

Model OGS-20 Oxygen Generator

Installation, Operation & Maintenance Manual



Oxygen Generating Systems Intl.

814 Wurlitzer Drive
North Tonawanda, New York 14120
Telephone - (716) 564-5165
Fax - (716) 564-5173
Toll Free - (800) 414-6474
E-mail - ogsimail@ogsi.com
Web Site - www.ogsi.com

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Freight Damage Claims & Initial Inspection

The crate should be opened and inspected immediately upon delivery. If the exterior of the crate is noticeably damaged at the time of delivery, make a note on the freight bill before signing it. Unpack the unit 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.

Do not discard the shipping crate. If for any reason the unit should need to be returned in the future, this crate is the best way to ship it back to the manufacturer.

If any damage is discovered during the initial visual inspection, call the Freight Company immediately. ***This must usually be done within 24 hours of delivery.*** Claims of damage due to freight handling can only be filed by you, the consignee, as **OGSI** shipping terms are Free On Board (FOB), North Tonawanda, NY USA. This means that once the equipment leaves our dock you are the owner of it. **OGSI** has no legal claim to make against any shipping company for damage.

At **OGSI**, 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. In our experience, we have found United Parcel Service (UPS) to be a poor carrier choice for equipment of this size and weight. Although they will accept and deliver it, we have often encountered problems with the way they handle the systems, and recommend other carriers be used.

Technical Service and Assistance

This manual is intended as a guide for operators of **OGSI** Oxygen Generators and Oxygen Generating Systems. It includes information on our warranty policy, on how the machines work, on proper set up and operation, and finally on how to maintain them.

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

If you do not find what you need in this manual or you have other questions about this equipment, please feel free to contact us directly. This can be done in a number of ways that are listed below. We look forward to serving your oxygen needs and invite your inquiries. We will respond to you as promptly as possible.

Technical service personnel are available at **OGSI** from 8:00 A.M. through 5:00 P.M. Eastern (U.S.) Standard Time which is Greenwich Mean Time minus 5 hours (GMT - 5). You may reach **OGSI** personnel through the following means:

- **By Telephone from within the United States** two numbers may be used:
 - (800) 414-6474 - our toll free number
 - (716) 564-5165 - our local direct number
- **By Telephone from outside the United States** you must dial:
 - Your local International Access Code (usually 0 or 00), followed by
 - The Country Code for the U.S. which is (1), followed by
 - Our Area Code and Number (716) 564-5165
- **By Automated Voicemail:**
 - at the numbers listed above -available 24 hours/day.
- **By Fax from within or outside the United States** as above at;
 - (716) 564-5173 - available 24 hours/day
- **By e-mail or through our World Wide Web site** at:
 - ogsimail@ogsi.com - available 24 hours/day
 - http://www.ogsi.com - available 24 hours/day
- **By Mail** at:
 - OGSI**, 814 Wurlitzer Drive, North Tonawanda, New York 14120 USA
- **By UPS, FedEx or Common Carrier** at:
 - (This address for return shipments – RMA is required for **any** return)*
 - OGSI**, 814 Wurlitzer Drive, North Tonawanda, New York 14120 USA

We also have a list of Distributors and Authorized Service Agents available upon request.

Customer Satisfaction Survey

Let us know how we are doing.

Please take our Customer Satisfaction Survey at www.ogsi.com

Warranty

Oxygen Generating Systems Intl., being a division of Audubon Machinery Corporation (hereinafter **OGSI**), provides a warranty on its products (the "Products") against defects in material and workmanship, under normal use and operation, to the extent set forth in this Warranty.

THIS WARRANTY IS THE SOLE AND EXCLUSIVE WARRANTY OF OGSi WITH RESPECT TO THE PRODUCTS AND IS IN LIEU OF ALL OTHER WARRANTIES EXPRESS OR IMPLIED ALL OF WHICH ARE HEREBY DISCLAIMED TO THE FULLEST EXTENT PERMITTED BY APPLICABLE LAW. WITHOUT LIMITING THE GENERALITY OF THE FOREGOING DISCLAIMER, AND EXCEPT AS OTHERWISE SET FORTH IN THIS WARRANTY, OGSi DISCLAIMS ALL WARRANTIES OF MERCHANTABILITY WITH RESPECT TO THE PRODUCTS AND ALL WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE. THE WARRANTY OF OGSi AS SET FORTH HEREIN IS FOR THE BENEFIT OF THE ORIGINAL USER OF THE PRODUCTS AND IS NOT TRANSFERABLE WITHOUT THE PRIOR EXPRESS WRITTEN CONSENT OF OGSi.

The **OGSI** Warranty provides the following:

- a.) OGSi shall repair or replace the Products free of charge to the original user where defects in the material and/or workmanship are evident at the time of delivery. Such replacement of the Products does not include damages incurred in shipping the Products. **OGSI** will pay for shipping the Products one way to the original user. If shipping damage is evident, the original user should contact the shipper immediately.
- b.) OGSi shall repair or replace the Products (excluding filter elements and sieve material) free of charge to the original user where defects in material and/or workmanship become evident between the time of delivery to the original user and one (1) year from the date of delivery to the original user. **OGSI** will pay for shipping the Products one way to the original user. In no event shall **OGSI** have any responsibility or liability for the cost of labor for the removal of component parts or equipment that constitute part of the Products, packaging of the component parts or equipment that constitute part of the Products or the re-installation of replacement of the component parts or equipment that constitute part of the Products.
- c.) The warranty provided by **OGSI** to the original user covers parts and equipment specifically manufactured by **OGSI** and used as components or equipment that constitute part of the Products. The warranty on parts or equipment manufactured by third parties and included as part of the Products (e.g., air dryers, air compressors, oxygen compressors, instrumentation, etc.) is limited to the respective original warranties of such third parties.

Note - A Return Authorization Number must be obtained from **OGSI** prior to the return shipment of the Product or any component parts or equipment of the Products. The Return Authorization Number must be visibly written on the outside of the package of the returned Products, component parts or equipment as applicable or **OGSI** will not accept the return.

Note - The warranties of **OGSI** as set forth herein shall also become null, void and not binding on **OGSI** if a defect or malfunction occurs in the Products or any part of the Products as a result of:

- a.) A failure to provide the Required Operating Conditions for the Products (see pg. 9)
- b.) Repair, attempted repair, adjustment or servicing of the Products, or any component parts or equipment that constitutes part of the Products by anyone other than an authorized representative of **OGSI**. The authorized service representative must obtain prior approval from OGSi's Service Manager before performing any warranty work.
- c.) External Causes (e.g., flood, hurricane, tornado, fire, any natural disaster, or any event deemed an act of God).

Molecular Sieve Replacement:

The breakdown of the molecular sieve inside the generator (dusting of the sieve) only occurs if excess water/oil are entrained in the feed air stream. Under no circumstances is the molecular sieve covered under any warranty by **OGSI**. If sieve dusting occurs on your machine, check the air compressor, air dryer and filter elements

Other Matters: **OGSI** is not liable for any special, indirect, punitive, economic, incidental or consequential losses or damages including without limitation, loss of use, replacement oxygen charges, delays or lost savings related to the Products or otherwise even if **OGSI** shall have been advised of the possibility of such potential losses or damages.

Limits of Liability

OGSI, shall not be liable for any special, indirect, incidental, or consequential damages resulting from the use, or as a malfunction of OGSI Oxygen Generator products.

OGSI Oxygen Generator 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 the US, Canadian or ISO norms for hospital oxygen systems.

Operational Warnings

OGSI Oxygen Generators are self-contained systems for the production of high concentration oxygen. Although oxygen itself is not combustible, it can be very dangerous. It greatly accelerates the burning of combustible materials.

- Precautions should be taken to avoid a fire in the area of the generator.
- Smoking should not be permitted in the area where the generator is located.
- All oxygen connections and hoses should be kept clean and free of grease, oil and other combustible materials.
- Valves controlling oxygen flow should be opened and closed slowly to avoid the possibility of fires or explosions that can result from adiabatic compression.
- When bleeding a tank or line, stand clear and do not allow oxygen to embed itself within clothing. A spark could ignite the clothing violently.
- High-pressure gasses may be present within the system. Valves should be opened and closed slowly, and safety glasses and hearing protection should be worn at all times while gasses are being vented.
- Do not attempt to modify or enhance the performance of a Generator in any way.

Pressure Swing Adsorption (PSA) Technology

The **OGSI** Oxygen Generator is an on-site oxygen-generating machine capable of producing oxygen on demand in accordance with your requirements. It requires less than 1100 Watts of electrical power to control its operation.

In effect, it separates the Oxygen (21% of air) from the air it is provided and returns the Nitrogen (78% of air) to the atmosphere through a waste gas muffler. The separation process employs a technology called Pressure Swing Adsorption (PSA). At the heart of this technology is a material called Molecular Sieve.

This Molecular Sieve is an innocuous, ceramic-like material that is designed to adsorb Nitrogen more readily than Oxygen. Each of the two beds that make up the generator contains this sieve. As air is fed into one of the beds, the sieve in that bed holds the Nitrogen to it and allows the Oxygen to flow through it and out to the surge tank as product gas. Eventually the sieve becomes saturated with Nitrogen. When this occurs, the feed air is directed to the other bed where the oxygen production/separation process continues. While the second bed is being fed air, the first is depressurized and safely releases the Nitrogen it has trapped through the waste gas muffler. This regenerates the sieve in the first bed and prepares it to accept feed air again continuing the process. The two beds continue to work in this alternating fashion to provide a continuous supply of Oxygen.

This air separation process is reliable and virtually maintenance free. The Molecular Sieve will last indefinitely, as long as it does not become contaminated with water and oil vapors. This is why regular filter element replacement is critical to trouble free operation. The filter elements are very inexpensive, semi-annual maintenance.

OGS-20

Oxygen Generator Specifications

PERFORMANCE :

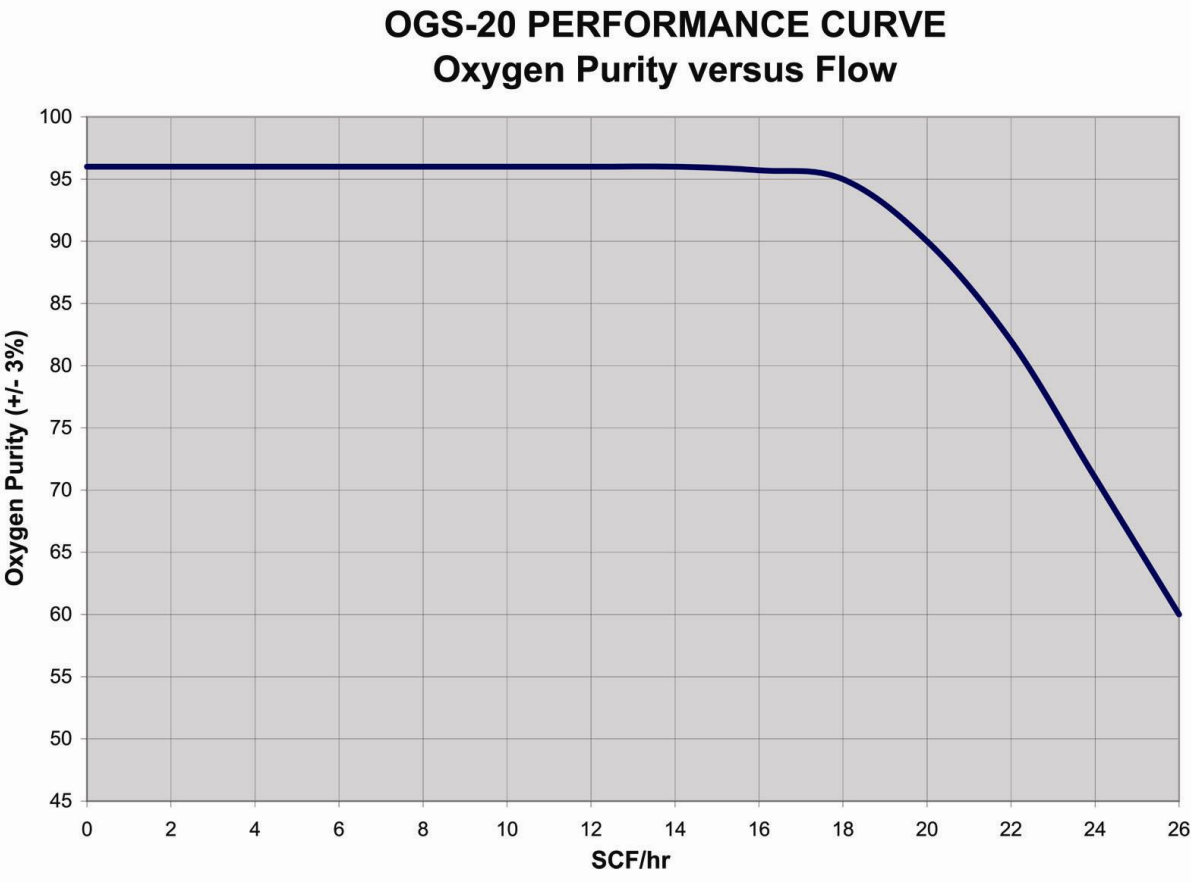
Oxygen Volume -	0 - 20 SCFH @ 0 – 15.0 PSI 0 - 0.57 Nm ³ /hr @ 103.1 k Pa
Oxygen Pressure -	turns on under 80 psi turns off under 90 psi
Oxygen Purity-	93% +/- 3% [See Graph, Page 9]
Oxygen Dew point -	- 40° F (-40° C)
Feed Air Requirement -	None, Compressor Included

PHYSICAL :

Oxygen Outlet Fitting -	B Size Oxygen Adapter
Sound Levels -	60 dba @ 1 meter
Dimensions -	Horizontal: 40" W x 17" D x 46" H Vertical: 24" W x 19" D x 69" H
Weight -	195 lb. (88 kg)
Power Requirements: Standard (Domestic) -	115 VAC, 60 Hz, Single Phase 10 amps

OGS-20 PERFORMANCE CURVE

Oxygen Purity versus Flow



Required Operating Conditions

Location of Machine: The standard Oxygen Generator is intended for use indoors in a commercial or light industrial setting. The enclosure meets **NEMA 12** protection guidelines, which provides a degree of protection against dust, falling dirt and non-corrosive liquids.

Feed Air/Ambient Air Quality: The useful life expectancy of any PSA Oxygen Generator is directly related to the air quality that is fed into it. Hot, humid, dirty, oily air deteriorates and degrades the performance of molecular sieve. In order to preserve the effectiveness and extend the useful life of the generator, all precautions should be taken to insure that Cool, Dry, Clean, Oil-Free air is provided to it.

Changing the inlet air filter is a simple and easy way to provide the unit with some protection. Where possible, it would be advantageous to locate the unit in an air-conditioned space, or at least a well-ventilated area. The room should also be free of toxic gases and high concentrations of hydrocarbons, especially carbon monoxide. Additionally, to the degree possible, humid, oily areas should be avoided as installation sites.

Ambient Air Temperature: The machine is designed for use over a temperature range of 40°F to 100°F (5°C to 38°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.

Note: Operation outside of this temperature range will not be warranted by **OGSI**.

Electrical Power: On U.S. models, the power for the control circuitry of the Oxygen Generator is a single-phase electrical supply of 115 Volts AC and about 10 Amps at a frequency of 60 Hz. This equates to approximately 1000 Watts of power. It is required that a 15 Amp circuit is **dedicated** to each OGS-20. Additionally, the unit must be plugged into this circuit using only the supplied power cord, and without additional extension cords.

Positioning: The unit must be operated in an upright position only, with no obstruction blocking airflow around the unit.

Pre-Installation Check Instructions

Although every **OGS-20** is thoroughly tested and checked before it is shipped from our factory, the following checks are necessary to insure that none of the internal components have been damaged in shipment. This check should take less than five minutes to perform.

- 1.) Make a visual inspection of the machine and make sure all parts are properly attached.
- 2.) Plug the unit into an electrical outlet. A receptacle plug of local configuration will need to be attached first if the machine has been shipped outside North America.
 - a. Turn the On/Off, green lighted switch to the on position and make sure the green light comes on,
 - b. Listen for the sound of the compressor to start running, if you do not hear it within a few seconds shut the machine down immediately and call the factory for assistance.
- 3.) You should see the tank pressure gauge indicate a pressure increase after approximately 15 minutes. If these things do not occur, check to make sure that none of the hose connections have come loose. Call the factory if no loose connections are found and trouble persists.

Setup & Installation Instructions

Before installing the **OGSI** Oxygen Generator, it is necessary to consider the location, space available and power supply for the generator.

1.) Locating the **OGS-20**:

a. The oxygen generator should be located in an area that is indoors and remains between 40°F (5°C) and 100°F (38°C). **Location of the machine outdoors or in an area that is not normally within this temperature range will void the OGS/ Warranty.**

b. There should also be at least 8 inches (20 cm) between the unit and any side wall in the room that it will be located. This is to ensure that airflow into the machine through the cooling fans is not restricted.

2.) Space Available for the **OGS-20**

If the **OGS-20** is going to be located in a room that is small, (less than 1000 cubic feet or 25 cubic meters), that room should be well ventilated (at least 5 air changes in the room per hour). There are two reasons for this. The first is that the generator will be discharging nitrogen into the atmosphere of the room, and a nitrogen build up could be dangerous to people entering the room. The second is that if, for instance, the generator was located in a small closet the air in that closet would become enriched with nitrogen. As the generator 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 generator.

3.) Power Supply for the **OGS-20**:

The oxygen generator should be positioned within 8 feet (2.2 meters) of the electrical outlet that will power it. The reason for this is that the motor has a large current draw especially during the first few seconds of startup. **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.

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.

1.) **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 generator. Smoking, heat and open flames are also not recommended near the unit. Individuals who have experience handling oxygen systems should become the designated operators of the oxygen generator within your facility.

2.) **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.

3.) In critical applications it is important to have a backup supply of oxygen, as it should be remembered that the generator does not come with any reserve storage tank and it does require electrical power to operate. Therefore **during power outages oxygen will not be produced.**

4.) As previously mentioned, **do not use extension cords to bring power to the generator.** The current draw into the unit is high and could overheat some extension cords. It is also important to use only a properly grounded outlet.

5.) **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.

Start up Procedures

Once the system has been installed in accordance with the setup and installation instructions, it may be run. The following steps should provide some direction. Please keep in mind that this system is not designed for use as a medical oxygen concentrator.

- 1.) Connect the oxygen outlet to the application
- 2.) Plug the power cord into a grounded outlet.
- 3.) Press the On/Off switch, check to see that the green light on the switch goes on and listen for the air compressor.
- 4.) If this is the initial startup, you may have to run the machine and then drain the tank several times before all of the low purity gas has been eliminated in the tank.
- 5.) Set your outlet pressure regulator to desired setting
- 6.) Begin using the oxygen

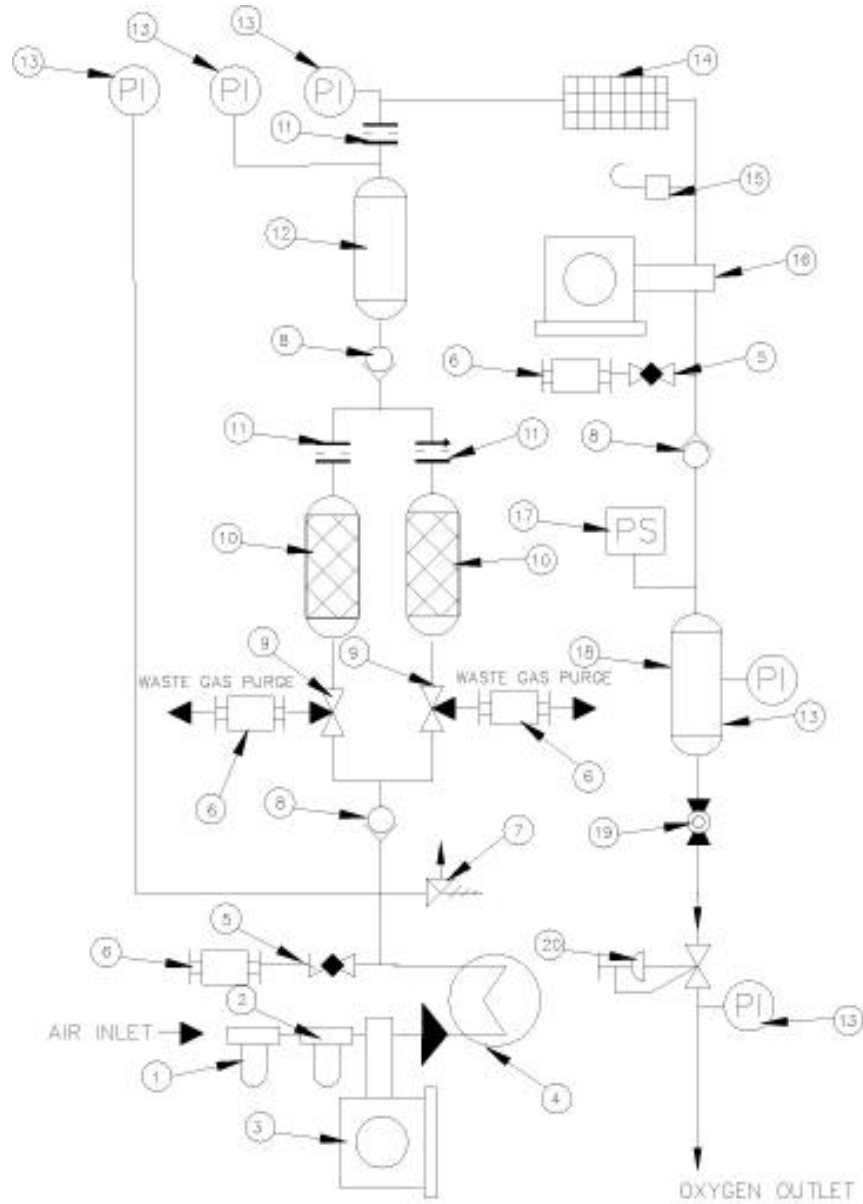
Shutdown Procedures

- 1.) To stop the flow of oxygen out of the unit temporarily, simply close the ball valve on the tank.
- 2.) To shut the machine off, press the On/Off button to the off position. The light should go out on the switch and the compressor noise should quickly die out.
- 3.) Do not turn the machine off and on quickly. Doing this will cause the compressors to stall out and trip the breaker or blow the fuse. The unit should have about 20 seconds to vent off pressure before being restarted.

OGS-20 Troubleshooting Guide

Problem	Possible Causes	Solutions
Machine won't start	Machine not plugged In	Be sure that the machine is plugged In
	Machine not turned on	Be sure that the switch is in the ON position
	No power to the machine	Be sure that there is a power supply to the machine.
	Circuit breaker has been tripped	Push in the reset button on the right hand side of the cabinet
	Compressor under pressure	Remove the head pressure that exists in the compressor outlet stream
	Loose wire	Check that all wiring connections are secure
White powder visible in machine	Dusting of sieve beds	Replace sieve beds
Pressure levels too high	Filters not replaced and dirt and dust have accumulated in the machine	Remove valve block from machine and clean valves and spools completely
	Dusting of sieve beds	Replace sieve beds
Machine Not Turning On/Off at Target Pressures	Faulty pressure switch	Remove switch and return for replacement
Storage Tank Not Filling to Desired Pressure	A leak exists in the system	Check system for leaks.

Process Flow Schematic: OGS-20



ITEM	DESCRIPTION
1	PRE-FILTER
2	INLET FILTER
3	AIR COMPRESSOR
4	COOLING TUBE
5	VENT VALVE
6	MUFFLER
7	PRESSURE RELIEF
8	CHECK VALVE
9	SIEVE BED VALVES
10	SIEVE BEDS
11	GRIFICES
12	RECEIVER TANKS
13	PRESSURE GAUGES
14	HEPA FILTER
15	VENT VALVE
16	OXYGEN COMPRESSOR
17	PRESSURE SWITCH
18	STORAGE TANK
19	BALL VALVE
20	PRESSURE REGULATR

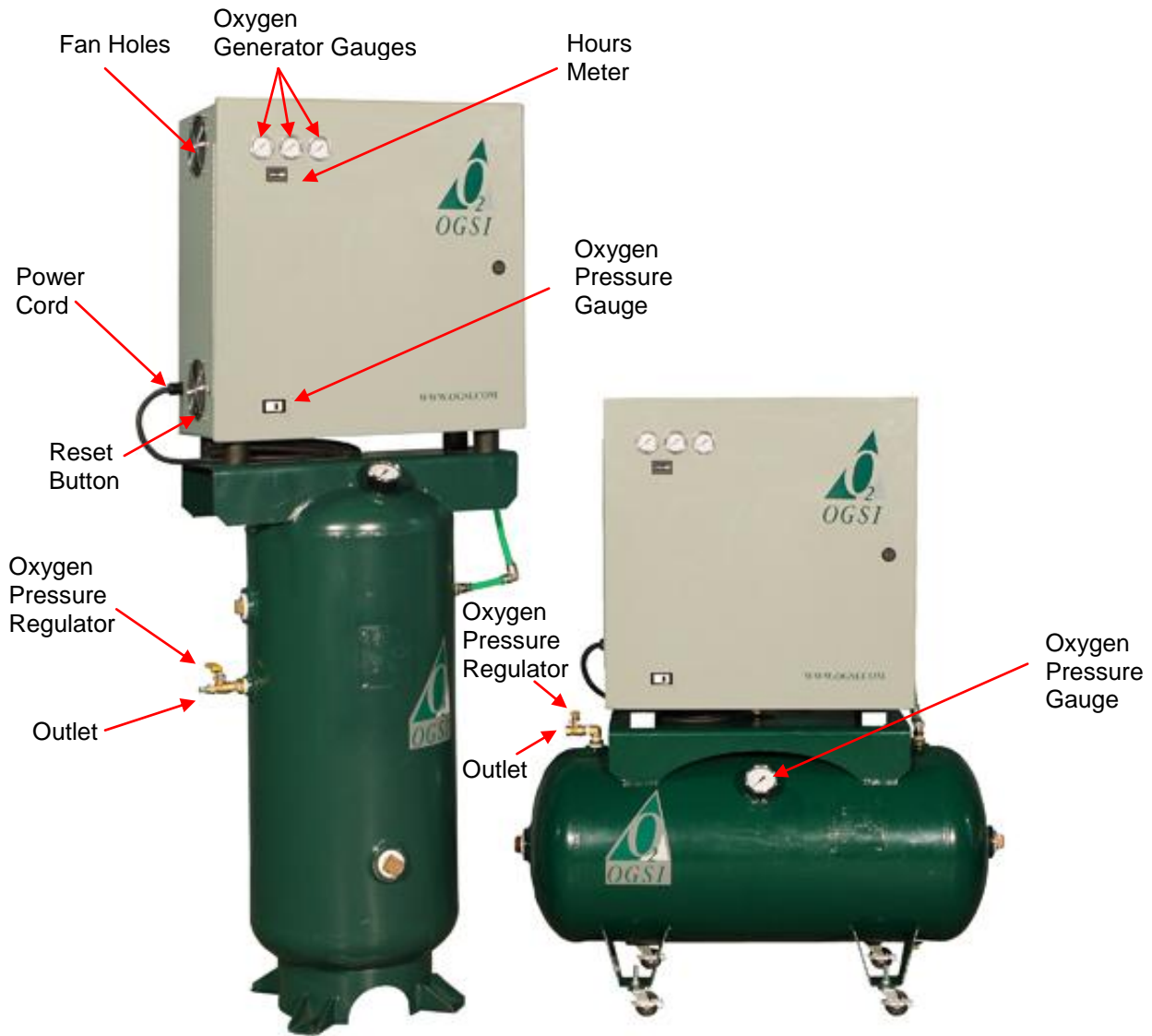
Process Flow Description

The normal flow of air through the **OGS-20** is shown on the previous page in the Process Flow Schematic Drawing. As you can see once the incoming air is filtered and compressed in the **OGS-20**, it is directed into one of the two sieve beds. As the air enters the bed, the nitrogen is adsorbed by the sieve and the oxygen passes through as product gas to the mixing tank. Each bed produces Oxygen until the sieve in that bed is saturated with Nitrogen. When that occurs, the feed airflow is directed to the other bed, which continues the production process. While the second bed is producing oxygen the first is venting the nitrogen it adsorbed to the atmosphere through a waste gas muffler.

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External Components

Drawings: OGS-20

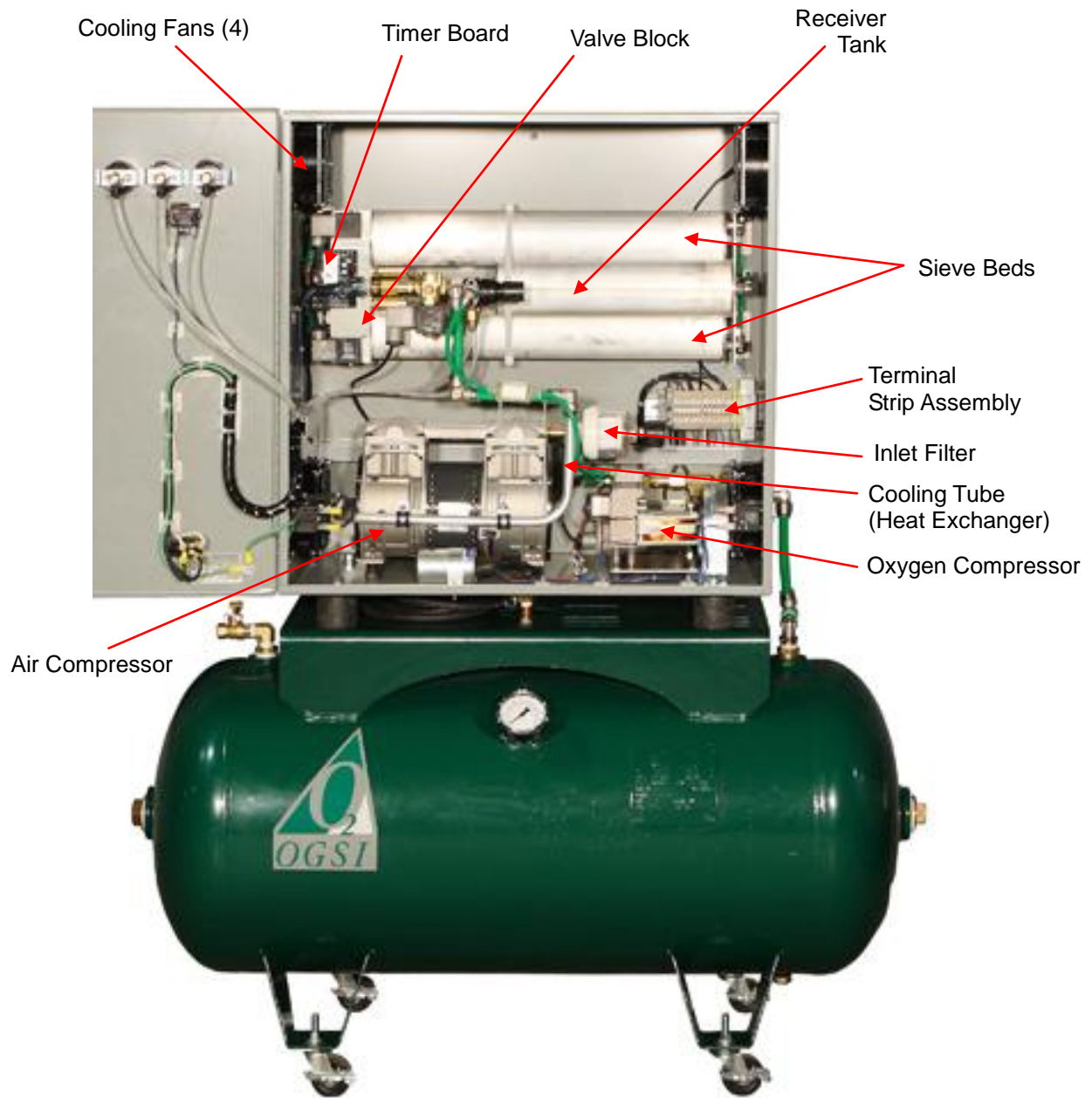


OGS-20

External Components Description

- Fan Holes-** These vent holes allow cooling air to enter the enclosure
- Outlet-** Oxygen (O₂) This fitting is a 'B' size oxygen adapter. It can be removed to expose a 1/4" female NPT pipe fitting
- On/Off Switch-** Controls power to machine. Is lighted while machine is on.
- Oxygen Pressure Gauge-** This gauge indicates the pressure at which the oxygen is being delivered. 13-15 PSIG is the rated delivery pressure for a 20 SCF per hour flow rate. The regulator can adjust the pressure
- Oxygen Pressure Regulator-** The regulator controls the oxygen delivery pressure level. Turning it clockwise increases the delivery pressure while turning it counter-clockwise decreases the delivery pressure. The oxygen pressure gauge will indicate the level set. To lock it into place push down the adjustment knob.
- Hours Meter-** The hours meter increments time while the unit is running. It provides an indication as to when service intervals are due.
- Reset Button-** The reset button is actually a circuit breaker that opens if there is an electrical overload in the system
- Power Cord-** The power cord is designed for use on 110 vac/60 Hz electrical systems and comes with a 3-pronged ground fault protected plug.
- Timer Board-** Operates the valves that direct air through the sieve beds.
- Valve Block-** Controls air from the compressor, sending it through the sieve bed and venting the nitrogen.

OGS-20 Internal Components Photo



OGS-20 Internal Component Description

- Terminal Strip Assembly-*** The terminal strip distributes electrical power as required to the compressor and control components of the machine.
- Sieve Beds-*** These beds contain the molecular sieve that performs the air separation process. They are spring loaded to prevent settling and should not ever need to be opened. If the sieve becomes contaminated the beds can be easily replaced.
- Valve Block-*** The valve block holds the main valves that control the direction of airflow in the machine. These are the feed and waste valves for each bed. They direct “feed” air to each bed during oxygen production and “waste” nitrogen through the muffler to regenerate the sieve. They cycle continuously while the unit is operating.
- Air Filter (Inlet)-*** The air filter keeps dust and dirt from entering the compressor and needs to be changed twice a year in normal environments to maintain the unit’s performance. In especially dirty, oily areas it should be changed more often, four times a year is recommended.
- Heat Exchanger-*** The heat exchanger runs in front of the cooling fan and delivers the feed air from the air compressor to the valve block.
- Cooling Fan-*** The cooling fan is used to draw air into the unit and to remove heat from the compressor. Whenever the unit is running, the fan will be operating.
- Air Compressor-*** The air compressor supplies the feed air to the sieve beds. It is held in place by four bolted rubber feet and can be easily replaced when necessary. It should work as designed for a minimum of 10,000 hours and will last 20,000 hours in many cases.
- Oxygen Booster-*** The oxygen booster increases the low pressure oxygen to the desired storage pressure.

Routine Maintenance Instructions

Filter Element Replacement:

The filter element provided with the OGS-20 must be replaced every six (6) months. The element helps to maintain the quality of the feed air supply and preserve the molecular sieve inside of the oxygen generators. **Failure to replace the filter element on schedule will result in the warranties becoming invalid.**

Cabinet & Power Cord:

The cabinet and power cord should be occasionally washed down with a sponge or clean rag and some soapy water. Avoid the use of ammonia or other strong chemical based cleaning solvents. The intention is to avoid dust and dirt from building up on the machine. Avoid getting water on any electrical components.

Long Term Maintenance

Air Compressor:

The air compressor should last at least two years under normal operating conditions. In many cases it will last five or six years. Eventually, however, it will need to be re-built 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 useful life. Replacement in the field is possible but return of the unit to the factory or an authorized service center is recommended, as by that time a complete maintenance check will be in order.

Valve Replacements:

As with compressor repairs the best practice will be to return the unit to the factory or to an authorized service center for repair.