

# *TOX HP* *OXYGEN CONCENTRATORS*



# Installation and Operation Manual

## Cautions, Warnings and Hazards

Ensure that the TOXHP oxygen concentrator is in a well-ventilated area. Do not allow rain or condensation to contact these components. These units must be operated indoors or in an enclosure in a non-condensing environment.

Carefully review and familiarize yourself with the following important safety information statements concerning the use of oxygen.

**WARNING** Oxygen concentrators produce high concentrations of oxygen which promotes rapid burning. DO NOT operate this device in the presence of open flames.

**WARNING** This industrial device generates heat and must be operated in a space with clean air adequate ventilation. Care must be taken not to block the air intake vents and heat discharge from the bottom.

**WARNING** Make sure this unit is securely located. Vibration can cause the unit to slide on hard smooth surfaces.

**WARNING** Only those who have read and understand this manual should operate this unit. Be sure to unplug the unit before attempting any service.

## Table of Contents

### Table of Contents

Cautions, Warnings and Hazards.....	2
Table of Contents.....	3
Introduction.....	4
Installation.....	5
Location.....	5
Connections.....	5
Initial Startup Procedure.....	6
Oxygen Concentrator Operation.....	8
Normal Operating Parameters.....	8
Alarms.....	8
TOXHP Troubleshooting Chart.....	9
Additional Trouble Shooting.....	10
TOXHP Maintenance.....	11
Specifications.....	12
Contact Info.....	12

## **Introduction**

The TOXHP oxygen concentrator series is a free standing unit for providing highly concentrated oxygen at pressures up to 100 psi. It produces concentrated oxygen by removing Nitrogen from the air we breathe.

The air compressor pulls air through the compressor intake filter. The process of compressing the air heats the air, so the air is first passed through a radiator to extract some heat. Compressed air also has a higher dew point which causes any water vapor in that air to condense into liquid at a higher temperature than its original pressure. The coalescing filter and air tank collect the condensed water vapor. The water is drained periodically with a solenoid drain valve. The air pressure gauge within the unit should read between 20 and 30 psi for best performance. Excessive pressure indicates some kind of restriction, and low pressure indicates a problems with leaks or worn out compressor.

The cooled and dry air cycles through the molecular sieve beds to extract the oxygen. The sieve material adsorbs (physically attracts) the nitrogen and allows the oxygen and other trace gases to pass through. When one sieve bed has become saturated with nitrogen, the solenoid valve set re-directs the dry air to the second bed and vents the nitrogen back to the atmosphere. Some of the oxygen passing through the second bed helps flush nitrogen from the first bed, and the rest of the oxygen is available for use. This process of removing nitrogen is called pressure swing adsorption (PSA).

Before entering the oxygen boost compressor, the oxygen gas passes through a pressure regulator and flow meter. A flow rate higher than the designed flow will result in low oxygen purity and poor performance. The oxygen pressure gauge on the door is reading the pressure of oxygen available to the boost compressor. An oxygen pressure of 5 psi is optimal entering the boost compressor.

The Oxygen Generator provides oxygen at the rated flow rate to the boost compressor. The boost compressor will continue to pressurize the oxygen receiving tank until the pressure switch setpoint (100 psi) is reached.

## **Installation**

**IMPORTANT:** Remove the Oxygen Generator and components from shipping crates and remove any packaging before use.

**IMPORTANT:** Choose a location for the oxygen generator that does not allow rain or condensation to contact the unit. The enclosure is air cooled and will be damaged with heavy amounts of dust or moisture flowing through the unit.

## **Location**

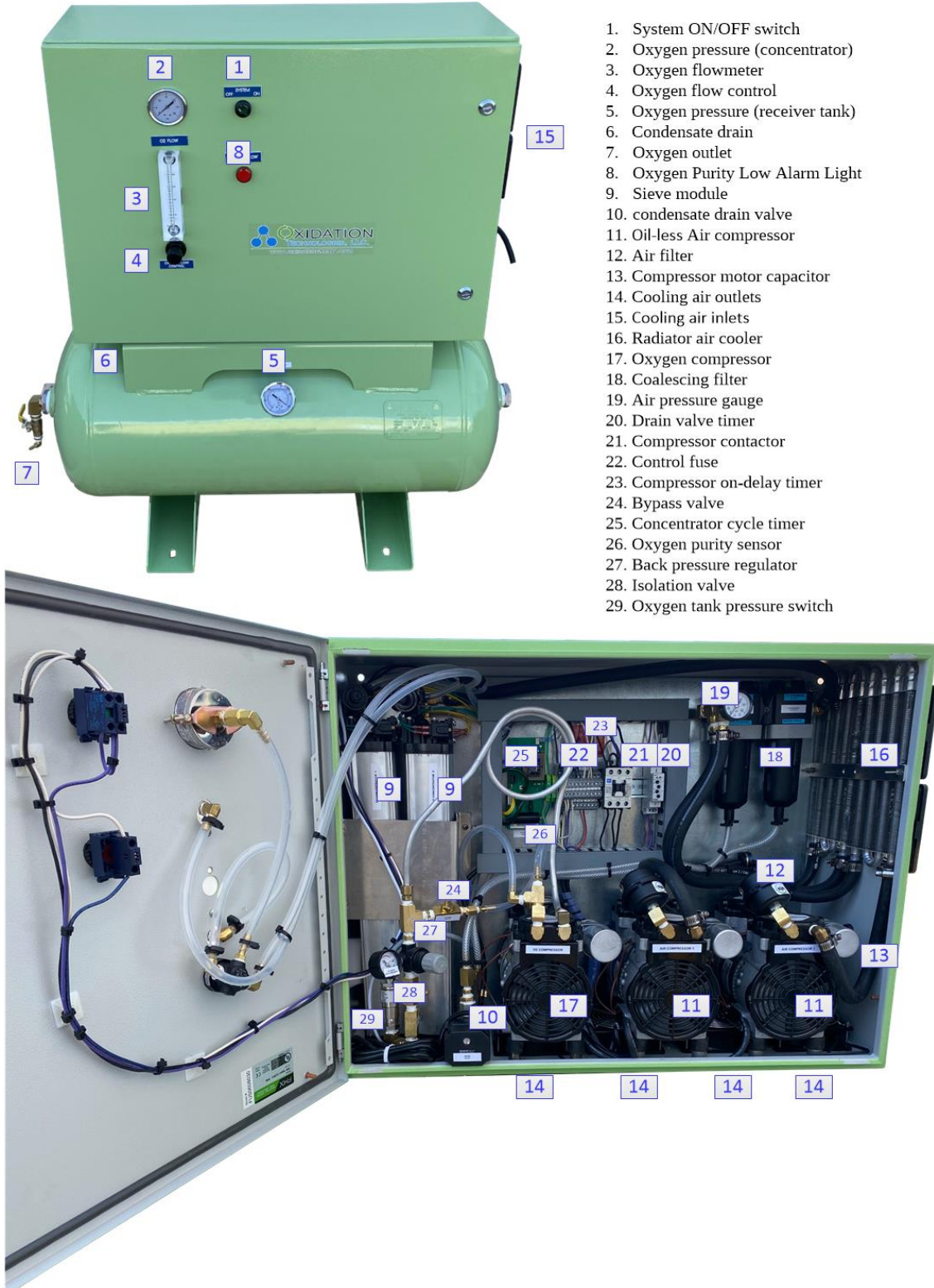
Choose a well-ventilated room between 40 deg F and 100 deg F. Avoid location with high humidity if possible. Ensure proper airflow into the concentrator and at the warm air discharge vents. A small closet will become enriched with Nitrogen without proper ventilation (at least 8 air changes in the room per hour) and reduce oxygen output.

## **Connections**

**Electrical power** of 120 VAC must be supplied the Oxygen Concentrator. The supplied cord can be plugged into a standard 120 VAC electrical circuit with at least 20 amps of capacity.

**Oxygen outlet** is provided as a 3/8" brass 3/8" Female NPT Fitting.

## Oxygen Concentrator Initial Startup Procedure



1. System ON/OFF switch
2. Oxygen pressure (concentrator)
3. Oxygen flowmeter
4. Oxygen flow control
5. Oxygen pressure (receiver tank)
6. Condensate drain
7. Oxygen outlet
8. Oxygen Purity Low Alarm Light
9. Sieve module
10. condensate drain valve
11. Oil-less Air compressor
12. Air filter
13. Compressor motor capacitor
14. Cooling air outlets
15. Cooling air inlets
16. Radiator air cooler
17. Oxygen compressor
18. Coalescing filter
19. Air pressure gauge
20. Drain valve timer
21. Compressor contactor
22. Control fuse
23. Compressor on-delay timer
24. Bypass valve
25. Concentrator cycle timer
26. Oxygen purity sensor
27. Back pressure regulator
28. Isolation valve
29. Oxygen tank pressure switch

1. Turn on the system switch. The air compressor on-delay ensures all pressure has been released prior to startup ensuring that the air compressor(s) are able to start.
2. Oxygen flow through visual flowmeter will start flowing. Adjust oxygen flow to a max flow of 20 SCFH (TOXHP 20) 30 SCFH (TOXHP 30) or 60 SCFH (TOXHP 60).
3. The oxygen boost compressor will compress the oxygen being generated into the receiver tank until it reaches a pressure of 100 psi or the unit is turned off. As the pressure builds, the oxygen flow may decrease. Flow can be re-adjusted to compensate.
4. Connect the TOXHP unit to your point of use with tubing rated for oxygen and at least 100 psi.
5. Oxygen flows higher than machine rating will result in lower oxygen purity and may trigger the low purity alarm.

## **Oxygen Concentrator Operation**

### **Normal Operating Parameters**

- Air Pressure 20-40 PSI
- Oxygen pressure (concentrator) = 3-6 PSI
- Oxygen pressure (receiver) = 50-100 psi
- Back pressure regulator = 50 psi
- Oxygen flow = 0-20/30/60 SCFH

**NOTE:** Flowmeters under pressure will read lower values than actual flow. At an indicated flow of 9 SCFH at 9 PSI actual oxygen flow is 7.6 SCFH.

### **Alarms**

Oxygen Purity Low - If flow exceeds the unit ratings, oxygen purity will be compromised and the O<sub>2</sub> purity low light will illuminate at 85%. Correct this alarm by reducing the oxygen flow. The alarm should clear within 30 seconds or after a system re-start.



## Oxygen Concentrator Troubleshooting Chart

<b>Problem</b>	<b>Probably Cause</b>	<b>Solution</b>
Unit does not run	No power to unit.  Control fuse burned out	Check wall outlet for power  Check for loose wiring, replace fuse with 5 amp fuse
Compressor shuts down intermittently	Restricted air flow through unit.  Unit overheating due to improper location  Defective cooling fan	Clean inlet cooling filter or remove obstruction.  Locate unit away from heating source, provide adequate ventilation on all sides.  Replace cooling fan
Compressor does not start after switch is on and time delay complete.	Extreme cold start  Compressor thermally cut out due to excessive heat. NOTE: it will not restart until it cools down and system pressure is released with drain valve.  Defective capacitor  Faulty electrical connection for compressor.	Allow unit to reach room temperature. Clear cooling obstructions, wait to turn unit on until cooled.  Replace capacitor.  Check electrical connections for compressor.
Oxygen purity low alarm	Excessive oxygen flow  Oxygen leak  Worn out sieve beds	Reduce oxygen flow with the flow control on the front panel.  Check for disconnected oxygen tubing or leaks.  Reset alarm by turning system off and back on.  Replace sieve beds
Low oxygen purity from receiver tank.	Defective O2 purity sensor on concentrator timer board.  Worn out oxygen compressor seals  Excessive oxygen flow	Verify with second oxygen purity sensor. Replace if defective.  Replace seals on oxygen compressor.  Adjust oxygen flow to stay at or below rating.
Unable to adjust oxygen flow to	Excessive bypass flow.	Turn bypass valve slightly

maximum flow		clockwise.

**Additional Trouble Shooting**

## **TOX HP Spare Parts List**

Component	Part Number	Maintenance	Schedule
Inlet air filters		Check	Monthly – replace or clean as needed.
Compressor inlet filter	Filter-4-R	Check	6 months – replace or clean as needed
Coalescing filters	MSP-96-648 MTP-96-649	replace	6 months
Fans	Fan 4.7-120v	Check	Replace if needed
Sieve module	OXO – 8 or 10		
Air Compressor	CP – Comp 50		
Oxygen Compressor	CP – Comp 40		
Compressor Rebuild Kit	CP Compressor - R		

## **Specifications**

*Oxygen Production:* 30 SCFH

*Environment:*

Operating Temperature: 32°F to 95°F

Storage Temperature: 32°F to 150°F

*Mechanical:*

Maximum Dimensions: 48”W x 18”D x 48” H

Weight: 250 lbs

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