

# ImPulse™ Elite OCD System Patient Manual



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# *The Ambulatory Oxygen System for Complete Patient Mobility*

## **Components**

The complete ImPulse™ Elite OCD System includes the following, as shown in Figure 1 below:

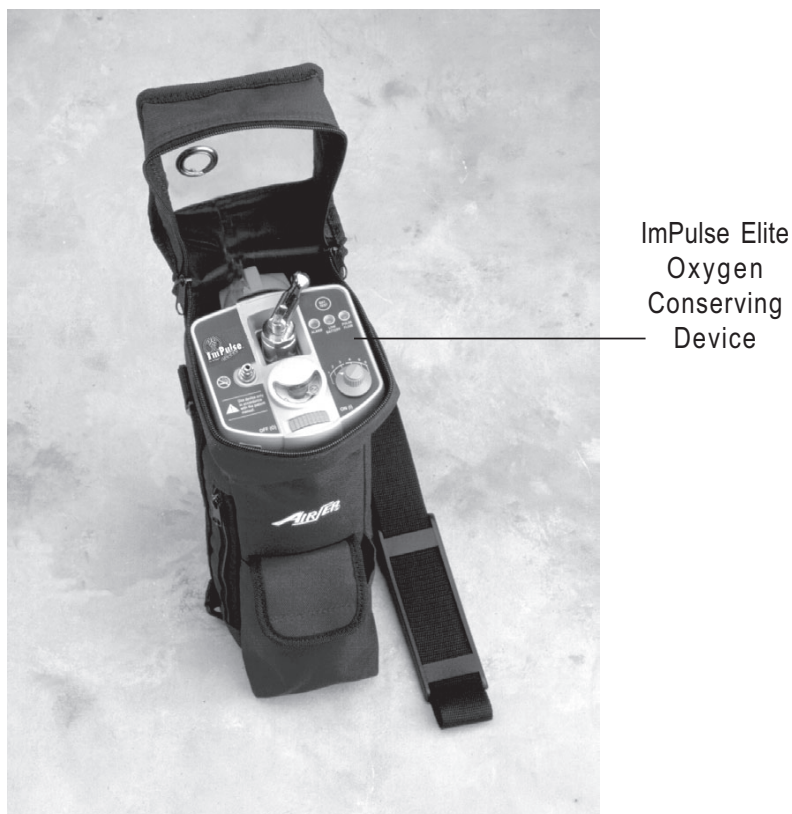


Figure 1

Not shown:

- (1) One Alkaline “D” Energizer® Battery
- ImPulse Elite OCD System Patient Manual

Note: The carrying case is available separately.

# Features

- Easy to operate with just one “D” alkaline battery (Energizer recommended). Cannula connects in seconds. Patient-accessible controls.
- Oxygen-conserving technology allows smaller cylinders to last longer.
- With ImPulse Elite, the “D” battery provides the greatest ambulation time. For most patients, 10–18 months.
- Pulse modes offer up to 6 lpm efficiency.
- Fail-safe electronic circuitry and alarm system provide added assurance of proper unit function and oxygen delivery.
- Audible alarm when device does not detect inhalation (inspiration), if cannula is disconnected or tubing kinked, or if the unit is inadvertently left on when not in use.
- Only minimal maintenance required.
- Designed for maximum patient mobility.
- Economical way for ambulatory oxygen patients to enjoy freedom of movement.
- Developed to enhance quality of life for patients using supplemental oxygen.

# Introduction

ImPulse™ Elite is an electronic oxygen conserving device (OCD) that provides convenience and mobility to patients with therapeutic oxygen needs. Designed and manufactured by AirSep Corporation, ImPulse Elite uses portable cylinders to provide patients with oxygen delivery at their prescribed dosages.

With this device, actual oxygen delivery to the patient occurs at or near the beginning of the breathing cycle when the patient starts to inhale.

Because ImPulse Elite does not deliver oxygen during exhalation, which accounts for approximately two-thirds of the breathing cycle, it wastes little or no oxygen. This differs greatly from conventional oxygen systems that deliver oxygen continuously. In addition, many patients are more comfortable with oxygen conserving devices than continuous flow systems because they have fewer problems with nasal dehydration that can result from constant flow into the nostrils.

## Maximizing Delivery with ImPulse Elite

ImPulse Elite's advanced electronics enable it to respond effectively to a patient's respiratory cycle. ImPulse Elite senses the start of inhalation. Because only a small amount of oxygen is actually required to oxygenate the blood effectively, ImPulse Elite delivers the precise amount when it is most beneficial — at the beginning of inhalation.

ImPulse Elite quickly delivers a pulse of oxygen compatible with your breathing rate and automatically adjusts with any change in your breathing cycle — depending on your prescribed oxygen requirement.

This method of oxygen delivery has been clinically tested and determined to meet oxygen needs satisfied by comparable flow settings on continuous flow units up to 6 lpm.

## Initial Setup

As part of your initial set up with ImPulse Elite, your clinician may choose to assess your saturation level through pulse oximetry. This helps to ensure proper titration while using the oxygen conserving device.

# Safety

ImPulse Elite meets applicable safety and environmental regulations. This assurance means you can fully enjoy all the benefits of this device. However, with all electronic devices and applications that require oxygen, normal care and precautions must be followed.

Before you attempt to use this oxygen conserving device and a portable oxygen cylinder, read all warning and caution notes in this section of the manual. Contact your Equipment Provider should you have further questions.



## Warnings

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Federal (USA) law restricts this oxygen conserving device to sale by, or on order of, a licensed physician. This device must be used only under the supervision of a licensed physician.

High purity oxygen promotes rapid burning. Do not allow smoking or open flames within five feet of this device, the portable oxygen cylinder, or any oxygen-carrying accessory.

If you observe that the oxygen conserving device is not working properly or you feel ill, contact your Equipment Provider and/or physician immediately.

Although oxygen is a non-flammable gas, it vigorously supports combustion. Use no oil, grease, or petroleum-based products on or near the device or any oxygen source.

Use this device and the oxygen cylinder only with clean, dry, oil-free hands.

Observe all federal and/or international regulations regarding vehicular travel by air, sea, or land while using and/or transporting oxygen cylinders.

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## Cautions

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Maintain a backup supply of oxygen, and periodically check the contents gauge on the unit, which monitors the consumption of oxygen in the cylinder.

Do not use this device with a humidifier or expose it to water or other liquids.

Do not expose the device to extreme temperatures.

Do not use this device

- with the batteries removed.
  - if the oxygen tubing is kinked or obstructed.
  - if the device was tampered with or opened by anyone other than your Equipment Provider.
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# Description of Parts

As you can see in Figure 2 below, all parts are within easy reach and allow you to adjust your ImPulse Elite unit as necessary. Follow your clinician's instructions before making any change to the flow selector setting.

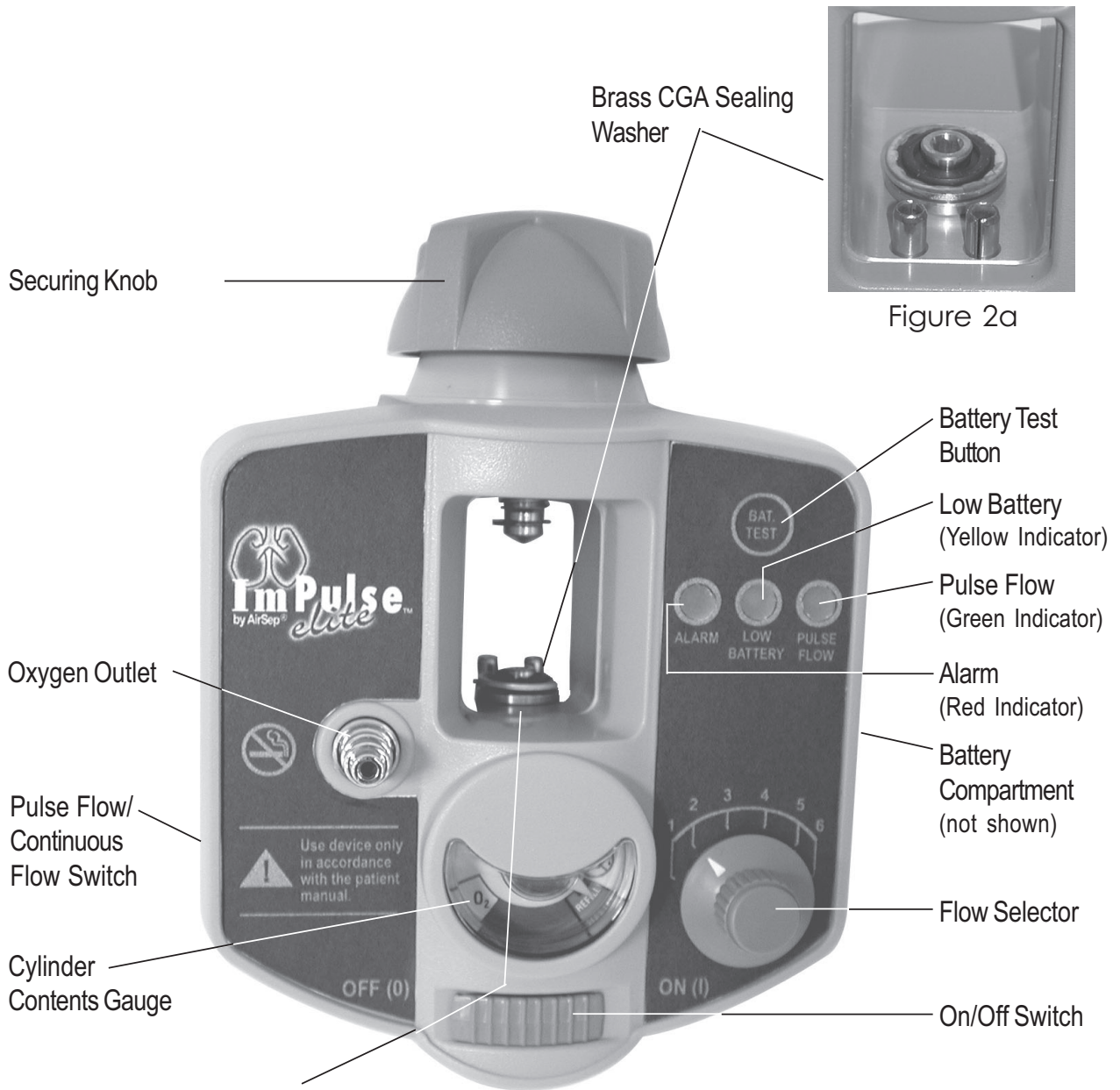


Figure 2a

Figure 2



Figure 2b

Easily connects to any standard post-valve cylinder.

# *How to Operate the Unit*

## **Oxygen Cylinder Connection**

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### **Warnings**

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High purity oxygen promotes rapid burning. Do not allow smoking or open flames within five feet of this device, the portable oxygen cylinder, or any oxygen-carrying accessory.

Use no oil, grease, or other petroleum-based products on or near the device or any oxygen source.

Use this device and the oxygen cylinder only with clean, dry, oil-free hands.

Oxygen in the cylinder is under high pressure. Do not open the cylinder valve without the ImPulse Elite unit properly connected to the cylinder.

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Your Equipment Provider will review proper cylinder care and connection procedures with you the first time you operate your unit.

Refer to the procedure on the following page should you need assistance with connecting your ImPulse Elite unit to an oxygen cylinder.

To connect the ImPulse Elite to any post-valve cylinder:

1. Loosen the ImPulse Elite securing knob. To ensure a leak-tight seal between the cylinder valve and the unit, make sure the sealing washer is present in the center of the unit before installation (Figure 3).



Figure 3

2. Align the two parallel alignment pins (Figure 4) on the unit with the holes on the neck of the cylinder (Figure 5).

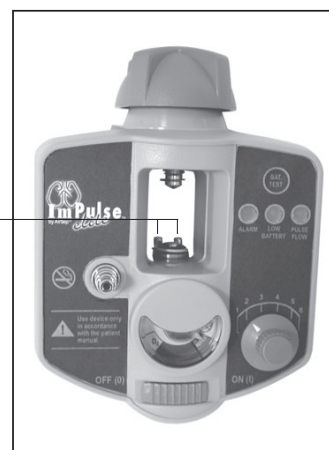


Figure 4

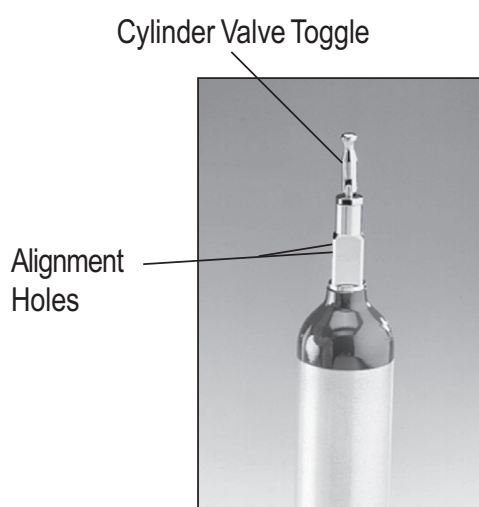


Figure 5

3. Push the alignment pins into the holes on the neck of the cylinder, and hold the unit in place against the cylinder with one hand while you turn the unit's securing knob clockwise with your other hand until the unit is secured firmly on the cylinder (Figure 6).



Figure 6

# Testing and Replacing Battery

ImPulse Elite requires just one 1.5 volt “D” size alkaline battery (Energizer recommended) for full operation. Battery life is dependent upon the predetermined unit settings, your breathing rate, and the length of daily ambulation time. Most patients experience 10–18 months of battery life. AirSep strongly recommends that you maintain a spare battery in your carrying case for replacement in this unit as necessary.

**To install or replace the battery,** follow the steps below:

1. Make sure the ON/OFF power switch is set to the *OFF* position. (It is not necessary to disconnect the cannula or remove the ImPulse Elite from the cylinder, although you may find it easier to replace the battery within the battery compartment door if the unit is first removed from the cylinder.)

2. If the unit is not connected to the cylinder, simply hold the unit with one hand while you press in and lift up on the battery compartment latch with your other hand. (Figure 7).

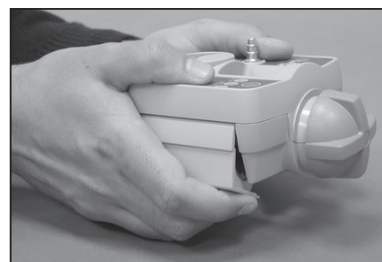


Figure 7

If the unit is connected to the cylinder, steady the unit by grasping the neck of the cylinder just below the unit with one hand while you press in and lift up on the battery compartment latch with your other hand (Figure 8).

3. Insert a fully charged battery into the inside door of the battery compartment. Make sure the battery is properly positioned to match the correct positive and negative polarity markings (Figure 9).



Figure 8

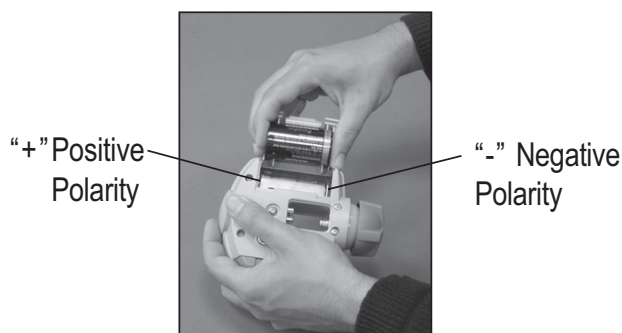


Figure 9

**To test the battery** to ensure that there is proper power available to operate the unit:

1. Make sure there is a battery in the unit's battery compartment and it is properly positioned to match the correct positive and negative polarity markings.
2. Make sure the ON/OFF power switch is set to the *ON* position.
3. Press and hold down firmly the center of the BAT. TEST button with your finger. (Figure 10.) (You can test the battery regardless of whether or not a cannula is connected to the oxygen outlet.)



Figure 10

The green PULSE FLOW indicator illuminates to indicate a good battery. If the battery requires replacement, the green PULSE FLOW and yellow LOW BATTERY indicators illuminate.

## Turning On the Unit for Proper Oxygen Usage

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### Note

Do not use a mask with the ImPulse Elite unit. A mask may not conform to the face properly enough for the unit to fully sense inhalation.

Do not use pediatric or low flow cannulas with the ImPulse Elite unit as their smaller tubing diameters negatively affect delivery volumes.

Use ImPulse Elite during sleep only under the recommendation of a qualified clinician.

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1. Check the energy level of the battery each time you use the unit.  
Refer to “Testing and Replacing Battery” for step-by-step instructions.
2. Check the oxygen cylinder setup and the cylinder contents gauge.  
If you need to change cylinders, which includes removal and reconnection of the ImPulse Elite unit, refer to Oxygen Cylinder Connection for step-by-step instructions.
3. Make sure the PULSE FLOW / CONTINUOUS FLOW switch is moved completely right (for pulse flow setting).
4. Set the ON/OFF switch to the ON position.

All three lights illuminate for less than 1 second. The ImPulse Elite unit automatically calibrates and reaches sensitivity within approximately 15 seconds. Then the green light shuts off, and the unit emits a short burst of oxygen. This indicates ImPulse Elite is ready for use.

5. Connect your cannula to the oxygen outlet. (You may use up to a 25 ft [7.5 m] cannula, if desired.) (Figure 11.)
6. Turn the cylinder valve slowly one full turn counter-clockwise to begin oxygen flow.
7. Make sure the cylinder contents gauge on the ImPulse Elite unit registers within the green shaded/green zoned areas.



Figure 11

This indicates an adequate oxygen supply in the cylinder. (If the cylinder contents gauge indicates the red REFILL zone, the cylinder needs to be replaced.)

8. Position the nasal cannula with the prongs inserted into your nostrils.
9. Set the flow selector between 1 and 6 depending on your prescribed dosage (Figure 12).



Figure 12

## Turning Off the Unit

1. Turn the oxygen cylinder valve fully clockwise to stop oxygen flow.
2. Set the ON/OFF power switch on the ImPulse Elite unit to the *OFF* position.



### Note

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If you do not set the unit's ON/OFF power switch to *OFF* when the unit is not in use, the alarm sounds until the battery fully discharges.

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## Alarm Light Indicators

The following chart provides an explanation of what each alarm light indicates:

Alarm/Light Indicators			
Setting	Light	Alarm	Indicates
OFF	No	No	Unit is not on, battery life is preserved.
ON + (Flow Selection)	Green	No	Pulse flow.
	Yellow & Green	Yes (Intermittent)	Battery almost discharged. Prepare to replace battery within 20-30 minutes.
	Red	Yes (Continuous)	No inspiration detected for approximately 30 seconds (cannula may be disconnected, tubing kinked, or unit remains on when not in use).
BAT. TEST	Green	No	Sufficient battery life.
	Yellow & Green	No	Battery almost discharged. Prepare to replace battery within 20–30 minutes.
	No	No	No battery or discharged battery in unit.



## Switching to Continuous Flow

If your unit is equipped with a continuous flow switch:

For very short time periods, this PULSE FLOW/ CONTINUOUS FLOW switch at the base of the unit can be moved completely left for *CONTINUOUS FLOW* to force the oxygen conserving unit to perform as a continuous flow unit (Figure 13).



Figure 13

A typical use for the *CONTINUOUS FLOW* setting occurs when the battery can no longer provide power. This setting provides 2 lpm of continuous flow oxygen.

Before setting ImPulse Elite to *CONTINUOUS FLOW*, make sure you set the ON/OFF power switch to the *OFF* position to preserve battery life as this is a manual override and no audible or visual alarm indicators are available in this “temporary” setting.



### Caution

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The continuous flow setting uses substantially more oxygen than the normally used pulse flow setting. Make sure the cylinder contents gauge is observed often when operating the unit as a continuous flow device.

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## Removing/Replacing the Cylinder

To easily remove the ImPulse Elite unit from a cylinder:

1. Close the oxygen cylinder valve by rotating the valve completely clockwise.
2. Press the BAT. TEST button OR temporarily set the PULSE FLOW/ CONTINUOUS FLOW switch to the *CONTINUOUS FLOW* setting until no oxygen can be heard venting from the unit.
3. Turn the unit's securing knob counterclockwise to lift the unit off the cylinder.

# *ImPulse Elite as a Portable Unit*

The ImPulse Elite unit and its accessories are light weight and portable. This means that ImPulse Elite can go virtually anywhere you go.



## Cautions

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Do not expose the device to, or submerge it in, water.

Do not expose the device to extreme temperatures.

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The universal-style carrying case, as shown in Figure 14, can be used with the unit. During use, ImPulse Elite should remain in your carrying case. This ensures added protection for the unit and allows discreet use. Simply check periodically to ensure that your cannula connection is secure and that the cylinder shutoff valve remains in the open position (one full turn counterclockwise) to enable oxygen flow.



Figure 14

# Proper Care & Maintenance

Keep the ImPulse Elite clean and free from moisture, dust, and extreme temperatures. To help prevent possible damage to the unit, keep ImPulse Elite in its carrying case.

Clean the unit periodically by wiping with a lint-free cloth. Pay special attention to the oxygen outlet for the cannula connection to make sure it remains free of dust, water, etc. Do not expose or submerge the ImPulse Elite device in water.

We recommend using a one-part bleach to 99 parts water solution or using Fantastik® spray cleaner as a safe cleaner for the ImPulse Elite's outer housing.

A list of undesirable chemical cleaning agents includes, but is not limited to the following, according to the plastic manufacturer: alcohol and alcohol-based products (isopropyl alcohol), concentrated chlorine-based products (Ethylene Chloride), and oil-based products (Pine-Sol, Lestoil). These are NOT to be used to clean the plastic housing on the ImPulse Elite OCD. These chemicals and the cleaners that contain them will crystallize the plastic and break down the plastic's molecular properties.

Replace the disposable cannula periodically following normal usage. Additional supplies are available from your Equipment Provider or AirSep.

Return empty oxygen cylinders to your supplier for replacement. Remove the unit from the empty cylinder before returning the cylinder to your supplier.



## Note

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Do not open the electronic compartment to service the device. Open only the battery compartment when necessary. To prevent a voided AirSep warranty, follow all manufacturer's instructions.

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# Troubleshooting Guide

If your unit fails to operate as described in this manual, first review the following chart for possible causes and solutions. If necessary, contact your Equipment Provider.

<b>Problem</b>	<b>Possible Cause</b>	<b>Solution</b>
Power switch ON but no lights display.	No battery in unit, or battery requires replacement.	Replace battery.
	Battery not inserted correctly.	Insert battery properly by referencing polarity guide on inside of battery compartment door.
Intermittent power, intermittent pulsing, lights flash, alarm sounds.	Battery may be discharged.	Replace Alkaline battery with new D-cell Energizer battery.
Oxygen leaks from unit.	Brass/CGA sealing washer is missing from unit.	Ensure that the brass/CGA sealing washer is present at the oxygen cylinder connection on the unit.
	Worn brass/CGA sealing washer.	Replace brass/CGA sealing washer.
	Unit not properly secured to cylinder, or securing knob not tight.	Close cylinder valve and verify that the unit alignment pins are correctly fitted to the cylinder alignment holes and that the securing knob is tight.
Constant flow of oxygen from unit.	PULSE FLOW/CONTINUOUS FLOW switch in <i>CONTINUOUS FLOW</i> position.	Position switch to PULSE FLOW position.
Unit does not deliver oxygen.	Cannula tubing is kinked or not properly adjusted.	Check or replace tubing as necessary.
	ON/OFF power switch set to <i>OFF</i> position.	Set ON/OFF power switch to <i>ON</i> position.
	Oxygen cylinder is empty.	Replace cylinder.
	Oxygen cylinder valve is closed.	Open cylinder valve a minimum of one turn counterclockwise.
Any other unit problem.		Contact your Equipment Provider.

# Equipment Provider Information

## Specifications

Dimensions: 4.39 in. x 5.58 in. x 2.55 in.  
11.15 cm x 14.17 cm x 6.48 cm

Weight: 24 oz (with D size battery)  
682 g

Power: (1) 1.5 V "D" alkaline battery

Indicators: Alarm/No inspiration — Audible/Visual (red)  
Low Battery — Audible/Visual (yellow)  
Pulse Flow — Visual (green); indicates good battery

Continuous Flow: 2 lpm oxygen; manual switch

Contents Gauge: Red/Refill Zone: 0–500 psi  
Green Shaded Zone: 500–2,200 psi  
Green Outlined Zone: 2,200–3,000 psi

Operating Temperature: 32°F to 104°F (0°C to 40°C)

Maximum Cylinder Pressure: 3,000 psi

# *Limited Warranty*

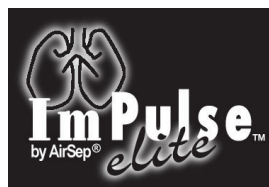
AirSep Corporation warrants the ImPulse Elite Oxygen Converter to be free from defect in parts for five years (as specified on the original invoice provided) from the date of delivery to the original purchaser, under normal use and operation. AirSep Corporation's obligations under this warranty are limited to the repair or replacement of any such item of equipment (or part thereof) shown to be defective or, at AirSep Corporation's option, to refunding the purchase price of any such defective item of equipment.

Each item of equipment for which a warranty claim is asserted shall, at the request of AirSep Corporation, be returned on a prepaid basis with proof of purchase date to the AirSep factory at the expense of the purchaser. The purchaser will be responsible for return freight charges. Replacement parts shall be warranted as stated above for the unexpired portion of the original five-year parts warranty (as specified on the original invoice provided). This warranty does not extend to any item or part subjected to misuse, accident, improper maintenance, or application, or which has been repaired or altered outside of the AirSep Corporation factory without the express prior written authorization of AirSep Corporation.

THE FOREGOING WARRANTY IS IN LIEU OF ANY OTHER WARRANTY, EXPRESSED OR IMPLIED, IN FACT OR IN LAW, INCLUDING WITHOUT LIMITATION THE WARRANTY OF MERCHANTABILITY OR THE WARRANTY OF FITNESS FOR PARTICULAR PURPOSE. IT IS EXPRESSLY UNDERSTOOD THAT PURCHASER'S SOLE AND EXCLUSIVE REMEDY FOR DEFECT IN PARTS IS LIMITED TO ENFORCEMENT OF AIRSEP CORPORATION'S OBLIGATION AS SET FORTH ABOVE, AND AIRSEP CORPORATION SHALL NOT BE LIABLE TO PURCHASER OR OTHERS FOR LOSS OF USE OF THE EQUIPMENT OR FOR OTHER SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES.



For service on your ImPulse™ Elite  
oxygen conserving device, contact:



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