OPERATING INSTRUCTIONS

PURITAN-BENNETT

HELIOS TM Oxygen System



Federal (U.S.) law restricts these devices to sale by or on the order of a physician.

SAVE THESE INSTRUCTIONS



IMPORTANT INFORMATION ABOUT YOUR PRESCRIPTION

Date your unit was received:
Your name:
Prescribed oxygen flow setting:
during sleep
• at rest
during exercise
Doctor's name:
Doctor's phone number:
Home care company's name:
Home care company's phone number:
Emergency contact's name:
Emergency contact's phone number:
Special Instructions:

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Important Notice:

Be sure to read and understand this instruction manual completely before attempting to operate your HELiOS Oxygen System.

Do not permit anyone who has not read these instructions to handle or operate this equipment.

The HELiOS Oxygen System is intended only for the delivery of medical grade oxygen as prescribed by your physician.

This manual is provided to assist in the safe operation of the HELiOS Oxygen System and to ensure maximum benefit from its use. If you have any questions about the operation of the equipment, please consult your oxygen supplier.

GENERAL SAFETY PRECAUTIONS

Throughout this manual you will see three kinds of special information: warnings, cautions and notes. Make sure you carefully read and understand this information. Each is important and may be related to the surrounding instructional information.

WARNING



A warning identifies a hazard and is boxed in and accompanied by a symbol. Warnings describe conditions that concern your personal safety and the safety of others. They are followed by the actions required to prevent injury. Ignoring warnings can lead to injury or death.



CAUTION

A caution informs you about conditions that may cause possible damage to the equipment or other property; or situations which may cause reduced, or no oxygen flow. Ignoring cautions may cause damage to the equipment or make it unusable.

NOTE: Notes provide important information about using the equipment properly.

WARNING



 Oxygen supplied from this equipment is for supplemental use and is not intended to be life supporting or life sustaining. This equipment is not intended for use by patients who would suffer immediate, permanent, or serious health consequences as a result of an interruption in the oxygen supply.



 Do not smoke near this equipment. Keep cigarettes or burning tobacco away from the area where equipment is operated.



 Keep flammable materials away from this equipment. Oils, grease, including facial creams and petroleum jelly, ignite easily and may burn rapidly in the presence of oxygen. Never lubricate any part of this equipment.



 Do not touch liquid oxygen or parts that have been in contact with liquid oxygen. Liquid oxygen is extremely cold (-297 °F / -183 °C). When touched, liquid oxygen, or parts of the equipment that have been carrying liquid oxygen, can freeze skin and body tissue.



Always keep the Reservoir in an upright position.



 Always keep the Portable in one of the following positions: upright, flat on its back or any position in between.



 Keep this equipment away from electrical appliances. Use and store Reservoir and Portable units at least five feet from electrical appliances that may cause heat or sparks.



 Keep oxygen equipment away from open flames. Use and store Reservoir and Portable units at least five feet away from equipment such as furnaces, water heaters, and stoves that may contain open flames.



Keep equipment in a well-ventilated area at all times. These
units periodically release small amounts of oxygen gas that must
be ventilated to prevent buildup. Do not store liquid oxygen
equipment in a closet, car trunk, or other confined area. Do not
place blankets, draperies, or other fabrics over equipment.

WARNING



 Do not carry the Portable unit under your clothing. These units normally vent oxygen. Wearing a Portable unit under clothing may saturate fabrics with oxygen and cause them to burn rapidly if exposed to sparks or flame. It may take several hours for oxygen levels in fabric to return to normal.



 Never tamper with the equipment. Doing so could create a hazardous condition and possibly cause the equipment to work improperly.



 Always keep tubing or oxygen supply line away from path of walking to avoid potential trip or fall.



 Use only with recommended supply line. Connecting the portable to a wrong gas source could cause inhalation of hazardous substances.



CAUTION

- Consistent with the recommendations of the medical community on the use of conserving devices (which includes the nasal cannula), it is recommended that the HELiOS System be qualified on patients in the situations it will be used (rest, exercise, sleep). Differences in nasal cannula design may vary the ability to trigger a conserving device.
- Although there are no risks associated with the disposal of any components within this device, in the interests of environmental protection, it is recommended that all used or faulty components be returned to the manufacturer.
- Remove the 9 volt battery from the Reservoir contents indicator if it will not be used for some time. Carefully dispose of the 9 volt battery from the Reservoir contents indicator with due regard for the environment.
- Although the HELiOS Oxygen System complies with IEC 601-1:1993, (Electromagnetic Compatibility), it is recommended that high energy emitting equipment, for example, cellular phones, are not operated in close proximity to the HELiOS Oxygen System.

DEFINITION OF SYMBOLS

SYMBOL	DEFINITION
	Reservoir Full
	Reservoir Empty
	Portable Full
	Portable Empty
- +	Low Battery (9VDC)
IPX 1	Drip Proof
†	Type BF (Electrical Safety)

Environmental Specifications

Operating: $-20 \, ^{\circ}\text{C} \text{ to } 40 \, ^{\circ}\text{C}$

95% maximum relative humidity

Storage: -40 °C to 70 °C

90% maximum relative humidity

INTRODUCTION TO YOUR HELIOS OXYGEN SYSTEM

Your HELiOS Oxygen System is designed to store and deliver oxygen at a prescribed rate. The system consists of two units: the Portable and the Reservoir.

The Portable can be supplied with oxygen for you to breathe in two ways. First, you may fill the Portable with liquid oxygen so you can be free to move about your home or leave your home for extended periods. Second, you can connect the Portable to the Reservoir.

The Portable may be used with either a standard HELiOS Reservoir or a HELiOS Universal Reservoir. The HELiOS Universal Reservoir can also be used to fill Puritan Bennett Companion[®] portables. Refer to the Companion portable operating instructions for procedures to properly fill the Companion portable.

The HELiOS System was designed to maximize your freedom of movement. You can fill the Portable with liquid oxygen every day to use as far from the Reservoir as you desire. When you are in your home and not moving about, such as in the evening or while you are sleeping, you may connect the Portable to the Reservoir with an oxygen supply line. When the Portable is connected to the Reservoir in this manner, the oxygen you breathe is supplied by the Reservoir unit.

Your oxygen supplier (e.g. home care provider) must refill your Reservoir unit periodically depending upon your rate of oxygen use.



Fill the Portable for mobility outside the home



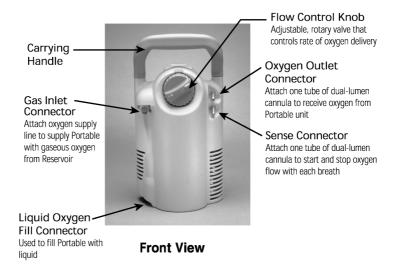
While resting or sleeping, connect oxygen supply line to Reservoir to decrease frequency of refill

Become familiar with the various parts of your HELiOS Oxygen System.

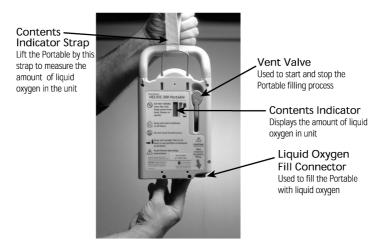
Reservoir



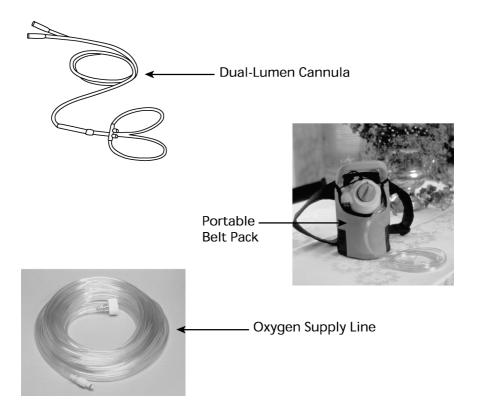
Portable



Portable



Back View



HOW TO USE YOUR HELIOS OXYGEN SYSTEM

Filling the Portable Unit

Fill the HELiOS Portable unit from the Reservoir as follows:

WARNING



 Using a dry cloth that is clean, wipe the fill connector dry on both the Reservoir and Portable units before filling to prevent freezing and possible equipment failure.



- Extreme cold hazard. Do not press or disturb the plastic poppet in the center of the fill connector on the Reservoir. This will cause a release of liquid oxygen from the fill connector.
- Check the contents indicator on the Reservoir by pressing the blue button to
 ensure there is enough liquid oxygen for filling purposes. If the yellow light
 comes on, you may proceed with filling the Portable, but you should inform
 your oxygen supply company.
- 2. Using a dry cloth that is clean, wipe the male fill connector on the Reservoir and female fill connector on the Portable.
- 3. Position the HELiOS Portable over the recessed area in the top of the Reservoir. (Figure 1).



POSITIONING THE PORTABLE FOR FILLING

Figure 1

- 4. Carefully lower the Portable into place, ensuring that the fill connectors are properly aligned.
- 5. Place one or both hands on top of the Portable and press straight down directly over the fill connector, being careful not to depress the release button on the Reservoir when engaging (Figure 2). This will lower the Portable unit approximately 3/8 inch (10 mm). Continue to apply downward force to ensure the fill connectors remain engaged.
- 6. While holding the Portable unit in the fill position, pull down and hold the vent valve lever in the open position (90° from the normal "off" position) (Figure 2). A hissing noise should be noticeable. During filling, maintain a slight downward force on the unit with one hand to keep the unit steady and maintain proper filling position.

NOTE: Fill time is usually between 25 and 60 seconds when the Portable is empty. The amount of time to fill the unit depends on the amount of oxygen remaining in the Portable.



FILLING THE PORTABLE

Figure 2

WARNING



Do not leave the HELiOS Portable unattended during the filling operation.

7. When you notice a change in the sound of venting gas followed by a dense, white vapor forming around the Reservoir cover, close the Portable vent valve by returning the vent lever to the upright position.

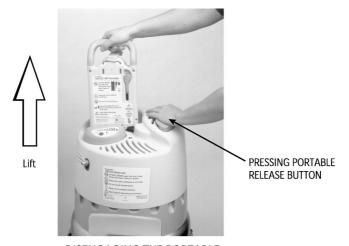


CAUTION

If the vent valve fails to close and the hissing continues, remove the Portable unit by depressing the Portable release button on the Reservoir unit. The Portable will stop venting in a few minutes. Allow the unit to warm until you can close the vent valve. The Portable may require as much as 60 minutes to restore adequate pressure for accurate oxygen flow. An alternate source of oxygen, such as a flow control valve attached to the Reservoir, can be used if needed.

NOTE: For shorter planned use times, you can partially fill the Portable by closing the vent valve sooner than normal. The Portable will then be lighter to carry.

8. Disengage the Portable from the Reservoir unit by holding the carrying handle and depressing the release button (Figure 3). Always hold the Portable unit with at least one hand when attempting to disengage it.



DISENGAGING THE PORTABLE

Figure 3

NOTE: If the units will not disengage easily, they may have become frozen. **DO NOT USE FORCE.** Simply allow a few minutes for the frozen parts to warm, then disengage the Portable when the ice has melted.

WARNING



- If a minor liquid oxygen leak from the Reservoir fill connector occurs when you disengage the Portable, re-engage and disengage the unit to help dislodge any ice or other obstruction. If the liquid oxygen leak persists, notify your oxygen supplier.
- If a major liquid oxygen leak from the Reservoir fill connector occurs when you disengage the Portable unit (that is, a steady stream of liquid oxygen), stay away from the unit and immediately notify your oxygen supplier.

NOTE: Immediately after filling, you may hear a slight hiss from the Portable. This is normal and will stop after a few minutes.

9. Check the oxygen contents indicator to make sure the Portable unit is filled to the desired level. The amount of liquid oxygen contained in the Portable is measured by an internal scale that is built into the unit. To operate the contents indicator: (1) lift the HELiOS Portable unit by the contents indicator strap, (2) push the bottom backside of the unit so that it is straight up and down and (3) observe the green bar that displays the liquid oxygen contents level inside the clear window (Figure 4).







Figure 4

NOTE: Do not try to overfill the Portable. Once you hear the change in the sound of venting gas and see the cloud of white vapor, the unit is full. Continuing the fill process will not put any more oxygen in the Portable. Overfilling may cause drops of liquid oxygen to spray from the bottom of the Portable.

NOTE: After each fill, do not try to refill the Portable again for at least 30 minutes. This will prevent the possibility of the unit wasting oxygen and prevent the vent valve from potentially freezing.

NOTE: The number of times that you have to fill up or "top off" your HELIOS Portable depends on which of the 11 settings is prescribed by your doctor and the frequency of your breath rate. On average, a setting of 2 lasts about 8 to 10 hours. However, the actual time may vary depending on your particular circumstances.

NOTE: You may also fill the HELiOS Portable from Puritan-Bennett Companion C21, C31, C41 Stationary or Companion Low Loss C31LL units.

Breathing From the Portable Unit

In order to breathe from your HELiOS Portable, you must do so through a duallumen nasal cannula. The nasal cannula has two connections at the Portable. One connection is used to sense when you inhale, the other connection is used to supply oxygen into your nose as you inhale.

Connect a dual-lumen cannula to your Portable as follows:

1. Attach both ends of dual-lumen cannula to the Portable as shown below. Either end of the dual-lumen cannula may be attached to either connector on the Portable (Figure 5).



Figure 5

2. Turn the flow control knob on the top of the Portable clockwise to the setting prescribed by your physician (Figure 6). The flow setting value should be clearly readable in the center of the window. The Portable unit will not deliver oxygen to you if the flow control knob is set between flow settings.



Figure 6

When your Portable unit is set to 1 or above, oxygen will be delivered only while you inhale. You should notice a small pulse at the beginning of each breath. Oxygen is delivered during this pulse, and continues as long as you inhale. Oxygen flow stops when you stop inhaling. It is normal for the device to occasionally skip a breath or to pulse twice in one breath.

When your portable unit is set below 1, oxygen is delivered continuously at the rate displayed on the flow control knob. For example, the .5 setting delivers continuous flow oxygen at .5 L/min.

The table below shows approximate use times for your Portable unit after it has been completely filled. The table below was constructed using a breathing pattern that is typical for oxygen patients. Your use time may vary substantially from the use time listed below. You should learn through experience how long the Portable unit will last under your circumstances. The table below of approximate use times is correct even though in some cases it doesn't seem logical. For example, the .75 setting doesn't last as long as the 1 setting because the .75 setting is continuous flow and the 1 setting is demand flow. Also, the 1 setting doesn't last twice as long as the 2 setting because of unique properties of liquid oxygen.

Approximate Use Time of a Full Portable Unit. YOUR USE TIME MAY VARY.					
Flow Control Knob Setting	Approximate Use Time				
0	Not Applicable				
.12	15 Hours				
.25	15 Hours				
.5	10 Hours				
.75	6.5 Hours				
1	13 Hours				
1.5	12 Hours				
2	10 Hours				
2.5	8.5 Hours				
3	6.5 Hours				
3.5	6 Hours				
4	5 Hours				



CAUTION

You must use a dual-lumen cannula of 7 foot length or shorter (see page 28) to insure proper oxygen delivery from the Portable unit. Make sure both connections of the dual-lumen cannula are firmly attached to the Portable Oxygen Outlet and Sensor connectors.

3. With the tips of the cannula pointing downward and toward you, place the two tips into your nostrils. Run the tubing over your ears and then slide the sleeve up under your chin until the cannula feels comfortable (Figure 7). Then breathe normally.

NOTE: Make sure that the tips remain in your nostrils and do not slide to one side.

NOTE: Ocassionally water droplets caused by exhaled humidity may accumulate in the cannula. This may disrupt the operation of the oxygen conserving device. If this happens, replace the moist cannula with a dry one. Allow the moist cannula to dry before using it again.

NOTE: Currently, there are two dual lumen cannula designs available for use with the HELiOS. One cannula provides sensing and delivery of oxygen in each nostril. This is the best one to use when experiencing a blocked nasal passage. The other provides oxygen from one side and senses when to provide oxygen on the other. Also, the tips are slightly smaller and softer.

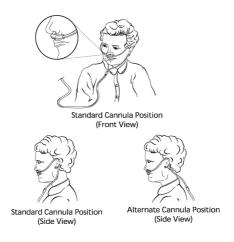


Figure 7

4. The contents indicator will show approximately how much liquid oxygen remains in the unit. To ensure you have enough oxygen to meet your needs, check the indicator periodically. Hold the unit by the strap and push the bottom backside of the unit until it is straight up and down to read contents (Figure 8). When checking the contents, it is important to remove any carry accessories and to make sure your nasal cannula is not pulling on the Portable.







Figure 8

Positioning of Portable Unit During Use

WARNING



Always keep the Portable in one of the following positions: upright, flat on its back or any position in between.

Your HELiOS Portable was designed to operate in a variety of positions for your convenience. It is important to always keep the portable in one of these positions or oxygen may escape. This will shorten the time you can be away from home.

Your HELiOS Portable is designed to work when sitting upright, when laying flat on it's back or anywhere in between. The unit should not be placed on its front, on its edge or with the handle lower than bottom of the unit. Figure 9 shows typical situations and how the Portable should be positioned. Figure 10 shows unacceptable positions.

ACCEPTABLE POSITIONS



Portable laying flat on its back



Portable laying in an incline position on its back



Portable in an upright position

Figure 9

UNACCEPTABLE POSITIONS



Portable positioned with handle lower than bottom of unit



Portable positioned on its front/edge



Portable positioned with handle lower than bottom of unit, laying on its front

Figure 10



CAUTION

If your Portable unit was placed in an unacceptable position for more than five minutes, check the contents level to see how much oxygen remains, and set the unit in an acceptable position for at least 15 minutes before attempting to fill the unit. Placing the Portable in an unacceptable position may cause loss of oxygen or vent valve lever to become too cold for filling.

Connecting the Portable Unit to the Reservoir Unit

When you no longer wish to leave home or move about for the day, you may connect the Portable to the Reservoir using the oxygen supply line. This will reduce wasted oxygen and will improve the efficiency of the Reservoir. To achieve maximum efficiency from the standard HELiOS Reservoir, you should connect the Portable to the Reservoir at least 10 hours per 24 hour period. It is important that the Portable be nearly empty so that the oxygen from the Portable comes directly from the Reservoir. This will maximize the efficiency of the system. Connect your Portable to the Reservoir as follows:

1. Thread the oxygen supply line nut onto the Reservoir oxygen supply outlet as pictured below (Figure 11). Make sure the connection is tight. If a hissing sound is heard, tighten until the hissing stops.

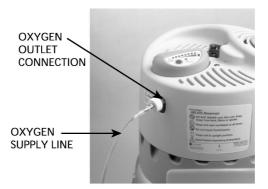


Figure 11

2. Connect the opposite end of the oxygen supply line to the Portable at the oxygen supply connector by pushing the supply line into the connector (Figure 12). The connectors should snap together. If the supply line does not easily engage into the Portable, push the silver release button on the Portable connector and try again.

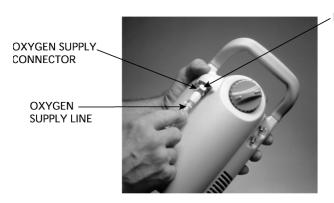


Figure 12

3. You can now breathe off the Portable unit as long as there is oxygen in the Reservoir unit. You can determine the oxygen contents in the Reservoir unit by pushing the blue button on the Reservoir contents indicator (reference Figure 14). If you get a green light, the level is fine. If the yellow light appears, inform your oxygen supply company.

CAUTION



When the Reservoir and Portable are connected, avoid putting the unrolled supply line in places where it might be damaged or tripped over. One sign of damage is frost on the supply line, indicating that a puncture or cut is causing an oxygen leak. If this occurs, disconnect the supply line from the Reservoir.

4. To disconnect the supply line from the Portable, push the release button and gently remove the supply line from the connector.

MAINTENANCE

Moisture Container:

If moisture is collected, empty by pulling out the moisture container and pouring the water into a sink for disposal (Figure 13). To reinstall the moisture container push it into the Reservoir housing until it is held firmly in place. Empty the container when the water reaches the full (1/1) line or water may spill onto your floor.



Figure 13

Low Liquid Oxygen Level:

To determine if the oxygen contents in the Reservoir unit, push the blue button on the contents indicator (Figure 14). If you get a green light, the level is fine. If the yellow light appears, inform your oxygen supply company.



Figure 14

Low Battery Level:

A yellow light appears on the Reservoir contents indicator when the battery needs to be replaced. This should happen very seldom. Your oxygen supply company may change your battery at their next visit or if you choose to change the battery, use a coin to open the battery door as shown below (Figure 15). Use only a 9 volt alkaline battery as pictured (Figure 16).

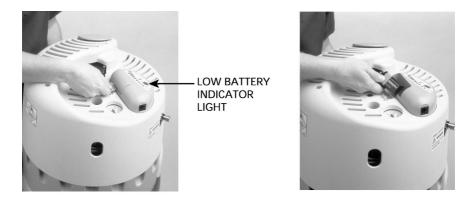


Figure 15 Figure 16

CLEANING

Do NOT use alcohol, solvents, polishes, or any oily substance on oxygen equipment. If cleaning is necessary, use only warm water and a mild dish washing detergent. Dampen a cloth in the detergent and water solution and wipe the outside surfaces of the equipment until clean.



CAUTION

- Do not allow water into any of the controls, the fill connector, or the oxygen supply connector.
- Never attempt to repair or disassemble this equipment. You could create a hazardous condition or cause equipment failure. If you have problems, questions, or are unsure if equipment is operating properly, call your liquid oxygen supplier.

TROUBLESHOOTING

The following information is intended to help you troubleshoot and solve simple operational problems that you may experience when using your HELiOS Portable.

1. The Portable makes a hissing sound.

Hissing can occur to maintain the correct operating pressure within the Portable. It is most likely to hiss after filling or when the position of the Portable is changed. Hissing can last for approximately 10 minutes after filling. Additionally, it can occur when the flow control valve is at a low setting.

2. The Portable does not pulse after filling.

If during the filling process, the Portable is disengaged with the vent valve lever down, pressure may be reduced within the Portable causing a delay in the conserving device function. It may require as much as 60 minutes to restore adequate pressure for accurate oxygen flow. Additionally, improper filling or lower than normal operating pressure in the Reservoir will contribute to the unit not pulsing.

3. The Portable stops pulsing during use.

- Ensure that both connections of the dual lumen cannula are firmly attached to the Oxygen Outlet and Sensor connectors.
- Change the cannula if water droplets are present from humidified exhaled gas. Replacing the cannula with a dry one enhances the ability of the Portable to pulse.
- Ensure that the cannula is not kinked.
- Ensure that the cannula tips remain in your nostrils and do not slide to one side.
- Ensure that there is oxygen in the Portable.
- With the cannula on, close your mouth and breathe only through your nose to verify that the Portable has stopped pulsing.

4. The Portable does not fill.

- Verify that there is oxygen in the Reservoir.
- Ensure that the Portable and Reservoir fill connectors are fully engaged throughout the filling process.

5. The Portable vent valve does not close properly at the end of the filling process.

If the vent valve fails to close and the hissing sound and oxygen vapor cloud continue, carefully remove the Portable by depressing the release button on the Reservoir. Venting from the bottom of the Portable will stop in a few minutes. Allow the unit to warm until you can close the vent valve. The Portable may require as much as 60 minutes to restore adequate pressure for accurate oxygen flow. If needed, use an alternate source of oxygen such as a flow control valve attached to the Reservoir.

6. Frost forms on the oxygen supply line connected to the Reservoir.

Frost on the supply line is most likely the result of a leaky connection or a split in the line. If the connection at the Reservoir outlet is leaking, keep tightening the nut until the leak stops. If the supply line is split or damaged, disconnect the line from the Reservoir and contact your home care provider.

7. The Portable does not disengage easily from the Reservoir after filling.

The Portable and Reservoir fill connectors may have become frozen. **DO NOT USE FORCE.** Allow a few minutes for the frozen parts to warm, then disengage the Portable when the ice has melted. To prevent the units from freezing together, always wipe the male fill connector on the Reservoir and the female fill connector on the Portable with a clean, dry cloth before filling.

ACCESSORIES

The following accessories are available to help you obtain the most benefit from your HELiOS System.



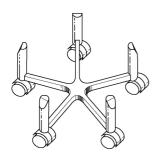
Dual-Lumen Cannula

An oxygen cannula delivers oxygen from the Portable unit to your nose. The cannula has two connections. One is to sense when you inhale, the other is to deliver oxygen to you while you inhale.



Oxygen Supply Line

The supply line is used to connect your portable unit to your reservoir. When the portable unit is connected, the oxygen you breathe comes from the reservoir. For instructions on how to connect the supply line, refer to page 20.



Roller Base

The roller base allows the delivery person to roll the reservoir to your door before taking it from the house to fill. It is not recommended for patients to roll the reservoir around frequently in the house. The reservoir is very heavy and should never be tipped over.



Portable Belt Pack

The Portable Belt Pack makes it convenient to carry the Portable unit with you.



Figure 17



Figure 18

External Flow Control

An external flow control is available to attach to your HELiOS reservoir (Figure 17). If your physician determines that you need an external flow control, your oxygen supply company will provide it. It should be attached as shown in the picture below. You may also be instructed to use a humidifier bottle with an external flow control (Figure 18). When using an external flow control, your oxygen supply company will supply you with a supply line and a single lumen cannula for use with the Reservoir.

WARNING



An external flow control that can be set higher than 10 L/min should not be attached to your HELiOS Reservoir.

Accessory Part Numbers	Description
B-701511-00	Dual-Lumen Cannula - 3 ft./0.9 m Length (Sense and delivery in each nostril)
6-778058-00	Dual-Lumen Cannula - 5 ft./1.5 m Length (Sense and delivery in each nostril)
6-778057-00	Dual-Lumen Cannula - 7 ft./2.1 m Length (Sense and delivery in each nostril)
B-701931-00	Dual-Lumen Cannula -4 ft./1.2 m Length (Sense and delivery in separate nostrils)
B-701930-00	Dual-Lumen Cannula - 7 ft./2.1 m Length (Sense and delivery in separate nostrils)
B-701656-00	Oxygen Supply Line - 50 ft./15.2 m Length
B-701432-00	Oxygen Supply Line, Extension - 50 ft./15.2 m Length
B-701537-00	Roller Base
B-701655-00	0-10 LPM External Flow Control
B-701654-00	Portable Belt Pack

You	Your local supplier:							



Manufacturer:

Puritan-Bennett Corp. 2800 Airwest Blvd. Plainfield, IN 46168 USA Toll Free: 1-800-635-5267