



# 120H/L High-Low Flow Air/O<sub>2</sub> Blender



## User Manual

## Contact Us for Product Assistance

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# AMVEX 120H/L HIGH-LOW FLOW AIR/O<sub>2</sub> BLENDER USER MANUAL

## TABLE OF CONTENTS

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<b>SECTION 1:</b> Introduction.....	01
<b>SECTION 2:</b> Overview of the 120 H/L High-Low Flow Air/Oxygen Blender Operation.....	02
<b>SECTION 3:</b> Warnings, Cautions & Notes.....	05
<b>SECTION 4:</b> Setup Diagram.....	07
<b>SECTION 5:</b> Performance Checks.....	08
<b>SECTION 6:</b> Cleaning & Sterilization.....	09
<b>SECTION 7:</b> Maintenance & Service Policy.....	10
<b>SECTION 8:</b> Disposal Instructions.....	11
<b>SECTION 9:</b> Replacement Parts.....	12
<b>SECTION 10:</b> Product Specifications.....	15
<b>SECTION 11:</b> Troubleshooting.....	17
<b>SECTION 12:</b> Warranty.....	19

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**NOTE:** This manual is intended as a guide for the handling of the 120H/L High- Low Flow Air/O<sub>2</sub> Blender.

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## SECTION 1: INTRODUCTION

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The AMVEX 120H/L High- Low Flow Air/Oxygen Blenders are intended for non-invasive mixing and delivery of a ratio of medical air and medical oxygen as stand-alone devices or as components of a respiratory support apparatus implemented by trained medical professionals. The main body of the device is constructed of aluminum, and primary flow channels are contained within or between the aluminum pieces. Various internal components that are or can be in contact with the gas or gases include diaphragms, o-rings, check valves, and foam filters. All components are safe for oxygen use.

The AMVEX 120H/L High-Low Flow Air/Oxygen Blender can be used in conjunction with:

- Blender Wall Mount
- Blender Mount with Pole Clamp
- Blender Mount with Eclipse® or Fairfield® Equipment Rail Bracket
- Blender Mount with Unimount® Equipment Rail Bracket
- Blender Water Trap with Two 90-Degree Fittings
- Medical Gas Hose

### INDICATIONS FOR USE:

The AMVEX 120H/L High-Low Flow Air/Oxygen Blender is intended to deliver air and oxygen with a respiratory setting. Oxygen concentrations can be adjusted from 21% to 100%. The blender is designed to operate from a 50 PSIG (3.52kg/cm<sup>2</sup>) air source and a 50 PSIG (3.52kg/cm<sup>2</sup>) oxygen source.

Use of this device is restricted to prescription by or direction by a licensed medical practitioner.

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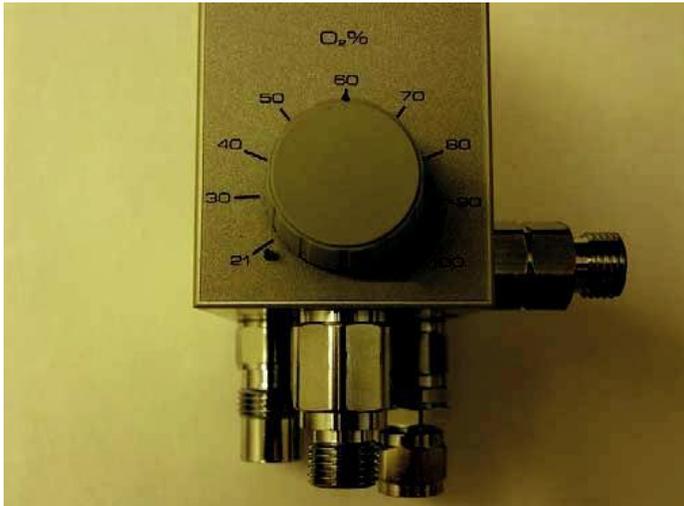
### NOTE:

Remove from the packaging and inspect for damage. If there is any damage, **DO NOT USE** and contact OHIO MEDICAL (refer to “Contact Us” page).

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## SECTION 2: OVERVIEW OF THE 120H/L HIGH-LOW FLOW AIR/OXYGEN BLENDER OPERATION

The 120H/L High-Low Flow Air/O<sub>2</sub> blender mixes medical grade compressed air and oxygen to provide a pressurized gas source ranging from 21% to 100% oxygen.



**Figure 1**

### GAS INLETS

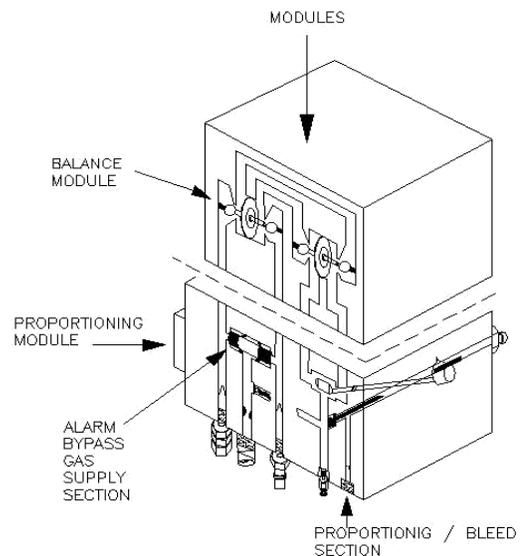
The two 30-75 PSIG gas sources enter through the diameter indexed (DISS) air and oxygen inlet connectors located on the bottom, rear of the blender (Figure 2). Each inlet connector incorporates a 30 micron particulate filter. After being filtered, the gases travel through duckbill check valves which prevent possible reverse gas flow to either the air or oxygen supply systems.



**Figure 2**

### BALANCE MODULE (FIGURE 3)

The two gases then enter the two-stage Balance Module. The purpose of this module is to equalize the operating pressure of the air and oxygen gas sources before entering the Proportioning Module. The diaphragm responds to the difference in pressure and directs the movement (stroke) of each ball valve assembly contained within the air and oxygen chambers. The movement of each ball valve adjusts the amount of gas flowing through the Balance Module, equalizing the air and oxygen pressures to the lower of the two pressures.



**Figure 3**  
**Amvex Air/O<sub>2</sub> Blender Diagram**

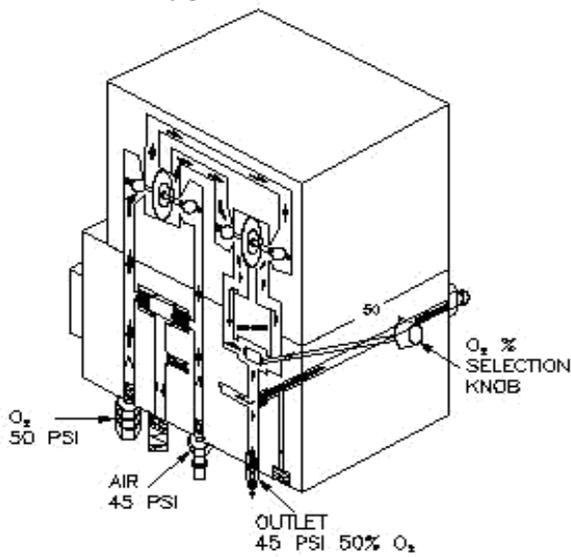
### PROPORTIONING MODULE (FIGURE 4)

From the Balance Module the gases flow into the Proportioning Module and are mixed according to the oxygen percentage selected on the external control knob. This Module consists of a double ended valve positioned between two valve seats.

## SECTION 2

### OVERVIEW OF THE 120H/L HIGH-LOW FLOW AIR/OXYGEN BLENDER OPERATION

One valve seat controls the passage of air and the other valve seat controls the passage of oxygen into the 120H/L High-Low Flow Air/O<sub>2</sub> blender outlet. At this point, the two gases have been blended according to the oxygen percentage selected on the oxygen blender control knob.



**Figure 4**

With the control knob at the full counterclockwise position (21%), the double ended valve will completely close off the flow of oxygen, allowing only the air to flow. By adjusting the control knob in the full clockwise (100%) position the flow of air is blocked, permitting only the flow of oxygen through the blender outlet.

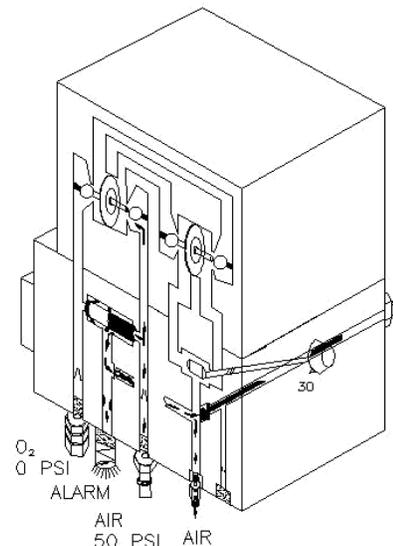
#### ALARM/BYPASS (FIGURE 5)

The alarm feature provides for an audible alarm if source pressures differ by 20 PSI (1.41 Kg/cm<sup>2</sup>) or more. The primary purpose of the alarm is to audibly warn the operator of an excessive pressure drop or depletion of either source gas. The alarm will also activate in the event of elevation of either source gas when a difference of 20 PSI (1.41 Kg/cm<sup>2</sup>) or more is detected.

Should both gas pressures (oxygen of medical air) increase or decrease simultaneously, and a 20 PSI

(1.41Kg/cm<sup>2</sup>) differential is not seen, there will not be an audible alarm. If either source gas pressure drops, the output pressure of the blender will drop similarly, since the source gases are always balanced to that of the lower pressure.

The bypass function operates in unison with the alarm. The alarm bypass poppet communicates directly with the air supply on one end and the oxygen supply on the other.



**Figure 5**

When the two source gases are near equal in pressure, the alarm bypass poppet is positioned over the bypass channel, blocking the flow of both gases. The poppet will remain seated for unequal pressures up to 20 PSI (1.41Kg/cm<sup>2</sup>). Once a 20 PSI (1.41Kg/cm<sup>2</sup>) difference is sensed by the poppet, the higher gas pressure will overcome the spring force and pressure the poppet at its opposite end, thus creating a path for gas (air or oxygen) to flow into the alarm channel. The gas with the higher pressure will also flow directly to the blender outlet port bypassing the Balance and Proportioning Modules. The gas is also directed to the bottom of the unit to the reed alarm, thus creating an audible warning. The oxygen concentration will be that of the gas at the higher pressure. The blender in the alarm/bypass mode will deliver the oxygen (100%) or air (21%) until the bypass mechanism resets when source gas pressure is restored to a differential of approximately 6 PSI (0.42 kg/cm<sup>2</sup>).

## SECTION 2

### OVERVIEW OF THE 120H/L HIGH-LOW FLOW AIR/ OXYGEN BLENDER OPERATION

If the 120H/L High-Low Flow Air/O<sub>2</sub> Blender is set at 21% and the OXYGEN source pressure is reduced sufficiently to produce a 20 PSI (1.41Kg/cm<sup>2</sup>) or greater differential, the unit will not alarm because it will continue to deliver 21% concentration according to the setting. If the control is moved slightly from the 21% setting, the alarm will sound.

Similarly, if the 120H/L High-Low Flow Air/O<sub>2</sub> Blender is set to deliver 100% concentration and AIR source pressure is reduced or lost, the unit will not alarm because it will continue to deliver the selected 100% concentration.

The 120H/L High-Low Flow Air/O<sub>2</sub> Blender should be disconnected when not being used. If left connected to source gases while not being used (i.e. no output flow or bleed flow), the unit will not alarm if a 20 PSI (1.41Kg/cm<sup>2</sup>) or greater pressure differential develops. If the blender is not in use, an alarm under these conditions may be an unnecessary distraction or nuisance.

#### GAS OUTLETS (FIGURE 6 and FIGURE 7)

The primary gas outlet is utilized for unmetered high flow applications in the range of 15-120 LPM. The flow of gas is automatically initiated by an attachment of a pneumatic device to the outlet port. A check valve is unseated upon connection allowing the mixed gases to flow through the primary outlet.



**Figure 6**



**Figure 7**

The auxiliary outlet is located on the right side of the 120H/L High-Low Flow Air/O<sub>2</sub> Blender and is designed to deliver metered gas through a flowmeter. Mixed gas may be delivered within specified accuracy tolerance from this outlet at 2 LPM and above. When a connection is made to the auxiliary outlet a 10-12 LPM bleed of mixed gas to the atmosphere is attained. The bleed flow exits the blender through a bleed port located on the bottom as shown in Figure 6. This bleed allows for applications utilizing low flows down to 5 LPM.

### SECTION 3: WARNINGS, CAUTIONS & NOTES

The 120H/L High-Low Flow Air/O<sub>2</sub> Blender should be operated by trained, qualified medical personnel under direct supervision of a licensed physician. Before clinical application, the WARNINGS, CAUTIONS and NOTES should be read and understood.

Safety Symbol	Content
 <b>WARNING</b>	Indicates potential serious adverse reactions and safety hazards which if not avoided could result in death or serious injury
 <b>CAUTION</b>	Defines any special care to be exercised by the user for the safe and effective use of the device and the care necessary to avoid damage to the device that may occur as a result of use or misuse
<b>NOTE</b>	Provides additional information to clarify an explanation or instruction for the safe and effective use of the device

## WARNINGS

- Use this 120H/L High-Low Flow Air/Oxygen Blender only for its Intended Use as described in this manual.
- Identify existing conditions that could adversely affect the operator or patient.
- **DO NOT** use this device in an MRI environment.
- Always use medical grade gasses that meet the requirements of ANSI/CGA G7.1-2011 Grade D or better and have a dew point of 5°F (2.75°C) or more below the lowest temperatures to which the air distribution (piping) system is exposed.
- An air inlet filter/ water trap is recommended for use with the 120H/L High-Low Flow Air/Oxygen Blender. Filters can become restricted in a manner that can cause insidious reduction in the flow capability of the blender and lead to malfunction.
- **DO NOT** occlude or obstruct the bleed port or muffler on the bottom of the blender.
- Adjustment of oxygen concentrations must be verified using an oxygen analyzer.
- **DO NOT** use this 120H/L High-Low Flow Air/Oxygen Blender when the alarm is sounding.
- Use recommended lubricants sparingly as lubricant may migrate to unintended parts of the blender and cause it to malfunction.
- The oxygen selector knob does not rotate 360 degrees. Rotating the dial beyond the endpoint settings will damage the 120H/L High-Low Flow Air/Oxygen Blender.

## SECTION 3

### WARNINGS, CAUTIONS & NOTES

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#### CAUTIONS

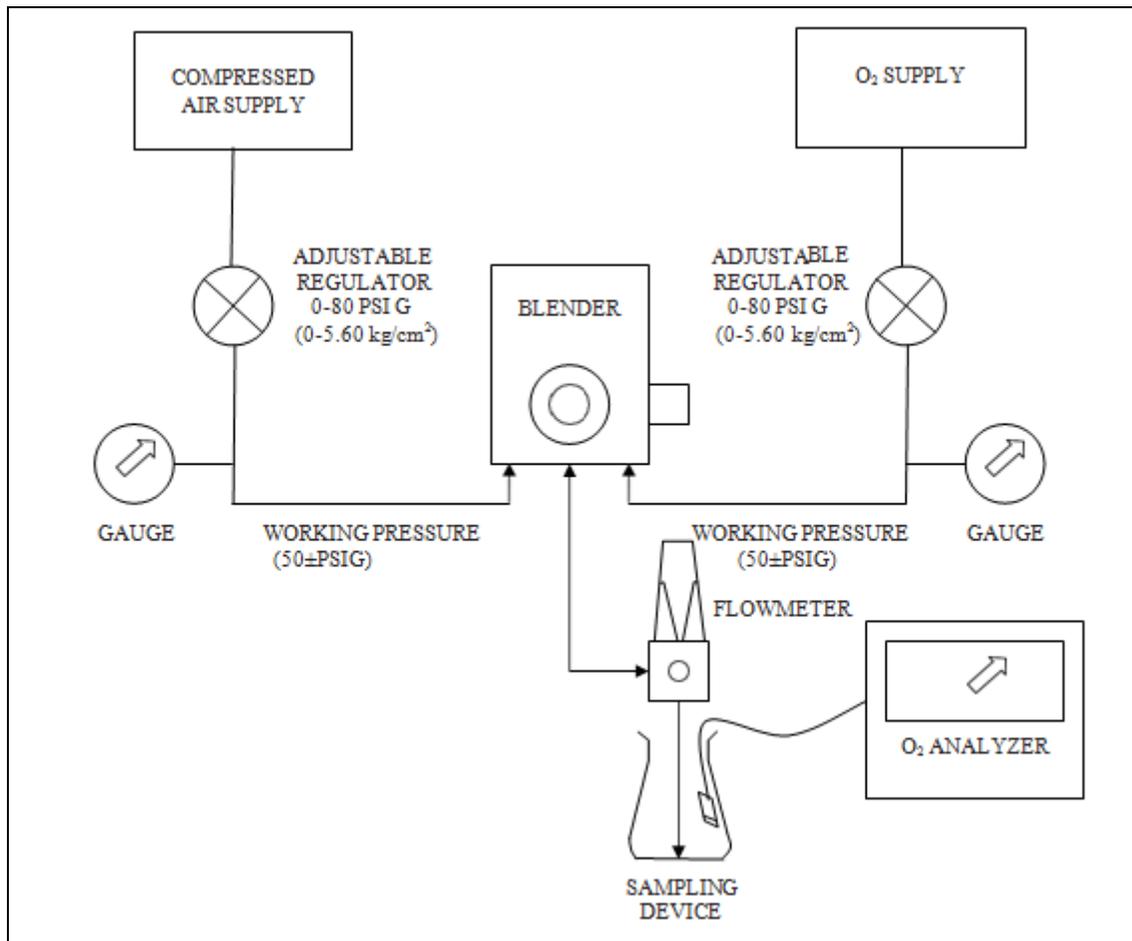
- U.S. Federal law restricts this device to sale by or on the order of a licensed medical practitioner.
- **DO** close off gas supply sources when the 120H/L High-Low Flow Air/Oxygen Blender is not in use and the auxiliary outlet is connected. The continuous gas bleed may drain compressed gas tanks empty.
- Store the 120H/L High-Low Flow Air/Oxygen Blender in a clean, dry are when not in use.
- Ensure all connections are tight and leak free.

#### NOTES

- Allow equilibration time for fractional concentration of inspired oxygen (FIO<sub>2</sub>) changes before analyzing gas.
- Use pressure regulators that display regulated pressures.
- Compressed gas can contribute to deposits that can obstruct filters. Filters can become restricted in a manner that can cause insidious reduction in the flow capability of the blender and lead to malfunction. It is important to perform preventative maintenance as recommended and more frequently if the gas supply is not known to be clean and/or free of condensed water.

## SECTION 4: SETUP PROCEDURE

The 120H/L High-Low Flow Air/Oxygen Blender should be tested in a system which closely duplicates the conditions of use for which the blender was designed. Illustrated below is a schematic diagram of the system that should be used to test the 120H/L High-Low Flow Air/ Oxygen Blender.



## SECTION 5: PERFORMANCE CHECKS

Prior to placing the 120H/L High-Low Flow Air/O<sub>2</sub> Blender into clinical use, always perform the following test:



### WARNINGS:

- If the 120H/L High Low Flow Air/Oxygen Blender does not function as described below. Contact the OHIO MEDICAL (Refer to “Contact Us” page).
- Do NOT use the blender until the correct performance is verified.

<b>BLENDER ALARM BYPASS CHECK</b>	
<b>BLENDER ADJUSTMENT</b>	<b>BLENDER RESPONSE</b>
1. Connect 50±5 PSIG (3.52±0.35 kg/cm <sup>2</sup> ) air/oxygen source gases. Adjust control knob to 60%. Connect flowmeter to auxiliary outlet, set flow to 5 LPM minimum.	1. Alarm/Bypass should <b>not</b> activate.
2. Connect an oxygen flowmeter to auxiliary outlet to activate auxiliary bleed and disconnect 50PSI (3.52 kg/cm <sup>2</sup> ) air source from Blender.  NOTE: The Blender must be flowing gas for the alarm to activate.	2. Audible alarm.
3. Reconnect 50PSI (3.52 kg/cm <sup>2</sup> ) air source to Blender.	3. Audible alarm stops. Verify oxygen concentration (57% to 63%) with an oxygen analyzer.
4. Disconnect 50PSI (3.52 kg/cm <sup>2</sup> ) oxygen source from Blender.	4. Audible alarm.
5. Reconnect 50PSI (3.52 kg/cm <sup>2</sup> ) oxygen source to Blender.	5. Audible alarm stops. Verify oxygen concentration (57% to 63%) with an oxygen analyzer)
6. Verify oxygen flowmeter is set at 5 LPM.	6. Oxygen analyzer should read 57% to 63% when measured from the flowmeter outlet.

## SECTION 6: CLEANING AND STERILIZATION

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### WARNINGS:

- Do NOT steam autoclave or otherwise subject 120 H/L High Low Flow Air/Oxygen Blender to temperatures over 145°F (62°C).
- Do NOT immerse assembled 120 H/L High Low Flow Air/Oxygen Blender into liquid decontamination agents.

Use an all-purpose liquid cleaner on exterior. For other general cleaning, use a 70% isopropyl alcohol solution.

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## SECTION 7: MAINTENANCE AND SERVICE POLICY

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 **WARNING:** The 120H/L High-Low Flow Air/Oxygen Blender should be serviced or calibrated by a qualified and trained service technician.

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The 120H/L High-Low Flow Air/Oxygen Blender should be subject to a regular maintenance and service program, including periodic accuracy checks between normal overhauls. Although the frequency of these tests will vary depending on degree and severity of service, it is recommended that they be performed at least once every six (6) months under the best of conditions.

Elastomer components such as diaphragms and O-Rings are designed to function satisfactory for a minimum of two (2) years. The need for cleaning and replacement depends on gas line conditions and is indicated by the blender not meeting its specified performance. The blender may malfunction due to excessive dirt and debris. Ohio Medical recommends that unit be overhauled every two (2) years. Elastomer components will not function indefinitely, and the probability of their causing malfunctions increases progressively after two (2) years of service.

**SECTION 8:  
DISPOSAL INSTRUCTIONS**

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This device and its packaging contain no hazardous materials. No special precautions need to be taken when disposing the device and/or its packaging.

**SECTION 9:  
REPLACEMENT PARTS**

<b>Part Number</b>	<b>Description</b>	<b>Quantity Required</b>
10-0700-020001	Proportion Block	1
10-0700-040002	Cover Plate – Dark Grey	1
10-0700-020002	Diaphragm Block	4
10-0700-030005	Alarm Sleeve Spring	2
10-0700-020003	Bypass Seat Cap	1
10-0700-010001	Bypass Adjuster	2
10-0700-020004	Alarm Shuttle	1
10-0700-070001	Alarm Sleeve	1
10-0700-030001	Primary Check Valve Spring	1
10-0700-070002	Primary Check Valve Poppet	1
10-0700-070003	Check Valve Housing	1
10-0700-030002	Auxiliary Check Valve Spring	1
10-0700-070004	Auxiliary Check Valve	1
10-0701-070001	High flow Auxiliary Outlet Connector	1
10-0700-070006	Oxygen Inlet Center Connector	2
10-0700-070007	Oxygen Inlet DISS	1
10-0700-070008	Oxygen Inlet DISS Nipple	1
10-0700-080002	Starwasher	1
10-0700-030003	Alarm Cap Spring	1
10-0700-030004	Rear Cap Spring	1
10-0700-010002	Checkball Retainer	1
10-0700-070009	Air Inlet Connector	1
10-0700-010004	Front Seat Nut	1
10-0700-040009	Control Knob	1
10-0700-010005	Knob Collet	1
10-0700-010006	Control Knob Washer	1
10-0700-010007	Control Knob Nut	1
10-0700-040006	Knob Cover	1
10-0700-030008	Socket Head Cap Screw, 2.25”	4
10-0700-080003	Diaphragm Block Ball Bearing	4
10-0700-030007	Diaphragm Block Spring	1
10-0700-030009	Socket Head Cap Screw, 0.75”	8
10-0700-060001	O-Ring, Balance Blocks and Check Valve	10
10-0700-060002	O-Ring, Alarm Sleeve and Block Cap	1
10-0700-060003	Front Valve Seat O-Ring	1
10-0700-060004	Inlet/Outlet Connector O-Ring	3

**SECTION 9:  
REPLACEMENT PARTS**

<b>Part Number</b>	<b>Description</b>	<b>Quantity Required</b>
10-0700-060005	Front Valve Stem O-Ring	1
10-0700-060006	Bypass O-Ring	2
10-0700-060007	Front Seat O-Ring	1
10-0700-060008	Alarm Cap O-Ring	2
10-0700-060009	Alarm Sleeve O-Ring	2
10-0700-060010	O-Ring, Connectors and Caps	4
10-0700-060011	Rear Seat O-Ring	1
10-0700-080004	Muffler Bleed	1
10-0700-080005	Foam Diffuser	1
10-0700-040003	Blender Alarm Cap	1
10-0700-060013	Check Ball	1
10-0700-060014	Duck Bill Check Valve	3
10-0700-040007	Step Washer	2
10-0700-080006	Inlet Cone Filter	2
10-0700-080007	Balance Block Diaphragm	2

The Quantity required column indicates the number of parts actually required for one 120H/L High-Low Flow Air/Oxygen Blender.

Maintenance Kit (P/N DAOBA-00000-05) is packaged with the actual quantity required.

**SECTION 8:  
REPLACEMENT PARTS**

**120H/L HIGH-LOW FLOW AIR/O<sub>2</sub> BLENDER KIT (P/N DAOBA-00000-05)**

<b>Part Number</b>	<b>Description</b>	<b>Quantity Required</b>
10-0700-130006	Caution/Warning Label	1
10-0700-080002	Starwasher	1
10-0700-030006	Control Knob Spring	1
10-0700-080003	Diaphragm Block Ball Bearing	4
10-0700-060001	Balance Blocks and Check Valve O-Ring	11
10-0700-060002	Alarm Sleeve and Block Cap O-Ring	3
10-0700-060003	Front Valve Seat O-Ring	1
10-0700-060004	Inlet/Outlet Connector O-Ring	4
10-0700-060005	Front Valve Stem O-Ring	1
10-0700-060006	Bypass O-Ring	2
10-0700-060007	Front Seat O-Ring	1
10-0700-060008	Alarm Cap O-Ring	2
10-0700-060009	Alarm Sleeve O-Ring	2
10-0700-060010	Connectors and Caps O-Ring	10
10-0700-060011	Rear Seat O-Ring	1
10-0700-060012	O <sub>2</sub> Inlet O-Ring	1
10-0700-080004	Muffler Bleed	1
10-0700-080005	Foam Diffuser	1
10-0700-060013	Check Ball	1
10-0700-060014	Duck Bill Check Valve	3
10-0700-040007	Step Washer	2
10-0700-080006	Inlet Cone Filter	2
10-0700-080007	Balance Block Diaphragm	2

## SECTION 10: PRODUCT SPECIFICATIONS

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### 120H/L HIGH-LOW FLOW AIR/O<sub>2</sub> BLENDER

Size (not including inlet and outlet fittings).....	Height– 3 ½” (9cm) Width– 2 ¼” (5.6cm) Depth– 4 ½” (11.5cm)
Weight.....	2.75 lbs (1.4kg)
Gas Supply Pressure (Air & O <sub>2</sub> ).....	30 – 75 PSIG (2.11 kg/cm <sup>2</sup> - 5.27 kg/cm <sup>2</sup> ). The blender will maintain stated accuracy at supply pressures provided the differential between supply pressures does not exceed 10 PSIG (0.70 kg/cm <sup>2</sup> ). Output flow rate will be diminished if either supply pressure is below 50 PSIG (3.52 kg/cm <sup>2</sup> ) and will be increased if both supply pressures are above 50 PSIG (3.52 kg/cm <sup>2</sup> ).
Knob Adjustment Range.....	21 to 100%
Primary Outlet.....	Bottom Port
Primary Outlet Flow Range.....	15 to 120 LPM (no bleed flow)
Maximum Flow @ 60% knob setting, 50 PSIG (3.52 kg/cm <sup>2</sup> ) inlet pressure.....	>120 LPM
Flow @ 21% or 100% knob setting, 50 PSIG (3.52 kg/cm <sup>2</sup> ) inlet pressure.....	>90 LPM
Bypass flow (loss of air or O <sub>2</sub> ) 50 PSIG (3.52 kg/cm <sup>2</sup> ) inlet pressure of remaining gas.....	>90 LPM
Auxiliary Outlet.....	Right Side Port (Facing unit)
Auxiliary Outlet Flow Range.....	2 to 100 LPM (Bleed 10-12 LPM)
Accuracy – with inlet gases within 10 PSIG (0.70 kg/cm <sup>2</sup> ) and each gas pressure greater than 30 PSIG (2.11 kg/cm <sup>2</sup> ), but less than 75 PSIG (5.27 kg/cm <sup>2</sup> ).....	± 3% of full scale over the stated flow ranges (i.e., 3 percentage points at any reading)

**SECTION 10:  
PRODUCT SPECIFICATIONS**

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**120H/L HIGH-LOW FLOW AIR/O<sub>2</sub> BLENDER**

Alarm/Bypass Activation.....	20 ± 2 PSIG (1.41 ± 0.14 kg/cm <sup>2</sup> ) when inlet gas pressures differ by a nominal 20 PSIG (1.41 kg/cm <sup>2</sup> ) or more provided maximum pressure of either supply gas does not exceed 75 PSIG (5.27 kg/cm <sup>2</sup> ) and minimum pressure of one supply gas remains at 40 PSIG (2.81 kg/cm <sup>2</sup> ) or above. In other words, one supply gas must remain at 40 PSIG (2.81 kg/cm <sup>2</sup> ) or above to provide enough gas pressure to operate the alarm in the event the other supply pressure falls to 20 PSIG (1.41 kg/cm <sup>2</sup> ) or below. There will be no alarm or bypass if the control knob is set to 21% and source oxygen pressure is reduced or turned off. Similarly, if control is set to 100% there will be no alarm if air pressure is reduced or turned off. In either case, the unit will continue to deliver the selected concentration of 21% or 100%. There will be no alarm under condition of 20 PSIG (1.41 kg/cm <sup>2</sup> ) or greater source pressure differential if unit is not in use (i.e. no output flow or bleed flow).
Alarm Sound Generator.....	Vibrating Reed
Alarm/Bypass Reset.....	When inlet pressure differential is 6 PSIG (0.42kg/cm <sup>2</sup> ) or less.
Pressure Drop.....	Less than 6 PSIG (0.42 kg/cm <sup>2</sup> ) at 50 PSIG (3.52 kg/cm <sup>2</sup> ) inlet pressure and 40 LPM flow

**SECTION 11:  
TROUBLESHOOTING**

<b>PROBLEM</b>	<b>POTENTIAL CAUSE</b>	<b>CORRECTIVE ACTION</b>
<p><b>Oxygen concentration discrepancy between blender setting and analyzer (greater than 3%)</b></p>	<ol style="list-style-type: none"> <li>1. Flow requirements are outside the specified LPM range</li> <li>2. Analyzer is out of calibration</li> <li>3. Blender is out of calibration</li> <li>4. Low flow bleed muffler obstructed causing restriction of fixed bleed</li> <li>5. Gas supply contaminated</li> <li>6. Air entrained into circuit by ventilator or accessory device.</li> </ol>	<ol style="list-style-type: none"> <li>1. Correct the flow. Verify that the correct outlet port is being used. Each outlet port has a different flow range. Auxiliary outlet (2 LPM or more). Primary outlet (15 LPM or more)</li> <li>2. Calibrate analyzer</li> <li>3. Contact OHIO MEDICAL for repair.</li> <li>4. Contact OHIO MEDICAL for repair.</li> <li>5. Check source gases with calibrated O<sub>2</sub> analyzer to confirm O<sub>2</sub> is 100% and AIR is 21%</li> <li>6. Contact OHIO MEDICAL for further information.</li> </ol>

<b>Alarm Sounding</b>	<ol style="list-style-type: none"><li>1. Inlet pressure differences of 20 PSI (1.41 kg/cm<sup>2</sup>) or more.</li><li>2. Alarm module is not calibrated properly.</li><li>3. Inlet gas contamination alarm module malfunction.</li></ol>	<ol style="list-style-type: none"><li>1. Correct the pressure difference.</li><li>2. Contact OHIO MEDICAL for repair.</li><li>3. Contact OHIO MEDICAL for repair.</li></ol>
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**SECTION 11:  
TROUBLESHOOTING**

<b>PROBLEM</b>	<b>POTENTIAL CAUSE</b>	<b>CORRECTIVE ACTION</b>
<b>120H/L High Low Flow Air/O<sub>2</sub> Blender in bypass- no alarm</b>	1.Reed plate is improperly installed or damaged.  2.Alarm gas orifice is obstructed.	1.Contact OHIO MEDICAL for repair.  2.Remove obstruction from orifice. If problem persists, contact Tenacore for repair.
<b>120H/L High Low Flow Air/O<sub>2</sub> Blender Accurate only when inlet gas pressures are equal</b>	1. Balance module not functioning properly.  2.Both air and oxygen gas sources are below 30 PSIG.	1.Contact OHIO MEDICAL for repair.  2.Correct the low pressure condition.

**SECTION 12:  
WARRANTY****PRODUCTS MANUFACTURED BY TENACORE HOLDINGS INC. ARE WARRANTIED TO BE FREE FROM DEFECTS IN MATERIALS AND WORKMANSHIP**

The liability of OHIO MEDICAL under this warranty is limited to replacing, repairing or issuing credit. Determination will be made by OHIO MEDICAL. Such determination will be made in relation to the parts that become defective or fail to meet published specifications during the warranty period. OHIO MEDICAL will not be liable under this warranty unless (A) OHIO MEDICAL is promptly notified in writing by Buyer upon discovery of defects or failure to meet specifications; (B) the defective unit or part is returned to OHIO MEDICAL, transportation charges prepaid by Buyer; (C) the defective unit or part is sent by buyer to OHIO MEDICAL prior to the last day of the warranty period; and (D) OHIO MEDICAL's examination results in a determination that the unit has suffered such defects or failures as a result of misuse, neglect, improper installation, unauthorized repair, alteration or accident.

OHIO MEDICAL warranties as described above and set forth shall not be accretive, diminished or affected by, and further no obligation or liability shall arise or grow from the disclosure of technical advice or service by OHIO MEDICAL or its agents in connection with Buyer's orders.

**LIMITATIONS OF LIABILITIES**

In no event shall OHIO MEDICAL be liable to Buyer for loss of profits, loss of use, consequential damage or damages of any kind based upon a claim of breach of warranty, other than the purchase price of any defective product covered within.

This warranty does not cover normal maintenance such as cleaning, adjustment or lubrication and updating of equipment or parts. This warranty shall be void and shall not apply if the equipment is used with accessories or parts not manufactured by TENACORE or authorized for use in writing by OHIO MEDICAL, or if the equipment is not maintained in accordance with a prescribed schedule of maintenance.

The warranty stated above shall extend for a period of six months from the day of delivery, with the following exceptions:

1. Elastomeric components and other parts or components subject to deterioration over which OHIO MEDICAL has no control are warranted for sixty (60) days from date of receipt.

The foregoing is in lieu of any other warranty, expressed or implied, including, without limitation, any warranty of merchantability, except as to title, and can be amended only in writing by a duly authorized representative of OHIO MEDICAL.

**A** MVEX®

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