**CAUTION**

**RX ONLY**

**OXYGEN HAS BEEN DETERMINED BY THE FDA TO BE A DRUG. THE POGS 33 IS ONLY TO BE OPERATED BY TRAINED MEDICAL PERSONNEL. OXYGEN IS TO BE ADMINISTERED ONLY BY PROPERLY TRAINED MEDICAL PERSONNEL.**

# On Site Gas Systems, Inc.

## PSA Oxygen Generator
## Operation, Maintenance, and Repair Manual

# POGS 33C

## Portable Oxygen Generation System – 33 LPM

**Updated 07/20/05**

**CAUTION**

**OXYGEN DRAMATICALLY INCREASES THE FLAMMABILITY OF OTHERWISE NONFLAMMABLE ITEMS, SUCH AS SYNTHETIC CLOTHING. CAUTION SHOULD BE USED SURROUNDING THIS SYSTEM. DO NOT SMOKE. DO NOT USE OIL TO CLEAN OR LUBRICATE ANY COMPONENT OF SYSTEM.**


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## Technical Bulletins

**As improvements are made to the POGS 33 and the POGS 33 , Maintenance, and Repair manual, minor changes that do not warrant a new revision to the manual will be released and distributed in the form of Technical Bulletins. The Technical Bulletins will describe any modifications to the manual and/or POGS 33, and should be kept with the Operation, Maintenance and Repair manual.**

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# Table Of Contents

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**DANGER, WARNING, CAUTION, IMPORTANT, and NOTE Statements**

***DANGER, WARNING, CAUTION,*** and *Note* statements are used throughout this manual to emphasize important and critical information. You must read these statements to help ensure safety and to prevent product damage. The statements are defined below.

**DANGER**

**DANGER indicates an imminently hazardous situation, which, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations.**

**WARNING**

**WARNING indicates a potentially hazardous situation, which, if not avoided, could result in death or serious injury.**

**CAUTION**

**CAUTION indicates a potentially hazardous situation, which, if not avoided, could result in minor or moderate injury. It may also be used to alert against unsafe practices.**

**IMPORTANT**

**An IMPORTANT statement is used to notify people of installation and operation information that is important, but not hazard-related.**

**NOTE**

**A NOTE statement is used to highlight information that may be helpful, but is not hazard related.**

**WARNING**

**READ AND UNDERSTAND THIS ENTIRE MANUAL BEFORE OPERATING THE POGS 33.**

**Improper use of this equipment may cause dangerous condition to both the operator and patients, resulting in serious injury or death.**

**NOTE**

**Oxygen purity range of the POGS 33 is 93 +/- 3%.**
**At Startup it may take 45-60 minutes for oxygen purity to reach >90%.**

**CAUTION**

**For any device that operates using oxygen and does not have an independent oxygen purity analyzer:**
**The Operator must be aware that oxygen purity is 93 +/- 3%.**
**The Operator must be certain that the Clinician is aware of the lower oxygen purity when mixing gases to be delivered to a patient.**
**Further, if the Clinician is mixing gases by volume using the oxygen from the POGS, the Operator must make the Clinician aware that there is a balance of 5-7% inert gases present in the oxygen stream.**

**IMPORTANT**

**Narkomed-M Anesthesia Machine and Impact Ventilator**

**Ventilator Compatibility**
**The only anesthesia equipment that is validated with the POGS 33 is Draeger's Narkomed-M and the Impact Portable Ventilator (IPV). No other anesthesia equipment is validated with the POGS 33 as of July 2005.**

**WARNING**

**Do not use oxygen produced by the POGS to calibrate any oxygen analyzer. Use only room air or calibration-grade oxygen.**

## GLOSSARY

| | |
|---|---|
| Adsorber Bed or Adsorber Vessel | A vessel, or tank used to hold molecular sieve in the oxygen generator |
| Adsorption | Physical adsorption of a substance, as in a sponge with water, incorrectly referred to as "absorption", which is more accurately a chemical process. |
| Ambient Air | Air surrounding the component, including its inherent temperature and dew point. |
| Argon | A colorless, odorless inert gaseous element found in the air. |
| ASME | American Society of Mechanical Engineers |
| Backup Oxygen | A method of redirecting contained oxygen to flow back to patients or equipment in the event of a power failure, or oxygen flow demand exceeds the capabilities of POGS 33. |
| Bed | A vessel or tank used to hold molecular sieve in the oxygen generator |
| Calibration | The act of calibrating; to standardize an instrument by determining the deviation from a standard so as to ascertain the proper correction factors. |
| Cannula | A small flexible tube inserted into a body cavity (such as nostrils) for draining off fluid or introducing medication (such as oxygen) |
| CE | Conformite Europeene:  CE Marking (European Standard) |
| CO | Carbon Monoxide |
| Coalescing Filter | Filters oil. |
| Condensate | A product of condensation. |
| Configuration | A particular arrangement of parts or components. |
| Dew point | The temperature at which a vapor begins to condense. |
| DISS Fitting | Diameter Index Safety System Fitting |
| FDA | Food and Drug Administration |
| HEPA | High Efficiency Particulate Air Filter, commonly used in medical oxygen and medical air |
| High-Volume Booster | High-Volume Oxygen Cylinder Filling Pressure Booster: boosts up to 66LPM |
| HP | Horse power |
| HV Booster | High Volume Booster |
| Humidifier Bottle | A container to which water is added and medical gas passes through to add moisture to the gas. |
| Knurled Knob | A knob with a series of small ridges or beads on a surface to aid in gripping |
| lbs | Pounds |
| Leak Check | A procedure to check for leaks in a system’s lines |
| Leak Solution | The solution used in the leak check procedure. |
| LPM | Liters per Minute (flow rate) |
| Microboost | Small Volume Oxygen Cylinder-Filling Pressure Booster: boosts up to 19 SCFH |
| MIL Spec | Military Specification [Standard] |
| Molecular Sieve | A crystalline substance (as a zeolite) characterized by uniformly sized pores |

## GLOSSARY

| | |
|---|---|
| | of molecular dimension that can adsorb small molecules and is used especially in molecule separations |
| N2 | Nitrogen |
| NFPA | National Fire Protection Agency (standard) |
| O2 | Oxygen |
| P&ID | Process and Instrumentation Diagram |
| Particulate Filter | Filters particles and water. |
| Power Surge | A spike in electrical current, or power |
| PPM | Parts Per Million, (a method of defining purity levels) |
| Product Receiver | A vessel or tank that receives, or holds, or stores the final product of oxygen. |
| PSA | Pressure Swing Adsorption – A method of gas separation |
| PSIG | Pounds per square inch gauge |
| POGS | Portable Oxygen Generation System built by On Site Gas Systems |
| RIX | Brand name of Microboost and High-Volume O2 Booster |
| SCFH | Standard cubic feet per hour (flow rate) |
| SCFM | Standard cubic feet per minute (flow rate) |
| Sieve Bed | A cylinder filled with Zeolite Molecular Sieve material |
| Tethered | To fasten or restrain by a tether. |
| USP | United States Pharmacopoeia [Manufacturing Standard] |
| Y-Fitting | A device used to split the flow of gas (such as oxygen) from one hose to two hoses. |
| Zeolite | A crystalline substance (as a zeolite) characterized by uniformly sized pores of molecular dimension that can adsorb small molecules and is used especially in separations |
| ZMS | Zeolite Molecular Sieve |

# 1 Introduction

## 1.1 Company Presentation

On Site Gas Systems is established as a world leader in the design and supply of systems for generation of nitrogen and oxygen. We have been manufacturing Nitrogen and Oxygen Generators since 1987. Information about our products and our company can be found at our web site: www.onsitegas.com.

On Site Gas Systems activities include full responsibility for conceptual and detailed engineering design, procurement, fabrication, supply and installation of packages for various industries worldwide.

## 1.2 Overview

The POGS 33 uses the latest PSA technology, and utilizes Zeolite Molecular Sieves (ZMS) to separate oxygen from the other gases contained in air. The Oxygen Generator uses two “beds” of ZMS to separate compressed air into a high-pressure oxygen product stream and low-pressure nitrogen-enriched exhaust stream. A particulate filter is included to remove impurities from the feed air. A HEPA filter is placed inline to filter the final oxygen product. Each Oxygen Generator comes pre-tested and fine-tuned to meet the customer specified flow rate at 90-96% oxygen purity. (Diagram 1)

## 1.3 System Components

### 1.3.1 The POGS 33 consists of 4 key components:

**a)** Feed Air Compressor (Fig 1.2)

**b)** Generator (Fig 1.1)

**c)** Microboost (Fig 1.3) (optional)

**d)** High Volume (HV) Booster (optional)

## 1.4 Overall Process

**a)** Ambient air enters the Feed Air Compressor (Fig 1.2), where it becomes compressed and dried. The compressed, dried air then flows into the Generator (Fig 1.1) where Medical Air and Oxygen are produced.

**b)** To produce Medical Air, the compressed air is filtered for use.

**c)** To produce Oxygen: Oxygen is separated from the Nitrogen in the air, the Nitrogen is released into the atmosphere, and Oxygen-enriched air, produced to meet specified purity standards (90-96% purity), is filtered, and is then ready for medical use.

**d)** Cylinders can be filled with Oxygen, using either the Microboost (Fig 1.3) or the High-Volume (HV) Booster (optional components).

**e)** In addition, either Booster along with the Generator (Fig 1.1) itself can provide Backup Oxygen from filled cylinders, using the Backup Oxygen system. This unit takes the oxygen from filled or partially filled cylinders and backflows the oxygen through a regulator to the Oxygen Receiver (Fig 3.51), through to the Oxygen Outlet Ports (Fig 2.22-25).

## 1.5 Maintenance

Maintenance is simple, yet necessary. Feed Air Compressor and filter maintenance procedures are especially important and should be followed carefully. If the recommended maintenance procedures are followed, the POGS 33 will provide you with many years of reliable service.

## 1.6 Limits of Liability

Buyer's exclusive remedy for all claims shall be for damages, and seller's total liability for any and all losses and damages arising out of any cause whatsoever including, without limitation, defects in or defective performance of the system, (whether such claim be based in contract, negligence, strictly liability, other tort or otherwise) shall in no event exceed the purchase price of the system in respect to which such cause arises or, at seller's option, the repair or replacement of such; and in no event shall seller be liable for incidental, consequential or punitive damages resulting from any such cause.

Seller shall not be liable for, and Buyer assumes all liability for the suitability and the results of using oxygen by itself or in any manufacturing or other industrial process or procedure, all personal injury and property damages connected with the possession, operation, maintenance, other use or resale of the System. Transportation charges for the return of the System shall not be paid unless authorized in advance by Seller.

**IMPORTANT**

**Any modifications made by customer without the consent of ON SITE GAS SYSTEMS, Inc will void the product purity and output specifications.**

## 1.7 Warranty

The Generator and Feed Air Compressor are warranted against defects in materials and workmanship, under normal use and operation, as applicable on the warranty listed below. All boosters and other accessories/options are covered by the original equipment manufacturer's warranty.

The On Site Gas Systems Warranty includes the following:

Free repair or replacement of component parts where defects occur within the first twelve (12) months of operation or twelve (12) months from the date of invoice, whichever comes first.

These warranties shall be null, void, inoperative, and not binding upon On Site Gas Systems, Inc. if a defect or malfunction occurs in the product or any part thereof from any feed air malfunction, or improper filter element maintenance, or repair, attempted repair, adjustment or servicing by anyone other than an authorized representative of On Site Gas Systems, or external causes. Said warranty shall extend and apply to the Oxygen Generator only while said system is owned and used exclusively by the original purchaser.

**NOTE**

**THERE ARE NO EXPRESS WARRANTIES BY ON SITE GAS SYSTEMS INC., OTHER THAN THOSE SPECIFIED HERE. NO WARRANTY OF TITLE AS PROVIDED IN THE UNIFORM, COMMERCIAL CODE SHALL BE IMPLIED OR OTHERWISE CREATED UNDER THE UNIFORM COMMERCIAL CODE, INCLUDING BUT NOT LIMITED TO WARRANTY OF MERCHANTABILITY AND WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE.**

## 1.8 Service Return Policy

If it is necessary to return a system for service, follow the procedure given below.

If the system cannot be repaired at the site, then the owner must obtain a written **Return Goods Authorization number,** which references the **model** and **serial number**, from On Site Gas Systems, Inc. No items will be accepted for service or credit unless On Site Gas Systems, Inc. has issued prior written authorization.

All items are to be returned with the original packaging material, if possible. Make sure that all items are packaged for safe return to On Site Gas Systems. On Site will not be responsible for damages that occur in transit. Any damage that occurs to the system because of failure to adhere to this procedure will be the sole responsibility of the customer. Contact On Site Gas Systems, Inc. for a return shipping address.

Shipping charges must be prepaid on all returns.

# 2 Safety Information

The following section outlines the basic safety considerations regarding use of your Oxygen Generator. Please refer to the technical references for additional information.

**NOTE**

**Read carefully and act accordingly before installing, operating or repairing the unit.**

**a)** The operator must employ safe working practices and rules when operating the Oxygen Generator.

**b)** The owner is responsible for maintaining the unit in a safe operating condition.

**c)** Always use approved parts when performing maintenance and repairs. Make sure that replacement parts meet or exceed the pressure requirements.

**d)** Only authorized, trained and competent individuals must perform installation, operation, maintenance and repair.

**WARNING**

**Use only materials with compatible pressure rating on product pipelines and components.**
**All parts must be free of grease/oil.**

**e)** Completely depressurize the Generator (Fig 1.1), Feed Air Compressor (Fig 1.2), and Microboost or HV Booster prior to performing any mechanical work, including changing the filters.

**f)** Do not use Generator (Fig 1.1) in a sealed room due to venting of nitrogen-enriched exhaust gas.

**g)** The nitrogen-enriched exhaust gas must be vented to the outside or to a large, well-ventilated room to avoid suffocation due to lack of oxygen.

**DANGER**

**Pressurized gases are contained within the Feed Air Compressor (Fig 1.2) and Generator (Fig 1.1).**
**High-pressure gases are dangerous and may cause injury or death if handled or used inappropriately.**

**h)** Never allow high-pressure gas to exhaust from an unsecured hose. An unsecured hose may exhibit a whipping action, which can cause serious injury. If a hose should burst during

use, immediately power down the Feed Air Compressor (Fig 1.2).

**i)** Never disable or bypass any safety relief valves on the feed air receiver or oxygen receiver.

**j)** Always make certain that the electrical system is “locked-out” and that the unit is unplugged prior to performing any electrical work.

**NOTE**

**If any statement or specification within this booklet, especially with regard to safety, does not agree with legislation or standard industry practices, the more demanding shall apply.**

# 3 Receiving and Inspecting

## 3.1 Receiving

The contents of the crates should be inspected upon delivery to assure that no damage has taken place during transit. Save the carton and wrapping, as it may be necessary to return a component in the event of shipping damage. If any components are damaged, the carrier should be notified immediately. The individual pieces should be checked against the packing list. If any discrepancy is found, contact your local distributor, or On Site Gas Systems, Inc. at (860) 667-8888. Please include the model number and the serial number with all correspondence.

## 3.2 Packing List

### 3.2.1 System Components:

**a)** Generator (Fig 1.1) (x1)

**b)** Feed Air Compressor (Fig 1.2) (x1)

**c)** Microboost (Fig 1.3) (Optional) (x1) in Accessory - Microboost Box

**d)** HV Booster (Fig 1.4) (Optional) (x1)

### 3.2.2 System Accessories - Inside Accessory – Microboost Box:

**a)** Accessory Storage Doors (Fig 4.95):

- Oxygen Flowmeters (Fig 2.38) (x6)
- Oxygen Y-Fitting (Fig 2.43) (x2)
- Medical Air Y-Fitting (Fig 2.44) (x3)
- Swivel (XMas Tree) Connectors (x6)

**b)** Contained in Accessory – Microboost Box:

- Cannulas (Fig 2.39) (x6)
- Humidifier Bottles (Fig 2.40) (x6)
- Oxygen Hoses (Fig 2.41) (Green) (May Be Used As Back-Flow Hose) (x6) – See below:
    - Oxygen Hoses: 8 ft (x2)
    - Oxygen Hoses: 15 ft. (x2)
    - Oxygen Hoses: 20 ft. (x2)
- Medical Air Hoses (Fig 2.42) (Yellow) (x6) – See below:
    - Medical Hoses: 8 ft (x2)
    - Medical Hoses: 15 ft. (x2)
    - Medical Hoses: 20 ft. (x2)

**c)** Feed Air Hose (Fig 5.116) (Black) (x1)

**d)** Remote Supply Air Hose (Fig 5.117) (Black) (also used as Feed Air Extension Hose) (x1)

**e)** Air Hose Wrench (Fig 5.117) (x1)

**f)** Rain Guard for Feed Air Compressor (x1)

**g)** Accessory High-pressure Pigtail For D or E Cylinders or High-pressure Pigtail for H/K Cylinders (x1)

**h)** Manuals (x2)

**i)** CD's (Manual) (x2)

**j)** USB Storage Device (Manual) (x1)

# 4 Specifications and Site Requirements

## 4.1 Specifications

### 4.1.1 Electrical

**a)** Generator…… 115V/60Hz/1PH/1A

**b)** Feed Air Compressor…… 208-240V/60Hz/3PH/15.5A

- Optional Single Phase……. 208-240V/60Hz/1PH/25A

**c)** Microboost……. 115/60Hz/1PH/6A

**d)** Optional: HV Booster……. 115/60Hz/1PH/19A

### 4.1.2 Physical Dimensions

**a)** Generator…… 51.62”L x 27.62”W x 23.36”H

**b)** Feed Air Compressor…… 29.06”L x 27.00”W x 26.62”H

**c)** Microboost……. 18”L x 12”W x 24”H

**d)** Optional: HV Booster……. 34.43”L x 27.40”W x 23.37”H

### 4.1.3 Weights based on Transportation Setup

**a)** Generator…… 244 lbs

**b)** Feed Air Compressor…… 200 lbs

**c)** Accessory – Microboost Box, including Microboost 200 lbs

**d)** Microboost itself… 118 lbs

**e)** Optional: HV Booster …… 274 lbs

### 4.1.4 Maximum Output (At Sea Level)

**a)** Generator

- Oxygen…… 33 LPM
- Medical Air …….. Up to 30 LPM

**b)** Compressor

- Air……... 14.7 SCFM @100 PSIG

**c)** Microboost

- Oxygen…….. 19 SCFH @ 2200 PSIG

**d)** Optional: HV Booster

- Oxygen…….. 120 SCFH @ 2200 PSIG

## 4.2 Site Specifications

### 4.2.1 Feed Air Compressor

**a)** The Feed Air Compressor (Fig 1.2) Supply Air Inlet Assembly must be located at least 50 feet from any sources of Carbon Monoxide. Sources of Carbon Monoxide include vehicles, power generators, heaters, stoves, and any equipment containing an internal combustion engine. If the Feed Air Compressor (Fig 1.2) is located in an area that may contain Carbon Monoxide, the Remote Supply Air Hose (Fig 5.117) must be utilized to locate the Supply Air Filter Assembly (Fig 5.113) in a clean air environment.

**b)** Ideally, the Feed Air Compressor (Fig 1.2) should be located indoors. Although the Feed Air Compressor (Fig 1.2) is designed to operate in mild inclement weather, if outdoor location is required, the location must provide protection from severe weather (heavy precipitation, blowing sand, etc). Protection from direct sunlight must be provided to maintain ambient temperature under 120ºF/48ºC.

### 4.2.2 Generator

**a)** The Generator (Fig 1.1) must be operated indoors only, protected from the elements.

### 4.2.3 Microboost or HV Booster

**a)** The Microboost (Fig 1.3) or HV Booster (Fig 1.4) must be operated indoors.

# 5 Principles of Operation

## 5.1 Introduction

An overview of the operation of the POGS 33 is given below. (Diagram 1)

## 5.2 Molecular Sieve Action

The Generator is a two-bed adsorber system. The Generator consists of two adsorber vessels filled with molecular sieve, a valve assembly, air filters, pressure regulator, and product receiver. Dry, compressed air (21% Oxygen, 78% Nitrogen, <1% argon) at about 65 PSIG / 4.5 bar is passed through the air filters, and then through the feed air Inlet. Clean and dry air is directed to one of the adsorber beds where nitrogen and water vapor is adsorbed faster than oxygen in the pore structure of the molecular sieve, thus increasing the oxygen purity of the product gas stream to 90-96%. This product flows out of the top of the adsorber bed, through the Purity Flow valve, and into low pressure Oxygen Receiver at a pressure slightly below the feed air pressure.

## 5.3 Molecular Sieve Purging

A portion of the intermediate product produced is directed through the purge orifice. This oxygen is allowed to flow back through the other sieve bed and out through the exhaust muffler at atmospheric pressure. This action purges the molecular sieve of nitrogen, and prepares the bed for the next cycle.

## 5.4 Cycling

The pressure in the sieve beds is equalized after about 30 seconds, before the next cycle starts. The beds switch roles; the first bed is purged while the second bed produces oxygen product. The active bed will remain on-line until just prior to becoming saturated with nitrogen. When the cycle is completed, the controller will exhaust the saturated bed, and pressurize the fresh adsorber bed. This allows a continuous flow of oxygen gas from the unit for as long as the unit is in operation.

## 5.5 Exhaust and Product Flow

Nitrogen-enriched exhaust gas is piped to the atmosphere through a silencer. Dry oxygen product stream, with the specified maximum oxygen content exits the adsorber vessels and is stored in the Oxygen Receiver.

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# 6 Monitors and Alarms

## 6.1 Carbon Monoxide (CO) and Dew Point Monitor

### 6.1.1 Introduction

An ENMET Med-Air 2000 Carbon Monoxide and Dew Point Monitor is installed inside the Generator (Fig 1.1). The monitor is located on the Generator frame located in the Generator Interior (Fig 3).

The monitor is hard-wired to the electrical system of the Generator (Diagram 2) and is active whenever the Generator Power Switch (Fig 2.16) is in the "ON" position.

### 6.1.2 Normal Operation

**a)** The Carbon Monoxide and Dew Point Monitor (Fig 3.67) is active whenever the Generator Power Switch (Fig 2.16) is in the "ON" position.

**b)** When the Generator Power Switch is changed to the "ON" position, the alarms may sound briefly. Pressing the ALARM ACKNOWLEDGE/AUDIO DEFEAT button on the monitor will silence the alarms.

**CAUTION**

**Verify CO and Dew Point readings are at acceptable levels (<10PPM CO, <39 degrees F dew point) before using the POGS 33.**

**c)** The display of the monitor, visible when the Generator Control Panel (Fig 2) is opened, will display the current CO content of the feed air. The display will also indicate if there is proper flow through the sensor and indicate the dew point of the medical air.

### 6.1.3 Calibration of the Med-Air 2000

**a)** The carbon monoxide and dew point sensor come pre-calibrated from the factory.

**b)** The carbon monoxide sensor should be calibrated every 3 months, using calibrations gases of 0PPM CO and 20PPM CO.

**c)** The dew point sensor cannot be field calibrated, and should replaced every 6 months to maintain accurate readings.

**d)** Calibration procedures are located in the Med-Air 2000 Manual.

### 6.1.4 Restarting (machine turned off or power lost)

**a)** When power is restored to the Generator (Fig 1.1), the Med-Air 2000 will resume operation as described in Section (6.1.2).

### 6.1.5 Malfunction Alerts

**a)** The Med-Air 2000 monitor continually monitors its circuits for internal faults. If a fault is detected, an audible and visual alarm will sound. Refer to the Med-Air 2000 manual for fault codes and repair step details.

**b)** The main fault of concern during normal operation is “Low Flow”. Possible causes of a “Low Flow” fault are:

- Feed Air Compressor “off” or not building correct pressure
- Dirty or clogged Medical Air HEPA filter.
- Clogged particulate filter inside the Med-Air 2000

**c)** Fault codes 01, 02, and 03 refer to calibration faults, and are covered in detail in the Med-Air 2000 manual.

### 6.1.6 CO Alarm

**a)** The Med-Air 2000 will sound a loud audible alarm if 10PPM or more of CO is detected in the feed air stream.

**DANGER**

**When the alarm sounds TAKE IT SERIOUSLY! CARBON MONOXIDE CAN CAUSE DEATH.**

**b)** A visual alarm on the front panel of the Generator Control Panel will indicate which alarm is activating.

**c)** The audible alarm may be silenced by opening the generator control panel and pressing the ALARM ACKNOWLEDGE button on the Med-Air 2000. The alarm will automatically re-arm once the CO level returns to less than 10PPM.

**d)** Remove all non-essential personnel from the area to an outside or fresh air area immediately.

**e)** Determine if anyone remaining in the area of the alarm or anyone that has been moved away from the area is experiencing any symptoms. If so, get medical attention immediately. Make sure that everyone is accounted for.

**f)** Open doors or windows to vent area, making sure that the source is not coming from any of those areas.

**g)** Determine the source of CO. The most likely source of CO that would activate the alarm is a CO source in close proximity of the Supply Air Filter Assembly (Fig 5.113) on the Feed Air Compressor (Fig 1.2). If this is the case, remove the source of CO or use the Remote Supply Air Hose (Fig 5.117) to move the Supply Air Filter Assembly (Fig 5.113) to a clean air area.

**h)** Purge the POGS 33 by flowing 15-20 LPM of oxygen for 30 minutes after the source of CO has been removed before using the oxygen or Medical Air on patients.

**Note:**

**False readings can be cause by other substances such as, Methane, propane, iso-butane, ethylene, ethanol, alcohol, iso-propanol, benzene, toluene, ethyl acetate, hydrogen, hydrogen sulfide, and sulfur dioxides. Additionally, aerosol sprays, alcohol based products, paint, thinners, solvents, adhesives, hair spray, after shaves and perfumes can contribute to incorrect readings on the CO alarm system.**

### 6.1.7 Dew Point Alarm

**a)** The Med-Air 2000 will sound a loud audible alarm if the dew point of the medical air outlet exceeds 39 degrees F

**b)** A visual alarm on the front panel of the Generator Control Panel will indicate which alarm is activating.

**c)** The audible alarm may be silenced by opening the generator control panel and pressing the ALARM ACKNOWLEDGE button on the Med-Air 2000. The alarm will automatically re-arm once the Dew Point returns to less than 39 degrees Fahrenheit.

**CAUTION**

**Do not use the medical air if the Dew Point is above 39 degrees Fahrenheit. Refer to the Troubleshooting section to determine the cause of the alarm and repair before using Medical Air.**

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## 6.2 Oxygen Analyzer

### 6.2.1 Introduction

The Oxygen Analyzer (Fig 2.17) display is located on the front of the Generator Control Panel (Fig 2). The Oxygen Sensor (Fig 3.65) is mounted in the Generator Interior (Fig 3).

The Oxygen Sensor (Fig 3.65) receives a small sample flow from the Oxygen Receiver (Fig 3.51) to continuously monitor the oxygen purity.

The Oxygen Analyzer (Fig 2.17) is equipped with alarms that will be activated if oxygen purity drops. If purity drops below a pre-set value (89% set at factory), an Audible Alarm (Fig 2.7) on the Generator Control Panel (Fig 2) will sound, and the “ALM1” indicator on the Oxygen Analyzer (Fig 2.17) display will flash. The analyzer is configured to provide a backup alarm at 85%.

### 6.2.2 Operation (Start-up)

**a)** The Oxygen Analyzer (Fig 2.17) receives power from the Generator Electrical System (Diagram 2), and will be active whenever the Generator Power Switch (Fig 2.16) is in the “ON” position.

### 6.2.3 Calibration of Oxygen Analyzer

**a)** The Generator (Fig 1.1) should be on for at least 30 minutes prior to calibration to allow for temperature stabilization of the Oxygen Analyzer (Fig 2.17).

**b)** Change the Alarm Bypass Switch (Fig 2.13) on the Generator Control Panel (Fig 2) to the “BYPASS” position.

**c)** Change the Operate/Calibrate [Valve Handle] (Fig 2.28) on the Generator Control Panel (Fig 2) to the “CALIBRATE” position.

**d)** Allow the Oxygen Analyzer (Fig 2.17) reading to stabilize. Stabilization normally takes approximately 10 minutes.

**e)** Press and release the “MODE” button on the Oxygen Analyzer (Fig 2.17).

**f)** Adjust the reading using the “▲” and “▼” buttons on the Oxygen Analyzer (Fig 2.17) until the display reads “20.9”.

**g)** Press and release the “MODE “ button on the Oxygen Analyzer (Fig 2.17) four (4) times. The display should read “RUN” momentarily, and then change back to the normal reading. The “FAULT”, “ALM1”, and “ALM2” indicators will flash on the Oxygen Analyzer (Fig 2.17) for approximately two (2) minutes. Oxygen Analyzer alarms will not be active during

this time. The Oxygen Analyzer (Fig 2.17) will then resume normal operation.

**h)** Change the Operate/Calibrate [Valve Handle] (Fig 2.28) on the Generator Control Panel (Fig 2) to the “OPERATE” position.

**i)** Once >89% or higher purity is indicated on the Oxygen Analyzer (Fig 2.17) display, change the Alarm Bypass Switch (Fig 2.13) on the Generator Control Panel (Fig 2) back to the “ACTIVE” position.

### 6.2.4 Calibration of Oxygen Analyzer with Calibration Gas

Performing a two-point calibration, using ambient air as described in section (6.3.5) and a calibration gas will provide more accurate Oxygen Analyzer readings. Calibration gas may be any purity between 80% and 99.9%. For the most accurate calibration, purity between 92% and 95% should be used. A regulator must be used to regulate the pressure of the calibration gas to 50PSIG +/- 5 PSIG. An adapter from the connection on the calibration gas source to a 5/32” SMC tubing fitting is required (not included).

**a)** The Generator (Fig 1.1) should be on for at least 30 minutes prior to calibration to allow for temperature stabilization of the Oxygen Analyzer (Fig 2.17).

**b)** Turn the Operate/Calibrate [Valve Handle] to the upright position (between “OPERATE” and “CALIBRATE”)

**c)** Open the Generator Control Panel (Fig 2)

**d)** Disconnect the 5/32” tubing from the center SMC fitting of the Operate/Calibrate [Valve]. To disconnect the tubing, push the orange ring of the fitting down and hold it while pulling out the tubing.

**e)** Connect the regulated calibration gas to the 5/32” tubing. This directs the calibration gas to the Analyzer Sensor (Fig 3.65).

**f)** Start the flow of the calibration gas.

**g)** Allow the Oxygen Analyzer (Fig 2.17) reading to stabilize. Stabilization normally takes approximately 10 minutes.

**h)** Press and release the “MODE” button on the Oxygen Analyzer (Fig 2.17).

**i)** Adjust the reading using the “▲” and “▼” buttons on the Oxygen Analyzer (Fig 2.17) until the purity of the calibration gas is displayed correctly.

**j)** Press and release the “MODE “ button on the Oxygen Analyzer (Fig 2.17) four (4) times. The display should read “RUN” momentarily, and then change back to the normal reading. The “FAULT”, “ALM1”, and “ALM2” indicators will

flash on the Oxygen Analyzer (Fig 2.17) for approximately two (2) minutes. Oxygen Analyzer alarms will not be active during this time. The Oxygen Analyzer (Fig 2.17) will then resume normal operation.

**k)** Stop the flow of the calibration gas.

**l)** Disconnect the 5/32" tubing from the calibration gas source.

**m)** Reconnect the 5/32" tubing to the center SMC fitting of the Operate/Calibrate [Valve]. To re-connect the tubing, push the tubing firmly into the fitting.

**n)** Change the Operate/Calibrate [Valve Handle] (Fig 2.28) on the Generator Control Panel (Fig 2) to the "OPERATE" position.

### 6.2.5 Testing the Oxygen Analyzer Alarm

**a)** Ensure the Alarm Bypass Switch (Fig 2.13) is in the "ACTIVE" position.

**b)** Change the Operate/Calibrate [Valve Handle] (Fig 2.28) on the Generator Control Panel (Fig 2) to the "CALIBRATE" position.

**c)** The reading on the Oxygen Analyzer (Fig 2.17) display should drop, and the Audible Alarm (Fig 2.7) on the Generator Control Panel (Fig 2) will sound.

**d)** Change the Alarm Bypass Switch (Fig 2.13) back to the "BYPASS" position.

**e)** Change the Operate/Calibrate [Valve Handle] (Fig 2.28) on the Generator Control Panel (Fig 2) to the "OPERATE" position.

**f)** Once 89% or higher purity is indicated on the Oxygen Analyzer (Fig 2.17) display, change the Alarm Bypass Switch (Fig 2.13) back to the "ACTIVE" position.

### 6.2.6 Malfunction Alerts

**a)** The Oxygen Analyzer (Fig 2.17) has two ways of indicating faults

- The "FAULT" light will illuminate on the Oxygen Analyzer (Fig 2.17). The fault codes for this type of error are in the Oxygen Analyzer instruction manual.
- The display on the Oxygen Analyzer (Fig 2.17) will read "ERx". This indicates a serious internal fault in the Oxygen Analyzer (Fig 2.17). The analyzer must be returned to the manufacturer for repair.

### 6.2.7 Alarms

**a)** The Audible Alarm (Fig 2.7) will sound if there is low purity or excessive flow.

- Purity: The Audible Alarm (Fig 2.7) on the Generator Control Panel (Fig 2) will sound if purity falls to 89%. A second backup alarm is set at 85%.
- Excessive Flow: The Audible Alarm (Fig 2.7) on the Generator Control Panel (Fig 2) will sound if Oxygen Receiver (Fig 3.51) Pressure falls below 47PSIG, indicating that the Generator (Fig 1.1) cannot keep up with the demand of oxygen flow.

**b)** Visible Alarm

- The “ALM1” indicator will illuminate on the Oxygen Analyzer (Fig 2.17) if purity falls below 89%, and the “ALM2” indicator will illuminate if purity falls below 85%.

# 7 POGS 33 Item Identification and Drawings

## 7.1 Part Names

### 7.1.1 POGS 33 (Fig. 1)

1. Generator
2. Feed Air Compressor
3. Accessory Case
4. Microboost (Optional)
5. HV Booster (Optional)

### 7.1.2 Generator Control Panel (Fig 2)

6. Latches (x2)
7. Audible Alarm
8. Oxygen Purity Alarm
9. Hour Meter
10. Standby [Mode Indicator]
11. Oxygen Outlet Pressure [Gauge]
12. Alarm Test Switch (ON/OFF)
13. Alarm [Bypass Switch] (BYPASS/ACTIVE)
14. Circuit Breaker
15. Operate [Mode Indicator]
16. Power Switch (ON/OFF)
17. Oxygen Analyzer
18. Oxygen Outlet Valve
19. Oxygen Outlet Valve
20. Oxygen Outlet Valve
21. Oxygen Outlet Valve
22. Oxygen Outlet Port
23. Oxygen Outlet Port
24. Oxygen Outlet Port
25. Oxygen Outlet Port
26. Medical Air Outlet Valve(3)
27. Medical Air Outlet Port(3)
28. Operate/Calibrate [Valve Handle]
29. Generator Power Cord
30. Feed Air Inlet Port
31. Backup Oxygen Inlet Port
32. Backup Oxygen Inlet Port Valve
33. Particulate Filter Assembly
34. Automatic Drain
35. Cover Wheels
36. Condensate Drain port

### 7.1.3 Generator Accessories (Fig. 2/Fig.4)

38. Oxygen Flowmeters (x6)
39. Cannulas (x6)
40. Humidifier Bottles (x6)
41. Oxygen Hoses (Green) (x6)
42. Medical Air Hoses (Yellow) (x6)
43. Oxygen Y-Fitting (x2)

44. Medical Air Y-Fitting (x3)
45. Drain Water Bottle (x2)
46. Swivel Conn (XMas tree) (x6)

### 7.1.4 Generator Interior (Fig. 3)

48. Air Receiver (Blue)
49. Sieve Bed - Left (Black)
50. Sieve Bed - Right (Black)
51. Oxygen Receiver (Green)
52. Air Receiver Pressure Gauge
53. Air Saver Valve - Top
54. Inline Filters (x2)
55. Check Valves (1/4”) (x2)
56. Crossover Valve
57. Standby Mode Pressure Switch
58. Backup Oxygen Check Valve
59. Oxygen Receiver Pressure Gauge
60. Purity Flow Valve
61. Oxygen Sample Flow Valve
62. Oxygen Sample Needle Valve
63. Oxygen Sensor Block
64. Oxygen Sensor Boot
65. Oxygen Sensor
66. Sensor Lead
67. Carbon Monoxide and Dew Point Monitor
68. Main Valve Assy Pilot Valve/ Manifold
69. Terminal Block
70. Timer Assembly
71. Timer Motor
72. Inline HEPA Filter (Medical Air)
73. Inline HEPA Filter Element (x2)
74. Medical Air Pressure Gauge
75. Medical Air Needle Valve
76. Exhaust Mufflers (4)
77. Main Valve Assembly
78. Condensate Drain Bottle
79. Manual Condensate Drain Valve
80. Velcro Strap
81. Oxygen Outlet Pressure Regulator
82. Alarm Pressure Switch
83. Inline HEPA Filter (Oxygen)
84. Air Saver Valve – Bottom (part of Main Valve Ass’y)
85. Air Receiver Relief Valve
86. Oxygen Receiver Relief Valve
87. Membrane Dryer
88. Medical Air Outlet Pressure Regulator

### 7.1.5 Generator Accessory Storage within Exterior Cover (Fig. 4)

95. Accessory Storage Door
96. Accessory Storage Netting or Canvas (x2)

### 7.1.6 Compressor Interior Cover (Fig. 5)

99. Feed Air Outlet Port
100. Cover Hinge
101. Rain Guard
102. Supply Air Inlet Port
103. Serial Number Label
104. Compressor Power Cord
105. Securing Knobs (x4)
106. Compressor Power Switch (ON/OFF)
107. Exterior Lid Support Base
108. Tethered Retaining Clip
109. Bolt Locks (x4)

### 7.1.7 Compressor Accessories (Fig. 5)

113. Supply Air Filter Assembly
114. Cooling Air Filter Element
115. Supply Air Filter Elements (x2)
116. Feed Air Hose (Black)
    a) Compressor End
    b) Generator End
117. Remote Supply Air Hose (Black) (may be used as Feed Air Extension Hose)
    a) Male End
    b) Female End
118. Air Hose Wrench

### 7.1.8 Compressor Interior (Fig. 6)

121.
122.
123. Check Valve (1/2”)
124.
125. Pressure Switch
126. Auto Drain Valve
127. Auto Drain Regulator
128. Side Cooling Air Filter Element
129. Surge Suppressor
130. Starter Box
131. Starter Box Locking Screw
132. Circuit Breaker Reset Button
133. Interior Cooling Fan
134. Heat Exchanger
135. Heat Exchanger Cooling Fan
136. Cooling Air Exhaust Foam Gasket
137. Compressor Motor
138. Scroll Compressor
139. Compressor Motor Pulley
140. Compressor Drive Belts (x2)
141. Scroll Compressor Pulley
142.
143.
144. Heat Exchanger Brackets (x2)

### 7.1.9 Starter Box Interior (Fig. 6)

148. Power Input Terminals (x3)
149. Heaters (x3)
150. Circuit Breaker
151. Trip Point Adjustment
152. Manual/Auto Reset Selector
153. Circuit Breaker Reset Button
154. Power Output Terminals (x3)

### 7.1.10 Compressor Exterior (Air Outlet Side) (Fig. 7)

159. Side Cooling Air Inlet Louver
160. Rivets (x8)

### 7.1.11 Compressor Exterior (Supply Air Inlet Side) (Fig. 7)

162. Exterior Lid Support
163. Lid Support Adjustment Knob
164. Cooling Air Exhaust Louver
165. Rivets (x8)
166. Exterior Lid

### 7.1.12 Microboost – Rear (Fig. 8)

167. Oxygen Inlet Port
168. Oxygen Inlet Pressure Gauge
169. Oxygen Inlet Pressure Regulator
170. Lid stop

### 7.1.13 Microboost – Front (Fig. 8)

174. D/E Oxygen Cylinder Support Assembly
175. Bolt Lock

### 7.1.14 Microboost – Right (Fig. 9)

179. Start Button
180. Power Switch

### 7.1.15 Microboost – Left (Fig. 9)

184. Power Cord
185. Circuit Breaker Reset [Button]

### 7.1.16 Microboost Top (Fig. 10)

189. Backup Oxygen Outlet Port
190. Backup Oxygen Outlet Valve
191. Backup Oxygen Outlet Pressure Gauge
192. Backup Oxygen Outlet Pressure Regulator
193. High Pressure Manifold Pressure Gauge
194. High Pressure Pigtails for D/E Cylinders
195. High Pressure Pigtails for D/E Cylinders
196. High Pressure Pigtails for D/E Cylinders
197. High Pressure Pigtails for D/E Cylinders
198. High Pressure Pigtails for D/E Cylinders
199. Accessory High Pressure Pigtail for H/K Cylinders
200. Needle Valve
201. Needle Valve
202. Needle Valve
203. High Pressure Manifold
204. Microboost Lid
205. Lid Latch

### 7.1.17 HV Booster Interior – Manifold Side (Fig. 11)

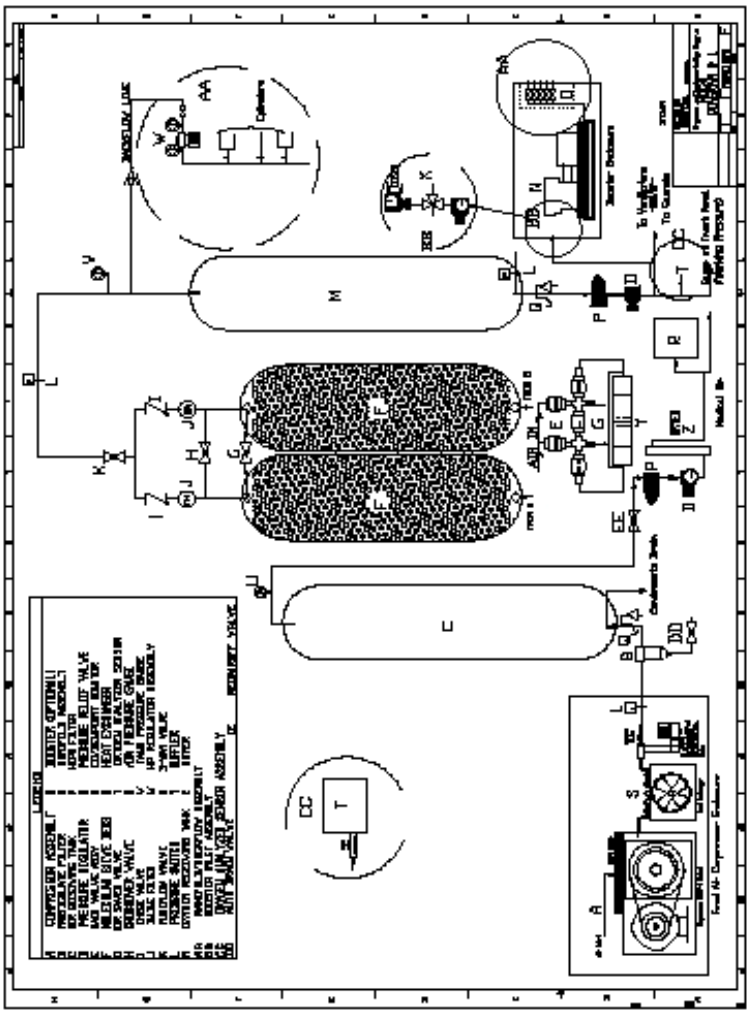
209. High Pressure Manifold
210. Needle Valve
211. Needle Valve
212. Needle Valve
213. High Pressure Manifold Pressure Gauge
214. Backup Oxygen Outlet Pressure Regulator
215. Backup Oxygen Outlet Pressure Gauge
216. Backup Oxygen Outlet Valve
217. Backup Oxygen Outlet Port
218. High Pressure Pigtails for H/K Cylinders
219. High Pressure Pigtails for H/K Cylinders
220. High Pressure Pigtails for H/K Cylinders
221. High Pressure Pigtails for H/K Cylinders
222. High Pressure Pigtails for H/K Cylinders
223. Accessory Storage Tray
224. Accessory High Pressure Pigtail For D/E Cylinders
225. Dual Oxygen Inlet Ports (x2)
226. Dual Oxygen Inlet Pressure Regulator
227. Dual Oxygen Inlet Pressure Gauge
228. Dual/Single Oxygen Inlet (Valve Handle)
229. Single Oxygen Inlet Pressure Regulator
230. Single Oxygen Inlet Pressure Gauge
231. Single Oxygen Inlet Port
232. Quick Reference Card (Specifications, Backup Oxygen, Cylinder Connectors)
233. High Pressure Cylinder Yoke

### 7.1.18 HV Booster Interior – Control Panel Side (Fig. 12)

237. 1st Stage Pressure Gauge
238. 2nd Stage Pressure Gauge
239. 3rd Stage Pressure Gauge
240. Control Panel
241. Power Cord
242. Power Switch
243. Manual/Automatic Switch
244. Circuit Breaker Reset [Button]
245. Indicator Lamp
246. Hour Meter

## 7.2 Diagrams and Figures

### 7.2.1 Diagram 1



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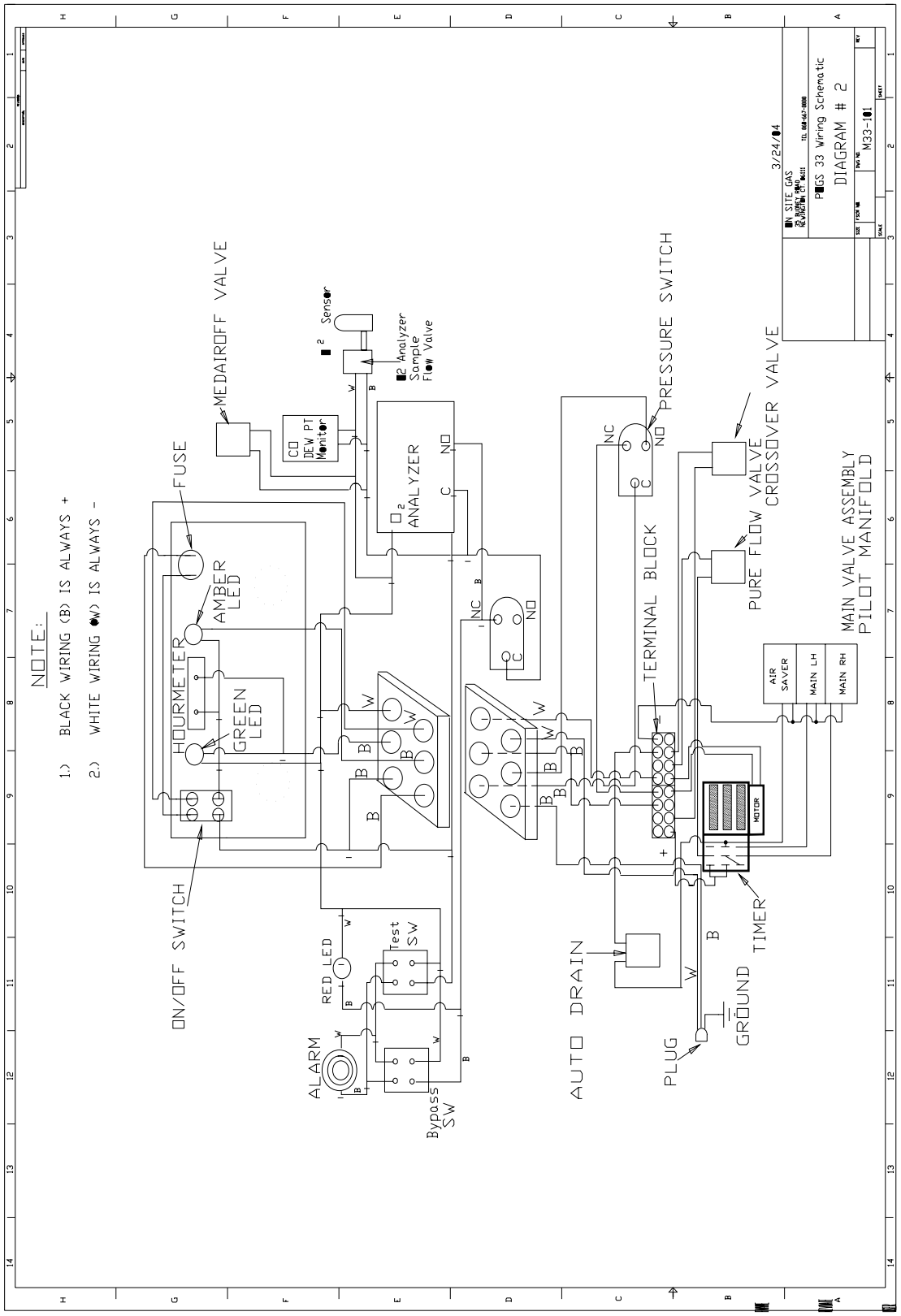

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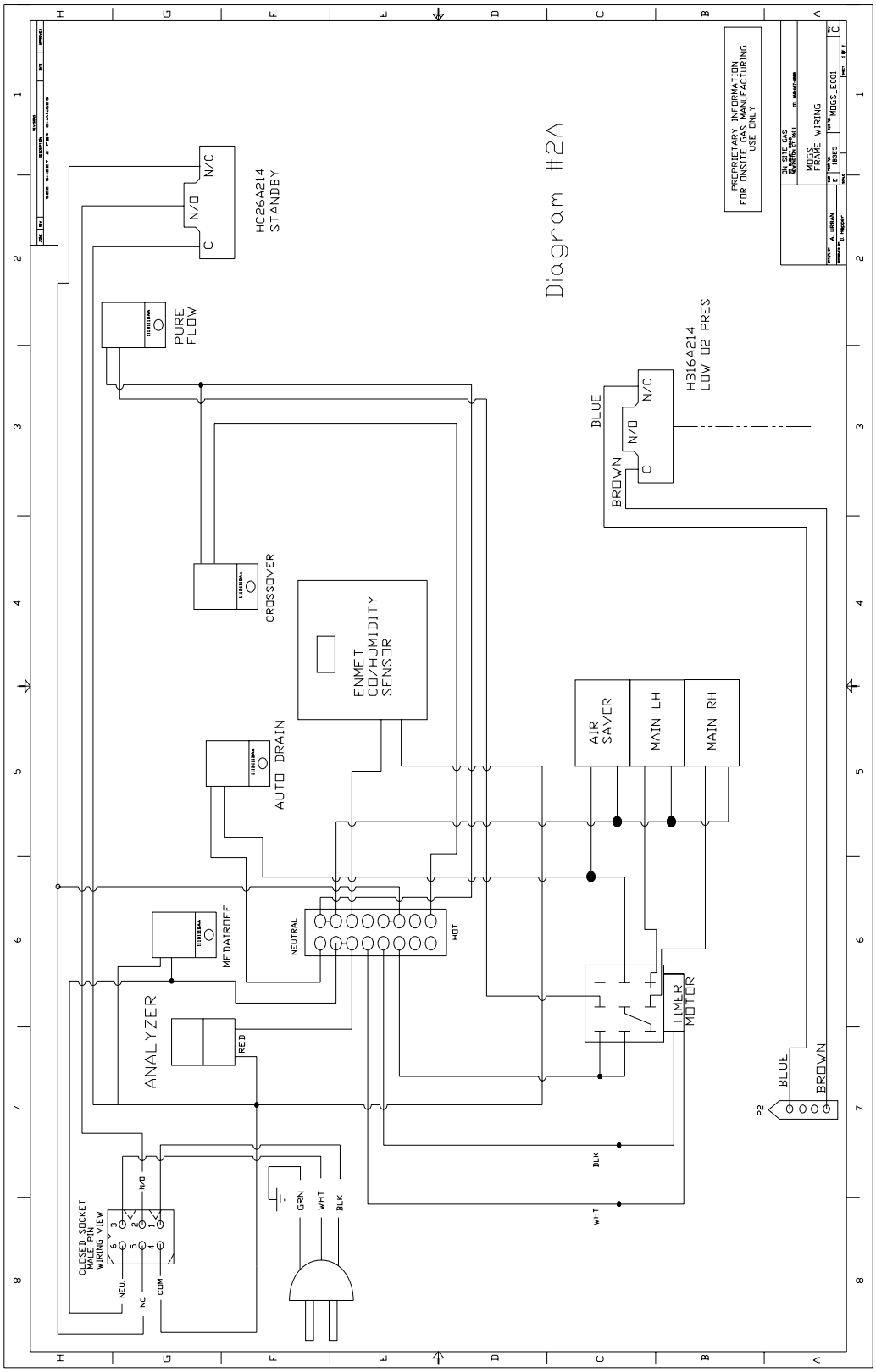
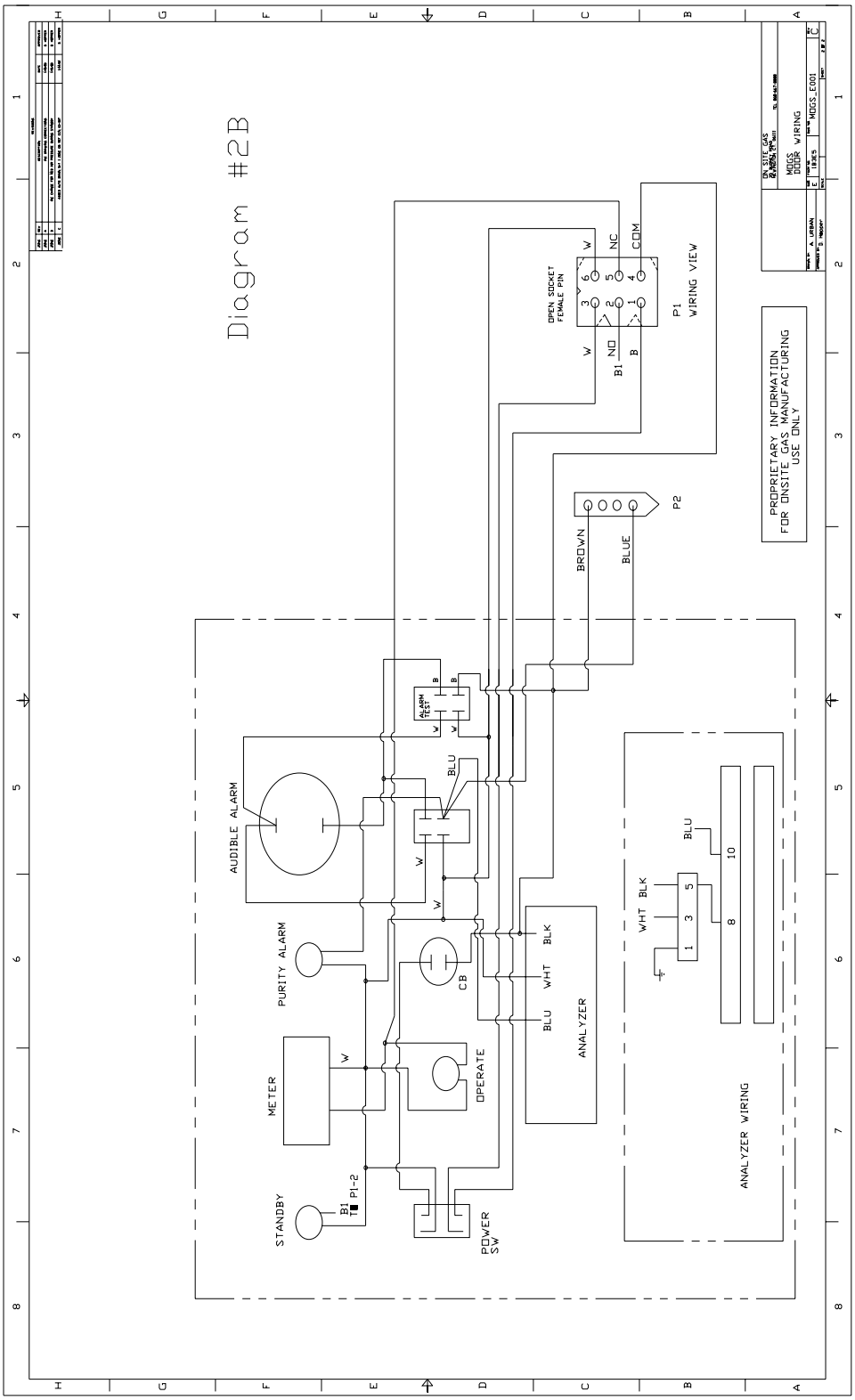


### 7.2.4 Diagram 2B



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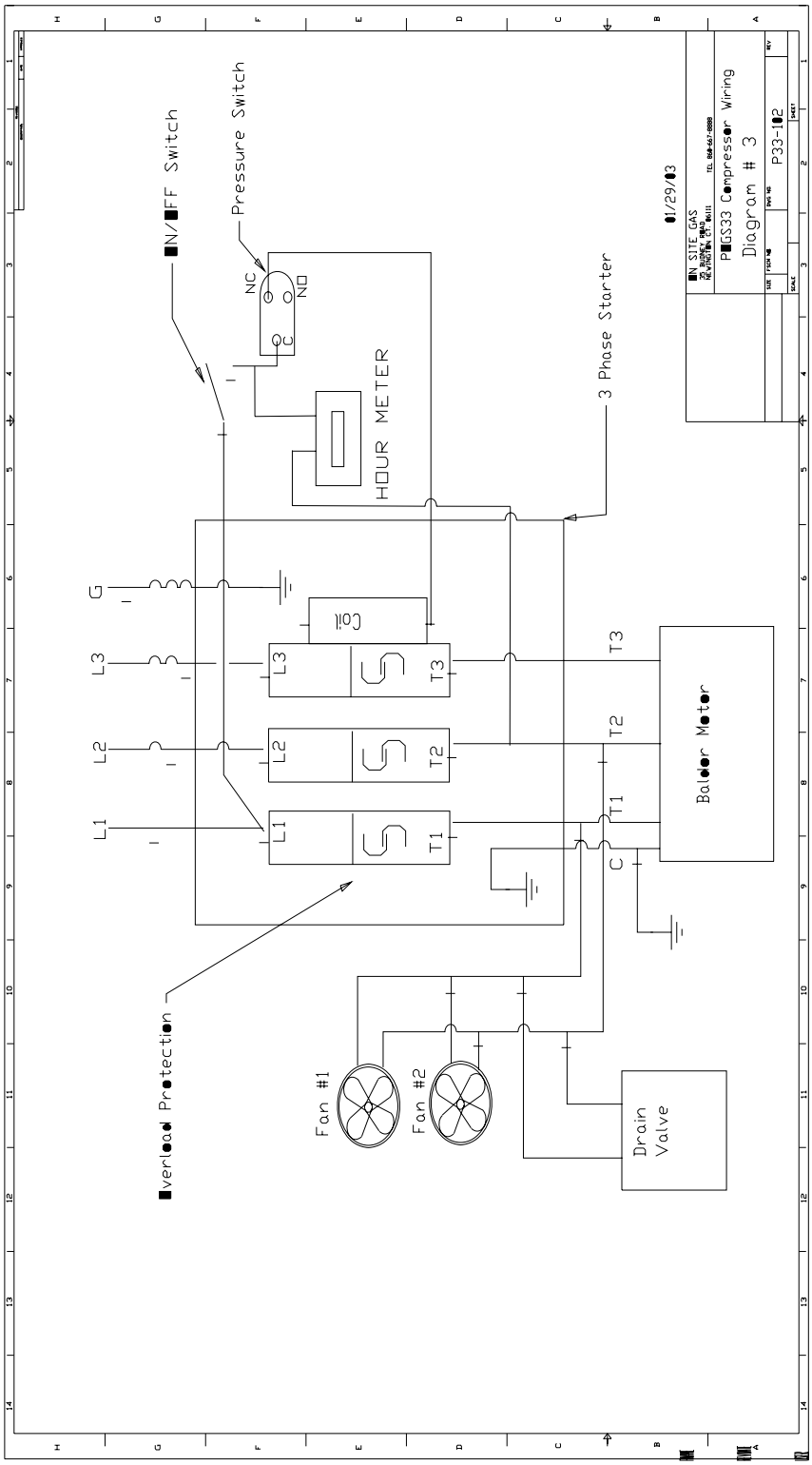
### 7.2.5 Diagram 3



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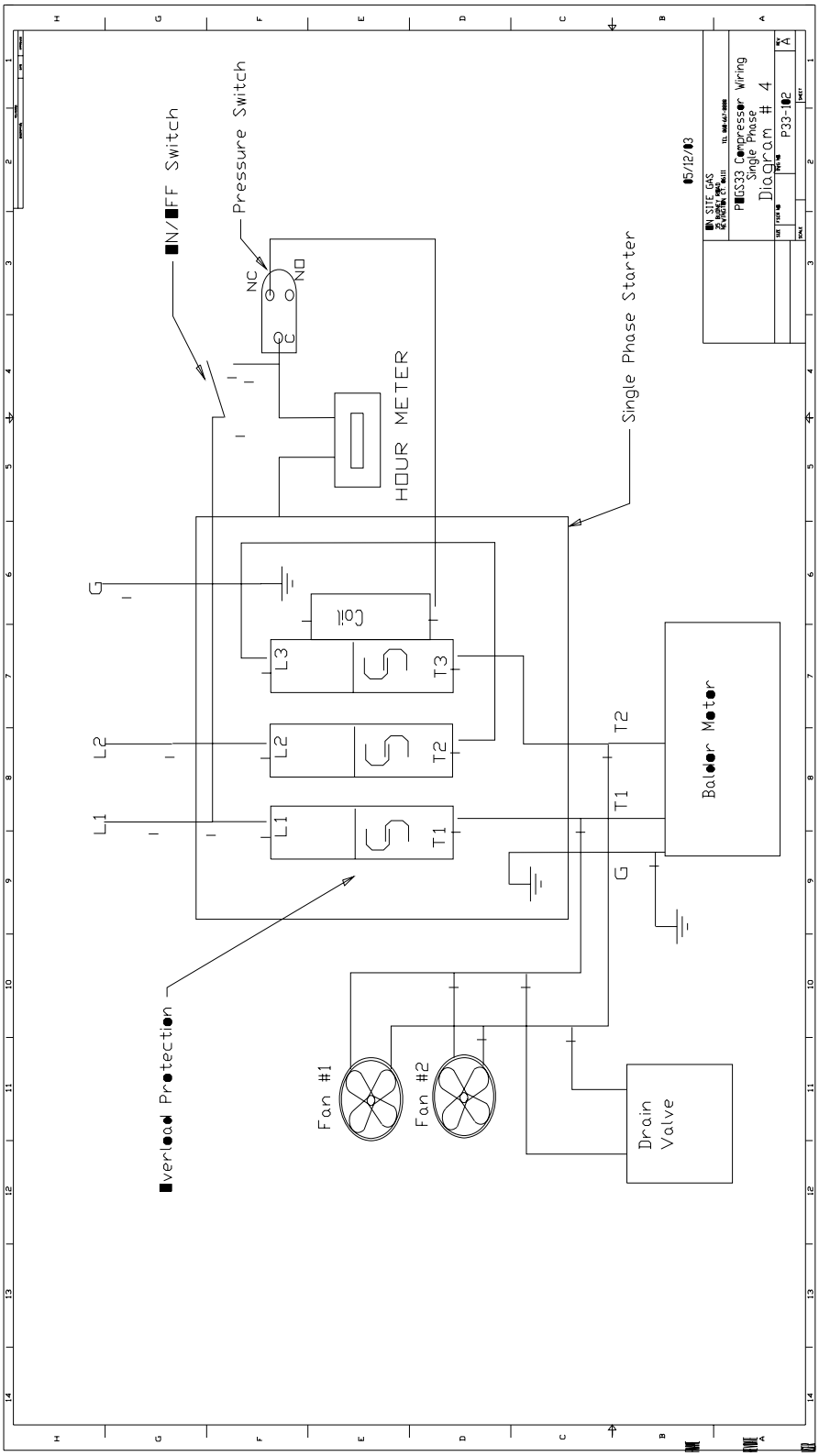
### 7.2.6 Diagram 4



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### 7.2.7 POGS 33 (Fig. 1)

1. Generator
2. Feed Air Compressor
3. Microboost (Optional)
4. HV Booster (Optional)

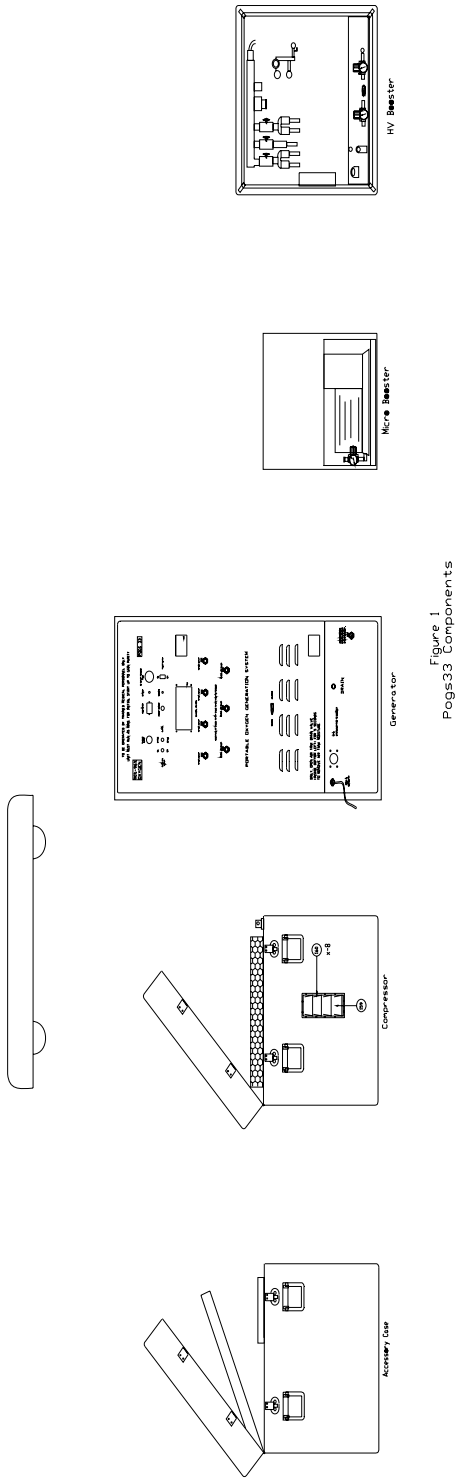


Figure 1
Pogs33 Components

### 7.2.8 Generator Control Panel (Fig 2)

6. Control Panel Latches (x2)
7. Audible Alarm
8. Oxygen Purity Alarm
9. Hour Meter
10. Standby [Mode Indicator]
11. Oxygen Outlet Pressure [Gauge]
12. Alarm Test Switch (ON/OFF)
13. Alarm [Bypass Switch] (BYPASS/ACTIVE)
14. Circuit Breaker
15. Operate [Mode Indicator]
16. Power Switch (ON/OFF)
17. Oxygen Analyzer
18. Oxygen Outlet Valve
19. Oxygen Outlet Valve
20. Oxygen Outlet Valve
21. Oxygen Outlet Valve
22. Oxygen Outlet Port
23. Oxygen Outlet Port
24. Oxygen Outlet Port
25. Oxygen Outlet Port
26. Medical Air Outlet Valve
27. Medical Air Outlet Port
28. Operate/Calibrate [Valve Handle]
29. Generator Power Cord
30. Feed Air Inlet Port
31. Backup Oxygen Inlet Port
32. Backup Oxygen Inlet Port Valve
33. Particulate Filter Assembly
34. Automatic Drain
35. Cover Wheels
36. Condensate Drain Port

### 7.2.9 Generator Accessories (Fig. 2/Fig.4)

38. Oxygen Flowmeters (x4)
39. Cannulas (x4)
40. Humidifier Bottles (x4)
41. Oxygen Hoses (Green) (x3)
42. Medical Air Hoses (Yellow) (x2)
43. Oxygen Y-Fitting (x2)
44. Medical Air Y-Fitting (x2)

(Fig. 2)

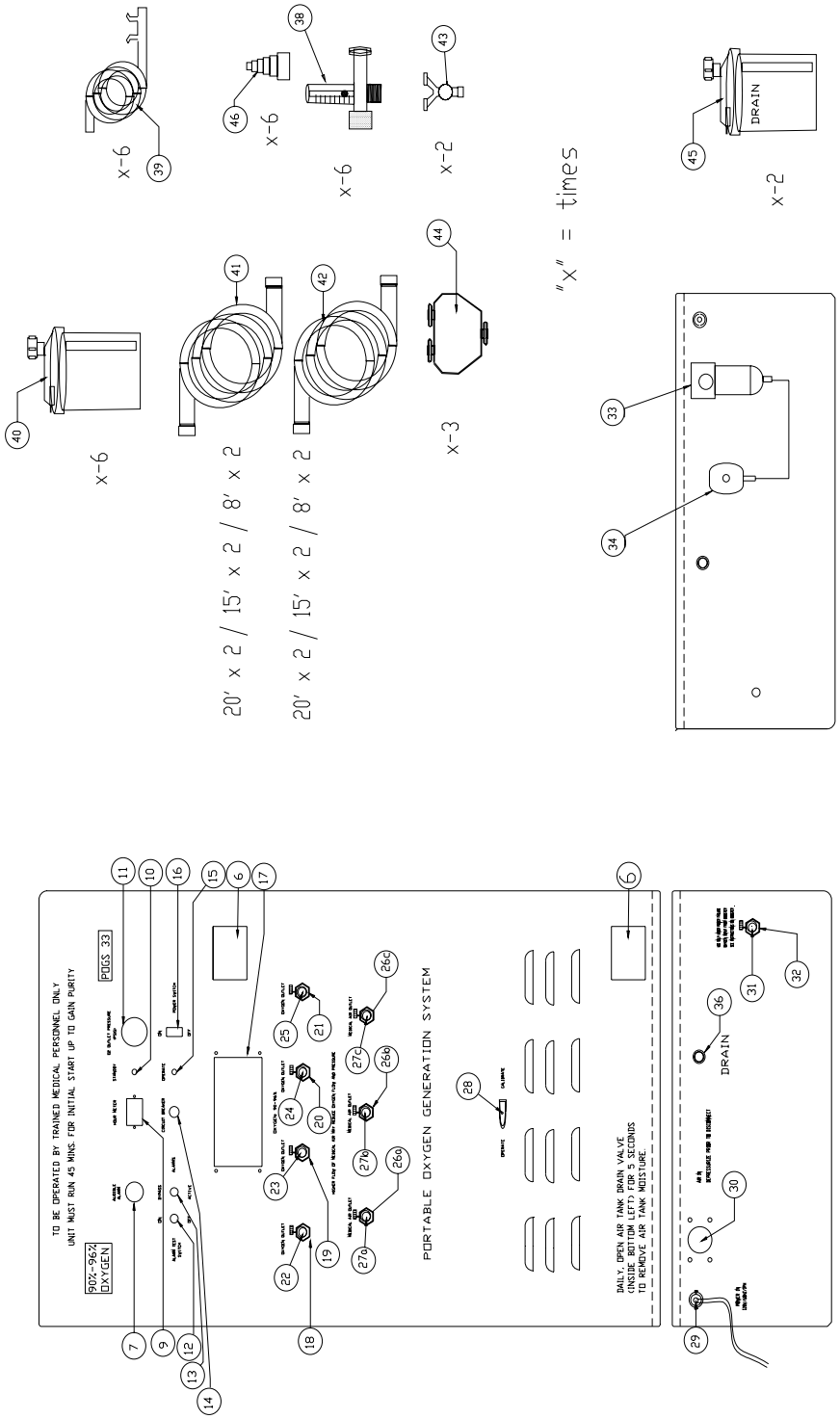


Figure 2
Generator Control Panel

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**(Fig. 2a)**

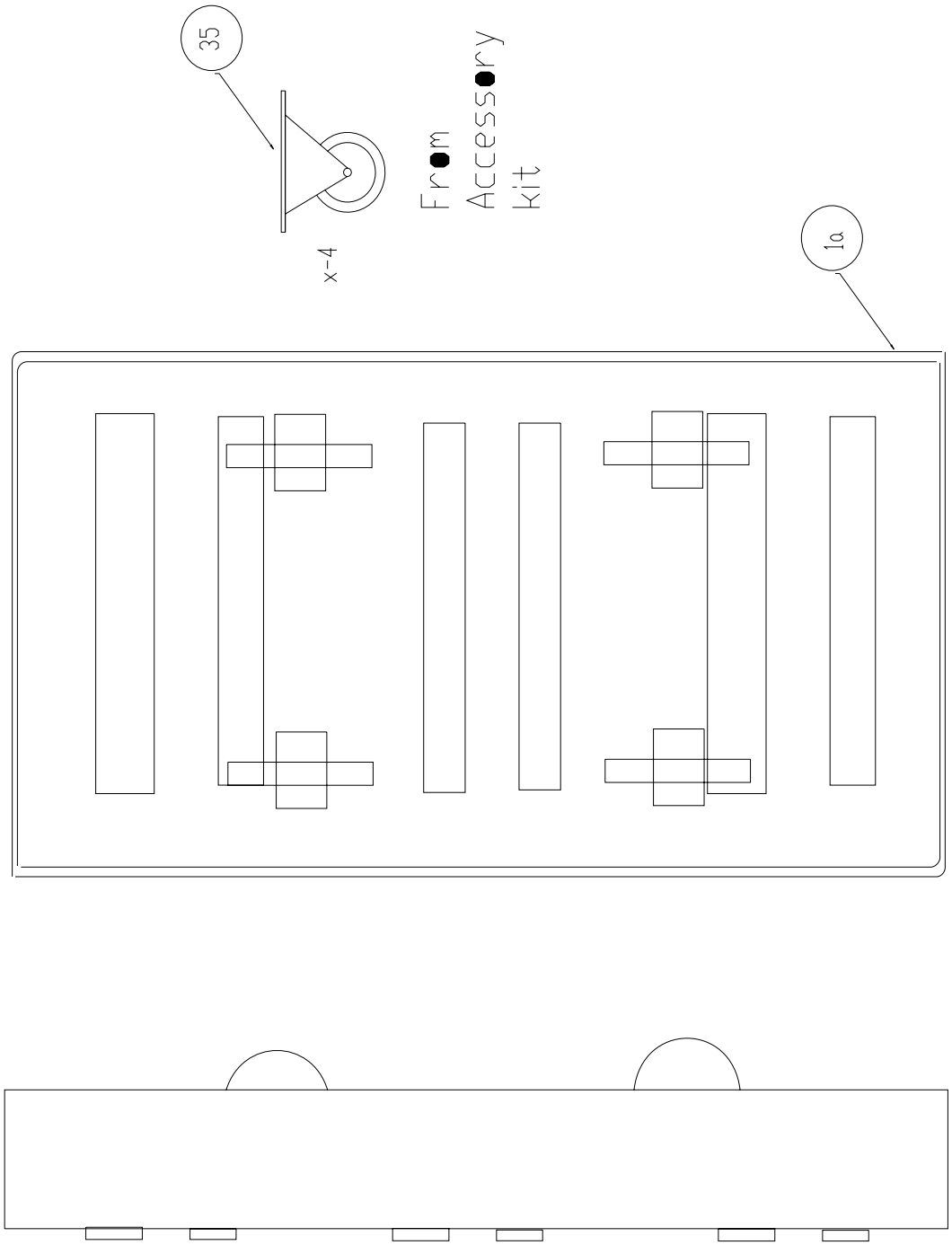



Figure 2a
Generator Dolly

### 7.2.10 Generator Interior (Fig. 3)

48. Air Tank (Blue)
49. Sieve Bed - Left (Black)
50. Sieve Bed - Right (Black)
51. Oxygen Receiver Tank (Green)
52. Air Tank Pressure Gauge
53. Air Saver Valve - Top
54. Inline Filters (x2)
55. Check Valves (x2)
56. Crossover Valve
57. Standby Mode Pressure Switch
58. Backup Oxygen Back-Flow Check Valve
59. Oxygen Tank Pressure Gauge
60. Purity Flow Valve
61. Oxygen Analyzer Sample Flow Valve
62. Oxygen Analyzer Sample Needle Valve
63. Oxygen Analyzer Sensor Block
64. Oxygen Analyzer Sensor Boot
65. Oxygen Analyzer Sensor
66. Oxygen Sensor Lead
67. Carbon Monoxide and Dew Point Monitor
68. Pilot Valves on Manifold for Main Valve Assy
69. Terminal Block
70. Timer Assembly
71. Timer Motor
72. Inline HEPA Filter (Medical Air)
73. Inline HEPA Filter Element (x2)
74. Medical Air Pressure Gauge
75. Medical Air Needle Valve
76. Exhaust Muffler(x4)
77. Main Valve Assembly
78. Not Used
79. Manual Condensate Drain Valve
80. Not used
81. Oxygen Outlet Pressure Regulator
82. Alarm Pressure Switch
83. Inline HEPA Filter (Oxygen)
84. Air Saver Valve – Bottom (Part of Main Valve Assy)
85. Air Receiver Relief Valve
86. Oxygen Receiver Relief Valve
87. Membrane Dryer
88. Medical Air Outlet Pressure Regulator

(Fig. 3)

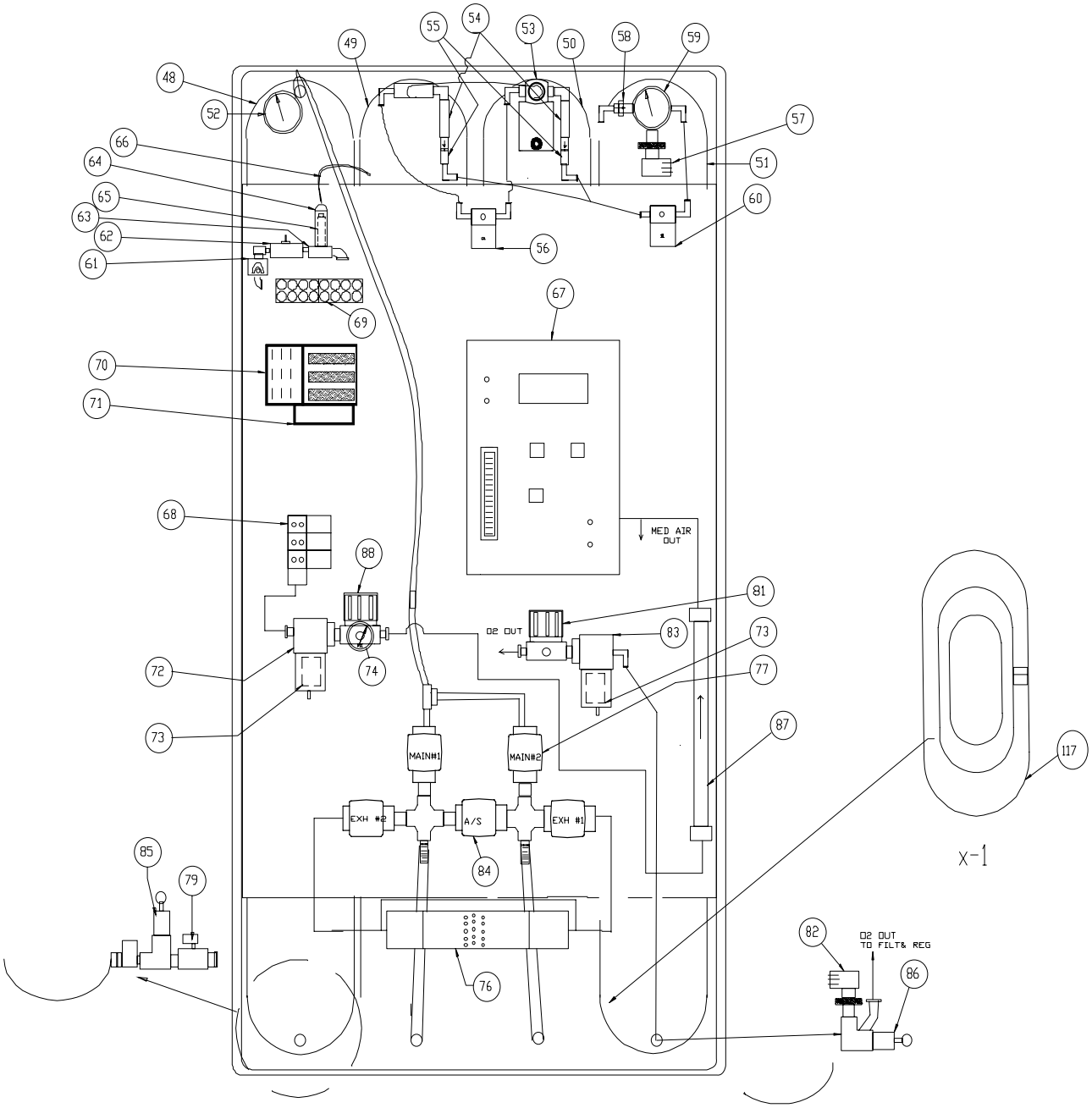



Figure 3
Generator Interior

### 7.2.11 Generator Accessory Storage within Exterior Cover (Fig. 4)

95. Accessory Storage Door
96. Accessory Storage Netting or Canvas (x2)

(Fig. 4)

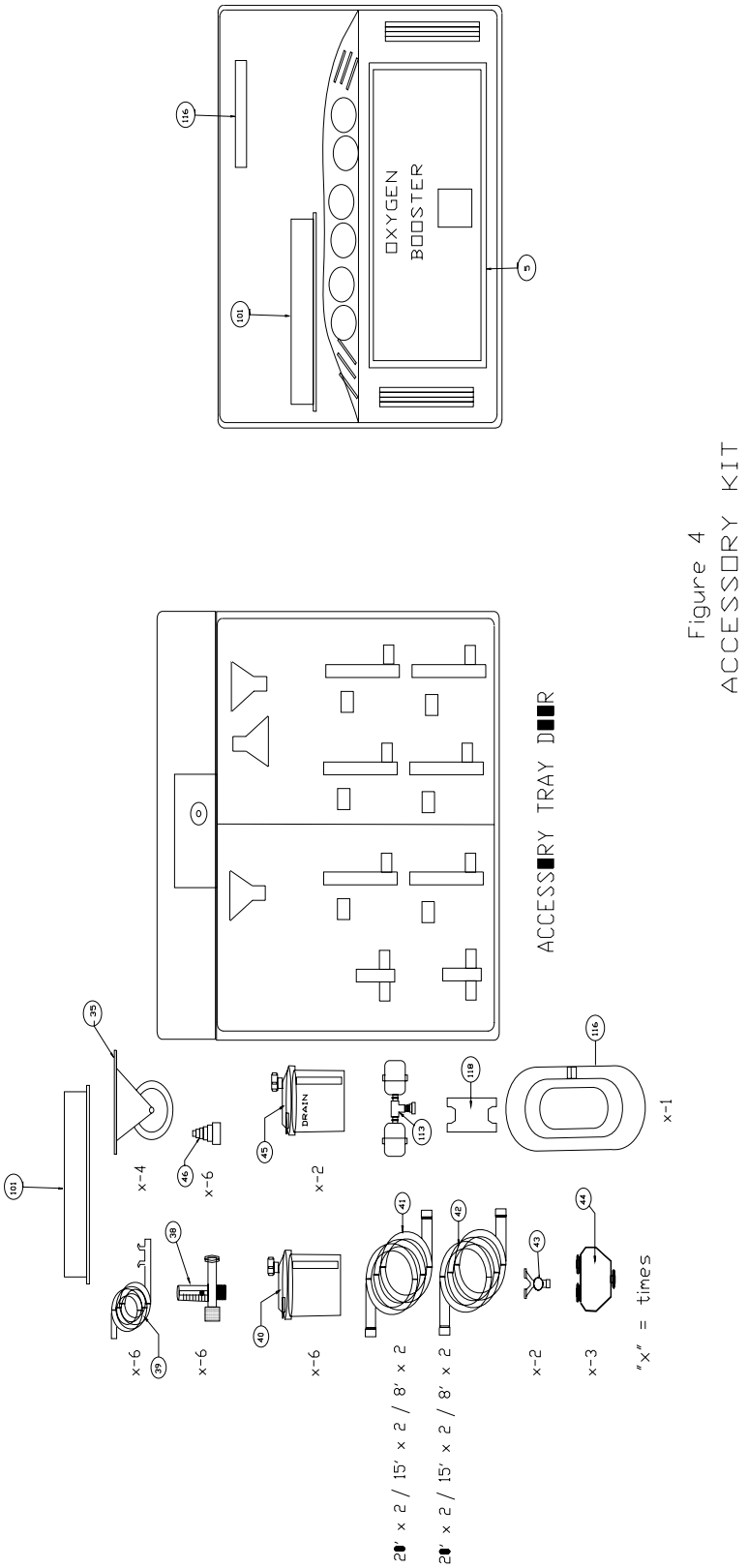



Figure 4
ACCESSORY KIT

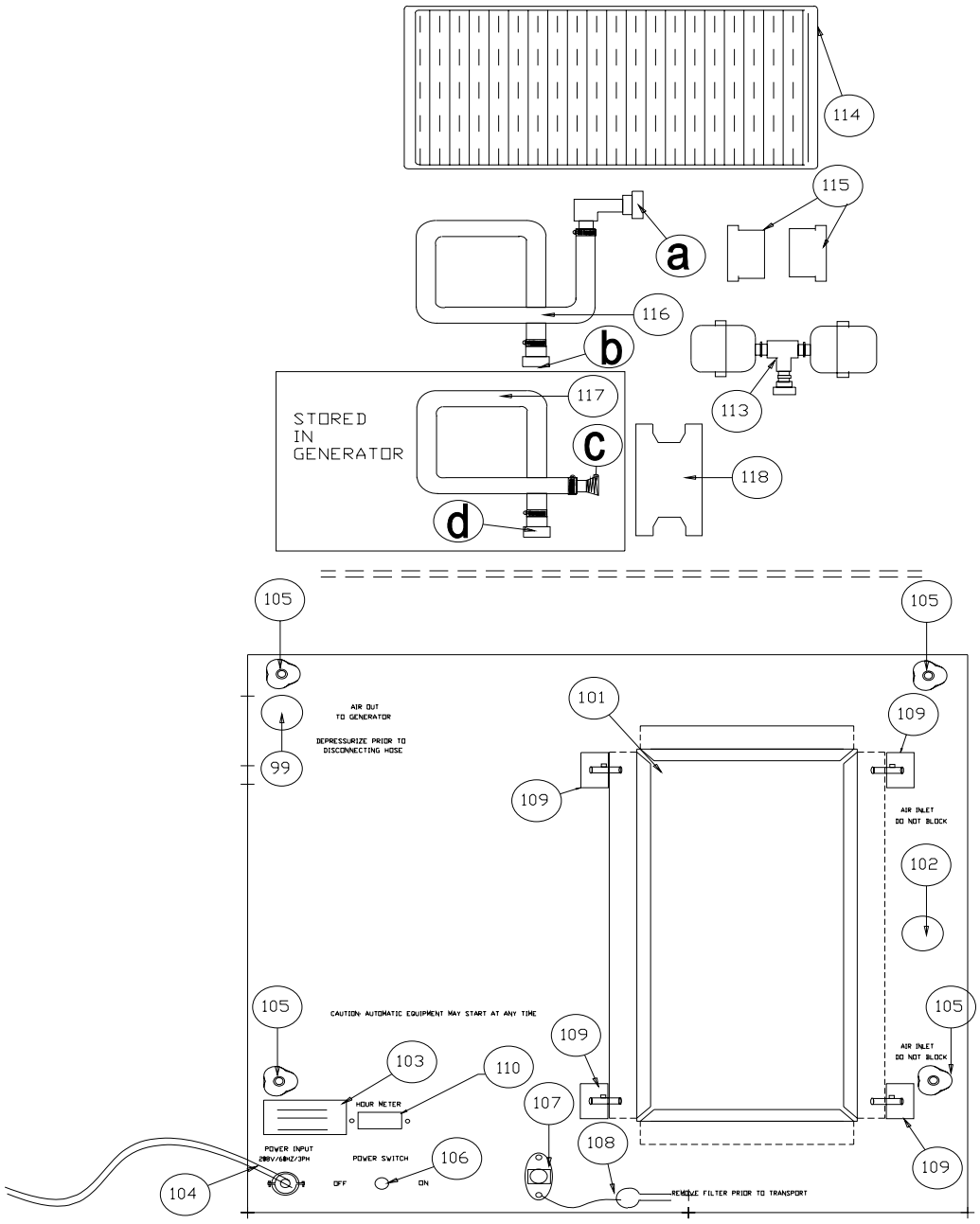
### 7.2.12 Compressor Interior Cover (Fig. 5)

99. Feed Air Outlet Port
100. Interior Compressor Cover Hinge
101. Top Cooling Air Inlet Rain Guard
102. Supply Air Input Port
103. Serial Number Label
104. Compressor Power Cord
105. Compressor Interior Cover Securing Knobs (x2)
106. Compressor Power Switch (ON/OFF)
107. Compressor Exterior Lid Support Base
108. Tethered Retaining Clip
109. Bolt Locks For Top Cooling Air Inlet Rain Guard (x4)

### 7.2.13 Compressor Accessories (Fig. 5)

113. Supply Air Input Filter Assembly
114. Top Cooling Air Inlet Filter Element
115. Supply Air Input Filter Elements (x2)
116. Feed Air Hose (Black) Compressor
    c) Feed Air Hose Compressor End
    d) Feed Air Hose Generator End
117. Remote Supply Air Input Hose (Black) (Feed Air Extension Hose)
    e) Remote Supply Air Hose Male End
    f) Remote Supply Air Hose Female End
118. Feed Air/Remote Supply Air Hose Wrench

(Fig. 5)




# Figure 5
# Compressor Interior Cover with Compressor Accessories Located in Accessory Case

### 7.2.14 Compressor Interior (Fig. 6)

121.
122.
123. Check Valve
124. Standby Pressure Switch bracket
125. Standby Pressure Switch
126. Auto Drain Valve
127. Auto Drain Regulator
128. Side Cooling Air Filter Element
129.
130. Compressor Starter Box
131. Starter Box Locking Screw
132. Compressor Starter Reset Button
133. Compressor Interior Cooling Fan
134. Heat Exchanger
135. Heat Exchanger Cooling Fan
136. Cooling Air Exhaust Foam Gasket
137. Compressor Motor
138. Scroll Compressor
139. Compressor Motor Pulley
140. Compressor Drive Belts (x2)
141. Scroll Compressor Pulley
142. Belt Guard

### 7.2.15 Compressor Starter Box Interior (Fig. 6)

148. Power Input Terminals (x3)
149. Heaters (x3)
150. Circuit Breaker
151. Circuit Breaker Current Adjustment
152. Circuit Breaker Manual/Auto Reset Switch
153. Circuit Breaker Reset Button
154. Power Output Terminals (x3)

(Fig. 6)

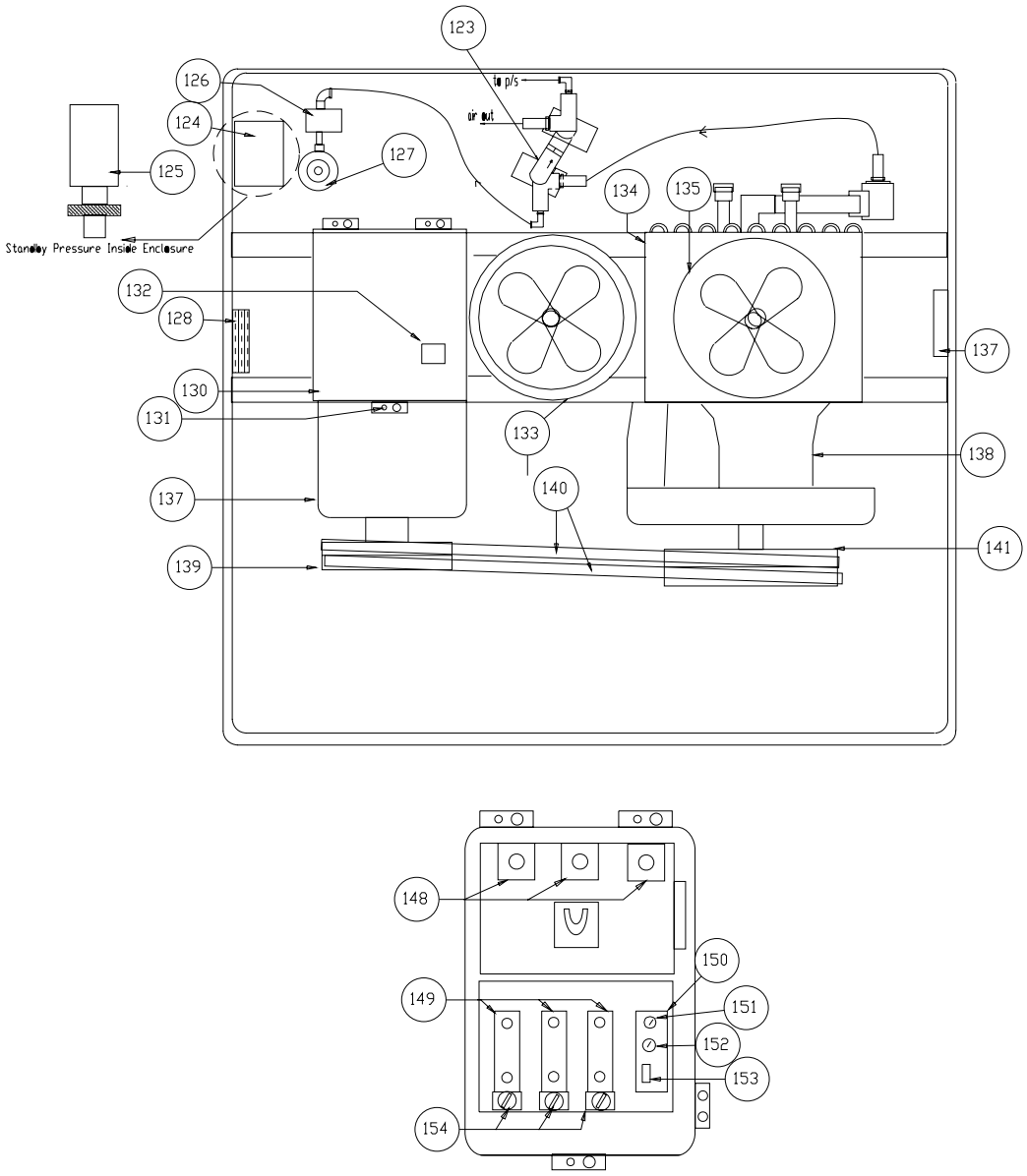



Figure 6
Compressor Interior
with
Compressor Starter Box Interior

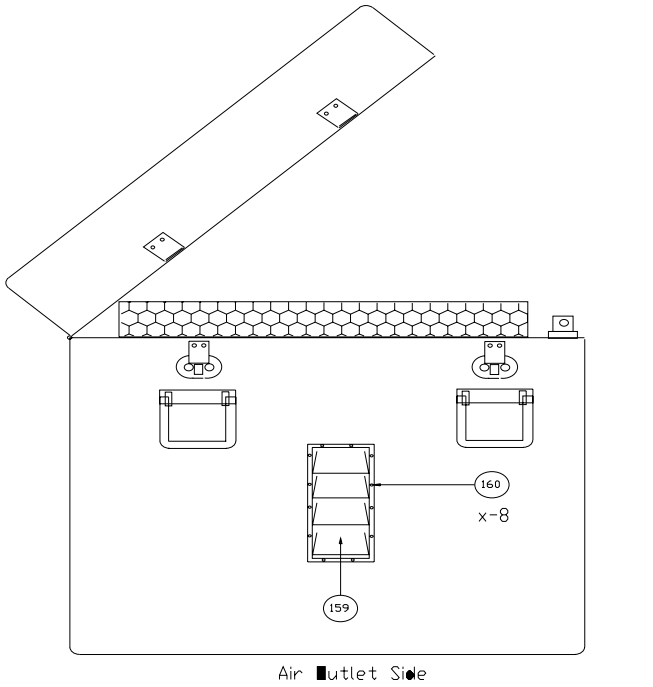
### 7.2.16 Compressor Exterior (Air Outlet Side) (Fig. 7)

159. Side Cooling Air Inlet Louver
160. Side Cooling Air Louver Rivets (x8)

### 7.2.17 Compressor Exterior (Supply Air Inlet Side) (Fig. 7)

162. Exterior Lid Support
163. Lid Support Adjustment Knob
164. Cooling Air Exhaust Louver
165. Cooling Air Exhaust Louver Rivets (x8)
166. Exterior Lid

(Fig. 7)



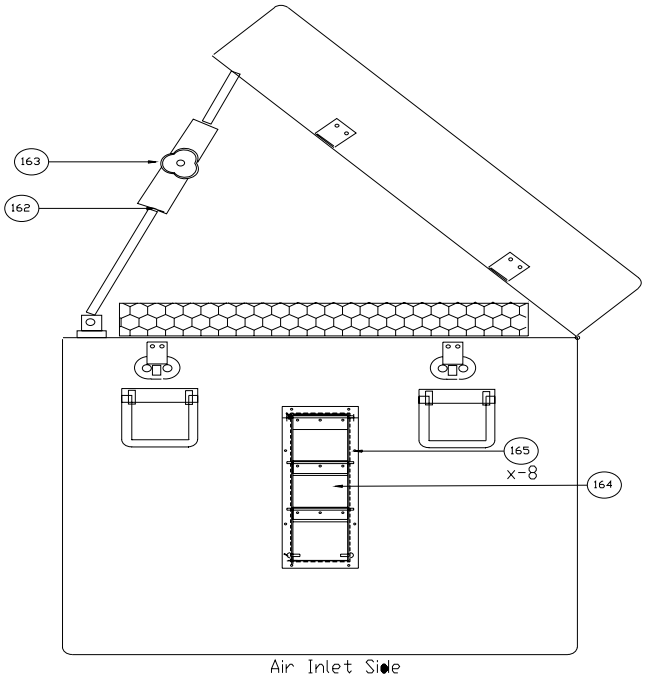




Figure 7

Compressor Exterior (Air Outlet Side)
with
Compressor Exterior (Air Inlet Side)

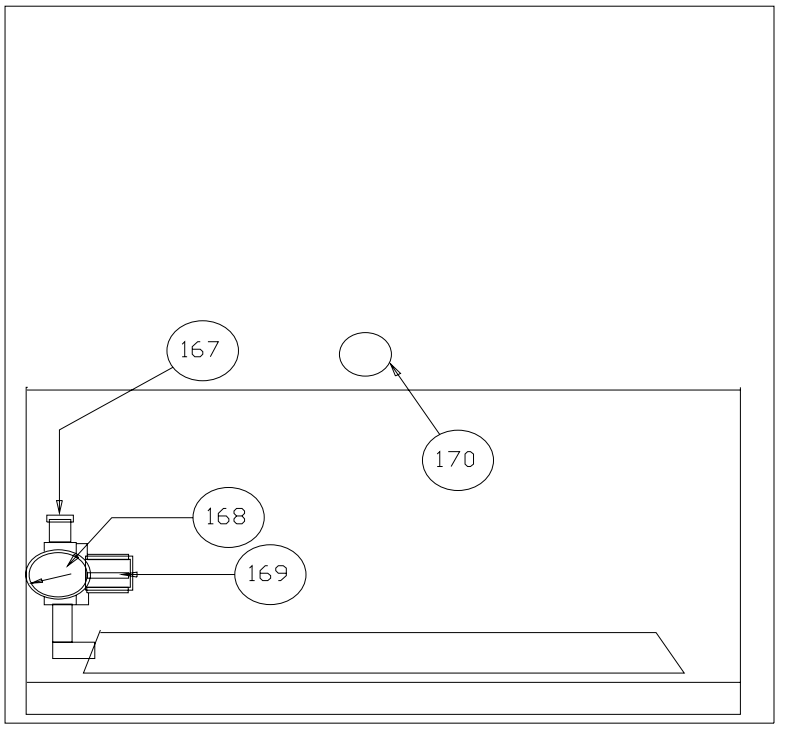
### 7.2.18 Microboost – Rear (Fig. 8)

167. Oxygen Inlet Port
168. Oxygen Inlet Pressure Gauge
169. Oxygen Inlet Pressure Regulator
170. Lid stop

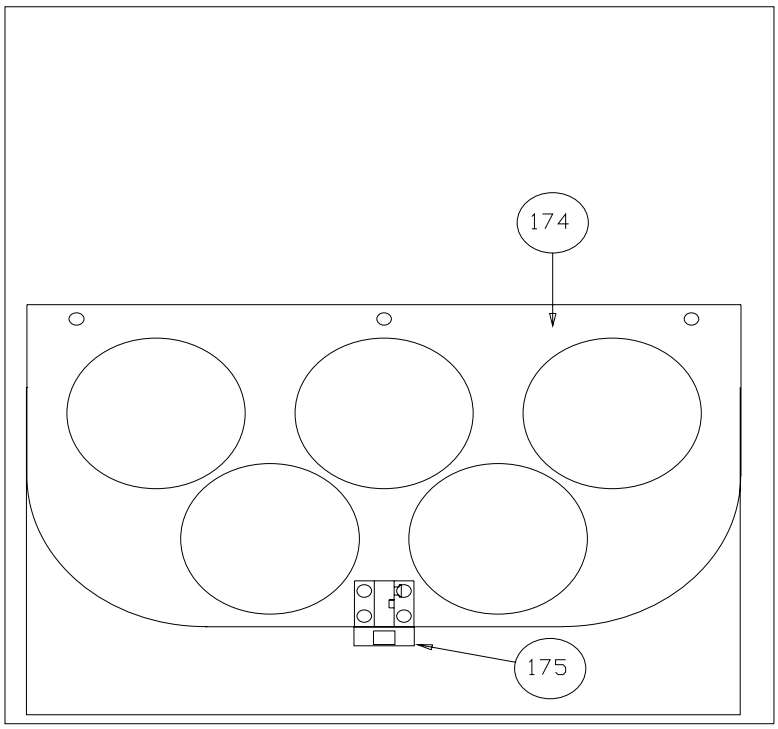
### 7.2.19 Microboost – Front (Fig. 8)

174. D/E or H Oxygen Cylinder Support Assembly
175. Bolt Lock

(Fig. 8)




Rear



### 7.2.20 Microboost – Right (Fig. 9)

179. Start Button
180. Power Switch

### 7.2.21 Microboost – Left (Fig. 9)

184. Power Cord
185. Circuit Breaker Reset [Button]

(Fig. 9)

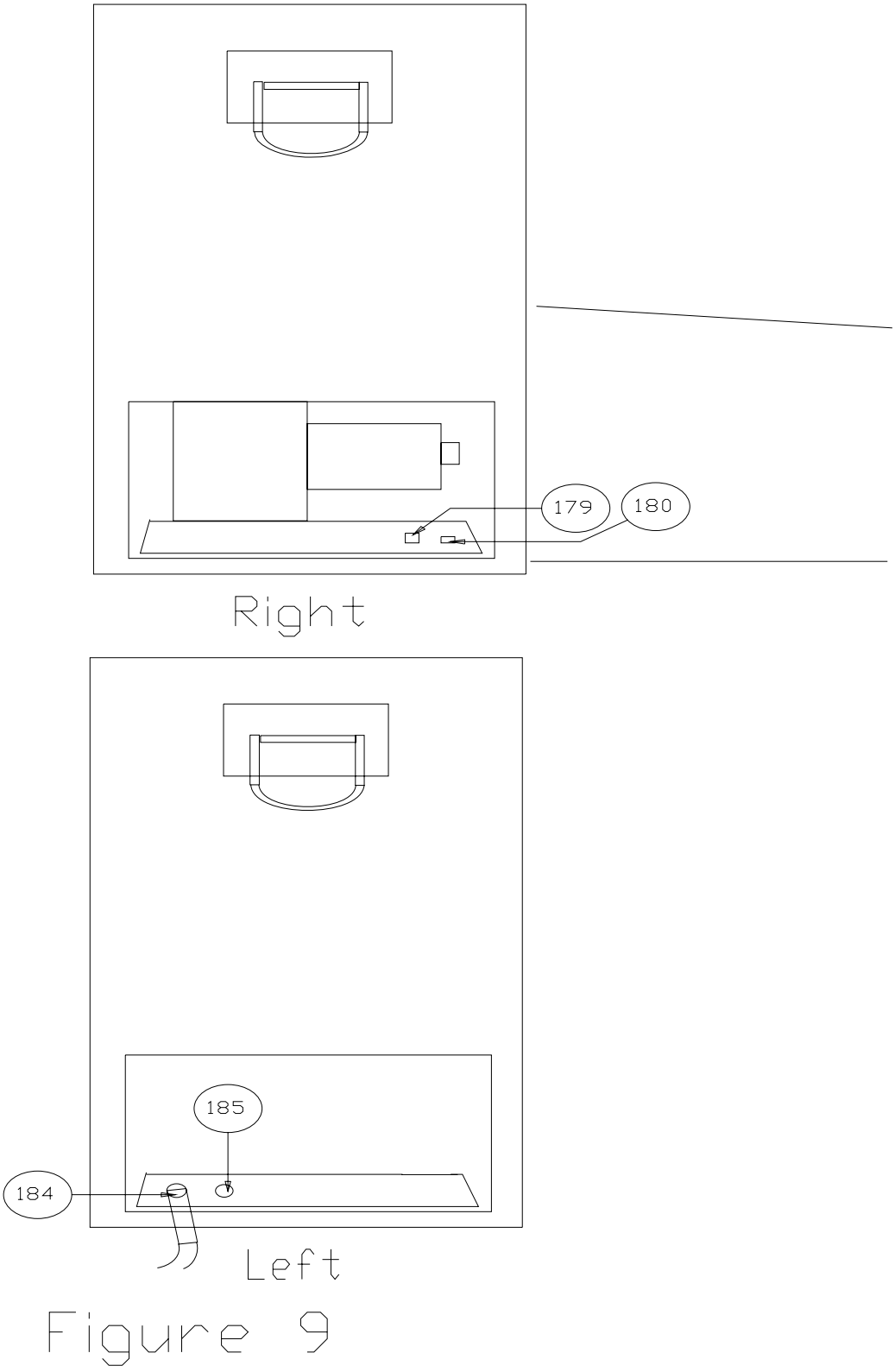
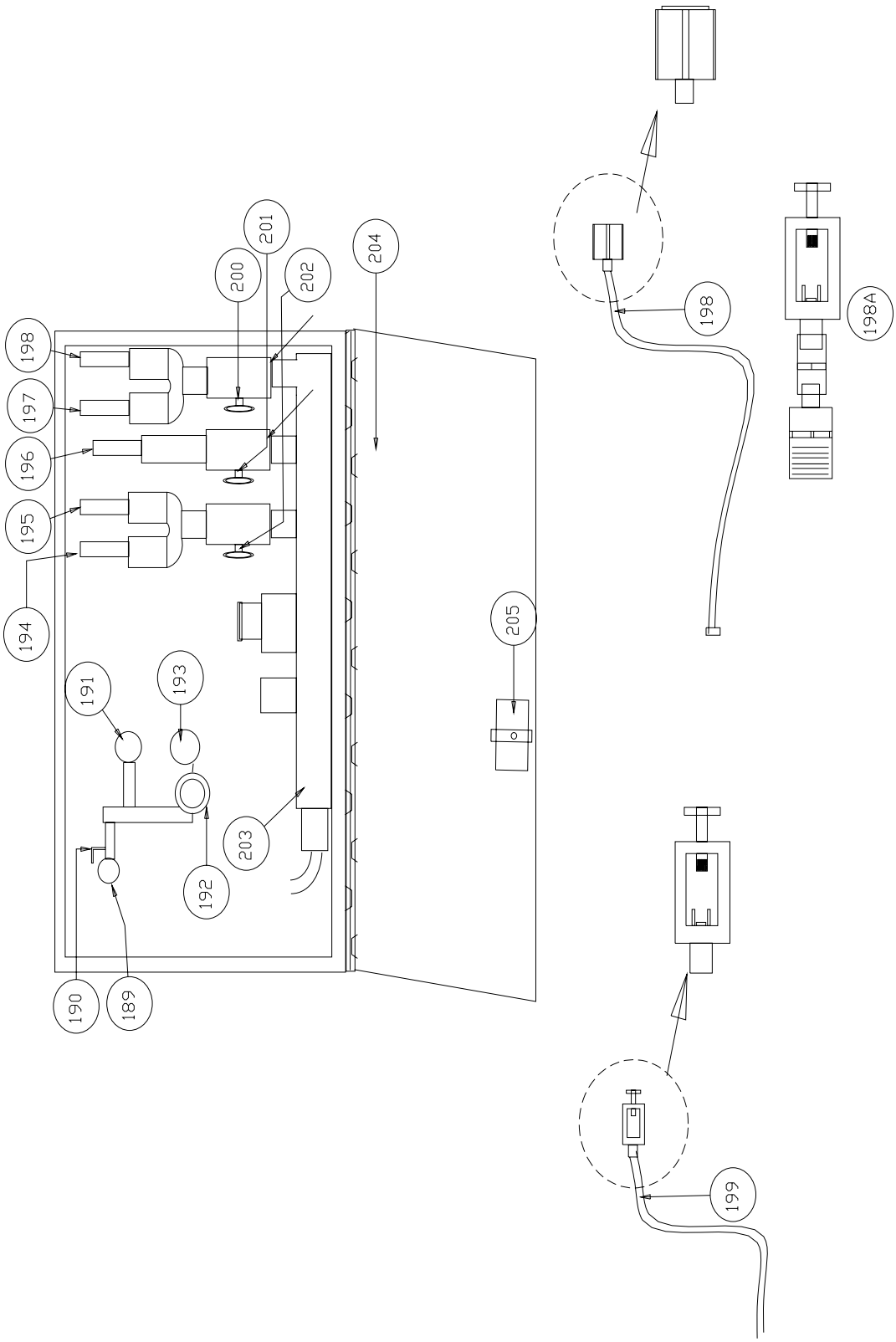



Figure 9

### 7.2.22 Microboost Top (Fig. 10)

189. Backup Oxygen Outlet Port
190. Backup Oxygen Outlet Valve
191. Backup Oxygen Outlet Pressure Gauge
192. Backup Oxygen Outlet Pressure Regulator
193. High Pressure Manifold Pressure Gauge
194. High Pressure Pigtails for D/E Cylinders
195. High Pressure Pigtails for D/E Cylinders
196. High Pressure Pigtails for D/E Cylinders
197. High Pressure Pigtails for D/E Cylinders
198. High Pressure Pigtails for H or D/E Cylinders
199. Accessory High Pressure Pigtail for H/K Cylinders
200. Needle Valve
201. Needle Valve
202. Needle Valve
203. High Pressure Manifold
204. Microboost Lid
205. Lid Latch

(Fig. 10)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### 7.2.23 HV Booster Interior – Manifold Side (Fig. 11)

209. High Pressure Manifold
210. Needle Valve
211. Needle Valve
212. Needle Valve
213. High Pressure Manifold Pressure Gauge
214. Backup Oxygen Outlet Pressure Regulator
215. Backup Oxygen Outlet Pressure Gauge
216. Backup Oxygen Outlet Valve
217. Backup Oxygen Outlet Port
218. High Pressure Pigtails for H/K Cylinders
219. High Pressure Pigtails for H/K Cylinders
220. High Pressure Pigtails for H/K Cylinders
221. High Pressure Pigtails for H/K Cylinders
222. High Pressure Pigtails for H/K Cylinders
223. Accessory Storage Tray
224. Accessory High Pressure Pigtail For D/E Cylinders
225. Dual Oxygen Inlet Ports (x2)
226. Dual Oxygen Inlet Pressure Regulator
227. Dual Oxygen Inlet Pressure Gauge
228. Dual/Single Oxygen Inlet (Valve Handle)
229. Single Oxygen Inlet Pressure Regulator
230. Single Oxygen Inlet Pressure Gauge
231. Single Oxygen Inlet Port
232. Quick Reference Card (Specifications, Backup Oxygen, Cylinder Connectors)
233. High Pressure Cylinder Yoke

(Fig. 11)

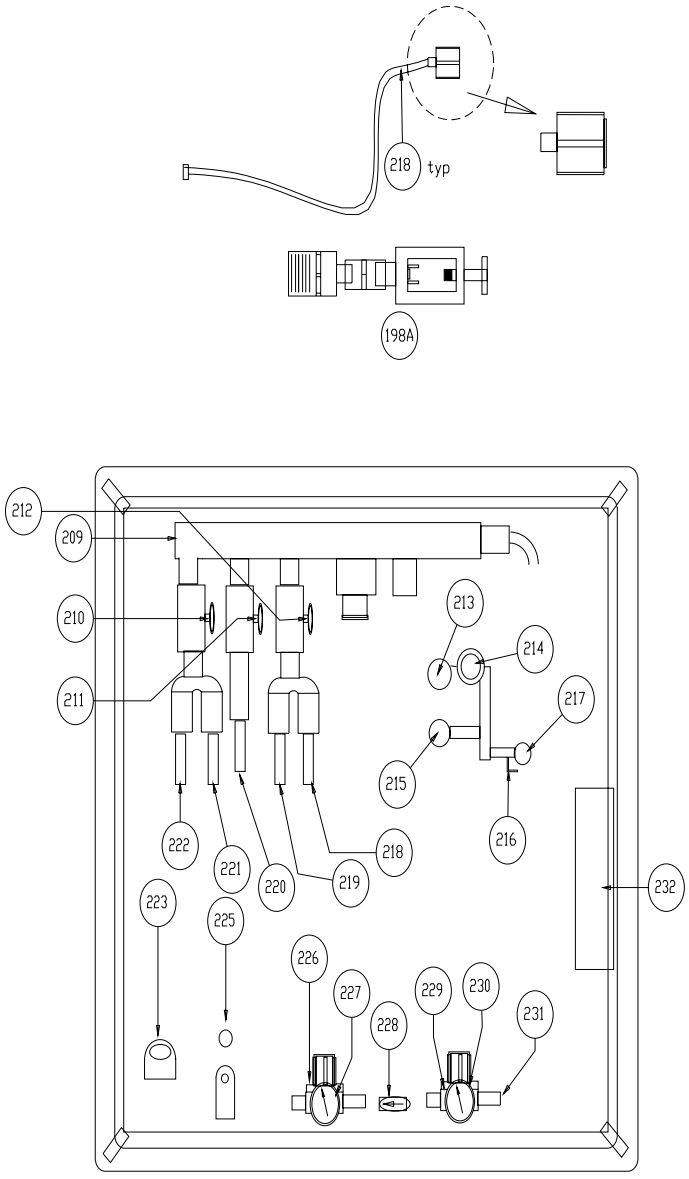


Figure 11

### 7.2.24 HV Booster Interior – Control Panel Side (Fig. 12)

237. 1st Stage Pressure Gauge
238. 2nd Stage Pressure Gauge
239. 3rd Stage Pressure Gauge
240. Control Panel
241. Power Cord
242. Power Switch
243. Manual/Automatic Switch
244. Circuit Breaker Reset [Button]
245. Indicator Lamp
246. Hour Meter

(fig. 12)

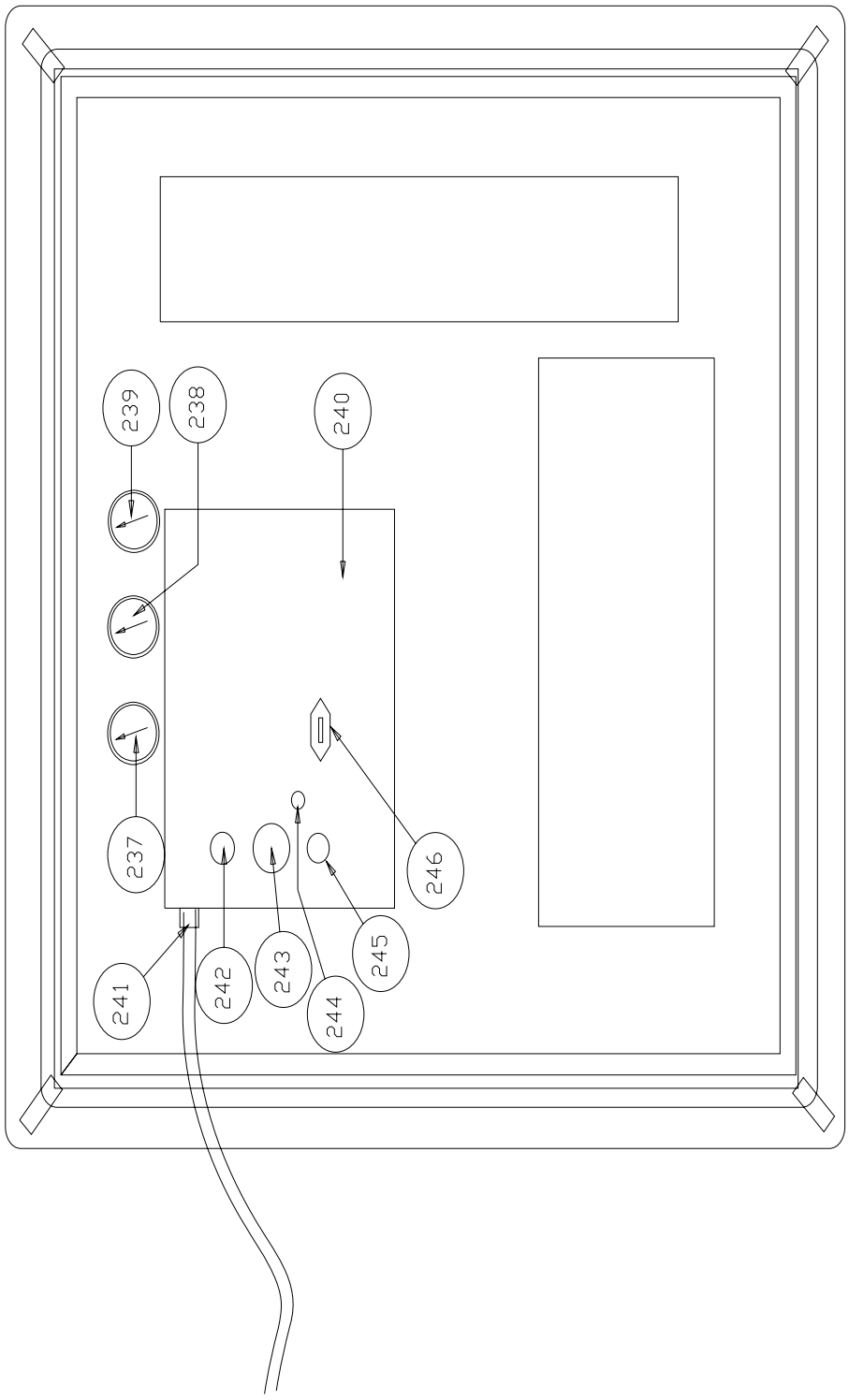


Figure 12

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# 8 Feed Air Compressor and Generator Startup Procedures

## 8.1 Feed Air Compressor and Generator Location

**IMPORTANT**

**The Generator (Fig 1.1), Microboost (Fig 1.3), and HV Booster (Fig 1.4) are designed only for indoor operation, protected from the elements.**

**IMPORTANT**

**Feed Air Compressor (Fig 1.2) location is essential to prevent overheating. Ideally, the Feed Air Compressor (Fig 1.2) should be located indoors. Although the it is designed to operate in mild inclement weather, if outdoor location is required, the location must provide protection from severe weather (heavy precipitation, blowing sand, etc). Protection from direct sunlight should be provided to maintain ambient temperature under 120ºF/48ºC. Failure to protect the Feed Air Compressor (Fig 1.2) from excessive heat will cause overheating and eventual failure of the Feed Air Compressor (Fig 1.2). When positioning the Feed Air Compressor (Fig 1.2), provide at least (12) twelve inches clearance for the Side Cooling Air Inlet Louvers (non-moving) and at least (24) twenty-four inches for the Cooling Air Exhaust Louvers (hinged). Failure to leave proper clearance may result in overheating and eventual failure of the Feed Air Compressor (Fig 1.2).**

**WARNING**

**The Supply Air Filter Assembly (Fig 5.113) must be located at least 50 feet from any sources of Carbon Monoxide. Sources of Carbon Monoxide include vehicles, generators, heaters, stoves, and any equipment containing an internal combustion engine. If the Feed Air Compressor (Fig 1.2) is located in an area that may contain Carbon Monoxide, the Remote Supply Air Hose (Fig 5.117) must be utilized to locate the Supply Air Filter Assembly (Fig 5.113) in a clean air environment.**

**NOTE**

**The POGS 33 is to be operated by trained medical personnel only**

## 8.2 Initial Startup

### 8.2.1 Definition

The Initial Startup Procedure is to be used when the POGS 33 is first received, or after the Storage and/or Shipping Shutdown procedure has been performed.

### 8.2.2 Installation and Inspection

**a)** Unlock seven (7) latches on the exterior of the Feed Air Compressor (Fig 1.2) case and Accessory – Microboost box.

**b)** Open the Exterior Lid (Fig 7.166) fully on both.

**c)** Open the Compressor Interior Cover (Fig 5) by removing the four (4) Securing Knobs (Fig 5.105) and lifting the cover. Verify the area is free and clear of debris and foreign material. Close the Compressor Interior Cover (Fig 5) and secure using the Securing Knobs (Fig 5.105).

**d)** Remove the Feed Air Hose (Black Hose) (Fig 5.116), Remote Supply Air Hose (Fig 5.117), Rain Guard (Fig 5.101), Supply Air Filter Assembly (Fig 5.113), and Cooling Air Filter Element (Fig 5.114)from the Accessory – Microboost Box. Place Filter in Cover Filter Bay with the arrows on the filter pointing down. Place Rain Guard (Fig 5.101) on the Cover over the filter and filter bay, securing in place by using the 4 sliding bolt lock assemblies (Fig 5.109). Ensure bolt locks are firmly in place and locked.

**CAUTION**

**Inspect the Feed Air Hose (Fig 5.116) and Remote Supply Air Hose (Fig 5.117) for any cuts or abrasions that may cause leaks or dangerous operating conditions. Replace as necessary.**

**e)** Verify the Supply Air Filter Assembly (Fig 5.113) and Top Cooling Air Inlet Filter are installed.

**f)** Remove the Generator Exterior Cover by unlocking fourteen (14) latches on the case and lifting the cover upwards. Set cover aside until needed. Unpack and inventory the accessories located in the Accessory - Microboost Box. A list of included accessories is shown on (Fig 4)

**g)** Stand the Generator (Fig 1.1) upright (minimum 4 people) orientating it so the Feed Air Inlet Port and Backup Oxygen Inlet Port are at the bottom.

**h)** Open the Generator Control Panel (Fig 2) by pulling on the Latches (Fig 2.6). Check for any foreign object or debris and

inspect wiring to verify no wires or connections have come loose and/or become damaged.

**NOTE**

**If any damage has occurred to the wiring a qualified electrician must repair the Generator (Fig 1.1) before further operation.**

**i)** Close the Generator Control Panel (Fig 2), ensuring that the Latches (Fig 2.6) engage.

**j)** The included Velcro Strap (Fig 3.80) located at the bottom left of the Generator (Fig 3) should secure the Condensate Drain Bottle (Fig 3.78). The Condensate Drain Bottle (Fig 3.78) should be connected to the Manual Condensate Drain Valve (Fig 3.79), located at the bottom of the Air Receiver (Fig 3.48) with the included 5/32" tubing, and the Manual Condensate Drain Valve (Fig 3.79) should be closed (9:00 position)

**NOTE**

**Verify power requirements of the Feed Air Compressor (Fig 1.2) match the power availability. Power requirements for the Feed Air Compressor (Fig 1.2) are indicated on the Serial Number Label (Fig 5.103) affixed to the Compressor Interior Cover (Fig 5). Verify capabilities are met to connect the Feed Air Compressor (Fig 1.2) to the power source. The Compressor Power Cord (Fig 5.104) must mate with power source connector. If any of these conditions are not met, consult a qualified electrician.**

**NOTE**

**Verification of Compressor (Fig 6.138) rotation is only required for Three Phase Feed Air Compressors. For (1) single Phase Feed Air Compressors, proceed to section (9.2.4).**

### 8.2.3 Verify Proper Compressor Rotation

**a)** Verify the Compressor Power Switch (Fig 5.106) on the Compressor Interior Cover (Fig 5) is in the "OFF" position.

**b)** Verify that no hoses are connected to the Feed Air Compressor (Fig 1.2).

**c)** Connect the Compressor Power Cord (Fig 5.104) to the power source.

**d)** Momentarily apply power to the Feed Air Compressor (Fig 1.2) with the Compressor Power Switch (Fig 5.106), while holding your hand 2-4 inches above the Feed Air Outlet Port (Fig 5.99). A strong stream of air exiting the Feed Air Outlet Port (Fig 5.99) indicates proper rotation.

**NOTE**

**If suction is observed at the Feed Air Outlet Port (Fig 5.99), rotation is not correct. A qualified electrician should perform the following procedure. If rotation is correct, proceed to section (9.2.4).**

**CAUTION**

**A small amount of residual voltage may remain in the Feed Air Compressor (Fig 1.2) (Fig 1.2) electrics after disconnecting power. Discharge any residual voltage from the Feed Air Compressor by shorting the plug pins to each other with an insulated screwdriver.**

**e)** Disconnect the Feed Air Compressor (Fig 1.2) from the power source.

**f)** Open the Compressor Interior Cover (Fig 5) by removing the four (4) Securing Knobs (Fig 5.105) and lifting the cover.

**g)** Open the Starter Box (Fig 6.130) (Fig 6.130) by turning the Starter Box Locking Screw (Fig 6.131) ½ turn counter-clockwise.

**h)** Remove the cover of the Starter Box (Fig 6.130) (Fig 6.130) and set aside.

**i)** Locate the large gauge red and black wires connected to the Power Input Terminals (Fig 6.148) at the rear of the Starter Box (Fig 6.130) (Fig 6.130). Loosen the securing screws that correspond to the red and black large gauge wires, and reverse the red and black large gauge wires, being careful not to disturb the smaller gauge wires. Tighten the securing screws.

**j)** Replace the Starter Box (Fig 6.130) cover, and secure by turning the Starter Box Locking Screw (Fig 6.131) ½ turn clockwise.

**k)** Close the Compressor Interior Cover (Fig 5) and secure using the four (4) Securing Knobs (Fig 5.105).

**l)** Repeat the steps at the beginning of section (9.2.3) to verify proper rotation.

### 8.2.4 Hose Connection for the Feed Air Compressor and Generator

**NOTE**

**The Feed Air Hose (Fig 5.116) must be positioned with the hose perpendicular to the Cover Hinge (Fig 5.100) to allow proper positioning of the Exterior Lid (Fig 7.166)**

**a)** Connect the Feed Air Hose (Fig 5.116) Compressor End to the Feed Air Outlet Port (Fig 5.99) on the Compressor Interior

Cover (Fig 5) and the Generator End to the Generator Feed Air Inlet Port. If the distance between the Feed Air Compressor (Fig 1.2) and Generator (Fig 1.1) is more than 15 feet, the Remote Supply Air Hose (Fig 5.117) may be used as an extension as described in the next step.

**b)** Use of the Remote Supply Air Hose (Fig 5.117) is optional. It has two (2) possible configurations:

- Remote Air Supply: The Remote Supply Air Hose Male End (Fig 5.117a) is connected to the Supply Air Inlet Port (Fig 5.102), with the Supply Air Filter Assembly (Fig 5.113) connected to the Remote Supply Air Hose Female End (Fig 5.117b). The Supply Air Filter Assembly (Fig 5.113) should be placed in a clean air environment.
- Extended Distance between Feed Air Compressor (Fig 1.2) and Generator (Fig 1.1): The Remote Supply Air Hose Female End (Fig 5.117b) is connected to the Feed Air Hose Generator End (Fig 5.116b). The Remote Air Supply Hose Male End (Fig 5.117a) is connected to the Feed Air Inlet Port (Fig 2.30) on the Generator Control Panel (Fig 2). This configuration allows a distance of up to 30 feet between the Feed Air Compressor (Fig 1.2) and the Generator (Fig 1.1).

**c)** Tighten all hose connections using Air Hose Wrench.

### 8.2.5 Preparing the POGS 33 for Oxygen Production

**a)** Connect the Compressor Power Cord (Fig 5.104) to the power source.

**b)** Change the Compressor Power Switch (Fig 5.106) located on the Compressor Interior Cover (Fig 5) to the (ON) position. Allow the Feed Air Compressor (Fig 1.2) to operate until it reaches standby mode (at approximately 110 PSIG the Feed Air Compressor (Fig 1.2) will shut down). Standby pressure may be verified by inspecting the Air Receiver (Fig 3.48) Pressure Gauge in the Generator Interior (Fig 3) at the top of the Air Receiver (Fig 3.48).

**c)** It is normal for the Feed Air Compressor (Fig 1.2) to cycle several times between standby mode and operate mode until pressure is balanced between the Generator (Fig 1.1) and the Feed Air Compressor (Fig 1.2). If the Feed Air Compressor (Fig 1.2) cycles more than 2-4 times, check all connections between the Feed Air Compressor (Fig 1.2) and the Generator (Fig 1.1) for leaks and repair as necessary.

**CAUTION**

**Perform another inspection of the Feed Air Hose (Fig 5.116) and Remote Supply Air Hose (Fig 5.117) for any cuts or abrasions that may cause leaks or dangerous operating conditions. Replace as necessary. Prior to disconnecting any hoses between the Feed Air Compressor (Fig 1.2) and the Generator (Fig 1.1), the Feed Air Compressor (Fig 1.2) should be turned off and the system depressurized by opening the Manual Condensate Drain Valve (Fig 3.79) located in the Generator Interior (Fig 3) at the bottom of the Air Receiver (Fig 3.48).**

**d)** Secure the Exterior Lid Support (Fig 5.162) to the Exterior Lid Support Base (Fig 5.107) on the Compressor Interior Cover (Fig 5) using the Tethered Retaining Clip (Fig 5.108). The Exterior Lid Support (Fig 5.162) is adjustable for varying weather conditions. During adverse conditions (dust, rain, snow), the support should be adjusted to minimize entry of rain, snow, sand, etc. The support should be in the fully raised position during fair weather conditions

**NOTE**

**Verify power requirements of the Generator (Fig 1.1) match the power availability. The Generator (Fig 1.1) is designed to operate on 110 Volts/ 60 Hertz/ Single Phase. Verify capabilities are met to connect the Feed Air Compressor (Fig 1.2) to the power source. The Generator Power Cord (Fig 2.29) must mate with power source connector. If any of these conditions are not met, consult a qualified electrician.**

**e)** Verify the (3)Medical Air Outlet Valves and all (4) Oxygen Outlet Valves on the Generator Control Panel (Fig 2) are in the closed position (9:00 position).

**f)** Verify the Operate/Calibrate [Valve Handle] (Fig 2.28) is pointing to the (OPERATE) position.

**g)** Verify the Power Switch (Fig 2.16), Alarm Test Switch (Fig 2.12), and Power [Bypass Switch] positions on the Generator Control Panel (Fig 2). The Power Switch (Fig 2.16) and the Alarm Test Switch (Fig 2.12) should be in the (OFF) position and the Alarm Bypass Switch (Fig 2.13) should be in the BYPASS position.

**h)** Plug the Generator Power Cord (Fig 2.29) into the power source.

**i)** Change the Power Switch (Fig 2.16) on the Generator Control Panel (Fig 2) to the (ON) position

**j)** The Generator (Fig 1.1) will run until Oxygen Receiver (Fig 3.51) pressure reaches approximately 70 PSIG, at which point the Generator (Fig 1.1) will switch to standby mode, indicated

by the illumination of the Standby [Indicator] on the Generator Control Panel (Fig 2). The Generator (Fig 1.1) should reach standby mode within 5 minutes. Oxygen Receiver (Fig 3.51) pressure may be verified by inspecting the Oxygen Receiver Pressure Gauge (Fig 3.59) in the Generator Interior (Fig 3) at the top of the Oxygen Receiver (Fig 3.51).

**NOTE**

**At altitudes of 5000 FT or above, the Generator (Fig 1.1) may not switch to standby mode. As altitude increases, the pressure, flow, and purity may decrease as volume of oxygen and air per cubic foot decreases. If the Generator (Fig 1.1) does not switch to standby mode within 5 minutes, and no oxygen leaks are observed, proceed to section (9.2.6).**

**NOTE**

**The Generator (Fig 1.1) is shipped from the manufacturer in Equalized Mode with zero pressure in Oxygen Receiver (Fig 3.51).**

### 8.2.6 Purge Low Pressure Oxygen Receiver

**a)** Install one or more of the Oxygen Flowmeters to the Oxygen Outlet Ports (Fig 2.22-25) on the Generator Control Panel (Fig 2). Fully open the corresponding Oxygen Outlet Valve (6:00 position) and adjust the Oxygen Flowmeters for a combined flow of 15-20 LPM.

**b)** Continue to flow 15-20 LPM until 90% oxygen concentration is achieved as indicated on the Oxygen Analyzer (Fig 2.17). 90% oxygen concentration will be achieved within 45-60 minutes.

**c)** Once 90% oxygen concentration is achieved, the Alarm Bypass Switch (Fig 2.13) should be changed to the ACTIVE position.

**d)** The Oxygen Flowmeters and Oxygen Outlet Valves should be closed (9:00 position) until oxygen flow is needed.

**e)** After successful completion of the Startup procedure, refer to section (10) for oxygen delivery configurations.

**NOTE**

**The Manual Condensate Drain Valve (Fig 3.79) at the bottom of the Air Receiver (Fig 3.48) in the Generator Interior (Fig 3) should be opened slowly, at least once a day, and left open until** water **no longer drains from the Air Receiver (Fig 3.48). More frequent draining may be necessary in hot and/or humid climates. The Condensate Drain Bottle (Fig 3.78) should be disconnected, emptied, and re-installed as necessary.**

## 8.3 Normal Startup

### 8.3.1 Definition

The Normal Startup procedure assumes that the POGS 33 has had no configuration changes made since the Initial Startup procedure was performed. It is also assumed that the POGS 33 has been shut down according to the Normal Shutdown procedure. Configuration changes include changes in hose connection between the Feed Air Compressor (Fig 1.2) and Generator (Fig 1.1), and change of power source. Configuration changes to accessories connected to the Oxygen Outlet Ports (Fig 2.22-25) do not prevent using the Normal Startup procedure.

**CAUTION!**

**Perform an inspection of the Feed Air Hose (Fig 5.116) and Remote Supply Air Hose (Fig 5.117) for any cuts or abrasions that may cause leaks or dangerous operating conditions. Replace as necessary. Prior to disconnecting any hoses between the Feed Air Compressor (Fig 1.2) and the Generator (Fig 1.1), the Feed Air Compressor (Fig 1.2) should be turned off, disconnected from power source, and the system depressurized by opening the Manual Condensate Drain Valve (Fig 3.79) located in the Generator (Fig 3) at the bottom of the Air Receiver (Fig 3.48).**

### 8.3.2 Visual Inspection

**a)** Open the Exterior Lid (Fig 7.166) fully.

**b)** Verify the Supply Air Filter Assembly (Fig 5.113) and Top Cooling Air Inlet Filter are installed.

**c)** If necessary, empty the Condensate Drain Bottle (Fig 3.78) at the bottom left of the Generator (Fig 3) and re-secure using the Velcro Strap (Fig 3.80).

### 8.3.3 Resuming POGS 33 Oxygen Production

**a)** Connect the Compressor Power Cord (Fig 5.104) to the power source.

**b)** Change the Compressor Power Switch (Fig 5.106) located on the Compressor Interior Cover (Fig 5) to the (ON) position. Allow the Feed Air Compressor (Fig 1.2) to operate until it reaches standby mode (at approximately 110 PSIG the Feed Air Compressor (Fig 1.2) will shut down). Standby pressure may be verified by inspecting the Air Receiver Pressure Gauge (Fig 3.52) in the Generator Interior (Fig 3) at the top of the Air Receiver (Fig 3.48).

**CAUTION**

**Perform another inspection of the Feed Air Hose (Fig 5.116) and Remote Supply Air Hose (Fig 5.117) for any cuts or abrasions that may cause leaks or dangerous operating conditions. Replace as necessary. Prior to disconnecting any hoses between the Feed Air Compressor (Fig 1.2) and the Generator (Fig 1.1), the Feed Air Compressor (Fig 1.2) should be turned off, disconnected from power source, and the system depressurized by opening the Manual Condensate Drain Valve (Fig 3.79) located in the Generator (Fig 3) at the bottom of the Air Receiver (Fig 3.48).**

**c)** Verify the three (3) Medical Air Outlet Valves and all four (4) Oxygen Outlet Valves on the Generator Control Panel (Fig 2) are in the closed position (9:00 position).

**d)** Verify the Operate/Calibrate [Valve Handle] (Fig 2.28) is pointing to the (OPERATE) position.

**e)** Verify the Power Switch (Fig 2.16), Alarm Test Switch (Fig 2.12), and Power [Bypass Switch] positions on the Generator Control Panel (Fig 2). The Power Switch (Fig 2.16) and the Alarm Test Switch (Fig 2.12) should be in the (OFF) position and the Alarm Bypass Switch (Fig 2.13) should be in the BYPASS position.

**f)** Connect the Generator Power Cord (Fig 2.29) to the power source.

**g)** Apply power to the Generator (Fig 1.1) by changing the Power Switch (Fig 2.16) on the Generator Control Panel (Fig 2) to the (ON) position

**h)** If the Oxygen Receiver (Fig 3.51) pressure is low, the Generator (Fig 1.1) will run until Oxygen Receiver (Fig 3.51) pressure reaches approximately 70 PSIG, at which point the Generator (Fig 1.1) will switch to standby mode, indicated by the illumination of the Standby [Indicator] on the Generator Control Panel (Fig 2). The Generator (Fig 1.1) should reach standby mode within 5 minutes. Oxygen Receiver (Fig 3.51) pressure may be verified by inspecting the Oxygen Receiver Pressure Gauge (Fig 3.59) in the Generator (Fig 3) at the top of the Oxygen Receiver (Fig 3.51).

**NOTE**

**At altitudes of 5000 FT or above, the Generator (Fig 1.1) may not switch to standby mode. As altitude increases, the pressure, flow, and purity may decrease as volume of oxygen and air per cubic foot decreases. If the Generator (Fig 1.1) does not switch to standby mode within 5 minutes, and no oxygen leaks are observed, continue with the procedure below.**

**i)** Observe the oxygen concentration indicated by the Oxygen Analyzer (Fig 2.17). If oxygen concentration is below 90%, remove any accessories from one or more Oxygen Flowmeters then open the corresponding Oxygen Outlet Valve(s); adjust the Oxygen Flowmeter(s) for a combined flow of 15-20 LPM. Continue flowing 15-20 LPM until oxygen concentration of 90% is achieved.

**j)** Once 90% oxygen concentration is achieved, the Alarm Bypass Switch (Fig 2.13) should be changed to the ACTIVE position.

**k)** The Oxygen Flowmeters and Oxygen Outlet Valves should be closed (9:00 position) until oxygen flow is needed.

**l)** After successful completion of the Startup procedure, refer to section (10) for oxygen delivery configurations

**NOTE**

**The Manual Condensate Drain Valve (Fig 3.79) at the bottom of the Air Receiver (Fig 3.48) in the Generator (Fig 3) should be opened slowly, at least once a day, and left open until** water **no longer drains from the Air Receiver (Fig 3.48). More frequent draining may be necessary in hot and/or humid climates. The Condensate Drain Bottle (Fig 3.78) should be disconnected, emptied, and re-installed as necessary.**

## 8.4 Emergency Startup

### 8.4.1 Definition

The Emergency Startup procedure assumes that the POGS 33 has had no configuration changes made since the Initial Startup procedure was performed. It is also assumed that the POGS 33 has been shut down according to the Emergency Shutdown procedure. Configuration changes to accessories connected to the Oxygen Outlet Ports (Fig 2.22-25) do not prevent using the Emergency Startup procedure.

### 8.4.2 Resuming POGS 33 Oxygen Production

**a)** Connect the Compressor Power Cord (Fig 5.104) to the power source.

**b)** Change the Compressor Power Switch (Fig 5.106) located on the Compressor Interior Cover (Fig 5) to the (ON) position. Allow the Feed Air Compressor (Fig 1.2) to operate until it reaches standby mode (at approximately 110 PSIG the Feed Air Compressor (Fig 1.2) will shut down). Standby pressure may be verified by inspecting the Air Receiver Pressure Gauge (Fig 3.52) in the Generator Interior (Fig 3) at the top of the Air Receiver (Fig 3.48).

**c)** If necessary, adjust the Exterior Lid Support (Fig 5.162). The Exterior Lid Support (Fig 5.162) is adjustable for varying weather conditions. During adverse conditions (dust, rain, snow), the support should be adjusted to minimize entry of rain, snow, sand, etc. The exterior lid should be in the fully raised position during fair weather conditions.

**d)** Connect the Generator Power Cord (Fig 2.29) to the power source.

**e)** Apply power to the Generator (Fig 1.1) by changing the Power Switch (Fig 2.16) on the Generator Control Panel (Fig 2) to the (ON) position

**f)** If the Emergency Oxygen Backflow has been implemented during the Emergency, disconnect the system as described

**g)** The POGS 33 will resume production of oxygen.

**NOTE**

**The Manual Condensate Drain Valve (Fig 3.79) at the bottom of the Air Receiver (Fig 3.48) in the Generator (Fig 3) should be opened slowly, at least once a day, and left open until** water **no longer drains from the Air Receiver (Fig 3.48). More frequent draining may be necessary in hot and/or humid climates. The Condensate Drain Bottle (Fig 3.78) should be disconnected, emptied, and re-installed as necessary.**

## 8.5 Startup after Configuration Changes

### 8.5.1 Definition

The Startup after Configuration Changes procedure assumes that the POGS 33 has had configuration changes made since the Initial Startup procedure was performed. It is also assumed that the POGS 33 has been shut down according to the Shutdown for Configuration Changes procedure. Configuration changes include any changes that require the hoses between the Feed Air Compressor (Fig 1.2) and Generator (Fig 1.1) to be disconnected and/or changes to the power source. Configuration changes to accessories connected to the Oxygen Outlet Ports (Fig 2.22-25) on the Generator Control Panel (Fig 2) do not require use of this procedure; the Normal Startup procedure should be used.

### 8.5.2 Visual Inspection

**a)** Verify the Supply Air Filter Assembly (Fig 5.113) and Top Cooling Air Inlet Filter are installed.

**CAUTION**

**Perform an inspection of the Feed Air Hose (Fig 5.116) and Remote Supply Air Hose (Fig 5.117) for any cuts or abrasions that may cause leaks or dangerous operating conditions. Replace as necessary. Prior to disconnecting any hoses between the Feed Air Compressor (Fig 1.2) and the Generator (Fig 1.1), the Feed Air Compressor (Fig 1.2) should be turned off, disconnected from power source, and the system depressurized by opening the Manual Condensate Drain Valve (Fig 3.79) located in the Generator (Fig 3) at the bottom of the Air Receiver (Fig 3.48).**

**b)** Open the Generator Control Panel (Fig 2) by pulling on the Latches (Fig 2.6). If necessary, empty the Condensate Drain Bottle (Fig 3.78) at the bottom left of the Generator (Fig 3) and re-secure using the Velcro Strap (Fig 3.80).

**c)** Close the Generator Control Panel (Fig 2), ensuring that the Latches (Fig 2.6) engage.

### 8.5.3 Verify Proper Compressor Rotation

(Only applies if the power source has changed from the time when the POGS 33 was last used for oxygen production. If it is unknown whether the power source is the same, this procedure should be performed.)

**NOTE**

**Verify power requirements of the Feed Air Compressor (Fig 1.2) match the power availability. Power requirements for the Feed Air Compressor (Fig 1.2) are indicated on the Serial Number Label (Fig 5.103) affixed to the Compressor Interior Cover (Fig 5). Verify capabilities are met to connect the Feed Air Compressor (Fig 1.2) to the power source. The Compressor Power Cord (Fig 5.104) must mate with power source connector. If any of these conditions are not met, consult a qualified electrician.**

**NOTE**

**Verification of Compressor (Fig 6.138) rotation is only required for Three Phase Feed Air Compressors. For (1) single Phase Feed Air Compressors, proceed to section (9.5.4).**

**a)** Verify the Compressor Power Switch (Fig 5.106) on the Compressor Interior Cover (Fig 5) is in the "OFF" position.

**b)** Verify that no hoses are connected to the Feed Air Compressor (Fig 1.2).

**c)** Connect the Compressor Power Cord (Fig 5.104) to the power source.

**d)** Momentarily apply power to the Feed Air Compressor (Fig 1.2) with the Compressor Power Switch (Fig 5.106), while holding your hand 2-4 inches above the Feed Air Outlet Port (Fig 5.99). A strong stream of air exiting the Feed Air Outlet Port (Fig 5.99) indicates proper rotation.

**NOTE**

**If suction is observed at the Feed Air Outlet Port (Fig 5.99), rotation is not correct. A qualified electrician should perform the following procedure. If rotation is correct, proceed to section (9.5.4).**

**CAUTION**

**A small amount of residual voltage may remain in the Feed Air Compressor (Fig 1.2) electrics after disconnecting power. Discharge any residual voltage from the Feed Air Compressor (Fig 1.2) by shorting the plug pins to each other with an insulated screwdriver or equivalent tool.**

**e)** Disconnect the Feed Air Compressor (Fig 1.2) from the power source.

**f)** Open the Compressor Interior Cover (Fig 5) by removing the four (4) Securing Knobs (Fig 5.105) and lifting the cover.

**g)** Open the Starter Box (Fig 6.130) by turning the Starter Box Locking Screw (Fig 6.131) ½ turn counter-clockwise.

**h)** Remove the cover of the Starter Box (Fig 6.130) and set aside.

**i)** Locate the large gauge red and black wires connected to the Power Input Terminals (Fig 6.148) at the rear of the Starter Box (Fig 6.130). Loosen the securing screws that correspond to the red and black large gauge wires, and reverse the red and black large gauge wires, being careful not to disturb the smaller gauge wires. Tighten the securing screws.

**j)** Replace the Starter Box (Fig 6.130) cover, and secure by turning the Starter Box Locking Screw (Fig 6.131) ½ turn clockwise.

**k)** Close the Compressor Interior Cover (Fig 5) and secure using the Securing Knobs (Fig 5.105).

**l)** Repeat the steps at the beginning of section (9.5.3) to verify proper rotation.

### 8.5.4 Hose Connection for the Feed Air Compressor and Generator

(Does not apply if the hoses between the Feed Air Compressor (Fig 1.2) and Generator (Fig 1.1) have not been disconnected)

**NOTE**

**The Feed Air Hose (Fig 5.116) must be positioned with the hose perpendicular to the Cover Hinge (Fig 5.100) to allow proper positioning of the Exterior Lid (Fig 7.166)**

**a)** Connect the Feed Air Hose (Fig 5.116) Compressor End to the Feed Air Outlet Port (Fig 5.99) on the Compressor Interior Cover (Fig 5) and the Generator End to the Generator Feed Air Inlet Port. If the distance between the Feed Air Compressor (Fig 1.2) and Generator (Fig 1.1) is more than 15 feet, the Remote Supply Air Hose (Fig 5.117) may be used as an extension as described in the next step.

**b)** Use of the Remote Supply Air Hose (Fig 5.117) is optional. It has two (2) possible configurations:

- Remote Air Supply: The Remote Supply Air Hose Male End (Fig 5.117a) is connected to the Supply Air Inlet Port (Fig 5.102), with the Supply Air Filter Assembly (Fig 5.113) connected to the Remote Supply Air Hose Female End (Fig 5.117b). The Supply Air Filter Assembly (Fig 5.113) should be placed in a clean air environment.
- Extended Distance between Feed Air Compressor (Fig 1.2) and Generator: The Remote Supply Air Hose Female End (Fig 5.117b) is connected to the Feed Air Hose Generator End (Fig 5.116b). The Remote Air Supply Hose Male End (Fig 5.117a) is connected to the Feed Air Inlet Port (Fig 2.30) on the Generator Control Panel (Fig 2). This

configuration allows a distance of up to 30 feet between the Feed Air Compressor (Fig 1.2) and the Generator (Fig 1.1).

**c)** Tighten all hose connections using Air Hose Wrench.

### 8.5.5 Resuming POGS 33 Oxygen Production

**a)** Connect the Compressor Power Cord (Fig 5.104) to the power source.

**b)** Change the Compressor Power Switch (Fig 5.106) located on the Compressor Interior Cover (Fig 5) to the (ON) position. Allow the Feed Air Compressor (Fig 1.2) to operate until it reaches standby mode (at approximately 110 PSIG the Feed Air Compressor (Fig 1.2) will shut down). Standby pressure may be verified by inspecting the Air Receiver Pressure Gauge (Fig 3.52) in the Generator Interior (Fig 3) at the top of the Air Receiver (Fig 3.48).

**c)** It is normal for the Feed Air Compressor (Fig 1.2) to cycle several times between standby mode and operate mode until pressure is balanced between the Generator (Fig 1.1) and the Feed Air Compressor (Fig 1.2). If the Feed Air Compressor (Fig 1.2) cycles more than 2-4 times, check all connections between the Feed Air Compressor (Fig 1.2) and the Generator (Fig 1.1) for leaks and repair as necessary.

**CAUTION**

**Perform another inspection of the Feed Air Hose (Fig 5.116) and Remote Supply Air Hose (Fig 5.117) for any cuts or abrasions that may cause leaks or dangerous operating conditions. Replace as necessary. Prior to disconnecting any hoses between the Feed Air Compressor (Fig 1.2) and the Generator (Fig 1.1), the Feed Air Compressor (Fig 1.2) should be turned off, disconnected from power source, and the system depressurized by opening the Manual Condensate Drain Valve (Fig 3.79) located in the Generator (Fig 3) at the bottom of the Air Receiver (Fig 3.48).**

**d)** Secure the Exterior Lid Support (Fig 5.162) to the Exterior Lid Support Base (Fig 5.107) on the Compressor Interior Cover (Fig 5) using the Tethered Retaining Clip (Fig 5.108). The Exterior Lid Support (Fig 5.162) is adjustable for varying weather conditions. During adverse conditions (dust, rain, snow), the support should be adjusted to minimize entry of rain, snow, sand, etc. The support should be in the fully raised position during fair weather conditions.

**e)** Verify the three (3) Medical Air Outlet Valves and all four (4) Oxygen Outlet Valves on the Generator Control Panel (Fig 2) are in the closed position (9:00 position).

**f)** Verify the Operate/Calibrate [Valve Handle] (Fig 2.28) is pointing to the (OPERATE) position.

**g)** Verify the Power Switch (Fig 2.16), Alarm Test Switch (Fig 2.12), and Power [Bypass Switch] positions on the Generator Control Panel (Fig 2). The Power Switch (Fig 2.16) and the Alarm Test Switch (Fig 2.12) should be in the (OFF) position and the Alarm Bypass Switch (Fig 2.13) should be in the BYPASS position.

**h)** Connect the Generator Power Cord (Fig 2.29) to the power source.

**i)** Apply power to the Generator (Fig 1.1) by changing the Power Switch (Fig 2.16) on the Generator Control Panel (Fig 2) to the (ON) position

**j)** If the Oxygen Receiver (Fig 3.51) pressure is low, the Generator (Fig 1.1) will run until Oxygen Receiver (Fig 3.51) pressure reaches approximately 70 PSIG, at which point the Generator (Fig 1.1) will switch to standby mode, indicated by the illumination of the Standby [Indicator] on the Generator Control Panel (Fig 2). The Generator (Fig 1.1) should reach standby mode within 5 minutes. Oxygen Receiver (Fig 3.51) pressure may be verified by inspecting the Oxygen Receiver Pressure Gauge (Fig 3.59) in the Generator (Fig 3) at the top of the Oxygen Receiver (Fig 3.51).

**NOTE**

**At altitudes of 5000 FT or above, the Generator (Fig 1.1) may not switch to standby mode. As altitude increases, the pressure, flow, and purity may decrease as volume of oxygen and air per cubic foot decreases. If the Generator (Fig 1.1) does not switch to standby mode within 5 minutes, and no oxygen leaks are observed, continue with the procedure below.**

**k)** Observe the oxygen concentration indicated by the Oxygen Analyzer (Fig 2.17). If oxygen concentration is below 90%, install one or more Oxygen Flowmeters, or if already installed, remove any accessories from one or more Oxygen Flowmeters, then open the corresponding Oxygen Outlet Valve(s); adjust the Oxygen Flowmeter(s) for a combined flow of 15-20 LPM. Continue flowing 15-20 LPM until oxygen concentration of 90% is achieved.

**l)** Once 90% oxygen concentration is achieved, the Alarm Bypass Switch (Fig 2.13) should be changed to the ACTIVE position.

**m)** The Oxygen Flowmeters and Oxygen Outlet Valves should be closed (9:00 position) until oxygen flow is needed.

**n)** After successful completion of the Startup procedure, refer to section (10) for oxygen delivery configurations

**NOTE**

**The Manual Condensate Drain Valve (Fig 3.79) at the bottom of the Air Receiver (Fig 3.48) in the Generator (Fig 3) should be opened slowly, at least once a day, and left open until** water **no longer drains from the Air Receiver (Fig 3.48). More frequent draining may be necessary in hot and/or humid climates. The Condensate Drain Bottle (Fig 3.78) should be disconnected, emptied, and re-installed as necessary.**

## 8.6 Startup after Maintenance or Repair

### 8.6.1 Installation and Inspection (only applies if the POGS 33 has been relocated from the time when it was last used for oxygen production.)

**a)** Unlock seven (7) latches on the exterior of the Feed Air Compressor (Fig 1.2) case and Accessory – Microboost box.

**b)** Open the Exterior Lid (Fig 7.166) fully on both.

**c)** Open the Compressor Interior Cover (Fig 5) by removing the four (4) Securing Knobs (Fig 5.105) and lifting the cover. Verify the area is free and clear of debris and foreign material. Close the Compressor Interior Cover (Fig 5) and secure using the Securing Knobs (Fig 5.105).

**d)** Remove the Feed Air Hose (Black Hose) (Fig 5.116), Remote Supply Air Hose (Fig 5.117), Rain Guard (Fig 5.101), Supply Air Filter Assembly (Fig 5.113), and Cooling Air Filter Element (Fig 5.114)from the Accessory – Microboost Box. Place Filter in Cover Filter Bay with the arrows on the filter pointing down. Place Rain Guard (Fig 5.101) on the Cover over the filter and filter bay, securing in place by using the 4 sliding bolt lock assemblies (Fig 5.109). Ensure bolt locks are firmly in place and locked.

**⚠ CAUTION**

**Inspect the Feed Air Hose (Fig 5.116) and Remote Supply Air Hose (Fig 5.117) for any cuts or abrasions that may cause leaks or dangerous operating conditions. Replace as necessary.**

**e)** Verify the Supply Air Filter Assembly (Fig 5.113) and Top Cooling Air Inlet Filter are installed.

**f)** Remove the Generator Exterior Cover by unlocking fourteen (14) latches on the case and lifting the cover upwards. Set cover aside until needed. Unpack and inventory the accessories located in the Accessory - Microboost Box. A list of included accessories is shown on (Fig 4).

**g)** Stand the Generator (Fig 1.1) upright (minimum 4 people) orientating it so the Feed Air Inlet Port and Backup Oxygen Inlet Port are at the bottom.

**h)** Open the Generator Control Panel (Fig 2) by pulling on the Latches (Fig 2.6). Check for any foreign object or debris and inspect wiring to verify no wires.

**i)** Open the Generator Control Panel (Fig 2) by pulling on the Latches (Fig 2.6). Check for any foreign object or debris and

inspect wiring to verify no wires or connections have come loose and/or become damaged.

**NOTE**

**If any damage has occurred to the wiring a qualified electrician must repair the Generator (Fig 1.1) before further operation.**

**j)** Close the Generator Control Panel (Fig 2), ensuring that the Latches (Fig 2.6) engage.

**k)** The included Velcro Strap (Fig 3.80) located at the bottom left of the Generator (Fig 3) should secure the Condensate Drain Bottle (Fig 3.78). The Condensate Drain Bottle (Fig 3.78) should be connected to the Manual Condensate Drain Valve (Fig 3.79), located at the bottom of the Air Receiver (Fig 3.48) with the included 5/32" tubing, and the Manual Condensate Drain Valve (Fig 3.79) should be closed (9:00 position)

### 8.6.2 Verify Proper Compressor Rotation

(Only applies if the POGS 33 has been relocated from the time when it was last used for oxygen production, the power source has changed, the Compressor Power Cord (Fig 5.104) connection has been modified, or the Starter Box wiring has been modified. If it is unknown whether electrical changes have been made, this procedure should be performed)

**NOTE**

**Verify power requirements of the Feed Air Compressor (Fig 1.2) match the power availability. Power requirements for the Feed Air Compressor (Fig 1.2) are indicated on the Serial Number Label (Fig 5.103) affixed to the Compressor Interior Cover (Fig 5). Verify capabilities are met to connect the Feed Air Compressor (Fig 1.2) to the power source. The Compressor Power Cord (Fig 5.104) must mate with power source connector. If any of these conditions are not met, consult a qualified electrician.**

**NOTE**

**Verification of Compressor (Fig 6.138) rotation is only required for Three Phase Feed Air Compressors. For (1) single Phase Feed Air Compressors, proceed to section (9.6.3).**

**a)** Verify the Compressor Power Switch (Fig 5.106) on the Compressor Interior Cover (Fig 5) is in the "OFF" position.

**b)** Verify that no hoses are connected to the Feed Air Compressor (Fig 1.2).

**c)** Connect the Compressor Power Cord (Fig 5.104) to the power source.

**d)** Momentarily apply power to the Feed Air Compressor (Fig 1.2) with the Compressor Power Switch (Fig 5.106), while holding your hand 2-4 inches above the Feed Air Outlet Port (Fig 5.99). A strong stream of air exiting the Feed Air Outlet Port (Fig 5.99) indicates proper rotation.

**NOTE**

**If suction is observed at the Feed Air Outlet Port (Fig 5.99), rotation is not correct. A qualified electrician should perform the following procedure. If rotation is correct, proceed to section (9.6.3).**

**CAUTION**

**A small amount of residual voltage may remain in the Feed Air Compressor (Fig 1.2) electrics after disconnecting power. Discharge any residual voltage from the Feed Air Compressor (Fig 1.2) by shorting the plug pins to each other with an insulated screwdriver or equivalent tool.**

**e)** Disconnect the Feed Air Compressor (Fig 1.2) from the power source.

**f)** Open the Compressor Interior Cover (Fig 5) by removing the four (4) Securing Knobs (Fig 5.105) and lifting the cover.

**g)** Open the Starter Box (Fig 6.130) by turning the Starter Box Locking Screw (Fig 6.131) ½ turn counter-clockwise.

**h)** Remove the cover of the Starter Box (Fig 6.130) and set aside.

**i)** Locate the large gauge red and black wires connected to the Power Input Terminals (Fig 6.148) at the rear of the Starter Box (Fig 6.130). Loosen the securing screws that correspond to the red and black large gauge wires, and reverse the red and black large gauge wires, being careful not to disturb the smaller gauge wires. Tighten the securing screws.

**j)** Replace the Starter Box (Fig 6.130) cover, and secure by turning the Starter Box Locking Screw (Fig 6.131) ½ turn clockwise.

**k)** Close the Compressor Interior Cover (Fig 5) and secure using the four (4) Securing Knobs.

**l)** Repeat the steps at the beginning of section (9.6.2) to verify proper rotation.

### 8.6.3 Hose Connection for the Feed Air Compressor and Generator

**NOTE**

**The Feed Air Hose (Fig 5.116) must be positioned with the hose perpendicular to the Cover Hinge (Fig 5.100) to allow proper positioning of the Exterior Lid (Fig 7.166)**

**a)** Connect the Feed Air Hose (Fig 5.116) Compressor End to the Feed Air Outlet Port (Fig 5.99) on the Compressor Interior Cover (Fig 5) and the Generator End to the Generator Feed Air Inlet Port. If the distance between the Feed Air Compressor (Fig 1.2) and Generator (Fig 1.1) is more than 15 feet, the Remote Supply Air Hose (Fig 5.117) may be used as an extension as described in the next step.

**b)** Use of the Remote Supply Air Hose (Fig 5.117) is optional. It has two (2) possible configurations:

- Remote Air Supply: The Remote Supply Air Hose (Fig 5.117) Male End is connected to the Supply Air Inlet Port (Fig 5.102), with the Supply Air Filter Assembly (Fig 5.113) connected to the other end. The Supply Air Filter Assembly (Fig 5.113) should be placed in a clean air environment.
- Extended Distance between Feed Air Compressor (Fig 1.2) and Generator: The Remote Supply Air Hose Female End (Fig 5.117b) is connected to the Feed Air Hose Generator End (Fig 5.116b). The Remote Air Supply Hose Male End (Fig 5.117a) is connected to the Feed Air Inlet Port (Fig 2.30) on the Generator Control Panel (Fig 2). This configuration allows a distance of up to 30 feet between the Feed Air Compressor (Fig 1.2) and the Generator (Fig 1.1).

**c)** Tighten all hose connections using Air Hose Wrench.

### 8.6.4 Preparing the POGS 33 for Oxygen Production

**a)** Connect the Compressor Power Cord (Fig 5.104) to the power source.

**b)** Change the Compressor Power Switch (Fig 5.106) located on the Compressor Interior Cover (Fig 5) to the (ON) position. Allow the Feed Air Compressor (Fig 1.2) to operate until it reaches standby mode (at approximately 110 PSIG the Feed Air Compressor (Fig 1.2) will shut down). Standby pressure may be verified by inspecting the Air Receiver Pressure Gauge (Fig 3.52) in the Generator Interior (Fig 3) at the top of the Air Receiver (Fig 3.48).

**c)** It is normal for the Feed Air Compressor (Fig 1.2) to cycle several times between standby mode and operate mode until

pressure is balanced between the Generator (Fig 1.1) and the Feed Air Compressor (Fig 1.2). If the Feed Air Compressor (Fig 1.2) cycles more than 2-4 times, check all connections between the Feed Air Compressor (Fig 1.2) and the Generator (Fig 1.1) for leaks and repair as necessary.

**NOTE**

**Perform another inspection of the Feed Air Hose (Fig 5.116) and Remote Supply Air Hose (Fig 5.117) for any cuts or abrasions that may cause leaks or dangerous operating conditions. Replace as necessary. Prior to disconnecting any hoses between the Feed Air Compressor (Fig 1.2) and the Generator (Fig 1.1), the Feed Air Compressor (Fig 1.2) should be turned off, disconnected from power source, and the system depressurized by opening the Manual Condensate Drain Valve (Fig 3.79) located in the Generator (Fig 3) at the bottom of the Air Receiver (Fig 3.48).**

**d)** Secure the Exterior Lid Support (Fig 5.162) to the Exterior Lid Support Base (Fig 5.107) on the Compressor Interior Cover (Fig 5) using the Tethered Retaining Clip (Fig 5.108). The Exterior Lid Support (Fig 5.162) is adjustable for varying weather conditions. During adverse conditions (dust, rain, snow), the support should be adjusted to minimize entry of rain, snow, sand, etc. The support should be in the fully raised position during fair weather conditions.

**NOTE**

**Verify power requirements of the Generator (Fig 1.1) match the power availability. The Generator (Fig 1.1) is designed to operate on 110 Volts/ 60 Hertz/ Single Phase. Verify capabilities are met to connect the Feed Air Compressor (Fig 1.2) to the power source. The Power Cord (Fig 2.29) must mate with power source connector. If any of these conditions are not met, consult a qualified electrician.**

**e)** Verify the three (3) Medical Air Outlet Valves and all (4) Oxygen Outlet Valves on the Generator Control Panel (Fig 2) are in the closed position (9:00 position).

**f)** Verify the Operate/Calibrate [Valve Handle] (Fig 2.28) is pointing to the (OPERATE) position.

**g)** Verify the Power Switch (Fig 2.16), Alarm Test Switch (Fig 2.12), and Power [Bypass Switch] positions on the Generator Control Panel (Fig 2). The Power Switch (Fig 2.16) and the Alarm Test Switch (Fig 2.12) should be in the (OFF) position and the Alarm Bypass Switch (Fig 2.13) should be in the BYPASS position.

**h)** Plug the Generator Power Cord (Fig 2.29) into the power source.

**i)** Change the Power Switch (Fig 2.16) on the Generator Control Panel (Fig 2) to the (ON) position

**j)** The Generator (Fig 1.1) will run until Oxygen Receiver (Fig 3.51) pressure reaches approximately 70 PSIG, at which point the Generator (Fig 1.1) will switch to standby mode, indicated by the illumination of the Standby [Indicator] on the Generator Control Panel (Fig 2). The Generator (Fig 1.1) should reach standby mode within 5 minutes. Oxygen Receiver (Fig 3.51) pressure may be verified by inspecting the Oxygen Receiver Pressure Gauge (Fig 3.59) in the Generator (Fig 3) at the top of the Oxygen Receiver (Fig 3.51).

**NOTE**

**At altitudes of 5000 FT or above, the Generator (Fig 1.1) may not switch to standby mode. As altitude increases, the pressure, flow, and purity may decrease as volume of oxygen and air per cubic foot decreases. If the Generator (Fig 1.1) does not switch to standby mode within 5 minutes, and no oxygen leaks are observed, proceed to section (9.6.5).**

### 8.6.5 Purge Oxygen Receiver

**a)** Install one or more of the Oxygen Flowmeters to the Oxygen Outlet Ports (Fig 2.22-25) on the Generator Control Panel (Fig 2). Fully open the corresponding Oxygen Outlet Valve (6:00 position) and adjust the Oxygen Flowmeters for a combined flow of 15-20 LPM.

**b)** Continue to flow 15-20 LPM until 93% oxygen concentration is achieved as indicated on the Oxygen Analyzer (Fig 2.17). 93% oxygen concentration will be achieved within 45-60 minutes.

**c)** Once 93% oxygen concentration is achieved, the Alarm Bypass Switch (Fig 2.13) should be changed to the ACTIVE position.

**d)** The Oxygen Flowmeters and Oxygen Outlet Valves should be closed (9:00 position) until oxygen flow is needed.

**e)** After successful completion of the Startup procedure, refer to section (9) for oxygen delivery configurations

**NOTE**

**The Manual Condensate Drain Valve (Fig 3.79) at the bottom of the Air Receiver (Fig 3.48) in the Generator (Fig 3) should be opened slowly, at least once a day, and left open until** water **no longer drains from the Air Receiver (Fig 3.48). More frequent draining may be necessary in hot and/or humid climates. The Condensate Drain Bottle (Fig 3.78) should be disconnected, emptied, and re-installed as necessary.**

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# 9 Oxygen Delivery System Configurations and Setup

**WARNING**

**Use only distilled or highly filtered water in the Humidifier Bottles (Fig 2.40) to prevent transmission of impurities from the water into the patient's lungs.**

**CAUTION**

**NEVER attach a Cannula hose or Humidifier Bottle (Fig 2.40) directly to an Oxygen Outlet Port (Fig 2.22-25). An Oxygen Flowmeter must be used to regulate the flow of oxygen to the Cannula or Humidifier Bottle (Fig 2.40)**

**CAUTION**

**Oxygen has been determined by the FDA to be a drug. The POGS 33 is only to be operated by trained medical personnel. Oxygen is to be administered ONLY by properly trained medical personnel.**

**CAUTION**

**Unlike an oxygen bottle configuration, which provides unlimited flow for a limited period of time, the POGS 33 provides limited flow for an unlimited amount of time. The operator must be aware at all times of the total flow of oxygen being used by the particular configuration, and budget oxygen flow accordingly. Exceeding a combined flow of 33 LPM of oxygen will cause oxygen pressure and purity to drop, possibly to unacceptable levels.**

**NOTE**

**At altitudes of 5000 FT or above, pressure, flow, and purity may be reduced. As altitude increases the volume air per cubic foot decreases, which reduce the volume of air the POGS 33 has available to extract oxygen from. Special attention must be given to the Oxygen Outlet Pressure [Gauge] (Fig 2.11) on the Generator Control Panel (Fig 2) to ensure available flow is not being exceeded.**

**CAUTION**

**When connecting EQUIPMENT (ventilator, Microboost, etc.) to the Oxygen Outlet Ports (Fig 2.22-25) on the Generator (Fig 1.1) instead of Humidifier Bottles (Fig 2.40) and Cannulas (Fig 2.39), DO NOT use an Oxygen Flowmeter between the Oxygen Outlet Port (Fig 2.22-25) and the equipment. Use of an Oxygen Flowmeter inline with a connection to equipment will cause inadequate oxygen pressure and flow to operate the equipment.**

## 9.1 Backup Oxygen

### 9.1.1 Definition

In situation where uninterrupted oxygen flow is critical, the Backup Oxygen system should be utilized. In the event of a power failure or other event that prevents the POGS 33 from producing oxygen, the Backup Oxygen system will allow uninterrupted oxygen flow to the patients or equipment attached to the POGS 33. The Backup Oxygen system will also provide backup if oxygen flow demand exceeds the capabilities of the POGS 33.

### 9.1.2 Setup (Using a High-pressure Oxygen Cylinder)

To use the Microboost (Fig 1.3) in a Backup Oxygen configuration, refer to section (11).

To use the HV Booster (Fig 1.4) in a Backup Oxygen configuration, refer to section (12).

A high-pressure oxygen cylinder with a regulator adjusted to 45 PSIG must be used if a Microboost (Fig 1.3) or HV Booster (Fig 1.4) configuration is not available.

**a)** Ensure the Backup Oxygen Inlet Port Valve (Fig 2.32) on the Generator Control Panel (Fig 2) is closed (9:00 position)

**b)** Connect an Oxygen Hose (Fig 2.41) to the Backup Oxygen Inlet Port (Fig 2.31) on the Generator Control Panel (Fig 2).

**c)** Connect the other end of the Oxygen Hose (Fig 2.41) to a regulator installed on a high-pressure oxygen cylinder.

**d)** Chose the configuration desired:

- For backup in case of power failure or oxygen flow demand exceeding the capabilities of the POGS 33: Open the high-pressure oxygen cylinder valve and adjust the regulator for 45 PSIG.
- For backup only in the case of power failure: Keep the high-pressure oxygen cylinder valve close until the need for

backup arises. Open the high-pressure oxygen cylinder valve when necessary.

### 9.1.3 Operation

**a)** Open the Backup Oxygen Inlet Port Valve (Fig 2.32) (6:00 position)

**b)** Monitor the Oxygen Outlet Pressure [Gauge] (Fig 2.11) regularly. In this configuration oxygen will flow from the high-pressure oxygen cylinder whenever the high-pressure oxygen cylinder valve is open and the Oxygen Receiver (Fig 3.51) Pressure drops below 45 PSIG.

**⚠ CAUTION**

**When the Backup Oxygen system is implemented during a power failure, oxygen delivery changes from a limited flow for UNLIMITED time to unlimited flow for a LIMITED time. Awareness of high-pressure oxygen cylinder pressure is vital to ensure uninterrupted oxygen flow.**

### 9.1.4 Shutdown of Backup Oxygen

When the condition that caused the POGS 33 to shut down or be overdrawn is corrected, the Backup Oxygen may be disconnected.

**a)** Close the high-pressure oxygen cylinder valve.

**b)** Close the Backup Oxygen Inlet Port Valve (Fig 2.32) on the Generator Control Panel (Fig 2).

**c)** If further need for the Backup Oxygen system is no longer needed, the Oxygen Hose (Fig 2.41) may be disconnected from the high-pressure oxygen cylinder and the Backup Oxygen Inlet Port (Fig 2.31) on the Generator Control Panel (Fig 2).

### 9.1.5 Extended Distances between Patient and Generator

In the even that the distance between the patients and Generator (Fig 1.1) exceed the reach of the Cannula (Fig 2.39) Hoses, a remote configuration may be used with the configurations in section (10.3) and (10.4), and (10.5). When using the remote configuration, substitute (2) of the Oxygen Flowmeter connections on the Generator Control Panel (Fig 2) with the configuration below.

### 9.1.6 Setup

**a)** Connect an Oxygen Hose (Fig 2.41) directly to one of the Oxygen Outlet Ports (Fig 2.22-25) on the Generator Control Panel (Fig 2)

**b)** Connect an Oxygen Y-Fitting to the opposite end of the Oxygen Hose (Fig 2.41).

**c)** Connect two (2) Oxygen Flowmeters to the open ports of the Oxygen Y-Fitting.

**d)** Ensure BOTH of the Oxygen Flowmeters are closed.

**e)** Install a Humidifier Bottle (Fig 2.40), filled with distilled or highly filtered water to the level indicated on the bottle, on each of the Oxygen Flowmeters.

**f)** Attach the female tapered hose end of a Cannula (Fig 2.39) to the corresponding male tapered connection of each Humidifier Bottle (Fig 2.40).

**g)** Secure the Humidifier Bottle (Fig 2.40) configuration to prevent accidental tipping of the bottles.

### 9.1.7 Operation

**a)** Open the Oxygen Outlet Valve (Fig 2. 18-21) corresponding to the Oxygen Outlet Port (Fig 2.22-25) with the Oxygen Hose (Fig 2.41) connected.

**b)** Attach the two Cannulas (Fig 2.39) to the patients and begin the flow of oxygen by opening the Oxygen Flowmeter until the desired flow of oxygen is indicated.

**c)** Monitor the flow as to not exceed 33 LPM combined flow between the remote configuration and any configuration used below.

**NOTE**

**The Microboost (Fig 1.3) is an optional component of the POGS 33.**

## 9.2 One or Two Cannulas and a Microboost

### 9.2.1 Setup

**a)** Connect an Oxygen Flowmeter to two of the Oxygen Outlet Ports (Fig 2.22-25) on the Generator Control Panel (Fig 2). Ensure that the Oxygen Flowmeters are closed.

**b)** Fill two Humidifier Bottles (Fig 2.40) with distilled or highly filtered water to the line indicated on the bottle and connect each to an Oxygen Flowmeter.

**c)** Attach the female tapered hose end of a Cannula (Fig 2.39) to the corresponding male tapered connection of each Humidifier Bottle (Fig 2.40).

**d)** Attach an Oxygen Hose (Fig 2.41) to one of the remaining available Oxygen Outlet Ports (Fig 2.22-25). Attach the other end of the Oxygen Hose (Fig 2.41) to the Oxygen Inlet Port (Fig 8.167) on the Microboost (Fig 1.3).

**⚠ CAUTION**

**When connecting EQUIPMENT (ventilator, Microboost, etc.) to the Oxygen Outlet Ports (Fig 2.22-25) on the Generator (Fig 1.1) instead of Humidifier Bottles (Fig 2.40) and Cannulas (Fig 2.39), DO NOT use an Oxygen Flowmeter between the Oxygen Outlet Port (Fig 2.22-25) and the equipment. Use of an Oxygen Flowmeter inline with a connection to equipment will cause inadequate oxygen pressure and flow to operate the equipment.**

### 9.2.2 Operation

**a)** Open the Oxygen Outlet Valve (Fig 2. 18-21) for each Oxygen Outlet Port (Fig 2.22-25) attached to an Oxygen Flowmeter or the Oxygen Hose (Fig 2.41) attached to the Microboost (Fig 1.3).

**b)** Attach the two Cannulas (Fig 2.39) to patients and begin the flow of oxygen by opening the Oxygen Flowmeter until the desired flow of oxygen is indicated.

**c)** Refer to section (11) for operation of the Microboost (Fig 1.3)

**NOTE**

**WHILE RUNNING, THE MICROBOOST (FIG 1.3) CONTINUOUSLY CONSUMES 9 LPM OF OXYGEN. IF THE MICROBOOST (FIG 1.3) DOES NOT RECEIVE 9 LPM OF OXYGEN, AN INTERNAL PRESSURE SWITCH WILL TRIP AND THE MICROBOOST (FIG 1.3) WILL STOP FILLING.**

## 9.3 Four Cannulas

### 9.3.1 Setup

**a)** Connect an Oxygen Flowmeter to all four (4) of the Oxygen Outlet Ports on the Generator Control Panel (Fig 2). Ensure that the Oxygen Flowmeters are closed.

**b)** Fill four (6) Humidifier Bottles (Fig 2.40) with distilled or highly filtered water to the line indicated on the bottle and connect each to an Oxygen Flowmeter.

**c)** Attach the female tapered hose end of a Cannula (Fig 2.39) to the corresponding male tapered connection of each Humidifier Bottle (Fig 2.40).

**d)** Open the Oxygen Outlet Valve (Fig 2. 18-21) for each Oxygen Outlet Port (Fig 2.22-25) attached to an Oxygen Flowmeter.

### 9.3.2 Operation

**a)** Open the Oxygen Outlet Valve (Fig 2. 18-21) corresponding to the Oxygen Outlet Port (Fig 2.22-25) with the Oxygen Hose (Fig 2.41) connected.

**b)** Attach the Cannulas (Fig 2.39) to the patients and begin the flow of oxygen by opening the Oxygen Flowmeters until the desired flow of oxygen is indicated.

## 9.4 Ventilator, One (1) Cannula and Microboost

**Ventilator Compatibility**

**The only respiratory equipment that is validated with the POGS 33 is Draeger's Narkomed-M and the Impact Portable Ventilator (IPV) Univent™ 750 model. No other equipment is validated with the POGS 33 as of March 2004**

### 9.4.1 Set-up

**a)** To operate the ventilator on medical air, connect the ventilator to the Generator (Fig 1.1) by connecting one of the Medical Air Hoses (Fig 2.42) to one of the three (3) Medical Air Outlet Ports on the Generator Control Panel (Fig 2), and connect the opposite end to the Medical Air Inlet on the ventilator.

**b)** Connect an Oxygen Hose (Fig 2.41) to one of the Oxygen Outlet Ports (Fig 2.22-25) on the Generator Control Panel (Fig 2), and connect the opposite end to the oxygen Inlet port on the ventilator.

**c)** On the Generator Control Panel (Fig 2), open the corresponding Medical Air Outlet Valve (Fig 2.26) and the Oxygen Outlet Valve (Fig 2. 18-21) corresponding to the Oxygen Hose (Fig 2.41) connection. Check the pressure gauges on the ventilator to ensure Medical Air and oxygen pressures are sufficient.

**d)** Connect an Oxygen Flowmeter to one of the Oxygen Outlet Ports (Fig 2.22-25) on the Generator Control Panel (Fig 2). Ensure that the Oxygen Flowmeter is closed.

**e)** Fill a Humidifier Bottle (Fig 2.40) with distilled or highly filtered water to the line indicated on the bottle and connect it to the Oxygen Flowmeter.

**f)** Attach the female tapered hose end of a Cannula (Fig 2.39) to the corresponding male tapered connection of the Humidifier Bottle (Fig 2.40).

**g)** Attach an Oxygen Hose (Fig 2.41) to the remaining available Oxygen Outlet Port (Fig 2.22-25). Attach the other end of the Oxygen Hose (Fig 2.41) to the Oxygen Inlet Port (Fig 8.167) on the Microboost (Fig 1.3).

**CAUTION**

**When connecting EQUIPMENT (ventilator, Microboost, etc.) to the Outlet Ports (Fig 2.22-25) on the Generator (Fig 1.1) instead of Humidifier Bottles (Fig 2.40) and Cannulas (Fig 2.39), DO NOT use an Oxygen Flowmeter between the Oxygen Outlet Port (Fig 2.22-25) and the equipment. Use of an Oxygen Flowmeter inline with a connection to equipment will cause inadequate oxygen pressure and flow to operate the equipment.**

### 9.4.2 Operation

**a)** Open the Oxygen Outlet Valve (Fig 2. 18-21) for each Oxygen Outlet Port (Fig 2.22-25) attached to an Oxygen Flowmeter or the Oxygen Hose (Fig 2.41) attached to the Microboost (Fig 1.3).

**b)** Attach the Cannula (Fig 2.39) to the patient and begin the flow of oxygen by opening the Oxygen Flowmeter until the desired flow of oxygen is indicated.

**c)** Refer to section (12) for operation of the Microboost (Fig 1.3)

**d)** Monitor the oxygen demand being placed on the POGS 33 to ensure 33 LPM is not exceeded.

## 9.5 Ventilator and Microboost

**Ventilator Compatibility**

**The only respiratory equipment that is validated with the POGS 33 is Draeger's Narkomed-M and the Impact Portable Ventilator (IPV) Univent™ 750 model. No other equipment is validated with the POGS 33 as of March 2004**

### 9.5.1 Set-up

**a)** To operate the Ventilator from Medical Air, connect the ventilator to the Generator (Fig 1.1) by connecting one of the Medical Air Hoses (Fig 2.42) to one of the three (3) Medical Air Outlet Ports (Fig 2. 27) on the Generator Control Panel (Fig 2), and connect the opposite end to the Medical Air Inlet on the ventilator.

**b)** Connect an Oxygen Hose (Fig 2.41) to one of the Oxygen Outlet Ports (Fig 2.22-25) on the Generator Control Panel (Fig 2), and connect the opposite end to the oxygen Inlet port on the ventilator.

**c)** On the Generator Control Panel (Fig 2), open the corresponding Medical Air Outlet Valve (Fig 2.26) and the Oxygen Outlet Valve (Fig 2. 18-21) corresponding to the Oxygen Hose (Fig 2.41) connection. Check the pressure gauges on the ventilator to ensure Medical Air and oxygen pressures are sufficient.

**d)** Attach an Oxygen Hose (Fig 2.41) to the remaining available Oxygen Outlet Port (Fig 2.22-25). Attach the other end of the Oxygen Hose (Fig 2.41) to the Oxygen Inlet Port (Fig 8.167) on the Microboost (Fig 1.3).

**CAUTION**

**When connecting EQUIPMENT (ventilator, Microboost, etc.) to the Oxygen Outlet Ports (Fig 2.22-25) on the Generator (Fig 1.1) instead of Humidifier Bottles (Fig 2.40) and Cannulas (Fig 2.39), DO NOT use an Oxygen Flowmeter between the Oxygen Outlet Port (Fig 2.22-25) and the equipment. Use of an Oxygen Flowmeter inline with a connection to equipment will cause inadequate oxygen pressure and flow to operate the equipment.**

### 9.5.2 Operation

**a)** Open the Oxygen Outlet Valve (Fig 2. 18-21) for each Oxygen Outlet Port (Fig 2.22-25) attached to the ventilator or the Microboost (Fig 1.3).

**b)** Refer to section (12) for operation of the Microboost (Fig 1.3)

**NOTE**

**While running, the Microboost (Fig 1.3) continuously consumes 9 LPM of oxygen. If the Microboost (Fig 1.3) does not receive 9 LPM of oxygen, an internal pressure switch will trip and the Microboost (Fig 1.3) will stop filling.**

**c)** Monitor the oxygen demand being place on the POGS 33 to ensure 33 LPM is not exceeded.

### 9.6 Ventilator and Two Cannulas

**Ventilator Compatibility**

**The only respiratory equipment that is validated with the POGS 33 is Draeger's Narkomed-M and the Impact Portable Ventilator (IPV) Univent™ 750 model. No other equipment is validated with the POGS 33 as of March 2004.**

#### 9.6.1 Set-up

**a)** To operate the Ventilator from Medical Air, connect the ventilator to the Generator (Fig 1.1) by connecting one of the Medical Air Hoses (Fig 2.42) to one of the three (3) Medical Air Outlet Ports (Fig 2. 27) on the Generator Control Panel (Fig 2), and connect the opposite end to the Medical Air Inlet on the ventilator.

**b)** Connect an Oxygen Hose (Fig 2.41) to one of the Oxygen Outlet Ports (Fig 2.22-25) on the Generator Control Panel (Fig 2), and connect the opposite end to the oxygen Inlet port on the ventilator.

**c)** On the Generator Control Panel (Fig 2), open the corresponding Medical Air Outlet Valve (Fig 2.26) and the Oxygen Outlet Valve (Fig 2. 18-21) corresponding to the Oxygen Hose (Fig 2.41) connection. Check the pressure gauges on the ventilator to ensure Medical Air and oxygen pressures are sufficient.

**d)** Connect an Oxygen Flowmeter to two of the Oxygen Outlet Ports (Fig 2.22-25) on the Generator Control Panel (Fig 2). Ensure that the Oxygen Flowmeters are closed.

**e)** Fill two Humidifier Bottles (Fig 2.40) with distilled or highly filtered water to the line indicated on the bottle and connect each to an Oxygen Flowmeter.

**f)** Attach the female tapered hose end of a Cannula (Fig 2.39) to the corresponding male tapered connection of each Humidifier Bottle (Fig 2.40).

**CAUTION**

**When connecting EQUIPMENT (ventilator, Microboost, etc.) to the Oxygen Outlet Ports (Fig 2.22-25) on the Generator (Fig 1.1) instead of Humidifier Bottles (Fig 2.40) and Cannulas (Fig 2.39), DO NOT use an Oxygen Flowmeter between the Oxygen Outlet Port (Fig 2.22-25) and the equipment. Use of an Oxygen Flowmeter inline with a connection to equipment will cause inadequate oxygen pressure and flow to operate the equipment.**

### 9.6.2 Operation

**a)** Open the Oxygen Outlet Valve (Fig 2. 18-21) for each Oxygen Outlet Port (Fig 2.22-25) attached to an Oxygen Flowmeter or the Oxygen Hose (Fig 2.41) attached to the Microboost (Fig 1.3).

**b)** Attach the Cannula (Fig 2.39) to the patient and begin the flow of oxygen by opening the Oxygen Flowmeter until the desired flow of oxygen is indicated.

**c)** Monitor the oxygen demand being place on the POGS 33 to ensure 33 LPM is not exceeded.

## 9.7 One Microboost with One POGS 33

### 9.7.1 Setup

**a)** Attach an Oxygen Hose (Fig 2.41) to one of the available Oxygen Outlet Ports (Fig 2.22-25) on the Generator Control Panel (Fig 2). Attach the other end of the Oxygen Hose (Fig 2.41) to the Oxygen Inlet Port (Fig 8.167) on the Microboost (Fig 1.3).

**CAUTION**

**When connecting EQUIPMENT (ventilator, Microboost, etc.) to the Oxygen Outlet Ports (Fig 2.22-25) on the Generator (Fig 1.1) instead of Humidifier Bottles (Fig 2.40) and Cannulas (Fig 2.39), DO NOT use an Oxygen Flowmeter between the Oxygen Outlet Port (Fig 2.22-25) and the equipment. Use of an Oxygen Flowmeter inline with a connection to equipment will cause inadequate oxygen pressure and flow to operate the equipment.**

### 9.7.2 Operation

**a)** Open the Oxygen Outlet Valve (Fig 2. 18-21) connected to the Oxygen Hose (Fig 2.41) attached to the Microboost (Fig 1.3).

**b)** Refer to section (12) for operation of the Microboost (Fig 1.3)

## 9.8 Two Microboosts with One POGS 33

### 9.8.1 Setup

**a)** Attach two Oxygen Hose (Fig 2.41) to two of the available Oxygen Outlet Ports (Fig 2.22-25) on the Generator Control Panel (Fig 2). Attach the other end of the Oxygen Hoses (Fig 2.41) to the Oxygen Inlet Ports (Fig 8.167) on the Microboosts (Fig 1.3).

**CAUTION**

**When connecting EQUIPMENT (ventilator, Microboost, etc.) to the Oxygen Outlet Ports (Fig 2.22-25) on the Generator (Fig 1.1) instead of Humidifier Bottles (Fig 2.40) and Cannulas (Fig 2.39), DO NOT use an Oxygen Flowmeter between the Oxygen Outlet Port (Fig 2.22-25) and the equipment. Use of an Oxygen Flowmeter inline with a connection to equipment will cause inadequate oxygen pressure and flow to operate the equipment.**

### 9.8.2 Operation

**a)** Open the Oxygen Outlet Valves (Fig 2. 18-21) connected to the Oxygen Hoses (Fig 2.41) attached to the Microboosts (Fig 1.3).

**b)** Refer to section (12) for operation of the Microboosts (Fig 1.3).

## 9.9 HV Booster with One POGS 33

### 9.9.1 Setup

**a)** Attach an Oxygen Hose (Fig 2.41) to one of the available Oxygen Outlet Ports (Fig 2.22-25) on the Generator Control Panel (Fig 2) of the Generator (Fig 1.1). Attach the other end of the Oxygen Hose (Fig 2.41) to the Single Oxygen Inlet Port on the HV Booster (Fig 1.4).

### 9.9.2 Operation

**a)** Open the Oxygen Outlet Valve (Fig 2. 18-21) connected to the Oxygen Hose (Fig 2.41) attached to the HV Booster (Fig 1.4) on the Generator (Fig 1.1).

**b)** Refer to 12 for operation of the HV Booster (Fig 1.4).

**NOTE**

**Do not use any other oxygen-consuming device when using the HV Booster (Fig 1.4) on the POGS 33. The HV Booster (Fig 1.4) consumes all available oxygen from the POGS 33.**

## 9.10 HV Booster with Two POGS 33

### 9.10.1 Setup

**a)** Attach an Oxygen Hose (Fig 2.41) to one of the available Oxygen Outlet Ports (Fig 2.22-25) on the Generator Control Panel (Fig 2) of one of the Generators (Fig 1.1). Attach the other end of the Oxygen Hose (Fig 2.41) to one of the Dual Oxygen Inlet Ports on the HV Booster (Fig 1.4).

**b)** Attach another Oxygen Hose (Fig 2.41) to one of the available Oxygen Outlet Ports (Fig 2.22-25) on the Generator Control Panel (Fig 2) of the second Generator (Fig 1.1). Attach the other end of this hose to the available Dual Oxygen Inlet Port on the HV Booster (Fig 1.4)

**CAUTION**

**When connecting EQUIPMENT (ventilator, Microboost, etc.) to the Oxygen Outlet Ports (Fig 2.22-25) on the Generator (Fig 1.1) instead of Humidifier Bottles (Fig 2.40) and Cannulas (Fig 2.39), DO NOT use an Oxygen Flowmeter between the Oxygen Outlet Port (Fig 2.22-25) and the equipment. Use of an Oxygen Flowmeter inline with a connection to equipment will cause inadequate oxygen pressure and flow to operate the equipment.**

### 9.10.2 Operation

**a)** Open the Oxygen Outlet Valve (Fig 2. 18-21) connected to the Oxygen Hose (Fig 2.41) attached to the HV Booster (Fig 1.4) on both of the Generators (Fig 1.1).

**b)** Refer to 12 for operation of the HV Booster (Fig 1.4).

**NOTE**

**Do not use any other oxygen-consuming device when using the HV Booster (Fig 1.4) on the POGS 33. The HV Booster (Fig 1.4) consumes all available oxygen from the POGS 33.**

# 10 Feed Air Compressor and Generator Shutdown Procedures

**IMPORTANT**

**The Feed Air Compressor (Fig 1.2) should not be shut down while the Generator (Fig 1.1) is operating.**

## 10.1 Storage and/or Shipping Shutdown

### 10.1.1 Definition

The Storage and/or Shipping Shutdown procedure is used when the POGS 33 will not be used for extended periods of time or will be shipped.

### 10.1.2 POGS 33 Shutdown

**a)** Close all four (4) Oxygen Outlet Valves on the Generator Control Panel (Fig 2) by turning them (¼ turn, 9:00 position).

**b)** Close all three (3) Medical Air Outlet Valves by turning them (¼ turn, 9:00 position).

**c)** Change the Power Switch (Fig 2.16) on the Generator Control Panel (Fig 2) to the (OFF) position.

**d)** Disconnect the Generator Power Cord (Fig 2.29) from the power source.

**e)** Remove the Tethered Retaining Clip (Fig 5.108) from the Exterior Lid Support Base (Fig 5.107) to release the Exterior Lid Support (Fig 5.162).

**f)** Open the Exterior Lid (Fig 7.166) fully.

**g)** Change the Compressor Power Switch (Fig 5.106) on the Compressor Interior Cover (Fig 5) to the (OFF) position.

**h)** Disconnect the Compressor Power Cord (Fig 5.104) from the power source.

### 10.1.3 Relieve Oxygen Receiver (Fig 3.51) and Air Receiver Pressure

**a)** If one or more Oxygen Flowmeters are installed on the Oxygen Outlet Ports (Fig 2.22-25), disconnect any accessory from the Oxygen Flowmeter and set aside.

**b)** If no Oxygen Flowmeters are installed on the Oxygen Outlet Ports (Fig 2.22-25), install one or more Oxygen Flowmeters to the Oxygen Outlet Ports (Fig 2.22-25)

**c)** Open the Oxygen Outlet Valves corresponding to the Oxygen Outlet Ports (Fig 2.22-25) that have Oxygen Flowmeters installed.

**d)** Adjust the knurled control knob on the Oxygen Flowmeters to 15LPM.

**e)** Allow oxygen to flow until the Oxygen Receiver (Fig 3.51) Pressure is 0 PSIG. The Oxygen Receiver Pressure may be observed on the Oxygen Outlet Pressure [Gauge] (Fig 2.11) once it falls below approximately 50 PSIG.

**f)** Close all four (4) Oxygen Outlet Valves on the Generator Control Panel (Fig 2) by turning them (¼ turn, 9:00 position).

**g)** Open the Generator Control Panel (Fig 2) by pulling on the two Latches (Fig 2.6.

**h)** Slowly Open the Manual Condensate Drain Valve (Fig 3.79) and allow air to flow until the Air Receiver (Fig 3.48) pressure reaches 0 PSIG. Air Receiver (Fig 3.48) pressure may be verified by inspecting the Air Receiver Pressure Gauge (Fig 3.52) in the Generator Interior (Fig 3) at the top of the Air Receiver (Fig 3.48) (Fig 3.48).

**i)** If necessary, empty the Condensate Drain Bottle (Fig 3.78) and reinstall, securing with the Velcro Strap (Fig 3.80).

### 10.1.4 Prepare the Generator (Fig 1.1) for Storage and/or Shipping

**a)** Remove all Oxygen Flowmeters from the Oxygen Outlet Ports (Fig 2.22-25)

**b)** Remove any accessories installed on the Medical Air Outlet Port (Fig 2. 27)

**c)** Secure all of the Oxygen Flowmeters and Generator Accessories in the Accessory – Microboost Box.

**d)** Disconnect the hose attached to the Generator Feed Air Inlet Port using Air Hose Wrench.

**e)** Lay the Generator (Fig 1.1) on its rear side (minimum 4 people).

**f)** Install the Generator Exterior Lid on the Generator (Fig 1.1)..

**g)** Secure the cover by using all (14) fourteen latches, ensuring that they are turned a full ½ turn clockwise.

### 10.1.5 Prepare the Feed Air Compressor (Fig 1.2) for Storage and/or Shipping

**a)** Disconnect the Remote Supply Air Hose (Fig 5.117) from the Supply Air Inlet or the Feed Air Hose (Fig 5.116) if necessary using the Air Hose Wrench. Also, if applicable, remove the Supply Air Filter Assembly (Fig 5.113) from the Remote Supply Air Hose (Fig 5.117).

**b)** Remove the Supply Air Inlet Assembly (Fig 5.102).

**c)** Disconnect the Feed Air Hose (Fig 5.116) from the Feed Air Outlet Port (Fig 5.99) using the Air Hose Wrench.

**d)** Remove the Rain Guard (Fig 5.101) and place in Accessory - Microboost Box.

**e)** Remove Cooling Air Filter Element and place in Accessory - Microboost Box.

**f)** Coil the Feed Air Hose and the Remote Air Hose tightly and place in Accessory - Microboost Box.

**g)** Coil the Compressor Power Cord (Fig 5.104) and place on top of the Compressor Interior Cover (Fig 5).

**h)** Close the Feed Air Compressor Exterior Lid (Fi 7.166).

**i)** Secure the Feed Air Compressor Exterior Lid (Fig 7.166) by using all seven (7) latches, ensuring that they are turned a full ½ turn clockwise.

## 10.2 Normal Shutdown

### 10.2.1 Definition

Then Normal Shutdown procedure is used to shutdown the POGS 33 for short periods when oxygen production is not needed, but the POGS 33 is to remain ready for quick startup.

### 10.2.2 Generator (Fig 1.1) Shutdown

**a)** Close all four (4) Oxygen Outlet Valves on the Generator Control Panel (Fig 2) by turning them (¼ turn, 9:00 position).

**b)** Close all three (3) of the Medical Air Outlet Valves by turning them (¼ turn, 9:00 position).

**c)** If the Oxygen Receiver (Fig 3.51) pressure is low, the Generator (Fig 1.1) will run until Oxygen Receiver (Fig 3.51) pressure reaches approximately 70 PSIG, at which point the Generator (Fig 1.1) will switch to standby mode, indicated by the illumination of the Standby [Indicator] on the Generator Control Panel (Fig 2). The Generator (Fig 1.1) should reach standby mode within 5 minutes. Oxygen Receiver (Fig 3.51) pressure may be verified by inspecting the Oxygen Receiver Pressure Gauge (Fig 3.59) in the Generator (Fig 3) at the top of the Oxygen Receiver (Fig 3.51).

**NOTE**

**At altitudes of 5000 FT or above, the Generator (Fig 1.1) may not switch to standby mode. As altitude increases, the pressure, flow, and purity may decrease as volume of oxygen and air per cubic foot decreases. If the Generator (Fig 1.1) does not switch to standby mode within 5 minutes, and no oxygen leaks are observed, proceed to section (11.2.2d).**

**d)** Change the Power Switch (Fig 2.16) on the Generator Control Panel (Fig 2) to the (OFF) Position.

**e)** Disconnect the Generator Power Cord (Fig 2.29) from the power source.

### 10.2.3 Feed Air Compressor (Fig 1.2) Shutdown

**a)** Remove the Tethered Retaining Clip (Fig 5.108) from the Feed Air Compressor (Fig 1.2) Exterior Lid Support Base to release the Feed Air Compressor (Fig 1.2) Exterior Lid Support.

**b)** Open the Exterior Feed Air Compressor (Fig 1.2) Lid fully.

**c)** Change the Compressor Power Switch (Fig 5.106) on the Compressor Interior Cover (Fig 5) to the (OFF) position.

**d)** Disconnect the Compressor Power Cord (Fig 5.104) from the power source.

**e)** Lower the Exterior Lid (Fig 7.166) without engaging the Exterior Lid Support to minimize foreign object entry.

### 10.2.4 Damage and Hazards

**a)** Store the Compressor Power Cord (Fig 5.104) and Generator Power Cord (Fig 2.29) in an area that will protect them from damage will not pose hazards to personnel in the area.

**b)** Ensure the hose(s) between the Feed Air Compressor (Fig 1.2) and the Generator (Fig 1.1) are routed to protect the hoses from damage and will not pose hazards to personnel in the area.

**c)** Ensure any accessories or hoses attached to the Oxygen Outlet Ports (Fig 2.22-25) or Medical Air Outlet Ports (Fig 2. 27) on the Generator Control Panel (Fig 2) are protected from damage and do not pose hazards to personnel in the area.

## 10.3 Emergency Shutdown

### 10.3.1 Definition

The Emergency Shutdown procedure is used when the power source is interrupted for either the Generator (Fig 1.1) or the Feed Air Compressor (Fig 1.2), or another event occurs that prevents normal operation while the POGS 33 is in operation.

**NOTE**

**If the Backup Oxygen system is installed, it should be activated as described in (11.3) before proceeding**

### 10.3.2 Generator (Fig 1.1) Shutdown

**a)** If the Backup Oxygen is not configured, close all four (4) Oxygen Outlet Valves on the Generator Control Panel (Fig 2) by turning them (¼ turn, 9:00 position).

**b)** Close all three (3) of the Medical Air Outlet Valves by turning them (¼ turn, 9:00 position).

**c)** Change the Power Switch (Fig 2.16) on the Generator Control Panel (Fig 2) to the (OFF) Position.

**d)** Disconnect the Generator Power Cord (Fig 2.29) from the power source.

### 10.3.3 Feed Air Compressor (Fig 1.2) Shutdown

**a)** Remove the Tethered Retaining Clip (Fig 5.108) from the Exterior Lid Support Base (Fig 5.107) to release the Exterior Lid Support (Fig 5.162).

**b)** Open the Exterior Lid (Fig 7.166) fully.

**c)** Change the Compressor Power Switch (Fig 5.106) on the Compressor Interior Cover (Fig 5) to the (OFF) position.

**d)** Disconnect the Compressor Power Cord (Fig 5.104) from the power source.

**e)** Lower the Exterior Lid (Fig 7.166) without engaging the Exterior Lid Support to minimize foreign object entry.

## 10.4 Shutdown for Configuration Changes

### 10.4.1 Definition

The Shutdown for Configuration Changes procedure is used when the POGS 33 needs configuration changes made after the Initial Startup procedure has been performed. Configuration changes include any changes that require the hoses between the Feed Air Compressor (Fig 1.2) and Generator (Fig 1.1) to be disconnected and/or changes to the power source. Configuration changes to accessories connected to the Oxygen Outlet Ports (Fig 2.22-25) on the Generator Control Panel do not require use of this procedure; the Normal Shutdown procedure should be used if necessary.

### 10.4.2 POGS 33 Shutdown

**a)** Close all four (4) Oxygen Outlet Valves on the Generator Control Panel (Fig 2) by turning them (¼ turn, 9:00 position).

**b)** Close all three (3) of the Medical Air Outlet Valves by turning them (¼ turn, 9:00 position).

**c)** Change the Power Switch (Fig 2.16) on the Generator Control Panel (Fig 2) to the (OFF) position.

**d)** Disconnect the Generator Power Cord (Fig 2.29) from the power source.

**e)** Remove the Tethered Retaining Clip (Fig 5.108) from the Exterior Lid Support Base (Fig 5.107) to release the Exterior Lid Support (Fig 5.162).

**f)** Open the Exterior Lid (Fig 7.166) fully.

**g)** Change the Compressor Power Switch (Fig 5.106) on the Compressor Interior Cover (Fig 5) to the (OFF) position.

**h)** Disconnect the Compressor Power Cord (Fig 5.104) from the power source.

### 10.4.3 Relieve Air Receiver (Fig 3.48) Pressure

**a)** Open the Generator Control Panel (Fig 2) by pulling on the two Latches (Fig 2.6.

**b)** Slowly Open the Manual Condensate Drain Valve (Fig 3.79) and allow air to flow until the Air Receiver (Fig 3.48) pressure reaches 0 PSIG. Air Receiver (Fig 3.48) pressure may be verified by inspecting the Air Receiver Pressure Gauge (Fig 3.52) in the Generator Interior (Fig 3) at the top of the Air Receiver (Fig 3.48) (Fig 3.48).

**c)** If necessary, empty the Condensate Drain Bottle (Fig 3.78) and reinstall, securing with the Velcro Strap (Fig 3.80).

## 10.5 Shutdown for Generator Maintenance or Repair

### 10.5.1 Introduction

The Shutdown for Maintenance or Repair procedure ensures that the Feed Air Compressor (Fig 1.2) and Generator (Fig 1.1) are de-pressurized. This provides a level of safety for the technician performing the maintenance or repair.

### 10.5.2 POGS 33 Shutdown

**IMPORTANT**

**During the Shutdown for Maintenance or Repair ONLY, the Power Switch (Fig 2.16) on the Generator Control Panel (Fig 2) should remain in the (ON) position while the Feed Air Compressor (Fig 1.2) is being shutdown. This allows the pressure in the Sieve Beds to be partially relieved.**

**a)** Remove the Tethered Retaining Clip (Fig 5.108) from the Exterior Lid Support Base (Fig 5.107) to release the Exterior Lid Support (Fig 5.162).

**b)** Open the Exterior Lid (Fig 7.166) fully.

**c)** Change the Compressor Power Switch (Fig 5.106) on the Compressor Interior Cover (Fig 5) to the (OFF) position.

**d)** Disconnect the Compressor Power Cord (Fig 5.104) from the power source.

**NOTE**

**If the Generator (Fig 1.1) is in Standby Mode, open one or more Oxygen Outlet Valves and the corresponding Oxygen Flowmeter to allow the Generator (Fig 1.1) to switch to Operate Mode.**

**e)** Allow the Generator (Fig 1.1) to operate with the Feed Air Compressor (Fig 1.2) off until no exhaust is heard or felt exiting the Muffler on the Main Valve in the Generator (Fig 3).

**f)** Change the Power Switch (Fig 2.16) on the Generator Control Panel (Fig 2) to the (OFF) position.

**g)** Disconnect the Generator Power Cord (Fig 2.29) from the power source.

### 10.5.3 Relieve Oxygen Receiver (Fig 3.51) and Air Receiver (Fig 3.48) Pressure

**a)** If one or more Oxygen Flowmeters are installed on the Oxygen Outlet Ports (Fig 2.22-25), disconnect any accessory from the Oxygen Flowmeter and set aside.

**b)** If no Oxygen Flowmeters are installed on the Oxygen Outlet Ports (Fig 2.22-25), install one or more Oxygen Flowmeters to the Oxygen Outlet Ports (Fig 2.22-25)

**c)** Open the Oxygen Outlet Valves corresponding to the Oxygen Outlet Ports (Fig 2.22-25) that have Oxygen Flowmeters installed.

**d)** Adjust the knurled control knob on the Oxygen Flowmeters to 15LPM.

**e)** Allow oxygen to flow until the Oxygen Receiver (Fig 3.51) Pressure is 0 PSIG. The Oxygen Receiver (Fig 3.51) Pressure may be observed on the Oxygen Outlet Pressure [Gauge] (Fig 2.11) once it falls below approximately 50 PSIG.

**f)** Close all four (4) Oxygen Outlet Valves on the Generator Control Panel (Fig 2) by turning them (¼ turn, 9:00 position).

**g)** Open the Generator Control Panel (Fig 2) by pulling on the two Latches (Fig 2.6.

**h)** Slowly Open the Manual Condensate Drain Valve (Fig 3.79) and allow air to flow until the Air Receiver (Fig 3.48) pressure reaches 0 PSIG. Air Receiver pressure may be verified by inspecting the Air Receiver Pressure Gauge (Fig 3.52) in the Generator Interior (Fig 3) at the top of the Air Receiver (Fig 3.48).

**i)** If necessary, empty the Condensate Drain Bottle (Fig 3.78) and reinstall, securing with the Velcro Strap (Fig 3.80).

### 10.5.4 Relieve Remaining Pressure in the Sieve Beds

**a)** Open the Generator Control Panel (Fig 2).

**b)** Locate the Check Valves

**CAUTION**

**A strong stream of air will exit the check valves after completing the next step. Take proper precautions to protect the eyes and face.**

**c)** Remove the clear ¼" tubing from the lower connection of one of the Check valves by pushing gently on the orange or red ring of the connector, then pull on the clear ¼" tubing while continuing to push on the orange or red ring.

**d)** Any remaining pressure in the Sieve Beds will exit through the check valves.

### 10.6 Shutdown for Compressor Maintenance or Repair

**a)** Change the Power Switch (Fig 2.16) on the Generator Control Panel (Fig 2) to the (OFF) position.

**b)** Disconnect the Generator Power Cord (Fig 2.29) from the power source.

**c)** Remove the Tethered Retaining Clip (Fig 5.108) from the Exterior Lid Support Base (Fig 5.107) to release the Exterior Lid Support (Fig 5.162).

**d)** Open the Exterior Lid (Fig 7.166) fully.

**e)** Change the Compressor Power Switch (Fig 5.106) on the Compressor Interior Cover (Fig 5) to the (OFF) position.

**f)** Disconnect the Compressor Power Cord (Fig 5.104) from the power source.

**g)** Open the Generator Control Panel (Fig 2) by pulling on the two Latches (Fig 2.6.

**h)** Slowly Open the Manual Condensate Drain Valve (Fig 3.79) and allow air to flow until the Air Receiver (Fig 3.48) pressure reaches 0 PSIG. Air Receiver pressure may be verified by inspecting the Air Receiver Pressure Gauge (Fig 3.52) in the Generator Interior (Fig 3) at the top of the Air Receiver (Fig 3.48).

**i)** If necessary, empty the Condensate Drain Bottle (Fig 3.78) and reinstall, securing with the Velcro Strap (Fig 3.80).

# 11 Microboost

**NOTE**

**Never use the Microboost (Fig 1.3) or HV Booster (Fig 1.4) to fill cylinders with** Medical Air**. The Microboost (Fig 1.3) and HV Booster (Fig 1.4) are only to be used for Oxygen fills.**

**NOTE**

**Follow the pre-startup and safety procedures for the Microboost (Fig 1.3) in the Microboost (Fig 1.3) manual.**

**NOTE**

**While running, the Microboost (Fig 1.3) continuously consumes 9 LPM of oxygen. If the Microboost (Fig 1.3) does not receive 9 LPM of oxygen, an internal pressure switch will trip and the Microboost (Fig 1.3) will stop filling.**

## 11.1 Operating Principles

The Microboost (Fig 1.3) oxygen high-pressure booster Feed Air Compressor (Fig 1.2) is designed to compress the oxygen produced by the POGS in order that a high volume of oxygen can be contained in a relatively small vessel such as a high-pressure oxygen cylinder. The Microboost (Fig 1.3) compresses oxygen in three stages to a pressure of 2200 PSIGG.

Oxygen at ambient pressure and temperature is one of the three components of the combustion triangle (heat, fuel and oxygen). When any gas is compressed, heat is produced. Oxygen, when compressed (under pressure) can encourage burning and even explosion to a point at which ignition temperature can be 70 degrees (F) or lower and any material, including steel, can become fuel. Therefore, extreme caution must be taken when compressing oxygen, particularly to a pressure as high as 2200 PSIG.

Rix Industries has been in the business of compressing oxygen for many years. The Microboost (Fig 1.3), when used as directed, is a safe and effective means to compress oxygen. Included in this manual is the full operating manual for the Microboost (Fig 1.3).

**NOTE**

**Although many of the instructions in that manual are included in this section, it is imperative that the operator read the Rix Microboost manual section and be completely familiar with the safety and startup procedures for the Microboost (Fig 1.3).**

### 11.2 Setup

**a)** Refer to section (10) for connection of the Microboost (Fig 1.3) to the POGS 33

**CAUTION**

**When connecting EQUIPMENT (ventilator, Microboost, etc.) to the Oxygen Outlet Ports (Fig 2.22-25) on the Generator (Fig 1.1) instead of Humidifier Bottles (Fig 2.40) and Cannulas (Fig 2.39), DO NOT use an Oxygen Flowmeter between the Oxygen Outlet Port (Fig 2.22-25) and the equipment. Use of an Oxygen Flowmeter inline with a connection to equipment will cause inadequate oxygen pressure and flow to operate the equipment.**

**b)** Open the Microboost (Fig 1.3) lid and pull out the High-pressure Pigtails.

**WARNING**

**Visually inspect all of the High-pressure Pigtails to ensure that they have no cracks, all connections are firm, and that there is no wear, damage, or corrosion present. Operating the Microboost (Fig 1.3) with worn or damage pigtails may cause dangerous conditions which can result in serious injury or death.**

**c)** Verify that the proper High-pressure Pigtails match the high-pressure cylinders to be filled. The Microboost (Fig 1.3) comes standard with “D” or “E” fittings. An optional H/K fitting may have been included with your Microboost (Fig 1.3).

**d)** Secure the high-pressure oxygen cylinders to be filled in the D/E Cylinder Support Assembly (Fig 8.174) (When filling an “H” cylinder, the Microboost (Fig 1.3) should be positioned on the ground with the high-pressure oxygen cylinder laid beside it, secured to the Microboost (Fig 1.3) frame).

**WARNING**

**Ensure that the High-pressure Cylinders are secured. A high-pressure cylinder that drops or is knocked over may burst and cause serious injury or death.**

**e)** Chose the configuration that is appropriate:

- When filling one (1) cylinder, the center High-pressure Pigtail should be used.

- The two left and two right High-pressure Pigtails are paired together, controlled by one High-pressure Manifold Needle Valve. These pairs must be used together.

**f)** Select which High-pressure Cylinder Fittings will be used.

**g)** Inspect each High-pressure Cylinder Fitting for any dirt, oil, or other foreign material. Clean with a mild detergent as necessary, ensuring to dry the fitting completely and remove any particles from any cloth used are removed. Ensure the gasket of the High-pressure Cylinder Fitting is in place and not damaged.

**h)** Open the High-pressure Cylinder Fitting by turning the handle counterclockwise until open enough to place over the valve of the high-pressure oxygen cylinder.

**i)** Place the High-pressure Cylinder Fitting over the high-pressure oxygen cylinder valve

**j)** Align the two pins of the High-pressure Cylinder Fitting with the two holes in the high-pressure oxygen cylinder valve and insert the pins into the holes. If the pins do not line up, remove and reverse the fitting.

**k)** Secure the High-pressure Cylinder Fitting to the high-pressure oxygen cylinder valve by turning the handle on the fitting clockwise, ensuring that the pins of the fitting seat in the holes of the valve.

**l)** Repeat steps (h) through (k) for each high-pressure oxygen cylinder to be used.

**m)** Open the High-pressure Manifold Valves corresponding to the High-pressure Pigtails used.

**n)** Ensure that the High-pressure Manifold Valves corresponding to any unused High-pressure Pigtails are closed.

**o)** Open the high-pressure oxygen cylinder valve on each cylinder to be filled.

### 11.3 Operation

**a)** Connect the Microboost (Fig 1.3) to the power source.

**b)** Change the Microboost (Fig 1.3) Power Switch (Fig 9.180) to the “ON” position.

**c)** Press the Start Button (Fig 9.179) and release.

**Note**

**The Microboost (Fig 1.3) will consume Oxygen at a rate of 9 LPM.**

**d)** The Microboost (Fig 1.3) will begin filling the cylinders. All cylinders are filled simultaneously, therefore the more

cylinders attached, the longer it will take. Progress of the cylinder filling operation can be monitored on the High-pressure Manifold Pressure Gauge. The Microboost (Fig 1.3) will automatically shut down when cylinder pressure reaches approximately 2200 PSIG.

### 11.3.2 Cylinder Removal

**a)** Close the high-pressure oxygen cylinder valves on all of the attached cylinders.

**b)** Close three (3) of the High-pressure Manifold Needle Valves.

**CAUTION**

**Keep your face clear of the High-pressure Cylinder Fittings.**

**c)** Repeat this process with each cylinder to be removed.

**d)** Remove the high-pressure oxygen cylinders from the High-Pressure Oxygen Cylinder Support Assembly.

## 11.4 Microboost Backup Oxygen

### 11.4.1 Definition

In situation where uninterrupted oxygen flow is critical, the Backup Oxygen system should be utilized. In the event of a power failure or other event that prevents the POGS 33 from producing oxygen, the Backup Oxygen system will allow uninterrupted oxygen flow to the patients or equipment attached to the POGS 33. The Backup Oxygen system can also be configured to provide backup if oxygen flow demand exceeds the capabilities of the POGS 33.

### 11.4.2 Setup (Using Microboost)

**a)** If a high-pressure oxygen cylinder that is filled or partially filled is not installed, install one or more per section (12.2), steps (b)-(o).

**b)** Connect one of the Oxygen Hoses (Fig 2.41) to the Backup Oxygen Outlet Port on the Microboost (Fig 1.3)

**c)** Connected the opposite end of the Oxygen Hose (Fig 2.41) to the Backup Oxygen Inlet Port (Fig 2.31) on the Generator Control Pane.

**d)** Open the Backup Oxygen Outlet Valve on the Microboost.

- If being used as a backup for an overdraw condition (exceeding the flow capabilities of the POGS 33) it is now ready to provide oxygen if the Oxygen Receiver (Fig 3.51) pressure drops below 45PSIG.

- If the POGS 33 has experienced an event that caused it to cease oxygen production, the Backup Oxygen system will now provide oxygen to the accessories or equipment connected to the Oxygen Outlet Ports (Fig 2.22-25) on the Generator Control Panel (Fig 2). Proceed to the Emergency Shut Down procedure in section (11.3)
- To maintain uninterrupted oxygen flow, when the high-pressure oxygen cylinder start to run low, one of the High-pressure Manifold Needle Valves should be closed and the corresponding bottles changed.

**WARNING**

**It is important to understand that** Medical Air **is not available from the POGS 33 if the Feed Air Compressor (Fig 1.2) is not running. Immediately upon loss of power to the Feed Air Compressor (Fig 1.2), all devices running on Medical Air must be changed over to Oxygen as the** drive **gas.**

**CAUTION**

**When the Backup Oxygen system is implemented during a power failure, oxygen delivery changes from a limited flow for UNLIMITED time to unlimited flow for a LIMITED time. Awareness of high-pressure oxygen cylinder pressure is vital to ensure uninterrupted oxygen flow.**

### 11.4.3 Setup (Using a High-pressure Oxygen Cylinder)

**a)** A high-pressure oxygen cylinder with a regulator adjusted to 45 PSIG must be used if a Microboost (Fig 1.3) or HV Booster (Fig 1.4) configuration is not available.

**b)** Ensure the Backup Oxygen Inlet Port Valve (Fig 2.32) on the Generator Control Panel (Fig 2) is closed (9:00 position)

**c)** Connect an Oxygen Hose (Fig 2.41) to the Backup Oxygen Inlet Port (Fig 2.31) on the Generator Control Panel (Fig 2).

**d)** Connect the other end of the Oxygen Hose (Fig 2.41) to a regulator installed on a high-pressure oxygen cylinder.

**e)** Chose the configuration desired:

- For backup in case of power failure or oxygen flow demand exceeding the capabilities of the POGS 33: Open the high-pressure oxygen cylinder valve and adjust the regulator for 45 PSIG.
- For backup only in the case of power failure: Keep the high-pressure oxygen cylinder valve close until the need for

backup arises. Open the high-pressure oxygen cylinder valve when necessary.

**WARNING**

**It is important to understand that** Medical Air **is not available from the POGS 33 if the Feed Air Compressor (Fig 1.2) is not running. Immediately upon loss of power to the Feed Air Compressor (Fig 1.2), all devices running on Medical Air, must be changed over to Oxygen as the** drive **gas.**

**CAUTION**

**When the Backup Oxygen system is implemented during a power failure, oxygen delivery changes from a limited flow for UNLIMITED time to unlimited flow for a LIMITED time. Awareness of high-pressure oxygen cylinder pressure is vital to ensure uninterrupted oxygen flow.**

### 11.4.4 Shutdown of Backup Oxygen

When the condition that caused the POGS 33 to shut down or be overdrawn is corrected, the Backup Oxygen may be disconnected.

**a)** Close the Backup Oxygen Outlet Valve in the Microboost (Fig 1.3).

**b)** Close the Backup Oxygen Inlet Port Valve (Fig 2.32) on the Generator Control Panel (Fig 2).

**c)** If further need for the Backup Oxygen system is no longer needed, the Oxygen Hose (Fig 2.41) may be disconnected from the Backup Oxygen Outlet Port in the Microboost (Fig 1.3) and the Backup Oxygen Inlet Port (Fig 2.31) on the Generator Control Panel (Fig 2).

### 11.4.5 Shutdown of Backup Oxygen (When Using A High-pressure Cylinder)

When the condition that caused the POGS 33 to shut down or be overdrawn is corrected, the Backup Oxygen may be disconnected.

**a)** Close the high-pressure oxygen cylinder valve.

**b)** Close the Backup Oxygen Inlet Port Valve (Fig 2.32) on the Generator Control Panel (Fig 2).

**c)** If further need for the Backup Oxygen system is no longer needed, the Oxygen Hose (Fig 2.41) may be disconnected from the high-pressure oxygen cylinder and the Backup Oxygen Inlet Port (Fig 2.31) on the Generator Control Panel (Fig 2).

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# 12 HV (High Volume) Booster

**NOTE**

**The HV Booster (Fig 1.4) is an optional component of the POGS 33.**

**NOTE**

**Never use the Microboost (Fig 1.3) or HV Booster (Fig 1.4) to fill cylinders with** Medical Air**. The Microboost (Fig 1.3) and HV Booster (Fig 1.4) are only to be used for Oxygen.**

**NOTE**

**Follow the pre-startup and safety procedures for the HV Booster (Fig 1.4) in the HV Booster (Fig 1.4) manual.**

**NOTE**

**Do not use any other oxygen-consuming device when using the HV Booster (Fig 1.4) on the POGS 33. The HV Booster (Fig 1.4) consumes all available oxygen from the POGS 33.**

## 12.1 Operating Principles

The Rix High Volume Booster is designed to store high volumes of oxygen in cylinders and do so at a rapid rate. The Rix HV consumes all of the generated oxygen (33 LPM) of the POGS. No additional demand can be put on the POGS when filling cylinders using the Rix HV. Additionally, the Rix HV Booster can double its rate of filling by feeding the full-generated volume of two POGS (66 LPM). Both POGS are unable to supply oxygen to any other system, or directly to patients when the RIX HV is in use.

Oxygen at ambient pressure and temperature is one of the three components of the burning triangle (heat, fuel and oxygen). When any gas is compressed, heat is produced. Oxygen, when compressed (under pressure) can encourage burning and even explosion to a point at which ignition temperature can be 70 degrees (F) or lower and any material, including steel, can become fuel. Therefore, extreme caution must be taken when compressing oxygen, particularly to a pressure as high as 2200 PSIG.

Rix Industries has been in the business of compressing oxygen for many years. The Rix High Volume Booster, when used as directed, is a safe and effective means to compress oxygen. Included in this manual is the full operating manual for the Rix HV Booster (Fig 1.4).

**NOTE**

**Although many of the instructions in that manual are included in this section, it is imperative that the operator read the Rix manual section and be completely familiar with the safety and startup procedures for the Rix HV Booster (Fig 1.4).**

### 12.2 Preparation and Start-up

**a)** Refer to section (10) for connection of the HV Booster (Fig 1.4) to the POGS 33

**CAUTION**

**When connecting EQUIPMENT (ventilator, Microboost, etc.) to the Oxygen Outlet Ports (Fig 2.22-25) on the Generator (Fig 1.1) instead of Humidifier Bottles (Fig 2.40) and Cannulas (Fig 2.39), DO NOT use an Oxygen Flowmeter between the Oxygen Outlet Port (Fig 2.22-25) and the equipment. Use of an Oxygen Flowmeter inline with a connection to equipment will cause inadequate oxygen pressure and flow to operate the equipment.**

**b)** Remove both side covers from the HV Booster (Fig 1.4).

**c)** Pull out the High-pressure Pigtails.

**WARNING**

**Visually inspect all of the High-pressure Pigtails to ensure that they have no cracks, all connections are firm, and that there is no wear, damage, or corrosion present. Operating the Microboost (Fig 1.3) with worn or damage pigtails may cause dangerous conditions which can result in serious injury or death.**

**d)** Verify that the proper High-pressure Pigtails match the high-pressure cylinders to be filled. The HV Booster (Fig 1.4) comes standard with H/K fittings. An optional “D” or “E” fitting may have been included with your Microboost (Fig 1.3).

**e)** Secure the high-pressure oxygen cylinders to be filled.

**WARNING**

**Ensure that the High-pressure Cylinders are secured. A high-pressure cylinder that drops or is knocked over may burst and cause serious injury or death.**

**f)** Chose the configuration that is appropriate:

- When filling one (1) cylinder, the center High-pressure Pigtail should be used.
- The two left and two right High-pressure Pigtails are paired together, controlled by one High-pressure Manifold Needle Valve. These pairs must be used together.

**g)** Select which High-pressure Cylinder Fittings will be used.

**h)** Inspect each High-pressure Cylinder Fitting for any dirt, oil, or other foreign material. Clean with a mild detergent as necessary, ensuring to dry the fitting completely and remove any particles from any cloth used are removed. Ensure the gasket of the High-pressure Cylinder Fitting is in place and not damaged.

**i)** Open the High-pressure Cylinder Fitting by turning the handle counterclockwise until open enough to place over the valve of the high-pressure oxygen cylinder.

**j)** Place the High-pressure Cylinder Fitting over the high-pressure oxygen cylinder valve

**k)** Align the two pins of the High-pressure Cylinder Fitting with the two holes in the high-pressure oxygen cylinder valve and insert the pins into the holes. If the pins do not line up, remove and reverse the fitting.

**l)** Secure the High-pressure Cylinder Fitting to the high-pressure oxygen cylinder valve by turning the handle on the fitting clockwise, ensuring that the pins of the fitting seat in the holes of the valve.

**m)** Repeat steps (i) through (l) for each high-pressure oxygen cylinder to be used.

**n)** Open the High-pressure Manifold Valves corresponding to the High-pressure Pigtails used.

**o)** Ensure that the High-pressure Manifold Valves corresponding to any unused High-pressure Pigtails are closed.

**p)** Open the high-pressure oxygen cylinder valve on each cylinder to be filled.

**q)** Connect the HV Booster Power Cord to the power source.

## 12.3 Operation

**a)** Turn the Manual/Automatic switch on the Control Panel to the "AUTO" position. This setting will automatically stop the HV Booster (Fig 1.4) when all of the cylinders being filled reach 2200 PSIG.

**b)** Push the HV Booster Power Switch (Fig 11.242) to the "ON" position

**c)** Push the Start button on the HV Booster (Fig 1.4) to begin the flow of oxygen into the cylinders.

**d)** The HV Booster (Fig 1.4) will begin filling the cylinders. All cylinders are filled simultaneously, therefore the more cylinders attached, the longer it will take. Progress of the cylinder filling operation can be monitored on the High-pressure Manifold Pressure Gauge. The Microboost (Fig 1.3) will automatically shut down when cylinder pressure reaches approximately 2200 PSIG.

### 12.3.2 Cylinder Removal

**a)** Close the high-pressure oxygen cylinder valves on all of the attached cylinders.

**b)** Close three (3) of the High-pressure Manifold Needle Valves.

**c)** Repeat this process with each cylinder to be removed.

## 12.4 HV Booster Backup Oxygen

### 12.4.1 Definition

In situation where uninterrupted oxygen flow is critical, the Backup Oxygen system should be utilized. In the event of a power failure or other event that prevents the POGS 33 from producing oxygen, the Backup Oxygen system will allow uninterrupted oxygen flow to the patients or equipment attached to the POGS 33. The Backup Oxygen system can also be configured to provide backup if oxygen flow demand exceeds the capabilities of the POGS 33.

### 12.4.2 Setup (Using HV Booster)

**a)** If a high-pressure oxygen cylinder that is filled or partially filled is not installed, install one or more per section (13.2), steps (b)-(o).

**b)** Connect one of the Oxygen Hoses (Fig 2.41) to the Backup Oxygen Outlet Port on the HV Booster (Fig 1.4)

**c)** Connected the opposite end of the Oxygen Hose (Fig 2.41) to the Backup Oxygen Inlet Port (Fig 2.31) on the Generator Control Panel (Fig 2).

**d)** Open the Backup Oxygen Outlet Valve on the HV Booster (Fig 1.4).

- If being used as a backup for an overdraw condition (exceeding the flow capabilities of the POGS 33) it is now ready to provide oxygen if the Oxygen Receiver (Fig 3.51) pressure drops below 45 PSIG.
- If the POGS 33 has experienced an event that caused it to cease oxygen production, the Backup Oxygen system will now provide oxygen to the accessories or equipment connected to the Oxygen Outlet Ports (Fig 2.22-25) on the Generator Control Panel (Fig 2). Proceed to the Emergency Shut Down procedure in section (11.3)
- To maintain uninterrupted oxygen flow, when the high-pressure oxygen cylinder start to run low, one of the High-pressure Manifold Needle Valves should be closed and the corresponding bottles changed.

**WARNING**

**It is important to understand that Medical Air is not available from the POGS 33 if the Feed Air Compressor (Fig 1.2) is not running. Immediately upon loss of power to the Feed Air Compressor (Fig 1.2), all devices running on Medical Air must be changed over to Oxygen as the** drive **gas.**

**CAUTION**

**When the Backup Oxygen system is implemented during a power failure, oxygen delivery changes from a limited flow for UNLIMITED time to unlimited flow for a LIMITED time. Awareness of high-pressure oxygen cylinder pressure is vital to ensure uninterrupted oxygen flow.**

### 12.4.3 Setup (Using a High-pressure Oxygen Cylinder)

**a)** A high-pressure oxygen cylinder with a regulator adjusted to 45 PSIG must be used if a Microboost (Fig 1.3) or HV Booster (Fig 1.4) configuration is not available.

**b)** Ensure the Backup Oxygen Inlet Port Valve (Fig 2.32) on the Generator Control Panel (Fig 2) is closed (9:00 position)

**c)** Connect an Oxygen Hose (Fig 2.41) to the Backup Oxygen Inlet Port (Fig 2.31) on the Generator Control Panel (Fig 2).

**d)** Connect the other end of the Oxygen Hose (Fig 2.41) to a regulator installed on a high-pressure oxygen cylinder.

**e)** Chose the configuration desired:

- For backup in case of power failure or oxygen flow demand exceeding the capabilities of the POGS 33: Open the high-pressure oxygen cylinder valve and adjust the regulator for 45 PSIG.
- For backup only in the case of power failure: Keep the high-pressure oxygen cylinder valve close until the need for backup arises. Open the high-pressure oxygen cylinder valve when necessary.

**CAUTION**

**When the Backup Oxygen system is implemented during a power failure, oxygen delivery changes from a limited flow for UNLIMITED time to unlimited flow for a LIMITED time. Awareness of high-pressure oxygen cylinder pressure and proper oxygen budgeting is vital to ensure uninterrupted oxygen flow**

**WARNING**

**It is important to understand that** Medical Air **is not available from the POGS 33 if the Feed Air Compressor (Fig 1.2) is not running. Immediately upon loss of power to the Feed Air Compressor (Fig 1.2), all devices running on Medical Air must be changed over to Oxygen as the** drive **gas.**

### 12.4.4 Shutdown of Backup Oxygen

When the condition that caused the POGS 33 to shut down or be overdrawn is corrected, the Backup Oxygen may be disconnected.

**a)** Close the Backup Oxygen Outlet Valve in the Microboost (Fig 1.3).

**b)** Close the Backup Oxygen Inlet Port (Fig 2.31) Valve (Fig 2.32) on the Generator Control Panel (Fig 2).

**c)** If further need for the Backup Oxygen system is no longer needed, the Oxygen Hose (Fig 2.41) may be disconnected from the Backup Oxygen Outlet Port in the HV Booster (Fig 1.4) and the Backup Oxygen Inlet Port (Fig 2.31) on the Generator Control Panel (Fig 2).

### 12.4.5 Shutdown of Backup Oxygen (When Using A High-pressure Cylinder)

When the condition that caused the POGS 33 to shut down or be overdrawn is corrected, the Backup Oxygen may be disconnected.

**a)** Close the high-pressure oxygen cylinder valve.

**b)** Close the Backup Oxygen Inlet Port Valve (Fig 2.32) on the Generator Control Panel (Fig 2).

**c)** If further need for the Backup Oxygen system is no longer needed, the Oxygen Hose (Fig 2.41) may be disconnected from the high-pressure oxygen cylinder and the Backup Oxygen Inlet Port (Fig 2.31) on the Generator Control Panel (Fig 2).

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# 13 Narkomed M Anesthesia Machine

## Narkomed-M Anesthesia Machine

**The only anesthesia equipment that is validated with the POGS 33 is Draeger's Narkomed-M and the Impact Portable Ventilator (IPV) Univent™ 750 model. No other equipment is as of March 2004.**

### 13.1 Oxygen Purity

The Oxygen output from the POGS 33 is 90-96% purity. The balance of the volume of gas coming out of the Oxygen ports is Argon and Nitrogen. The reading on the calibrated POGS Oxygen sensor will be accurate as to measurement of Oxygen content in the gas going to the patient.

## NOTE

**When mixing $N_2O$, the Clinician should understand that there would be a 5-7% added volume of inert gas in the system. This added volume might change the volume of $N_2O$ required to achieve the same mix of Oxygen and $N_2O$ for the patient.**

### 13.2 Medical Air and Oxygen Budgeting

There is a venturi tube in the drive gas operating system that takes in ambient air. This ambient air mixes at a 1-to-1 ratio with the drive gas to double the volume of the drive gas. Therefore, drive gas requires an absolute maximum of 11.25 LPM Oxygen or Medical Air. This extreme occurs in very rare circumstances. Medical Air/Oxygen demand for drive gas depends on the inspiratory flow. Average demands are:

| Demand | Medical Air or Oxygen |
|---|---|
| Low | 3 to 4 LPM |
| Medium | 5 to 7 LPM |
| High | 8 to 11.25 LPM |

Medical Air/Oxygen drive gas demand should be monitored constantly to be certain air system is not being overtaxed. If Medical Air and Oxygen pressure readings on the Narkomed display on the POGS start to drop, it is an indication that the Medical Air is being overdrawn and system should be readjusted if possible to diminish Medical Air/Oxygen demand.

Oxygen consumption through the Narkomed Oxygen Flowmeter can be measured by observing the movable ball on the graduated scale of the Oxygen Flowmeter. The Narkomed Oxygen Flowmeter will accurately display the flow of Oxygen into the system.

If Medical Air is being used as the drive gas, add the Narkomed Oxygen Flowmeter reading to the other POGS Oxygen demands to feed other systems, such as Cannulas (Fig 2.39) and other equipment.

**NOTE**

**Always be certain that total oxygen demand never exceeds 33 LPM except during oxygen flush or in extreme conditions.**

### 13.3 Oxygen Flush

**a)** If oxygen is being used as a drive gas, if available, prior to flush, drive gas should be shifted to Medical Air.

**b)** When the "OXYGEN FLUSH" button on the Narkomed M is pushed (see Narkomed Manual section (6-10)), the instantaneous oxygen demand goes to 55 LPM. This is a condition of oxygen overdraw for the POGS 33. This overdraw will run the POGS Oxygen Receiver (Fig 3.51) pressure down below 35 PSIG within approximately one (1) minute, presupposing no other Oxygen demand. Using the Backup Oxygen will alleviate this pressure drop. If a Microboost (Fig 1.3) is available for Backup Oxygen, see section (12.3) for configuration. If a HV Booster (Fig 1.4) is available for Backup Oxygen, see section (13.3) for configuration. If a high-pressure oxygen cylinder is available for Backup Oxygen, see section (10.1) for configuration. After flush is complete, follow the Backup Oxygen shutdown procedures in the same sections.

**c)** During and after an Oxygen flush, other systems demanding oxygen should be closed or monitored closely for failure or oxygen starvation.

## 13.4 Operation

**NOTE**

**Fully read and acquaint yourself with the Narkomed M instructions For installation and operation.**

### 13.4.1 Operating One Narkomed with One POGS 33

**a)** If you have not filled an “E” or “D” cylinder using oxygen from the POGS 33 and one of the two boosters, Microboost (Fig 1.3) or HV Booster (Fig 1.4), do so and attach it to the oxygen cylinder yoke per the Narkomed instructions (see Narkomed Manual section (5-11 to 5-14).

**b)** Ensure that any unused Oxygen Outlet Valves (Fig 2. 18-21) and the Medical Air Outlet Valve (Fig 2.26) are closed.

**c)** Attach one end of one Medical Air Hose (Fig 2.42) to one of three (3) Medical Air Outlet Ports (Fig 2. 27) on the Generator Control Panel (Fig 2).

**d)** Attach the other end of the Medical Air Hose (Fig 2.42) to the Medical Air Inlet port in the back of the Narkomed M (see Narkomed M manual section (5-11 to 5-14).

**CAUTION**

**When connecting EQUIPMENT (ventilator, Microboost (Fig 1.3), etc.) to the Oxygen Outlet Ports (Fig 2.22-25) on the Generator (Fig 1.1) instead of Humidifier Bottles (Fig 2.40) and Cannulas (Fig 2.39), DO NOT use an Oxygen Flowmeter between the Oxygen Outlet Port (Fig 2.22-25) and the equipment. Use of an Oxygen Flowmeter inline with a connection to equipment will cause inadequate oxygen pressure and flow to operate the equipment.**

**e)** Attach an Oxygen Hose (Fig 2.41) to an unused Oxygen Outlet Port (Fig 2.22-25) on the Generator Control Panel (Fig 2).

**f)** Attach the opposite end of the Oxygen Hose (Fig 2.41) to the Oxygen Inlet port in the back of the Narkomed M (see Narkomed M manual section (5-11 to 5-14).

**g)** Make certain that the knurled flowmeter control knobs (Narkomed M manual 2-8) on the front of the Narkomed M are completely closed

**NOTE**

**1.5 LPM of oxygen will be flowing through the system to the Narkomed even with the flowmeters closed.**

**h)** Open the Oxygen Outlet Valve (Fig 2. 18-21) on the Generator Control Panel (Fig 2) corresponding to the Oxygen Outlet Port (Fig 2.22-25) to which the Oxygen Hose (Fig 2.41) connected to the Narkomed M is connected.

**i)** Open the Medical Air Outlet Valve on the Generator Control Panel (Fig 2).

**j)** Choose either Medical Air or Oxygen as the drive gas by using the Drive Gas selector switch (see Narkomed Manual 2)

**k)** Please note that if there is a power failure, the POGS will not be able to produce Medical Air, so none will be available as the Narkomed's drive gas.

**NOTE**

**Follow startup and operating instructions for normal Narkomed operation after reading all sections below.**

### 13.5 Operating Two Narkomed M's with one POGS 33

#### 13.5.1 Two Narkomed M's can be operated using one POGS 33 by following the procedure below:

**a)** Fully read and acquaint your self with the Narkomed M instructions for installation and operation.

**b)** If you have not filled an "E" or "D" cylinder using oxygen from the POGS 33 and one of the two boosters, Microboost (Fig 1.3) or HV Booster (Fig 1.4), do so and attach it to the oxygen cylinder yoke of each Narkomed M per the Narkomed instructions (Narkomed Manual section (5-11 to 5-14).

**c)** Ensure that all Oxygen Outlet Valves (Fig 2. 18-21) and all Medical Air Outlet Valves (Fig 2.26) are closed.

**d)** Connect two (2) Medical Air Hoses to any two (2) Medical Air outlet Valves.

**e)** Connect the opposite ends of both Medical Air Hoses (Fig 2.42) to the back of each Narkomed M (Narkomed M manual section (5-11to 5-14)

**CAUTION**

**When connecting EQUIPMENT (ventilator, Microboost (Fig 1.3), etc.) to the Oxygen Outlet Ports (Fig 2.22-25) on the Generator (Fig 1.1) instead of Humidifier Bottles (Fig 2.40) and Cannulas (Fig 2.39), DO NOT use an Oxygen Flowmeter between the Oxygen Outlet Port (Fig 2.22-25) and the equipment. Use of an Oxygen Flowmeter inline with a connection to equipment will cause inadequate oxygen pressure and flow to operate the equipment.**

**f)** Connect an Oxygen Hose (Fig 2.41) to an available Oxygen Outlet Port (Fig 2.22-25) on the Generator Control Panel (Fig 2).

**g)** Connect the opposite end of the Oxygen Hose (Fig 2.41) to the oxygen Inlet port in the back of the Narkomed M (Narkomed M manual section (5-11 to 5-14).

**h)** Repeat (g) and (h) for the other Narkomed M with another green Oxygen Hose (Fig 2.41)

**i)** Ensure that the flowmeters (Narkomed m manual 2-8) on the front of each Narkomed M are fully closed (1.5 LPM of oxygen will be flowing through the system to the Narkomed even with the flowmeter fully closed)

**j)** Open the Oxygen Outlet Valve (Fig 2. 18-21) on the Generator Control Panel (Fig 2) corresponding to the Oxygen Outlet Ports (Fig 2.22-25) to which the Oxygen Hoses (Fig 2.41) (Fig 2.41) connected to the Narkomed M's are connected.

**k)** Open two (2) Medical Air Outlet Valves.

**l)** Choose air as the drive gas for one Narkomed M by switching the Drive Gas selector switch (Narkomed Manual 2-22) to "AIR".

**m)** Choose oxygen as the drive gas for the other Narkomed M by switching the Drive Gas Selector switch (Narkomed Manual section (2-22)) to "OXYGEN"

**n)** Since you have 33 LPM of air available and you will not be using air for any other purpose, use oxygen as the drive gas on the Narkomed which is demanding the lowest inspiratory flow. This will make more oxygen available for budgeting to Narkomed flowmeters

**o)** Follow the startup and operating instructions for normal Narkomed operation after reading all sections below.

**p)** Monitor oxygen consumption by estimating drive oxygen consumption based on inspiratory flow and adding that figure to the flowmeter readings on the two oxygen flowmeters on the front of the Narkomed M (Manual section (2-8)).

## REMINDER

**Oxygen drive flow**
**+ Narkomed M Flowmeter reading**
**+ Narkomed Flowmeter reading**
**+ Cannula Flowmeter readings**
**+ Other devices in other POGS Oxygen ports**
**= Total Oxygen Consumption**

## 13.6 Power Failure with Backup Oxygen Configuration

**CAUTION**

**If a power failure occurs to the Feed Air Compressor (Fig 1.2), even if the Backup Oxygen system is configured to supply oxygen, the MEDICAL AIR IS NO LONGER AVAILABLE through the POGS 33 Medical Air Outlet Port (Fig 2. 27).**

### 13.6.1 On Loss of Power

**a)** Immediately open the Backup Oxygen Outlet Valve on the Microboost (Fig 1.3) or HV Booster (Fig 1.4) to start the flow of oxygen back through the Oxygen Receiver (Fig 3.51).

**b)** Immediately change the drive gas switch to “OXYGEN” (see Narkomed manual section (2-22)).

**c)** Perform the Emergency Shutdown procedure in section (11.3)

**d)** Monitor the pressure of Oxygen in the high-pressure cylinders feeding the Backup backflow regulator (X) by monitoring the High-pressure Manifold Pressure Gauge in the booster.

**CAUTION**

**When the Backup Oxygen system is implemented during a power failure, oxygen delivery changes from a limited flow for UNLIMITED time to unlimited flow for a LIMITED time. Awareness of high-pressure oxygen cylinder pressure and proper oxygen budgeting is vital to ensure uninterrupted oxygen flow**

**e)** Be aware that you have a limited supply of oxygen until the POGS 33 is operational again, and work with the Clinician to budget oxygen wisely until power is restored.

### 13.6.2 On Restoration of Power

**a)** When power is restored, follow the Emergency Startup procedure in section (9.4). Once completed, change the drive gas switch (see Narkomed manual section (2-22)) back to “Medical Air”.

**b)** When the Generator (Fig 1.1) begins to build up pressure and the Oxygen Receiver (Fig 3.51) reaches 45 PSIG or higher, the POGS 33 will automatically stop drawing from the Backup Oxygen system.

**c)** Close the Backup Oxygen Outlet Valve in the Microboost.

**d)** Close the Backup Oxygen Inlet Port Valve (Fig 2.32) on the Generator Control Panel (Fig 2).

# 14 Impact Portable Ventilator (IPV) Uni-Vent™ 750 Model

## Anesthesia Compatibility

**The only anesthesia equipment that is validated with the POGS 33 is Draeger's Narkomed-M and the Impact Portable Ventilator (IPV) Univent™ 750 model. No other equipment is as of March 2004.**

**Fully read and acquant yourself with the IPV instructions for installation and operation.**

### 14.1 Oxygen Purity

The Oxygen output from the POGS 33 is 90-96% purity. The balance of the volume of gas coming out of the Oxygen ports is Argon and Nitrogen. The reading on the calibrated POGS Oxygen sensor will be accurate as to measurement of Oxygen content in the gas going to the patient.

## NOTE

**When mixing $N_2O$, the Clinician should understand that there would be a 5-7% added volume of inert gas in the system. This added volume might change the volume of $N_2O$ required to achieve the same mix of Oxygen and $N_2O$ for the patient.**
**When mixing Oxygen and Air, the Clinician should understand that Oxygen purity with the POGS 33 can vary from 90-96% Oxygen.**
**Verify oxygen purity with the Oxygen Analyzer on the Front Panel of the Generator. Mix Air and Oxygen purity accordingly to achieve desired oxygen purity to the patient.**
**For verification of oxygen purity, Impact recommends the use of an oxygen analyzer.**

### 14.2 General

The IPV is operated directly from an oxygen gas cylinder, piped gas, on the POGS 33. IPV flow adjust is based upon 50 psi input. The IPV oxygen source can be supplied directly or via an external gas blender.

## NOTE

**Always be certain that total oxygen demand never exceeds 33 LPM except during oxygen flush or in extreme conditions.**
**Maximum Oxygen demand is 33 LPM. Additional Oxygen flow, if needed in extreme conditions, will decrease oxygen purity and pressure. Maximum Medical Air is 30 LPM.**

**14.3 Direct connection**

**14.3.1 (oxygen only) (no air oxygen mixer)**

**14.4 The IPV Hoses:**

**14.4.1 IPV is provided with a six (6) foot green oxygen hose. Attach one end to the IPV oxygen fitting marked "gas in". Connect the other end of the hose to one of the four (4) oxygen outlets on the POGS 33 marked "oxygen outlet". Note: the connection to the POGS 33 should be direct with no flowmeter in line to impede the flow.**

**14.5 IPV Ready for Operation:**

**14.5.1 Open the ball valve on the "oxygen outlet". The IPV is ready to operate per IPV instruction manual.**

**14.6 Connection via air oxygen mixer**

**14.6.1 If less than 90-96% oxygen is desired, the IPV requires an air-oxygen mixer provided by impact.**

**14.6.2 The IPV is provided with two (2) green oxygen hoses and one (1) air hose.**

**14.6.3 Connect one end of the green hose to the IPV oxygen fitting marked "gas in". Connect the opposite end to the mixer at bottom (primary outlet-high flow outlet).**

**14.6.4 There are two (2) gas inlets at rear of mixer. Connect a green oxygen hose to the mixer marked "oxygen". Connect the other end of the oxygen hose to one of the four (4) oxygen outlets on the POGS 33 marked "oxygen outlet". Note: the connection to the POGS 33 should be direct with** no **flowmeter in line to impede the flow.**

**14.6.5 Connect one end of the black air hose to the mixer at rear marked "medical air". Connect the opposite end of the black air hose to the front panel of the POGS 33 marked "medical air". Note: a medical air flowmeter should** not **be used as it will impede the flow.**

**14.6.6 Open the ball valve at "oxygen outlet" fitting. Open the ball valve at the "medical air" fitting. The blender is now ready for use per the blender instructions manual.**

**14.7 Operation of two (2) IPV's**

**14.7.1 Direct connection**

Connection of two (2) IPV's is identical to the connection of one IPV. See section 2.0. Connect each of the two green oxygen hoses to the front panel of the POGS 33 marked "oxygen outlet". Open ball valves at two "oxygen outlets". Review IPV operation manual.

Connection via air oxygen mixer.

4.1.1 The connection of two (2) IPV's via the Air Oxygen Mixer is identical to the connection of one (1) IPV. Connect the two (2) black medical air hoses from the two (2) Air Oxygen Mixers to two (2) of the Medical Air Outlet fittings. Open the ball valve of the Medical Air Outlet Fitting. Review the IPV Air Oxygen Mixer Instruction Manual and IPV Operation Manual.

### 14.8 Power Failure with Backup Oxygen Configuration

**CAUTION**
**If a power failure occurs to the Feed Air Compressor (Fig. 1.2), even if the Backup oxygen system is configured to supply oxygen, the MEDICAL AIR IS NO LONGER AVAILABLE THROUGH THE POGS 33 MEDICAL AIR OUTLET PORTS. (FIG. 2.27)**

**CAUTIION**
**If the Air-Oxygen Blender is being used and there is a power failure to the POGS Feed Air Compressor, the blended gas will revert to 90-96% oxygen. The Blender will alarm (audible) (low gas pressure) the duration of the power failure.**

**Upon Loss of Power**

Immediately open the Backup Oxygen Outlet Valve on the Microboost or HV Booster to start the flow of oxygen back through the Oxygen Receiver.
Perform the Emergency Shutdown procedure in Section 10.3.
Monitor the pressure of Oxygen in the high-pressure cylinders feeding the Backup Backflow Regulator by monitoring the high-pressure manifold pressure Gauge in the booster.
Be aware that you have a limited supply of oxygen until the POGS 33 is operational again, and work with the Clinician to budget oxygen wisely until power is restored.

**The connection of two (2) IPV's via the air oxygen mixer is identical to the connection of one (1) IPV. Connect the two (2) black medical air hoses from the two (2) air oxygen mixers to two (2) of the "medical air" outlet fittings.. Open the ball valve of the medical air outlet fitting. Review the IPV air oxygen mixer instruction manual and IPV oeration manual.**

**On Restoration of Power**

When the Generator (Fig. 1.1) begins to build-up pressure and the Oxygen Receiver (Fig. 3.51) reaches 45 PSIG or higher, the POGS 33 will automatically stop drawing from the Backup Oxygen System.

Close the Backup Oxygen Outlet Valve in the Microboost.

Close the Backup Oxygen Inlet Port Valve (Fig. 2.32) on the Generator Control Panel (Fig. 2).

# 15 Maintenance

## 15.1 Maintenance Overview

It is strongly recommended that all maintenance work be recorded in the Maintenance Logbook. This will assure that good maintenance policy is employed and will provide valuable information should troubleshooting become necessary.

**WARNING**

**Before attempting any maintenance or service procedures that may expose the sieve beds to the atmosphere, ensure that the service or maintenance is completed and the sieve beds do not remain exposed for an extended period of time.**

**WARNING**

**Before attempting to perform any maintenance procedures, make certain that the air supply is turned off, the electrical source is locked-out, and the POGS 33 system is depressurized!**

**WARNING**

**The interior of the control cabinet contains electrical parts that will produce an electrical hazard if not properly handled. Use extra caution when servicing this equipment to prevent electrical shock. Be sure to unplug the power cord before working inside the cabinet.**

## 15.2 Daily

### 15.2.1 Operator's Logbook

An Operator's Logbook encourages documentation of the POGS 33 performance. This information may be extremely helpful if diagnostic work is required and may save many hours of repair time. Please take a few minutes each day to observe the unit operating and record the operating conditions. The few minutes spent recording information may save many hours of work later. A log sheet entry should be made at least once per shift. Completed log sheets should be stored in a safe place

### 15.2.2 Check for proper sample flow through the CO and Dewpoint monitor

**a)** Once the POGS 33 has been setup and the Feed Air Compressor switched on to pressurize the system, 1.5 to 2.4 SCFH of sample flow should be observed on the Med-Air 2000 front panel.

**b)** If proper flow is not observed

- Check the Medical Air Outlet Pressure Gauge. It should read <48 PSIG

- If the Medical Air Outlet Pressure Gauge reads correctly, the particulate filter in the Med-Air 2000 should be replaced according to the direction in the Med-Air 2000 manual.

## 15.3 Weekly

### 15.3.1 Supply Air Inlet Filters

- Remove the Supply Air Filter Elements from the Supply Air Inlet Assembly and inspect
- Replace the element if dirty.

## 15.4 Monthly

### 15.4.1 Cooling Air Filter Element (Fig 5.114)

The Cooling air filter element (Fig 5.114) prevents dust, dirt, and other particles from entering the Compressor Interior (Fig 6) during operation. A dirty filter element will restrict cooling airflow and may cause overheating conditions.

- Open the Rain guard (Fig 5.101) by sliding the four (4) Bolt Locks (Fig 5.109) away from the guard and lifting upward.
- Remove the Cooling air filter element (Fig 5.114) and discard.
- Inspect, and if necessary, install a new Cooling air filter element (Fig 5.114), ensuring that the arrow on the side of the element points downward.
- Close the Rain guard (Fig 5.101) by lowering the guard and securing in place by sliding the four (4) Bolt Locks (Fig 5.109) toward the guard.

## 15.5 Three (3) Months

### 15.5.1 Calibrate Carbon Monoxide Sensor

**a)** Calibration of the Carbon Monoxide Sensor requires the following items (not included):

- Calibration Adapter
- A cylinder of 20.9% oxygen (zero gas)
- A cylinder of 20 PPM Carbon Monoxide (span gas)

**b)** Follow the calibrations procedure in section 5 of the Med Air 2000 Manual, which is included in the appendix of this manual.

## 15.6 Six (6) Months

### 15.6.1 Dew Point Sensor

**a)** The dew point sensor should be replaced following the procedures in the Med-Air 2000 manual, which is included in the appendix of this manual.

### 15.6.2 Side Cooling Air Filter Element (Fig 6.127)

The Side Cooling Air Filter Element (Fig 6.127) prevents dust, dirt, and other particles from entering the Compressor Interior (Fig 6) during operation. A dirty filter element will restrict cooling airflow and may cause overheating conditions.

- Open the Compressor Interior Cover (Fig 5) by removing the four (4) Securing Knobs (Fig 5.105) and lifting the cover.
- Locate and remove the Side Cooling Air Filter Element (Fig 6.127) by grasping and pulling straight up.
- Install a new Side Cooling Air Filter Element by sliding it into the channel of the Side Cooling Air Inlet Louver. Ensure that the element seats all the way to the bottom of the louver.
- Close the Compressor Interior Cover (Fig 5) and secure using the Securing Knobs (Fig 5.105).

### 15.6.3 HEPA Filters

**a)** The Generator (Fig 1.1) has two HEPA Filters: one for the Oxygen and one for Medical Air. Relieve the Oxygen and Medical Air pressure before attempting to replace the HEPA filters.

**b)** Oxygen Filter

- Located in bottom section of Generator (Fig 3), open front panel via two latches at bottom cabinet door. Locate blue HEPA filter housing. Unscrew the base of the filter housing. Unscrew the black retainer and remove the filter element and replace. Reinstall the retainer and bowl assembly.

**c)** Medical Air Filter

- Located in bottom section of Generator Interior (Fig 3), open front panel vial two latches. Locate blue HEPA filter housing. Follow same procedure as above to change filter element.

### 15.6.4 Generator (Fig 1.1)

**a)** Particulate Filter Assembly

- There is one (1) Particulate Filter Assembly after-filter located in the Generator Interior (Fig 2). It should be replaced every six months: If air hose is connected between Feed Air Compressor (Fig 1.2) and Generator (Fig 1.1) the system must be depressurized by opening the Manual Condensate Drain Valve (Fig 3.79) located in the Generator Interior (Fig 3) at the bottom of the Air Receiver (Fig 3.48).
- Locate the after-filter housing (marked F26-04-FMO) in the Generator Interior (Fig 2). Push the tab on the filter bowl assembly of the lower section of the filter housing.

- 3. Remove the filter bowl assembly. Locate the small white filter element and unscrew retainer holding it in place. Remove the filter and replace. Reinstall the retainer and bowl assembly.
-

**15.7 Yearly**

**a)** Leak Testing

- Check for air/oxygen leaks using a “leak test solution” or a soap and water solution that creates bubbles.
- Apply the solutions to all fittings where they join together.
- Best method is to apply with small brush.
- Look for bubbles, which would indicate a leak.

**b)** If found:

- Relieve the pressure from the system (see “depressurize system”)
- Tighten fitting or unscrew the fitting
- Re-tape
- Pressurize system (see “normal start-up”)
- Leak test again.

Check for leaks on all fittings, using leak test solution.

# 16 POGS 33 Generator Spare Parts

## 16.1 Introduction

The parts listed here are the ones that are most likely to be needed.

## 16.2 Identification of list columns

### 16.2.1 The information is listed as follows:

**a)** Column 1 – Component identification

**b)** Column 2 – Figure/drawing

**c)** Column 3 – Item identification number on the figure/drawing

**d)** Column 4 – Item Description

**e)** Column 5 – Our order number

**f)** Column 6 – Manufacturer

**g)** Column 7 – Unit price

**h)** Column 8 – Recommended quantity

**i)** Column 9 – Extended price

## 16.3 How to Purchase Spare Parts

### 16.3.1 Order spare parts through On Site Gas Systems

Mailing Address: 35 Budney Rd., Newington, CT 06111 USA
Telephone: 860.667.8888
Fax: 860.667.2222
Email: pogs@onsitegas.com
Website: www.onsitegas.com (through “Contact Us”)

### 16.3.2 Methods of payment available

**a)** Cash, check, money order, or wired monies

**b)** Credit card

**c)** Letter of credit

**d)** Approved credit with deposit

## 16.4 Spare Parts List

(On next page)

# 17 Troubleshooting

This section enables the operator to determine the cause of simple operation problems and suggests remedies for the problems. The Repair section should be consulted for problems not solved here.

| Symptom | Possible Cause | Corrective Action |
|---|---|---|
| Generator not operating | Generator Power Switch in "OFF" position | Change Generator Power Switch to "ON" position |
| | Circuit Breaker tripped | Press white button on Circuit Breaker to reset |
| | Incorrect Power Source | Verify Power Source is 120V, 60Hz, and capable of 1A. Correct if necessary |
| | Generator is in Standby Mode | Check if Standby Mode Indicator is illuminated. Generator will remain in standby until Oxygen is used and Oxygen Reciever pressure drops below ~65PSI |
| Generator Runs Continuously (Does switch to Standby Mode) | Oxygen being used | While Oxygen is being used, the Generator will continue to run to keep up with the demand. This is normal. |
| | Altitude higher than 5000ft above sea level. | The Generator may not build enough pressure to switch to Standby Mode at higher altitudes. |
| | Oxygen Outlet Valve not closed completely | If oxygen is not being used, all Oxygen Outlet Valves should be closed. |
| | Manual Condensate Drain Valve open | Close the Manual Condensate Drain Valve durring normal operation |
| | Feed Air pressure too low | Check for leaks from the Feed Air Hose. Check Supply Air Filter Elements, replace if needed. |
| | Leaks | Refer to the Repair section (18) to locate and repair leaks. |
| Oxygen Purity under 90% | Generator not allowed to build purity | The Generator should be run with 15-20LPM of oxygen flowing for 45-60 minutes to build purity and purge the system upon. |
| | Oxygen Analyzer displaying incorrect reading. | Check purity of oxygen with a stand alone oxygen analyzer if available. Refer to the Repair Section (18) for analyzer calibration. |
| | Oxygen demand exceeding POGS 33 capability | Reconfigure oxygen use to reduce demand to < 33LPM |
| Oxygen Pressure too low | Sufficient time not allowed for pressure to build | The Generator may need 5-10 minutes to build pressure before oxygen use begins. |
| | Oxygen Outlet Valve not closed completely | Oxygen Outlet Valves for any Oxygen Outlets not being used should be fully closed. |
| | Manual Condensate Drain Valve open | Close the Manual Condensate Drain Valve durring normal operation |
| | Feed Air pressure too low | Check for leaks from the Feed Air Hose. Check Supply Air Filter Elements, replace if needed. |
| | Leaks | Refer to the Repair section (18) to locate and repair leaks. |
| Feed Air Compressor not operating | Feed Air Compressor Power Switch in "OFF" position | Change Generator Power Switch to "ON" position |
| | Compressor is in Standby Mode | Check Air Reciever Pressure Gauge. If the pressure is above ~105 PSI, the compressor is in standby mode. |
| | Incorrect Power Source | Verify Power Source matches power requirments on serial number label |
| | Circuit Breaker tripped | Press the blue Reset Button on the Compressor Starter Box |
| HV Booster will not start | Power Switch in "OFF" position | Rotate Switch to "HAND" or "AUTO" position. |
| | Incorrect Power Source | Verify Power Source is 120V, 60Hz, 20A circuit. Correct if necessary |
| | Input Pressure too low | HV Booster will not operate with less than 30 PSIG at the input. Ensure the proper Oxygen Outlet Valves are open fully, with no flowmeters installed inline |
| | All Needle Valve closed | The HV Booster has a pressure switch that automatically stops the booster once the high pressure manifold reaches 2200 PSI. If no Needle Valves are open, the unit may not start, or may stall quickly |
| No water drains from Manual Condensate Drain Valve | Compressor Running | The most moisture will drain out when the Feed Air Compressor is either off or in Standby Mode |

# 18 Frequently Asked Questions

## 18.1 What safety devices are installed on the POGS 33?

The POGS 33 main safety feature is its design that prevents any hazard from occurring that would injure personnel and damage equipment. The internal Receivers have pressure relief valves installed that prevent any over-pressurization from occurring. The system has regulators installed that will regulate the pressure throughout the system. Alarms are installed that would give a visual and audible indication for high dew point, carbon monoxide, low purity and low pressure.

## 18.2 What maintenance needs to be performed on the POGS 33?

The POGS 33 needs little maintenance to keep it in ideal condition to manufacture oxygen. Maintenance procedures and schedules are contained in the Operation and Maintenance Manual.

## 18.3 Will a power surge damage the Generator?

No, the POGS 33 Oxygen Generator will not be affected by a power surge because there are no electronic parts involved with the oxygen generation process. The installed Oxygen Analyzer (Fig 2.17) and Carbon Monoxide/Dew Point Monitor (Fig 3.67) may be affected due to the internal electronics, but this will not affect the system performance.

## 18.4 Where can the POGS 33 be installed?

The POGS 33 can be run in any location where it is accessible to trained personnel. The Feed Air Compressor (Fig 1.2) can be run outdoors or indoors. The Generator can be located up to 30 feet away from the Feed Air Compressor (Fig 1.2) and up to 30 feet from the equipment that is being fed oxygen from the system. The Microboost can be located up to 30 feet from the Generator.

## 18.5 Are there any dangerous gases in the system?

No, the Generator takes air from the Feed Air Compressor (Fig 1.2) and separates the gas. The exhaust from the Generator is a mixture of Nitrogen (82%), Argon (0.2%), and Oxygen (17.8%). This exhaust dissipates into the atmosphere quickly and will not be detectable outside of the cabinet.

### 18.6 What alarms are on the POGS 33?

- Low Oxygen Content (<89%)
- High Carbon Monoxide (CO) Content (>10ppm)
- Low Oxygen Receiver (Fig 3.51) Pressure (<48 PSIG)
- High Dew Point (>39 degrees (F))

### 18.7 Which repairs can the customer perform, and when does the unit have to be sent back for repairs?

The repairs for the POGS 33 are design to be performed so the POGS 33 will be operational in less than an hour from system or component failure. Trained maintenance personnel should perform any necessary repairs using approved repair parts that have been included in the spare parts kit. There is not a repair that could not be performed in the field by trained personnel, so sending the unit back to the manufacturer is not necessary to get the system up and running quickly.

### 18.8 Does the feed air compressor exterior lid need to be open?

Yes, the Exterior Lid (Fig 7.166) needs to be open to ensure the Supply Air Inlet Filters have a sufficient airflow to produce enough compressed air for the Generator and to prevent any possible over-heating of the Scroll Compressor (Fig 6.138) and Compressor Motor (Fig 6.137). During inclement weather the Exterior Lid (Fig 7.166) can be propped open using the Exterior Lid Support (7.162) located inside the Exterior Lid.

### 18.9 How long do I need to run the POGS 33 before specified purity is achieved?

During the initial start-up the POGS 33 may need to be 45-60 minutes to reach 90% purity.

### 18.10 What happens if I use too much oxygen?

If your demand has increased to exceed the 33 LPM called for, the system will experience a drop in oxygen pressure and purity, and an alarm will sound. For this reason we suggest the use of the Backup Oxygen Flow-Back as a backup.

### 18.11 What is the backup oxygen flow-back feature?

In the event of power failure, or to supplement the flow of the Generator during overdraw conditions, high-pressure oxygen cylinders can be utilized to backflow through the hose to the Generator's oxygen outlets.

### 18.12 Do I need to wait before I use medical air?

Medical Air is available for use almost immediately. The Medical Air is monitored for Carbon Monoxide and Dew Point level, and supplied through a filter and regulator that regulate the Air from the Air Receiver (Fig 3.48) internal to the Generator.

### 18.13 Are there any precautions for using the Rix Microboost?

The main precaution in using the Microboost is maintaining oil-free connections due to the danger associated with introducing oil to a high-pressure (2200 PSIG) oxygen line.

### 18.14 Who is responsible for installation of the POGS 33?

Trained personnel should make appropriate connections (air hoses, oxygen connections, power, Medical Air connections). The Generator, Feed Air Compressor and Microboost each require its own power source, and should be connected in accordance with standard safety practices.

### 18.15 Does the system need to be monitored during normal operation?

No, the system has the security of audible alarms should any malfunction occur. Trained personnel should perform a periodic check of gauge readings, connections, visual indications, and power.

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# 19 Repair

**CAUTION**

**Trained technicians should perform the procedures in the Repair section of this manual. For leaks and other non-electrical problems, a general knowledge of medical gas pluming and use of hand tools is assumed. For electrical related problems, a properly trained electrician with knowledge in using diagnostic tools such as a multi-meter is assumed.**

## 19.1 POGS 33 Basics

### 19.1.1 Feed Air Compressor (Fig 1.2)

**a)** The Feed Air Compressor (Fig 1.2) supplies the Generator (Fig 1.1) with air to extract oxygen from. The air that is compressed by the Feed Air Compressor (Fig 1.2) is obtained from the air surrounding the Feed Air Compressor (Fig 1.2) (ambient air).

**b)** Ambient air enters through the Supply Air Filter Assembly (Fig 5.113) and enters the Scroll Compressor.

**c)** The Scroll Compressor compresses the air.

**d)** The compressed air then travels through heat exchanger to remove excess heat from the compressed air.

**e)** Once through the Heat Exchanger, the compressed air travels through a Check Valve. This check valve prevents the compressed air from flowing back through the Scroll Compressor when the Feed Air Compressor (Fig 1.2) goes into standby mode.

**f)** After the Check Valve, the compressed air is fed to the Feed Air Outlet Port, through the Feed Air Hose, to the Generator (Fig 1.1).

### 19.1.2 Generator (Fig 1.1)

**a)** Once entering the Generator (Fig 1.1), the compressed air enters the Particulate filter. The Air Receiver stores the compressed air to compensate for surges in demand of compressed air. The Air Receiver also allows the compressed air to cool further, and collects the condensate (water) from the compressed air.

**b)** For the Medical Air, the compressed air flows through an Inline HEPA Filter, then a regulator to keep the Medical Air at 52 PSIG, then the Medical Air Dryer, and then a needle valve to control flow.

**c)** Compressed air is fed through the Main Valve Assembly into one of the Sieve Beds. The sieve bed adsorbs the nitrogen

from the compressed air, and oxygen flows through the top port of the Sieve Bed.

**d)** While one Sieve Bed is being fed compressed air, the Main Valve allows the other Sieve bed to exhaust the nitrogen it adsorbed through the Muffler Assembly.

**e)** The oxygen then flows through an inline filter to remove any larger particles, and through a check valve.

**f)** The Purity Flow Valve controls the flow of oxygen after the check valve into the Oxygen Receiver.

**g)** Oxygen is stored in the Oxygen Receiver until ready for use.

**h)** On the bottom of the Oxygen Receiver, a pressure switch monitors oxygen pressure. Once oxygen pressure reaches 70 PSIG, the Generator (Fig 1.1) goes into standby mode.

**i)** When oxygen is needed, it flows through an Inline HEPA Filter and through the Oxygen Outlet Pressure Regulator to Oxygen Outlet Ports.

### 19.1.3 Oxygen Analyzer

**a)** Whenever the Power Switch on the Generator Control Panel (Fig 2) is in the "ON" position, a small amount (~1SCFH) of oxygen or Medical Air (depending on the position of the Operate Calibrate [Valve Handle]) flows through the Oxygen Sensor.

## 19.2 Leak Check

**WARNING**

**To perform a leak check, the components being checked must be pressurized**

### 19.2.1 Feed Air Compressor (Fig 1.2)

**a)** To check for leaks in the Feed Air Compressor (Fig 1.2), the compressor and Generator (Fig 1.1) must first be set up according to the Start Up procedures in section 8.

**NOTE**

**To check the Remote Supply Air Hose (Fig 5.117) for leaks it should be configured as an extension for the Feed Air Hose.**

**b)** Power off the Generator (Fig 1.1) and Compressor

**c)** Disconnect the Compressor Power Cord (Fig 5.104) from the power source.

**d)** Open the Compressor Interior Cover by removing the four (4) Securing Knobs and lifting the cover.

**e)** Apply leak check solution to each joint starting from the Feed Air Outlet Port and stopping at the Check Valve. When applying leak check solution, ensure that the joint is wetted all the way around.

**f)** Check for large leaks by listening for hissing, if in a quiet environment, or passing your hand over and around each joint. A larger leak will be heard or felt, but may blow the leak solution away and not produce bubbles in the next step.

**g)** Large leaks will produce large bubbles. Smaller leaks will produce small bubbles or small amounts of foaming. Smaller leaks may take a few minutes to become visible, so after wetting of the joints, allow about 5 minutes, while inspecting the joints, to allow for small leaks to become visible.

### 19.2.2 Feed Air Hose

**a)** Visually inspect the Feed Air Hose for any cuts or abrasions. A damaged hose should be replaced immediately to prevent dangerous operating conditions.

**b)** Apply leak check solution to the hose connections on the Feed Air Compressor (Fig 1.2) and Generator (Fig 1.1), and to the connection between the Feed Air Hose and Remote Supply Air Hose (Fig 5.117) if applicable. If bubbles appear at the connections, depressurize the hose by opening the Manual Condensate Drain Valve inside the Generator Interior (Fig 3), then loosen the connections and re-tighten.

### 19.2.3 Generator (Fig 1.1)

**a)** To check for leaks in the Generator (Fig 1.1), the Feed Air Compressor (Fig 1.2) and Generator (Fig 1.1) must first be set up according to the Start Up procedures in section 8.

**b)** Ensure the Feed Air Compressor (Fig 1.2) and Generator Power Switches are in the “ON” position.

**NOTE**

**Following each application of leak check solution in the steps below, the joints should be visually inspected for formation of bubbles. It may take a few minutes for smaller leaks to become visible.**

**c)** Install Oxygen Flowmeters (Fig 2.34) on all of the Oxygen Outlet Ports.

**d)** Close all of the Oxygen Flowmeters (Fig 2.34) by turning the knurled knobs clockwise.

**e)** Open all four (4) Oxygen Outlet Valves.

**f)** Apply Leak Check Solution to each joint between the Oxygen Flowmeters (Fig 2.34) and the Generator Control Panel (Fig 2). Inspect for leaks.

**g)** Open the Oxygen Flowmeters (Fig 2.34) for a combined flow of approximately 33 LPM of oxygen.

**h)** Allow the Oxygen Receiver pressure to fall until the Generator (Fig 1.1) switches to Operate Mode.

**i)** Open the Generator Control Panel (Fig 2) by pulling on the two Latches

## CAUTION

**When working in the Generator Interior (Fig 3) with power applied, special care must be taken to avoid contact with exposed electrical terminals. Special care must also be taken to avoid accidental applications of leak check solution to an electrical or electronic component.**

**j)** Starting in the bottom left corner of the Generator Interior (Fig 3), apply leak check solution to each joint. When dripping of leak check solution onto electrical or electronic components is possible, a paper towel or rag should be used under the joint being checked to protect the electrical or electronic component. The leak check solution should be applied to a few joints at a time (i.e. one assembly at a time) and then inspected for leaks. Any leaks that are found should be marked (using a piece of masking tape, dot sticker, paint stick, etc)

## NOTE

**When checking assemblies connected to the Sieve Beds, it should be noted that only one bed is pressurized at a time. Bed pressurization alternates every 30 seconds while the Generator (Fig 1.1) is in Operate Mode.**

**k)** Several joints are located in areas that are not easily visible. An inspection mirror will aid in inspecting these areas:

- The rear of the Oxygen Outlet Pressure Regulator
- The rear or the Medical Air Outlet Pressure Regulator
- The rear of the Purity Flow Valve
- The joints of the Air Receiver Gauge and Oxygen Receiver Gauge

**l)** The (blue) MAC valves (fig 3.56, 3.60, 3.77) may be leaking from the valve body. To check these, apply leak test solution to the white nylon plug at the bottom of the smaller valves, and the white nylon manual valve actuator on the top of all the

valves. Care must be taken not to get leak test solution into the coils of the valve. These Valves must be replaced if they leak from the valve body.

**m)** The joints on the rear of the Generator Control Panel (Fig 2) should also be checked for leaks.

### 19.3 Repairing Leaks or Replacing Defective Components

**a)** Shut down the Feed Air Compressor (Fig 1.2) and Generator (Fig 1.1) according to section (10.5) (Shutdown for Maintenance or Repair)

**b)** Disassemble the assembly that is leaking or defective. Remove any Teflon tape from the male and female threads of the parts.

**c)** Apply new Teflon tape to the male threads of all male threads. The Teflon tape must be wrapped clockwise around the threads, when viewed from the first threads that are inserted into the female threads. The first thread should also not have Teflon on it to prevent stray pieces of Teflon from entering the plumbing. (5-6) Five to six tight wraps of Teflon tape should be used.

**d)** Reverse the disassembly order, using new parts if applicable, to re-assemble the assembly.

**e)** Perform the Leak Check procedure to ensure proper repair.

### 19.4 Low Oxygen Outlet Pressure: Possible Causes

#### 19.4.1 Excessive Oxygen Flow Demand

**a)** The POGS 33 is designed to deliver 33 LPM of oxygen and 25-30 LPM of Medical Air. Higher flows of either gas will result in a decrease of pressure. If higher demand is anticipated, and an additional POGS 33 is not available, the Backup Oxygen configuration in section (9.1) should be used.

#### 19.4.2 Elevations exceeding 5000 ft above sea level

**a)** The POGS 33 is designed to deliver 33 LPM of oxygen at altitudes below 5000ft. As altitude increases, the pressure, flow, and purity may decrease as volume of oxygen and air per cubic foot decreases. The Backup Oxygen configuration in section (9.1) can be used to supplement the oxygen output of the POGS 33.

#### 19.4.3 Defective Gauge (proper pressure is present, but not indicated correctly)

**a)** The Oxygen Outlet Pressure gauge should read in the range of 48-52 PSIG.

**b)** If the gauge is indicating low pressure, open the Generator Control Panel (Fig 2) and check the Oxygen Receiver

Pressure Gauge. This gauge should read the same or higher than the Oxygen Outlet Pressure Gauge. If the Oxygen Receiver Gauge reads low pressure also, the Oxygen Outlet Pressure Gauge is not defective.

**c)** If the Oxygen Receiver Pressure Gauge reads higher than 52 PSIG, try adjusting the Oxygen Outlet Pressure Regulator by lifting the knob on top and turning clockwise, while watching the Oxygen Outlet Pressure Gauge. If the Oxygen Outlet Pressure Gauge indicates an increase in pressure, the regulator may have been accidentally adjusted. Adjust the Oxygen Flowmeters (Fig 2.34) for a combined flow of 33LPM, and then adjust the Oxygen Outlet Pressure Regulator so the Oxygen Outlet Pressure Gauge reads 50PSIG. If the Oxygen Outlet Pressure Gauge does not indicate an increase in pressure, turn the regulator knob counter-clockwise while watching the Oxygen Outlet Pressure Gauge. If the pressure indicated does not change, the gauge should be replaced. Refer to section (18.3) for proper repair procedure.

### 19.4.4 Misadjusted or Defective Oxygen Outlet Pressure Regulator

**a)** Perform the steps in section (18.4.3) to rule out a defective Oxygen Outlet Pressure Gauge.

**b)** If the Oxygen Outlet Pressure Gauge is replaced, and it still does not indicate a change in pressure while adjusting the Oxygen Outlet Pressure Regulator, the regulator should be replaced. Refer to section (18.3) for proper repair procedure.

### 19.4.5 Leaks

**a)** Leaks in the feed air or oxygen lines will reduce the available oxygen. Leaks may also cause the POGS 33 to not remain in standby mode when oxygen and Medical Air are not being used.

**b)** Perform the Leak Check procedure in section (18.2) and repair any leaks as described in section (18.3)

### 19.4.6 Inadequate Feed Air Pressure

**a)** Open the Generator Control Panel (Fig 2).

**b)** Observe the Air Receiver Pressure Gauge.

**c)** While the POGS 33 is in Operate Mode, this gauge should read between 50 and 100 PSIG.

**d)** If the pressure does not fall within this range, refer to section (18.6) for Feed Air Compressor Repair.

### 19.4.7 Defective Component – Troubleshooting Setup

**a)** The Generator (Fig 1.1), the Feed Air Compressor (Fig 1.2) and Generator (Fig 1.1) must first be set up according to the Start Up procedures in section 8.

**b)** Ensure the Feed Air Compressor (Fig 1.2) and Generator Power Switches are in the “ON” position.

**c)** Install Oxygen Flowmeters (Fig 2.34) on two (2) or more of the Oxygen Outlet Ports.

**d)** Open the Oxygen Outlet Valves (Fig 2.18-21) corresponding to the Oxygen Outlet Ports that have Oxygen Flowmeters (Fig 2.34) Installed.

**e)** Open the Oxygen Flowmeters (Fig 2.34) for a combined flow of approximately 20 LPM of oxygen.

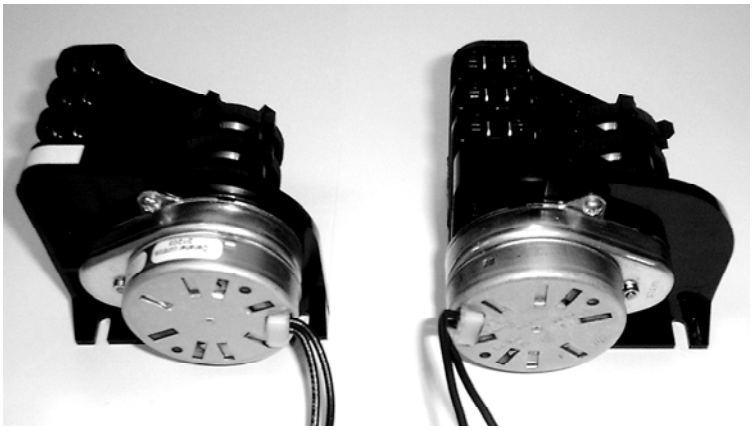
**f)** Allow the Oxygen Receiver pressure to fall until the Generator (Fig 1.1) switches to Operate Mode.

**g)** Open the Generator Control Panel (Fig 2) by pulling on the two Latches

### 19.4.8 Defective Timer Assembly

**a)** The Timer Assembly (Fig 3.70) controls the Main Valve (Fig 3.77), Purity Flow Valve (Fig 3.60), and Air Saver Pilot Valve (Fig 3.68).

**b)** There are two different versions of the Timer Assembly (Pic 1). Both will turn one revolution per minute, but rotate in opposite directions. The two different Timer Motors are <u>not</u> interchangeable. The entire Timer Assemblies, which include the Timer Motor, are interchangeable, as the wiring to the switch contacts is identical.

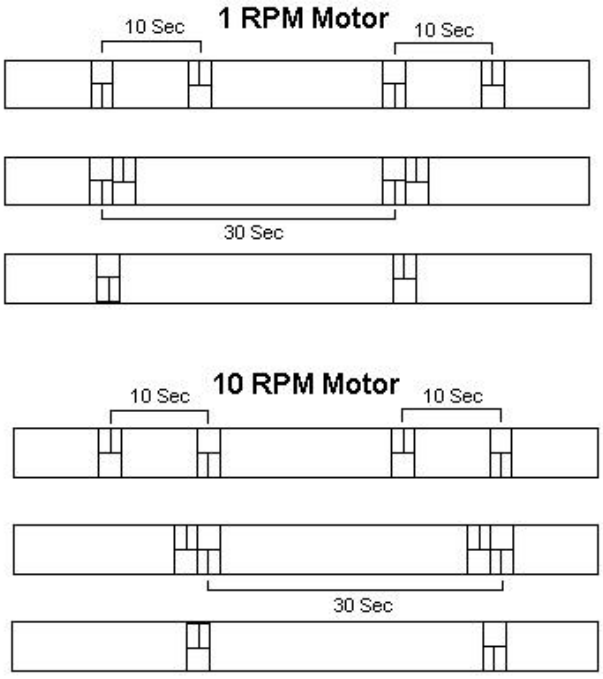


**PICTURE 1**

Left – 10-RPM motor with reduction gear
Right – 1RPM motor
(Notice motor orientation on Timer Assembly)

**c)** If the Timer Assembly (fig 3.70) is determined to be defective and in need of replacement, each wire should be removed from the switch contacts individually and connected to the corresponding contact on the replacement timer.

**d)** The setup for the timer fingers is shown below.



### 19.4.9 Defective Main Valve Assembly (Fig 3.77)

**a)** The Main Valve (Fig 3.77) controls which Sieve Bed (Fig 3.49-50) is pressurized or depressurized. The valve alternates the Sieve Beds every 30 Seconds.

**b)** While the Generator (Fig 1.1) is in Operate Mode, hold a hand near (2) Exhaust Mufflers (Fig 3.76)

**c)** Every 30 seconds, a strong stream of exhaust should be felt exiting the (2) left or right mufflers.

**d)** If a strong stream is not felt, a qualified electrician should troubleshoot the Generator Electrical System to determine if the Main Valve (Fig 3.77) is receiving the proper power, or if it is defective.

### 19.4.10 Defective Check Valves (Fig 3.55)

**a)** The check valves keep oxygen from flowing from the pressurized sieve bed to the de-pressurized sieve bed.

**b)** With the generator in operate mode, increase the Oxygen Flowmeter (Fig 2.38) flows until the pressure indicated on the Oxygen Receiver Pressure Gauge (Fig 3.52) is at 50PSIG or lower.

**c)** Close all of the Oxygen Outlet Valves (Fig 2.18-21).

**d)** Observe the Oxygen Receiver Pressure Gauge (3.52) while the Generator (Fig 1.1) is operating. With no oxygen flow, the pressure indicated on this gauge should rise in steps. The pressure should not drop more than 1 PSIG between rises in pressure. Watch the gauge for at least 1 minute to see both check valves in operation. If the pressure does drop between rises, replaces the Check Valves (1/4") (Fig 3.55).

### 19.4.11 Defective Purity Flow Valve (Fig 3.60):

**a)** This valve opens to allow oxygen to flow from the Sieve Beds (Fig 3.44, 3.50) to the Oxygen Receiver (Fig 3.51).

**b)** With the Generator (fig 1.1) in Operate Mode, hold a pen or small screwdriver (or similar instrument) lightly against the white button at the top of the Purity Flow Valve (Fig 3.60).

**c)** When the Generator switches which sieve bed is pressurized (a loud rushing air sound will be heard then a high flow of exhaust from the Exhaust Muffler (Fig 3.76) can be felt), this valve will close (white button will pop out). Approximately 10 seconds after the switch, the Purity Flow Valve (Fig 3.60) should be felt opening (white button will be pulled in).

**d)** If the valve is not felt opening, allow the generator to change which sieve bed is being pressurized and feel for the valve opening again.

**e)** If the valve is not opening, it should be replaced. Refer to section (18.3)

### 19.4.12 Defective Air Saver Pilot Valve (Fig 3.68)

**a)** The Air Saver Pilot Valve (Fig 3.68) controls the Air Saver Valves (Fig 3.53,3.84). The Air Saver Valves are tubed so that they both open and close at the same time.

**b)** With the Generator (Fig 1.1) in Operate Mode, remove the 5/32" tubing from the P1 fitting on the top Air Saver Valve (Fig 3.53) (fittings are labeled on valve head). To remove the tubing, push on the white ring of the fitting, and then pull out the tubing.

**c)** There should be no airflow from this tubing except for approximately three (3) seconds of each cycle.

**d)** Replace the tubing to the P1 fitting by inserting the tubing and pushing it in firmly.

**e)** Remove the 5/32" tubing from the P2 fitting on the top Air Saver Valve (Fig 3.53).

**f)** There should be airflow from this tubing for all but three (3) seconds of each cycle.

**g)** If the timing of the airflow is reversed, check the bottom Air Saver Valve (part of Main Valve Assy)(Fig 3.84) in the same manner. If both have reversed airflow, swap the tubing at the Air Saver Pilot Valve (Fig 3.68). If only one has reversed airflow, swap the tubing at the affected valve.

**h)** If the Air Saver Pilot Valve (Fig 3.68) is not controlling the airflow correctly, have a qualified electrician check that the valve is receiving power for three (3) seconds each cycle.

**i)** If the valve is receiving power, but does not operate correctly, replace the valve.

### 19.4.13 Defective Air Saver Valves (Fig 3.53, 3.84)

**a)** These valves open between cycles to transfer some of the pressure from the pressurized sieve bed to the depressurized sieve bed. This reduces the demand for air from the compressor. They operate by air, controlled by a pilot valve, instead of electric coils.

**b)** With the Generator (Fig 1.1) in Operate Mode, place a hand on the black ¾" hose connected to the top Air Saver Valve (Fig 3.53). For three (3) seconds of each cycle, a strong rush of air should be felt going through the hose. Repeat this step on the bottom Air Saver Valve (Fig 3.84).

**c)** If either Air Saver Valve is not operating, and proper operation of the Air Saver Pilot Valve (Fig 3.68) has been verified, replace the defective valve.

### 19.5 1Low Oxygen Purity

**NOTE**

**The POGS 33 may take 45-60 minutes upon initial power-up to reach specified purity. Refer to section (8), "Feed Air Compressor and Generator Startup Procedures" for further information.**

**NOTE**

**Low Oxygen Purity should be verified with a known good oxygen analyzer (if available) to rule out an incorrect low reading.**

**NOTE**

**A problem with the mechanical components of the POGS 33 that causes low oxygen purity may also cause low oxygen pressure. Even with normal pressure, the procedures in section (18.4) should be performed if it is determined that the Oxygen Analyzer is reading correctly.**

#### 19.5.1 Insufficient Oxygen Sensor Sample Flow

**a)** The Analyzer Sensor (Fig 3.65) receives a sample flow of either oxygen or ambient air, depending on the position of the Operate/Calibrate [Valve Handle]. The sample flow is turned on or off by the Analyzer Sample Flow Valve (Fig 3.61), and is regulated to 1 SCFH by the Analyzer Sample Needle Valve (Fig 3.62).

**b)** The Analyzer Sensor Block (Fig 3.63) has a fitting with a length of 5/32" tubing attached. This is the sensor exhaust.

**IMPORTANT**

**The Sensor Exhaust must not be blocked in any way. Any blockage that creates backpressure will damage the Analyzer Sensor (Fig 3.65). If using a flowmeter with a flow control, ensure the flow control is fully open before connecting to the sensor exhaust.**

**c)** The flow through the Oxygen Sensor assembly can be verified by attaching a flowmeter to the sensor exhaust tube(1 scfh observed). The Generator Power Switch (Fig 2.16) must be in the "ON" position for the Sample Flow Valve (Fig 3.61) to allow flow through the Analyzer Sensor (Fig 3.65).

**d)** If a flowmeter is not available, flow through the Analyzer Sensor (Fig 3.65) should still be verified. Holding a wet finger or lips close to the end of the sensor exhaust tube, with the

Generator Power Switch (Fig 2.16) in the “ON” position, a small flow should be felt.

**e)** The Sample Flow Valve (Fig 3.65) should allow flow through the Analyzer Sensor (Fig 3.65) whenever the Generator Power Switch (Fig 2.16) is in the “ON” position. This includes both Operate and Standby modes.

**f)** If proper operation of the Analyzer Sample Flow Valve is not observed, a qualified electrician should verify that the valve is receiving power, and the valve replaced if necessary

### 19.5.2 Problem Calibration of Oxygen Analyzer

**a)** The Generator (Fig 1.1) should be on for at least 30 minutes prior to calibration to allow for temperature stabilization of the Oxygen Analyzer (Fig 2.17).

**b)** Change the Alarm Bypass Switch (Fig 2.13) on the Generator Control Panel (Fig 2) to the “BYPASS” position.

**c)** Change the Operate/Calibrate [Valve Handle] (Fig 2.28) on the Generator Control Panel (Fig 2) to the “CALIBRATE” position.

**d)** Allow the Oxygen Analyzer (Fig 2.17) reading to stabilize. Stabilization normally takes approximately 10 minutes.

**e)** Press and release the “MODE” button on the Oxygen Analyzer (Fig 2.17).

**f)** Adjust the reading using the “▲” and “▼” buttons on the Oxygen Analyzer (Fig 2.17) until the display reads “20.9.”If not achieved replace Oxygen sensor.

**g)** Press and release the “MODE “ button on the Oxygen Analyzer (Fig 2.17) four (4) times. The display should read “RUN” momentarily, and then change back to the normal reading. The “FAULT”, “ALM1”, and “ALM2” indicators will flash on the Oxygen Analyzer (Fig 2.17) for approximately two (2) minutes. Oxygen Analyzer alarms will not be active during this time. The Oxygen Analyzer (Fig 2.17) will then resume normal operation.

**h)** Change the Operate/Calibrate [Valve Handle] (Fig 2.28) on the Generator Control Panel (Fig 2) to the “OPERATE” position.

**i)** Once 90% or higher purity is indicated on the Oxygen Analyzer (Fig 2.17) display, change the Alarm Bypass Switch (Fig 2.13) on the Generator Control Panel (Fig 2) back to the “ACTIVE” position.

### 19.5.3 Problem Calibration of Oxygen Analyzer with Calibration Gas

Performing a two-point calibration, using ambient air as described in section (18.5.2) and a calibration gas will provide more accurate Oxygen Analyzer readings. Calibration gas may be any known purity between 80% and 99.9%. For the most accurate calibration, purity between 90% and 95% should be used. A regulator must be used to regulate the pressure of the calibration gas to 50PSIG +/- 5 PSIG. An adapter from the connection on the calibration gas source to a 5/32" SMC tubing fitting is required (not included).

**a)** The Generator (Fig 1.1) should be on for at least 30 minutes prior to calibration to allow for temperature stabilization of the Oxygen Analyzer (Fig 2.17).

**b)** Turn the Operate/Calibrate [Valve Handle] to the upright position (between "OPERATE" and "CALIBRATE")

**c)** Open the Generator Control Panel (Fig 2)

**d)** Disconnect the 5/32" tubing from the center SMC fitting of the Operate/Calibrate [Valve]. To disconnect the tubing, push the orange ring of the fitting down and hold it while pulling out the tubing.

**e)** Connect the regulated calibration gas to the 5/32" tubing. This directs the calibration gas to the Analyzer Sensor (Fig 3.65).

**f)** Start the flow of the calibration gas.

**g)** Allow the Oxygen Analyzer (Fig 2.17) reading to stabilize. Stabilization normally takes approximately 10 minutes.

**h)** Press and release the "MODE" button on the Oxygen Analyzer (Fig 2.17).

**i)** Adjust the reading using the "▲" and "▼" buttons on the Oxygen Analyzer (Fig 2.17) until the purity of the calibration gas is displayed correctly.

**j)** Press and release the "MODE " button on the Oxygen Analyzer (Fig 2.17) four (4) times. The display should read "RUN" momentarily, and then change back to the normal reading. The "FAULT", "ALM1", and "ALM2" indicators will flash on the Oxygen Analyzer (Fig 2.17) for approximately two (2) minutes. Oxygen Analyzer alarms will not be active during this time. The Oxygen Analyzer (Fig 2.17) will then resume normal operation.

**k)** Stop the flow of the calibration gas.

**l)** Disconnect the 5/32" tubing from the calibration gas source.

**m)** Reconnect the 5/32” tubing to the center SMC fitting of the Operate/Calibrate [Valve]. To re-connect the tubing, push the tubing firmly into the fitting.

**n)** Change the Operate/Calibrate [Valve Handle] (Fig 2.28) on the Generator Control Panel (Fig 2) to the “OPERATE” position.

**NOTE**

**A problem with the mechanical components of the POGS 33 that causes low oxygen purity may also cause low oxygen pressure. The procedures in section (18.4) should be performed if it is determined that the Oxygen Analyzer is reading correctly, even with normal pressure.**

### 19.5.4 Defective Crossover Valve

**a)** The Crossover Valve (Fig 3.56) allows a small amount of oxygen to flow from the pressurized Sieve Bed to the de-pressurized Sieve Bed to help purge exhaust gases. It is normal for the Crossover Valve (Fig 3.56) to be warm during operation because it remains energized as long as the Generator (Fig 1.1) is in Operate Mode.

**b)** With the Generator (fig 1.1) in Operate Mode, hold a pen or small screwdriver (or similar instrument) lightly against the white button at the top of the Crossover Valve (Fig 3.60). The Crossover Valve (Fig 3.60) should be open (white button pulled in) whenever the Generator (Fig 1.1) is in Operate Mode.

**c)** Close the Oxygen Outlet Valves (Fig 2.18-21) and allow the Generator (Fig 1.1) to reach Standby Mode, while monitoring the state of the Crossover Valve (Fig 3.60). The valve should close when the Generator (Fig 1.1) reaches Standby Mode (white button will pop out). The Crossover Valve (Fig 3.60) should also close when the Generator Power Switch (Fig 2.16) is in the “OFF” position.

**d)** If the valve does not operate properly, have a qualified electrician determine if it is a wiring problem, and replace if necessary.

### 19.5.5 Defective Check Valves

### 19.5.6 Damaged Sieve Beds

**a)** The Sieve Beds (Fig 3.49,3.50) are filled with molecular sieve (Zeolite) and are responsible for the actual separation of oxygen from ambient air. The Zeolite will last for many years under normal use and with proper maintenance of the POGS 33. It is important to drain the water from the Air Receiver (Fig 3.48) at least once a day, more often under hot and/or humid conditions. Excess water entering the Sieve Beds (Fig 3.49,3.50) may damage the Zeolite, in which case the beds must be replaced.

## 19.6 Defective Carbon Monoxide and Dew Point Monitor

The Med-Air 2000 Carbon Monoxide and Dew Point Monitor senses the Medical Air for levels of carbon monoxide and moisture. An alarm is set to activate at 10 PPM carbon monoxide or 39 degrees Fahrenheit dew point. The sample for the monitor is obtained from the stream of compressed air after it has gone through a HEPA filter and membrane dryer. When the alarm is sounded, an indicator on the Generator Front Panel will indicate which condition is causing the alarm.

### 19.6.1 Insufficient Sample Flow

**a)** During normal operations, the flowmeter on the face of the Med-Air 2000 should read between 1.5 and 2.4SCFH. If insufficient flow is observed the particulate filter in the monitor must be replaced according to the procedures in Med-Air 2000 Manual.

### 19.6.2 CO sensor cannot be calibrated

**a)** If the CO sensor cannot be calibrated properly, the CO sensor and humidifier tube should be replaced according to the procedures in the Med-Air 2000 manual.

## 19.7 Feed Air Compressor Problems

### 19.7.1 Feed Air Compressor (Fig 1.2) Not Operating (Compressor is silent)

**a)** Verify that the Feed Air Compressor (Fig 1.2) is not in Standby Mode

- Open the Generator Control Panel
- Observe the Air Receiver Pressure Gauge. If the gauge indicates between 100 and 115 PSIG, the Feed Air Compressor (Fig 1.2) is in Standby Mode. Flowing oxygen or Medical Air from the Generator (Fig 1.1) will cause the Feed Air Compressor (Fig 1.2) to resume operation.

**b)** Reset Circuit Breaker

- Ensure the Compressor Power Switch is in the “OFF” position.
- Reset the Circuit Breaker by pressing the Reset Button (Blue) on the Starter Box in the Compressor Interior (Fig 6)
- Change the Compressor Power Switch to the “ON” position.
- If the Feed Air Compressor (Fig 1.2) resumes operation, a spike in the power source may have triggered the protection circuits
- If the Feed Air Compressor (Fig 1.2) resumes operation, but shuts down shortly after (and it is not in Standby Mode), have a qualified electrician troubleshoot the Compressor Electrical System (Diagram 3)

**c)** Verify that the Feed Air Compressor (Fig 1.2) is receiving power

- Verify the Compressor Power Cord is connected to the power source.
- Verify the power source is operating correctly
- Ensure the Compressor Power Switch is in the “OFF” position.
- Open the Compressor Interior Cover.
- Look at the Surge Suppressor. There should be three (3) green LED indicator illuminated, one indicating each phase.
- If one (1) or two (2) indicators are not illuminated, the Feed Air Compressor (Fig 1.2) is most likely not receiving all three phases of power.
- If none of the indicators are illuminated, have a qualified electrician check for voltage in the Starter Box and troubleshoot the Feed Air Compressor electrical system. Refer to (Diagram 3)

**d)** Inspect for damaged starter heaters.

- Ensure the Compressor Power Switch is in the “OFF” position.
- Disconnect the Compressor Power Cord from the power source.

**CAUTION**

**A small amount of residual voltage may remain in the Feed Air Compressor (Fig 1.2) electrics after disconnecting power. Discharge any residual voltage from the Feed Air Compressor (Fig 1.2) by shorting the plug pins to each other with an insulated screwdriver or equivalent tool.**

- Open the Starter Box.
- Remove the Heaters (Fig 6.149) by loosening the two Philips screws at each end of the heater.
- Inspect for any damage or broken connection, and replace as necessary.

**e)** Scroll Compressor seized or Compressor Motor damaged.

- Ensure the Compressor Power Switch is in the "OFF" position.
- Disconnect the Compressor Power Cord from the power source

**CAUTION**

**A small amount of residual voltage may remain in the Feed Air Compressor (Fig 1.2) electrics after disconnecting power. Discharge any residual voltage from the Feed Air Compressor by shorting the plug pins to each other with an insulated screwdriver.**

- Remove the Belt Guard (Fig 6.142)
- Turn the Compressor Motor Pulley (Fig 6.139) by hand. If the Compressor Motor Pulley (Fig 6.139) cannot be turned by hand, the Scroll Compressor (Fig 6.138) is most likely seized. Refer to section (18.8) for Scroll Compressor (Fig 6.138) replacement.
- If the Compressor Motor Pulley (Fig 6.139) can be turned and the Compressor Motor (Fig 6.137) has power to it, but does not operate, the Compressor Motor (Fig 6.137) is most likely damaged. Refer to section (18.7) for Compressor Motor (Fig 6.137) replacement.

### 19.7.2 Feed Air Compressor (Fig 1.2) Makes Noise After Shutting Down.

**a)** It is normal for the Feed Air Compressor (Fig 1.2) to turn backward a few times after shutdown or when it switches to Standby Mode. The noise made when it turns backwards should last no more than five (5) seconds. If the noise continues longer than that, the Check Valve (1/2") needs to be replaced.

**b)** When replacing the Check Valve, the arrow on the check valve must be pointing downward to allow airflow from the compressor to pass.

### 19.7.3 Replacing or Tightening of Compressor Drive Belts (Fig 6.140)

**a)** Shutdown the Feed Air Compressor (Fig 1.2) and Generator (Fig 1.1) according to section (10.6)

**b)** Open the Compressor Interior Cover. (Fig 5)

**c)** Remove the Belt Guard (Fig 6.142)

**d)** Using a 9/16" wrench, loosen (approximately 1 turn) the four (4) mounting nuts securing the Compressor Motor (Fig 6.137) mount to the frame of the Feed Air Compressor (Fig 1.2).

**e)** Drill out the eight (8) Rivets (Fig 7.160) on the Side Cooling Air Inlet Louver (Fig 7.159)

**f)** Remove the Side Cooling Air Inlet Louver (Fig 7.159)

**g)** Looking inside the exposed hole to the lower left, observe the head of the belt tension adjustment bolt.

**h)** Using a ¾ " wrench, turn this bolt clockwise to tighten the belts, counterclockwise to loosen the belts.

**i)** To remove the Compressor Drive Belts (Fig 6.140), loosen the belts enough to "walk" them off of the pulleys.

**j)** After replacement of the belts, tighten the belts using the belt tension adjustment bolt.

**k)** Tighten the four (4) mounting nuts securing the Compressor Motor (Fig 6.137) mount to the frame of the Feed Air Compressor (Fig 1.2).

**l)** Replace the Belt Guard (Fig 6.142)

## 19.8 Compressor Motor Replacement

### 19.8.1 Compressor Motor Removal

**a)** Shutdown the Feed Air Compressor (Fig 1.2) and Generator (Fig 1.1) according to section (10.6)

**b)** Remove the Feed Air Compressor Frame

- Disconnect the wires from the Compressor Power Switch (Fig 5.106).
- Disconnect the Compressor Power Cord from the Power Input Terminals (Fig 6.148) in the Starter Box (Fig 6.130).
- Loosen the holding screws for the power cord strain relief on the Starter Box (Fig 6.130)
- Remove the power cord from the Starter Box (Fig 6.130)

- Disconnect the hoses from the Supply Air Inlet and Feed Air Outlet (underside of Compressor Interior Cover) by loosening the hose clamps and pulling the hose off the hose barb.
- Remove the Compressor Interior Cover (Fig 5) by removing the two Philips screws securing the Cover Hinge (Fig 5. 100) to the exterior case.
- Remove the 24 screws from the 6 exterior case handles (screws are in Compressor Interior)
- Lift the Compressor Frame from the exterior Case (4 person minimum)

**IMPORTANT**

**Once removed from the Exterior Case, the Compressor frame looses some if its structural strength. Use care handling the frame to prevent breakage of the welds of the frame.**

**c)** Disconnect all remaining wires in the Starter Box (Fig 6.130), except for those leading to the two cooling fans (Fig 6.133,135).

**d)** Loosen the holding screws for all of the strain reliefs on the Starter Box (Fig 6.130) except for those leading to the two cooling fans (Fig 6.133,135).

**e)** Remove all of the wiring from the starter box, except for those leading to the two cooling fans (Fig 6.133,135), labeling if necessary for later re-installation.

**f)** Loosen and remove the compression fitting from the Heat Exchanger (Fig 6.134).

**g)** Remove the four (4) bolts holding the Heat Exchanger Brackets (Fig 6.144) and remove the bracket assembly.

**h)** Loosen four (4) mounting nuts on the Compressor Motor (Fig 6.137) mount approximately 1 turn.

**i)** Turn the belt tension adjustment bolt counterclockwise to loosen the belt tension enough to remove the Compressor Drive Belts (Fig 6.140).

**j)** Remove the Compressor Drive Belts (Fig 6.140)

**k)** Remove the pulley assembly from the Compressor Motor (Fig 6.137) shaft.

**l)** Remove the four (4) mounting nuts from the Compressor Motor (Fig 3.137) mount.

**m)** Lift the Compressor Motor (Fig 6.137) from the motor mount (2 person lift), and remove.

**n)** Remove the power cord from the Compressor Motor (Fig 6.137), noting the wiring for re-connection to the new motor.

### 19.8.2 Compressor Motor (Fig 6.137) Installation

**a)** Have a qualified electrician wire the junction box on the new Compressor Motor.

**b)** Install the Compressor Motor (Fig 6.137) on the motor mount (2 person lift).

**c)** Loosely install the four (4) mounting nuts on the Compressor Motor (Fig 3.137) mount.

**d)** Install the pulley assembly onto the Compressor Motor (Fig 6.137) shaft.

**e)** Install the Compressor Drive Belts (Fig 6.140)

**f)** Turn the belt tension adjustment bolt clockwise to tighten the Compressor Drive Belts (Fig 6.140).

**g)** Tighten four (4) mounting nuts on the Compressor Motor (Fig 6.137) mount.

**h)** Install the Heat Exchanger Bracket (Fig 6.144) assembly and install four (4) bolts to secure it.

**i)** Install and tighten the compression fitting on the Heat Exchanger (Fig 6.134).

**j)** Re-Insert all of the wiring into the starter box.

**k)** Loosen the holding screws for all of the strain reliefs on the Starter Box (Fig 6.130) except for those leading to the two cooling fans (Fig 6.133,135).

**l)** Reconnect all of the wires in the Starter Box (Fig 6.130),

**m)** Install the Feed Air Compressor Frame

- Lift the Compressor Frame into the exterior Case (4 person minimum)
- Install the six (6) exterior case handles and secure using twenty-four (24) screws removed earlier.
- Insert the Compressor Power Cord into the Starter Box (Fig 6.130)
- Reconnect the Compressor Power Cord to the Power Input Terminals (Fig 6.148) in the Starter Box (Fig 6.130).
- Tighten the holding screws for the power cord strain relief on the Starter Box (Fig 6.130)
- Install the Compressor Interior Cover (Fig 5), securing the Cover Hinge (Fig 5. 100) to the exterior case using the Philips screws and nuts removed earlier.

- Reconnect the hoses from the Supply Air Inlet and Feed Air Outlet (underside of Compressor Interior Cover) by pushing the hose completely onto the hose barb, then secure by tighten the hose clamps.
- Reconnect the wires to the Compressor Power Switch (Fig 5.106).

## 19.9 Scroll Compressor Replacement

### 19.9.1 Scroll Compressor Removal

**a)** Shutdown the Feed Air Compressor (Fig 1.2) and Generator (Fig 1.1) according to section (10.6)

**b)** Remove the Feed Air Compressor Frame

- Disconnect the wires from the Compressor Power Switch (Fig 5.106).
- Disconnect the Compressor Power Cord from the Power Input Terminals (Fig 6.148) in the Starter Box (Fig 6.130).
- Loosen the holding screws for the power cord strain relief on the Starter Box (Fig 6.130)
- Remove the power cord from the Starter Box (Fig 6.130)
- Disconnect the hoses from the Supply Air Inlet and Feed Air Outlet (underside of Compressor Interior Cover) by loosening the hose clamps and pulling the hose off the hose barb.
- Remove the Compressor Interior Cover (Fig 5) by removing the two Philips screws securing the Cover Hinge (Fig 5. 100) to the exterior case.
- Remove the 24 screws from the 6 exterior case handles (screws are in Compressor Interior)
- Lift the Compressor Frame from the exterior Case (4 person minimum)

**IMPORTANT**

**Once removed from the Exterior Case, the Compressor frame looses some if its structural strength. Use care handling the frame to prevent breakage of the welds of the frame.**

**c)** Disconnect all remaining wires in the Starter Box (Fig 6.130), except for those leading to the two cooling fans (Fig 6.133,135).

**d)** Loosen the holding screws for all of the strain reliefs on the Starter Box (Fig 6.130) except for those leading to the two cooling fans (Fig 6.133,135).

**e)** Remove all of the wiring from the starter box, except for those leading to the two cooling fans (Fig 6.133,135), labeling if necessary for later re-installation.

**f)** Loosen and remove the compression fitting from the Heat Exchanger (Fig 6.134).

**g)** Remove the four (4) bolts holding the Heat Exchanger Brackets (Fig 6.144) and remove the bracket assembly.

**h)** Loosen four (4) mounting nuts on the Compressor Motor (Fig 6.137) mount approximately 1 turn.

**i)** Turn the belt tension adjustment bolt counterclockwise to loosen the belt tension enough to remove the Compressor Drive Belts (Fig 6.140).

**j)** Remove the Compressor Drive Belts (Fig 6.140)

**k)** Remove the four (4) mounting nuts that secure the Scroll Compressor (Fig 6.138).

**l)** Lift the Scroll Compressor (Fig 6.138) from the compressor frame (2 person lift), and remove.

**m)** Remove any piping from the Scroll Compressor (Fig 6.138) that will be needed for the new scroll compressor.

### 19.9.2 Scroll Compressor (Fig 6.138) Installation

**a)** Install any piping removed from the old scroll compressor.

**b)** Install the Scroll Compressor (Fig 6.138) on compressor frame (2-person lift).

**c)** Install the four (4) mounting nuts on the Scroll Compressor (Fig 3.138) mount and tighten.

**d)** Install the Compressor Drive Belts (Fig 6.140)

**e)** Turn the belt tension adjustment bolt clockwise to tighten the Compressor Drive Belts (Fig 6.140).

**f)** Tighten four (4) mounting nuts on the Compressor Motor (Fig 6.137) mount.

**g)** Install the Heat Exchanger Bracket (Fig 6.144) assembly and install four (4) bolts to secure it.

**h)** Install and tighten the compression fitting on the Heat Exchanger (Fig 6.134).

**i)** Re-Insert all of the wiring into the starter box.

**j)** Loosen the holding screws for all of the strain reliefs on the Starter Box (Fig 6.130) except for those leading to the two cooling fans (Fig 6.133,135).

**k)** Reconnect all of the wires in the Starter Box (Fig 6.130),

**l)** Install the Feed Air Compressor Frame

- Lift the Compressor Frame into the exterior Case (4 person minimum)
- Install the six (6) exterior case handles and secure using twenty-four (24) screws removed earlier.
- Insert the Compressor Power Cord into the Starter Box (Fig 6.130)
- Reconnect the Compressor Power Cord to the Power Input Terminals (Fig 6.148) in the Starter Box (Fig 6.130).
- Tighten the holding screws for the power cord strain relief on the Starter Box (Fig 6.130)
- Install the Compressor Interior Cover (Fig 5), securing the Cover Hinge (Fig 5. 100) to the exterior case using the Philips screws and nuts removed earlier.
- Reconnect the hoses from the Supply Air Inlet and Feed Air Outlet (underside of Compressor Interior Cover) by pushing the hose completely onto the hose barb, then secure by tighten the hose clamps.
- Reconnect the wires to the Compressor Power Switch (Fig 5.106).

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