MOGS – 100

Installation, Operation and Maintenance Manual

Oxygen Generating Systems Intl. (*OGSI*)
814 Wurlitzer Drive, North Tonawanda, New York 14120 USA
Tel: (716) 564-5165 ***Toll Free:*** (800) 414-6474 ***Fax:*** (716) 564-5173
E-mail: ogsimail@ogsi.com
Website: www.ogsi.com

Part # 9000000.004 **US$ 25.00**

Effective 11/2010

Table of Contents

Password to Access Touch Screen

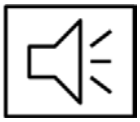
647401

Please take appropriate measures to keep this password secure and prevent unauthorized access.

Using the Manual

This manual is intended as a guide for operators of ***OGSI*** Oxygen Generators and Oxygen Generating Systems. It includes information on our warranty policy, features, functions, applications, proper set-up and installation, operation and maintenance of our products.

The following symbols are used throughout the manual:

	**Information** (Do not use product before reading the manual)		**Electrical Hazard**
	**Sound**		**Fire Hazard**
	**No Smoking**		**Warning**
	**No Open Flames**		**Power ON/OFF**
	**Flow Meter**		**Timer**
	**No Oil**		**Not Connected to Outlet**

Initial Inspection

The crate should be opened and inspected immediately upon delivery. 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.

If for any reason the unit should need to be returned in the future, the original crate is the best way to ship it back to the manufacturer. 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.

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 EXPRESSED 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:

1) ***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. If shipping damage is evident, the original user should contact the shipper immediately. ***OGSI*** will pay for shipping the Products to the original user as well as returning damaged/defective Products to ***OGSI***. Once the Products are repaired, ***OGSI*** will ship the Products back to the original user and cover all costs incurred in shipping.

2) ***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 to the original user as well as returning damaged/defective Products to ***OGSI***. Once the Products are repaired, ***OGSI*** will ship the Products back to the original user and cover all costs incurred in shipping. 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 or replacement of the component parts or equipment that constitute part of the Products.

3) 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: A *Credit Certificate* will be created for all Warranty Exchange transactions. ***OGSI*** will provide the *Credit Certificate* with an invoice at the time of shipment to the original user. The *Credit Certificate* must be included in the package to ***OGSI*** with the returned products within 30 days of the date of the invoice. Failure to return Warranty Exchange Products to ***OGSI*** within 30 days will make the Warranty Exchange process void and payment for Products will be billed and due on receipt.

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 Page 25)*

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 is 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, malfunction of ***OGSI*** products, 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 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 American, Canadian or ISO norms for hospital oxygen systems.

Safety Guidelines

Handling of Compressed Gas Cylinders

Many of the following procedures for the handling, storage, and utilization of compressed gas in cylinders are taken from material furnished 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.

Do not place cylinders in a position where they might become part of an electric circuit. When electric welding is taking place, precautions should be taken to prevent accidental grounding of cylinders, permitting them to be burned by electric welding arc.

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

If cylinder leaks, other than normal venting, and the leak cannot be corrected by tightening a valve gland or packing nut, the valve should be closed and a tag attached stating that the cylinder is not serviceable. Remove the cylinder outdoors to a well-ventilated or open area, notify the supplier, and follow the supplier's instructions for the return of the cylinder.

Keep the cylinder valve closed at all times except when in active use. When removable caps are provided for valve protection, they should not be removed except for active use. Remember to replace removable caps when not in use.

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 ft** apart; preferably separated by a fire resistant partition.

For additional information refer to the CGA publications that can be found at ***http://www.cganet.com***

See also ISO publication 10083 that can be found online at ***http://www. iso.org***

Operating

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.

Do not attempt to modify or enhance the performance of an oxygen generator in any way.

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.

Product Information

Features and Applications

The ***OGSI*** model **MOGS-100** is a self-contained oxygen generating system that uses Pressure Swing Adsorption (PSA) technology. It allows users to generate medical-grade oxygen (conforming to United States Pharmacopeia (USP) XXII oxygen 93% Monograph) to be used on-site. It concentrates oxygen up to **93% (± 3 %)** purity.

Features

Durable

- **MOGS-100** unit has a PLC controller with a UL® listed electrical panel. It has a sound attenuating enclosure with slam-action latches and lift-off hinges.

Economical

- The **MOGS-100** unit reduces oxygen supply costs by **80%** or more in most cases. It consumes less than **1 kWh** of energy to fill one „M' size oxygen cylinder. It eliminates all delivery and handling charges from oxygen suppliers.

Dependable

- Having a **MOGS-100** unit assures care providers that their oxygen supply chain will not be disrupted in the event of a disaster. The system itself can be transported for use at a disaster site. It can be moved by truck and fits easily through a standard 36" wide doorway.

Applications

The **MOGS-100** can be used in various applications. A few examples are given below.

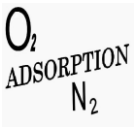
EMS (Emergency Medical Services)

Fire Departments

Hospitals and Clinics

Veterinary Centers

Nursing Homes

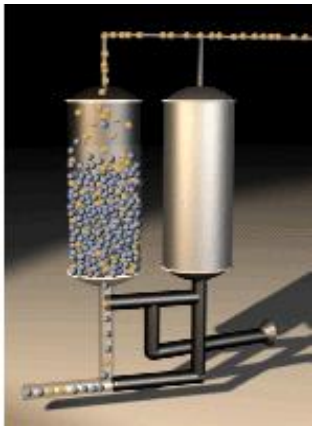


Pressure Swing Adsorption(PSA) Technology

An ***OGSI*** Oxygen Generator is an on-site oxygen generating machine capable of producing oxygen on demand in accordance with your requirements. In effect, it separates the oxygen (21%) from the air it is provided and returns the nitrogen (78%) 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 (Zeolite). This sieve is an inert, 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. The process is described below.

Stage 1

Compressed air is fed into the first molecular sieve bed. Nitrogen is trapped, while oxygen is allowed to flow through.

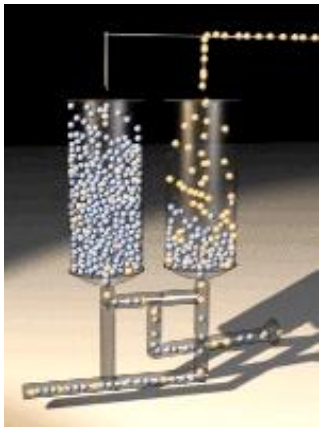


Stage 2

When the sieve in the first bed becomes full of nitrogen, the airflow is then directed into the second bed.

Stage 3

As the second bed separates the oxygen from the nitrogen, the first bed vents its nitrogen into the atmosphere.



Stage 4

Compressed air is once again fed into the first bed and the process is repeated continuously. A constant flow of oxygen is produced.

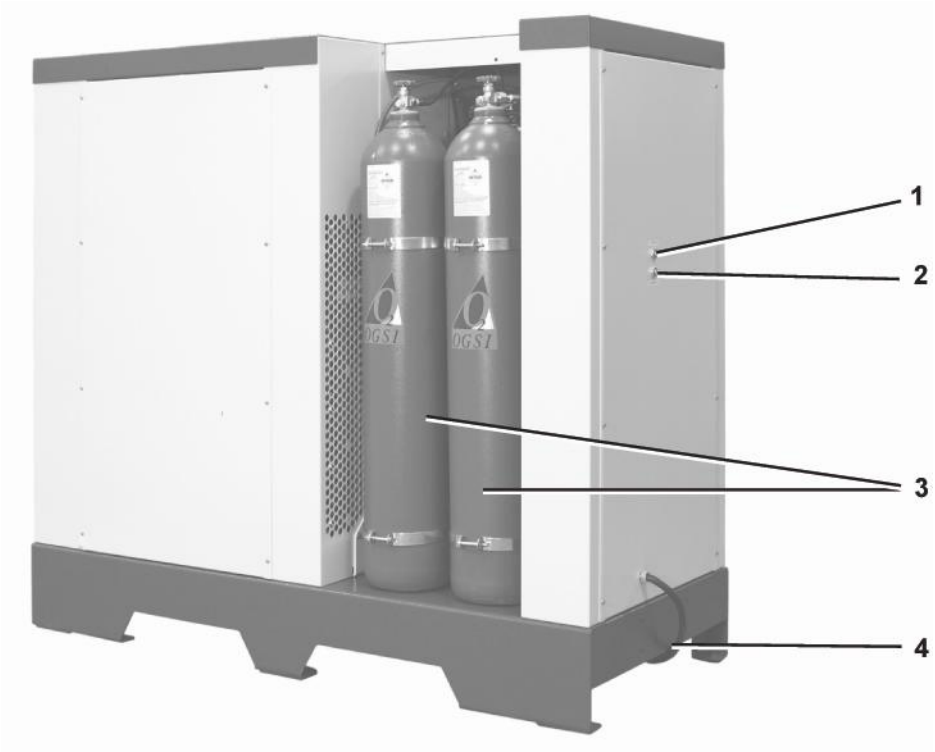
This air separation process is reliable and virtually maintenance-free. The molecular sieve will last indefinitely, as long as it does not become contaminated with water and oil vapors. This is why regular filter element replacement is crucial to trouble-free operation. The filter elements are inexpensive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

External Components

Front View

1. **Control Panel**
2. **Fill/Blast Containment Chamber**
3. **Side Access Door**
4. **Front Access Door**
5. **Frame Inlet Air Filter (Underside)**

Rear View

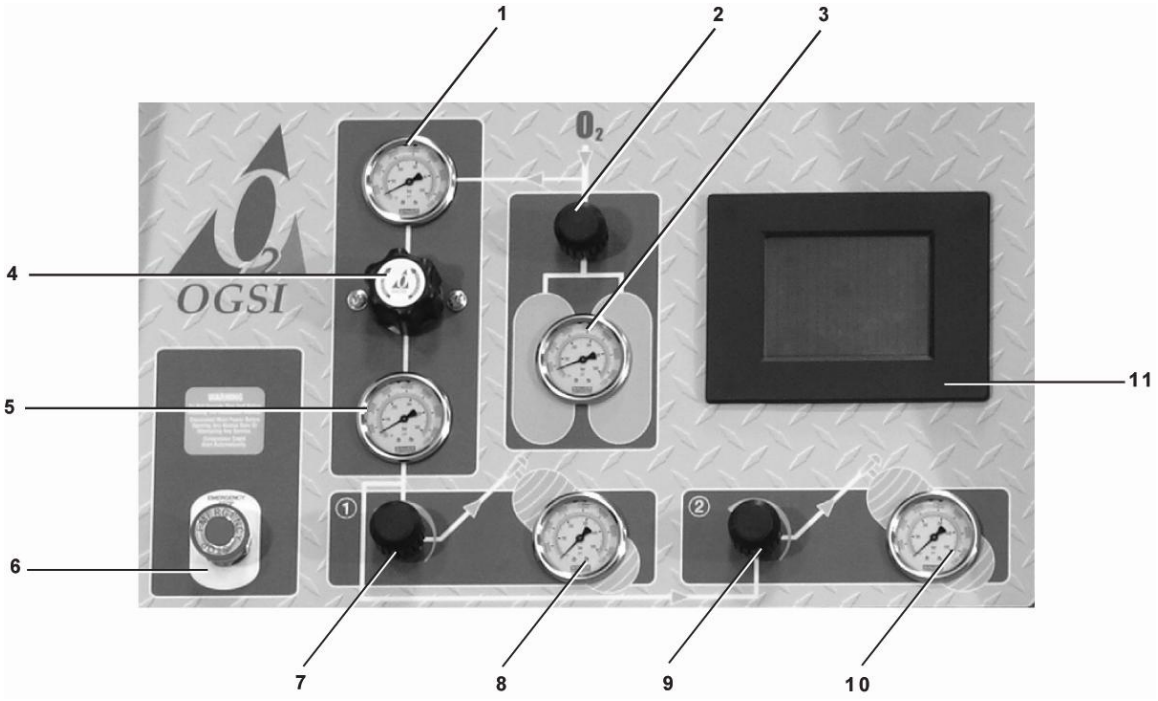


1. **Upper Auxiliary Oxygen Port (70/90 psi)**
2. **Lower Auxiliary Oxygen Port (1900/2200 psi)**
3. **Reserve Oxygen Cylinder Bank**
4. **Power Cord**

MOGS-100 with Auxiliary Manifold and Cylinders

1. **Auxiliary Cylinder Filling Manifold Shown with Copper Pigtails (Optional)**
2. **Extra Reserve Cylinders (Optional)**

Control Panel



1. **Oxygen Compressor Outlet Pressure Gauge**
2. **Reserve Bank Valve**
3. **Reserve Bank Pressure Gauge**
4. **Fill Chamber Pressure Regulator**
5. **Regulated Pressure to Containment Chamber**
6. **Emergency Stop Button**
7. **Valve – Fill Chamber # 1**
8. **Gauge – Fill Chamber # 1**
9. **Valve – Fill Chamber # 2**
10. **Gauge – Fill Chamber # 2**
11. **Touch Screen Pad**

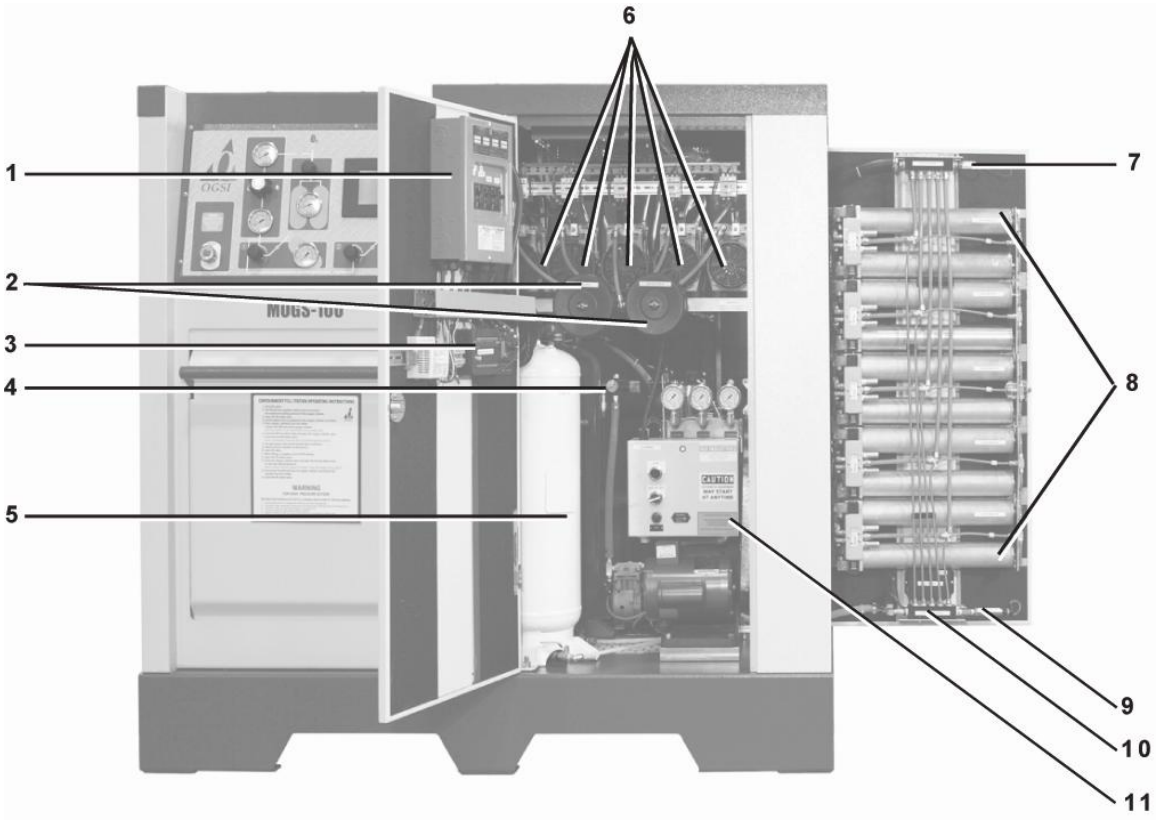
External Components Description

Control Panel	This feature is the operator interface area for normal control of the machine. Each of the components of the control panel and its operation will be described in more detail below.
Fill/Blast Containment Chamber	The cylinders are loaded and connected for refill at this chamber. The purpose of this chamber is to protect the operator in the unlikely event of a cylinder explosion.
Side Access Door	The side door provides access to the oxygen generator bank and many of the other components of the system.
Front Access Door	The front door provides access to many of the system components.
Frame Inlet Air Filter	Maintains the air flow through the enclosure and only allows air to pass through the bottom of the machine. This filter can be accessed by reaching under the machine from the front and pulling it forward.
Upper Auxiliary Oxygen Port (70 psi)	The upper port allows for bypassing the high pressure oxygen compressor inside the **MOGS** and delivering oxygen at **70 psi (4.8 bar)** directly to a clinic, hospital or other application. In order to do this, the oxygen compressor inside the machine must be switched **OFF**. If this capability is used, ***OGSI*** recommends that an additional oxygen storage tank be installed and located next to the left side of the cabinet.
Lower Auxiliary Oxygen Port (2200 psi)	The lower port allows for the expansion of the reserve cylinder bank beyond the two (2) cylinders that are included in the frame of the machine. From this port an auxiliary high pressure manifold can be connected, increasing the size of the reserve bank by 3, 4, etc. additional cylinders. These additional high pressure reserve manifolds along with extra cylinders are available from ***OGSI.***
Reserve Cylinder Bank	The system is shipped with a reserve bank of two (2) H /K size (244 ft^3 capacity) steel cylinders, rated at **2200 psi**. These are located on the back side of the machine and used to trans-fill smaller D, E or M size cylinders in the blast containment chamber. These cylinders come fully connected and leak checked and should not have to be removed or serviced until they need to be re-certified.

Power Cord	The power cord is designed for use at **230 VAC** (single phase). An electrician will need to wire this into a dedicated circuit with a disconnect/lockout.
Reserve Cylinder Valve	This valve allows the reserve bank to be isolated from the system for the purpose of trans-filling smaller cylinders in the containment chamber directly.
Reserve Cylinder Gauge	The system is shipped with reserve bank of two (2) H /K size (244 ft^3 capacity) steel cylinders. This gauge shows the pressure in the reserve bank.
Fill Chamber Pressure Regulator	This regulates the outlet pressure used for trans-filling smaller cylinders loaded in the fill/blast containment chamber.
Emergency Stop Button	This button allows the oxygen generator power to be instantly shut off in the event of an emergency. This button should not be used to turn off the equipment under normal conditions.
Valve – Fill Chamber # 1	This valve controls oxygen flow to the small cylinder being filled in Chamber # 1 when open.
Valve – Fill Chamber # 2	This valve allows oxygen to flow to the small cylinder being filled in Chamber # 2 when open.
Gauge – Fill Chamber # 1	This gauge displays the oxygen pressure in the small cylinder being filled in Chamber # 1.
Gauge – Fill Chamber # 2	This gauge displays the oxygen pressure in the small cylinder being filled in Chamber # 2.
Touch Screen	The touch screen is the main user interface for the machine. All controls are programmed within the touch screen.

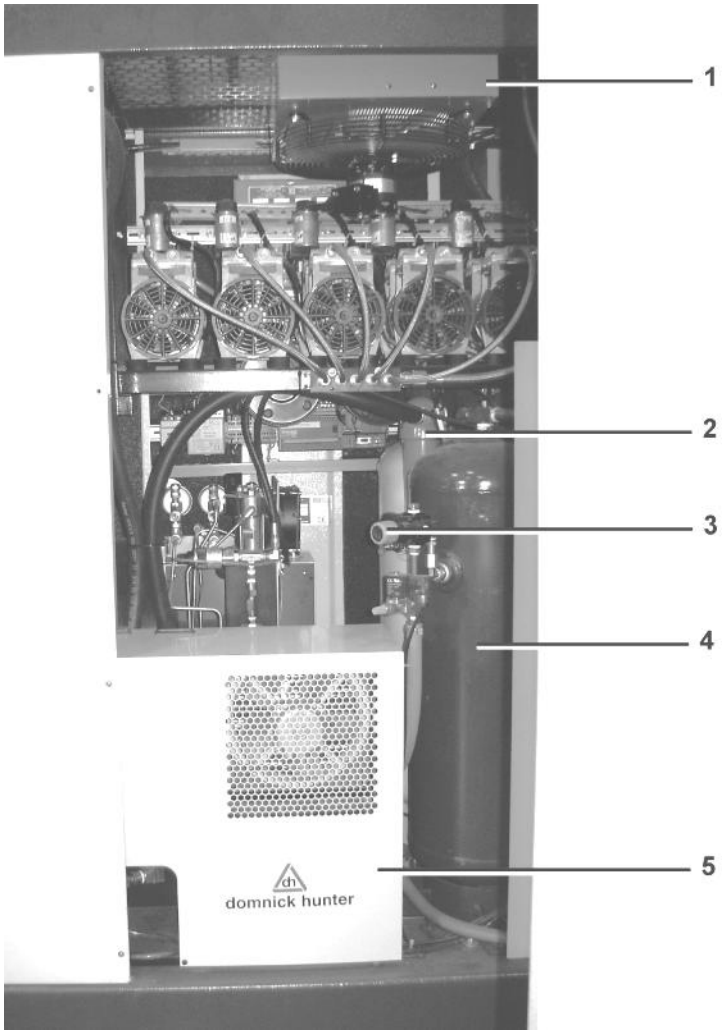
Internal Components

Front View



1. **Power Distribution Panel**
2. **Inlet Air Filters**
3. **Programmable Logic Controller (PLC)**
4. **Back Pressure Regulator Gauge**
5. **Air Storage Tank**
6. **Air Compressors Bank (5)**
7. **Air Pressure Transducer**
8. **Oxygen Generator Bank (5)**
9. **Low Oxygen Pressure Transducer**
10. **Oxygen Purity Sensor**
11. **Oxygen Compressor**

Rear View



1. **Heat Exchanger**
2. **Compressed Air Filter**
3. **Back Pressure Regulator**
4. **Oxygen Storage Tank**
5. **Refrigerant Dryer**

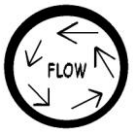
Fill/Blast Containment Chamber

1. **Fill Whip # 1**
2. **Fill Chamber # 1**
3. **Fill Whip # 2**
4. **Fill Chamber # 2**

Internal Components Description

Power Distribution Panel	The terminal board distributes electrical power to the different components of the system.
Inlet Air Filter	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. It should be changed more often in dirty, oily areas. Four (4) times a year is recommended.
PLC	The PLC (Programmable Logic Controller) processes inputs and outputs to and from system components, and communicates with the touch screen. This is the brain of the machine.
Back Pressure Regulator Gauge	This gauge controls the balance between oxygen flow and oxygen purity. Initial setting is between **45 psi (3.1 bar)** and **50 psi (3.4 bar)**. A higher back pressure will increase purity but decrease storage tank pressure. A lower back pressure will increase storage tank pressure but decrease purity. This regulator will adjust the storage pressure and oxygen purity.
Air Storage Tank	Air from the air compressors is stored in this tank before going through the sieve bed sets on the side of the machine. Normally this tank pressure holds between **23 psi (1.6 bar)** and **26 psi (1.8 bar)**.
Air Compressor	The air compressors supply the feed air for the sieve beds. They are held in place by four bolted rubber mounts and can be easily replaced when necessary. They should work as designed for a minimum of 10,000 hours and will last 20,000 hours in many cases.
Air Pressure Transducer	The transducer gives a variable output current to the PLC at different pressures. The PLC then communicates this signal to a virtual gauge in the touch screen.
Oxygen Generators	These generators contain the molecular sieve that performs the air separation process. Exposing the internal sieve material to the atmosphere will cause contamination. However, if the sieve becomes contaminated the beds can be easily replaced.
Low Oxygen Pressure Transducer	The transducer gives a variable output current to the PLC at different pressures. The PLC then communicates this signal to a virtual gauge in the touch screen.
Oxygen Purity Sensor	The oxygen sensor gives a variable output current to the PLC at different levels of oxygen purity. The PLC then communicates this signal to a virtual gauge in the touch screen. See *Appendix Page IV* for details on how to make an adjustment to this sensor.

Oxygen Compressor	The (RIX) oxygen compressor boosts the oxygen pressure from the oxygen storage tank to **2200 psi (152 bar)**. It is a two-stage compressor with a self-contained motor, starting capacitor, pressure switch, pressure relief valve, and check valve. This is a complex machine and comes with its own ***Service Manual***. In **AUTO** mode, it will turn on at about **1900 psi (131 bar)** and turn off at **2200 psi (152 bar)**.
Heat Exchanger	The heat exchanger/cooling fan is used to draw air into the unit and to remove heat from inside the enclosure. It also cools the compressed air before it is delivered to the air storage tank. The fan operates while the unit runs.
Oxygen Storage Tank	The storage tank serves as a reservoir for the oxygen, prior to entering the oxygen compressor. The tank is painted green to represent oxygen as opposed to the grey color of the air tank. The generator will run according to the pressure in this tank – **ON** at **70 psi (4.8 bar)**, **OFF** at **90 psi (6.2 bar)**. With the oxygen at this pressure it can be delivered to the high pressure oxygen compressor or be sent directly out of the machine through the lower auxiliary oxygen port. Pressure will usually drop to about 30 psi when the oxygen compressor is running.
Oxygen Booster	The oxygen booster increases the oxygen pressure prior to it being delivered to the oxygen storage tank.
Fill Whip Chamber #1	This whip allows oxygen to flow to the small cylinder being filled in Chamber # 1. It has a *CGA 870* Valve at the end of it.
Fill Whip Chamber #2	This whip allows oxygen to flow to the small cylinder being filled in Chamber # 2. It has a *CGA 870* Valve on the end of it.
Fill Chamber #1	This is the left side blast chamber that the small cylinders can be filled in.
Fill Chamber #2	This is the right side blast chamber that the small cylinders can be filled in.



Process Flow Description

The incoming air enters the machine through a filtered opening in the floor of the machine frame. This opening is protected by a furnace filter type element, which is 12″ x 16″ x 1″. The air is drawn into the air compressor bank after being filtered through one of two additional inlet air filters on the feed air manifold. The air is compressed in the compressor bank and is directed through an air to air heat exchanger and into the grey storage tank. The fan that is used in the air to air heat exchanger also serves the purpose of drawing fresh air into the machine through the floor of the frame and removing the air that is heated by the operation of the components inside the machine. The resulting hot air is released through the top of the machine and can be ducted outside in hot environments or used as a supplemental heat source in cold environments.

The clean compressed air is then sent into one of the five sieve bed sets. These are the oxygen generators. Each bed produces oxygen until the sieve in that bed is saturated with nitrogen. When this occurs, the feed air flow is directed to the other bed which continues the production process. While the second bed is producing oxygen, the first bed is releasing into the atmosphere the nitrogen it adsorbed, under very low pressure through a waste gas muffler. As the air enters the bed, the nitrogen is adsorbed by the sieve and the oxygen passes through as product gas.

The oxygen is then drawn through an oxygen booster which pressurizes the product oxygen to a pressure of **70-90 psi (4.8-6.2 bar)** and sends it to the green oxygen storage tank. This oxygen storage tank serves as a reservoir for the oxygen prior to entering the high pressure oxygen compressor. The oxygen product gas is then delivered to the high pressure oxygen compressor where it is compressed up to **2200 psi (152 bar).** Oxygen is then delivered through a high pressure line either to the reserve cylinder bank for trans-filling to smaller cylinders at a later time or sent directly to a small cylinder that is filled inside the blast containment chamber. Once the system senses that the cylinders are full it will automatically stop until new cylinders are connected for refilling.

Unit Specifications

Performance

Oxygen Volume	0 – 100 SCFH (3 Nm^3/h) 0 – 47 LPM
Oxygen Pressure	High Pressure: Up to 2200 psi (152 bar) Low Pressure: Up to 70 psi (4.8 bar)
Oxygen Purity ▪ *Oxygen Concentration* ▪ *CO_2 Output* ▪ *CO Output*	United States Pharmacopeia (USP) XXII oxygen 93% Monograph 93% (± 3%) ≤ 300 ppm ≤ 10 ppm
Oxygen Dew Point	- 100° F (-73°C)
Response Time	Approximately **5** minutes to attain maximum purity after initial start-up or extended shut-down

Physical:

Air Inlet Filtration Level	0.3 μm
Oxygen Outlet Fitting	¼" FNPT Bulkhead
Sound Levels ▪ Door Closed	 65 dBA @ 1 m
Dimensions	34 x 70 x 72 in (W x D x H) 86 x 178 x 183 cm (W x D x H)
Weight	2550 lb (1157 kg)
Power Requirement	230 VAC, 50/60 Hz, Single Phase, 30 A (*Do **NOT** run at 208 VAC*)
Operating Temperature Range	40°F to 100°F (5°C to 38°C)

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 **MOGS-100** unit. **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 **MOGS-100** unit within your facility**.**

In critical applications, it is important to have a backup supply of oxygen since the generator 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 generator. 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 violently ignite the clothing.

Pre-Installation

Before installing the ***OGSI*** **MOGS-100** unit, it is necessary to consider the location, space available and power supply for the generator.

1) Locating the **MOGS-100:**

- The oxygen generator should be located in an area that is indoors and remains between **40°F** (**5°C**) and **100°F** (**38°C**). **Setting up the machine outdoors or in an area that is not normally within this temperature range will void the *OGSI* Warranty.**
- There should also be a distance of at least **8"** (**20 cm**) between the unit and any side wall in the room that it will be located in. This is to ensure that airflow into the machine through the cooling fans is not restricted.

2) Space Available for the **MOGS-100:**

- If the **MOGS-100** unit is going to be set up in a room that is small, (less than **1000 ft^3** or **28.3 m^3**), that room should be well ventilated (at least **5** air changes in the room per hour). The oxygen generator 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 generator is placed in a small closet, the air in that closet will become enriched with nitrogen. As the oxygen generator continues to operate, 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 oxygen generator.

3) Power Supply for the **MOGS-100:**

- The oxygen generator should be positioned within **8 ft** (**2.2 m**) of the electrical outlet that will power it. The **MOGS-100** is a stationary unit and should not be powered by extension cords exposed to wear. The electrical outlet system to which the ***OGSI*** oxygen generator is connected should be used exclusively for that purpose and no other electrical appliances should be connected to it. It is recommended that you use a disconnect/lockout panel on the **MOGS-100** inlet power source to make it easier to service the machine. The **MOGS-100** unit will run on **230 VAC** single phase power 50/60 Hz. ***Do NOT run at 208 VAC, this will damage components in the machine and void your warranty.***

Required Operating Conditions

Location of Machine:

The **MOGS-100** unit 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 life of any PSA **MOGS-100** unit 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 generator, 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 **100°F** (**5°C** to **38°C**). Since hot air has the ability to hold 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 **MOGS-100** unit is a single-phase electrical supply of **230 VAC** and about **20 A** at a frequency of **60 Hz**. This equates to approximately **4.6 kW** of power. It is required that a **30 A** circuit be dedicated to each **MOGS-100** unit. Additionally, the unit must be plugged into this circuit using only the supplied power cord, and without additional extension cords. ***Do NOT run at 208 VAC.***

Positioning:

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

Set-up & Installation

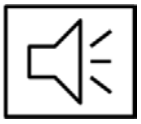
Although every **MOGS-100** unit is thoroughly tested and checked before it is shipped from our facility, the following checks are necessary to ensure that none of the internal components have been damaged in shipment. This check should take less than five minutes to perform. *(Refer to '**Initial Inspection**' on Page 2 before reading the instructions below)*

Make a visual inspection of the interior and exterior of the machine. Ensure that all parts are properly attached and that there is no obvious damage including external manifold (if applicable).

Connect the unit to an electrical panel of **230 VAC** with a **30 A** circuit breaker.

Ensure that the touch screen is powered and a display is visible. Consult the troubleshooting guide in this manual (*See Page 28*) for any problems encountered.

After entering a password and selecting a language, start the machine by pressing both the *Operating Mode* **(AUTOMATIC)**, and then the **ON/OFF** buttons.



Listen for the sound of the compressors and cooling fan to start running, if you do not hear them within a few seconds, shut the machine down immediately by pressing the **ON/OFF** button and call ***OGSI*** for assistance.

Once the machine is running, press the **MAIN MENU** button then press **GAUGES** to view the **GAUGE** screen. Both the regulated air and low oxygen pressure gauge needle indicators should be operating within the highlighted green area. The Oxygen Purity Gauge should steadily increase to above **90%**.

The oxygen storage tank pressure gauge should indicate a pressure increase after approximately **15** minutes. If this does not occur, check to make sure that none of the hose connections have come loose. Call ***OGSI Technical Service Department*** at ***(800) 414-6474*** (toll free number in USA and Canada) or ***(716) 564-5165*** if no loose connections are found and trouble persists.

Operating Instructions

Start-up

Once the system has been installed in accordance with the set-up and installation instructions, it may be energized and cylinder filling may begin. It is highly recommended that the user read the „**Touch Screen Overview**' section (*Pages 30-43*) prior to operating the system.

On the **MAIN MENU** screen, press the **CONTROL** button.

Choose between **AUTOMATIC** and **MANUAL** modes of operation. For a detailed explanation of modes and all other touch screen functions, see the „**Touch Screen Overview**' section (*Pages 30-43*). If selected, the **AUTOMATIC** mode will initialize the system when pre-programmed conditions are satisfied and the **ON/OFF** button is in the **ON** position. The **MANUAL** mode requires the user to press an additional **START** button to initialize the system. This is intended to prevent an inadvertent system initialization. With the system running, ensure that the air compressor indicator toggles from red to green. The oxygen booster compressor should toggle from red to green after the oxygen compressor is activated and that will occur when the system has produced oxygen of **90%** purity or greater for **4** minutes. The system should continue to operate until the desired pressure is reached, a fault is encountered or it is de-energized by the user.

Shut-down

The **MOGS-100** unit has been programmed to automatically de-energize when cylinder pressure reaches the set point (normally **2200 psi** i.e. **152 bar**), indicating that cylinder filling is complete.

The machine may be manually de-energized by pressing the **Power** button on the **CONTROL** screen to **OFF** at any time.

The machine can also be de-energized at any time by pressing the red **Emergency-Stop** button on the front of the control panel. Pressing this button only breaks the electrical power to the machine. There may still be oxygen stored at high pressure inside the system which could represent a hazard in an emergency situation.

Troubleshooting Guide

Problem	Sign	Cause	Solution
No power	Blank touch screen display	• Circuit breaker has tripped • Loose wires	• Ensure that power is available from **230 VAC** supply. • Check the **Emergency-Stop** button. If this button is pushed in, it secures all power to the system. • Visually inspect the electrical wiring. Reconnect any loose wires to the labeled location.
System failure	No sound	• System is in **MANUAL** mode • Low pressure	• Press the additional **START** button if system is in manual mode. • Check the **GAUGE s**creen and ensure that the current High Oxygen Pressure is not greater than the set **Low-point**. • Check the **ALARM** screen for any faults. A „**WARNING ACTIVE**' sign will appear at the bottom of each screen if a fault has occurred.
System shuts down inadvertently	„**WARNING ACTIVE**' indication	Extreme change in oxygen pressure	• Check the **ALARM** screen. If a warning is active, follow the instructions. • Check the high oxygen pressure gauge. If the reading is equal to the set point, the machine has been programmed to shut down.
Valves Sticking	Pressure levels too high	Dusting of sieve or machine filled with dirt and dust due to filters not being replaced	Remove valve block from machine and clean valves and spools completely.
Pressure Transducer not Working	Machine not shutting **ON/OFF** at target pressures	Faulty transducer	Remove transducer and return for replacement.

Warning Signs

Thermal Switch Warning	The appropriate thermal overload switch must be reset (by pressing it) and the „**CLEAR WARNING**' button must be pressed. Normal operation can then be resumed.
Low Oxygen Pressure	This may be a result of a leak in the system. Use a leak testing solution to locate and repair any leaks.
The machine has run for 30 minutes and purity has not yet been reached	This may be a result of a leak in the system. Use a leak testing solution to locate and repair any leaks.
Oxygen purity has fallen below acceptable limits	This may be an indication of a leak within the system. Use a leak testing solution to locate and repair any leaks.
No power screen	Touch screen has lost its program.
PLC Communication timeout	PLC has lost its program. The cable has come loose. The system is not running in the appropriate mode.

Touch Screen Overview

The touch screen is the main interface between the operator and machine, and incorporates all controlling mechanisms within its display.

Listed below are the Main Operator Features incorporated within the touch screen:

- Language selection
- Password protection
- Energize/de-energize the machine
- Monitor the operating condition of valves and compressors
- Monitor all system pressures and oxygen purity
- Hours meter and real time clock to monitor service intervals
- Line graphs meter readings showing performance (for up to the previous 24 hours)
- Self-diagnostic alarm panel

The following pages give a detailed description of the 8 individual screens:

Language Screen

The language screen enables the user to choose the language – English, French or Spanish. After choosing a language, select **MAIN MENU**.

Password Screen

This screen prompts the user to enter the password supplied by the manufacturer.

- Select **PASSWORD AREA**
- Enter the password using the numeric keypad displayed on the screen.
- Select **ENTER**

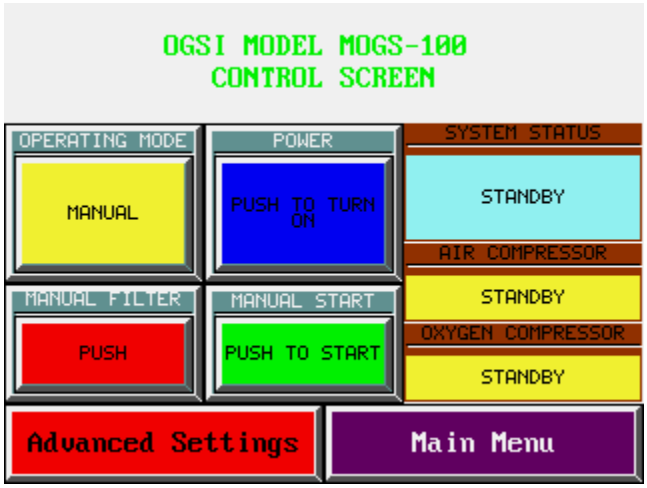
The password will be verified and the screen will change to the **CONTROL** screen when the password is accepted.

Main Menu Screen

This screen allows the user to navigate through the program from screen to screen and it will get you where you need to go inside the program.

(**Note**: A notification will appear at the top of the screen only if the machine has the timer set and is turned **ON**.)

Control Screen



The **CONTROL** screen is used to operate the machine. The mode of operation – **AUTOMATIC** or **MANUAL** is selected here and the system status can also be viewed here.

- **Power**

  In **AUTOMATIC** mode, the machine will start running when the button is in the **ON** position. In **MANUAL** mode, this button must be in the **ON** position and also requires the additional **START** button to be pressed. When pressed again, this button will stop the machine regardless of the mode of operation.

- **Operating Mode**

  This feature allows the selection of either **MANUAL** or **AUTOMATIC** modes. The **AUTOMATIC** mode will initiate machine operation when the **ON/OFF** button is in the **ON** position and all other conditions are satisfied. The **MANUAL** mode requires an additional **START** button to be pressed and is intended to prevent inadvertent machine operation.

- **Manual Start**

  This feature is used in conjunction with the **MANUAL** mode of operation, and must be pressed each time the system is started.

- **System Status**

  This feature monitors the current status of the system. It will display **STANDBY** when the system is deactivated and **CYCLING** when the system is activated.

- **Air Compressor**

  This feature monitors the operational condition of the air compressors. When the air compressors are de-energized, it will display **STANDBY** and will toggle to **RUNNING** when they are energized.

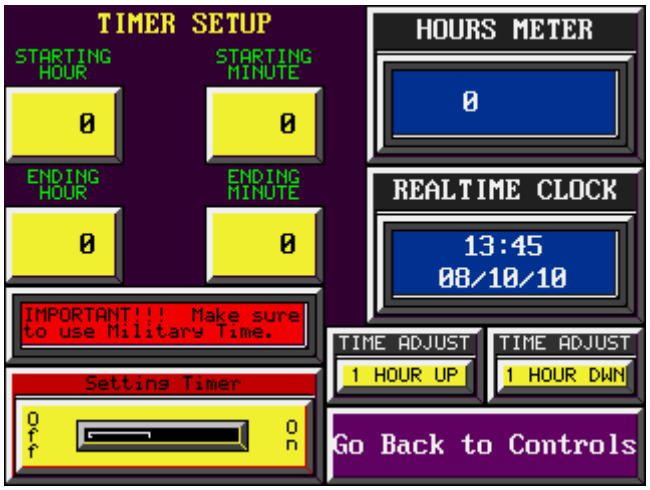
- **Oxygen Compressor**

  This feature monitors the operational condition of the oxygen booster compressor. When the oxygen compressor is de-energized, the feature will display **STANDBY** and will toggle to **RUNNING** when it is energized.

- **Advanced Settings**

  This feature allows the user to modify timer and clock settings. It also allows you to check the number of hours that the machine has been operating.

Advanced Settings Screen



- **Timer Setup**

  If there are particular hours of the day you want the machine to run, you can enter the hour and minutes (military time) you want into the starting and ending time inputs.

- **Setting Timer**

  This button activates the timer. When the „**SETTING TIMER**' feature is in use, the machine will run only during those times entered in the „**TIMER SETUP**' above.

- **Hours Meter**

  This meter displays the accumulated operating time of the system. This meter will increment only while the system status is **CYCLING**, and will reset to zero (0) after 10,000 hours. Most maintenance will be related to the number of run time hours the machine has accumulated on it.

- **Real-time Clock**

  The hours may be updated to synchronize with the current time zone by pressing the appropriate button below the display. Each button is password protected.

- **Timer Adjust**

  These two buttons will either increase or decrease the **Realtime Clock** by one hour.

Gauge Screen

The **GAUGE** screen displays the instantaneous reading of the four primary variables during system operation. These are described below:

- **Oxygen Purity**

  This feature displays the percentage of oxygen present which is typically about **93% (±3%)**.
  The system will shut down automatically if low oxygen purity (less than **90%**) is produced for more than a short period of time and an alarm will be activated.

- **Bed Output Pressure**

  This feature displays the oxygen pressure after entering the oxygen generator sieve beds, typically in a range of **4-10 psi (0.3 - 0.7 bar)**.

- **Air Tank Pressure**

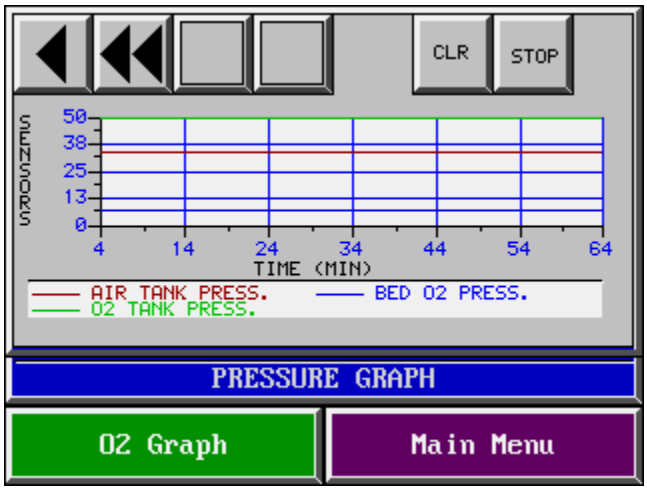
  This feature displays the pressure associated with the air storage pressure tank, typically between **24-26 psi (1.7 – 1.9 bar)**.

- **Oxygen Tank Pressure**

  This feature displays the oxygen pressure existing in the oxygen storage pressure tank (entering the oxygen compressor), typically **0-90 psi (0-6.2 bar)**.

Note that if the oxygen tank is full (has **70-90 psi i.e. 4.8-6.2 bar**), the machine will not run to produce oxygen. Once the pressure falls below **70 psi (4.8 bar)** the system can be started manually or will turn on automatically, depending on the mode of operation it is in.

Graph Screen



This screen shows the graph based on the readings on the **GAUGE** screen. **60** minutes are displayed at a time and 24 hours are stored in memory. If power to the machine is lost (**Emergency-Stop** button is pushed in, machine is unplugged, etc.), the chart memory will be lost. The **GRAPH** screen shows the history of what has been displayed on the **GAUGE** screen for up to the previous 24 hour period. Note that the machine only has a 24 hour memory when it is **ON** so after 24 hours it will start deleting or writing over previous history. In addition, these readings are stored in dynamic memory, so if the machine is de-energized, these readings will be lost. The readings that are recorded are for: Oxygen Purity, Bed Oxygen Pressure, Air Tank Pressure and Oxygen Tank Pressure. This information can be stored indefinitely when downloaded to computer with an optional touch screen SD card.

Alarm Screen

This feature displays warnings when any of the following faults occur:

- Oxygen pressure has fallen below acceptable limits (This fault does not de-energize the machine)
- Oxygen purity has fallen below acceptable limits
- Air compressor thermal switch has tripped
- Oxygen compressor thermal switch has tripped
- Air compressor has been running one hour, and the purity has not yet reached an acceptable level

Instructions will be displayed on the screen to clear any warnings. For certain alarms, the machine will not operate until the „**CLEAR WARNING**' button has been pressed.

The **ALARM** screen displays warnings when any of the following faults occur:

- **<u>30 Minute Warning</u>**

  Air compressors have been running 30 minutes, and the purity has not yet reached an acceptable level. This could occur for a number of reasons. A leak in the machine is chief among them. If this occurs the **TROUBLESHOOTING** screen (*See Page 42*) can be used to test each of the five oxygen generators individually to find the source of the problem.

- **<u>Low Bed Pressure</u>**

  This may be a result of a leak in the system. Use a leak testing solution to locate and repair any air leaks. If this occurs the **WARNING-TROUBLESHOOTING** Screen (*See Page 42*) can be used to test each of the five oxygen generators individually to find the source of the problem. It could also result from a problem with one or more of the air compressors. Check to see that they are all running.

- **High Air Pressure**

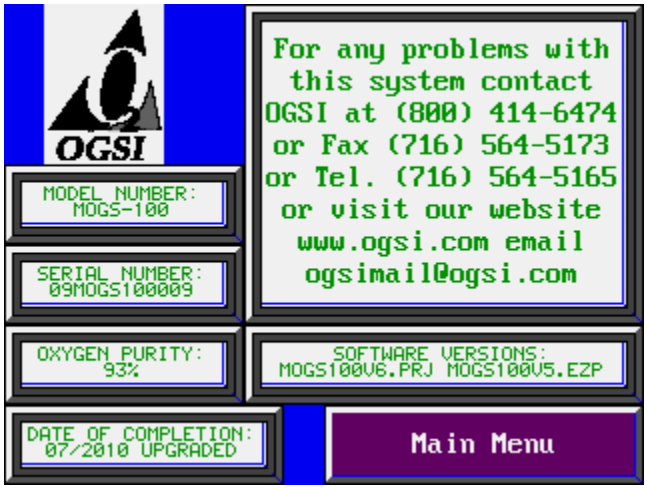
  This warning is usually indicative of a contamination of the molecular sieve inside one or more of the oxygen generators.

  Warning

  *Contact ***OGSI*** if this warning occurs.**

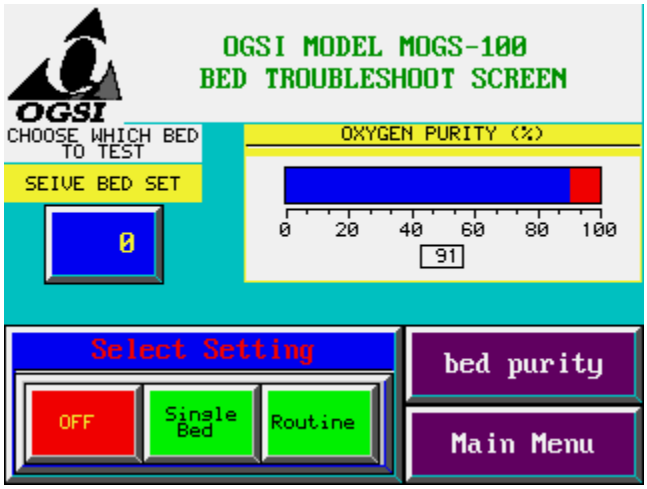
  These warnings must be cleared after following the instructions on the displayed warning indicator. For certain alarms, the machine will not operate until the „**CLEAR WARNING**' button has been pressed.

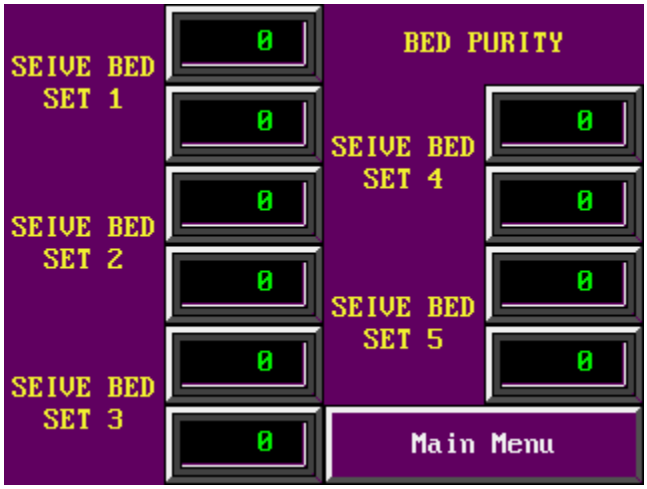
Information Screen



This screen displays information pertinent to the system, and manufacturer contact information. The Model Number of the Machine and its Serial Number are displayed along with the Date of Completion. The software versions for both the Programmable Controller and Touch Screen are also shown. During the course of normal maintenance, the company may offer to upgrade the software packages on the machine as improvements and modifications to it become available.

Troubleshooting Screen





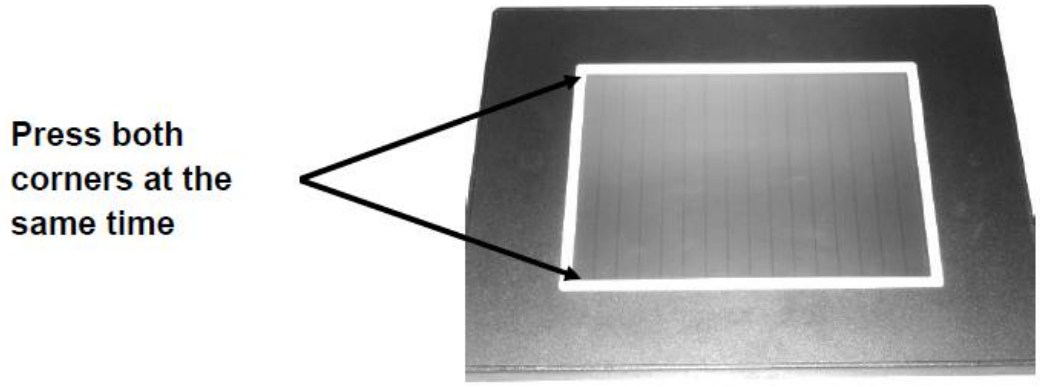
The **TROUBLESHOOTING** screen was designed to test each set of sieve beds individually to see if one is out of purity in the system. It is important to note that once you enter this troubleshooting mode the system will not continue to operate normally. Once the troubleshooting has been completed the system can be re-started again.

To begin the troubleshooting you need to push the button under the sieve bed set you want to start up and then push the **ON/OFF** button. This will only activate that set of sieve beds. Then, after 15 minutes of running, you will see on the „**Oxygen Purity Gauge**' if that sieve bed set is not running properly (making at least 90% pure oxygen).

In some cases, especially if the reading is only slightly low (80-89%) a leak may have developed in the machine. While the system is still running and pressurized, a small amount of soapy water can be used to try to find the leaking part. If the purity is very low the sieve beds may need to be replaced. They are designed to be able to be replaced quickly and easily in the field. If you do not have a replacement set of beds in your stock, contact the factory or your local distributor.

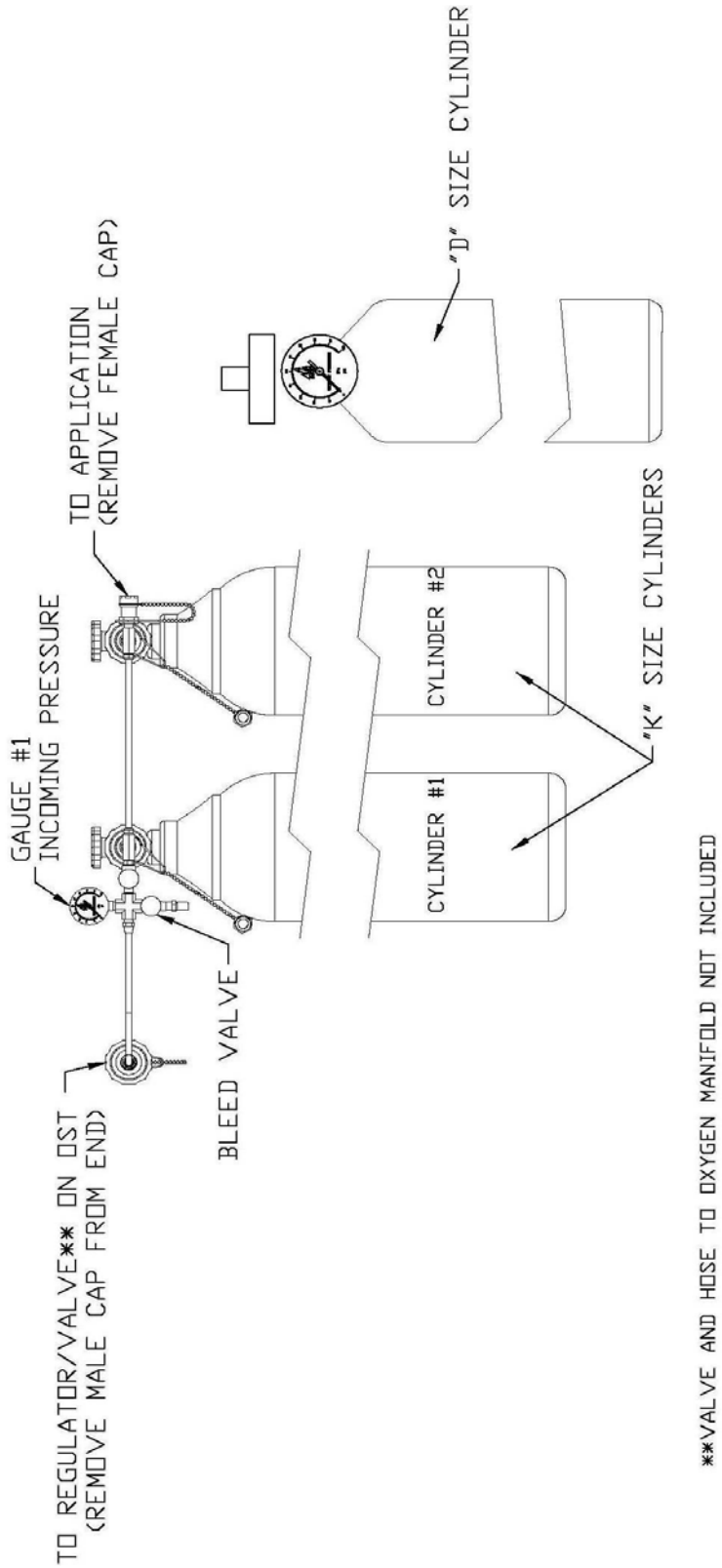
Correcting Missing or Irregular Touch Screen Color Scheme

- Ensure that the machine is not in **CYCLING** mode and leave the machine in the **ON** position.
- Touch both the top left corner and the bottom left corner of the touch screen at the same time.



- Select the appropriate language – English or Spanish.
- Select **DISPLAY TEST**. The screen will display all the colors continuously, allowing the user to see if a color is not displayed correctly. Select **EXIT** at any time to go back to the previous screen.
- Select **TOUCHPAD TEST**. The screen will display a grid. The user can select each square in the grid to ensure that all sections of the screen are responding. Select **EXIT** to return to the main menu.
- Select **EXIT** when done to return to the screen displayed before the two corners were pressed.

MOGS-100 Filling Manifold Design & Installation (Optional)



Design

The **MOGS-100** oxygen generating system manifold serves two purposes:

- To connect the **MOGS-100** to each bottle for filling
- To connect the bottles to one another for equalizing during trans-filling (filling smaller bottles from larger ones)

A shut off valve is located at the end of the manifold, downstream of the K-type storage cylinders. This valve stops the flow of oxygen when a small cylinder is not attached in the filling station and also allows the user to fill the storage cylinders. Every oxygen cylinder is equipped with its own shutoff valve, so any additional valves in the system are unnecessary. It is recommended that the filling manifold be as simple as possible with few valves and fittings in order to keep the number of potential leak points to a minimum.

Preferred materials for use in high pressure oxygen generation include, but are not limited to:

- Stainless Steel
- Brass
- Bronze

Installation

When building and installing a cylinder filling manifold, it is necessary to ensure that the threads on all NPT connections and all stainless steel on stainless steel connections are lubricated by Teflon tape or a similar pipe dope (such as Krytox grease). It is equally important to ensure that the threads on all compression fittings, such as the *CGA-540* connections on K-type cylinders, are clean unless the threads are stainless steel on stainless steel. All fittings should be tightened with a wrench (much tighter than hand tight). Once the manifold is built and installed, it needs to be checked for leaks with oxygen at **2200 psi (152 bar)**. This can be done by shutting the valves on all bottles and using the **MOGS-100** to fill the manifold to **2200 psi (152 bar)**. Each joint should then be checked for leaks by applying soapy water to the joint using a spray bottle or a small paintbrush. If bubbles are formed, it means that there is a leak. If a leak is found, the joint should be tightened further with a wrench. If this does not work, the joint should be disassembled and cleaned, then reassembled and tested. If this does not work, the leaking fittings need to be replaced.

Cylinder-Filling Procedures

Warning:

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. The intended use of the **MOGS-100** is to fill large **K-type** cylinders. The smaller **M-type** cylinder can then be trans-filled from the **K-type** cylinder.

Important:

Your **MOGS-100** unit is factory leak checked to insure trouble free operation. If any external storage tanks or manifolds are installed, every installed fitting and connection needs to be checked for leaks. Failure to ensure that there are no leaks in the system can cause the system to run excessively due to wasted oxygen. This in turn will cause premature wear on your machine.

Reserve Cylinders and Certification:

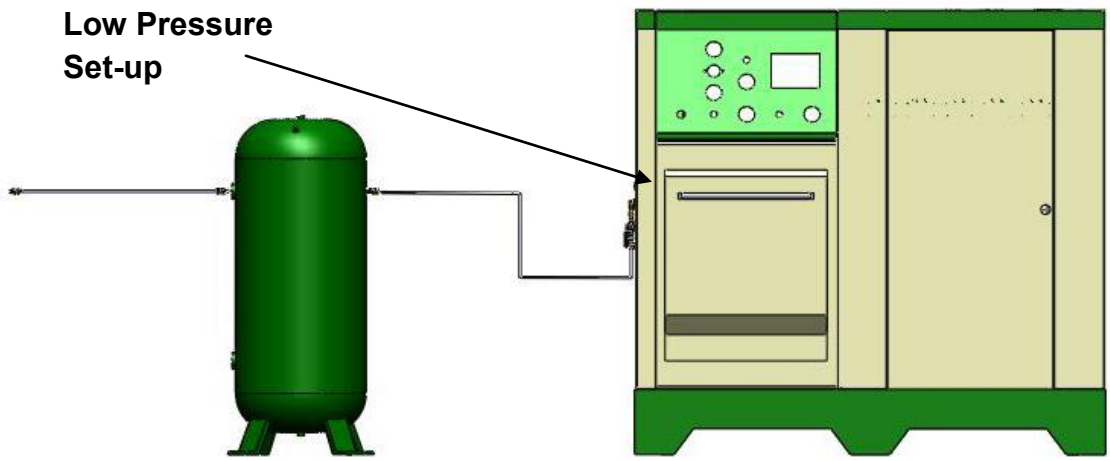
The system is shipped with a reserve bank of two (2) H/K sized (**244 ft^3** capacity) steel cylinders, rated at **2200 psi (152 bar)**. These are located on the back side of the control panel and are used to trans-fill smaller D, E or M size cylinders in the blast containment chamber. These cylinders come fully connected and leak checked and do not have to be removed or serviced until they need to be re-certified. Department of Transportation (DOT) recertification is required every five or ten years, depending on the previous certification. The date of last certification is stamped on the collar of the cylinder (month and year only). If a star symbol is stamped next to the date, re-certification is not required for ten (10) years. If there is no star symbol then the cylinder must be re-certified after five (5) years. These cylinders have an industry standard *CGA 540* valve at the top. These valves are normally open but can be closed by turning them fully clockwise.

Auxiliary External Oxygen Ports:

On the left side of the **MOGS-100** cabinet (as you face the Control Panel) there are two (2) ¼″ NPT threaded ports.

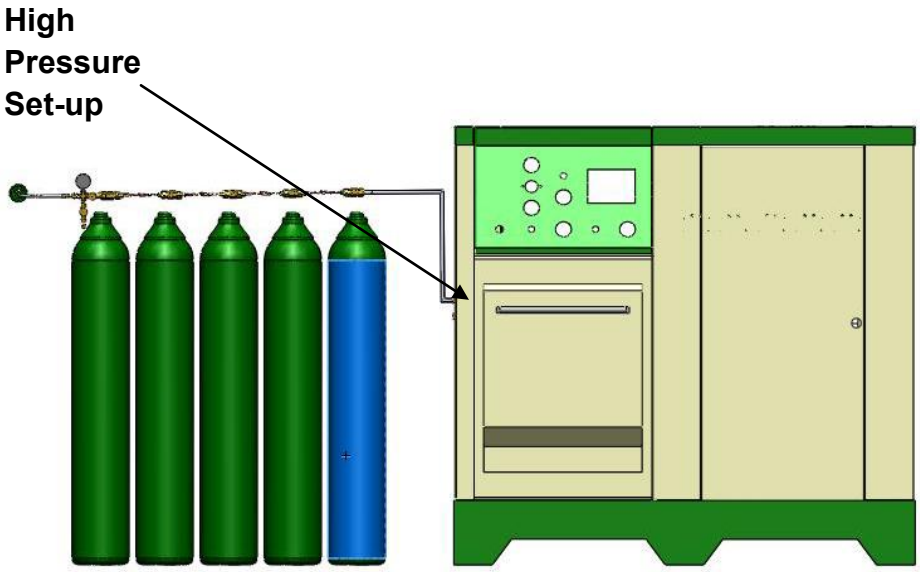
Upper Port:

The upper port allows for bypassing the high pressure oxygen compressor inside the **MOGS-100** unit and delivering oxygen at **70 psi (4.8 bar)** directly to a clinic, hospital or other low pressure oxygen demand. In order to use this option, the oxygen generator needs to be set to automatic (on the touch screen) and the oxygen compressor inside the machine must be manually switched to the **OFF** position. *(It will normally be in the* **AUTOMATIC** *Mode).* There is a three position switch on the control panel which is accessible when the front access door of the machine is open. You cannot fill cylinders and draw oxygen from the **70 psi (4.8 bar)** port at the same time. A low output pressure will result if this is attempted. If this capability is used ***OGSI*** recommends that an additional oxygen storage tank be installed and located next to the left side of the cabinet. **MOGS-100** should use a **120 gal** storage tank. ***See drawing on the following page for suggested layout.***



<u>Lower Port</u>:

The lower port allows for the expansion of the reserve high pressure cylinder bank beyond the two cylinders that are included in the frame of the machine. From this port, an auxiliary high pressure manifold can be connected, increasing the size of the reserve bank by 3, 4, etc. additional cylinders. These additional high pressure reserve manifolds along with extra cylinders are available from ***OGSI. See drawing below for suggested layout.***



Attaching and Filling Additional H/K size Cylinders:

Start by fixing the Auxiliary Cylinder Filling Manifold to a wall or other stable structure near the **MOGS** machine. Then connect the manifold to the Lower Auxiliary Oxygen port on the left side of the **MOGS** unit using the high pressure interconnecting line provided by ***OGSI*** or your manifold supplier. Make sure the cylinder valves on the two (2) reserve cylinders already connected are closed and that the manifold line is de-pressurized when you begin to make use of this connection. Next, with all valves initially closed, connect the steel-braided pigtail connection whip between a manifold valve and a cylinder valve, and tighten both connections using a **1 1/8"** wrench. These are all *CGA 540* Valve adapters. Slowly open the cylinder valve and then the manifold valve. Fully open both valves, backing off ¼ turn to prevent the valve from sticking in the open position and appearing closed. At this point, the gauge on the top of the manifold will read the pressure contained within the cylinder. Cylinder filling can be initiated by starting the machine (*See Start-up Procedures on Page 27*). It is also recommended by ***OGSI*** that these external cylinders be wall mounted or secured in a cart to make sure they are not bumped over or accidentally tipped. If they fall over and the valve breaks off, the cylinders will become projectiles and serious injury or death could occur.

Detaching a H/K-type cylinder:

With the machine turned off, close each of the appropriate manifold and cylinder valves.

Warning: Oxygen under high-pressure is present. The use of safety glasses and hearing protection is required.

Slowly disconnect the steel whip from the cylinder valve, using **1 1/8"** wrench. Be aware of the venting of oxygen under high pressure. If difficulty is encountered while attempting to remove the steel whip, open the appropriate manifold valve and then slowly open the bleed valve to vent the pressure. This will allow easier removal of the steel whip. Ensure that both manifold and bleed valves are closed after venting pressure.

Attaching and filling smaller cylinders in the blast containment chamber:

Smaller cylinders (D, E or M size) can be filled from the reserve bank of larger H/K-type cylinders at anytime, even if there is no power to the machine. If the machine is operating, the reserve bank can be closed off and the small cylinders can be filled directly from the machine. This takes a little longer, but it conserves the reserve bank. Start by opening the door to the blast containment chamber (push the green bar down) and set the cylinder in one of the two fill chambers. Connect the small cylinder to the filling whip. These whips and the small cylinder should both have *CGA 870* Valve adapters. Then open the valve to the appropriate fill port on the control panel. If the machine is filling the small cylinder directly, it will shut off when the cylinder is full. If you are trans-filling from the reserve bank, observe the pressure indicator to see when the small cylinder is full. Be sure to close the cylinder valve and reserve bank valve before trying to remove the small cylinder from the filling whip.

Warning: Oxygen under high-pressure is present. The use of safety glasses and hearing protection is required. Disconnect the steel whip following the procedure outlined in „**Detaching a H/K-type cylinder'** above.

Preventive Maintenance

Frame Inlet Air Filter Element Replacement:

The Frame Inlet Air Filter Element provided with the **MOGS-100** must be replaced every three to six months, depending on the amount of dust and debris in the operating location. The element helps to maintain the quality of the feed air supply and to keep the inside of the machine relatively clean. This filter element is accessed by reaching under the front of the machine and pulling it forward. While these can be supplied by ***OGSI*** as part of a spares kit, the easiest way to get replacements is by going to any hardware store and buying 16″ x 12″ x 1″ furnace filters.

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

Inlet Air Filter Element Replacement:

The air filters (2) keep dust and dirt from entering the air compressors and need to be changed twice a year in normal environments to maintain system performance.
In areas of excessive dust and oil, it is important to change the filters more often.
A quarterly change is recommended. These filter elements are accessed by removing the wing nuts on the black filter housing covers at eye level inside the front door. These can also be supplied by ***OGSI*** as part of a spares kit.

Cabinet:

The cabinet 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. Ammonia in particular will contaminate the molecular sieve inside the oxygen generators and result in poor unit performance.

Air Storage Tank Drain:

When the system is first installed it is a good idea to open the solenoid valve drain located at the bottom of the grey air tank every few days. If more than a few drops of water are drained from the tank, it implies that your location is very humid and you should check the storage tank regularly (every few days). If there is very little or no water drainage, then the storage tank can be checked less frequently (once every month). The idea is to prevent water from getting into the oxygen generator sieve beds. This is not needed for units with an auto-drain.

Air Compressors:

The Air Compressors should last four (4) to five (5) years or longer under normal operating conditions. Eventually, they will need to be re-built or replaced. This operation is usually needed after 8000 – 10,000 hours. 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 and takes about 30 minutes per compressor.

Oxygen Generator:

The oxygen generators are designed to run 24 hours a day for many years without failure. The most common failure mode is molecular sieve contamination due to high moisture content. These units can be re-built at ***OGSI*** or new units can be installed in the field. Replacement in the field is possible and takes about 20 minutes per generator.

Oxygen Booster:

The Oxygen Booster is a single-stage, oil-less compressor that should last two (2) to four (4) years under normal conditions. ***Low Oxygen Tank*** pressure (less than **60 psi or 4.1 bar**) will be an indicator that this booster needs to be replaced. Replacement in the field is possible and takes about 30 minutes per compressor.

Oxygen Compressor:

The high pressure oxygen compressor is a two-stage, oil-less compressor that will require maintenance at normal intervals. ***OGSI*** does sell the spare parts for this compressor as a kit. Please consult ***OGSI*** for the spares kit for this machine and have the serial number for the oxygen compressor (or the **MOGS** Unit) available when you call.

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.

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. We look forward to serving your oxygen needs and invite your inquiries. We will respond to you as promptly as possible.

You can reach ***OGSI*** through the following means:

- **By Telephone (Within the United States and Canada)**:

  (800) 414-6474 - Our toll free number (Within USA and Canada only)
  (716) 564-5165 - Our direct number

- **By Telephone (Outside the United States)**:

  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:**

  (716) 564-5165

- **By Fax (Within or outside the United States)**:

  (716) 564-5173

- **By E-Mail or Website:**

  ogsimail@ogsi.com
  http://www.ogsi.com

- **By Mail**:

  OGSI
  814 Wurlitzer Drive
  North Tonawanda, New York 14120 USA

- **By UPS, FedEx or Common Carrier:** *(Address to return shipments)*

  OGSI
  814 Wurlitzer Drive
  North Tonawanda, New York 14120 USA

*Technical service personnel are available from **8:00 AM** to **5:00 PM** **EST** (GMT - 5).*
We also have a list of Distributors and Authorized Service Agents available upon request.

Customer Satisfaction Survey

Help us serve you better. Please take our Customer Satisfaction Survey at www.ogsi.com

Appendix

Spare Parts List

PART NAME	PART NUMBER	QUANTITY
1/4" NC Direct Acting Solenoid Valve	1510009.CD3	3
3/4" Check Valve	1530001.G02	1
25A Motor Contactor	1810107.003	1
100 psi Air Pressure Transducer	1910001.100	1
1/2" Compressor Inlet Filter (***Change every 6 months***)	2180001.E01	8
Replacement Air Compressor Assembly	7030004.R04	2
Double Solenoid Valve 230VAC	1510007.220	1
100 psi Pressure Transducer-medium oxygen pressure	1910001.100	1
50 psi Pressure Transducer-low oxygen pressure	1910001.050	1
Oxygen Booster Pump	212000T.220	1
Oxygen Purity Sensor	3110003.008	1
Replacement OEM Module	7010006.R02	1
Replacement Set of Sieve Beds	7060003.001	5
RIX Spares Kit(seals, gaskets, valves) (***Per RIX Manual Maintenance Schedule***)	212602P.001	1
Touch Screen Panel	1810001.S6C	1
After Cooler	2140003.220	1
Cabinet Filter (***Change every 6 months***)	2180001.J01	4
Domnick Hunter Element #AO-020 (***Change annually***)	218D020.001	1
Manual – Available Free on Website	9000000.004	1

Oxygen Cleaning Procedure

Scope

This procedure sets forth the cleaning requirements for parts that are used in the construction of ***OGSI*** oxygen systems and are in the gaseous oxygen product stream including but not limited to valves, tubing, fittings, manifolds and pipes.

Objective

The objective of this procedure is to provide personnel with clear directions and an understanding of how parts are to be cleaned and why that is important. This document is based on guidelines provided in publication ***CGA G-4.1-2009*** which is produced by the Compressed Gas Association (CGA) and is intended to ensure that our internal procedure is compliant with that publication.

Safety

Harmful contamination such as grease, dirt, oil, dust, solvents, weld slag, sand, rust and previously applied thread sealants on parts that come into contact with oxygen can cause a combustion reaction resulting in system degradation or failure or worse, a hazard to nearby personnel. Care needs to be taken in the cleaning and handling of components used in oxygen service to prevent any contamination related failure.

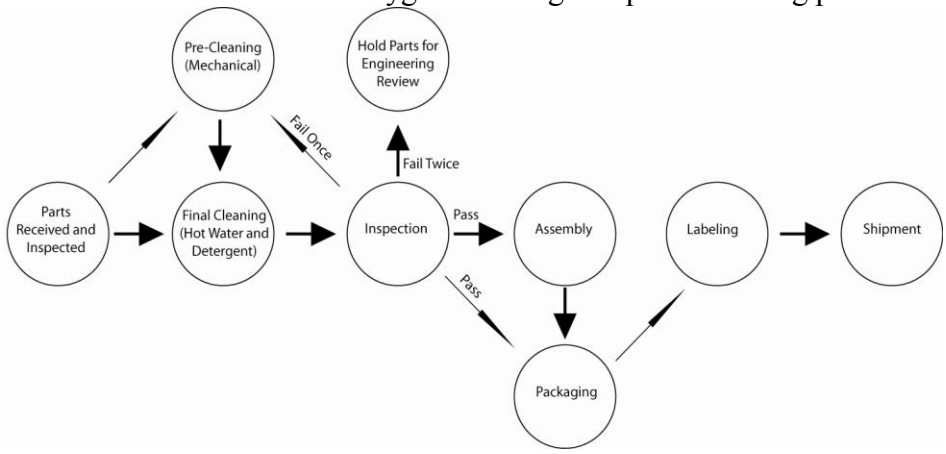
While the ***CGA G-4.1-2009*** standard makes allowance for cleaning parts using caustic agents, acids or solvents, the ***OGSI*** procedure will use only mechanical (soaking, wire brushing or grinding) means for pre-cleaning and hot water cleaning with aqueous detergents for final cleaning. This is done to reduce any chemical exposure risk to personnel and to eliminate the additional steps needed to remove these cleaning agents from the parts themselves.

Training

Personnel involved in the cleaning and preparation of parts used in oxygen service should be trained in these cleaning procedures and be familiar with this document.

Process Flow Chart

The flow chart below describes oxygen cleaning and parts handling process.



Parts Received and Initial Inspection

Upon determining which parts need to be cleaned, the technician needs to perform an initial visual inspection (under white light). Check for the presence of visible residue on the parts including but not limited to oil, grease, dirt, dust, rust, weld slag or pre-existing thread sealant

among others. For parts that have an internal cavity that is not directly observable by the naked eye, a lint free cloth that is first soaked in water can be inserted into the part and withdrawn for evidence of contamination. No part failing inspection shall be used in any assembly.

Pre-Cleaning

Pre-cleaning methods include soaking parts in a water based solution with an aqueous detergent, using a wire brush or thread pick, holding it under a wire brush grinding wheel or simply wiping it down with a clean rag. Upon completion of pre-cleaning, the part should be clear of any visible contamination and ready for final cleaning.

Final Cleaning

Final cleaning involves placing the parts in the parts washing machine, adding an appropriate amount of detergent and running them through the cleaning cycle. Consideration shall be given to the size, shape and number of parts to be cleaned at one time to ensure that the system is not overloaded or its function impaired. The cleaning temperature inside the washer shall be **120°F (49°C)** to **140°F (60°C)** and the detergent to be used shall be Cascade™. This detergent has a flash point above **105°F (41°C)** but it does not sustain combustion and there are no exposure controls for it. Parts can be removed from the washer once the drying cycle is complete.

Inspection

Upon completion of the final cleaning cycle, all parts should be removed from the parts washing machine and inspected for any residual contamination. The item shall be observed to confirm the absence of any contaminants including any oil, grease, detergent, moisture, lint, or other foreign materials. If any material remains on the part after the final cleaning cycle, the part shall be returned for a second round of pre-cleaning and final cleaning.

Packaging

Once a part or assembly has been cleaned for oxygen service, it should be protected to prevent recontamination if it will be put into storage. Small to medium sized parts should be packaged in plastic bags. Larger assemblies should be bubble-wrapped or wrapped in foam material and then moved on to final packaging in boxes and/or crates.

Labeling

Once a part or an assembly has been cleaned and packaged for oxygen service, it should be labeled per the customer's instructions, but at a minimum;

- contain the statement "**Cleaned for Oxygen Service**"
- contain the date of cleaning or packaging

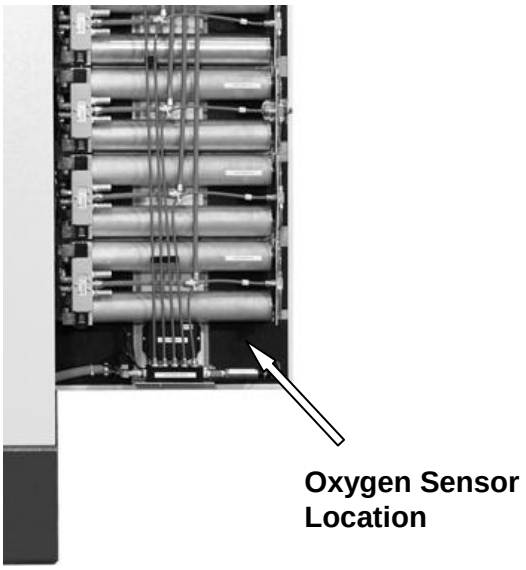
References

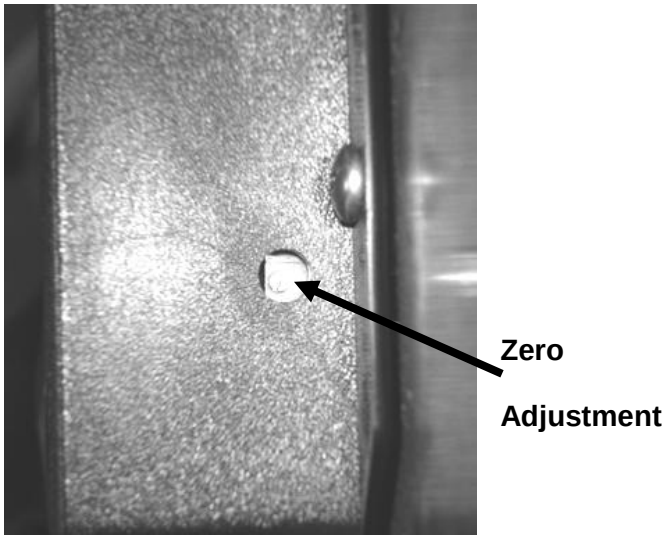
The following publications were referenced in the creation of this document.

- CGA G-4.1-2009, ***Cleaning Equipment for Oxygen Service***, Compressed Gas Association, Inc., 4221 Walney Road, 5th Floor, Chantilly, VA 20151. www.cganet.com
- ***Oxygen Cleaning Procedure*** Rev. L (8/05), RIX Industries, Inc., 4900 Industrial Way, Benicia, CA 94510. www.rixindustries.com

Oxygen Sensor Calibration

The oxygen sensor is located at the bottom of the right side cabinet access door. The ‚Zero' adjustment screw is shown below as viewed from the right side of the open door. The sensor is a Model 120J OxyAlert 2-Gas Sensor with **±1%** accuracy. It is made by Douglas Scientific (Compass Controls).





The Zero Adjustment Screw is used to calibrate the zero point of the sensor. Normal air has 20.9% oxygen in it and air can be used as a zero gas for sensor calibration.

Procedure:

- Disconnect the oxygen sample line feeding the sensor and let the sensor sit in the open air for 15 minutes.
- Verify the sensor reading matches the purity of the oxygen in the air (21%). If the display does not say 21%, adjust the screw until it does. Then re-connect the sample tap line to the sensor and continue running the system. The oxygen reading should now accurately measure the purity being produced.

Air Changes by Room Size/Machine Size

Air Changes Required in a Room Per Hour for All Models											
Model Number	**Room Volume in Cubic Feet (ft^3)**										
	1000	**2000**	**3000**	**4000**	**5000**	**6000**	**7000**	**8000**	**9000**	**10000**	**12500**
OG-15	5	2.5	2	1.5	1	1	1	1	1	1	1
OG-20	8	4	2.5	2	2	1.5	1	1	1	1	1
OGS-20	8	4	2.5	2	2	1.5	1	1	1	1	1
OG-25	10	5	4	2.5	2.5	2	1.5	1	1	1	1
OG-50	20	10	7.5	5	5	4	3	2.5	2	2	1.5
OG-100	NR	20	15	10	9	8	7	5	4	4	3
OG-175	NR	25	18	12.5	11	10	8	6	5	5	4
OG-250	NR	30	22.5	15	13	11	9	7.5	7	6	5
OG-375	NR	NR	30	27	22.5	18	15	13	11	8	7
OG-500	NR	NR	NR	30	27	22.5	18	15	13	11	8
OG-650	NR	NR	NR	NR	30	27	22.5	18	15	13	11
OG-750	NR	NR	NR	NR	NR	30	27	22.5	18	16	13
OG-1000	NR	NR	NR	NR	NR	NR	NR	30	26	22	17
OG-1250	NR	NR	NR	NR	NR	NR	NR	NR	NR	30	24
OG-1500	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	30
CFP-15+/15M	5	2.5	2	1.5	1	1	1	1	1	1	1
MOGS-100	NR	20	15	10	9	8	7	5	4	4	3

Notes:

1. **NR** *means that the models indicated are not recommended for rooms of this size.*
2. *For air changes requirements for models* ***OG-2000*** *and above, please contact* ***OGSI****.*

Units of Measurement

lb	U.S. Pound
hp	Horsepower
psi	Pound-force per Square Inch
kW	Kilowatt
kWh	Kilowatt hour
ft^3	Cubic Feet
VAC	Volts Alternating Current
Hz	Hertz
SCFH	Standard Cubic Foot per Hour
SCFM	Standard Cubic Foot per Minute
LPM	Liter Per Minute
1 bar	1.45×10^1 psi
dBA	Decibel (A scale)
A	Ampere
W	Watt
°C	Degree Celsius/Centigrade
°F	Degree Fahrenheit
µm	Micrometer or Microns
ppm	Parts Per Million

Maintenance Log

Date	Part	Reason for Maintenance	Authorized Service Technician Signature