



# **OXYGEN CONCENTRATOR TECHNICAL SERVICE MANUAL**



**Model Numbers JB0160-010B, JB0160-010,  
JB0160-010B-220, JB0160-010-220  
and  
JB0160-015B, JB0160-015, JB0160-015B-220,  
JB0160-015-220 with O<sub>2</sub> Sensor**

**Important: Do not service this concentrator without  
first reading and understanding this manual!**

# CONTENTS

|    |                                               |    |
|----|-----------------------------------------------|----|
| 1  | INTRODUCTION .....                            | 3  |
| 2  | SPECIFICATIONS .....                          | 5  |
| 3  | SAFETY .....                                  | 6  |
| 4  | HANDLING .....                                | 9  |
| 5  | BILL OF MATERIALS AND REPLACEMENT PARTS ..... | 10 |
| 6  | OPERATION .....                               | 11 |
| 7  | USER MAINTENANCE .....                        | 16 |
| 8  | EQUIPMENT PROVIDER MAINTENANCE .....          | 18 |
| 9  | SERVICE.....                                  | 20 |
| 10 | TROUBLESHOOTING GUIDE .....                   | 28 |
| 11 | LIMITED WARRANTY .....                        | 30 |
| 12 | EXPLODED DRAWINGS.....                        | 32 |
| 13 | INDEX.....                                    | 34 |

 **Federal Law (USA) restricts this device to sale by or on the order of a physician. This product should not be used unless the operator has been instructed by a qualified health care professional.**

All specifications and product configurations are subject to change without notification.

**⚠ WARNING: Users who require continuous oxygenation must plan for alternate reserve sources of power and oxygen in the event of a failure or loss of power and oxygen. This device is to be used ONLY as an oxygen supplement device and is NOT intended to be a life-supporting or life-sustaining device.**

## 1 INTRODUCTION

The John Bunn O<sub>2</sub> Premier oxygen concentrator is intended for use as an oxygen supplement device in a home or care facility. Use the concentrator only as prescribed by a physician.

The concentrator separates oxygen from ambient air, providing the user a high concentration of oxygen. Oxygen concentrator usage is therapeutically equivalent to other types of oxygen delivery systems.

### Characteristics

- Reliable, safe, complete plastic outer shell.
- Display screen shows total elapsed working hours.
- Pressure safety valve helps ensure operating pressure.
- Power loss alarm function.
- High and low pressure alarm function.
- Heat protection to ensure the safety of the compressor and concentrator.
- JB0160-015B, JB0160-015, JB0160-015B-220 and JB0160-015-220 only:
  - yellow fault light illuminates when 71% < O<sub>2</sub> concentration < 82%; system works
  - red warning light illuminates when O<sub>2</sub> concentration < 71%; system shuts off

### Equipment Provider Responsibility

All equipment providers must assume responsibility for handling, operational check out, patient instruction, and provider maintenance.

It is the responsibility of the equipment provider to perform the following:

- Perform a visual inspection of each unit upon receipt. Report any damage immediately to Graham Field or the freight company (see Section 4, Handling, for Graham-Field's freight policy).
- Check operation of each unit before delivery to patient. After running the unit for 30 minutes, check operation, alarm system, and oxygen purity, as described in this manual.
- This device delivers a prescribed drug. Ensure that patient has obtained a prescription from a duly authorized physician. This unit should not be used as a life supporting device. A back-up source of oxygen should be available.
- Using the user manual as a guide, instruct the patient in the use of this device. **Be sure to deliver a copy of the User Manual at the same time this device is installed and review it with the patient.**
- Be sure to post NO SMOKING signage.
- Review general safety precautions regarding the use of oxygen as outlined by the N.F.P.A. and C.G.A.

- Instruct patients to notify their physician and/or equipment provider if they experience any signs of discomfort.
- Instruct patient and/or caregiver how to perform maintenance of the bottom filter and check alarm system operation when turning concentrator on.
- Be available to service a patient at any time. Since the user is instructed not to open the filter or battery access doors, the equipment provider is required to clean/replace the side filters, intake filter, and battery.
- Maintain unit in accordance with user and service manuals.
- Repair components and replace parts as outlined in this manual, using only Graham-Field parts.
- As the equipment provider, you are responsible for the safe use of this device and the understanding the patient has of its application. Reinforce the need to communicate with you or a physician if there is a change in clinical condition.

## **Tool and Supply List**

The following tools and supplies are required to perform service covered in this manual:

*Pressure manometer (Range: 0-30cm/H20)*

*Oxygen Analyzer (Accurate within 2%)*

*DC Voltmeter (Range 0-24VDC)*

*Socket wrench with 7/32" socket*

*M10 open end wrench*

*M13 open end wrench*

*M16 open end wrench*

*M18 open end wrench*

*Flat blade screwdriver*

*Phillips head screwdriver, blade #1*

*Phillips head screwdriver, blade #2*

*Leak detector*

*Cable ties*

*18# shrink wrap*

*60/40 Lead/Tin solder for electronics—DO NOT use acid core (plumbing) solder*

## 2 SPECIFICATIONS

- Flow Range: 1 to 5 LPM
- Oxygen Concentration: 1-4 LPM 94%  $\pm$ 2%  
5 LPM 92%  $\pm$ 2%
- Maximum Outlet Pressure: 6.52 psi  $\pm$  .065 psi (45kPa  $\pm$  4.5kPa)
- Pressure Relief Mechanism Operational at: 36.26 psi  $\pm$  3.63 psi (250kPa  $\pm$  25kPa)
- Altitude: Up to 5,997 feet (1,828 meters) above sea level without degradation of concentration levels. Efficiency of 90% from 5,997 to 13,123 feet (1,828 to 4,000 meters) above sea level.
- Sound Level:  $\leq$  55dB
- Power Supply: JB0160-010B, JB0160-010, JB0160-015B, JB0160-015:  
AC120V $\pm$ 10% (60Hz) (4.6amps)  
JB0160-010B-220, JB0160-010-220, JB0160-015B-220 JB0160-015-220  
AC220V $\pm$ 10% (50Hz) (2.2amps)
- Input Power: 400 Watts Average
- Weight: 57lbs (26kg)
- Dimensions: H 27" x W 18" x D 15"
- Minimum Warm-Up Time Before Use: 30 minutes
- Electrical Classification: II Class B Type
- System: Continuous
- JB0160-015B, JB0160-015, JB0160-015B-220, JB0160-015-220 only:  
yellow fault light illuminates when 71% < O<sub>2</sub> concentration < 82%; system works  
red warning light illuminates when O<sub>2</sub> concentration < 71%; system shuts off

### Normal Operation Conditions

- Temperature range: 41°F to 104°F (5°C to 40°C)
- Relative humidity: 20% to 60%
- Atmospheric pressure: 12.47 psi to 15.37 psi (86kPa to 106kPa)

### 3 SAFETY

The John Bunn O<sub>2</sub> Premier oxygen concentrator is intended for use as an oxygen supplement device in a home or care facility. Use the concentrator only as prescribed by a physician.

#### Important Information

Please note the following special statements, used throughout this manual, and their significance:

*Note: Explanatory information.*

**▲ Damage: Action could result in damage to equipment.**

**⚠ ATTENTION: Action could result in personal injury.**

**⚠ CAUTION: Action could result in electric shock.**

**⚠ WARNING: Action could result in fire and explosion.**

#### Before Installation

**▲ Damage: During transport, always keep the concentrator upright to prevent damage.**

**▲ Damage: Only use stable and safe electrical power sources.**

**▲ Damage: If the electrical power source becomes unstable, discontinue use and find an alternate source.**

**▲ Damage: The oxygen concentrator cabinet contains no serviceable parts! The oxygen concentrator cabinet should ONLY be opened by an authorized equipment provider.**

#### Placement

**⚠ ATTENTION: The oxygen concentrator is intended to be rolled from room to room. Do not place the oxygen concentrator in surroundings where its airflow is obstructed.**

**⚠ ATTENTION: Be certain to place the unit so that all sides are at least 12 inches (30 cm) away from walls, draperies, furniture, or other obstructions. Do not place the unit in a confined area.**

**⚠ ATTENTION: The oxygen concentrator MUST be kept away from heat, fire and excessive water sources and conditions.**

**⚠ ATTENTION: Do not place items on top of the concentrator.**

**⚠ ATTENTION: NEVER block the concentrator's air openings.**

**⚠ ATTENTION: Always place the concentrator on a hard surface. Never place the concentrator on a surface such as bed or couch, where the concentrator may tip or fall.**

**⚠ ATTENTION: Keep the concentrator openings free from lint, hair, etc.**

## Fire Warning & Explosion

**⚠ WARNING: Keep the concentrator away from flammable and explosive areas.**

**⚠ WARNING: To reduce the risk of fire, special care must be taken when using oxygen concentrators. DO NOT SMOKE while using this device. Keep all matches, lighted cigarettes or other sources of ignition out of the room in which this concentrator is located. In public settings or when used in hospital or long-term care environments, prominently display NO SMOKING signs.**

**⚠ WARNING: Textiles and other materials that normally would not easily burn, can ignite and burn with great intensity in oxygen enriched air.**

**⚠ WARNING: A spontaneous and violent ignition may occur if oil, grease or greasy substances come in contact with oxygen under pressure. ALWAYS keep these substances away from the oxygen concentrator and all other oxygen equipment. DO NOT use any lubricants unless recommended by manufacturer.**

**⚠ WARNING: Failure to observe these warnings can result in severe fire, property damage and cause physical injury or DEATH.**

## Maintenance

**⚠ CAUTION: The oxygen concentrator was specifically designed to minimize routine preventive maintenance. Only an authorized equipment provider or factory-trained personnel should perform preventive maintenance or adjustments to the oxygen concentrator.**

## Radio Frequency Interference

Most electronic equipment is influenced by Radio Frequency Interference (RFI). ALWAYS exercise CAUTION with regard to the use of portable communications equipment in the area around such equipment.

## Additional Safety Warnings

**⚠ WARNING: TO REDUCE THE RISK OF BURNS, ELECTROCUTION, FIRE OR INJURY TO PERSONS, avoid using while bathing. If continuous usage is required by the direction of a physician, the concentrator must be located in another room at least 9 feet (2.8m) from the bath.**

**⚠ WARNING: DO NOT reach for a concentrator that has fallen into water. UNPLUG IT IMMEDIATELY.**

**⚠ WARNING: In certain circumstances, oxygen therapy can be hazardous. Graham-Field recommends that you seek medical advice before using this product.**

- ⚠ WARNING: Avoid creation of any spark near medical oxygen equipment. This includes sparks from static electricity created by any type of friction.**
  
- ⚠ ATTENTION: DO NOT come in contact with the concentrator when you are wet.**
  
- ⚠ ATTENTION: DO NOT place or store the concentrator where it can drop into water or other liquid.**
  
- ⚠ ATTENTION: NEVER leave the concentrator unattended when plugged in.**
  
- ⚠ ATTENTION: This device is to be used only in accordance with the prescription of a physician and this user manual. If at any time the patient or attendant concludes that the patient is receiving an insufficient amount of oxygen, contact the provider and/or physician immediately. NEVER make adjustments to the flow rate unless prescribed by a physician.**
  
- ⚠ ATTENTION: ALWAYS supervise closely when this product is used near children or those who require close supervision.**
  
- ⚠ ATTENTION: Only use this device as intended and described in this manual.**
  
- ⚠ ATTENTION: DO NOT use parts, accessories or adapters other than those authorized by manufacturer.**
  
- ⚠ ATTENTION: DO NOT connect the concentrator in parallel or series with other oxygen concentrators or oxygen therapy devices.**
  
- ⚠ ATTENTION: JB0160-015B, JB0160-015, JB0160-015B-220, JB0160-015-220, only: Discontinue concentrator use immediately if O<sub>2</sub> sensor red warning light illuminates; oxygen concentration is too low for safe use.**

## 4 HANDLING

### **GF Health Products, Inc. Freight Policy For Your Protection, Read Carefully**

The carrier accepted this merchandise “in good condition” and is responsible for safe delivery.

Before signing the freight bill, inspect the shipment carefully for damage or missing pieces.

#### **Apparent Loss or Damage**

Should visual inspection show loss or damage, this **MUST** be noted on the freight bill and signed by the carrier’s agent. Failure to do so may result in the carrier failing to honor the claim. Please contact the carrier to obtain the paperwork necessary to file a claim.

#### **Concealed Loss or Damage**

If damage is discovered after delivery is made, a concealed damage claim must be entered with the freight carrier. When this occurs, make a written request to the carrier for inspection. This request for inspection must be made within 15 days of delivery. The carrier will provide all paperwork necessary to file a concealed damage or loss claim, since such damage or loss is the carrier’s responsibility.

Each concentrator is checked before leaving the factory. To assure no damage has occurred in transit you must perform the following inspection prior to delivering the unit to a patient.

#### **Unpacking**

*Note: Unless the oxygen concentrator is to be used immediately, retain containers and packing materials for storage until concentrator use is required.*

1. Check for obvious damage to the carton or its contents. If damage is evident, please notify the carrier.
2. Remove all loose packing from the carton.
3. Carefully remove all the components from the carton.

#### **Inspection**

Examine exterior of the oxygen concentrator for nicks, dents, scratches or other damages. Inspect all components.

#### **Storage**

Store the repackaged oxygen concentrator in a dry area. **DO NOT** place anything on top of the repackaged concentrator.

## 5 BILL OF MATERIALS AND REPLACEMENT PARTS

The concentrator includes the following components:

- Oxygen concentrator (one each)
- User manual (one each)
- Humidifier bottle hose (one each)
- Humidifier bottle adapter (one each)

The concentrator comes with one bottom filter, two side filters, and one intake filter already installed; Model Nos. JB0160-015B, JB0160-015, JB0160-015B-220 and JB0160-015-220 come with one O<sub>2</sub> sensor already installed.

### Replacement Parts and Optional Accessories

A list of available replacement parts for the concentrator follows; please refer to the exploded drawings at the end of this manual to visually identify these parts. Please visit [www.grahamfield.com](http://www.grahamfield.com) for additional information.

| <u>Part Number.....</u> | <u>Description</u>                                               |
|-------------------------|------------------------------------------------------------------|
| JB0160-BF .....         | bacteria filter                                                  |
| JB0160-TC .....         | tube and adapter (6 each)                                        |
| JB0160-BH.....          | battery holder                                                   |
| JB0160-CFR.....         | bottom filter                                                    |
| JB0160-CTB.....         | cabinet top (outer shell), blue                                  |
| JB0160-CT .....         | cabinet top (outer shell), beige                                 |
| JB0160-CV .....         | check valve                                                      |
| JB0160-CVRK .....       | check valve repair kit                                           |
| JB0160-CB.....          | circuit board                                                    |
| JB0160-COMP .....       | compressor                                                       |
| JB0160-CC.....          | compressor capacitor                                             |
| JB0160-CMA.....         | compressor mount assembly                                        |
| JB0160-CRK .....        | compressor repair kit                                            |
| JB0160-EC .....         | electrical cord                                                  |
| JB0160-FANS.....        | fan (2 each)                                                     |
| JB0160-PTK.....         | pressure tubing kit for check valve                              |
| JB0160-IF .....         | filter mesh (for intake filter)                                  |
| JB0160-FM.....          | flowmeter (includes flowmeter, silicone tube, and mounting nuts) |
| JB0160-LEDP.....        | LED plate                                                        |
| JB0160-OSS .....        | outlet sound silencer                                            |
| JB0160-OS.....          | oxygen sensor                                                    |
| JB0160-OON.....         | oxygen outlet nipple                                             |
| JB0160-OTK.....         | product tank tubing kit                                          |
| JB0160-PR .....         | pressure regulator                                               |
| JB0160-PT .....         | product tank                                                     |
| JB0160-RV .....         | relief valve                                                     |
| JB0160-CFS.....         | side filter (2 each)                                             |
| JB0160-SB .....         | sieve bed (2 each)                                               |
| JB0160-TRAN .....       | transformer                                                      |
| JB0160-CS.....          | caster wheel (4 each)                                            |
| JB0160-FP .....         | Face plate with label, no oxygen sensor                          |
| JB0160-FPS .....        | Face plate with label, oxygen sensor                             |

## 6 OPERATION

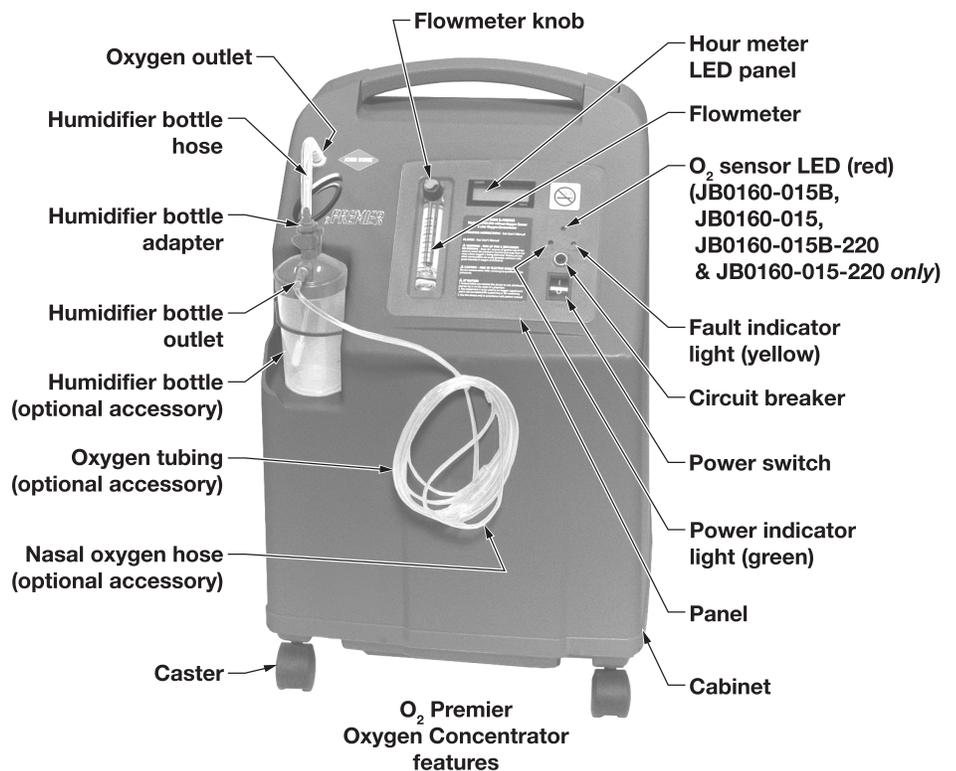
### Description of Operation

Air is drawn into the concentrator cabinet through gross particulate filters. A portion of this air is drawn into the compressor housing to provide a cool operating environment for the compressor and heat exchanger. The remaining air supply is drawn into the compressor through a filter, where particulates are removed and noise reduction is applied. Pressurized air leaves the compressor and passes through the heat exchanger. The air, which has now been cooled to room temperature, is directed to one of two sieve beds by check (electromagnetic) valves. As air passes through the molecular sieve, nitrogen adheres to sieve material, leaving oxygen and various trace gases to pass out of the chamber to a product tank. When pressure within the charging sieve bed reaches a predetermined level, the check valves switch, causing the compressed air to be directed into the remaining bed. The resting bed is purged with oxygen, which removes the collected nitrogen. Oxygen, stored in a product tank, then passes through a regulator which sets the service pressure of the system; then to a flowmeter which determines the amount of oxygen to be delivered to the patient. The unit delivers therapeutic oxygen to the patient at flow rates of up to 5 liters per minute.

**⚠ ATTENTION: Ensure you have performed the following three checks: Checking Concentrator Operation, Checking Alarm System and Battery, and Checking Oxygen Purity, before giving concentrator to end user.**

### For Equipment Provider: Checking Concentrator Operation

1. Ensure that the power switch is off; plug the concentrator's AC connector into a properly grounded power outlet.
2. Press the power switch to start the concentrator. There will be a brief delay before the concentrator starts, after which you should observe the following:
  - a. The alarm system emits a tone of one second duration.
  - b. The word HELLO appears on the hour meter LED.



- c. There is a four second pause while the unit performs internal diagnostics.
  - d. After four seconds the compressor starts.
  - e. Air flows out the bottom of the unit.
  - f. The green power indicator light illuminates.
  - g. If the unit is equipped with the optional O<sub>2</sub> sensor, the control panel red warning light remains illuminated until the unit is producing oxygen of at least 71% purity.
3. Turn the flowmeter control knob counter clockwise until it reaches 5 liters per minute.

### **For Equipment Provider: Checking Alarm System and Battery**

The concentrator has a battery powered alarm system. Every time the concentrator power switch is turned on, the alarm system performs a self test, and emits a tone of one second duration. **To perform alarm system self test:**

1. Ensure that the power switch is off; plug the concentrator's AC connector into a properly grounded power outlet.
2. Press the power switch to start the concentrator.
3. There will be a brief delay before the concentrator starts.
4. The alarm system should emit a tone of one second duration.

#### **To fully test the alarm system and battery:**

1. Ensure that the power switch is off and that the concentrator's AC connector is unplugged.
2. Press the power switch to start the concentrator. The alarm should sound loud and steady. Run test for five seconds. If the alarm sound wavers, stops, or is weak, replace the battery.

In addition to the start-up self test and the alarm system/battery test, the alarm will sound under the following conditions:

- Power failure
- Electricity unavailable to concentrator
- Concentrator unplugged
- Circuit breaker tripped and needs to be reset
- Inadequate power available to operate concentrator (brown out)

## **For Equipment Provider: Checking Oxygen Purity**

To ensure that the concentrator is performing within specification, you must perform an oxygen purity test. This test uses an analyzer to determine the purity of the oxygen generated. The test should be performed upon initial inspection, at time of delivery to a patient, and at periodic intervals as determined by the equipment provider.

The default interval set by Graham-Field is 90 days. The interval set by the equipment provider may be longer or shorter for those choosing to set their own protocol.

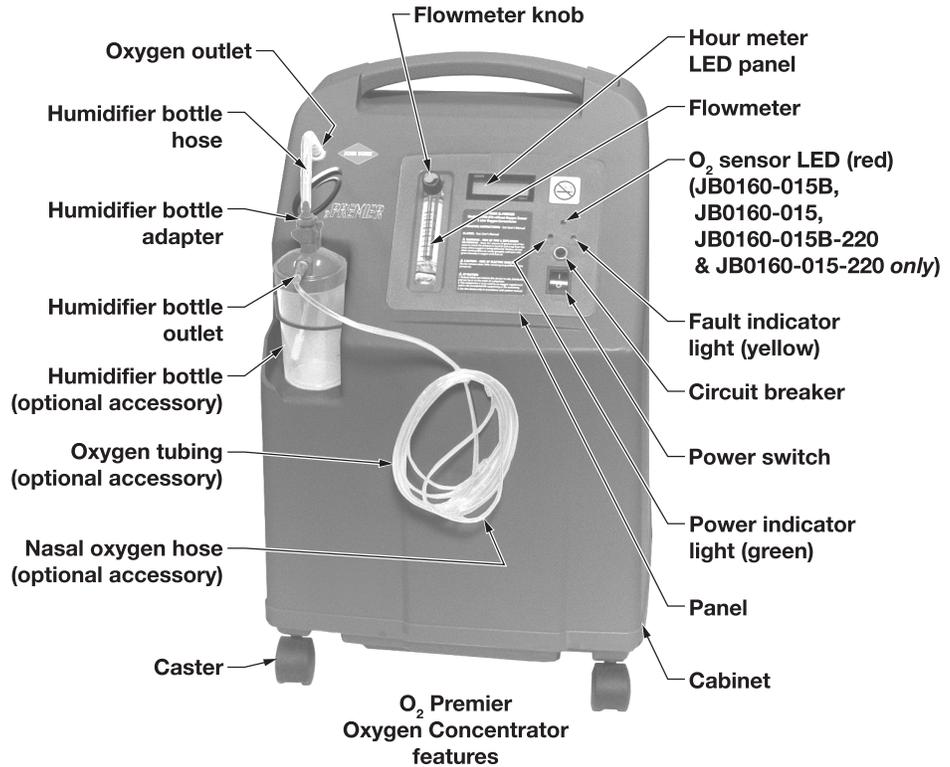
1. Ensure that the power switch is off; plug the concentrator's AC connector into a properly grounded power outlet.
2. Press the power switch to start the concentrator.
3. Run the concentrator for at least 30 minutes before performing the test.
4. Connect the analyzer to the outlet fitting on the cabinet. Do not attach the analyzer to a humidifier.
5. Adjust flowrate to a level consistent with the limitations of the test device. Do not forget to return flow to setting prescribed for the patient upon completion of test.
6. Allow gas to flow through analyzer for a period of time consistent with manufacturer's guidelines to determine an accurate reading.
7. To determine the accuracy of your reading, consider the accuracy of the test device you are using and the tolerance of the concentrator.

### **O<sub>2</sub> Premier Purity Specifications:**

- Flow Rate: 1 to 5 LPM
- Oxygen Concentration: 1-4 LPM 94%  $\pm$ 2%  
5 LPM 92%  $\pm$ 2%

## For User: Preparing the Concentrator (refer to picture at right)

1. Unscrew the humidifier bottle cover, if so equipped (humidifier bottle is optional).
2. Fill the humidifier bottle with purified water (or distilled water) between the maximum and minimum water level lines. If needed, add medication to the water, as prescribed by physician.
3. Screw the cover back on the humidifier bottle.
4. Screw the humidifier bottle adapter into the humidifier bottle cover.
5. Insert the humidifier bottle into the elastic belt on the left side of the unit.
6. Connect the other end of the oxygen hose to the oxygen outlet.
7. Ensure that the power switch is off; plug the concentrator's AC connector into a properly grounded power outlet.



## Turning the Concentrator On

1. Press the power switch to start the concentrator. There will be a brief delay before the concentrator starts. The alarm system emits a tone of one second duration, the word HELLO appears on the hour meter LED panel, and the green power indicator light illuminates.

**⚠ ATTENTION: Every time the concentrator starts, the alarm system performs a self test, and emits a brief tone. If the alarm does anything other than emit a brief tone, see Section 10, Troubleshooting, and follow the appropriate steps.**

2. Turn the flowmeter knob to the setting prescribed by your physician or therapist.

*Note: To properly read the flowmeter, locate the prescribed flowrate line on the flowmeter.*

3. Turn the flowmeter knob until the flowmeter ball rises to the appropriate line.
4. Center the flowmeter ball on the LPM line prescribed.

**▲ Damage: If the flowrate on the flowmeter ever falls below 0.5 LPM, check tubing or accessories for blocked or kinked tubing, or check for a defective humidifier bottle.**

If using the optional humidifier bottle, the oxygen comes from the humidifier bottle outlet.

5. Connect the oxygen tubing barb connector securely to the humidifier outlet; the other end of the oxygen tubing is used by the patient.

*Note: Oxygenation times and the flowrate ranges are established and prescribed by your physician.*

### **Turning the Concentrator Off**

Turn off the power switch and unplug the concentrator's AC connector from the power outlet.

## 7 USER MAINTENANCE

### Cleaning the Cabinet

Clean the cabinet at least once a month.

1. Turn off the power switch and unplug the concentrator's AC connector from the power outlet.
2. Clean the cabinet with a mild household cleaner and a non-abrasive cloth or sponge. Do not spill liquid inside the cabinet.

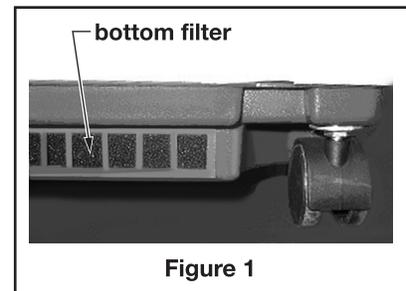
### Cleaning or Replacing the Filters (3 Types)

Clean or replace the filters as often as specified in the following paragraphs in order to protect the compressor and extend the concentrator's life. Replacement filters are available from your Graham-Field equipment provider.

#### Bottom filter

The bottom filter does not typically require cleaning, but it may if operated in extremely dirty conditions. Perform a visual inspection of the bottom filter every 2 weeks; if the filter is dirty, clean it. The bottom filter is located at the bottom rear of the cabinet (see Figure 1).

1. Remove the bottom filter from the squares carefully with your fingers.
2. Inspect the filter; if any part of it is cracked or broken, replace it instead of cleaning it.
3. If cleaning, rinse filter well with clear water until all dirt is removed.
4. To dry filter, squeeze it carefully between two absorbent towels. **Wait for filter to dry before installing it in concentrator.** When dry, install filter carefully as shown in Figure 1.



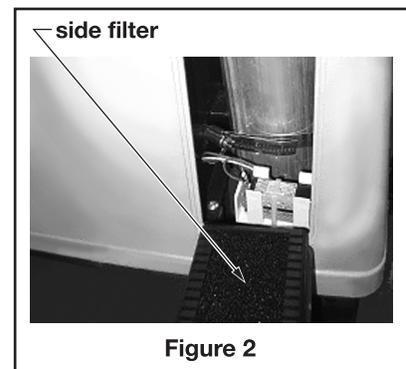
**▲ Damage: Do not operate the concentrator without the filters installed, or while filters are wet. These actions could permanently damage the concentrator.**

#### Side filters

*Note: For earlier models only, you will need a small blade screwdriver to open the side filter access door. For later models, the filter grill simply pulls out. If this operation is too difficult for you to perform, please contact your equipment provider to perform this for you.*

Clean the side filters weekly. There are two side filters, one located on each side of the concentrator cabinet. Perform the following steps on both side filters.

1. Turn off the power switch and unplug the concentrator's AC connector from the power outlet.
2. For earlier models, use a small blade screwdriver to open the air intake access door; for later models, open the filter grill (see Figure 2).
3. Remove the side filter carefully with your fingers.



4. Inspect the filter; if any part of it is cracked or broken, replace it instead of cleaning it.
5. If cleaning, rinse filter well with clear water until all dirt is removed.
6. To dry filter, squeeze it carefully between two absorbent towels. Wait for filter to dry before installing it in concentrator. When dry, install filter carefully as shown in Figure 2.

**▲ Damage: Do not operate the concentrator without the filters installed, or while filters are wet. These actions could permanently damage the concentrator.**

**▲ Damage: Please note that the side filters may require cleaning more often, especially if the concentrator is operated where the following conditions exist:**

- A wood stove is used
- Kerosene or oil is used
- Pets are present
- Tobacco is used

### **Intake filter**

*Note: Please have your Graham-Field equipment provider replace the intake filter. This operation requires opening the intake filter access door.*

Replace, do not clean, the intake filter annually (or more often, if the intake filter turns black). The frequency of replacement depends on usage and condition of the environment where the concentrator is used.

### **Cleaning the Optional Humidifier Bottle**

Change the water in the humidifier bottle every day. Wash the humidifier bottle weekly with warm soapy water, rinse with a solution of 1 part vinegar to 10 parts water, and rinse thoroughly with hot water before refilling.

### **Replacing the Battery**

*Note: Please have your Graham-Field equipment provider replace the battery. If the concentrator will not be used for an extended period, please have your Graham-Field equipment provider remove the battery.*

*Note This device uses a 9V battery. If the concentrator will not be used for an extended period, remove the battery.*

When the battery becomes weak, the alarm will sound. Have your Graham-Field equipment provider change the battery immediately.

**⚠ ATTENTION: Without the battery, the alarm will not work. ALWAYS change the battery when necessary.**

## 8 EQUIPMENT PROVIDER MAINTENANCE

### Preparing for a New Patient

1. Clean the cabinet as described in Section 7, User Maintenance.
2. Clean or replace the side filters as described in Section 7, User Maintenance.
3. Perform the following: Checking Concentrator Operation; Checking Alarm System and Battery; and Checking Oxygen Purity; as described in Section 6, Operation.

### Cleaning or Replacing the Filters (3 Types)

Clean or replace the filters as often as specified in the following paragraphs in order to protect the compressor and extend the concentrator's life.

#### Bottom filter

Clean/replace the bottom filter as described in Section 7, User Maintenance.

#### Side filters

Clean/replace the side filters as described in Section 7, User Maintenance.

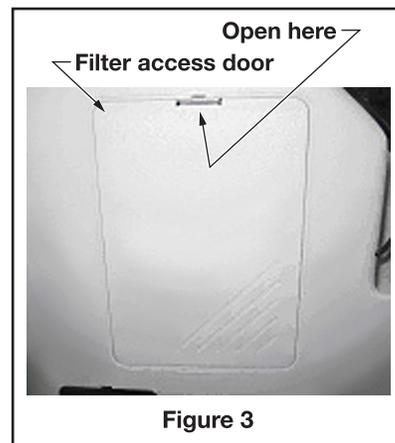
#### Intake filter

*Note: You will need a small blade screwdriver to open the intake filter access door.*

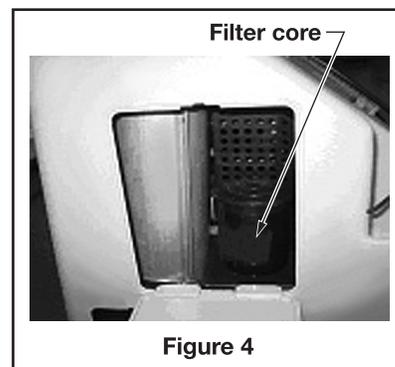
Replace, do not clean, the intake filter annually (or more often, if the intake filter turns black). The frequency of replacement depends on usage and condition of the environment where the concentrator is used.

The intake filter access door is located on the left side of the concentrator, above and to the left of the left side filter.

1. Turn off the power switch and unplug the concentrator's AC connector from the power outlet.
2. Use a small blade screwdriver to open the access door (see Figure 3); for later models, open the filter grill.



3. Unscrew the filter core (see Figure 4).



4. Remove the intake filter and replace it with a new one (see Figure 5).
5. Reinstall the filter core.
6. Close and secure the intake filter access door.

*Note: Always keep the filter core clean to ensure that oxygen can pass through.*

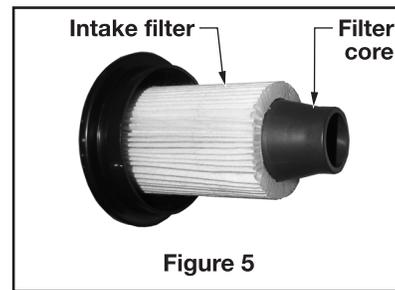


Figure 5

**▲ Damage: Do not operate the concentrator without the filter installed; this could permanently damage the concentrator.**

## Replacing the Battery

**⚠ ATTENTION: Without the battery, the alarm will not work. ALWAYS replace the battery when necessary.**

*Note This device uses a 9V battery. If the concentrator will not be used for an extended period, remove the battery.*

*Note: For earlier models only, you will need a small blade screwdriver to open the intake filter access door. For later models, the filter grill simply pulls out.*

When the battery becomes weak, the alarm will sound. Change the battery immediately.

1. Turn off the power switch and unplug the concentrator's AC connector from the power outlet.
2. For earlier models, use a small blade screwdriver to open the battery access door; for later models, open the left side filter grill (see Figure 6).
3. Lift the battery out of the battery holder and unclip the battery.
4. Install the new 9V battery.
5. Turn on the power switch to test the battery.
6. Record battery replacement information on company record.
7. Close and secure the battery access door.

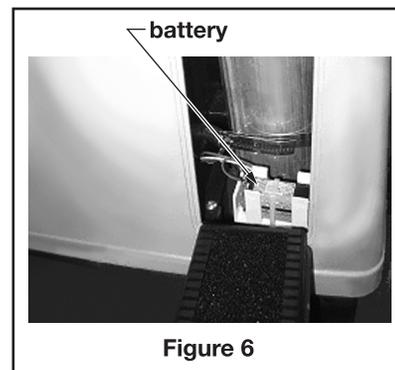


Figure 6

## Replacing the Bacteria Filter

The bacteria filter should be replaced after 15,000 hours of use. It need not be replaced between patients. It is located between the product tank and flowmeter (see exploded drawing "Front View of Hush House" in Section 12, Exploded Drawings). Follow the procedure for removal of the cabinet, described later in this manual. When changing the bacteria filter, be sure to observe any direction of flow indicated on the filter.

## 9 SERVICE

*Note: Please refer to Section 12, Exploded Drawings, when performing the following concentrator service functions.*

### **Cabinet Removal**

1. Turn off the power switch and unplug the concentrator's AC connector from the power outlet.
2. Use a Phillips screwdriver to remove the four Phillips head screws, two on either side of the unit, that secure the cabinet to the concentrator.
3. Perform the previous steps in reverse to reassemble.

### **Control Panel Removal**

1. Insert a flat blade screwdriver into the two slots between the top of the control panel and cabinet outer shell; turn 30 degrees to release the panel from the cabinet.
2. When control panel is free, disconnect the oxygen supply tube from the top port of the flowmeter to facilitate removal of cabinet.
3. Remove the control panel.
4. Perform the previous steps in reverse to reassemble.

### **Caster Replacement**

1. Turn off the power switch and unplug the concentrator's AC connector from the power outlet.
2. Place concentrator on its side
3. Use an M13 open end wrench to unscrew caster to be replaced.
4. Replace caster; use M13 open wrench to install.

### **Compressor Operation**

The compressor is a two piston pump that pushes room air into the sieve beds as directed by the valve assembly. The compressor has a six year warranty and should not require any service for at least 52,000 hours of use.

Over an extended period of time (greater than 52,000 hours) the cup seals, which prevent air from leaking around the piston and cylinder wall, may wear and create a leak. This decrease in output may result in a decrease in oxygen purity because less air will be available to the sieve beds.

The pistons are driven by a single shaft which is balanced by ball bearings. If the bearings wear significantly, the noise level of the compressor may become significantly loud and require replacement of the ball bearings.

## **Compressor Removal**

To remove the compressor assembly for exchange:

1. Turn off the power switch and unplug the concentrator's AC connector from the power outlet.
2. Remove cabinet as described previously.
3. Use a Phillips screwdriver to remove the six Phillips head screws on front panel of hush house.
4. Use a Phillips screwdriver to remove the eight Phillips head screws on sides and back lip of hush house.
5. Apply a downward pull to compressor inlet hose located on left side of compressor to remove.
6. Use a flat blade screwdriver to loosen air outlet hose from right side of compressor and pull down.
7. Unlock Molex connector at rear of compressor.
8. Use an M10 open end wrench to remove nuts that secure compressor to mounts.

## **Compressor Installation**

1. Perform compressor removal procedure in reverse.
2. Leak test pressurized connections.

## **Compressor Capacitor Replacement**

1. Turn off the power switch and unplug the concentrator's AC connector from the power outlet.
2. Cut the two cable ties that secure capacitor.
3. Remove two wires from Molex connector that connect to capacitor.
4. Insert two Molex tipped wires into Molex harness from new capacitor.
5. Insert new cable ties into slots from which cable ties have been removed.
6. Secure new capacitor with new cable ties.

## **Check Valve Operation**

The O<sub>2</sub> Premier uses two electromagnetic valves to control the inflow of compressed air to the sieve beds. These valves operate on a voltage of 24VDC. The ON cycle will last from five to seven seconds. When a peak pressure is detected by the circuit board, the cycle is terminated on one valve and initiated on the other.

These valves require no routine maintenance.

## **Check Valve Testing**

1. Use a 0VDC to 24VDC voltmeter to test the check valve.
2. There should be a voltage flow of five to seven seconds on each valve.
3. The presence of voltage indicates that the circuit board is operating correctly. If voltage is not present, perform Circuit Board replacement.

Test the check valve magnet:

4. Unscrew the blue cap.
5. Attempt to slide the magnet over the shaft during two cycles of machine.
6. If the valve is working properly, a slight resistance will be felt during the cycle in which the valve is energized. If no resistance is felt, replace the magnet.

## **Check Valve Magnet Replacement**

1. Turn off the power switch and unplug the concentrator's AC connector from the power outlet.
2. Disconnect the two wires.
3. Use a Phillips screwdriver to remove the two Phillips head screws that secure the valve assembly to the L-shaped bracket.
4. Disconnect the clear pressure-sensing tube by pulling down.
5. Use an M16 open end wrench to unscrew the high pressure line coming from the compressor.
6. Lift the valve assembly up and turn it 45 degrees in order to reach the blue cap.
7. Unscrew the blue cap and slide it off the electro magnet.
8. Replace magnet.
9. Perform the previous steps in reverse to reassemble.

## **Check Valve Replacement**

1. Turn off the power switch and unplug the concentrator's AC connector from the power outlet.
2. Disconnect the two wires.
3. Use a Phillips screwdriver to remove the two Phillips head screws that secure the check valve assembly to the L-shaped bracket.
4. Disconnect the clear pressure-sensing tube by pulling down.
5. Use an M16 open end wrench to unscrew the high pressure line coming from the compressor.
6. Replace the check valve.
7. Perform the previous steps in reverse to reassemble.

## **Sieve Bed Operation**

The O<sub>2</sub> Premier employs two beds filled with molecular sieve (Zeolite). The functional characteristics of the concentrator are determined, in part, by the type of sieve and the packing method used in its construction. DO NOT repackage the sieve or use non-Graham-Field replacement parts; this could change the performance characteristics of the concentrator. All warranties and liability are void if non-Graham-Field replacement parts are used.

## **Sieve Bed Replacement**

1. Turn off the power switch and unplug the concentrator's AC connector from the power outlet.
2. Use an M16 open end wrench to remove the inlet fittings from the top of the sieve bed.
3. Open the two hose clamps that secure the sieve bed to the hush house.
4. Use an M12 open end wrench to remove the outlet hose from the bottom of the sieve bed.
5. Install new sieve bed.
6. Perform the previous steps in reverse to reassemble.

## **Product Tank Operation**

The product tank serves a reservoir for the oxygen created in the sieve beds.

## **Product Tank Repair or Replacement**

If a leak is detected in the tank:

1. Turn off the power switch and unplug the concentrator's AC connector from the power outlet.
2. First attempt to tighten the eight Phillips head screws, attempting to apply equal torque to all.
3. If the leak is still present, apply leak detector to the connection between the regulator and product tank and the inlet at the bottom of the tank.
4. If the leak is still present, try to repair it:
5. Remove the hose clamp.
6. Cut the cable tie that secures the regulator output flow and pull the hose off.
7. Unscrew the regulator.
8. Use leak detector to check for a leak.
9. If a leak was present, replace Teflon tape and follow previous instructions in reverse to reinstall.
10. If a leak was not present, replace tank:
11. To remove tank, hold brass fitting while unscrewing tank.
12. Insert new tank.
13. Perform the previous steps in reverse to reassemble.

## Pressure Regulator Operation

The pressure regulator controls the pressure with which oxygen is delivered to the flowmeter. The operating pressure of this unit is 6.5 psi. There are no serviceable parts in the regulator.

## Operating Pressure Adjustment

To adjust operating pressure:

1. Turn concentrator on and set flow to 5 LPM.
2. Place a pressure manometer downstream from the flowmeter
3. Adjust the pressure by pulling up on the black knob on the regulator; turn clockwise to increase pressure and counterclockwise to decrease pressure.

## Pressure Regulator Replacement

1. Turn off the power switch and unplug the concentrator's AC connector from the power outlet.
2. Cut the cable tie that secures the outlet tube and pull tube off.
3. Turn the regulator counterclockwise to unscrew the regulator.
4. Wrap a two-inch piece of Teflon tape around the replacement regulator.
5. Perform the previous steps in reverse to reassemble.

## Circuit Board Operation

The circuit board controls the switching of the valves that control the flow of air to the sieve beds and the alarm functions of the concentrator. Components on the circuit board are sensitive to electrostatic discharge.

**▲ Damage: USE ESD precautions when handling the circuit board.**

## Circuit Board Removal

1. Turn off the power switch and unplug the concentrator's AC connector from the power outlet.
2. Using ESD precautions, disconnect the seven Molex connectors from the circuit board.
3. Use a  $7/32$  socket wrench to remove the two nuts that secure the circuit board.
4. Mount new circuit board and replace Molex fittings.
5. Perform the previous steps in reverse to reassemble.

## Transformer Operation

The transformer provides low power to operate the components of the concentrator. The input voltage is 115VAC on the red wires.

Output voltages are:

14.7 volts blue

24.5 volts white

## **Transformer Replacement**

1. Turn off the power switch and unplug the concentrator's AC connector from the power outlet.
2. Disconnect Molex connector from Circuit Board.
3. Use a Phillips head screwdriver to remove the two self tapping screws that secure the transformer to the Hush House.
4. Cut the two red wires at the point where they are connected to the brown wires.
5. Cut brown wires and skin to expose sufficient wire to solder new connections.
6. Install a 1" piece of #18 shrink wrap over each wire.
7. Splice and solder primary wires.
8. Slide shrink wrap over connection and shrink to fit.
9. Perform the previous steps in reverse to reassemble.

## **Audible Alarm Operation**

All audible alarms are sounded through the audible alarm transducer located to the right of the circuit board. To test the alarm:

1. Turn off the power switch and unplug the concentrator's AC connector from the power outlet.
2. Press the power switch to start the concentrator.
3. If there is no audible alarm and battery integrity is verified, replace the audible alarm transducer.

## **Audible Alarm Transducer Replacement**

1. Turn off the power switch and unplug the concentrator's AC connector from the power outlet.
2. Disconnect the Molex connector from the circuit board.
3. Unscrew the two self tapping Phillips head screws that secure the audible alarm transducer to the Hush House.
4. Replace the audible alarm transducer
5. Perform the previous steps in reverse to reassemble.

## **Light Indicator Board Operation**

The control panel lights are controlled by this board. If the concentrator is equipped with an O<sub>2</sub> sensor (Model Nos. JB0160-015B, JB0160-015, JB0160-015B-220 and JB0160-015-220 only), its light is also controlled by this board.

## **Light Indicator Board Replacement**

1. Turn off the power switch and unplug the concentrator's AC connector from the power outlet.
2. Remove the two Molex connectors and two blade connectors.
3. Use Phillips screwdriver to remove four Phillips screws.
4. Replace light indicator board.
5. Perform the previous steps in reverse to reassemble.

## **Circuit Breaker Operation**

The concentrator is equipped with a 10amp circuit breaker.

## **Circuit Breaker Replacement**

1. Turn off the power switch and unplug the concentrator's AC connector from the power outlet.
2. Disconnect the two blade connectors.
3. Unscrew the nut on the front of the panel.
4. Replace with new circuit breaker.
5. Perform the previous steps in reverse to reassemble.

## **Power Switch (On/Off Switch) Operation**

The flow of electricity to the unit is controlled by the power switch. Turning the power switch to the ON position initiates the self-test procedure and ultimate activation of the concentrator.

## **Power Switch Replacement**

1. Turn off the power switch and unplug the concentrator's AC connector from the power outlet.
2. Disconnect the blade connectors.
3. Squeeze plastic fingers on top and bottom of switch and push from back to front.
4. Insert new switch. Connect paired yellow wires to top right and right middle blade connector.
5. Connect single yellow wire to top left blade and remaining white wire to middle left blade.
6. Perform the previous steps in reverse to reassemble.

## **LED Display Operation**

The "HELLO" display and digital hour meter functions are displayed on the LED panel.

## **LED Display Replacement**

1. Turn off the power switch and unplug the concentrator's AC connector from the power outlet.
2. Disconnect the Molex connector.
3. Remove the four self tapping Phillips head screws from the LED box.
4. Replace box and reconnect.
5. Perform the previous steps in reverse to reassemble.

## **Flowmeter Operation**

The flowmeter is designed to deliver oxygen flow from .5 to 5.0 LPM at an operating pressure of 6.5 psi. The unit is back pressure compensated. Should the flowmeter not be able to deliver a flow within its prescribed range, verify that no downstream obstruction exists, and that a pressure of 6.5psi is being delivered to the flowmeter.

## **Flowmeter Replacement**

1. Turn off the power switch and unplug the concentrator's AC connector from the power outlet.
2. Disconnect outlet tubes.
3. Use an M18 wrench to remove the two nuts that secure the flowmeter to the control panel.
4. Remove and replace flowmeter.
5. Test flow and validate pressure.
6. Perform the previous steps in reverse to reassemble.

## **Power Cord Replacement**

1. Turn off the power switch and unplug the concentrator's AC connector from the power outlet.
2. Disconnect black and white leads from terminal block on top right hand side of Hush House.
3. Disconnect cable ties
4. Unscrew tension bar at inlet to base and pull cord out.
5. Insert new cord and reconnect.
6. Perform the previous steps in reverse to reassemble.

# 10 TROUBLESHOOTING GUIDE

## User Troubleshooting

The following table, provided for your reference, appears in the user manual.

| SYMPTOM                                                                 | CHECK / ACTION                                                               |
|-------------------------------------------------------------------------|------------------------------------------------------------------------------|
| Concentrator power is on and alarm is on, but concentrator doesn't work | Check if concentrator is unplugged; plug in.                                 |
|                                                                         | Check if circuit breaker is tripped; reset circuit breaker.                  |
|                                                                         | If concentrator still doesn't work, contact Graham-Field equipment provider. |

| SYMPTOM                                                                                          | CHECK / ACTION                                                                                                                                                             |
|--------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Concentrator works, green power indicator light illuminates, but little or no oxygen from outlet | Inspect tubes and cannula to ensure that they are not kinked or blocked. Smooth tubes to unblock.                                                                          |
|                                                                                                  | Check humidifier bottle, if so equipped, for leaks or jamming. Give humidifier bottle a slight shake to open safety valve. Clean humidifier bottle, reinstall and tighten. |
|                                                                                                  | If condition persists, contact Graham-Field equipment provider.                                                                                                            |

| SYMPTOM                                                     | CHECK / ACTION                                                                         |
|-------------------------------------------------------------|----------------------------------------------------------------------------------------|
| Flowmeter ball located on "0" position or float is unstable | Adjust flowmeter knob. If condition persists, contact Graham-Field equipment provider. |

| SYMPTOM                                      | CHECK / ACTION                                                                                                                                                             |
|----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Concentrator works, but makes abnormal sound | If yellow fault light blinks, and alarm sounds at low intervals, or yellow fault light illuminates continuously and alarm sounds, contact Graham-Field equipment provider. |

| SYMPTOM                                                                                                                   | CHECK / ACTION                                                                                                                                                                                                                                                                                |
|---------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Concentrator works, but yellow fault light illuminates (JB0160-015B, JB0160-015, JB0160-015B-220 and JB0160-015-220 only) | OK to continue use, but contact Graham-Field equipment provider immediately. Concentrator's oxygen concentration is safe, but decreasing. When oxygen concentration is too low for safe use, concentrator will shut off and optional O <sub>2</sub> sensor red warning light will illuminate. |

| SYMPTOM                                                                                                                                                                  | CHECK / ACTION                                                                                                      |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|
| Concentrator doesn't work; alarm sounds; optional O <sub>2</sub> sensor red warning light illuminates (JB0160-015B, JB0160-015, JB0160-015B-220 and JB0160-015-220 only) | Discontinue use; contact Graham-Field equipment provider immediately. Oxygen concentration is too low for safe use. |

## Equipment Provider Troubleshooting

| SYMPTOM                                                                                                                            | CHECK / ACTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Concentrator power is on and alarm is on, but concentrator doesn't work                                                            | <p data-bbox="454 262 1487 294">Check if concentrator is unplugged; plug into AC power outlet.</p> <p data-bbox="454 315 1487 346">Faulty electrical connection; change to a workable AC power outlet.</p> <p data-bbox="454 367 1487 399">Check if circuit breaker is tripped; reset circuit breaker.</p> <p data-bbox="454 430 1487 493">Transformer connector pins have become disconnected; reconnect transformer connector pins.</p> <p data-bbox="454 525 1487 556">Transformer damaged; replace transformer.</p> |
| SYMPTOM                                                                                                                            | CHECK / ACTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| No power alarm (No light illuminates after power-on; no display on hour meter; compressor not running; buzzer sounds continuously) | <p data-bbox="454 642 1487 674">Check if concentrator is unplugged; plug into AC power outlet.</p> <p data-bbox="454 695 1487 726">Faulty electrical connection; change to a reliable AC power outlet.</p> <p data-bbox="454 747 1487 779">Check if circuit breaker is tripped; reset circuit breaker.</p> <p data-bbox="454 810 1487 873">Transformer connector pins have become disconnected; reconnect transformer connector pins.</p> <p data-bbox="454 905 1487 924">Transformer damaged; replace transformer.</p> |
| SYMPTOM                                                                                                                            | CHECK / ACTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Concentrator works, but little or no oxygen from outlet                                                                            | <p data-bbox="454 1010 1487 1073">Open filter access door and panel; check tube parts and connections to ensure they are not loose or poorly connected. Fix any loose parts or connections.</p> <p data-bbox="454 1104 1487 1155">Inspect tubes and cannula to ensure that they are not kinked or blocked. Smooth tubes to unblock.</p>                                                                                                                                                                                 |

## 11 LIMITED WARRANTY

This warranty is extended only to the original purchaser of our products. This warranty gives you specific legal rights and you may also have other legal rights which may vary from state to state. GF Health Products, Inc. warrants its John Bunn O<sub>2</sub> Premier Oxygen Concentrator to be free from defects in materials and workmanship from the date of purchase for the following time period:

Compressor:                      six (6) years  
Balance of concentrator: five (5) years

Removal of the concentrator cover, unauthorized attempts to service the unit or unauthorized replacement of parts, other than routine maintenance, as described in this user manual, will void all warranties applicable to this concentrator device.

If within such warranty period any such product shall be proven to GF Health Products, Inc.'s satisfaction to be defective, such product shall be repaired or replaced, at GF Health Products, Inc.'s option. This warranty only applies to the labor for repairs performed by the authorized Equipment Providers. It does not apply to the labor performed by the purchaser or user. This warranty does not include normal wear and tear or shipping charges. GF Health Products, Inc.'s sole obligation and your exclusive remedy under this warranty shall be limited to such repair or replacement.

Routine maintenance items, such as filters, are excluded from this warranty. For warranty service, please contact GF Health Products, Inc.'s Customer Service. Upon receiving notice of an alleged defect in a product, GF Health Products, Inc. will issue a serialized return authorization. It shall then be the responsibility of the purchaser to return the entire unit or remove, at purchaser's cost, the defective component part(s) identified, pack the component part(s) in a manner to avoid shipping damage and to ship the component part(s) to either GF Health Products, Inc. or an Authorized Equipment Provider, as specified by GF Health Products, Inc. in advance.

Defective component part(s) must be returned for warranty inspection, using the serialized return authorization number as identification, within thirty (30) days of the return authorization date. Do not return products to GF Health Products, Inc. or its Authorized Equipment Providers, without prior consent. C.O.D. shipments will be refused. All return shipments must prepay shipping charges, unless otherwise authorized by GF Health Products, Inc.

Concentrator warranty for the John Bunn O<sub>2</sub> Premier Oxygen Concentrator (part numbers JB0160-010B, JB0160-010, JB0160-010B-220, JB0160-010-220, JB0160-015B, JB0160-015, JB0160-015B-220, JB0160-015-220) limitations and exclusions:

The foregoing warranty shall not apply to products subjected to negligence; accident; improper operation, maintenance or storage; soot or smoke-filled environments; other than normal application, use or service; modification without GF Health Products, Inc.'s express written consent (including, but not limited to, modification through the use of unauthorized parts or attachments); damage by reason of repairs made to any component without the specific consent of GF Health Products, Inc.; or to products damaged by circumstances beyond GF Health Products, Inc.'s control.

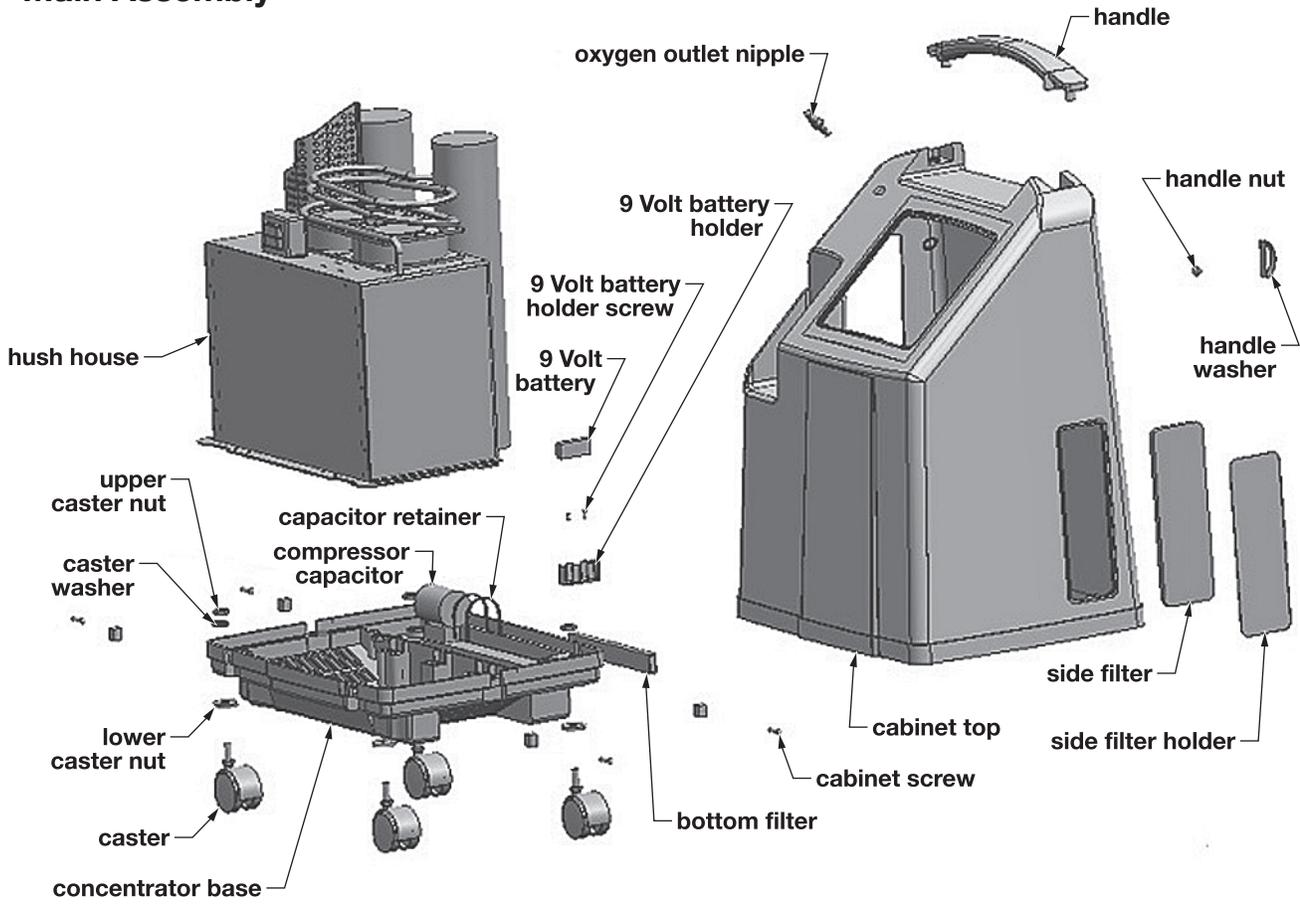
The foregoing express warranty is exclusive and in lieu of any other warranties whatsoever, whether express or implied, including the implied warranties of merchantability and fitness for a particular purpose; and the sole remedy for violations of any warranty

whatsoever shall be limited to repair or replacement of the defective product pursuant to the terms contained herein. The application of any implied warranty whatsoever shall not extend beyond the duration of the express warranty provided herein. GF Health Products, Inc. shall not be liable for any consequential or incidental damages whatsoever. Some states do not allow the exclusion or limitation of incidental or consequential damage, or limitation of how long an implied warranty lasts, so the above exclusion and limitation may not apply to you. This warranty shall be extended to comply with state/provincial laws and requirements.

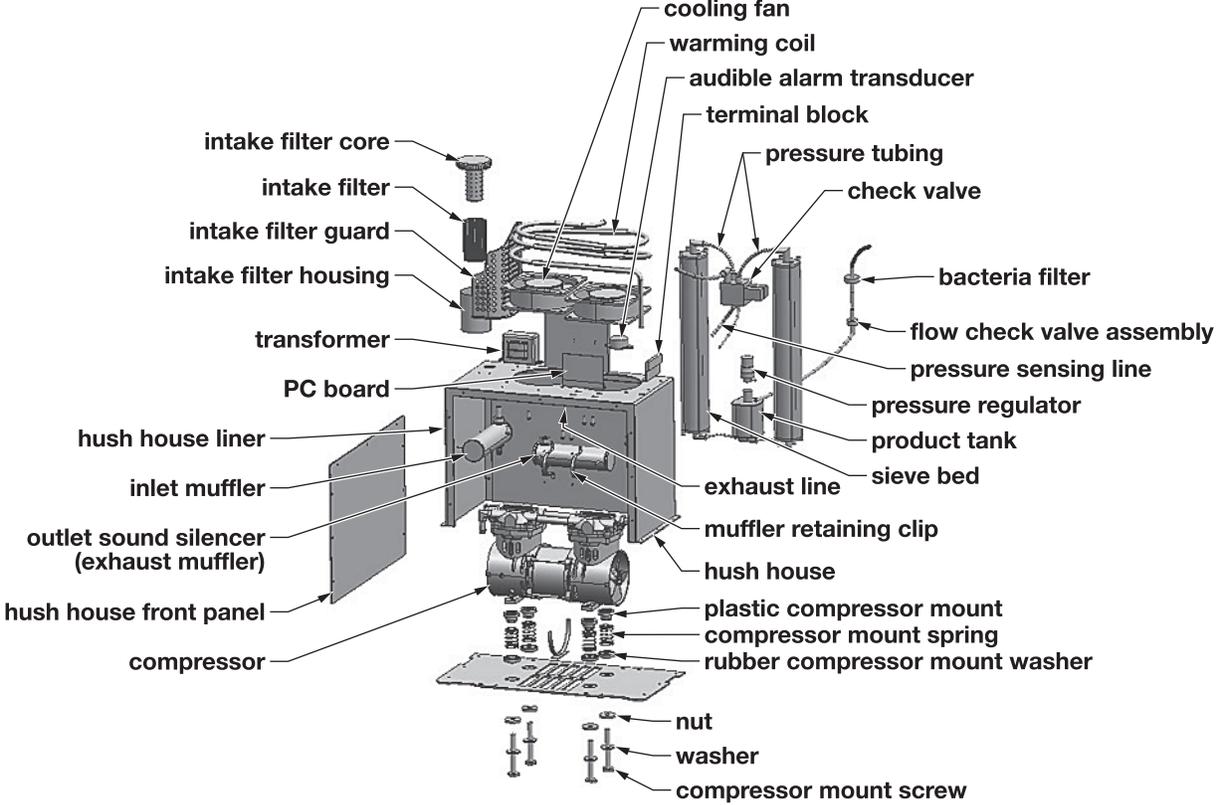
*Note: The above warranty has been written to comply with Federal Law applicable to products manufactured after July 4, 1975.*

# 12 EXPLODED DRAWINGS

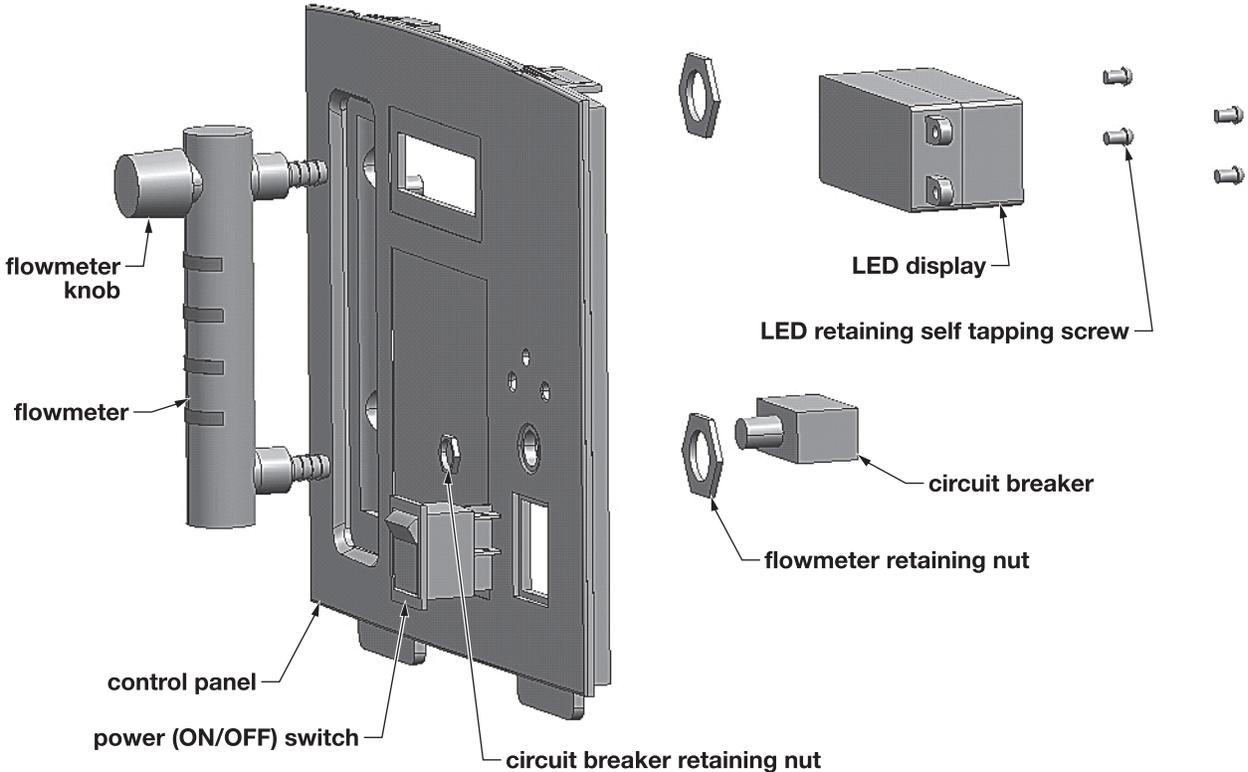
## Main Assembly



# Front View of Hush House



# Control Panel



## 13 INDEX

### A

ATTENTION, significance 6  
Audible alarm operation 25  
Audible alarm transducer replacement 25

### B

Before installation, safety 6  
Bill of materials 10

### C

Cabinet removal, service 20  
Caster replacement 20  
CAUTION, significance 6  
Checking alarm system (equipment provider) 12  
Checking concentrator operation (equipment provider) 11  
Checking oxygen purity (equipment provider) 13  
Check valve magnet replacement 22  
Check valve operation 21  
Check valve replacement 22  
Check valve testing 22  
Circuit board operation 24  
Circuit board removal 24  
Circuit breaker operation 26  
Circuit breaker replacement 26  
Cleaning the cabinet 16  
Compressor capacitor replacement 21  
Compressor installation 21  
Compressor operation 20  
Compressor removal 21  
Control panel, exploded drawing 33  
Control panel removal 20

### D

Damage, significance 6  
Drawings, exploded 32

### E

Equipment provider responsibility 3

### F

Filters, cleaning or replacing, equipment provider 18  
Filters, cleaning or replacing, user 16  
Fire warning & explosion, safety 7  
Flowmeter operation 27  
Flowmeter replacement 27  
Freight policy, Graham-Field's 9  
Front view of hush house, exploded drawing 33

### H

Handling 9

### I

Inspection 9  
Introduction 3

### L

LED display operation 26  
LED display replacement 27  
Light indicator board operation 25  
Light indicator board replacement 26

### M

Main assembly, exploded drawing 32  
Maintenance, equipment provider 18  
Maintenance, safety 7  
Maintenance, user 16

### N

Normal operation conditions 5  
Note, significance 6

### O

Operating pressure adjustment 24  
Operation 11

### P

Placement, safety 6  
Power cord replacement 27  
Power switch (on/off switch) operation 26  
Power switch replacement 26  
Pressure regulator operation 24  
Pressure regulator replacement 24  
Product tank operation 23  
Product tank repair or replacement 23

### R

Radio Frequency Interference (RFI) 7  
Replacement parts and optional accessories 10  
Replacing the battery 17

### S

Safety 6  
Safety warnings, additional 7  
Service 20  
Sieve bed operation 23  
Sieve bed replacement 23  
Specifications 5  
Storage 9

### T

Tool and supply list 4  
Transformer operation 24  
Transformer replacement 25  
Troubleshooting guide 28  
Turning the concentrator off 15  
Turning the concentrator on 14

### U

Unpacking 9

### W

WARNING, significance 6  
WARRANTY 30



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