

PRO₂













PRO 30 Oxygen Concentrator Installation & Maintenance Manual

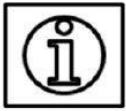


USING THIS MANUAL

This guide is intended for operators and users of PROO2, LLC. It includes information on our warranty, policy, features, functions, proper set-up and installation, operation and preventive maintenance of our device.

The following symbols are used throughout this guide.

	ON (Mains Power switched on)
	OFF (Mains Power switched off)
	Class I Electrical Protection
	DO NOT EXPOSE TO OPEN FIRE
	DO NOT USE OIL OR GREASE
	Technical Information
	Consult the accompanying documents
	Keep in a vertical position
	Fragile – Handle with care
	Sound-Listen for Sound
	General Warning
	Timer-



Initial Inspection

The crate should be opened and inspected immediately upon delivery. Unpack the device at once and perform a visual inspection to determine if it is dented, bent or scratched. Also check to make sure the power cord is attached and that the control panel has not been damaged in any way during shipment.

At **PROO2, LLC (PROO2)**, we are committed to using shipping companies with good reputations for taking care in the handling of freight and providing service in the event of damage.

TYPICAL APPLICATIONS

Oxygen Concentrator

Veterinary Clinic

Fish Farms

Ozone Production

Glass Blowing

Welding

Laboratory Use

Aquaculture

Warranty

PROO2, LLC, Inc. (PROO2), warrants to the original dealer-purchaser of a PROO2 PRO 30 Oxygen concentrator, that it shall: 1) Conform to PROO2's specifications, subject to ANSI tolerances, at the time of manufacture and 2) be free of defects in material and workmanship for a period of twelve (12) months from the date of delivery.

To make claim under this warranty, the Purchaser must: 1) Give PROO2 written notice of the breach of warranty, within ten (10) days after discovery of such breach; 2) immediately upon discovery of the claimed breach, discontinue all use of the enricher; and 3) upon the request of PROO2, return the concentrator or the applicable component part, freight prepaid, to PROO2's plant of manufacture or such other location as designated by PROO2. If it is determined by PROO2 that the concentrator or the applicable component is in breach of warranty, PROO2, at its option, will repair or replace it without charge.

The cost of returning the concentrator or component part to the Purchaser after repair or replacement will be paid by PROO2. If, however, any concentrator or component part returned by the Purchaser because of an alleged breach of warranty is found by PROO2 not to be in breach of warranty, then the concentrator or component part will be returned to the Purchaser, shipping charges collect, and the Purchaser agrees to pay a service charge to PROO2 to cover the cost of handling and testing the concentrator or component part. Dealer labor costs for removal and replacement of parts under warranty are not covered and are the responsibility of the dealer.

This warranty is void if the concentrator or any component part thereof has been damaged by accident, abuse, misuse, neglect, alteration, improper service, repair by other than authorized personnel or other causes not arising out of defects in material or workmanship. Wear of components in normal operation, and failures resulting there from, as determined by PROO2, are excluded from this warranty.

This warranty is not assignable by the Purchaser.

PROO2 MAKES NO OTHER WARRANTIES OF ANY KIND WHATSOEVER, EXPRESS OR IMPLIED, WITH RESPECT TO THE CONCENTRATOR OR ITS COMPONENT PARTS AND ALL IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY EXPRESSLY DISCLAIMED AND EXCLUDED BY PROO2. PROO2's non-exclusive liability with respect to the concentrator shall be to repair or replace (at PROO2's sole option) the concentrator or any of its component parts that prove to be defective in materials or workmanship during the warranty period. Normal maintenance required during the warranty period is not included in this warranty. No claim of any kind whatsoever against PROO2 with respect to the concentrator or its component parts whether or not based in contract, warranty, negligence, strict liability in tort, or any other theory of law, shall be greater in amount than the purchase price of the concentrator. Without limiting the generality of any of the foregoing, PROO2 shall in no event be liable for any special, indirect, incidental, or consequential damages.

PROO2 Oxygen Concentrator products shall not be used for breathable or medical oxygen applications; unless they are assembled with the appropriate support equipment, tested, and operated in compliance with either American, Canadian or ISO norms for hospital oxygen systems

If the PROO2 Oxygen Concentrator product is planned to be used to supply oxygen to a high pressure filling station, please refer to:

- CGA publications that can be found at <http://www.cganet.com>
- ISO 10083 that can be found at <http://www.iso.org>

GENERAL SAFETY GUIDELINES

Only persons who have read and understood this entire manual should be allowed to install and operate the PRO 30 Oxygen Concentrator (hereafter known as the *device*).

The WARNINGS below indicate a potentially hazardous situation. If conditions are not avoided a situation could occur that results in serious injury or death.



- Oxygen is not a flammable gas, but it accelerates the combustion of materials. Do not use in explosive atmosphere. To avoid risk of fire and explosion the concentrator should be kept away from Flames, Heat sources, Incandescent sources, Smoking Materials, Matches, Oil, Grease, Solvents, Aerosols, etc. Do not allow oxygen to accumulate on upholstery or other fabric such as bedding or personal clothing. If concentrator is operating while not connected to patient, position cannula so that the gas flow is diluted in the ambient air.



- Improper patient connection to and use of the cannula may result in injury including strangulation. Avoid situations that might cause the cannula or hose to become entangled about the patient's neck.



- Use of other accessories not described in this User's Guide are not recommended. Patient benefit may be diminished.



- No modification to the equipment is allowed. To do so may affect patient benefit.



- Contraindications; those who continue to smoke (because of the increased fire risk and the probability that the poorer prognosis by smoking will offset the treatment benefit).



- Device must have power to operate. In the event of power loss and for continued operation a backup source is recommended.



- DO NOT disassemble due to danger of electrical shock. Refer servicing to qualified service personnel.



- To avoid the risk of electric shock, this equipment must only be connected to a supply mains with protective earth. If not available, contact a qualified electrician. Do not defeat this safety feature.

The CAUTIONS below indicate a potentially hazardous situation. If conditions are not avoided a situation could occur that results in property damage or minor injury or both.



- Use the power cord provided, and check that the electrical characteristics of the power socket used match those indicated on the manufacturer's plate on the rear panel of the device.



- We recommend against the use of extension cords and adapters, as they are potential sources of sparks and fire.



- The *device* has an audible alarm to warn the user of problems. In order that the alarm may be heard, the maximum distance that the user can move away from it must be determined to suit the surrounding noise level.



- The *device* must only be used for oxygen therapy and only on a medical prescription. The indicated daily duration and flow must be followed, otherwise it may present a risk to the health of the patient.



- Do not position *device* so that it is difficult to access the mains power cord, so that it accessible for disconnect.



- Do not use in a specifically magnetic environment (MRI, X-ray, etc.). May cause device malfunction.



- Note: Medical Device Regulations require users and service providers to report to the manufacturer any incident that could, if repeated, result in injury to any person.

Product Information



Features and Applications

The *PROO2* Model **PRO 30** extracts oxygen from the atmosphere using Pressure Swing Adsorption (PSA) technology. It concentrates oxygen up to **93% (± 3 %)** purity which can be applied in various ways.

Features

Easy to use

Just connect to an electrical outlet, turn the Master Switch **ON/OFF** power switch to the **ON** position and press the **START** button on the front display panel and set the desired flow rate.

Dependable

Its internal air compressors, filtration system, molecular sieve, storage tanks and flow control system are designed for **24/7** operation.

Durable

With oxygen-clean brass tubing and valves, the **PRO 30** can operate even in environments as described under the specifications page.

Safe

A built-in oxygen pressure regulator maintains oxygen outlet pressure at 50 **psi (3.4 bar)**. Each of the compressors on the **PRO 30** has **0.38 hp** and have a built-in safety relief valve to prevent excessive pressures in each compressor.

Unit Specifications	
Performance	
Oxygen Volume/Pressure	63 SCFH @ 50 psi 30 LPM or @ 3.4 bar
Oxygen Purity	93% (± 3%) [United States Pharmacopeia (USP) XXII oxygen 93% Monograph]
Oxygen Dew point	- 60° F (-51° C)
Feed Air Requirement	None, compressors included
Response Time	Approximately 5 minutes to attain maximum purity after initial start-up or extended shut-down, or longer if a supplemental tank is used.
Physical	
Oxygen Outlet Fitting	1/8" NPT Male Insert
Sound Levels	60 dBA @ 1 m
Dimensions	24 x 21 x 44 in (W x D x H) 610 x 530 x 1120 mm (W x D x H)
Weight	200 lb (91 kg)
Power Requirement	
□ □ Standard (International)	230 VAC, 50/60 Hz, Single Phase, 11 A
Oxygen Flow Rate	63 SCFH / 30LPM

Safety Precautions



It is very important that you read the precautions below and make yourself aware of the hazards of oxygen in general. While it can be handled and used very safely, it can also be mishandled or applied incorrectly causing dangerous situations.



Oxygen is a fire hazard. It can be very dangerous as it vigorously accelerates the burning of combustible materials. To avoid fire and/or the possibilities of an explosion, oil, grease or any other easily combustible materials must not be used on or near the oxygen concentrator. **DO NOT SMOKE NEAR THE UNIT.** The unit should be kept away from heat and flames. Individuals who have experience handling oxygen systems should become the designated operators of the oxygen concentrator within your facility.



In sensitive applications, it is important to have a backup supply of oxygen since the concentrator does not come with any reserve storage tank and requires electrical power to operate. ***Therefore, during power outages oxygen will not be produced.***

Do not use extension cords to bring power to the concentrator. The current drawn into the unit is high and could overheat some extension cords. It is also important to use only a properly grounded outlet.

High pressure oxygen may present a hazard. Always follow proper operating procedures, and ***open valves slowly.*** Rapid pressurization may result in personal injury. Safety glasses and hearing protection are required when venting oxygen under high pressure.



Ensure that the oxygen outlet stream is not directed toward anyone's clothing. Oxygen will embed itself in the material and one spark or hot ash from a cigarette could ignite the clothing vigorously.



There are several onboard storage locations that might remain pressurized after the unit is shutoff, ***Ensure*** that this pressure is released prior to performing any service on the unit.



Pre-Installation

Before installing the *PROO2* Oxygen Concentrator, it is necessary to consider the location, space available and power supply for the concentrator.

1) Locating the **PRO 30**:

- The oxygen concentrator should be located in an area that is indoors and remains between **40 F (5 C)** and **100 F (38 C)**. **Setting the machine outdoors or in an area that is not normally within this temperature range will void the *PROO2* Warranty.**
- There should be a distance of at least **12 in (20 cm)** between the unit and any side or back wall in the room that it will be located. It should also not be located any closer than **24 in. (60 cm)** from the discharge of any other operating units. This ensures proper airflow into the concentrator and minimizes any restriction.

2) Space Available for the **PRO 30**:

- If the **PRO 30** unit is going to be set up in a room that is small, (less than **2000 ft³** or **56.6 m³**), that room should be well ventilated (at least **8** air changes in the room per hour). The concentrator will be discharging nitrogen into the atmosphere of the room and a nitrogen build up could be dangerous to people entering the room. If the concentrator is placed in a small closet, the air in that closet will become enriched with nitrogen. As the concentrator continues to run, it would become more and more difficult for it to separate the oxygen from the air because oxygen will make up a smaller and smaller fraction of the air that is fed into the

3) Power Supply for the **PRO 30**:

- The oxygen concentrator should be positioned within **8 ft (2.2 m)** of the electrical outlet that will power it. The reason for this is that the motor draws a large current during the first few seconds of start-up. **It is also very important for this reason NOT to use any extension cords with the unit.** They could overheat and melt, possibly causing a fire. Caution should be exercised to ensure the mains power cord is accessible in the event the unit needs to be disconnected from the mains supply.



Required Operating Conditions

Location of Machine:

The standard oxygen concentrator is intended for use indoors in a commercial or light industrial setting. The enclosure meets **NEMA 1** protection guidelines, which provides a degree of protection against dust and falling dirt. It is classified as **IPX1** in accordance with 60529-1:2001, which provides for a degree of protection from spillage and falling water.

Feed Air/Ambient Air Quality:

The life of any PSA oxygen concentrator is directly related to the air quality that is fed into it. Hot, humid, dirty, oily air deteriorates and degrades the performance of the molecular sieve. In order to preserve the effectiveness and extend the life of the concentrator, precautions must be taken to ensure that the air provided is cool, dry, clean and oil-free. Changing the inlet air filter is a simple and easy way to provide the unit with some protection. It is advisable to set up the unit in an air-conditioned or a well-ventilated area. The room should also be free of toxic gases and high concentrations of hydrocarbons, especially carbon monoxide. Humid, oily areas should be avoided as installation sites as much as possible.

Ambient Air Temperature:

The machine is designed for use over a temperature range of **40 F to 104 F (5 C to 40 C)**. Since hot air has the ability to hold much more water in the form of humidity than cool air, operating the units in hot areas will reduce the effective life of the molecular sieve. Acceptable humidity is between 15 % and 95 % for both operations and storage.

Note: Operation outside of this temperature range will not be warranted by **PROO2**. The device may be stored at between **-20° C and 60° C**

Electrical Power:

The power for the control circuitry of the oxygen concentrator is a single-phase electrical supply of **230 VAC** and about **11 A** at a frequency of **50 Hz or 60Hz** depending on model. This equates to approximately **2100 W** of power. It is required that a **15 A** circuit be dedicated to each **PRO 30** unit. Additionally, the unit must be connected to this circuit using only the supplied power cord, and without additional extension cords.

Positioning:

The unit must be stored, transported and operated in an upright position only, with no obstruction blocking airflow around the unit.

Set-up & Installation



Although every **PRO 30** unit is thoroughly tested and checked before it is shipped from our facility, the following checks are necessary to ensure that none of the internal components have been damaged in shipment. This check should take less than five minutes to perform. (*Refer to 'Initial Inspection' on Page 2 before reading the instructions below*)

Make a visual inspection of the machine and make sure all parts are properly attached. (*Refer to 'Components' section*)

Connect the unit into an electrical outlet. A receptacle plug of local configuration will need to be attached first if the supplied plug is not acceptable.

Turn the **ON/OFF** switch to the **ON** position and make sure that the display light is illuminated. Press the **START** Button on the display unit.

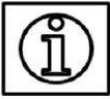


After a brief delay, listen for the sound of multiple compressors to start operating, if you do not hear it within ten minutes, shut the machine down immediately and call **PROO2** for assistance.



The oxygen flow will continue to increase on the flow meter until the unit is up to operating pressure at which time the flow meter will indicate correctly. If this does not occur, check to make sure that none of the hose connections have come loose.

Operating Instructions



Start-up

- Once the system has been installed in accordance with the set-up and installation instructions, it may be operated. The following steps should provide some direction.
- Connect the oxygen outlet to the application
- After connecting it to an electrical outlet and making sure the master switch is in the **ON** position, press the start button on the display unit on the machine to the, wait for **5 to 10** minutes for the unit to come up to rated purity.
- As the unit is coming up to pressure and the correct purity the panel will remain “red” indicating unacceptable output. Once the purity and pressure are acceptable the display will change to “green” indicating it is ready for use. Once flow is established the digital display will indicate the purity of the output Oxygen and the flow meters will indicate the amount of Oxygen flowing to the output.
- Begin using Oxygen.



Shut-down

- To shut off the machine, press the stop button on the display unit. The compressors will quit immediately and the display will continue to show the unit status. If the unit will be off for an extended period then the master switch on the back of the unit can be placed in the off position.
- To shut off the machine, press the stop button on the display unit. The compressors will quit immediately and the display will continue to show the unit status. If the unit will be off for an extended period then the master switch on the back of the unit can be placed in the off position

Caution: **After unit is turned to off the oxygen flow will continue as the pressure in the unit bleeds down.**

Troubleshooting Guide

Problem	Sign	Cause	Solution
Machine not starting		Machine not plugged in Machine not turned on No power to the machine Circuit breaker has tripped Compressor under pressure Loose wire	Ensure that machine is plugged in. Ensure that switch is in the ON position. Ensure that there is power supply to the machine. Push in the reset button on the right hand side of the cabinet. Remove the head pressure that exists in the compressor outlet stream. Check that all wiring connections are secure.
Pressure Switch not Working	Machine not turning ON/OFF at target pressures	Faulty switch	Remove switch and return for replacement.
Low Oxygen Pressure		This may be a result of a leak in the system.	Use a leak testing solution to locate and repair any air leaks.
Oxygen purity has fallen below acceptable limits		This may be a result of a leak in the system. Beds Are Hydrated Dirty Filters	Use a leak testing solution to locate and repair any air leaks. Replace Beds Replace Filters

Preventive Maintenance

Air Filter Cleaning

The air filter elements (3) should be removed and cleaned in soapy water every two weeks or 20 hours of operation to reduce the dust and dirt contamination for inside of the unit.

Compressor Filter Element Replacement:

The air filter element provided with the **PRO 30** must be replaced every **six (6)** months on an average and more frequently in dusty environments. This element helps to maintain the quality of the feed air supply, preserve the molecular sieve inside the oxygen enricher and extend the life of the air compressor.

Failure to replace the filter element on schedule will result in the warranty becoming invalid.

Cabinet & Power Cord:

The cabinet and power cord should be occasionally wiped down with a sponge or clean rag and some soapy water. Avoid the use of ammonia or other strong chemical-based cleaning solvents. This prevents dust and dirt from building up on the machine.

Air Compressor:

You should consider your air compressors an important part of your oxygen generating system. In addition to changing the air filter element, maintenance is relatively simple. The fans on either end should remain free of debris/dust. The air compressors should last **five (5) or six (6) years** or longer under normal operating conditions. The low-pressure compressors should be rebuilt after 15,000 hours of operation. The booster compressor should be rebuilt after 6,000 hours of operation. Hour meters on the rear of the unit indicated hours on the low pressure (LP) compressors and booster (HP) compressor. As indicated by use, both will need to be rebuilt or replaced. Oxygen purity and flow rate along with feed air pressure delivered to the sieve beds will all be indicators that the air compressor has expended its life.

Replacement in the field is possible, but returning the unit to **PROO2** or an authorized service center is recommended.

OCSI Display Board

The OCSI board should never require calibration and cannot be calibrated in the field. Calibration can be verified if needed periodically. Remove the back of the unit disconnect the hoses from the sensor on the large board, supply the board with calibration quality oxygen (99.99%) and check the display, if the display is reading 90.2% +/- 3% then it is within the calibration specifications, if it is outside the range it should be replaced

Technical Service Assistance

It is our intention to provide complete customer satisfaction. This manual is one way in which we hope to provide you with technical assistance.