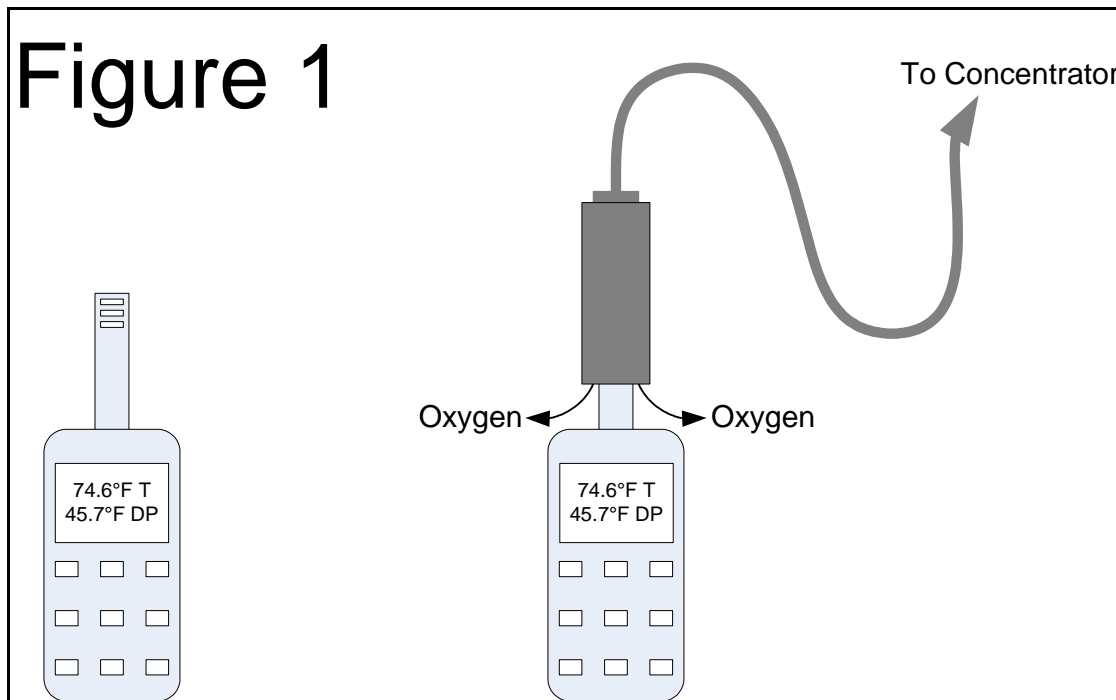


## Optional Performance Verification

Each HUMIDIFLOW™ is put through a series of tests prior to leaving our facility to ensure a high quality product that will perform well for many years. To ensure long life and optimal performance, it is important that the filters in the O<sub>2</sub> concentrator are replaced according to the mfg.'s recommended schedule and in some cases (i.e. cigarette smoking indoors) more often than recommended. Proper and timely replacement of the filters will ensure peak performance of both the HUMIDIFLOW™ and the O<sub>2</sub> concentrator. If you wish to check the performance of the HUMIDIFLOW™, please use the following procedure.

You will need a humidity sensor with a humidity probe that can be enclosed by tubing (see Figure 1). We recommend a humidity sensor that has at least an accuracy of  $\pm 3\%$  of reading, preferably  $\pm 2\%$  of reading or better. This sensor also needs to have the ability to read out moisture level as dew point. This is important because most oxygen concentrators warm the out coming oxygen, and relative humidity (RH) is strongly affected by temperature. Dew point is not affected by changes in temperature. There are many places to buy such a unit. Not all of these units will be able to read out in dew point, so it's important to verify this feature. The unit that is used by the manufacturer for HUMIDIFLOW™ testing is Lufft model C200. It is available through McMaster Carr (<http://www.mcmaster.com/>) as part number 6495T98, but may also be found elsewhere.

**Note:** While Figure 1 shows two humidity sensors, it is best to use only one sensor for both measurements, due to slight disagreement between sensors.





## Optional Performance Verification

### Testing Instructions:

1. Place the concentrator in a stable environment. (One where the temperature and relative humidity change slowly.)  
**Note:** Use an environment that is at normal environmental relative humidity (at least 30% RH or 40°F dew point). If the environment is very dry, it will be difficult to measure the HUMIDIFLOW™ performance.
2. Make sure that the concentrator has a new inlet filter and a new outlet final filter. If either filter has a high pressure drop, it will reduce the HUMIDIFLOW™ performance.
3. Turn on the concentrator and allow it to warm up. Allow at least 30 minutes if the concentrator has come from a different environment, such as a cold vehicle.
4. Once it has warmed up, set the oxygen flow to 3 liters per minute.
5. Turn on the humidity sensor, place it near the oxygen concentrator, preferably near the air inlet, and allow it to stabilize at the dew point of the room.  
**Note:** Do not breathe near sensor nor have it near a person.
6. Record the room dew point.
7. Enclose the probe of the humidity sensor in tubing from the oxygen concentrator. It may be necessary to install an adapter with larger diameter tubing at the end to fit over the probe. See Figure 1  
**Note:** Make sure that the tubing completely encloses the open portion of the probe. Make sure also that the fit over the probe is loose enough to easily allow the oxygen to exit around the probe.
8. Allow the humidity sensor to stabilize at the dew point of the oxygen.
9. Record the oxygen dew point.
10. If the HUMIDIFLOW™ is working correctly, the dew point of the oxygen should be within 7°F (4°C) of the ambient room dew point.  
**Note:** There are many factors that can affect the performance of the HUMIDIFLOW™ device once installed in an oxygen concentrator. Any pressure drop in a gas stream dries the stream slightly, so inlet filters, restrictive tubing, and sound abatement equipment producing a pressure drop in the air stream will dry the air slightly before entering the HUMIDIFLOW™ and thus reduce the dew point of the outlet oxygen slightly. Pressure drop in the outlet filter or any constricted tubing will reduce the oxygen pressure and thus dry it slightly after leaving the HUMIDIFLOW™. Small oxygen concentrators (3 lpm units) intake less air into the HUMIDIFLOW™ and thus do not humidify the oxygen quite as well as larger 5 and 10 lpm units.



## Frequently Asked Questions

**Q:** *How can I increase the humidity of the output oxygen in a very dry room?*

**A:** The HUMIDIFLOW™ uses the intake room air to humidify the output oxygen. To increase the humidity of the output oxygen, simply place a room air humidifier in the same room as the oxygen concentrator.

**Q:** *How often does the HUMIDIFLOW™ need to be serviced?*

**A:** The HUMIDIFLOW™ is designed to be maintenance-free. Regular maintenance of the oxygen concentrator includes filter cleaning and/or changes, which will maintain the efficiency of the HUMIDIFLOW™. The module itself does not require any additional service.

**Q:** *Can I use an external humidifier bottle on a HUMIDIFLOW™-equipped oxygen concentrator?*

**A:** It is not necessary to use a humidifier bottle in conjunction with a HUMIDIFLOW™. However, a humidifier bottle can be used for additional humidification, if desired.

**Q:** *Do I need to use an in-line water trap with a HUMIDIFLOW™-equipped oxygen concentrator?*

**A:** Since the HUMIDIFLOW™ does not transfer liquid water to the output oxygen, an in-line water trap is not required.

**Q:** *Does the HUMIDIFLOW™ affect the accuracy of the built-in flow gauge on my oxygen concentrator?*

**A:** No, the flow gauge maintains the same level of accuracy that it had without a HUMIDIFLOW™ installed.

**Q:** *Will installing a HUMIDIFLOW™ affect the portable cylinder filling function of my oxygen concentrator?*

**A:** No. The HUMIDIFLOW™ is integrated in such a way that it does not affect the oxygen used for filling a portable cylinder. The oxygen supplied to the filling port remains unhumidified, and cylinder filling is unaffected.

**Q:** *Can I expect to see condensation (rain-out) in the oxygen supply tubing as a result of installing a HUMIDIFLOW™?*

**A:** No. The HUMIDIFLOW™ will never humidify the oxygen stream above the ambient level. Additionally, HUMIDIFLOW™ specifically transfers molecular water to the oxygen stream, so it will not be encumbered by liquid water.



## Trouble Shooting Guide

Problem	Probable Cause	Solution
The unit does not power up after HUMIDIFLOW™ installation.	Power cord not plugged in. Circuit breaker tripped.	Insert plug into power outlet. Refer to oxygen concentrator documentation for instructions on resetting.
The unit does not put out sufficient flow after installation of the HUMIDIFLOW™.	The flow control knob is improperly adjusted. The oxygen flow is being obstructed. There is a leak in the oxygen tubing or fittings. The in-line oxygen filter is restricting the flow.	Adjust flow to prescribed level using flow control knob. Check all oxygen lines to ensure they are not kinked or pinched. Check all fittings for leaks, and re-secure as necessary. Ensure that the in-line oxygen filter is has been changed.
The flow gauge does not drop to zero when testing the unit after installation of the HUMIDIFLOW™.	The output flow is not being completely blocked. There is a leak in the oxygen tubing or fittings.	Completely block the oxygen flow to accurately test the system. Check all fittings for leaks, and re-secure as necessary.
The unit alarms or displays a low O <sub>2</sub> warning after installation of the HUMIDIFLOW™.	The oxygen flow is being obstructed. There is a leak in the oxygen tubing or fittings. The in-line oxygen filter is restricting the flow. The intake air is being restricted.	Check all oxygen lines to ensure they are not kinked or pinched. Check all fittings for leaks, and re-secure as necessary. Ensure that the in-line oxygen filter is has been changed. Ensure that the air intake filter is has been changed.
The output oxygen concentration seems to have dropped significantly after installing the HUMIDIFLOW™.	The measurement device is providing an inaccurate reading because of the humidified oxygen stream. The oxygen flow is being obstructed. There is a leak in the oxygen tubing or fittings.	Ensure that the recommended in-line dryer is in place, drying the oxygen for an accurate measurement. Also verify that the dryer is new or recently regenerated, as a saturated dryer will cause inaccurate readings. Check all oxygen lines to ensure they are not kinked or pinched. Check all fittings for leaks, and re-secure as necessary.



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