

# Magellan-2200 Model 1 Anesthesia Machine **Operators Manual**



**Oceanic**  
Medical Products, Inc.  
www.oceanicmedical.com  
8005 Shannon Industrial Park Lane  
Atchison, Kansas 66002  
Tel: 913 874 2000  
Fax: 913 874 2005  
oceanicmedical@lwnorth.com

<b>TABLE OF CONTENTS</b>	<b>PAGE</b>
<b>SUBJECT</b>	
• <b>General Description</b>	3
• <b>Definition of Statements</b>	3
• <b>General Warnings</b>	3
• <b>Machine Specifications</b>	3
• <b>Functional and Operational Procedures</b>	5
Assembly of Components	6
Pre-Use Checklist	10
Operation of Controls and Accessories	15
Post-Use Checklist	20
• <b>Cleaning, Disinfecting and Sterilization</b>	21
• <b>Minor Maintenance Recommendations</b>	21
Tools Needed for Maintenance	21
Cylinder Gas Duration Formula	24
Gas Flow Diagrams	25
• <b>Items Furnished with Each Machine and Part Numbers</b>	30
• <b>Additional Items Needed for Operation and Maintenance</b>	32
• <b>Bill of Materials with Part Numbers</b>	33
• <b>Exploded View Diagrams of Major Components</b>	35

## GENERAL DESCRIPTION

---

The Magellan-2200 Anesthesia Machine is compact robust and flexible, easy to transport and was designed for military forward surgical teams, combat surgical hospitals, general civilian hospitals, outpatient surgical centers, office-based anesthesia, military and civilian veterinary medicine.

The Magellan-2200 is completely pneumatically powered and is designed to be used with any complete or simple patient monitoring system that the operator prefers to use or has on hand.

The Magellan-2200 may be mounted on its custom-made carrying case, a mobile trolley especially designed for the unit, other mobile carts or on a tabletop as the operator prefers.

### Factory Quality Assurance Testing

Each Magellan-2200 is tested several times during the manufacturing process. Final testing and calibration of components and the completed machine are recorded and a final functional test copy is included in the shipment from the factory to the initial customer.

## DEFINITION OF STATEMENTS

---

The following terminology and statements are important for the operator to understand before proceeding with the manual or operation of the Magellan-2200:

**WARNINGS:** indicate a possibility of injury to the operator or others

**CAUTIONS:** indicate a possibility of damage to the equipment

**NOTES:** indicate points of interest for proper operation of the equipment

### General Warnings:

**1.** Patients requiring life-support equipment should be under the constant surveillance of competent medical practitioners. There is always the possibility of machine and alarm failure and some malfunctions require immediate, corrective action.

**2.** Vaporizer-Tilting the vaporizer past 45 degrees with liquid agent in the chamber can result in patient injury or death. If tilted past 45degrees, empty the chamber, fully open the percent control, then flush the vaporizer with Oxygen from the Oxygen flowmeter set to 5 lpm for 10 minutes.

**3.** Ventilator Power Source-Ensure that adequate Oxygen or Compressed Medical Air pressure and volumes are available before engaging the ventilator power toggle switch to ensure proper operation of the ventilator.

## MACHINE SPECIFICATIONS

---

### DIMENSIONS

<b>Height</b>	23 inches
<b>Depth</b>	23 inches
<b>Width</b>	17 inches
<b>Weight</b>	
• Free-Standing	45 lbs
• Enclosed in Carrying Case	100 lbs
<b>Machine Materials</b>	Aluminum, brass and plastic
<b>Carrying Case Materials</b>	Plastic, military grade
<b>Operating Temperature Range</b>	35 degrees F to 110 degrees F
<b>Required Gas Supply Sources</b>	
• O2 Main and Cylinders	38 to 70 psi (50 psi is optimal)
• Air and/or Air Compressor	38 to 70 psi (50 psi is optimal)
• Oxygen Concentrator	3 to 10 psi (For O2 Flowmeter only)
<b>Flowmeter Fresh Gas Flow</b>	1 to above 20 lpm (each flowmeter)
<b>Oxygen Flush Valve</b>	Recessed, self-closing, push-button, color coded and labeled, provides 45-55 lpm constant flow, while push-button is depressed; may not be used with O2 concentrator as O2 power source
<b>CO2 Absorber System</b>	King Systems KAB-9 (re-fillable) or KAB-1 (pre-filled/disposable)
<b>CO2 Absorber Canister Capacity</b>	400 grams soda lime
<b>Directional Valves</b>	Built in the CO2 Absorber

<b>CO2 Absorber Holding Bracket</b>	Plastic, secured with knob to main frame of machine	<b>Auxiliary O2 Flow Selector</b>	Scaled 0-10 LPM in set increments, used for pre/post anesthesia	
<b>Bag-Ventilator Switch/PRV and Scavenger Outlet Port</b>	Hand-operated selector switch and rotating knob for PRV and scavenging outlet	<b>Vaporizer</b>	Penlon SigmaDelta Series, bolt (cage) mounted, temperature compensated, very low maintenance	
<b>Bellows</b>	Latex free, upward inflating, range from 0 to 1.6 L	<b>Airway Pressure Gauge</b>	Dual scaled in cmH2O and mmHg, located on front panel of ventilator	
<b>Bellows Pressure Relief</b>	Pre-set at 60 cmH2O	<b>Pressure Gauge Tubing</b>	May be attached to bag/vent switch arm or to a point within the patient breathing circuit (operators choice).	
<b>Common Gas Outlet</b>	Quick-connect, size indexed	<b>Mechanical Ventilator</b>	Pneumatically powered, time cycled, volume constant, flow variable	
<b>Tubing Circuit</b>	King Systems F-360-61 or any standard anesthesia circle circuit	<ul style="list-style-type: none"> <li>• <b>Ventilator Pressure Relief</b></li> <li>• <b>Volume Range</b></li> <li>• <b>Insp. Flow Range</b></li> <li>• <b>Insp. Time Range</b></li> <li>• <b>Exp. Time Range</b></li> <li>• <b>Pressure Relief Valve</b></li> </ul>	Pre-set to maximum of 60 cmH2O located in main vent box 0 to 1.6 L 0 to .90 lps 0.2 to 3.0 seconds 0.2 to 30 seconds Preset to 60 cmH2O	
<b>Gas Pressure Hoses</b>	DISS and thread indexed, female connectors at both ends	<b>Ventilator Gas Power Requirements</b>	40 to 70 psi, 50 psi optimal Use toggle switch to select gas source	
<b>Gas Inlet Manifold</b>	DISS and thread indexed, male connectors with one-way valves	<b>Waste Gas Scavenger</b>	Positive and negative relief valves, 1 L reservoir bag, vacuum control knob	
<b>Gas Inlet Manifold Filters</b>	Located behind Manifold Air and O2 inlet male connectors	<b>Total Machine Gas Leakage</b>	@ 30 cmH2O	-0- ml/Min
<b>Gas Inlet Pressure Regulators</b>		@ 80 cmH2O		-0- ml/min
<ul style="list-style-type: none"> <li>• <b>Main supply cylinder</b></li> <li>• <b>Safety back up cylinder</b></li> </ul>	DISS/thread indexed for O2 Pin-indexed, yoke mounted for "D" and "E" cylinders for O2	<b>Internal System Compliance</b>	@ 20 cmH2O	1.1 ml/cmH2O
<b>Oxygen and Air Supply Gauges</b>	0-3000 psi range, color coded and clearly labeled	@ 40 cmH2O		1.3 ml/cmH2O
<b>Oxygen Supply Alarms</b>		<b>Internal System Resistance</b>	@ 1.0 L/sec gas flow	4.11 cmH2O
<ul style="list-style-type: none"> <li>• <b>Main and safety back-up</b></li> <li>• <b>O2 Concentrator</b></li> <li>• <b>Alarm power source</b></li> <li>• <b>Alarm on/off</b></li> </ul>	Pneumatically actuated when O2 supply falls below 30 psi Pneumatically actuated when O2 supply falls below 1 psi 9-volt battery located in body of alarm box Labeled toggle switch located on body of alarm box	@ 0.5 L/sec gas flow		1.80 cmH2O
<b>Air and O2 Flowmeters</b>	Calibrated and scaled 0-10 lpm, color coded, O2 flowmeter has a fluted control knob for easy identification by touch, alone	<b>APL Valve Pressure Drop</b>	@ 3.0 L/min gas flow	0.12 cmH2O
<b>Oxygen Concentrator</b>	To power O2 flowmeter only	@ 30 L/min gas flow		1.03 cmH2O
<b>Air Compressor</b>	May be used to power ventilator and air flowmeter	<b>Storage</b>		
<b>Oxygen Analyzer/Monitor</b>	OM-25-ME (or equivalent) Galvanic cell sensor, life expectancy 2 years under normal conditions	<ul style="list-style-type: none"> <li>• <b>Indoor</b></li> <li>• <b>Outdoor</b></li> </ul>	+ 160°F	Allow unit to warm to normal OR temp for 1hour
<b>Oxygen Analyzer Power Source</b>	2 each AA batteries, life expectancy approx. 3000 use hours		- 30°F	

## FUNCTIONAL AND OPERATIONAL PROCEDURES

The following procedures should be performed between the time the Magellan-2200 is assembled for use, actually used and post-use, to ensure proper assembly of components and operation.

**1. Removal and Mounting of Machine**  
Turn on side, open, remove lid



**2. Remove machine; Turn open box so that wheels are down.**



**3. Review parts in lid of ventilator box.**



**4. Positioning of parts in lid of ventilator box.**



**5. Mount anesthesia machine to top of box, securing with mounting screws.**



**6. Reattach lid of box to front of box with machine mounted.**



**7. Attach small O2 cylinder mount to box back.**



**8. O2 cylinder mount completely attached.**



## ASSEMBLY OF COMPONENTS FOR USE OF THE MACHINE

### BACK OF MACHINE

#### 1. Pressure Reducing Regulator:

Attach yoke-type pressure reducing regulator to the "D" or "E" Oxygen cylinder to be used for safety back-up purposes.

#### 2. Oxygen Hose:

Attach one end of the 24" green O2 high pressure hose to the outlet port of the pressure reducing regulator and the opposite end to the left-side of the Gas Manifold.



#### 3. Oxygen Hose: Main O2 Supply:

Attach one end of the 15' green O2 high pressure hose to the top left O2 inlet connector on the Gas Manifold and the opposite end to the O2 source (either an O2 Cylinder or O2 Wall outlet.)



#### 4. Oxygen Concentrator in Lieu of Main O2 Source:

If an O2 Concentrator is to be used instead of cylinder or wall O2 sources, the tubing from the O2 concentrator should be connected to the specially labeled (O2 concentrator only) inlet nipple located above and to the right side of the Gas Manifold.



### 5. Water Trap:

Attach the Water Trap to the Air inlet port on the GasManifold

**CAUTION:** Do not attach the water trap to the outlet port of the Air Compressor as water may condense enroute to the anesthesia machine and cause possible malfunction of some of the components.

### 6. Air Hose:

Attach one end of the 15' yellow Air high-pressure hose to the inlet port of the Water Trap. Attach the opposite end of the high pressure hose to the air compressor outlet port or to other Air sources (wall or cylinder)



### 7. Waste Gas Scavenger Tubing Connection:

1. Attach the waste gas scavenger to the upper right hand side of the back frame, using the Velcro strip or keyhole mounting, then attach the reservoir bag to bottom port of the scavenger. Attach suction source tubing to the inlet port of scavenger control knob port.

**NOTE:** In military field conditions the reservoir bag to the bottom port of the scavenger may be replaced with a large bore hose to possibly evacuate waste anesthetic out of the work area.



**WARNING:** Scavenger system should always be mounted in order to keep debris from entering the bellows outlet port.

1. Attach one end of the first scavenger tubing to the scavenger outlet port of the B/V Switch labeled "to scavenger" and the opposite end to the "TEE" connector.
2. Attach one scavenger tubing, with the 19mm purple connector to the center port located on the base of the Bellows, and attach the other end to the "TEE" connector.
3. Attach the final scavenger tubing to the top of the Waste Gas Scavenger and the other end to the "TEE" connector.

## VENTILATOR SIDE OF MACHINE

### 1. CO<sub>2</sub> Absorber Support Arm:

Attach the CO<sub>2</sub> Absorber Support Arm to the Main body of the machine by inserting the two pins of the Arm into the two holes provided-then screw in the knob-screw from the back side of the frame to secure the Arm. Ensure that the stem of the Arm is pointed upwards.



### 2. Bag-Vent Switch Assembly Arm:

Attach the Bag/Vent Switch Assembly Arm to the top of the machine, using the dowel pin guide located under the top of the machine and insert the B/V Switch hole provided for the dowel pin. Secure the B/V Switch by inserting the knob-screw through the top of the machine.



**3. Reservoir Bag:**

Attach the Reservoir bag to the chrome inlet port connector located on the bottom of the B/V Switch Arm.



**4. Airway Pressure Gauge Tubing:**

Attach the Airway Pressure Gauge Tubing connector to the bottom of the B/V Switch Arm.



**5. Gas Flow Tubing:**

Attach the semi-clear tubing from the Common Gas Outlet to the inlet connector of the CO2 absorber.

**NOTE:** If the clear plastic connector (supplied with the CO2 canister) is not available, the semi-clear tubing may be directly attached to the inlet port nipple of the CO2 canister.



### 6. CO2 Absorber Canister:

Attach the CO2 Absorber Canister to the Absorber Support Arm.



### TUBING

7. Attach the **RED** labeled tubing to the outlet of the ventilator as shown on the label. Then attach the other end of the tubing to the ventilator inlet port of the bellows (far right port) using the 17mm connector.

8. Attach the **GREEN** labeled tubing to the brass outlet port of the B/V Switch and the opposite end to the bottom right connector ("L" shaped) located on the bottom-right position of the CO2 Absorber.

9. Attach the **BLUE** labeled tubing to the right side inlet port of the Bellows (labeled blue) and the opposite end to the lower outlet port of the B/V Switch (labeled "To Bellows").



### 10. Patient Tubing Circuit:

Attach the preferred Patient Tubing Circuit to the CO2 Absorber inlet and outlet connecting points.



**NOTE:** Any patient tubing circuit approved for use with an anesthesia machine may be used. The factory supplies a King Systems F-360-61 circuit with each machine as it is initially shipped.

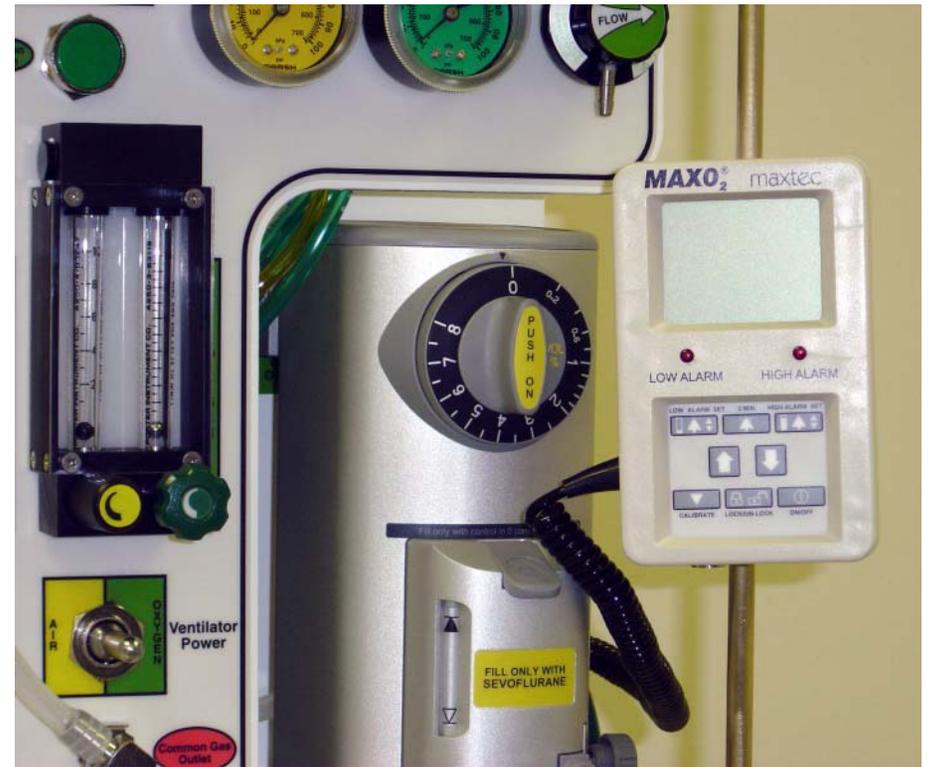
## FRONT AND TOP OF ANESTHESIA MACHINE

### OXYGEN MONITOR ATTACHMENTS

1. Attach the O2 monitor-mounting bracket to the right side support post. Insert the monitor into the slide bracket.
2. Attach the blue O2 monitor sensor bracket into the Inspiratory outlet located on the left-hand side of the front of the CO2 absorber.
3. Attach the O2 monitor O2 sensor into the blue O2 sensor bracket.



**CAUTION:** Insure that the O2 monitor sensor is mounted into the sensor bracket facing upward for best performance and to keep any humidity from accumulating around the sensor.



## PRE-USE CHECKLIST

### Emergency Ventilation Equipment

1. Verify backup ventilation equipment is available and functioning. It is recommended that a self-inflating bag/valve/mask device with the ability to provide high concentrations of O<sub>2</sub> be immediately available.

### High Pressure System

2. Check Oxygen Cylinder Supply

- A. Open O<sub>2</sub> cylinder and verify at least half full (approx. 1000 psi).
- B. Close cylinder



3. Check Central Pipeline Supplies

- A. Check that hoses are connected and pipeline gauges read approx. 50 psi.

### Low Pressure System

4. Check Initial Status of Low Pressure System

- A. Close flow control valves and turn vaporizer off.
- B. Check fill level and tighten vaporizer filler cap.

5. Perform Leak Check of Machine Low Pressure System

- A. Verify that the machine flow control valves are OFF.
- B. Attach "Suction Bulb" to common gas outlet.
- C. Squeeze bulb repeatedly until fully collapsed.
- D. Verify bulb stays fully collapsed for at least 5 seconds.
- E. Open vaporizer and repeat "C" and "D" above.
- F. Remove suction bulb and reconnect fresh gas hose.



A. Adjust flow of Oxygen and Air through their full range, checking for smooth operation of floats and undamaged flowtubes.



### Scavenging System

8. Adjust and Check Scavenging System

- A. Attach hose from bag-vent switch scavenger outlet to scavenger inlet.
- B. Attach reservoir bag to scavenger connection port.
- C. Attach suction source to suction inlet connection port.
- D. Adjust suction on and ensure bag collapses.
- E. Turn suction off.



### Breathing System

9. Calibrate Oxygen Monitor

- A. Ensure monitor reads 21% in room air.
- B. Verify low oxygen alarm is enabled and functioning
- C. Re-install sensor in circuit and flush breathing system with Oxygen.
- D. Verify that monitor now reads greater than 90%.



10. Check Initial Status of Breathing System

- A. Set selector switch to "bag" mode. (See photo)
- B. Check that the breathing circuit is complete, undamaged and unobstructed.
- C. Verify that CO2 absorbent is adequate.
- D. Install breathing circuit accessory equipment (e.g. humidifier and filter) to be used during the case.



### 11. Perform Leak Check of the Breathing System

- Set all gas flows to zero (or minimum).
- Close PRV valve and occlude "Y" piece or install a reservoir bag to distal end of circuit.
- Pressurize breathing system to about 30 cmH<sub>2</sub>O with O<sub>2</sub> Flush.
- Ensure that pressure remains fixed for at least 10 seconds.
- Open PRV valve and ensure that pressure decreases.



### Manual and Automatic Ventilation Systems

#### 12. Test Ventilation Systems and Unidirectional Valves

- Place a second breathing bag on "Y" piece.
- Set appropriate ventilator parameters for next patient.
- Switch to automatic ventilation (ventilator) mode.
- Fill bellows and breathing bag with O<sub>2</sub> Flush. Turn ventilator power switch to air or O<sub>2</sub>.
- Set O<sub>2</sub> flow to minimum, Air to zero.
- Verify that during inspiration, bellows deliver appropriate tidal volume and that during expiration, bellows fills completely.
- Set fresh gas flow to approx. 5 L/min.
- Verify that the ventilator bellows and simulated lungs fill and empty approximately without sustained pressure at end-expiration.
- Check for proper action of unidirectional valves located in CO<sub>2</sub> canister.

#### J. Exercise breathing circuit accessories to ensure proper function.

- Turn ventilator gas power switch to the "OFF" position and turn bag switch to "BAG" mode.
- Ventilate bag manually and assure inflation and deflation of artificial lung and appropriate feel of system resistance and compliance.
- Remove second bag from "Y" piece.
- Turn B/V switch to "Vent". Allow bellows to fill.
- Set Inspiratory flow to .8 lps, inspiratory time to 1 second and expiratory time to 6 seconds.
- Utilize a 1 liter breathing bag as a test lung.
- Turn on the ventilator to either air or O<sub>2</sub> depending on which gas you will be using to drive the vent. Adjust the inspiratory time to deliver a tidal volume of exactly 800 ml. (This adjustment will compensate for slight variations in delivery pressure from high pressure sources.)
- When making further adjustments in ventilating specific patients, one simple and reliable procedure is to adjust the tidal volume by making changes in the inspiratory flow rate and changes in respiratory rate by adjusting the expiratory time.



## Monitors

13. Check, Calibrate and/or Set Alarm Limits of All Monitors
  - A. Ventilator and ventilation monitor parameters including Oxygen analyzer.
  - B. Physiologic monitor that may include vaporizer agent, capnometer and pulse oximeter.

## Final Position

14. Check Final Status of Machine
  - A. Vaporizer off.
  - B. PRV valve open.
  - C. Selector switch to BAG
  - D. All flowmeters to zero
  - E. Patient suction device available
  - F. Breathing system ready to use



## FUNCTIONAL OPERATION OF CONTROLS AND ACCESSORIES

With the Pre-Use Checklist completed, the Magellan-2200 is ready to use. It is imperative that the operator understands how to utilize the controls of the machine properly and the following information will be helpful:

### Center "L" Frame Controls and Gauges



**1. Auxiliary O2 Flow Selector:** Designed to allow the operator to supply oxygen to a patient pre and post-op with small bore tubing for a nasal cannula or disposable oxygen mask. The selector knob will allow the operator to provide oxygen flow at 2,4,6,10 and 15 liters per minute.

**Note:** When not in actual use, the O2 flow selector control knob should be kept in the "OFF" position as to not waste oxygen sources.

**2. Oxygen Pressure Gauge:** Indicates the source pressure of oxygen for all oxygen-related components of the machine.

**3. Air Pressure Gauge:** Indicates the source pressure of compressed air for all air-related components of the machine.

**4. Oxygen Pressure Toggle Switch:** This switch allows the operator to select which oxygen source is being used; either high pressure (from a cylinder or mains) or very low pressure from an oxygen concentrator.

**NOTE:** When using high pressure oxygen sources, all of the functional oxygen controls may be utilized, e.g. auxiliary oxygen selector, oxygen flowmeter, oxygen flush valve, and oxygen selector to power the ventilator.

**NOTE:** When using an oxygen concentrator as an oxygen source, there is **ONLY** enough oxygen pressure to power the oxygen flowmeter. No other oxygen-powered/related systems will be able to function. The O<sub>2</sub> flush will be powered by the backup "D" or "E" oxygen cylinder when the low pressure O<sub>2</sub> concentrator is selected for use.

**WARNING:** If the O<sub>2</sub> flush button is depressed when using an O<sub>2</sub> concentrator, the flush valve will exhaust the oxygen concentrator reservoir for at least 10 seconds or longer. Be certain that the backup O<sub>2</sub> cylinder is turned on.

**WARNING:** If the oxygen concentrator is employed and the operator desires to utilize the mechanical ventilator, compressed air is the only power source that can energize the ventilator for operation. Once high-pressure oxygen is again available, the O<sub>2</sub> pressure toggle switch can be returned to the high-pressure position and all O<sub>2</sub>-related systems will then operate normally.

**5. Flush Button:** Press the button inwards to activate 100 % oxygen through the system. When activated, the oxygen gas flows from the flush button to the Common Gas Outlet and thence directly to the inspiratory side of the patient tubing circuit.

**NOTE:** One way valves prevent the oxygen flow from the Flush Button from mixing with other gases and vapors already in use from the flowmeters and vaporizer.

**6. Flowmeters:** The oxygen and air flowmeters are operated by turning the control knobs clock-wise for decreased flow and counter-clockwise for increased flow.

**NOTE:** Titration of FIO<sub>2</sub> is managed by using both flowmeters and adjusting them until the desired FIO<sub>2</sub> is observed on the O<sub>2</sub> monitor read-out.

**7. Ventilator Power Selector Switch:** This toggle has three positions:

- A. Center-OFF
- B. Right-Oxygen
- C. Left-Air

**NOTE:** Selection of gas power from the Air Compressor (if available) will allow O<sub>2</sub> sources to be conserved.

**WARNING:** Use only "Medical Grade Air Compressors" to power the Magellan-2200 air systems. Non-Medical Grade air compressor-output may include oil which can cause physiologic problems for the Patient and could result in a combustible O<sub>2</sub>-oil mixture or, damage the equipment beyond reasonable repair.

**8. Common Gas Outlet:** Provides a channel for all low flow gas and vapor to flow to the inspiratory side of the CO<sub>2</sub> Absorber and then on to the patient and the rest of the circle system.

**NOTE:** An adapter is available to insert into the CGO in order that the operator may use either a Jackson-Reese or Mapleson "D" system.

## Vaporizer Mounting and General Use

### 1. Dismounting:

**A.** Remove the two holding knob-screws holding the retainer plate located on the bottom-front of the vaporizer. Then remove the retainer plate.



**B.** Remove the two holding knobs and spacer plate from the back plate located on the backside of the frame behind the vaporizer.



- C. Pull the vaporizer forward and remove the inlet and outlet tubing connectors.



## 2. Mounting:

- A. Reverse the preceding instructions.

**CAUTION:** After re-mounting the vaporizer, be certain that all four of the retaining knobs are very secure in order to keep the vaporizer from moving during any transport or movement.



## 3. Utilization:

- A. Pour-Fill Type: Ensure that the percent control knob is set to "0".
1. Remove filler cap.
  2. Pour agent into opening, observing the "fill" chamber window to desired level.
  3. Replace filler cap.
- B. Key-Fill Type: Ensure that the percent control knob is set to "0"
1. Attach the keyed filler adapter to the bottle.
  2. Loosen the clamp screw and remove the plug.
  3. Insert keyed end of bottle adapter fully into vaporizer receiver; tighten clamp screw.

4. Raise the bottle above the filler.
5. Open the filler control latch.
6. Fill the chamber by observing the "fill" chamber window.
7. Close filler control latch.
8. Lower bottle below the level of the filler.
9. Loosen clamp screw and remove the key adapter.
10. Insert the clamp screw and tighten clamp screw.

## C. Use During Procedure:

- A. Turn percent control knob to desired position.
- B. Adjust percent control as needed by observing the patient monitor-indicating percentage delivered.

**WARNING:** Tilting the vaporizer past 45 degrees with liquid in the chamber can result in patient injury or death.

If tilted past 45 degrees, empty the chamber, fully open the percent control, and then open the O<sub>2</sub> flowmeter to 5 LPM for 10 minutes.

**NOTE:** For complete vaporizer information, refer to the provided Penlon Sigma Delta User Instruction Manual.

## USE OF MECHANICAL VENTILATOR

**Purpose:** The mechanical ventilator is used to power the bellows. The air or oxygen used to power the ventilator does NOT mix with the gas mixture that enters the inside portion of the bellows from the flowmeters and vaporizer.

### Ventilator Nomenclature:

Pneumatically Powered  
Time Cycled  
Inspiratory Flow Variable  
Volume Constant  
Square Wave Flow Pattern Only  
Volume Range --0- to 1.5 L  
Pre-set High Pressure Relief Valve  
@ 60 cmH<sub>2</sub>O  
Positive End Expiratory Pressure  
(PEEP)



**1. Power Source:** Air or oxygen delivered to the gas manifold at 40-70 PSI, 50 PSI Optimal.

**CAUTION:** If Oxygen is the desired gas pressure source, ensure that the Gas Power Toggle Switch (top left on "L" frame) is in the "High Pressure" position.



**NOTE:** Use of the Air Compressor is the preferred ventilator gas power source in order to conserve cylinder oxygen sources.

**NOTE:** When powering up the air compressor, turn the pressure to zero, then adjust to read 50 PSI on the pressure gauge.



## 2. Controls:

- Inspiratory Flow-Governs the gas flow rate per unit of time during the operator selected Inspiratory Time.
- Inspiratory Time-Governs the actual Inspiratory Phase Time as selected by the operator.
- Expiratory Time/BPM-Governs the Expiratory Time and/or Breaths Per Minute (dual scale label). This is the time that the ventilator is not providing gas flow.
- Inspiratory to Expiratory Ratios (I:E) are the result of the settings of Inspiratory Time and Expiratory Time. Example; Insp. Time of 1 second and Expiratory Time of 3 seconds results in an I:E of 1:3.



### 3. Ventilator Gas Delivery:



- A. Close the Pressure Relief Valve located on the Top of the Bag/Vent Switch.
- B. Place a 1 liter reservoir bag on the patient end of the Patient Tubing Circuit.
- C. Turn the Bag/Vent Switch to "VENT" position.
- D. Allow the Bellows to completely fill.
- E. Turn the Inspiratory Flow Control Knob clock-wise until the control knob stops. Rotate the knob counter-clockwise to the .80 LPS position.
- F. Adjust the Inspiratory Time Control Knob to read approximately 1.0 seconds.
- G. Adjust the Expiratory Time/BPM Control Knob to position desired.
- H. Ensure that the bellows is full and adjust with gas from the Flowmeters and/or Flush Button if necessary.
- I. Turn the Ventilator Gas Power Switch to either Air or O<sub>2</sub>.
- J. Allow the ventilator to cycle at least twice.
- K. During the Inspiratory Phase of each cycle, observe the depression level of the bellows.
- L. Adjust the Inspiratory Flow and/or Inspiratory Time Control(s) to make the bellows depress to the desired approximate Tidal Volume.



- M. Re-adjust the three controls until the Operator is satisfied with the settings and volume delivery.
- N. Adjust the Pressure Relief Valve to a slightly open position.



**NOTE:** After removing the reservoir bag and attaching the Patient Tubing Circuit to the Patients airway, check the bellows again for complete filling and completely fill the bellows using the Flush Button, if necessary.

- O. Observe the Airway Pressure Gauge and ensure that expected Inspiratory Pressure is being generated.



- P. Check the Tidal Volume with a spirometer and adjust the ventilator controls if necessary.



- Q. Observe other monitoring devices (if available) for accuracy of respiratory and vaporizer function and adjust controls as needed.

**3. PEEP:** If PEEP is desired, attach the PEEP valve between the expiratory limb of the breathing circuit and the 22 mm expired gas port on the King Systems KAB-9 (refillable) or KAB-1 (pre-filled/disposable) and set to approximate PEEP value desired by observing the Patient Airway Pressure Gauge; adjust as necessary.

**WARNING:** When a PEEP valve is utilized, the airway pressure line connector **MUST** be attached to adapter on top of the PEEP valve. If the airway pressure is measured at another point, during PEEP, pressure may not be properly measured.



#### 4. End of Mechanical Ventilation Procedure:

- Turn the Ventilator Gas Power Switch to off Position.
- Turn the Bag/Vent Switch to "Bag" and allow the patient to breathe spontaneously or "bag" the tidal volume.



#### POST-USE CHECKLIST

- Turn off all inlet gas pipeline and cylinder supplies.
- Turn off the vaporizer and completely empty the fluid chamber.
- Remove all patient-contact tubing and fittings.
- Turn off ventilation and physiologic monitors.
- Turn off the back-up oxygen cylinder.

## CLEANING AND DISINFECTION

---

### Cleaning:

The Magellan-2200 may have the exterior of the device and its external components, cleaned with a mild solution of soap and water, then thoroughly dried off.

### Disinfection:

The Magellan-2200 may have the entire exterior of the device and its exterior components, disinfected with a mild, hospital grade disinfectant solution such as CaviCide. Follow the disinfectant manufacturers directions for use.

### Steam Sterilization:

The following components may be autoclaved at a temperature of 121 degrees C for fifteen minutes:

1. Tubing and connectors from the common gas outlet to the absorber inlet port.
2. Tubing and connectors from the air and oxygen flowmeters to the vaporizer port.
3. Tubing and connectors from the outlet port of the vaporizer to the common gas outlet.
4. Tubing from the ventilator to the bellows, bag/vent switch to the bellows and from the CO2 absorber to bag/vent switch support arm
5. Tubing and connector for the scavenger system.
6. Oxygen sensor "tee" mount.
7. Bag/Vent switch assembly and support arm.

### Bellows:

1. The latex-free rubber bellows may be cleaned, disinfected and sterilized as stated above.

### Vaporizer:

1. The process of filling and emptying the vaporizer with agent will clean the internal passageways of the vaporizer filler block satisfactorily.
2. The exterior of the vaporizer should be kept clean and dust free with a dry cloth, or, if necessary, use proprietary cold sterilized wipes or cloths and dry thoroughly.

### CO2 Absorber Canister (refillable version)

1. The King Systems KAB-9 refillable absorber may be autoclaved 40 times then should be replaced.

## MINOR MAINTENANCE RECOMMENDATIONS

---

**Purpose:** To ensure that the Magellan-2200 anesthesia machine is in proper operating condition.

**Scope of Recommendation:** These recommendations are for routine maintenance. Annual or other maintenance procedures are contained in the Magellan-2200 Service Manual.

### Recommendations:

1. Perform a Pre-Use Check according to the Pre-Use Checklist.
2. Check all monitoring devices according to the manufacturers recommendations.
3. Ensure that the Oxygen sensor can be calibrated properly. If the sensor does not calibrate, replace.

### Tools Needed for All Maintenance:

1. 1-16" Allen Wrench
2. Screwdriver, regular head
3. Small, adjustable wrench

## PROBLEM SOLVING GUIDE

### PROBLEM

**Low O2 Pressure Alarm Activates**

**Soda Lime in absorber canister changes color from white to blue**

**Reservoir Bag does not inflate**

**Oxygen Sensor does not calibrate**

**Ventilator does not cycle**

### SOLUTION

- Check main pipeline O2 gas supply and the emergency O2 backup cylinder by observing the gas pressure gauges. Resolve by ensuring adequate pipeline and cylinder O2 supplies are adequate and are attached to anesthesia machine.

- Replace soda lime in canister

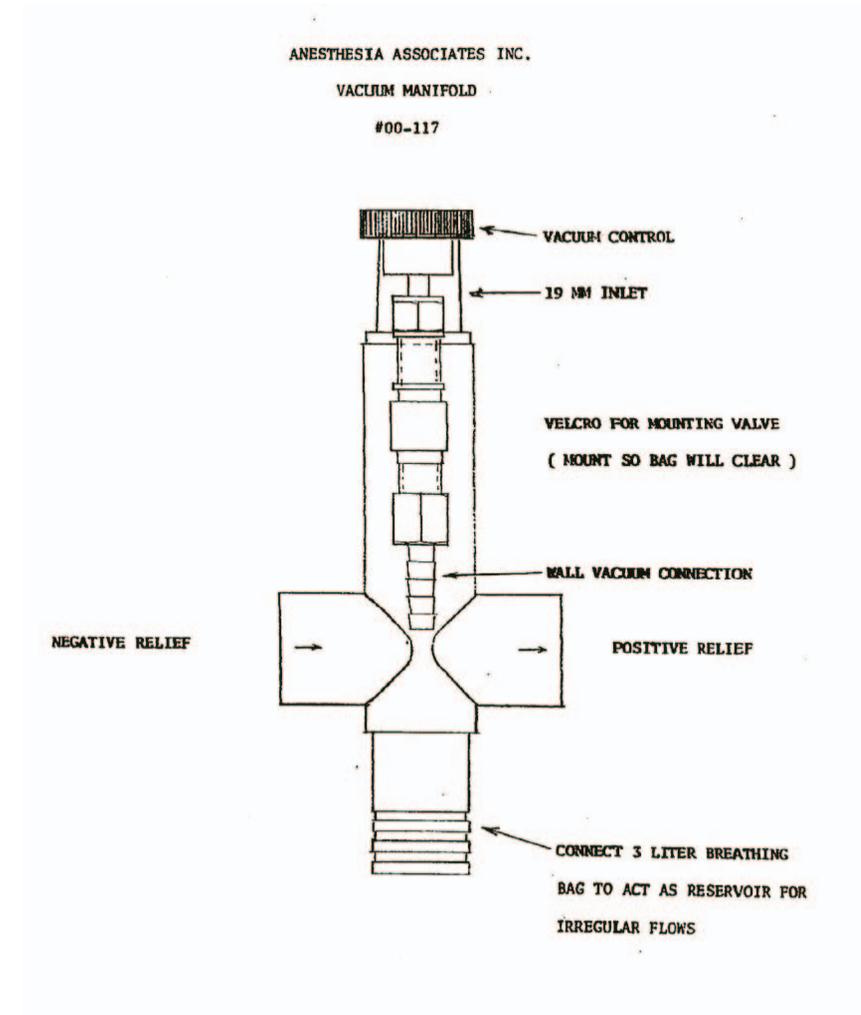
- Check Bag/Vent Switch for "vent" position
- Check PRV Control Knob for "closed" position

- Check entire tubing circuit for leaks

- Check O2 supply and O2 Pressure Gauge to ensure O2 is available
- Check O2 sensor to ensure proper seating in "tee" adapter
- Check that opposing (Air or O2) flowmeter is OFF

- Check Air or O2 gas power supply for 40-70 PSI on pressure gauges
- Check Vent Power Selector Switch in Air or O2 position
- Check expiratory time control to ensure settings
- If O2 is selected for power, check O2 Power Selector Toggle Switch and ensure it is in the High Pressure Position

## VACUUM MANIFOLD



## CYLINDER GAS TABLE

---

### Cylinder Gas Formula

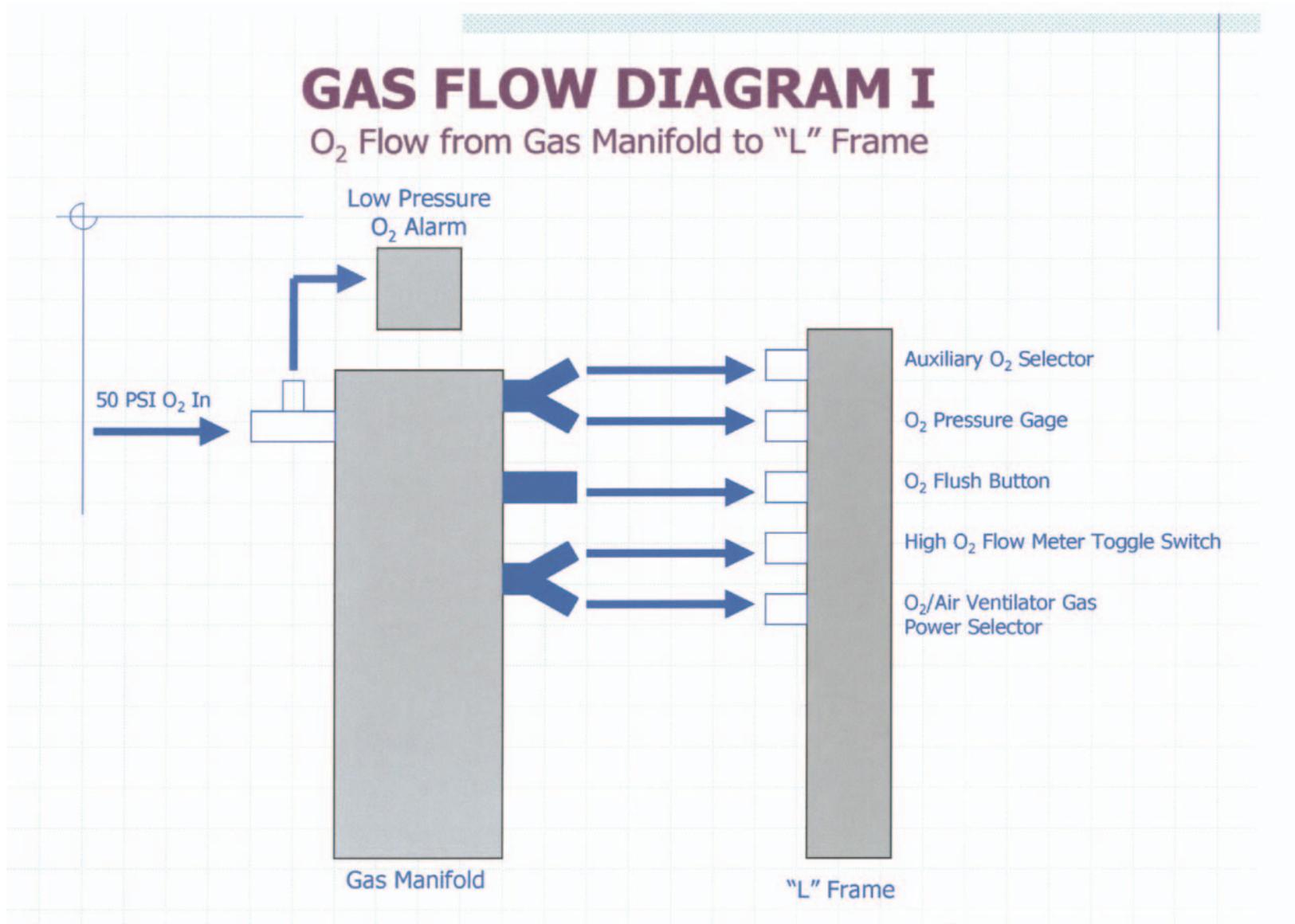
Gas Volume of Cylinders	C	E	G	H	(Size)
1. Pressure 2200 psi	12.7	22	187	244	
2. Factors, duration of flow Air/O <sub>2</sub>	0.6	0.28	2.41	3.14	
3. Formula, duration of flow:	Flow (minutes) = $\frac{\text{Cylinder press.} \times \text{factor}}{\text{liter flow}}$				

Example: "E" Cylinder

$$\frac{2200 \times 0.28}{8} = \frac{616}{8} = 77 \text{ minutes}$$

$$\frac{77}{60} = 1.28 \text{ Hours}$$

O<sub>2</sub> Flow from Gas Manifold to "L" Frame

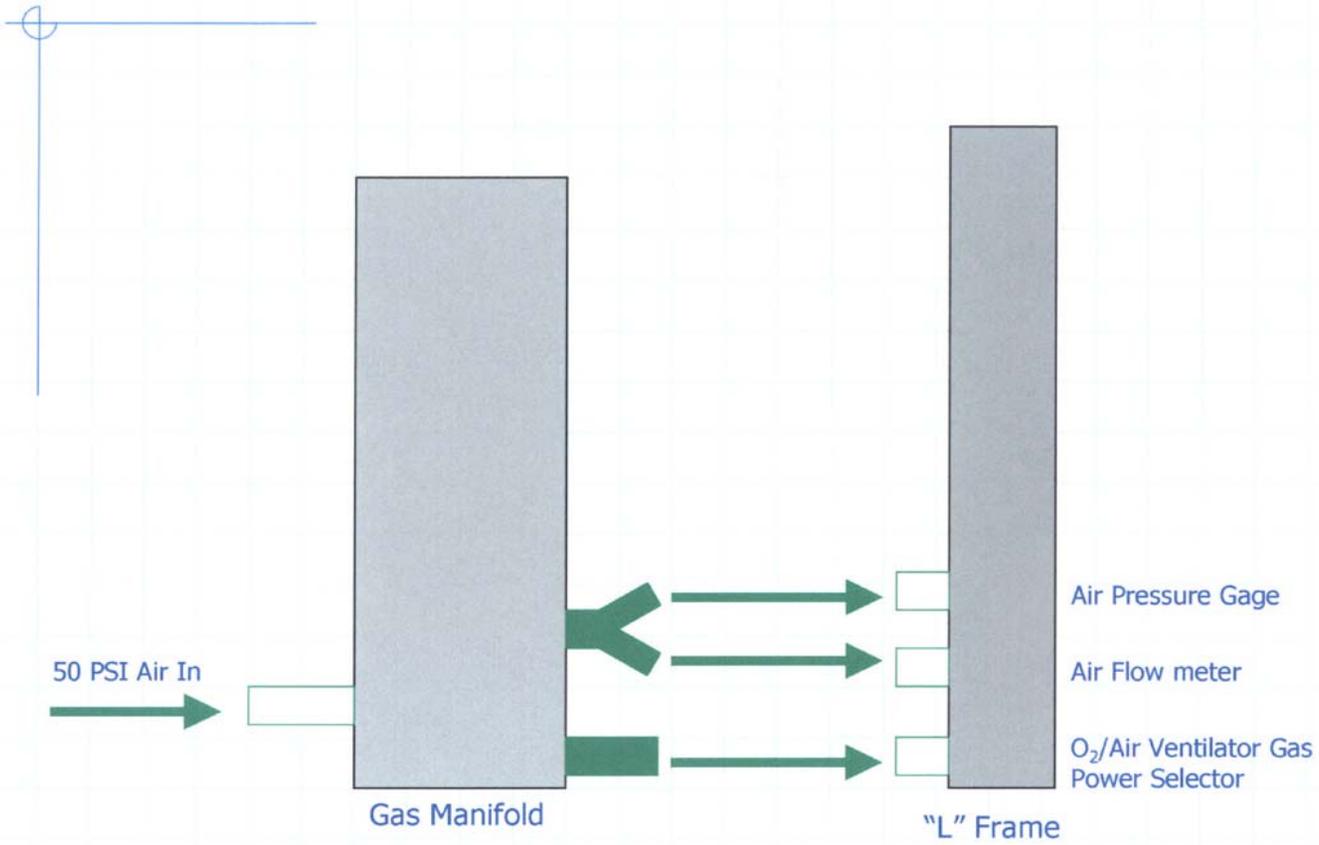


**GAS FLOW DIAGRAM II**

Air Flow from Gas Mnifold to "L" Frame

# GAS FLOW DIAGRAM II

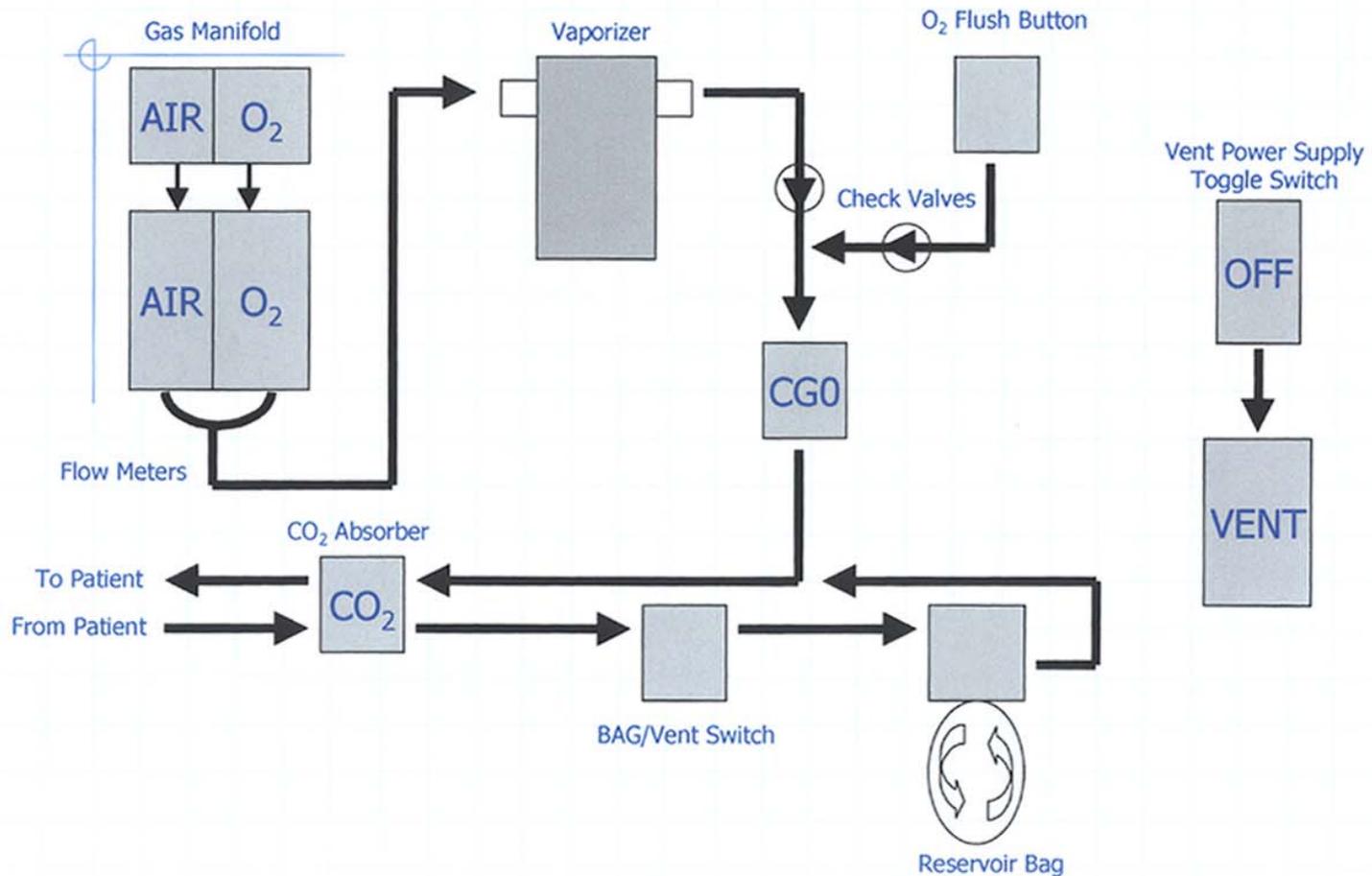
Air Flow from Gas Manifold to "L" Frame



Air/O<sub>2</sub> From Flow Meters to Common Gas Outlet (CGO)  
Bag/Vent Switch on "BAG" Position

# GAS FLOW DIAGRAM III

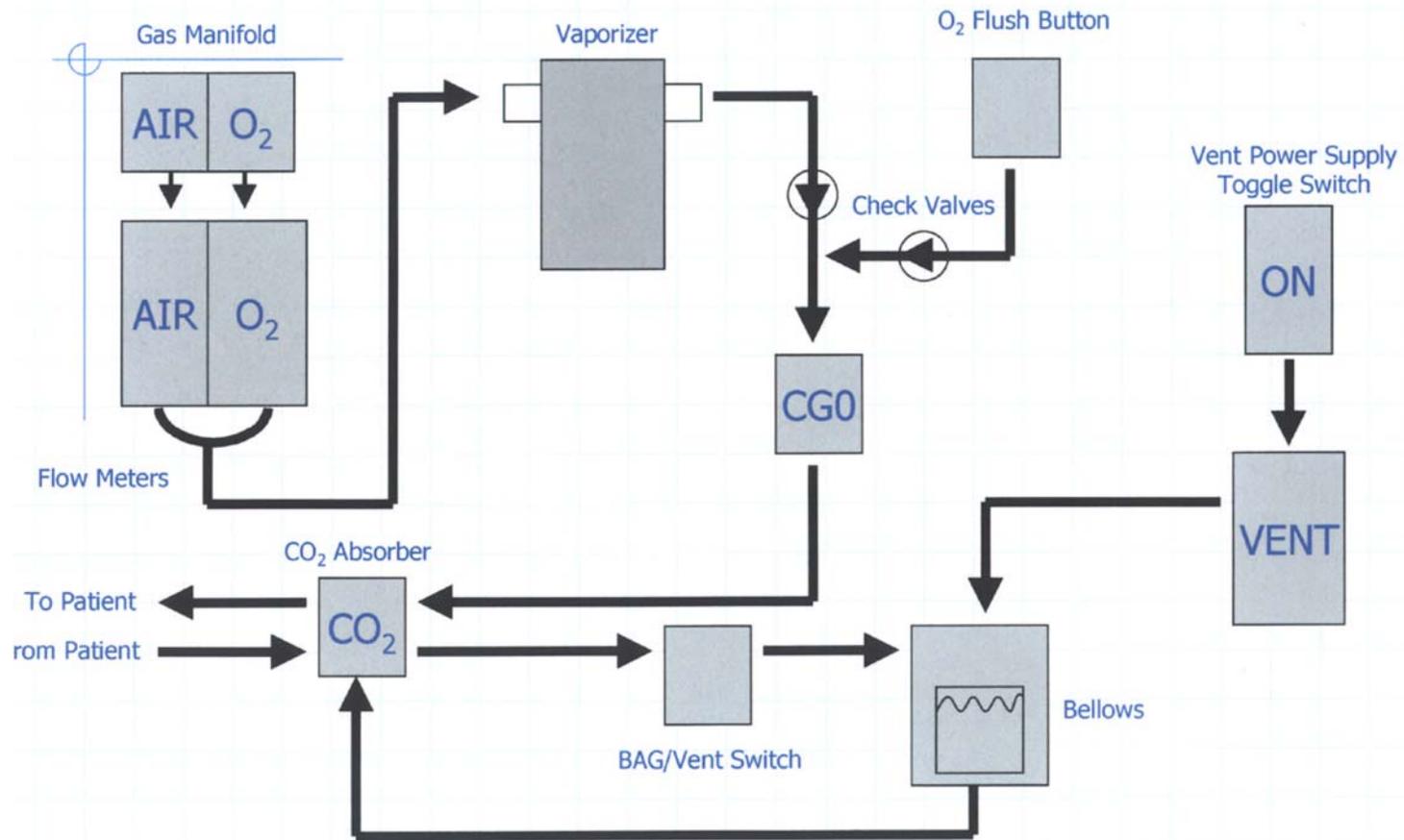
Air/O<sub>2</sub> From Flow Meters to Common Gas Outlet (CGO)  
BAG/Vent Switch on "BAG" Position



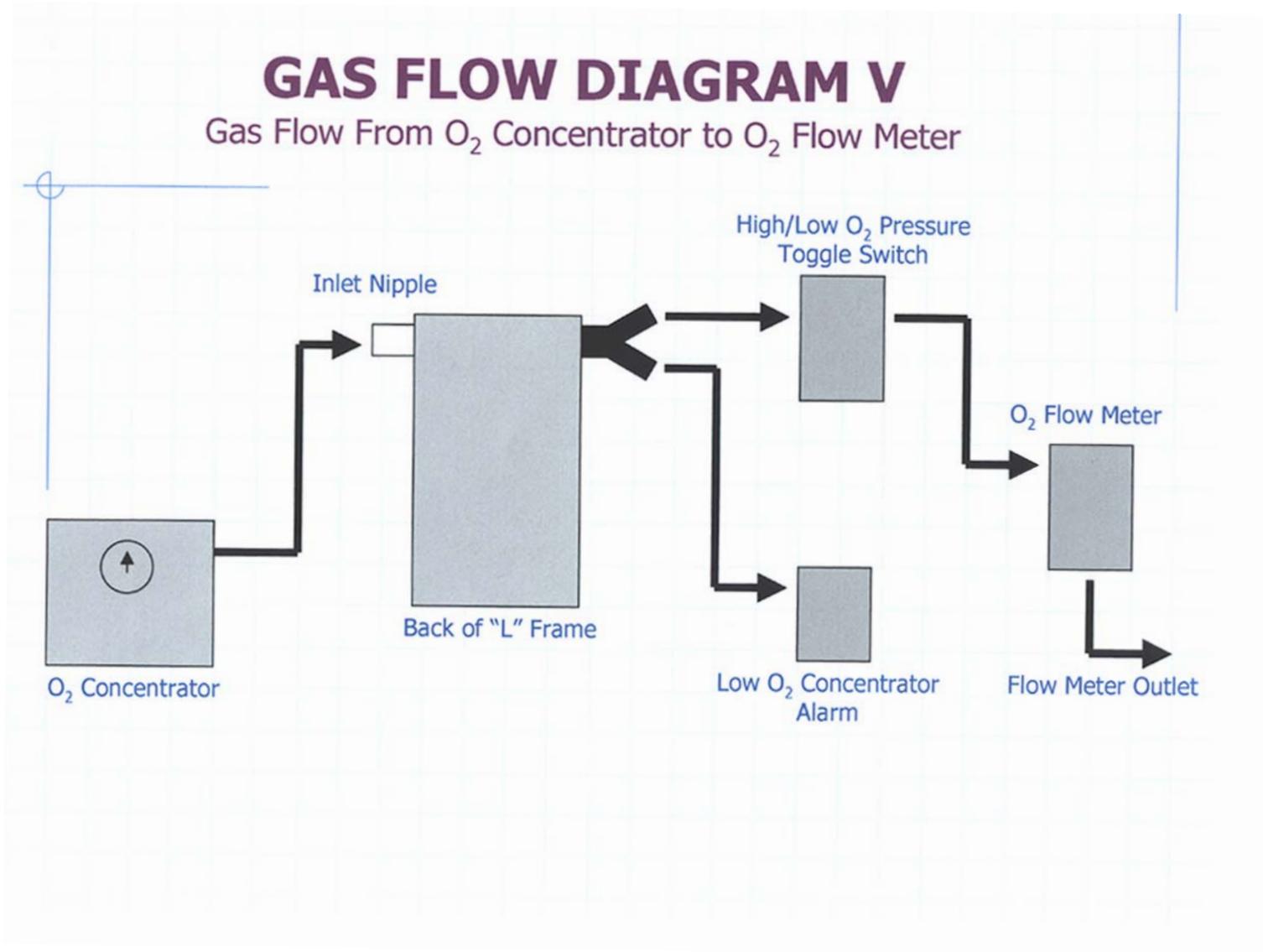
Air/O<sub>2</sub> From Flow Meters to Common Gas Outlet (CGO)  
Bag/Vent Switch on "Vent" Position

# GAS FLOW DIAGRAM IV

Air/O<sub>2</sub> From Flow Meters to Common Gas Outlet (CGO)  
BAG/Vent Switch on "Vent" Position



Gas Flow From O<sub>2</sub> Concentrator to O<sub>2</sub> Flow Meter



## ITEMS FURNISHED WITH DELIVERY OF EACH MACHINE

Effective Date: March, 2004

DESCRIPTION	PART NO.
__ One each oxygen pressure reducing regulator, DISS	P/N 26.1
__ One each oxygen pressure reducing regulator, Yoke-type	P/N 26.0
__ One each Air pressure reducing regulator, DISS	P/N 26.2
__ One each oxygen high pressure hose, 15"	P/N 26.4
__ One each oxygen high pressure hose, 24"	P/N 26.3
__ One each Air high pressure hose, 15"	P/N 26.5
__ Bag/vent switch mounted on support arm w/mounting knob & screw	P/N 14.0 and 14.2
__ CO <sub>2</sub> absorber support arm with Mounting Knob	P/N 15.0 and 14.2
__ One each King Systems CO <sub>2</sub> absorber with adapters and reservoir bag	P/N A-116
__ One each King Systems Patient Tubing Circuit	P/N A-117
__ One each hose, b/v switch to bellows, color coded blue	P/N 20.11
__ One each hose, b/v switch to CO <sub>2</sub> absorber, color coded green	P/N 20.0
__ One each hose, ventilator outlet to bellows inlet, with 17mm adapter, color coded red	P/N 20.2 and 20.3
__ One each low pressure bulb with Comon Gas Outlet adaptor	P/N 16.0
__ One each Pre-Use Checklist	P/N 25.3
__ One each Set-Up Instructions Card	P/N 25.2
__ One each Penlon vaporizer manual	P/N 25.1
__ One each CD with Operators Manual and Service Manual	P/N 25.0
__ One each Mapleson "A" Jackson-Reese CGO adaper	P/N A-107
__ One each Waste Gas Scavenger	P/N 16.0
__ One each Anesthesia Machine Carrying Case	P/N A-103
__ One each Carrying Case to Machine Securing Bolt	P/N A-114.1
__ One each Cylinder Holder for Carrying Case	P/N A-103
__ One each Air Compressor with Carrying Case	P/N A-100
__ One each Water Trap for Air Compressor	P/N A-102
__ One each Oxygen Monitor, Mounting Clamp and Plastic Sensor Adapter	P/N A-105 and A-106
__ One each PEEP Valve and Accessory Tubing with Connector	P/N A-110
__ One each Military Accessory Bundle	P/N A-109
__ One each Respirometer with Adapters	P/N A-111

## ADDITIONAL ITEMS NEEDED FOR OPERATION AND MAINTENANCE

**Note:** "Military specified" means military provided part or component  
 "Part #" means can be obtained from Oceanic Medical Products, Inc.

DESCRIPTION	PART #
<b>1. Maintenance</b>	
__ Annual Service Kit	A-108
__ One each regular screwdriver	Military specified
__ One each 1/16" Allen's wrench	Military specified
__ One each Cresent wrench	Military specified
__ One each rubber test lung, 1 liter capacity	A-118
__ One each mechanical test lung or electrical-mechanical test lung	Military specified
__ Patient tubing circuit for annesthesia machines, any brand	Military specified
__ Small tube of Krytox or any brand of oil-free lubricant	A-119
<b>2. Operations</b>	
__ Spare, reusable King Systems CO <sub>2</sub> absorber, refillable	KAB-009
__ Case(s), disposable King Systems CO <sub>2</sub> absorber, pre-filled	KAB-008
__ Spare, oxygen sensor for P/N A-105 Oxygen Monitor	A-105-A
__ Additional anesthetic vaporizer, agent specific	24.0
__ Aluminum mobile trolley for CSH and general hospital use	A-104
__ Soda lime in container, any capacity	Military specified
__ Oxygen cylinders, "E" or "D" size	Military specified

## ARMY BILL OF MATERIALS

DATE INITIATED: JAN. 4, 2002

PART #	DESCRIPTION
1.0	L - Frame
2.0	Flowmeter Pair
2.1	1/8-inch Hose Barb
2.2	Male Connector
2.3	Knob, Green, Fluted
2.4	Flowmeter Guard Bar
3.0	CGO Coupling Body
3.1	CCO Coupling Insert
4.1	O2 Flush Button
4.2	Acutator
2.1	1/8-inch Hose Barb
4.3	Elbow
5.0	Vent On/Off Switch
4.3	Male Elbow
6.0	High/Low O2 Selector Toggle Switch
2.2	Male Connector
4.3	Male Elbow
7.0	Air Press Gauge
7.1	Female Coupling
4.3	Elbow
8.0	O2 Press Gauge
9.0	
7.1	Female Coupling
4.3	Elbow
9.0	O2 Auxiliary Flow Selector
4.3	Elbow
<b>10.0</b>	<b>Main Body Frame</b>
10.1	Rods, Steel/Brass
10.2	1/4 - 20 Rod Screws
10.3	Dowel Pin Absorber Mount
10.2	1/4 - 20 Rod Screws
2.1	1/8-inch Hose Barb
7.1	Female Coupling
7.2	Y-Connector

## ARMY BILL OF MATERIALS - CONT'D.

PART NO.	DESCRIPTION
<b>11.0</b>	<b>Gas Manifold</b>
11.1	Air DISS Adapter
11.2	Metal Spacer-Air
11.3	Bronze Filter
11.4	O2 DISS Adapter
11.5	Metal Spacer-O2
11.3	Bronze Filter
2.2	Male Connector
7.2	Y Connector
<b>12.0</b>	<b>Ventilator Container</b>
12.1	Container Front Plate
12.2	Container Back Plate
12.2.1	Container Top Plate
12.3	Plastic Valve Spacer
12.4	Alum Spacer Posts
12.5	8/32 x 1 1/4 Brass Screws
12.6	Exhalation Valve
12.7	Plastic Exhalation Valve Tee
12.8	Pressure Relief Valve
12.8.1	Plastic Adapter
12.8.2	Tee Adapter
12.8.3	Hose Nipple Adapter
12.9	Acrylic Block/Fittings
12.5	8/32 x 1 1/4 Brass Screws
12.10	Timing Valves, Inspiratory and Expiratory Time
12.11	Air Volume Tank
12.12	Street Elbow
12.13	Nipple
12.14	1/8" Countersink Plug
12.14	Flow Accelerator Components "A" / "B"
12.16	Inspiratory Flow Valve 1 1/32"
12.16-A	Insp Flow Valve Nut
12.17	Insp Flow Valve Bracket
12.18	8-32 Brass Nuts

**ARMY BILL OF MATERIALS – CONT'D.**

PART NO.	DESCRIPTION
12.19	Pressure Gauge, Dual Scale, Non-Magnetic
12.20	Pressure Gauge Bracket
12.18	8-32 Brass Nuts
12.21	5/40 x π Brass Screw
12.22	Aluminum Exhalation Valve Bracket
12.23	Bracket 8-32 x π Screws
12.24	Reduced Branch
12.25	Cross Union "x"
12.26	Urethane Tubing, 1/8" ID, 9 ft.
12.27	6-32 x π Brass Screws
12.28	8-32 x π Brass Screws
12.29	6-32 x 1/8 Brass Screws
12.30	Flow Control Locking Knob
12.31	Time Valves Locking Knobs
<b>13.0</b>	<b>Bellows Complete</b>
14.0	Bag/Vent Switch
14.1	B/V Switch Arm
14.1.1	Coupling Body with one way shutoff valve
14.1.2	Hose Barb
14.2	1/8 x □ Holding Knob
<b>15.0</b>	<b>CO2 Absorber Arm</b>
14.2	1/8 x □ Holding Knob
<b>16.0</b>	<b>Scavenger, Waste Gas</b>
<b>17.0</b>	<b>Bulb, Squeeze/Low Presssure Testing</b>
3.1	CGO Adapter for Bulb
<b>18.0</b>	<b>Alarm, Hi Pressure Box</b>
18.1	Electric Switch
18.2	Switch Cover
18.3	Alarm Buzzer
18.4	Alarm Plunger
18.5	9 Volt Battery
18.6	1/8 x 10-32 fitting

**ARMY BILL OF MATERIALS – CONT'D.**

PART NO.	DESCRIPTION
18.7	On Off Switch
<b>19.0</b>	<b>Alarm, Lo Pressure Box</b>
19.1	Low Pressure Switch
18.3	Alarm Buzzer
18.5	9 Volt Battery
18.6	1/8 x 10-32 fitting
18.7	On/Off Switch
7.1	Extender
<b>20.0</b>	<b>Tubing, Color Green</b>
20.1	Tubing, Color Blue
20.2	Tubing, Color Red
20.3	Adapter, from Red Tubing to Bellows 17mm Inlet, Red
<b>21.0</b>	<b>Label, "L" Frame</b>
21.1	Label, Vaporizer Warning
21.3	Label, Ventilator, Front Panel
21.4	Label, Ventilator, Side Panel
21.5	Label, Magellan 2200, Large Oval
21.5.1	Label, Magellan 2200, Small Oval for Trolley
21.6	Label, Air Flowmeter Knob
21.7	Label, O2 Flowmeter Knob
21.8	Label, Pressure Relief Valve/Scavenger Port Knob
21.9	Label, O2 Concentrator Inlet
21.10	Label, Fed Law Restricts Use
21.11	Label, Low Pressure, from O2 Concentrator, O2 Alarm
21.12	Label, Hi Pressure O2 Alarm
21.13	Label, Front Manifold
21.14	Label, O2 Out, 2"
21.15	Label, O2 In ≤"
21.16	Label, Air Out ≤"
21.17	Label, To Absorber/Pressure Gauge
21.18	Label, Serial #
21.19	Label, Factory Address

**ARMY BILL OF MATERIALS – CONT'D.**

PART NO.	DESCRIPTION
21.20	Label, To Scavenger
21.21	Label, To Bellows
21.22	Label, O2 Pressure
<b>CARRYING CASE INSERT LABELS</b>	
21.23	Label, Water Trap
21.26	Label, Regulator
21.27	Label, Scavenger
21.28	Label, Respirometer
21.29	Label, Absorber Canister
21.30	Label, Oxygen Monitor
21.31	Label, Regulator/Yoke
21.32	Label, Flow Arrow for Auxiliary Flow Selector
21.33	Label, Caution Energizing Ventilator
21.34	Label, Oceanic Square
21.35	Label, O2/Air Inlet Locations for Gas Manifold
21.36	Label, Caution, for Air Compressor Use
<b>22.0</b>	<b>Tubing Set, from FM's</b>
22.1	Tubing, from Vaporizer
22.2	Tubing, from CGO
22.3	Valve, One Way
22.4	Tee Connector
<b>23.0</b>	<b>Vaporizer Retainer</b>
23.1	Retainer Holding Knobs
24.0	Vaporizer
24.1	Vaporizer End Male end
24.2	Vaporizer End Female
24.3	Felt Pads
24.4	Key, Agent Specific
24.5	Holding Knobs
25.0	Manual, Oper/Serv CD

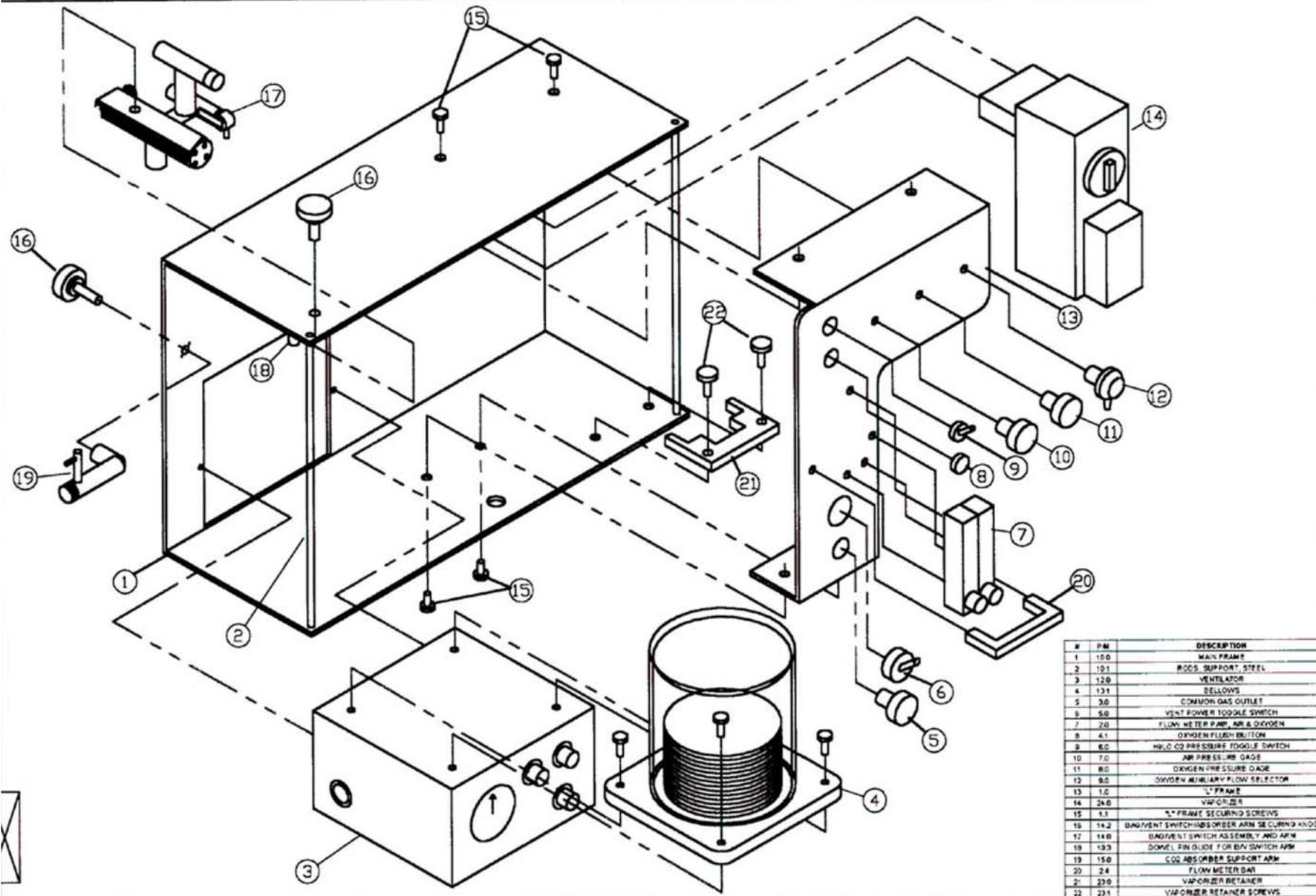
**ARMY BILL OF MATERIALS – CONT'D.**

PART NO.	DESCRIPTION
25.1	Penlon Vaporizer Manual
25.2	Card, Set-up Machine
25.3	Card, Pre-Use Checklist
<b>26.0</b>	<b>O2 Regulator, yoke</b>
26.1	O2 Regulator, DISS
26.2	Air Regulator, DISS
26.3	Oxygen Hose, 24"
26.4	Oxygen Hose, 15'
26.5	Air Hose, 15'
<b>Accessories ** indicates included in military delivery of goods</b>	
A-100 **	A/C Complete
A-101	Air Compressor
A-102 **	Water Trap, for Air Compressor
A-103	AC Carrying Case
A-104	Aluminum Trolley, for General Hospital Use
A-105 **	Oxygen Monitor
A-105-A **	Oxygen Sensor
A-106 **	Oxygen Tee Adapter for Oxygen Sensor
A-107 **	Mapleson Adaptor to fit into CGO
A-108	Annual Service Kit Bellows, latex free Tubing kit w/valves (for Flowmeters to vaporizer/vaporizer to CGO/Flush to CGO/CGO to CO2 canister with metal end caps for vaporizer) Manifold filters (3) and (3) metal spacers Tweezers for removing filters and spacers 1/16" Allen's wrench Squeeze bulb with CGO adapter Tubing, color coded (3) and red adapter Instructions for Service Sheet Krytox lubricant, tube, 1 oz Washer, Press Red Regulator, Yoke, (2 ea)

**ARMY BILL OF MATERIALS – CONT'D.**

---

PART NO.	DESCRIPTION
A-109 **	ReSposable Bundle Surgical masks, size 0-5, inclusive (6 total masks) Reusable mask hook rings (2) Breathing tube 16mm x 72" Breathing bag 1.0 L silicone (1) Breathing bag 3.0 L silicone (1) Elbow, polysulfone, white cap Wye, fixed, autoclavable Tee, fixed, autoclavable Adapter, autoclavable, 22 ID x 15 ID/22 OD Silicone breathing tube, 16mm x 12" Headstrap Resusable CO2 Absorber Connector - KAB 1930 D Reusable Scavenging Tubing - 3 pieces, each 12" long 3.0 L breathing bag
A-110 **	PEEP Valve
A-111 **	Respirometer, Mechanical, Hand-Held
A-112	Rubber bellows only
A-113 **	Scavenger Tubing Kit
A-114 **	Machine Carrying Case
A-114.1 **	Mounting Bolt, Carry CS
A-115 **	Cylinder Holder, Carry CS
A-116 **	King Systems CO2 Refillable Absorber w/out APL
A-117 **	King Systems Patient Tubing Circuit
A-118	Rubber Test Lung
A-119	Krytox lube, 1 oz Tube



#	PA#	DESCRIPTION
1	100	MAIN FRAME
2	101	RODS SUPPORT STEEL
3	120	VENTILATOR
4	131	BELLOWS
5	30	COMMON GAS OUTLET
6	50	VENT POWER TOGGLE SWITCH
7	20	FLOW METER PUMP, AIR & OXYGEN
8	41	OXYGEN FLUSH BUTTON
9	60	HALO O2 PRESSURE TOGGLE SWITCH
10	70	AIR PRESSURE GAUGE
11	80	OXYGEN PRESSURE GAUGE
12	90	OXYGEN AUXILIARY FLOW SELECTOR
13	10	"L" FRAME
14	240	VAPORIZER
15	13	"L" FRAME SECURING SCREWS
16	142	BAG/VENT SWITCHES ORDER ARM SECURING KNOB
17	140	BAG/VENT SWITCH ASSEMBLY AND ARM
18	130	DOME PIN GUIDE FOR BIN SWITCH ARM
19	150	CO2 ABSORBER SUPPORT ARM
20	24	FLOW METER BAR
21	230	VAPORIZER RETAINER
22	231	VAPORIZER RETAINER SCREWS

Revisions:  
1.0

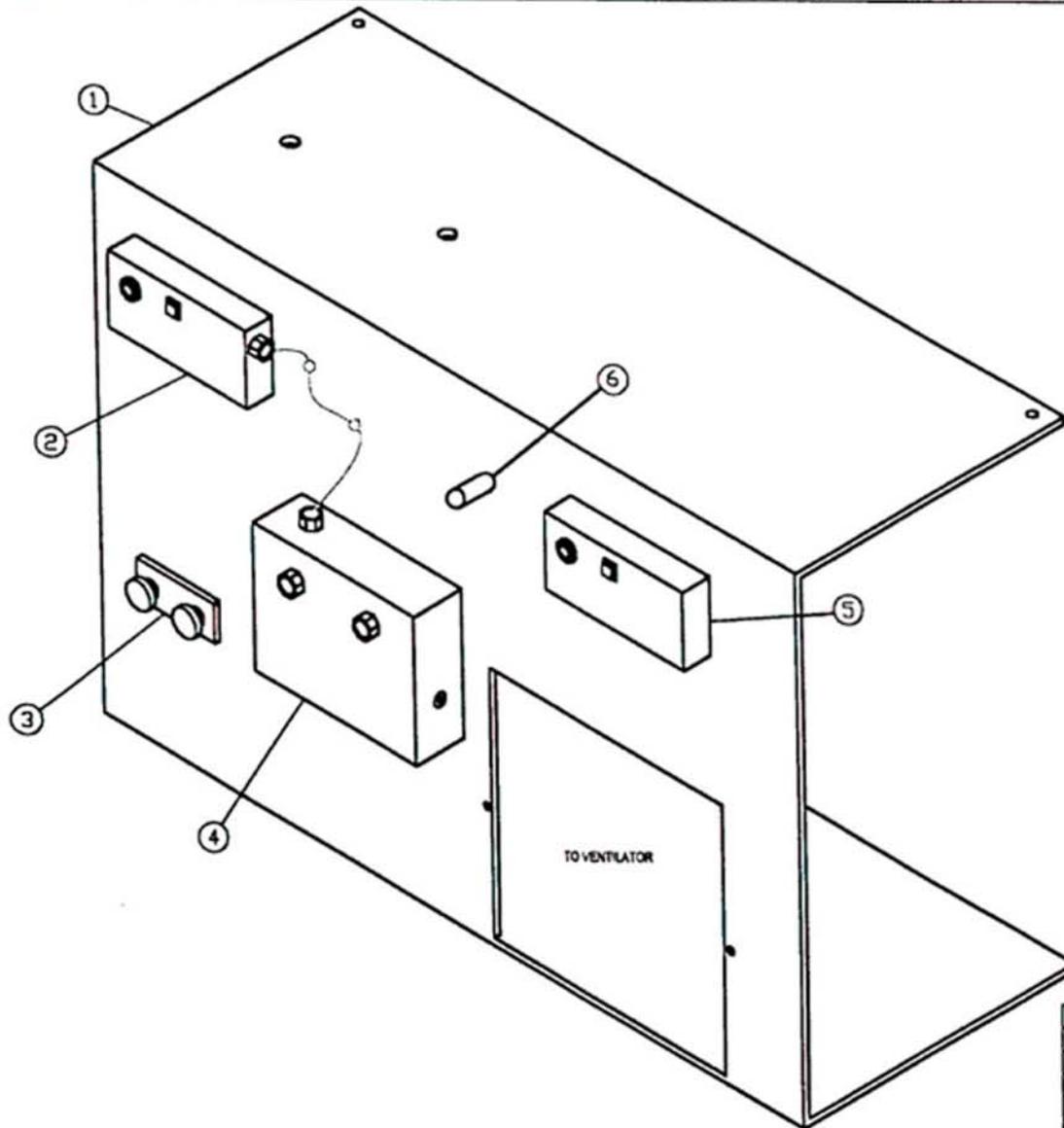
Project: Magellan 2200  
Anesthesia Machine

Oceanic Medical Products, Inc.  
8005 Shannon Industrial Park Lane  
Atchison, Ks 66002  
(913) 874-2000



Date  
Mar, 2004  
Draftman:  
J. Bunck

Sheet No.:  
1 - 2



#	P/N	DESCRIPTION
1	10.0	MAIN BODY FRAME
2	18.0	MAIN LOW PRESSURE OXYGEN ALARM
3	24.5	VAPORIZER HOLDING SPACER & SECURING KNOBS
4	11.0	GAS MANIFOLD, MAIN AIR & OXYGEN
5	19.0	O2 CONCENTRATOR LOW PRESSURE ALARM
6	3.4	SCREW

REVISED  
 10

**Project: Magellan 2200**  
 Anesthesia Machine

Ozark Medical Products, Inc.  
 8005 Sherman Industrial Park Lane  
 Auburn, AL 36802  
 (913) 874-2000

Date  
 Mar, 2004  
 Drafter  
 J. Bunk

Sheet No.  
 2 - 2