

# Porta-Lung, Inc.

## OPERATING MANUAL

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### GENERAL DESCRIPTION

The Porta-Lung ventilating chamber body is made of molded fiberglass and allows for easy sealing of the patient below the neck from atmospheric pressure. Respiratory gas exchange can be enhanced utilizing both negative and positive pressures within the chamber while allowing the patient's head to be outside of the chamber in direct communication with the atmosphere. Easy entering, using and exiting the chamber involve opening and closing a clear plastic door along with sealing and unsealing the patient at the neck via an adjustable spiral collar. The chamber has the following components and specifications:

#### Components:

Fiberglass chamber body

Clear polycarbonate plastic door with polyester terephthalate modified with glycol (PETG) protection

Latching system

Gasket materials for pressure seals

Integrated spiral collar and headrest assembly

Mattress and pillow with washable covers (*memory foam is a new option*)

Portholes with arm seals for access to patient (*eg., cough assist*)

Ports with optional plugs or adapters for IV and monitoring access

### **Chamber Capabilities:**

Continuous negative pressure for increasing functional residual capacity with or without ventilatory assistance;

Intermittent positive pressure to enhance exhalation;

Respiratory rates available up to 60 breaths per minute;

Operating pressure range between -60 and +20 centimeters of water pressure.

### **Sizes, Dimensions and Weights:**

Custom sizing is available when appropriate advance time is noted in the order;

<b><u>Dimensions/Weight</u></b>	<b><u>X-Small (PL-5)</u></b>	<b><u>Small (PL-3)</u></b>	<b><u>Medium (PL-2)</u></b>	<b><u>Large (PL-4)</u></b>
Length w/o collar and headrest	31 inches (79 cm.)	42 inches (107 cm)	55 inches (140 cm)	61.3 in. (156 cm.)
Length w/ collar and headrest	42 inches (107 cm)	53 inches (135 cm)	66 inches (168 cm)	72.3 in. (184 cm.)
Height	25 inches (64 cm.)	25 inches (64 cm.)	25 inches (64 cm.)	28.5 in. (72 cm.)
Outer diameter	25 inches (64 cm.)	25 inches (64 cm.)	25.5 inches (65cm)	28.5 in. (72 cm.)
Inside diameter	21.5 inches (55cm)	21.5 inches (55cm)	22 inches (56 cm.)	25 inches (64 cm.)
Approximate Shipping weight	86 lbs. (39 Kg.)	96 lbs. (44 Kg.)	115 lbs. (52 Kg.)	160 lbs. (73 Kg.)

**SPIRAL COLLAR ASSEMBLY** The spiral collar is constructed of soft, durable urethane-impregnated nylon and may be hand-laundered in a solution of warm water and non-detergent soap, such as Woolite, rinsed thoroughly and air dried. **DO NOT** machine launder or use a heated dryer as the elastic and urethane coating may be damaged.

The following types and sizes are available:

SIZE	LENGTH	TYPE & PART NO.	
		Yellow Nylon	Soft Blue
Small	12” for individuals with a small neck (child) or those requiring a trachea depressor bar	C09562	1009848
Medium	15” average adult application	C09563	1009847
Large	18” for individuals with large or padded neck	C09564	1009846

**Instructions for installing the spiral collar on the Porta-Lung chamber:**

**STEP 1** Turn the collar inside out so that the tag is on the outside of the collar;

**STEP 2** Remove the rotation ring by removing the three (3) wing nuts and nylon spacers; note the orientation of the spacer with relation to the rotation ring;

**STEP 3** Install the small end of the collar (marked with collar size) over the small diameter ring and check to see that the elastic band is evenly and firmly seated in the bottom of the groove;

**STEP 4** Replace the rotation ring by guiding the collar through the center of the ring and placing the ring in its channel; replace the spacers and wing nuts making sure the large shoulder of the spacer is over the face of the rotation ring;

**STEP 5** Install the larger end of the collar over the large diameter ring and check to see that the elastic band is evenly and firmly seated in the bottom of the groove;

**STEP 6** Rotate the collar to tighten and observe that the collar spirals uniformly and provides a firm, consistent pressure seal.

**IMPORTANT:** DO NOT over-tighten the large wing nuts or cap nuts when mounting the spiral collar assembly onto a Porta-Lung chamber. Over-tightening may cause bowing of the assembly which may result in the spiral ring not turning smoothly.

### **Instructions for installing the twist insert on the spiral collar:**

**IMPORTANT:** When removing the spiral collar assembly, place hand under the headrest for support in order to prevent the assembly from falling while removing the wing nuts or cap nuts;

**NOTE:** It may be easier to install the twist insert on the spiral collar using two people.

**STEP 1** Turn the collar inside out so that the yellow nylon is on the outside;

**STEP 2** Remove the rotation ring by removing the two (2) integrated aluminum knobs and washers;

**STEP 3** Install the small end of the twist insert (marked with the insert size) over the small diameter ring and check to see that the elastic band is evenly and firmly seated into the bottom of the groove;

**STEP 4** Replace the rotation ring by guiding the insert through the center of the ring and placing the ring in its channel; replace the integrated aluminum knobs and washers, making sure the washer is over the edge of the rotation ring, thus securing the ring;

**STEP 5** Install the larger end of the insert over the larger diameter ring and check to see that the elastic band is evenly seated into the bottom of the groove;

**STEP 6** Rotate the collar ring to tighten and observe that the collar ring spirals uniformly and provides a firm, consistent pressure seal.

**IMPORTANT:** DO NOT over-tighten large wing nuts or cap nuts when mounting the spiral collar assembly onto a Porta-Lung chamber. Over-tightening may cause bowing of the assembly which may result in the spiral ring not turning smoothly.

## CHAMBER MAINTENANCE

The Porta-Lung ventilating chamber has been designed so that it should not require any major maintenance for several years when the following procedures are used:

1. Modular sub-assemblies are subject to wear and can be replaced in a matter of minutes;
2. These sub-assemblies are available on an exchange basis and include installation instructions that must be followed;
3. Do not attempt to perform maintenance or repairs other than those outlined in this manual or in authorized instructions from Porta-Lung, Inc.
4. Do not make modifications to fit equipment to the chamber unless authorized by the manufacturer.

## MONTHLY INSPECTION

Inspect door gasket for foreign materials, gouges, tears, etc. Replace the gasket if significant gouges or tears are present. Replacement gasket material is available from the manufacturer and replacement instructions are included in this manual.

1. Inspect hose connector; make sure it is easy to make a tight connection;
2. Inspect the door latch positions and tension; adjust as needed for an effective seal;
3. Inspect the spiral collar insert and the grooves of both rings to ensure an effective seal;
4. Inspect the ventilator hose for kinks, holes or loose connectors.
5. Adjust or replace parts as needed to ensure proper functioning of the unit.

## CHAMBER CLEANING

1. **Use only soft, lint-free cloth or sponges to clean the Porta-Lung chamber;**
2. Washing: **Do not use harsh detergents or abrasive cleaners on the plastic door** as they will leave scratches; wash the chamber inside and out with a soft,

lint free cloth or sponge using a mild soap solution; rinse and air dry appropriately; an anti-static polish can be used on the door;

3. Disinfection: The chamber should be disinfected according to the patient's needs and it is recommended that a diluted solution of Germicide P.D. 64 be used as described above in washing. Always rinse carefully with clean water after applying a disinfectant and allow all surfaces to dry completely before using the chamber.

## GENERAL CARE

1. The chamber should not be used or positioned near any heat sources;
2. Keep the chamber door closed when not in use;
3. Keep the chamber covered with a soft, clean cloth when not in use;
4. Do not store items near the chamber if there is a possibility they may fall on or against the chamber;
5. Do not allow children or unauthorized persons near the chamber when not in use.

## IDENTIFYING PRESSURE LEAKS

**Step 1.** Check arm port covers. The gasket must be even and flat under the stainless steel cover. Cap or wing nuts must be tight enough (*do not over-tighten*) to secure a pressure seal.

**Step 2.** Check the main ventilator hose for correct attachment between the chamber and the pump and also check the connections for the pressure-reading tube. Check the tubings for any cuts or tears.

**Step 3.** Check the hose connection at the end of the chamber to ensure that there is a gasket on the inside and outside of the connection. Make sure that both gaskets are flat and seated correctly.

**Step 4.** Check the spiral collar to be sure the cap nuts or wing nuts holding the collar to the chamber are not too tight. If the nuts are excessively tight the spiral collar may bow and not fit into a flat position causing a pressure leak.

**Step 5.** Check the spiral collar insert to be sure the elastic is securely positioned into the spiral collar groove. When the insert is loose from either ring, refer to the spiral twist collar insert instructions for re-attachment.

**Step 6.** Check the entire perimeter of the 2" x 1/4" gasket on the door for cuts, tears or spaces between strips of the gasket. Check the gasket to be sure it is in a straight line along the horizontal edges of the door and has not shifted or moved out of alignment. Also check the gasket running across both ends of the door to make sure the gasket has not shifted from its original alignment.

**Step 7.** Check the latch adjustment for pressure leaks by referring to the general operation and functional checkout procedure sheet.

## **REMOVAL and REPLACEMENT of DOOR GASKET**

**Step 1.** For removal, the gasket must be removed by carefully peeling the gasket starting at the ends of each strip. Pull the gasket very slowly from the surface. If any glue or gasket remains, ZEP Big Orange solvent or equivalent may be used to soften any excess glue. Use a cloth and a putty knife, **not a sharp blade knife**, with gentle pressure as needed to scrape and remove all adhesive, gum, solvent and old gasket fragments from the door and/or the chamber body surfaces. Clean excess solvent from all surfaces with mild soap and water, then rinse with clean water and let all surfaces dry completely before proceeding to step 2.

**Step 2.** For replacement, all gaskets need to be 1/2" longer than the space needed at each end so that the additional 1/2" of gasket can be tucked into the adjoining strip forming a tight pressure seal. First, apply the gasket strips to the horizontal edges of the door at the hinge and latch sides. Second, apply the gasket strips to the curved ends of the door. Carefully press the gaskets to the surface of the door and work out from the middle of each gasket strip toward the ends. Then tuck the extra 1/2" at the ends of each gasket strip down and into the junction with the next gasket strip to ensure a tight seal.

**Important Note:** The door and all contact surfaces must be completely clean, dry and free of all adhesive, solvent, gasket and other material before replacing the gasket as noted in step 1.

## OPERATING INSTRUCTIONS

1. Always consult with appropriate professional health care providers, including physicians and respiratory therapists, to develop a plan of care incorporating the appropriate use of negative pressure before actually treating a patient with the chamber;
2. Bolt or strap the chamber securely to a table, gurney or other stable surface to prevent the chamber from moving while in use;
3. Place spiral collar-headrest assembly on the mounting bolts at the head-end of the chamber. Hand-tighten the wing nuts. **Do not over-tighten.** Over-tightening may cause bowing of the assembly which may result in the spiral ring not turning smoothly;
4. Loosen all tension screws on the spiral collar and rotate the inner ring counter-clockwise until the vinyl is fully open;
5. Position the patient on the mattress so that his/her head is through the opening of the spiral collar. Terry cloth or a cloth dickey may be used to prevent chaffing or irritation from the spiral collar. Rotate the spiral collar clockwise until snug around the neck of the patient. **Do not over-tighten.** Hand-tighten the tension screws to prevent the ring and collar from loosening;
6. Close the door and secure all the latches;
7.
  - (i) attach the ventilator pump and flex hose to the connector fitting on the chamber;
  - (ii) set and activate the ventilator pump using the manufacturer's instructions and according to the patient's needs as determined by the consulting physician and respiratory therapist; appropriate settings are commonly within the following ranges:
    - (a) intermittent negative pressure between -18 to -28 centimeters of water pressure for inspiration;
    - (b) respiratory rate between 10 and 16 breaths per minute;
    - (c) the ratio of inspiratory to expiratory time (I/E ratio) between 1:2.5 and 1:3;
  - (iii) also please remember that needs of individual patients may vary. As noted above, always consult with appropriate health care professionals to

determine the proper and efficient therapeutic use of negative pressure for treating each patient individually;

8. An optional mirror may be attached to the two mounts at the top of the head end of the chamber;

**9. Probes and IV ports:**

a. Select sizes for the hole and stopper needed to fit the IV line or probe;

b. Insert the line/probe through the hole in the chamber and connect as needed to the patient;

c. Open the slot in the rubber stopper and lay the line inside the stopper hole. If the hole is too small consult bio-medical equipment personnel or call the manufacturer. If the hole is too large, fill with appropriate soft rubber material or call the manufacturer;

d. Insert the rubber stopper into the hole in the chamber to obtain a tight seal. Always check for leaks by listening and feeling around the seal.

10. **WARNING:** While the door is in the open position, do not bump either the chamber door, door restraint, or the chamber itself as this may cause the door to close abruptly and possibly cause injury to the patient or attendant.

## WARRANTY

Porta-Lung, Inc. (“the Company”) warrants to the original purchaser that the Porta-Lung chamber manufactured by the Company will be free from defects in materials and workmanship under normal use for one year from the date of delivery.

## WARRANTY SERVICE

Porta-Lung, Inc. will repair or replace, at its option, component parts which on examination by Porta-Lung, Inc. are found to be defective in material or workmanship, except that when minor defects occur Porta-Lung, Inc. will provide material, parts and instructions as necessary to make repairs and the purchaser shall have the obligation to make the repair. Porta-Lung, Inc. reserves the right to have the chamber shipped to its factory for repairs when appropriate.

## GENERAL PROVISIONS

- A. This Warranty does not apply to the chamber or any part thereof which has been subject to improper usage, accident, negligence, alteration, abuse, misuse or repairs by anyone not authorized by Porta-Lung, Inc. (“the Company”).
- B. Parts replaced under this Warranty are warranted only through the term of the original Warranty.
- C. In no event shall Porta-Lung, Inc. be liable for any special or consequential damages, or for loss of use of the chamber, or loss of time, inconvenience, or for any delay in the performance of this Warranty.
- D. Porta-Lung, Inc. makes no representation or warranties whatsoever as to the fitness or usefulness of the chamber for any medical treatment, physical condition or any other purpose; and Porta-Lung, Inc. shall have no liability whatsoever for personal injury or consequential damages to any buyer, person or property arising out of or in connection with the said chamber or its use in any manner.
- E. The foregoing shall constitute the sole and exclusive remedy of any purchaser of the Porta-Lung ventilating chamber and the sole and exclusive liability of the Company in connection therewith. **This Warranty Is Expressly In Lieu** of any other express, implied, or statutory warranty, condition or guarantee including, but not limited to, any implied warranty of merchantability or fitness which constitute obligations or liabilities of the Company. The Company neither assumes nor authorizes any person to assume any other obligations or liability in connection with this product without the prior written approval of the Company.

## WARRANTY FORM

Model Number: \_\_\_\_\_

Serial Number: \_\_\_\_\_

Chamber Size: \_\_\_\_\_

Date Received: \_\_\_\_\_

Received from: \_\_\_\_\_

## WHERE WILL THIS CHAMBER BE USED?

Client, Hospital or other Facility: \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

Telephone No. (incl. area code): \_\_\_\_\_

Patient Diagnosis: \_\_\_\_\_

Equipment Supplier: \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

Telephone No. (incl. area code): \_\_\_\_\_

## WHEN RECEIVED DID THE CHAMBER PERFORM SATISFACTORILY?

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COMMENTS: \_\_\_\_\_

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Authorized Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Name (please print): \_\_\_\_\_

Title: \_\_\_\_\_

Address: \_\_\_\_\_

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Telephone No. (incl. area code): \_\_\_\_\_